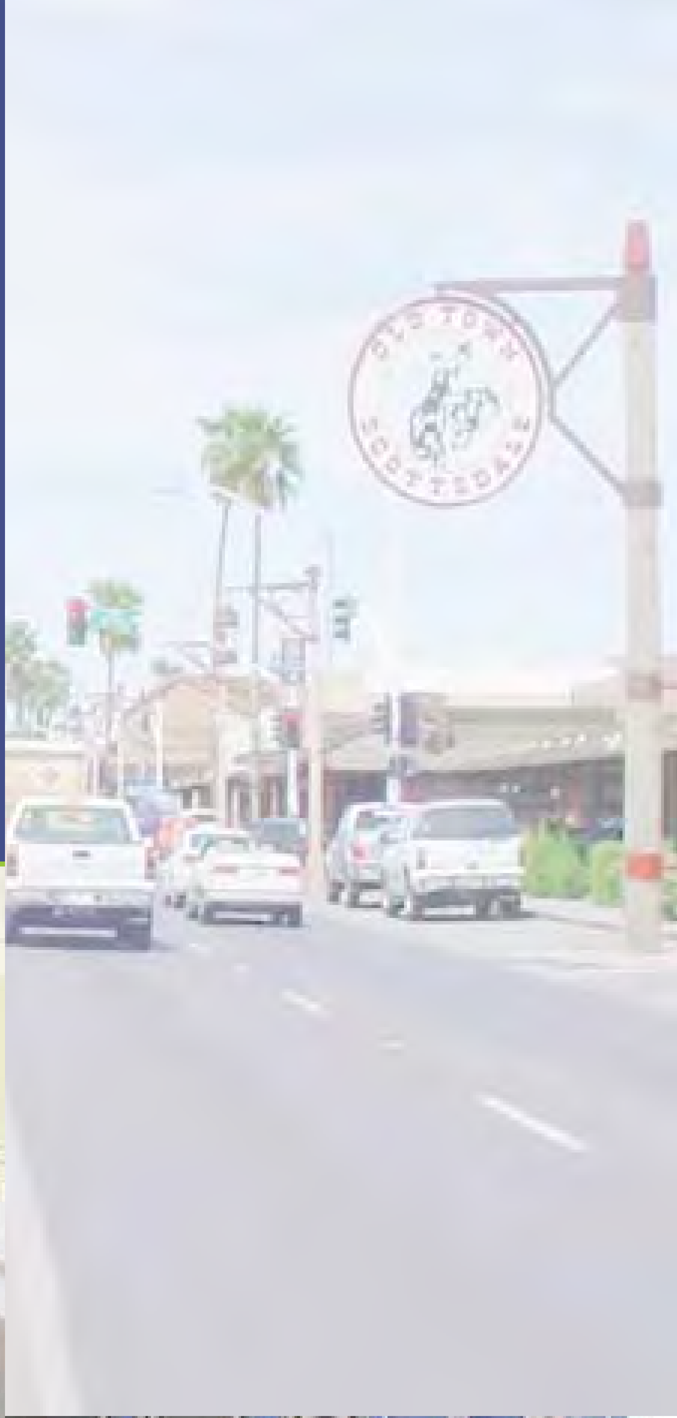
CITY OF SCOTTSDALE ARIZONA



Scottsdale
Transportation Master Plan

January 2008

TRANSPORTATION MASTER PLAN

ADOPTED JANUARY 8, 2008

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SPECIAL ACKNOWLEDGEMENTS

COMMUNITY WORKING GROUP

Marilyn Armstrong
Marilynn Atkinson
Nancy Cantor
Carla
Don Couvillion
Janie Ellis
Lisa Haskell
Steve Hogan
Karl Isenburg
Jim Keeley/Grant Estabrook
Michael Kelly
Graham Kettle
Rick Kidder
Kevin Kudlo
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CITY STAFF

Former City Manager Jan Dolan
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Assistant City Manager David Ellison
Assistant City Manager Ed Gawf

Mary O'Connor, Transportation General Manager
Dave Meinhart, Transportation Planning and Transit Director
Paul Porell, Traffic Engineering Director
Scott Gray, Airport Director
Teresa Huish, Principal Transportation Planner/Project Manager

Rose Arballo, Office Coordination Manager
Debra Astin, Transit Manager
Jennifer Bohac, Senior Traffic Engineer
Walt Brodzinski, Right of Way Manager
Madeline Clemann, Public Works Planner
Dawn Coomer, Senior Transportation Planner
Bruce Dressel, ITS Supervisor
Daniel Gabiou, Transportation Intern
Amy Hargraves-Foerster, Transit Manager
John Kelley, Transit Planner
Reed Kempton, Principal Transportation Planner
Phil Kercher, Principal Traffic Engineer
Jennifer Lewis, Transportation Planner
John Lynch, Senior Transportation Planner
Jim McIntyre, Communications Specialist
Evelyn Ng, Transportation Planner
Lorraine Protocollo, Administrative Secretary
Todd Taylor, Senior Traffic Engineer
George Williams, Senior Traffic Engineer

CONSULTING TEAM

HDR Engineering, Inc.
HDR | SR Beard
Sprinkle Consulting
Beneficial Design

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

EXECUTIVE SUMMARY

There are five main elements in the *Transportation Master Plan*: Policy; Streets; Transit; Bicycle; and Pedestrian. In addition, three specific area circulation studies were completed in the *Transportation Master Plan*: North; Airpark; and Central/Downtown. Many of the area plan policy statements and objectives are included in the elements of the *Transportation Master Plan*; however, the complete area circulation studies are included in the body of the *Master Plan* document for easy reference.

1.0 CITYWIDE POLICY

The Policy Element addresses general citywide policies that are not specific to a particular transportation mode, or a specific area within the City. Based on the voter-approved *General Plan*, the focus is on providing choices in transportation modes, increasing efficiencies of our transportation system, as well as improving and maintaining safety.

A formal "Complete Streets" policy and implementation of that policy. The City's guidelines and design practices already promote the idea of streets that can be used comfortably by all users. However, a "Complete Streets" policy reinforces this concept to ensure that the entire right-of-way is designed for safe and comfortable access for all users (vehicles, bicycles, pedestrians, transit users, and equestrians) and relates to local context within the different areas of the City. Provision of facilities for users including lighting and safety improvements, travel lane restriping for bicycle lanes, and ensuring that complete streets are incorporated in all new roadway construction and reconstruction projects will be part of the implementation of this policy.

Mode split and vehicle miles traveled (VMT) targets for 2030. Numerical goals, in the form of target percentages for increasing mode split (improvement of the share of non-auto trips) and reducing the per capita amount of vehicle miles traveled, are included in the Policy Element.

- The policy sets a goal of mode split targets of 25 percent by non-single occupant vehicle modes within the City's activity centers (e.g., Downtown) by 2030. [Current citywide mode split during peak hours is approximately 20 percent, including carpools.]
- Vehicle miles traveled per capita has been fairly flat since about 2000. The policy sets a goal of 10 percent reduction in vehicle miles traveled per capita by 2015, and 20 percent by 2030.

Recognize different transportation solutions for different areas of the community. Context-sensitive design is defined as an approach to developing and redesigning transportation facilities that fit into the local environment (natural and man-made) while preserving aesthetic, historic, community, and natural environmental values. Policies regarding context-sensitive design respect the City's area circulation plans as well as relevant parts of adopted Character/Community Area plans for transportation standards and design.

Dedicate a higher percentage of available capital funding for transit, bicycle, trail, and pedestrian system enhancements. Currently, approximately 26 percent of the City's transportation capital funding is used for transit, bicycle, trail, and pedestrian system enhancements. The Policy Element increases this percentage to 33 percent of available transportation capital funding.

Promote the efficiency of the transportation system through a variety of existing and new policies.

- Develop a measure of person-capacity in the transportation system, versus the traditional tool of vehicular capacity, through the City's new travel demand model.
- Maintain vehicular level of service (LOS) D or better at most signalized intersections, except in designated activity cores or urban roadway corridors where walkability, transit access, and aesthetic or right-of-way considerations are overriding.
- Monitor average roadway travel times and develop mitigation strategies when a trip takes 25 percent longer in peak travel times than during non-peak times.
- Continue to use access management to maximize roadway capacity, and streamline access management administration to allow requests for exceptions to be reviewed by the Transportation General Manager, with appeals to the Transportation Commission.
- Enhance Intelligent Transportation System (ITS) usage and application to other transportation modes such as *Regional Transportation Plan* bus rapid transit corridors, and applications that show real-time traffic conditions on the Internet or real-time transit vehicle speed and estimated trip timing through vehicle sensors.
- Continue to enhance the City's rights-of-way management program through ordinance revisions and other methods, providing a central point of coordination and management for competing activities in the public right-of-way to minimize impacts and avoid parallel lane closures and restrictions.

Roadway modification guidelines (using 2030 forecasted average daily volumes).

- There should be no widening beyond six through travel lanes.
- Traffic volumes on two-lane collectors should be <8,000 vehicles per lane per day
- Traffic volumes on four-lane collectors should be <9,000 vehicles per lane per day
- Traffic volumes on four-lane arterials should be <10,000 vehicles per lane per day
- Use character type considerations when roadways should be widened:
  - Rural – when forecasted volumes reach 90 percent of target traffic volume threshold (listed above)
  - Suburban – when forecasted volumes reach 100 percent of target threshold
  - Urban – when forecasted volumes reach 120 percent of target threshold
- Widening to add through travel lanes is limited to minimum 1-mile segments (typically)
- Four-lane roadways could be considered for lane reductions when forecasted volumes are <12,000 vehicles per day total (fewer than 3,000 vehicles per lane per day).
- Consider the least impactful solutions for corridor capacity first. For example, assess and implement signing, striping, intersection control, and sight distance improvements before considering adding pavement to enhance capacity.

Embrace sustainability in the transportation system. The City of Scottsdale is dedicated to the goals of sustainability as evidenced through its McDowell Sonoran Preserve and Green Buildings program focus. The Policy Element encourages using environmentally sensitive materials and technologies in transportation projects and improvements, encourages greater transit use and recognizes walking and biking as serious modes of transportation to potentially decrease the number of vehicles on the road, and uses innovative traffic engineering solutions such as ITS and roundabouts to reduce roadway lifecycle costs, fuel consumption, and vehicle emissions associated with travel delay.

Embrace the concept of universal design by providing facility designs that accommodate the widest range of potential users, including people with disabilities and other special needs. This will be accomplished through education programs; by assessing a percentage of all shared-use paths each year for accessibility, maintenance, and inventory; by increasing the number of shaded/lighted bus stops, including shelters and passenger information; and providing multi-modal access guides for the public, with maps and other information on access by people with disabilities to particular destinations.

Formalize existing City safety policies and focus on education, enforcement, and engineering solutions to transportation safety issues.

- Improve coordination between roadway design speeds/speed limits and the character and function of the roadway corridor.
- Continue to reduce annual collision rates through engineering solutions such as lagging left-turn arrows, roundabouts (installation prioritized at high accident and/or congested locations or where geometry or cost-effectiveness favors), and ITS solutions.
- Develop a safety education program for all users (drivers, cyclists, pedestrians, transit users).
- Establish an ongoing Safe Routes to School program.

Truck route policy/guidelines. The previous City truck routes are displayed on a map last updated in 1996 which did not show any freight or truck routes north of Indian Bend Road. The Policy Element indicates that all major roadways are considered truck routes with time of day limitations considered, based on criteria that include: connection to a regional freeway; reasonable alternative routes for truck traffic; historical usage by truck traffic; adjacent land uses; and noise mitigation measures. Neighborhood and local system roadways will NOT be considered for truck route designations.

Adopt a modified version of the Arizona Department of Transportation (ADOT) noise mitigation policies for use in City roadway projects. The City currently uses the ADOT noise mitigation policies as a guide when building or rebuilding roadways. The Policy Element recommends a policy similar to ADOT's, without a formal cost limitation for noise mitigation. The policy applies to new corridors or projects that add travel lanes and uses a 64 decibel threshold (modeled with rubberized asphalt). Part of the Scottsdale policy is to prioritize noise mitigation alternatives to sound walls, such as earthen berms or vegetation; use rubberized asphalt and other methods to minimize roadway noise; and avoid use of sound walls where scenic corridor setbacks exist.

Implement roadway construction management programs that consider access, through travel, cost and time of construction projects. Schedule arterial roadway construction so that parallel arterials will not be under construction at the same time. On major roadways, work to avoid through travel limitations during construction.

Work with neighbors in unsubdivided and/or non-master planned areas to provide infrastructure to these areas. The purpose of the local infrastructure plans is to guide local decisions for infrastructure improvement (streets, water, trails, etc.) and related development, and to help coordinate the efforts of various City departments in providing these necessary services.

Implement parking policies which can contribute to sustainable transportation practices as well as land use efficiencies, and can make modal choice more convenient. Recommendations include: working with school districts to assist with parking; pick-up and drop-off issues; using ITS and other technologies to provide customer information regarding parking availability; working to develop thresholds for the inclusion of parking structures versus parking lots; reinforcing walkable, "park once" districts in Downtown and other urban character and activity centers within the City; and recognizing City funding for construction of public parking garages as a business support function and not a transportation enhancement.

Incorporate public art elements in transportation projects, coordinated through the Scottsdale Public Arts program. The Policy Element directs that up to two percent of the total eligible costs of all transportation improvement projects be dedicated for the selection, acquisition, fabrication, installation, and maintenance of public art (not required by current ordinance).

Continue street and alley maintenance and other transportation infrastructure life cycle planning and identify funding sources to continue high quality infrastructure maintenance. The Municipal Services Department handles street resurfacing, alley maintenance (including construction debris disposal, and brush and large object pick up schedules), streetlight and traffic signal maintenance. To maintain the health, safety, and appearance of alleys, the City seeks resident cooperation to keep the alleys in the best condition possible. Maintenance and operations of existing facilities should continue to be the first priority for the use of Highway User Revenue Fund (HURF) revenue, and new or expanded funding sources should be identified as the City's infrastructure moves from a new construction to a maintenance mode.

Coordinate a traffic incident management strategy. The Policy Element recommends that City departments work together to promote, develop, and sustain effective Traffic Incident Management programs. The Transportation Department will coordinate with Police, Fire, Municipal Services, and Communications and Public Affairs to develop a mechanism for achieving the following goals:

- Improved responder safety;
- Safe, quick clearance; and
- Prompt, reliable, interoperable communications.

2.0 STREETS ELEMENT

The Streets Element aim is to design, operate, and maintain Scottsdale's streets to provide safe and convenient access and mobility for all users: pedestrians, bicyclists, transit users, and equestrians, as well as vehicles.

- All minor collectors, major collectors, minor arterials, and major arterials are designated as either rural, suburban, or urban based on surrounding land use character. All roadways north of Pinnacle Peak Road and including Pinnacle Peak Road are designated as rural character; most roadways south of Pinnacle Peak Road are designated as suburban character. Urban character areas are current or future activity centers where greater numbers of pedestrians can be expected, such as Downtown or the One Scottsdale area. Table EX-1 shows the recommended change in classification for streets, from what is shown in the City's 2003 *Streets Master Plan*.

TABLE EX-1: Street Classification Revisions From the 2003 *Streets Master Plan*	
Street Segment	**Change**
90th St between Shea Blvd and Desert Cove	from minor collector to local street
91st St between Bahia Dr and Bell Rd	from minor collector to major collector
92nd St between Raintree Dr and Frank Lloyd Wright Blvd	from major collector to minor collector
94th St between Bahia Dr and Bell Rd	from major collector to minor collector
100th St loop north of Frank Lloyd Wright Blvd connecting back to Frank Lloyd Wright Blvd	from major collector to minor collector
104th St between Mountain View Rd and Via Linda	from minor arterial to minor collector
118th St	from major collector to minor collector
128th St between Via Linda and Cactus Rd	from minor collector to local street
132nd St between Via Linda and Paradise Ln	from minor collector to local street
Cave Creek Rd east of Lone Mountain Pkwy	from major collector to minor collector
Chaparral Rd between Miller Rd and 78th St	from major collector to minor collector
Dynamite Blvd	from major arterial to minor arterial
Happy Valley Rd between Scottsdale and Pima roads	from minor arterial to major collector
Hayden-Miller between Pinnacle Peak Rd and Dynamite Blvd	from major collector to minor collector
Hayden Rd between Redfield Rd and Raintree Dr	from minor arterial to major arterial
Hayden Rd between Pinnacle Peak and Happy Valley roads	from minor collector to local street
Jomax Rd between Alma School Rd and 118th St	from major collector to minor collector
Lone Mountain Pkwy between Stagecoach Pass and Cave Creek Rd	from major collector to minor collector
Lone Mountain Rd	from minor arterial to minor collector
Miller Rd between Osborn Rd and 2nd St	from minor collector to major collector
Mountain View Rd between Scottsdale Rd and 90th St	from major collector to minor arterial
Paradise Ln between 98th St and Thompson Peak Pkwy	from minor collector to local street
Pima Rd north of Happy Valley Rd	from major arterial to minor arterial
Raintree Dr between Hayden Rd and the Loop 101	from minor arterial to major arterial
Scottsdale Rd north of Happy Valley Rd	from major arterial to minor arterial
Stagecoach Pass between 84th St and Lone Mountain Pkwy	from major collector to minor collector
Sweetwater Ave between 90th and 96th streets	from major collector to minor collector
Thompson Peak Pkwy between 100th St and Bell Rd	from major arterial to minor arterial
Union Hills Dr between Hayden Rd and Perimeter Dr	from minor arterial to major collector
Via Linda between 132nd and 136th streets	from major collector to minor collector
Westland Dr between Hayden and Pima roads	from minor arterial to minor collector
Williams Dr between Hayden-Miller and Pinnacle Peak	major collector to minor collector
South freeway frontage between Hayden and Pima roads	remove from regional and local plans
Airport Tunnel	remove from regional and local plans
Downtown Couplet (Goldwater and Drinkwater boulevards)	reduce to four through travel lanes to provide additional bicycle and pedestrian access to and through Downtown

- The Street Element is closely linked to the Policy Element of the *Transportation Master Plan*. The Street Element also contains summary policies concerning establishing a "complete streets" policy, that is policies for freight mobility/truck routes, Intelligent Transportation Systems, speed limits, and access management; roadway modification guidelines; targets for minimizing peak period travel time delay; and roadway noise mitigation, roadway construction impact management, traffic signal timing, and local area infrastructure plans. The Neighborhood Traffic Management Program is included by reference.

3.0 TRANSIT ELEMENT

The Transit Element focuses on enhancing the existing transit network including bus service and neighborhood connector service. Also included in the Transit Element is a discussion of High Capacity Transit (HCT), which examines different modes such as bus rapid transit, light rail, and modern streetcar.

Key Objectives

- Provide a mix of transit and paratransit options.
- Develop service standards that meet or exceed regional service standards.
- Meet standards on existing routes before extending coverage to other areas of the community.
- Develop safe, comfortable, and convenient transit facilities, such as transit centers and park-and-ride lots that are served by local and regional transit services, and use technology to improve passenger convenience, system efficiency and effectiveness.
- Encourage partnerships between residents, businesses, system users, the Regional Public Transportation Authority (RPTA), and the City to develop, promote, and implement services.
- Demand high standards (e.g., passenger comfort, service reliability) from transit service providers.
- Actively market transit services and educate consumers to increase ridership and fare revenues concurrently with service enhancements.
- Consider measures which facilitate service quality such as transit signal priority and queue jumps.
- Apply operating savings from Proposition 400 or other new transit funding sources to new transit improvements.

Service Standards

- Minimum 15-minute peak, 30-minute off-peak frequency and 19 hours of service for regional routes (5 a.m. – midnight)
- Minimum 30-minute frequency and 16 hours of service for local routes
- Minimum 20-minute frequency for circulator service
- Minimum 10-minute peak, 20-minute off-peak frequency and 20 hours of service for high capacity transit (5 a.m. – 1 a.m.)

Transit Improvements

Transit improvements in Scottsdale must include a range of transit technologies, from local, regional, and express bus service to neighborhood circulators, as well as enhanced transit service and quality. Capital investments directly affect passengers' experience of transit, and as such, should be implemented with the highest quality of experience in mind.

- Near-term (5 years) transit improvements focus on improving the level of bus service in Scottsdale to match that of its neighboring jurisdictions. Some of the fixed route bus service in Scottsdale operates with less frequency and a shorter service span when compared to Phoenix and Tempe.
  - Improve service frequencies on east-west route segments west of Scottsdale Road, working with the city of Phoenix to facilitate service connecting to Scottsdale Road. This includes Route 17 (McDowell Road), Green line (Thomas Road), Route 50 (Camelback Road), Route 154 (Greenway Road), and Route 106 (Shea Boulevard).
  - Improve service frequencies on Scottsdale Road and extend service to Thompson Peak Parkway.
  - Add trips to existing and planned express bus routes.
  - Extend the Neighborhood Connector to serve the Skysong transit center.
  - Begin transition to low-floor vehicles for circulator service.
  - Complete transit facilities.
- Mid-term (10 years) transit improvements continue to focus on improving the overall level of fixed route bus service, and introducing new express bus service.
  - Extend Route 41 (Indian School Road) to Scottsdale Community College and Route 170 (Bell Road/Frank Lloyd Wright Boulevard) to Shea Boulevard.
  - Improve service frequencies on local routes, such as Route 66 (68th Street) and Route 76 (Miller).
  - Implement new Airpark/Downtown Phoenix express route.
  - Implement expanded BRT on Scottsdale Road to the Loop 101 (Proposition 400) with limited stops and 10-minute peak hour frequency.
  - Expand circulator service to additional neighborhoods.
  - Build freeway HOV ramp connections to park-and-ride areas.
  - Expand Dial-a-Ride services commensurate with the expansion of fixed route bus service.
- Long-term (20 years) transit improvements continue to focus on improving the overall level of transit service, especially fixed route bus service.
  - Improve frequencies on all routes and consider 10-minute frequencies on some routes.
  - Implement new two-way all-day express bus between Skysong and downtown Phoenix.
  - Implement additional Airpark services including: circulator, rerouting or limited stop service on Hayden Road to serve Airpark from the south; extending Thunderbird Road fixed route from Phoenix to Airpark; and development of a new transit center to serve as a new hub for transit services in the northern portion of the City and more convenient transfers between routes.
- The City will work to standardize bus stop spacing at 1/4-mile intervals for fixed bus routes where possible, with shorter spacing for neighborhood circulators and longer spacing for limited stop/express bus routes. Exceptions to this spacing would be in areas of greater demand and/or roadway corridors designated as urban on the Street Element Functional Classification map and/or areas predominantly used by seniors and persons with disabilities. Shade and passenger comfort is an important consideration for all bus stops.

- Bus shelters are located based on bus frequency, ridership, bus operational requirements, pedestrian safety, passenger comfort, and right-of-way availability. Shelters will be prioritized for the highest ridership bus stop locations.
- Bus bays/bus pullouts are not recommended along roadway corridors designated as Urban on the Street Functional Classification Map. It is recommended that bus bays be constructed at bus stops in Scottsdale only under the following circumstances:
  - The bus stop is a time point where the bus may dwell longer than normal to maintain schedule;
  - The bus stop is a high transfer location, where the bus may dwell longer than normal to facilitate transfers between routes;
  - The bus stop is a layover location where the bus dwells at the beginning or end of a bus route;
  - Safety concerns related to the location of the bus stop prohibit the bus from safely dwelling in the travel lane; and
  - LOS in a suburban corridor of the bus route is below D.
- Bus bulbs will be included as a standard design element at the following locations:
  - Downtown and other urban activity cores where pedestrian concentrations are located.;
  - Roadways with on-street parking; and
  - Scottsdale Road in conjunction with enhanced bus service.
- Freeway high occupancy vehicle (HOV) ramps should be connected to park-and-ride facilities and partnerships should continue to be developed for shared parking agreements for park-and-ride facilities.
- Circulators will be expanded to include more neighborhoods in various parts of the City.

3.1 High Capacity Transit

Potential HCT alternatives were explored in the High Capacity Transit Feasibility Study and are included in the Transit Element. Regional transit system studies are currently underway that made it logical to suspend the Scottsdale study at the conceptual analysis level, called Tier 1, in the Federal evaluation process. It is important for the City to continue to be involved in the regional studies regarding high capacity transit currently underway or pending, recognizing that Scottsdale is part of a regional network of transit services. On December 11, 2007, the City Council opted to join Valley Metro Rail (METRO), to enable the City's participation in these studies.

- Primary study purpose of the HCT feasibility study was to examine a new mobility option that would provide frequent, all-day service to employment, residential, commercial, retail, entertainment, educational, civic, and cultural activities in the Scottsdale Road corridor.
- The transit system has an opportunity to capture more ridership through a solution that consolidates and improves transit in a priority corridor.
- Transportation demand continues to grow and travel patterns change along with population and employment growth in the Scottsdale Road corridor and study area.
- Proposed HCT investments support continued revitalization in the project corridor.
- Tier 1 conceptual analysis recommended that the following options move forward in a more detailed evaluation when appropriate:
  - Option A1 – Light Rail Transit (LRT) to McDowell Road (in median);
  - Modified Option A2 – Light Rail Transit to Highland Avenue/Chaparral Road via Drinkwater or Goldwater boulevards;

- Option B1 and B2 combined – Modern Streetcar to Chaparral Road (Left Lane/ Downtown analysis for curb lane through Downtown); and
- Option C1 – Bus Rapid Transit (BRT) to Chaparral Road (Left Lane/Curb Lane in Downtown).

- Tier I Options Eliminated from Consideration:
  - Option A2 – Light Rail Transit to Chaparral Road via Scottsdale Road (Median); and
  - Option C2 – Bus Rapid Transit to Chaparral Road (Curb Lane).
- All options recommended for Tier 2 and Alternatives Analysis should be planned to connect to the regional HCT network.
- Additional regional considerations that have been raised by the community include:
  - Options for additional high frequency and amenity regional transit service on the Loop 101 corridor;
  - An interest in results from the region's first light rail corridor, the Central Phoenix/ East Valley line scheduled to open December 2008; and
  - Consideration of updates to the *Regional Transportation Plan* (RTP) to better integrate current and proposed HCT services (express, BRT, LRT, and commuter rail).
- Studies currently or soon to be underway that affect the outcome of any future Scottsdale Alternatives Analysis include: regional arterial BRT study (RPTA); regional freeway express/BRT study (RPTA); regional transit framework study (MAG); and Tempe south Alternatives Analysis (METRO).

4.0 BICYCLE ELEMENT

The Bicycle Element examines ways to advance the overall bike system to enhance this environmentally-friendly and healthy method of transportation. In particular, there is close focus on connectivity of bicycle routes for schools, parks, and within neighborhoods.

- In addition to the broad goals for the *Transportation Master Plan*, specific goals for the Bicycle Element include:
  - Provide a safe, connected and convenient on-road bicycle network throughout the City;
  - Expand the network of off-street shared-use paths and trails within the City;
  - Achieve a Bicycle Friendly Community rating of Gold from the League of American Bicyclists;
  - Incorporate the needs of human-powered transportation into the policy-making, planning, design, construction and maintenance phases of all existing and new City policies, plans, programs, projects, facilities, and operations;
  - Devise and adopt design guidelines and standards needed to implement a safe, functional, convenient, accessible, and pleasurable walking and cycling environment for recreation and transportation;
  - Develop and implement comprehensive and proactive safety, education, and enforcement programs for all bicyclists, pedestrians, and motorists; and
  - Employ comprehensive and proactive programs to promote cycling as a viable, economically desirable form of transportation and recreation for both residents and visitors.
- While Scottsdale's bicycle system is very good, it can continue to improve. Key bicycle system goals include increasing:

- Percentage of streets with speed limits greater than or equal to 30 mph that have on-street bike lanes:
  - 33 percent today
  - 50 percent by 2015
  - 75 percent by 2030
- Traffic signals with actuation for bicycles
  - 0 percent today
  - 50 percent by 2015
  - 100 percent by 2030
- Scottsdale addresses within 1/2 mile of a shared-use path
  - 60 percent today
  - 75 percent by 2015
  - 90 percent by 2030

- Specific recommendations for implementation of the Bicycle Element include:
  - Systematically implement bicycle facility on- and off-street projects per the recommendations and prioritization listed in the Bicycle Element;
  - Fund and implement a continuous north/south path from Salt River to Tonto Forest;
  - Fund and implement a continuous east/west path using the CAP Canal corridor;
  - Implement wayfinding, path naming, and signal actuation programs;
  - Systematic lane restriping for on-street facilities (bike lanes);
  - Enhance corridors for Roosevelt Street, Belleview Street, Oak Street, Osborn Road, Chaparral Road, and Jackrabbit Road;
  - Prioritize projects based on potential (latent) demand, existing conditions (level of service), and ability to connect. Implement as opportunities arise as well; and
  - Complete an inventory of trails and trail easements and integration of trails information into the shared-use path/trail system.

5.0 PEDESTRIAN ELEMENT

The Pedestrian Element of the plan assesses priorities in making Scottsdale more walkable. There is a need to provide safe, convenient pedestrian ways and facilities that make it easier for people to walk short distances. An emphasis on pedestrian safety and programs such as the Safe Routes to School program are included.

- In addition to the broad goals for the *Transportation Master Plan*, specific goals for the Pedestrian Element include:
  - Create a street environment that is safe and secure for pedestrians;
  - Create a street environment that allows pedestrians to directly access key destinations by walking;
  - Provide pedestrian amenities and promote land uses that enhance public spaces, neighborhoods, commercial, and employment areas – amenities that will entice more people to walk;
  - Educate citizens, community groups, businesses, and developers on safety, health, and civic aspects of walking; and
  - Incorporate pedestrian needs into the policy-making, planning, design, construction, and maintenance of existing and new policies, plans, programs, projects, facilities, and operations.

- All sidewalks and walkways must provide a minimum of 6 feet of travel space to accommodate pedestrians moving in both directions, including pedestrians using assistive devices.
- All sidewalks and walkways adjacent to arterials must provide a minimum travel space to accommodate pedestrians, providing sufficient walking areas, not including for example, landscaping or site furnishings. The following listing incorporates the character types of rural, suburban, and urban as well as the pedestrian route network identification:
  - Rural - minimum travel space of 6 feet for rural areas identified on the pedestrian route network maps as low and medium low. A trail could replace sidewalk/walkway in rural areas identified on the pedestrian route network maps as low; this requires an accessible surface (stable, firm, slip-resistant);
  - Suburban - minimum travel space of 8 feet for areas identified as medium or medium high; minimum of 10 feet for areas identified as high on the pedestrian route network maps; and
  - Urban - minimum travel space of 10 feet for all urban areas; minimum of 12 feet in areas identified as high on the pedestrian route network maps.
- Specific recommendations for implementation of the Pedestrian Element include:
  - Improve pedestrian safety, comfort, and amenities;
  - Improve pedestrian connections including neighborhood to neighborhood and neighborhood to commercial;
  - Allow greater priority for pedestrians than additional auto capacity in urban corridors and high activity areas like the Downtown and the Airpark;
  - Reduce walk speeds for pedestrian signals to 3.5 feet per second (to allow for more time to cross the street);
  - Establish enhanced corridors for Roosevelt Street, Belleview Street, Oak Road, Osborn Road, Chaparral Road, and Jackrabbit Road;
  - Use latent demand model to determine need and scale of pedestrian improvements;
  - Fill gaps in the pedestrian network and ensure universal design is used as a basis for improvements;
  - Implement a comprehensive Safe Routes to School Program;
  - Create a pedestrian safety action plan; and
  - Create and maintain a comprehensive pedestrian facilities inventory.

6.0 SPECIAL AREA CIRCULATION STUDIES

The *Transportation Master Plan* includes three special area circulation studies for different geographic areas of the City – North, Airpark, and Central/Downtown Scottsdale. Each of these studies examines issues that these unique areas face and recommends context sensitive transportation solutions. The main policies and street recommendations are incorporated in the broader elements of the *Transportation Master Plan,* but these sections are included in the body of the *Transportation Master Plan* as well.

6.1 North Area Circulation Study

The purpose of this area circulation study was to analyze potential transportation improvements to effectively manage traffic circulation and future demand in Scottsdale's predominantly rural, low density northern area. Careful attention was given to the environmental sensitivity as well as aesthetic guidelines already in place for this area. The North area generally includes lands that are subject to the City's Environmentally Sensitive Lands Ordinance.

- One of the biggest transportation challenges in the northern area was to "right-size" the planned roadway network. Through analysis of the results of Scottsdale's travel demand model, it was determined that several roadways were planned for more capacity than necessary to meet the travel demand. Scottsdale Road, Pima Road, and Dynamite Boulevard are three of the major roadways where the classification was revised, in these cases from a six-lane major arterial to a four-lane minor arterial.
- While the 2030 projected traffic volumes indicate that these roadways will not require six travel lanes, the right-of-way will be retained to provide flexibility for drainage needs, additional travel lanes, and alternative transportation modes if needed.
- The City will complete an analysis regarding public restrooms for path/trail users in areas where commercial facilities are not available for use by business patrons. Items to examine will include construction and maintenance costs, security needs, as well as other available alternatives. Restroom facilities are currently provided at most City parks.
- To encourage a consistent low intensity, rural environment at roadway crossings, a North area arterial intersection cross section that provides key elements of universal access will be included in the Design Standards and Policies Manual (DS&PM).
- The texture and location of stabilized decomposed granite paths will be carefully considered for use in the North area.
- As an update to the *Trails Master Plan*, an inventory of existing trails facilities and easements will be conducted to coordinate with future updates of the *Transportation Master Plan* and trails policy for the City.

6.2 Airpark Circulation Study

The purpose of the Airpark area circulation study was to identify and analyze potential transportation solutions for through and destination traffic at the Scottsdale Airpark. Through the regional transportation plan (RTP) with Proposition 400 funding, a tunnel under the runway of the Scottsdale Airport was planned to connect the east and west sides of the Airport and provide an alternative east-west route. The Airpark area circulation study determined that the tunnel would not provide as much connectivity and relief from traffic as other roadway improvements in the area, summarized below.

- The construction of a "ring road" around the Airport and other intersection and roadway improvements would help to provide additional Airpark area circulation.
- To facilitate internal circulation over the long-term, the Airpark area circulation study includes an effective multi-component parking management strategy, implementation of a transportation demand management program, and the designation of certain streets internal to the Airpark that would facilitate travel of non-motorized modes.
- Bicycle improvements include: bicycle connections from Airpark to the CAP Canal corridor; bicycle roadway enhancements on Greenway-Hayden Loop, Redfield Road, 73rd Street, Hayden Road, Raintree Drive, and Northsight Boulevard; and potentially a grade-separated crossing where the CAP Canal path meets the Loop 101.
- An Airpark area circulator would enhance transit service in the Airpark.
- Citywide Transportation Demand Management (TDM) program per the Policy Element may help improve traffic in the area.

6.3 Central/Downtown Scottsdale Circulation Study

The purpose of this area circulation study was to examine Downtown area transportation issues such as Chaparral Road and how people were getting to and through the area; nighttime and daytime congestion; and ways to encourage non-automotive travel in this activity center of the City.

- The question of widening the segment of Chaparral Road between Miller Road and 78th Street was resolved with City Council direction to remove widening the roadway from further consideration.
- Move forward with the Indian School Road streetscape project to incorporate bike lanes, enhanced sidewalks, shade, landscaped medians where appropriate, and enhanced transit stops.
- Intersection improvements are incorporated into the project listing for the *Transportation Master Plan*.
- In the long term, convert the third travel lane on each leg of the Couplet to provide bicycle and pedestrian facilities.
- Pedestrian and bicycle facility improvements include: pedestrian signals at intersections in Downtown and pedestrian crossings where appropriate; bicycle parking throughout the Downtown districts as well as in and around Scottsdale Healthcare Osborn campus area; and improving connections and wayfinding to and throughout prominent recreation areas such as the Arizona Canal and the Indian Bend Wash. Specific roadways (Osborn Road, 70th Street, Civic Center Plaza, 68th Street, Miller Road) are designated as key pedestrian and bicycle links throughout this area.
- On minor streets in the study area, a minimum of 6-foot sidewalk/walkway travel space is required. Arterials in the study area should use the guidelines from the Pedestrian Element of the *Transportation Master Plan*.

7.0 IMPLEMENTATION

Implementation addresses key policies and strategies necessary to facilitate a transportation system than meets the goals of the *Transportation Master Plan*. The following points pertain to the implementation of the options recommended in all of the elements of the *Transportation Master Plan*. A prioritized project listing including estimated project costs and funding sources was approved by the Transportation Commission at their April 30, 2008 meeting, and will be updated annually with the Transportation capital improvements budget.

- The *Transportation Master Plan* project list includes projects not already in the City's 5-Year Capital Program.
- Proposed roadway capital improvement projects are based on forecasted 2030 travel demand.
- The Policy Element recommends that one-third of future transportation CIP be committed to transit/bicycle/pedestrian improvements.
- Transportation 0.2 percent privilege tax currently generates $21 million annually
    - Currently split 50/50 between transportation capital projects and transportation operations (primarily transit service)
- The countywide transportation sales tax (Proposition 400) provides approximately $589 million through 2025 for City roadway improvements and transit operations and capital.

- Federal grants currently provide approximately $2 million per year in funding for capital improvements; however, this is not a guaranteed funding source from year to year.
- Potential projects south of Indian Bend Road consist mainly of system enhancements and provision of multi-modal options; potential projects between Indian Bend Road and Union Hills Drive blend all project types depending on location; and potential projects north of Union Hills Drive primarily are roadway widening and new paths. The following are some (not all) of the capital projects identified for implementation in the *Transportation Master Plan*:
  - Roadway Corridor Capacity
    - In the Airpark area create a ring road around the Scottsdale Airport providing connections not using Frank Lloyd Wright Boulevard or Scottsdale Road. Use instead Raintree Drive (six lanes from Loop 101 to Hayden Road), Hayden Road (six lanes from Redfield Road to Raintree Drive), Northsight Boulevard (realign and connect), new frontage road (south of Frank Lloyd Wright Boulevard), Thunderbird/Raintree Loop (new roadway connecting from Thunderbird Road at Scottsdale Road to Hayden Road), and/or Redfield Road/Thunderbird Road.
    - Shea Boulevard Corridor – intersections/ITS
    - Miller Road (includes freeway underpass)
    - Frank Lloyd Wright Boulevard interchange improvements
    - Center Drive/Union Hills Drive (new road and extensions)
    - Scottsdale Road (six lanes to Happy Valley Road, four lanes to City limit)
    - Pima Road (six lanes to Happy Valley Road, four lanes to City limit)
    - Carefree Highway (four lanes)
    - Dynamite Boulevard (four lanes)
    - Happy Valley Road (four lanes)
    - Pinnacle Peak Road (four lanes west of Pima Road)
    - 56th Street (four lanes)
    - Hayden Road/Miller Road (two-lane collector)
    - 118th Street (two-lane collector)
    - Westland Drive (two-lane collector)
  - Accelerate Loop 101 general purpose lanes
  - Intersection Capacity
    - Hayden Road/Thomas Road, Hayden Road/McDowell Road, Hayden Road/Camelback Road, Hayden Road/Chaparral Road
    - Pima Road/McDowell Road, Pima Road/Thomas Road, Pima Road/Indian School Road, Pima Road/Chaparral Road, Pima Road/McDonald Drive, Pima Road/Indian Bend Road
    - Thomas Road/64th Street, Thomas Road/68th Street
    - Highland Avenue/Scottsdale Road, Highland Avenue/Goldwater Boulevard (in addition to Highland Avenue streetscape improvements)
    - Pima Road Corridor
    - HOV ramps at Northsight Boulevard and Hayden Road
    - Hayden Road/Frank Lloyd Wright Boulevard, Raintree Drive/Loop 101, Princess Drive/ Loop 101 Freeway ramps, 90th Street/Via Linda, Hayden Road/Mountain View Road, Union Hills Drive bridge
    - Thompson Peak Parkway bridge
    - Most intersections with roadway widening

- Streetscape Improvements
  - Roosevelt Street/Oak Street/Osborn Road/Chaparral Road/ Jackrabbit Road bike-pedestrian corridors
  - Thomas Road – 60th Street to Pima Road, broken into phases
  - Miller Road – McKellips Road to McDowell Road
  - 68th Street – Roosevelt Street to Osborn Road
  - Greenway-Hayden Loop and 73rd Street
  - Paradise Lane (consider roundabout instead of stop signs)
- Downtown Couplet
  - Lane reductions and Scottsdale Road transitions in the long term
- Transit service and facility improvements listed in the Transit Element summary
- Paths are listed in the Bicycle Element prioritization charts. The following are the primary projects:
  - CAP Canal corridor
  - Pima Road extension
  - New path on the south side of Scottsdale Ranch/Stonegate
  - Powerline corridor
  - Scottsdale Road
  - Pima Road
  - Reata Pass Wash corridor
- Right-sizing
  - 100th Street, 92nd Street, Sweetwater Avenue, Redfield Road east of Loop 101

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1 INTRODUCTION

1 INTRODUCTION

The *Transportation Master Plan* is a comprehensive look at the City's transportation system, building upon mobility goals and objectives outlined in the voter-approved 2001 City of Scottsdale *General Plan (General Plan)*. The Master Plan identifies specific policies, projects, and programs that implement the goals of the *General Plan* elements, focusing on the Community Mobility Element, as well as the Economic Vitality, Character and Design, Neighborhoods, and other elements. The goals for the *Transportation Master Plan* are taken directly from the twelve Community Mobility Element goals, with three goals regarding regional coordination and sustainability added, based on input from individual citizens, a community working group, the Transportation Commission and City Council. The Master Plan is intended to provide connections among various forms of transportation within Scottsdale, and from Scottsdale to surrounding communities. It has been structured to allow for long-term transportation planning, while addressing a number of key short-term community issues and transportation needs. The *Transportation Master plan* includes new and/or updated streets, bicycle, pedestrian, and transit plans as well as area circulation plans for the North, Airpark, Central/Downtown Scottsdale areas. The Transit Element of the Master Plan also provides further guidance for the next steps in the analysis of high capacity transit (HCT). The most recent steps had been taken in the Scottsdale/Tempe North/South Transit Corridor Study (2003), when the City Council designated Scottsdale Road as the primary high capacity transit corridor and directed that bus rapid transit (BRT), light rail transit (LRT), and modern streetcar be examined in future studies.

1.0 BACKGROUND

The *Transportation Master Plan* is the first comprehensive look at the City's entire transportation system since the late 1980s. Several efforts (Let's Get Moving, the Transit Plus campaign, and the efforts to complete a comprehensive transportation plan following the failure of the Transit Plus tax election) provided a foundation for the *Streets Master Plan* of 2003 and the *Transit Plan* of 2003. Prior to these planning efforts the Circulation Element of the *General Plan* guided transportation decisions for streets, street design, bicycle facilities, transit and paratransit facilities, and trails. Street cross sections were included directly in the Circulation Element in 1980 and 1991. Concurrent with the 1991 Circulation Element update, a Final Report of the Transportation Commission (based on the Citizens for Better Transportation plan and the recommendations of the Bicycle Task Force) provided the details for transportation facilities and policy. The Transportation and Planning Departments worked closely on these guiding documents which were adopted by the Scottsdale City Council in 1991.

Transportation, how Scottsdale residents, visitors, employees, and businesses take the trips of daily life, has a big impact on our quality of life. Over the next 25 years, it is projected that another 40,000 people will become residents of Scottsdale (over a 15 percent increase from today), potentially adding over 35,000 vehicles to the City's streets. During the same time span, the population of Maricopa County is expected to increase 65 percent to over 6 million people. Regional and local land use changes make it critical that mobility and transportation choices continue to be available to City of Scottsdale residents, businesses and employees, and tourists or visitors. Ensuring that the plan meets the needs of Scottsdale residents and businesses has been one of the primary focal points of the planning process. The knowledge and ideas of

Scottsdale citizens have been an important resource for this effort, in tandem with the technical expertise of the Transportation Commission, City staff, and the professional consultants.

The City intends for this plan not to be a theoretical document, but an action-oriented, practical guide to how we improve existing, or build new, streets, sidewalks, bike lanes, paths and trails, and improve our transit system. When it comes to transportation, the old saying is true: "Failing to plan is planning to fail." With Scottsdale residents, businesses, and the City's planning team working together, the *Transportation Master Plan* can help to direct our resources wisely and ensure that our transportation system serves us well in the years ahead.

2.0 PLANNING PROCESS

The *Transportation Master Plan* process got underway with the City Council approval of a contract with HDR Engineering, Inc. and various sub-contractors on November 1, 2005. For at least one year prior to this contract approval, the Master Plan had been a topic of discussion and various people asked to be included in this important process. A database of the interested persons was maintained and updated on a weekly basis prior to the Master Plan process even getting underway. The *Transportation Master Plan* was developed through data collection and research, synthesis and analysis of information collected through the process, and the crafting of a Master Plan designed to address short- and long-term transportation needs for the City of Scottsdale.

The Public Engagement Plan that was developed for the *Transportation Master Plan* was designed to ensure a comprehensive and meaningful involvement and information process. A multi-phase public involvement process was developed. The process consisted of:

- information-gathering meetings from November 2005 through April 2006 and focused citizen and property owner interviews in March 2006;
- a public-ideas generation workshop held on March 30, 2006;
- a public alternatives development workshop held over three days in April 2006;
- periodic meetings of a community working group (discussed in more detail below);
- presentations and updates to stakeholder groups, neighborhood organizations, business groups, and City Boards and Commissions;
- monthly special meetings of the Transportation Commission;
- periodic reviews at City Council meetings;
- public open houses in October 2007; and
- public hearings of the Transportation Commission and City Council in November and December 2007 and January 2008.

To help the City and consultant team draft the *Transportation Master Plan* and identify future transportation needs, in March 2006 citizens were invited to participate in a confidential hour-long, one-on-one meeting with HDR's team of planners and traffic engineers. The purpose of these meetings/interviews was to help the project team better understand the vision for the future of transportation in Scottsdale and learn about issues or problems that need to be addressed from the people most impacted by the issues – Scottsdale citizens. Over 100 citizens participated in these focused interviews, which were held in five locations throughout the community.

On March 30, 2006, Rick Cole, current City Manager of Ventura, California, and former Mayor of Pasadena, California, made a presentation at a community informational workshop.

Following Mr. Cole's presentation, participants were invited to work at "table exercises" identifying transportation issues and possible tools that could be used to address those issues. Approximately 75 citizens attended the workshop. Mr. Cole's presentation was frequently re-broadcast on the CityCable 11 television station from April through October 2006.

Building on the March 30 workshop, the next phase of public involvement was an intensive, interactive planning workshop held April 17-19, 2006. The workshop took place in meetings covering three evenings and two days at Scottsdale Community College (SCC). The goal of these meetings was to continue to foster discussion, gather further input and ideas on community transportation needs and concerns, and begin shaping options for how Scottsdale's transportation system will work in the future.

Following the spring workshops, alternatives and ideas were evaluated based on criteria and goals that were based in the City's 2001 *General Plan* and refined through dialogue with citizens, the Transportation Commission, and the City Council. Base traffic conditions and future projections were prepared using the Maricopa Association of Governments (MAG) regional traffic model. As the Master Plan proceeded, it became apparent that the development of a more refined, sub-area traffic model would be necessary to improve forecast accuracy and provide Scottsdale-specific projections of future travel demand. The results of this Scottsdale sub-regional model were used to test potential traffic system scenarios prior to their inclusion in the final *Transportation Master Plan*.

Beginning in early 2007, the Transportation Commission agreed to meet twice monthly instead of their scheduled one time per month. The second monthly meeting was for the most part dedicated to discussion and review of *Transportation Master Plan* sections and drafts. Draft sections of the *Transportation Master Plan* were crafted and discussed with the Transportation Commission, and made available on the City's Web site (on a *Transportation Master Plan* Web page as well as the Transportation Commission agenda Web page).

In addition to the twice-monthly Transportation Commission meetings, an open house featuring a panel discussion of sustainable transportation ideas was held on September 19, 2007 at the Granite Reef Senior Center. Panelists Robert Jones of Taliesin West; Aaron Golub, ASU associate professor of planning and sustainability; and Jim Charlier, President of Charlier Associates, Inc of Boulder, Colorado, presented and discussed how transportation can support sustainability. Information about preliminary recommendations of the *Transportation Master Plan* was provided for review and comment at this open house.

On October 27 and 29, 2007 open houses featuring recommendations and findings of the *Transportation Master Plan* were held, providing additional opportunity to view and comment on the *Transportation Master Plan*. Saturday morning, October 27, an open house was held at the Civic Center Library book discussion room. Monday evening, October 29, an open house was held at the City's Water Campus.

Throughout the process, public outreach also occurred through additional methods including periodic coordination meetings with neighboring jurisdictions and other agencies; newsletters; visits with homeowner, community, senior, youth, and school groups; one-on-one and small group meetings; press releases; information booths at public gatherings; and CityCable 11 programming. The public participation program was designed to be inclusive and open to all. Some additional methods used are listed here:

- Electronic access to information: The City's Web site included drafts of the *Transportation Master Plan* as they became available, public participation opportunities, and related links to transportation information.
- Youth involvement: Staff met with Mayor's Youth Council where students provided input on future transportation needs for Scottsdale.
- Neighborhood meetings: Instead of holding random meetings at City locations, City staff went to meeting sites where homeowner associations, service groups, etc. were already meeting. If a neighborhood met on Saturday morning, then staff made arrangements to be included on that agenda.
- Community working group: By creating a neighborhood/business outreach program, community representatives were able to assist in gleaning input from a wide variety of organizations - many of whom aren't necessarily involved in City policy issues (more details below).
- Community events: Staff participated in a wide variety of community events, such as the Green Building Expo, Scottsdale Arts Festival, and San Francisco Giants Spring Training baseball games to distribute information and encourage participation in the *Transportation Master Plan*.
- Ongoing briefings with City Council, citizen Boards and Commissions, and the community working group.
- An extensive contact list created from the outreach programs to do mailings and electronic notices for information and public involvement opportunities.
- Local media invitations to all meetings and provision of regular updates.

Community Working Group

One method that was used to gather input for the *Transportation Master Plan* was the development of a community working group. This group met several times throughout the process. The role of the working group was to provide input, identify issues, and provide a feedback loop to the residents and businesses with whom they are associated. The working group was made up of volunteers who did not vote on the plan recommendations but expanded opportunities for outreach and provided insight that was used by the Transportation Commission and City Council in their deliberations on the *Transportation Master Plan*. The 20 to 25 member group represented a wide variety of geographic and community viewpoints on Scottsdale's transportation system. Meetings of the working group were open to the public. Over the course of the process, actual participants varied for specific organizations/interests. During the meetings HDR Engineering, the consultant for the *Transportation Master Plan*, and staff presented information, facilitated discussion and encouraged dialogue, and information sharing.

The importance of community participation in the process to create and update the *Transportation Master Plan* cannot be underestimated. For a plan to meet the needs and expectations of its community, it must thoroughly consider all sectors of the community, consider various positions and alternatives, and ultimately analyze and present the results in a fair and non-biased manner.

The *Transportation Master Plan* was finalized through a recommendation of the Transportation Commission at their December 20, 2007 public hearing and adopted by the City Council at their January 8, 2008 public hearing.

3.0 PLAN ADMINISTRATION

The *Transportation Master Plan* was designed to be a living document, periodically updated to better meet the needs of the community and respond to changing conditions or direction. As this is the first comprehensive transportation plan in over 15 years, it is anticipated that it will be next updated within 3 to 5 years.

During the *Transportation Master Plan* process many issues were raised and resolved, and new state-of-the-art transportation concepts explored and incorporated. Some items which require further review include:

Trails Program and Trails Master Plan Update

Prior to July 2007, the Trails program was housed in the City's Preservation Division. While trail considerations were included in the early deliberations for the *Transportation Master Plan*, the *Trails Master Plan* has not been updated through the Master Plan process. The first update to the *Transportation Master Plan* should include an update of the 2004 *Trails Master Plan*.

The updated plan should include detailed neighborhood trails planning. Recommendations in the *Transportation Master Plan* include completing an inventory of existing trails and trail easements to coordinate with the *Trails Master Plan* designations. In addition, the Trails program is now housed in the Transportation Department to better coordinate all non-motorized transportation modes.

High Capacity Transit

The high capacity study identified alternatives for more detailed evaluation, but due to the status of regional studies did not recommend a specific technology. All options recommended for Tier 2 and Alternatives Analysis should be planned to connect with the regional HCT network. The Tier 1 conceptual analysis examined three technologies (BRT, LRT, and modern streetcar) in two different design or alignment options for each technology. The options are listed as follows:

- A1 – LRT to McDowell Road (Median)
- A2 – LRT to Chaparral Road (Median)
- B1 – Modern Streetcar to Chaparral Road (Left Lane)
- B2 – Modern Streetcar to Chaparral Road (Left Lane/Curb Lane through Downtown)
- C1 – BRT to Chaparral Road (Left Lane/Curb Lane through Downtown)
- C2 – BRT to Chaparral Road (Curb Lane)

Recommended options to be analyzed in a Tier 2 or Alternatives Analysis include:

- A1 – LRT to McDowell Road(Median)
- Modified A2 – LRT to Highland Avenue/Chaparral Road via Drinkwater or Goldwater boulevards
- B1 and B2 combined – Modern Streetcar to Chaparral road (Left Lane/Curb Lane or other design option through Downtown)
- C1 –BRT to Chaparral Road (Left Lane/Curb Lane through Downtown)

Tier 1 options eliminated from further consideration include:

- LRT to Chaparral Road on Scottsdale Road through Downtown
- BRT to Chaparral Road (Curb lane)

Additional regional considerations that have been raised by the community include:

- Options for additional high frequency and amenity regional transit service on the Loop 101 corridor;
- An interest in results from the region's first light rail corridor, the Central Phoenix/East Valley line scheduled to open December 2008; and
- Consideration of updates to the *Regional Transportation Plan* (RTP) to better integrate current and proposed high capacity services (express bus, BRT, LRT, and commuter rail), as well as the results of arterial and freeway BRT studies being prepared by the Regional Public Transportation Authority and a Tempe South study being prepared by Valley Metro Rail (METRO).

On December 11, 2007, the City Council opted to join METRO to enable the City's participation in the Alternatives Analysis underway among METRO, Tempe, and Chandler. Scottsdale is working with METRO to make sure that the City has a place in these regional deliberations.

4.0 SCOTTSDALE OVERVIEW

This chapter provides the *Transportation Master Plan* with an overview of the City of Scottsdale: the history, character, and vision of the City. This chapter also provides summaries of the past plans and policies that were referenced for the development of the Master Plan, most notably the City of Scottsdale 2001 *General Plan*. Similar to all long range planning, the *Transportation Master Plan* builds off the foundation of goals and strategies already developed in the *General Plan* as well as past plans and policies. Therefore, it strives to retain the character that makes Scottsdale special and unique.

4.1 Brief History of Scottsdale

Scottsdale was founded in 1888 by Chaplain Winfield Scott when he purchased 640 acres of land. When Scottsdale was incorporated in 1951, the City was a small community of 2,000 residents situated on two square miles of land. Daily activities focused on citrus groves, cotton fields, dairy farms, and shopping in Downtown around Main Street and Scottsdale Road. There were few paved roads in the City. Soon after incorporation, residents raised money to pave streets with a gala called the "Street Pavers Ball" and by 1954 four stop signs adorned Scottsdale Road giving it the nickname "Stopsdale."

From 1958 to 1965 the City experienced explosive growth in housing and population – from less than 10,000 to 65,000 people (Table 1-1). Housing for this population growth was predominantly single family detached homes on modest sized lots, not unlike housing growth occurring at the same time in suburbs in metropolitan areas across the country. The City annexed rapidly, first southward from Downtown and later northward to Deer Valley Road, growing in area from approximately two square miles to over 60 square miles. In the late 1960s, major service uses and public amenities were established with the opening of the Scottsdale Airport in 1967 and City Hall in 1968. Throughout the 1970s and 1980s Scottsdale continued to grow in land area through annexations to the north and east. The Indian Bend Wash Greenbelt Flood Control Project was started in 1971 with its series of community and neighborhood parks and an extensive path system. Dial-a-Ride transit service began in 1979 with the goal of providing transportation services to Scottsdale's elderly and residents with disabilities. To help boost tourism in Downtown, the first Molly Trolley system began operating in 1980.

TABLE 1-1: Population of Scottsdale from Incorporation to Today		
Year	Population	Square Miles
1951	Approximately 2,000	1.0
1960	10,026	4.9
1970	67,800	62.2
1980	88,622	88.6
1990	130,000	185.0
Today (2007)	239,630	185.0

It was during the 1990s that changes began to occur in Downtown following the adoption of the *Downtown Plan* in 1984. The Downtown Streetscape Project was completed in 1991. In order to ease traffic congestion through Downtown on Scottsdale Road, the couplets were constructed. Goldwater Boulevard was completed in 1991 and Drinkwater Boulevard in 1993. It was also during the 1990s that the Arizona Department of Transportation (ADOT) began the construction of the Loop 101 Freeway through and around Scottsdale (Table 1-2).

TABLE 1-2: Construction History of Loop 101 through Scottsdale		
Section	Start Date	Open to Traffic
Loop 202 traffic interchange	April 1998	October 1999
McDonald Dr to Thomas Rd	April 1997	July 1998
90th St to McDonald Dr	June 1997	May 1999
Shea Blvd to 90th St	-----	December 1999
Pima Rd to Shea Blvd	July 1998	February 2001
Cave Creek Rd to Scottsdale Rd	November 1999	August 2001
Scottsdale Rd to Pima Rd	September 2001	April 2002

Source: Arizona Department of Transportation

Today, Scottsdale is a vibrant and diverse city with a population of approximately 240,000 on 185 square miles of land. Through its evolution, the City has become a major center of business activity while retaining its strong tourism and retail business sectors.

4.2 Scottsdale's Place in the Region

The City of Scottsdale is located in the northeast quadrant of the Phoenix metropolitan area. The southern end of the City is near the geographical center of the metropolitan area population distribution. The northern end of the City abuts the Tonto National Forest. Much of the southern portion is bordered by the Salt River Pima-Maricopa Indian Community (SRPMIC) on the east (Figure 1-1). Another large part of the eastern edge of the City borders the McDowell Mountain Regional Park. This limits the extent to which ongoing development can occur on the outer edge of Scottsdale.

Geographically, the City of Scottsdale is long and narrow. The distance from the northern boundary to the southern boundary is approximately 30 miles. In some areas, Scottsdale can be as narrow as two miles from west to east.

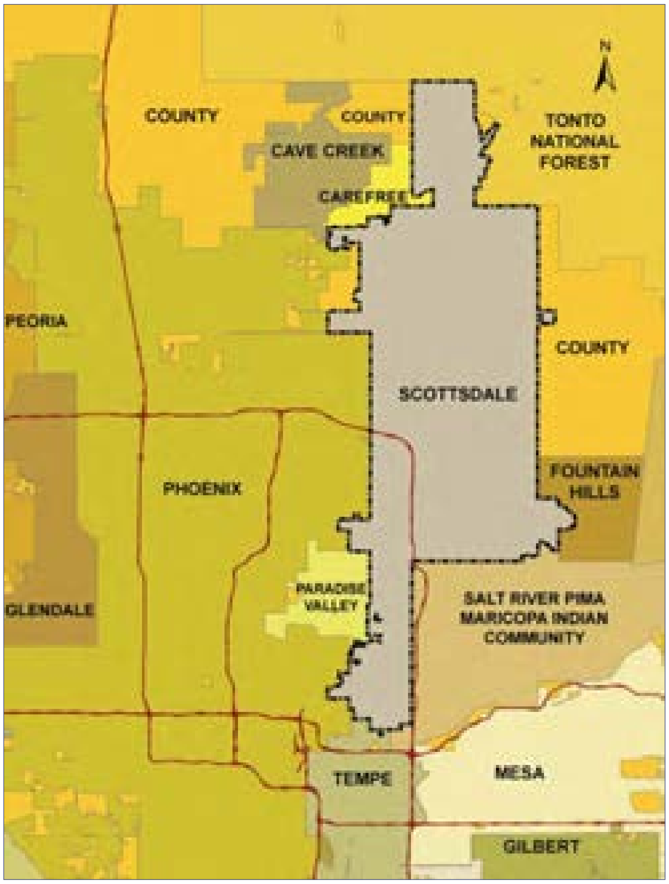


FIGURE 1-1: Scottsdale, Arizona and Neighboring Communities

Scottsdale has unique characteristics that set it apart from other communities in the Phoenix metropolitan area. Scottsdale is both a net importer of employment and a regional retail center of activity. The City's retail centers, parks, employment centers, and libraries are heavily used by both residents and nonresidents. Household sizes are typically smaller than in other Valley communities and household incomes are higher than most.

Scottsdale is also the major resort center of the metropolitan area. Along with these resorts located in the City, Scottsdale contains the core of specialty shopping, art galleries, recreational facilities, and many cultural and sporting events that attract and sustain the local tourism industry. The high aesthetic quality of the City's physical environment is an important community standard that helps maintain this industry.

4.3 Character of Scottsdale

For planning purposes, the City has been divided into three generalized areas: southern, central, and northern Scottsdale (Figure 1-2). Each area has its own unique character which the *Transportation Master Plan* took into consideration during the recommendations phase, to ensure the recommendations were context-sensitive.

It should be noted that the Master Plan examined specific areas within each of these larger generalized areas in more depth. Central/Downtown Scottsdale area, located in the southern planning area of Scottsdale; the Airpark area which is located in central Scottsdale, and all of the northern area were included in specific circulation studies. These studies are located in the main body of the *Transportation Master Plan* following the modal elements.

Southern Area of Scottsdale

The general makeup of the southernmost section of Scottsdale consists of an array of commercial and office land uses mixed into suburban-density residential neighborhoods. Most of the infrastructure of the area was developed in the 1960s and 1970s. This area has been incrementally revitalized with infill development helping to create a community that is both rooted and progressive at the same time. The combination of smaller scale neighborhoods with unique personality and the complex mixed-use areas such as SkySong create one of the most diverse areas of the community.

Southern Scottsdale is also home to Downtown Scottsdale. Downtown is considered the commercial, cultural, civic, and symbolic center of the City. The Central/Downtown Scottsdale area circulation study examines the area between Thomas and McDonald roads, including Downtown, in more depth.

When looked at in a regional context, the southern area of Scottsdale has excellent accessibility to surrounding communities and other areas of Scottsdale. It is bordered by Phoenix, Tempe, and the SRPMIC. The Pima Freeway (Loop 101) located on the east and the Papago Freeway (Loop 202) on the south makes it a convenient location to live, work, and visit. The main north-south corridors of this area are Scottsdale, Hayden, Miller, and Pima roads. Important east-west connections are McDowell, Thomas, Indian School, Camelback, and Indian Bend roads. There is also a strong bicycle and pedestrian connection along the Indian Bend Wash that connects in the south to Tempe Town Lake.

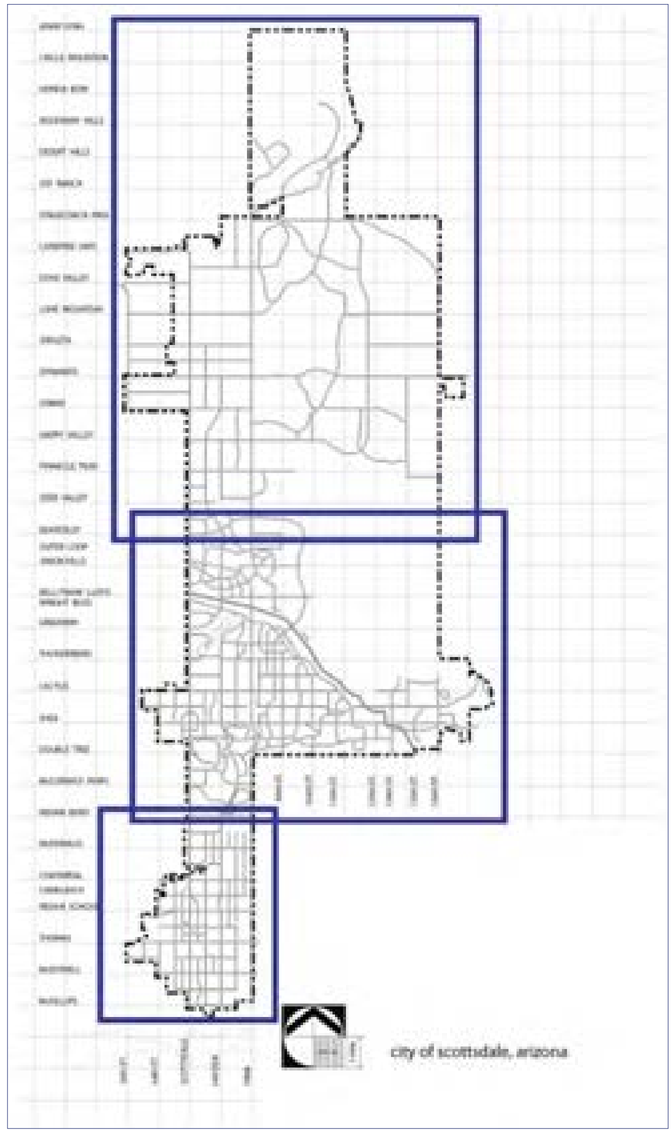


FIGURE 1-2: Generalized Planning Areas in Scottsdale

Central Area of Scottsdale

The central section of Scottsdale includes the community's premier employment center (Scottsdale Airpark), the Shea Boulevard corridor, and the Central Arizona Project (CAP) Canal. The Airpark Area Circulation Study examines the area mainly between Thunderbird Road and the Loop 101 and from Scottsdale Road to the Loop 101 in more depth. An estimated 2,500 business firms with over 50,000 employees (estimated as of December 2006) are located in the Airpark making it the third largest employment center in Arizona. Scottsdale Airpark is projected to grow into Arizona's largest center of employment by 2010. The area surrounding the Airpark has seen tremendous commercial growth in recent years. Most recently, the area north of Frank Lloyd Wright Boulevard up to the Loop 101 is quickly becoming a major core and corridor of business activity. Shea Boulevard is a major regional east-west corridor through Scottsdale, connecting Fountain Hills to the east with Phoenix to the west. Shea Boulevard is one of the most popular access points to the area; many businesses have consolidated their efforts along this road, especially near major cross streets such as Scottsdale Road and the Loop 101. Central Scottsdale features some of the first master planned communities in the state such as McCormick Ranch and Scottsdale Ranch and more recent master planned communities such as DC Ranch and McDowell Mountain Ranch.

Central Scottsdale is also home to some of region's biggest attractions including Taliesin West, the desert home and studio of the late world-renowned architect Frank Lloyd Wright. The Tournament Players Club (TPC) Princess golf course is home to the FBR Open PGA golf tournament, and WestWorld, an important venue location for large scale events such as the Barrett-Jackson Auto Auction and the Scottsdale Arabian Horse Show, are located in this area of the City. The southern reaches of the McDowell Mountains are also located in the central section of Scottsdale.

Northern Area of Scottsdale

Northern Scottsdale is one of the least densely populated areas in the City but is currently the most actively developing area of Scottsdale. Northern Scottsdale contains some of the most rugged topography in Maricopa County with the McDowell Mountains along the eastern edge of the City and the Continental Mountains to the north. This area is characterized by widely scattered steep hills, boulder outcroppings, and native desert vegetation.

Rural desert character is predominant in this area. Retaining this character is both a desert preservation and lifestyle goal of northern Scottsdale residents. Individuals move into this area to experience the openness of the natural desert setting and the rustic feel of the developed form. Residents currently living in these remote areas are generally willing to travel longer distances for services. This is part of the lifestyle goal but needs to be balanced with air quality, infrastructure, and development pattern issues that would encourage the provision of basic services close to residential areas in order to reduce travel distances and to provide a better sense of community and sustainability.

Scottsdale, Pima, and Cave Creek roads serve as the major north-south connections to and through northern Scottsdale. Important east-west links are Pinnacle Peak, Happy Valley, Rio Verde/Dynamite, and Lone Mountain roads, and Carefree Highway. The Loop 101 links northern Scottsdale to the rest of the region.

4.4 Scottsdale Values and Vision

It is important to integrate transportation planning with land use planning to develop an efficient transportation system for the City. The community vision documented in the following plans is built from a foundation of citizen-driven processes. These citizen participation processes, encompassing thousands of work hours, have helped to define the future vision for the community and have provided new tools with which to achieve that vision. The *Transportation Master Plan* builds from these citizen processes in order to carry on the community vision. Further discussion of the *Transportation Master Plan* vision and goals are in the Vision, Values, and Goals section.

Scottsdale Shared Vision Report

In 1991, a process of "community visioning" was initiated to identify the most important and significant beliefs and desires about the long-term future of the community. In December 1992, the City Council adopted a report outlining Scottsdale's Shared Vision. The Shared Vision identified four mutually supportive dominant themes, which reflect Scottsdale's special qualities and are the foundation for Scottsdale's long-term vitality. The four themes represent Scottsdale's core expression. They define the City of Scottsdale and present a vision of its emerging place in the broader regional, national, and global economy.

Four Dominant Themes
Sonoran Desert
Resort Community
Arts and Culture
Health and Research

CityShape 2020, Comprehensive Report

In order to ensure that the visions and goals from the adopted Shared Vision Report were achieved, a comprehensive review of the *General Plan* called CityShape 2020, was begun in late 1994. Completed in 1996, the recommendations from the CityShape 2020 process are the basis for planning in Scottsdale today. The recommendations include a three level approach to planning: citywide, character area, and neighborhood. CityShape 2020 also identified an enhanced focus on "character and quality" in development and established six Guiding Principles:

- **Preserve Meaningful Open Space** – The City of Scottsdale is committed to promoting the acquisition, dedication, and setting aside of open space as a community amenity and in support of the tourism industry in Scottsdale.
- **Enhance Neighborhoods** – Scottsdale's residential and commercial neighborhoods are a major defining element of this community. The quality of our experience as a Scottsdale citizen is expressed first and foremost in the individual neighborhoods where we live, work, and play. Scottsdale is committed to maintaining and enhancing our existing and future neighborhoods. Development, revitalization, and redevelopment decisions, including rezoning and infrastructure planning, must meet the needs of our neighborhoods in the context of broader community goals.
- **Seek Sustainability** – Scottsdale is committed to the effective management of its finite and renewable environmental, economic, social, and technological resources to ensure that they serve future needs.
- **Support Economic Vitality** – Scottsdale is committed to the goal of supporting its existing economic strengths by targeting new opportunities which can diversify our economic base, providing for the fiscal health of the City, and forming partnerships with the community which strengthen our ability to meet this goal.
- **Advance Transportation** – The transportation system must be the backbone of Scottsdale, supporting its economy and serving and influencing its land use patterns in a positive way.
- **Value Scottsdale's Unique Lifestyle and Character** – Scottsdale offers a superior and desirable Sonoran Desert lifestyle for its citizens and visitors. The preservation of this unique lifestyle and character will be achieved through a respect for our natural and man-made environment, while providing for the needs of our citizens.

Future in Focus

In June 1999 a comprehensive community involvement process began as part of the update to the Scottsdale *General Plan*. The goals of this process were to create awareness and understanding of the *General Plan*, engagement of all audiences and affirm the community vision and values identified in previous City visioning processes.

The process, called Future in Focus, took the vision created through Scottsdale Visioning and the guiding principles of CityShape 2020 and used them to re-evaluate Scottsdale's *General Plan*, bring it up to date with the Growing Smarter and Growing Smarter Plus state legislation, and make sure the overall direction for the City was still in line with the community's goals and visions. After the Future in Focus process was completed, the updated *General Plan* was adopted by City Council in October 2001 and ratified through citizen vote in March 2002.

4.5 City of Scottsdale 2001 General Plan

The *General Plan* is a statement of goals and policies that work as the primary tool for guiding the future development of the City. It establishes an intent and direction for the future growth and character of the community. A *General Plan* may include maps, diagrams, tables, and text setting out community conditions, principles, goals, objectives, and strategies. It is not a specific plan, but rather it is a guiding set of principles that provides a sense of order, coordination, and quality to the City's policies and actions affecting its reinvestment and vitality.

The policies in the *General Plan* are implemented and detailed through ordinances and ongoing formal procedures of the City, such as the Zoning Ordinance, Subdivision Ordinance, Design Guidelines and master plans such as the *Transportation Master Plan*. The intent of the *General Plan* is implemented through recommendations from City Boards and Commissions and decisions made by the City Council. Over time the *General Plan* is a living document that is manifested by many specific decisions and events that cause it to respond to the changing conditions, needs, and desires of the community. The *General Plan* serves as the foundation for the creation of the *Transportation Master Plan*.

4.5.1 General Plan Elements

The Scottsdale *General Plan* consists of twelve sections called "elements." Each element promotes the community vision by establishing policies, goals, and strategies. All twelve *General Plan* elements are important because they each address issues that are fundamental to the current and the future quality of life in Scottsdale. Coordination between and among all of the *General Plan* Elements is required to have a comprehensive policy document that speaks to the future needs of the community. The *General Plan* strives to show the relationships between elements and because of this all mention transportation issues in some form. Below is a summary of the main objectives, goals and key programs within the *General Plan* elements.

Community Mobility Element

The Community Mobility Element's policies concentrate on providing safe, efficient, and accessible choices for the movement of people, goods, and information. This element speaks most directly to the *Transportation Master Plan*. The Community Mobility Element is discussed in greater detail in the Vision, Values, and Goals section of the *Transportation Master Plan*.

Land Use Element

The Land Use Element establishes the general polices for the types and location of land uses throughout the City. Now and in the future it is important that land use patterns are fostered that help conserve natural resources, reduce dependence on the automobile, alleviate traffic congestion, contribute to the character of the community, and adequately serve the needs of the citizens. The Land Use Element states that Scottsdale values land use and transportation planning that creates logical and efficient transportation options and patterns to help connect people to jobs, services, and amenities.

Economic Vitality Element

The Economic Vitality Element addresses policies to better evaluate decisions and encourage economic development that will sustain the community. The policies of the Economic Vitality Element are designed to support and enhance this sustainability.

Neighborhoods Element

Scottsdale's vision is to preserve, reinforce, and where appropriate, revitalize the core characteristics and stability that define all of its neighborhoods, commercial, and residential. As Scottsdale matures, the City must continue to look at preserving and enhancing its built environment. The preservation, revitalization, and redevelopment of, and reinvestment in Scottsdale's mature neighborhoods are critical to maintaining and strengthening the health, safety, prosperity, and enjoyment of the community.

Growth Areas Element

The Growth Areas Element approaches growth management from a perspective of identifying those areas of the community that are most appropriate for development focus. Growth areas are intended to discourage sprawl by focusing new development into targeted areas that are most appropriate for integrating open spaces, natural resources, accommodating a variety of land uses, and are oriented to multi-modal (transit, pedestrian, bicycling, as well as autos, etc.) activity. This element states that Scottsdale values multi-modal solutions that will support the diverse movement and circulation requirements of all socioeconomic components of our community in ways that are efficient, affordable, and environmentally compatible.

Public Services and Facilities Element

The Public Services and Facilities Element provides broad guidance about the provision of community services and physical facilities for the City of Scottsdale in keeping with governmental roles of protecting the health, safety, and welfare of the community.

Preservation and Environmental Planning Element

The Preservation and Environmental Planning Element translates the values and vision of the community into a set of concrete goals to achieve an environmentally sustainable community. This element infuses the importance of environmental sensitivity into the City's planning efforts. Some strategies mentioned in this element are promoting rideshare, carpooling, and the use of non-auto travel modes. This element also discusses the importance of supporting the completion of the bikeway system.

Character and Design Element

The Character and Design Element emphasizes the importance of diverse character and unique quality of design that Scottsdale residents and visitors value. Appropriate development in Scottsdale will strike a balance that respects the natural desert settings, historically significant resources and the surrounding neighborhood context, with the objectives and needs of future generations. Art and aesthetic enhancement will continue to be essential components of the community's character and lifestyle.

Community Involvement Element

Through the guidelines contained in the Community Involvement Element, Scottsdale demonstrates its commitment to encouraging early and meaningful citizen input in important planning processes. Such participation helps the City resolve concerns early in the planning process, and level the playing field for citizens, property owners, elected officials, other stakeholders, and the development community. It also provides an opportunity for early input into the formation of City policy and regulations. The ultimate goal is to ensure a level of dialogue that is mutually respectful, responsible, and civil.

Housing Element

Now and in the future, Scottsdale will need to focus attention on the revitalization and preservation of the more mature residential neighborhoods, to seek creative infill development strategies and to encourage a diversity of housing that accommodates a variety of income levels, households, and socioeconomic needs.

Open Space and Recreation Element

This element establishes a set of integrated visions, values, goals, and implementation strategies that guide decision-making and lead toward the provision of a comprehensive open space system and recreational plan. Furthermore, this element represents an important step in the City's continuing effort to enhance the public's ability and opportunities to enjoy recreation in Scottsdale. Key to this is establishing a network of parks, scenic corridors, paths, and trails that will provide access to nature and urban open spaces, providing recreation opportunities, ecological benefits, and a source of beauty for residents.

Cost of Development Element

The City of Scottsdale has long held the philosophy that new development should "pay for itself" and not burden existing residents and property owners with the provision of infrastructure, public services, and facilities. The purpose of the Cost of Development Element is to identify the fiscal impacts created by new development and determine how costs will be equitably distributed.

4.5.2 General Plan Update 2011

As part of the 1998 and 2000 Growing Smart Acts, the *General Plan* must be updated every ten years. The next update for the Scottsdale *General Plan* is set to occur in 2011. All plans and policies will be reviewed and used as the basis for the *General Plan* update. Ultimately, the entire *Transportation Master Plan* will be integral to the Transportation/Mobility Element in the 2011 *General Plan*.

4.6 Review of Prior Plans and Policies

Land use and transportation have an important relationship. Just as land use is often the basis for transportation recommendations and mode choices, transportation can be used to shape land use. The following are plans and policies that were consulted during the creation of the *Transportation Master Plan*.

4.6.1 Community Area Planning

The City of Scottsdale is forming a long-range planning program which will continue to address "level two" of the planning process established in CityShape 2020. This planning process is called Community Area Planning and the purpose is to focus on a specific area of the City to develop more detailed goals and strategies, building off of the broad goals discussed in the *General Plan*.

There are six proposed Community Areas for Scottsdale. From south to north, these areas are: Southern Scottsdale Area, Downtown, Shea Corridor Area, Greater Airpark Area, McDowell Vistas Area, and the Tonto Foothills Area. Each Community Area will have a long range plan completed for it which will address issues and opportunities that the community identifies during the public outreach process. All past policies and plans will be incorporated into the new Community Area Plans. Information that has been developed in the *Transportation Master Plan* will feed into these Community Area Plans. Ultimately, the six Community Area Plans will then be used to update the *General Plan* in 2011.

4.6.2 Character Area Plans

Since CityShape 2020 and the recommendation of character planning, there have been two new Character Area Plans adopted and the *Downtown Plan* was considered the prototype for a Character Area Plan. The Desert and Dynamite Foothills Character Area Plans will eventually become incorporated into the Tonto Foothills Community Area Plan but until that occurs, it is important that these plans were reviewed and referenced for the *Transportation Master Plan*. Detailed summaries of the Desert and Dynamite Foothills Character Area Plans are located in the North Area Circulation Study.

Downtown Plan Update

Downtown will be the first Community Area to have a long range plan completed for it. The plan is currently underway and will be completed in 2008. The scope of the update includes a circulation policy document which will build from the recommendations in the Central/Downtown Area Circulation Study of the *Transportation Master Plan*.

4.6.3 Scenic Roadways

Scenic Corridors, Buffered Roadways, and Desert Scenic Roadways are thoroughfares designated by the City's *General Plan* to incorporate scenic desert setbacks that provide a sense of openness for the community. Scenic roadways also serve to link with vista corridors along major washes and other significant open spaces. The setbacks serve to buffer adjacent land uses from the adverse affects of traffic on the roadway. Scenic roadways are discussed in detail in the North Area Circulation Study section of the *Transportation Master Plan*.

4.6.4 Streetscape Design Guidelines

Streetscape design guidelines are specific streetscape design enhancement guidelines for landscape, hardscape, development walls, and public amenities (such as transit stop shelters and street furniture). Specific streetscape design guidelines have been developed for:

- Shea Boulevard east of Frank Lloyd Wright Boulevard to the City boundary at 144th Street (approved by City Council in 1994).
- Frank Lloyd Wright Boulevard from Scottsdale Road to Shea Boulevard – applied to the Boulevard ROW and the landscaped area between the ROW line up to, and including, the development walls. Frank Lloyd Wright Boulevard is also designated as a buffered setback roadway (approved by City Council in 1989 and revised in 1991).
- Via Linda east of the CAP Canal to the terminus near the 140th Street alignment (approved by City Council in 1994).

4.6.5 Design Standards and Policies Manual (DS&PM), 2007

The *Design Standards and Policies Manual* (DS&PM) presents clear and concise technical requirements, policies, and processes to enable design professionals to prepare plans and reports necessary for development of both public and private projects within the City.

The manual consists of ten chapters that address the development process, site planning issues, land divisions and dedications, grading and drainage, transportation, water systems, wastewater systems, medians, parks and trails, public works and facilities, and native plants. The information is presented in a sequence that parallels developing a raw tract of land, from site planning and platting issues, to grading and drainage considerations.

These guidelines clarify and supplement requirements in the Scottsdale Revised Code, including the zoning and subdivision ordinances, floodplain and stormwater regulations, fire and building codes, and other regulations for land development and construction within Scottsdale. The intent is to assist homeowners, architects, developers, engineers, contractors, and others through the development process.

4.6.6 Trails Master Plan, 2004

The *Trails Master Plan* and the *Conceptual Trails Plan* for the McDowell Sonoran Preserve were prepared for the purpose of creating a citywide network of interconnected trails for use by multiple non-motorized user groups. The *Conceptual Trails Plan* for the McDowell Sonoran Preserve, accepted by the City Council in 1999, controls the provision of trails within the boundary of the McDowell Sonoran Preserve. The *Trails Master Plan*, approved by the City Council in 2004, guides the provision of trails throughout the City outside of the McDowell Sonoran Preserve.

- The purpose of this study was to develop a vision and set goals and objectives to guide development of a City-wide trails master plan that will be implemented through expenditures of 2000 bond funds and beyond.
- The goal was to create a seamless network of unpaved trails that link neighborhoods to destinations including the McDowell Sonoran Preserve.
- Trails are created so as to minimize disturbance to the natural environment.
- Trails create close-to-home recreational opportunities.
- Trails promote knowledge and understanding of the Sonoran Desert environment.
- The trail system provides opportunities for physical activity resulting in improved mental and physical health.
- The three primary trail user groups are hikers, bicyclists, and equestrians.
- Motorized vehicles are prohibited (per Ordinance 17-62) from using Scottsdale's public trails.

4.6.7 Streets Master Plan, 2003

The *Streets Master Plan* built upon the policy groundwork developed in the 2001 *General Plan* and further refined the direction given. It is mainly used to understand the future of the transportation networks and provided consistent information and guidance in the transportation planning decision making process. The *Streets Master Plan* determined the future roadway network for Scottsdale and mapped out a strategy to keep the streets operating efficiently. Strategies included building or widening streets, making existing streets work better, and applying technology to improve traffic flow among many others.

- The street classification map in this plan replaced the street plan map from the 1991 *General Plan* Circulation Element (The *General Plan* was consolidated into one document and reprinted in 1999).
- Enhanced day-to-day decision-making by refining the broad street categories used in the *General Plan* into specific street classifications.
- Users of the plan were provided a preview of what the Scottsdale street network might look like at build-out.
- Explained how streets are classified and how the functional classifications of streets are used to plan the City's street network.
- The design guides for street cross sections in the plan did not set construction standards but did dictate the general guidelines and definition of the street classification system.
- Cross-sections designed for rural and environmentally sensitive areas of the City permitted flexibility in the application of street classifications.
- Explained the "expandable roadways" concept and how using it benefits street projects.
- Demonstrated how the street network can accommodate the needs of a multi-modal transportation system.

4.6.8 Transit Plan, 2003

The *Transit Plan* included the vision for the future alternative transportation networks in the City of Scottsdale. The goal of this transit plan was to provide policy guidance in the development of the citywide transit system. The plan includes strategies to keep Scottsdale transit modes operating efficiently and effectively include policies, capital projects, operating methods, service levels, and many different modes of travel. The vision for Scottsdale is to have a transit system consisting of accessible mobility choices that support a diverse population, improved air quality, greater safety, cost effectiveness, multiple mobility modes, and integration with other valley transit systems.

- Explicitly tied transit implementation to customer demand, system performance, and funding availability.
- Recommended changes to existing transit, including expanding service on the Scottsdale Trolley to Sundays and for longer hours every day.
- Recommended 15 new transit services, both for areas with existing demand and those likely to see growth in the future. Included in the recommendations is a second Scottsdale Trolley route for Downtown and a neighborhood circulator in southern Scottsdale.
- Described programs designed to meet the special transit needs of senior citizens and people with disabilities.
- Outlined operating procedures for route design, fare pricing, bus stop placement, and other features.
- Established transit system performance standards.
- Provided guidelines for capital improvements and funding.
- Suggested methods of integrating transit into land use planning and street design.

4.6.9 Bicycle/Pedestrian Transportation Master Plan, 1994

The *Bicycle/Pedestrian Transportation Master Plan* was created to help enhance the lifestyle of the community, and meet its diverse needs, while promoting safety and efficiency in non-motorized travel. It is a guide to assist in the integration of non-motorized modes of transportation into City plans and policies. It outlines goals and objectives and provides recommendations for their implementation. The *Bicycle/Pedestrian Transportation Plan* was developed to support the Community Mobility Element of the *General Plan*.

The Bicycle/Pedestrian Plan Task Force identified deficiencies and projected needs by studying the limitations of existing policies and facilities. Plan recommendations include four "action programs" labeled as: Level I-Continue Current Program, Level-II Basic Action Program, Level III-Intermediate Action Program, and Level IV-Optimum Program. Scottsdale needs to integrate a high degree of bicycle and pedestrian requirements into all public and private development plans in order to create a bicycle/pedestrian friendly community.

- Bicycle and Pedestrian Planning: Integration of bicycle and pedestrian requirements into all public and private development plans is crucial to a bicycle/pedestrian friendly community.
- Facility Design: Correctly designed components in a well-connected system will address the needs of all types of cyclists, walkers, and other users, promote a variety of use, encourage safety, and reduce potential liability.
- Safety, Education, and Enforcement: Good educational programs, appropriately designed for different age groups and backed up by the enforcement of codes, will improve safety. These should include bicyclists and motorists.
- Promotional Efforts: People should be encouraged to walk or ride their bikes to work, participate in special events, and use non-motorized modes for short trips.

2 VISION, VALUES, AND GOALS

2 VISION, VALUES, AND GOALS

1.0 INTRODUCTION

The *Transportation Master Plan* is an implementation plan, subordinate to larger plans and their statements of community values. In particular, the *Transportation Master Plan* is governed by the City's adopted *General Plan*.

The Scottsdale *General Plan* is the policy foundation for the *Transportation Master Plan* goals and elements. The foundation of the *General Plan* is the community vision built from a series of citizen-driven processes that formed and shaped that vision. A comprehensive review of the Scottsdale *General Plan* called CityShape 2020 was intended to be an extensive educational and community outreach process to reaffirm and improve the Scottsdale *General Plan* as an expression of the Shared Vision (created through the Scottsdale Visioning process two years earlier). As discussed in Chapter 1, Section 4.4, the recommendations from CityShape 2020 included six Guiding Principles, intended to highlight and organize in the *General Plan* the most important goals of the community. One of these Guiding Principles (Advance Transportation) specifically focuses on goals for transportation in Scottsdale.

Advance Transportation

The transportation system must be the backbone of the City, supporting its economy and serving and influencing its land use patterns in a positive way. Scottsdale's commitment to transportation planning will be reflected in both development and redevelopment decisions. Historically, Scottsdale has grown up with the automobile as the primary mode of transportation. Although the automobile will likely remain the primary mode of transportation, Scottsdale shall provide alternatives to diversify our City's transportation system. The alternatives will provide greater accessibility for residents and visitors, alleviate pollution and congestion, and serve and influence land use patterns.

Strategies identified in CityShape 2020 for achieving these goals include:

- Maintain a continuous and integrated land use and transportation planning process to ensure that development and infrastructure planning accurately reflect the travel demands and complement each other;
- Provide for adequate transportation corridors by allocating enough land during the planning process to allow for high occupancy vehicle (HOV) lanes, bike lanes, multi-use paths, and transit facilities for future demands;
- Encourage land use patterns that reduce the amount of travel by the development of neighborhoods where mixed-use centers and services are easily accessible from residences;
- Expand and enhance pedestrian, bicycle, and transit access by considering safe and inviting access to shopping, offices, schools, etc. from multi use paths and transit facilities in all development decisions; and
- Ensure that the physical location and design of our transportation corridors are environmentally sensitive to our desert, mountains, scenic corridors, and neighborhoods.

One of the twelve inter-related elements of the *General Plan* is the Community Mobility Element. The Community Mobility Element's policies concentrate on providing safe, efficient, and accessible choices for the movement of people, goods, and information.

The Community Mobility Element strives to expand the field of mobility to fully integrate non-automotive modes, such as public transit, cycling, walking, trip reduction strategies, and telecommunications. It also recognizes the inter-relationships among transportation, land use, and neighborhoods. To maintain mobility, land use and transportation policies must emphasize work, live, and play relationships and more efficient and accessible/walkable transportation options must be provided. There is also a strong recognition that different areas within the City may have unique mobility needs requiring solutions that, while part of a larger system, are designed for specific areas of the City.

The vision statement from the Community Mobility Element states: Scottsdale will be a community that safely, conveniently, and efficiently moves people, goods, and information by providing access and mobility choices. Scottsdale recognizes that there will be a diversity of mobility systems to match the character and lifestyle of different areas of the community. Mobility choices will provide alternatives to the automobile, increase accessibility, improve air quality, enrich the community and its neighborhoods, and contribute to the community's quality of life.

The Community Mobility Element also states the following values:

- Live, work, and play relationships in land use patterns that reduce the number and distance of auto dependent trips and are supported by mobility networks (such as: mixed-use projects or focused development near to non-automotive mobility systems);
- Mobility choices that reflect the community's diverse needs and lifestyle in all areas of the City, respect neighborhood dynamics, and reduce reliance on the automobile;
- Balance between regional, citywide, and neighborhood level transportation needs;
- Citywide and regional systems that minimize impacts on viewsheds, the natural environment, and local neighborhoods;
- Maintenance of regional, citywide, and neighborhood connections/networks;
- Design of networks to move people goods, and information that meet the aesthetic standards of Scottsdale and that enhance the pedestrian use of the City;
- Free flowing and safe movement within the various modes of transportation, including aircraft, commercial vehicles, automobiles, pedestrians, equestrians, and cyclists;
- Transportation practices that support the community interests in maintaining economic vitality, protecting natural resources, and preserving neighborhood life;
- Partnerships between citizens, businesses, system users, and the City to develop and implement mobility solutions; and
- Use of technology to achieve a mobility system that meets community goals (safety, efficiency, accessibility, alternatives and choice, reduction of travel time, reduction of traffic congestions, improvement of air quality, etc.).

The goal statements which follow are intended to translate the themes of the *General Plan* into goals for transportation.

1.1 Transportation Master Plan Goals

Goal: Direct transportation policies, investments, and decisions in ways which support the community's adopted vision and values.

Scottsdale is a community of vision and values. That vision and those values are described in the Community Vision and Community Values statements contained in the voter-approved

Scottsdale *General Plan*. These statements set forth a shared vision and iterate intended practices for how Scottsdale will seek to realize it. Transportation policies and investments can either support or erode successful realization of this vision.

Goal: Increase the range and convenience of transportation choices.

Scottsdale is a "community of choice", a destination for both residents and visitors seeking a high quality of life; quality of life is the primary reason residents and visitors choose this destination. The transportation options each of us use will affect that quality of life, positively or negatively.

Goal: Direct transportation policies, investments, and decisions to design context-sensitive responses.

Scottsdale is a diverse place, a city made up of varied communities and landscapes. As the *General Plan* is realized through public and private investment, that diversity will increase. While the desert landscapes and low population densities in the largely residential areas of northern Scottsdale will be preserved, other areas (particularly in and around the Airpark, Downtown, and southern Scottsdale) will see significant changes in composition and density. It is important that the transportation system acknowledge and support the character of these distinctive areas.

Goal: Coordinate transportation policies, investments, and decisions with neighboring communities and the larger region, while effectively managing impacts of increasing demand for regional highway travel.

Scottsdale is part of a large metropolitan area, one which continues to grow in population, land area, and vehicle miles traveled. Although Scottsdale has completed its territorial expansion through annexations completed in the 1980s, significant growth in employment and residents is expected over the next 20 years. In this context, the region's growth will affect Scottsdale's transportation system by increasing demand for travel on the regional highway network, which will lead to challenges in providing efficient direct access to and from Scottsdale, and increased regional trips through Scottsdale, by assorted modes and routes. The larger region is also making a major investment in transit systems, intended to provide greater mobility options and to influence public and private investment.

Goal:
a) Focus investments on improvements which add long-term value.
b) Maintain the transportation system in ways which minimize life cycle cost.

Scottsdale is a capable steward of public assets and public funds, a city government that anticipates trends with provisions to address future challenges, manages resources competently, and delivers high quality public services. Scottsdale's citizens expect that its public agencies will invest in the transportation system in ways that support the community's goals and values. They also expect that the City will properly manage and maintain those assets.

These *Transportation Master Plan* Goals reflect the goals of the *General Plan*'s Community Mobility Element, as well as a policy of sustainability. Specific criteria, intended to apply these goals in more measurable ways and to evaluate transportation options, are listed following the Community Mobility Element goals. Note that the goals shown in italics have been added to the *General Plan* goals through the *Transportation Master Plan* process.

1.2 Adopted Community Mobility Element Goals

1.2.1 Regional Systems

- Protect the function and form of regional air and land corridors.
- Protect the physical integrity of regional networks to help reduce the number, length, and frequency of automobile trips, to improve air quality, reduce traffic congestion, and enhance quality of life and the environment.
- Promote regional diversity and connectivity of mobility choices.
- Prioritize regional connections to safely, effectively, and efficiently move people, goods, and information beyond the City boundaries.
- *Enhance connectivity to regional transportation facilities; however, these systems need to respect the City of Scottsdale* General Plan.

1.2.2 Citywide Systems

- Relieve traffic congestion.
- Optimize the mobility of people, goods, and information for the expected buildout of the City.
- Maintain Scottsdale's high aesthetic values and environmental standards in the City's transportation system.
- Emphasize live, work, and play land use relationships to optimize the use of citywide systems and reduce the strain on regional and local/neighborhood systems.

1.2.3 Local/Neighborhood Systems

- Protect neighborhoods from negative impacts of regional and citywide networks.
- Encourage a diversity of links between neighborhood systems, and with citywide and regional systems.
- Provide opportunities for building "community" through neighborhood mobility.
- Recognize the diversity of neighborhoods throughout the City and their different mobility needs.

1.2.4 Sustainability

- *Use 'green' technologies and processes when possible and practical.*
- *Reduce emissions that degrade air quality.*

2.0 GOALS AND EFFECTIVENESS MEASURES

The goals and effectiveness measures shown in Table 2-1 provide guidelines to assist in effective decision-making for the City's transportation network, and also to assist in measuring system effectiveness.

TABLE 2-1: Transportation Master Plan Guide For Decision-Making

Goal/Criterion *what are we trying to accomplish?*	Effectiveness Measures *how will we know if we are accomplishing it?*
Mode Choice	Increasing the transportation system's non-automobile capacity, evaluated through consideration of pedestrian and bicycle levels of service
	Improving the availability of multiple travel modes at a given location
	Ensuring accommodation of all modes on City streets
Managing regional impact	Moving regional travel through Scottsdale
	Connecting Scottsdale to the larger region while minimizing disruption to travel within Scottsdale
Safety	Reducing the number and severity of collisions
	Preserving the ability to respond to large-scale emergencies
	Maintaining adopted incident response time
Automobile access and convenience	Maintaining acceptable level of service
	Maintaining travel time reliability
	Increasing, where possible, the availability of alternative routes
Pedestrian access and convenience	Raising the pedestrian level of service to the appropriate level (depending on the location)
	Improving connectivity to transit and access to major destinations
	Reducing conflicts with other modes
Universal Access	Applying the principles of universal design
Bicycle access and convenience	Reducing gaps in bicycle system
	Improving the bicycle level of service
	Reducing conflicts with other modes
Transit access and utilization	Improving the transit level of service (headways, hours, capacity)
	Improving the proximity and access to high-quality transit service
	Ensuring, as practicable, minimized walk distance to transit stops and major destinations
	Ensuring accommodation of bicycles on transit vehicles
Equestrian access and convenience	Improving the connectivity of trails
	Reducing conflict with roadway system

TABLE 2-1: Transportation Master Plan Guide For Decision-Making

Goal/Criterion *what are we trying to accomplish?*	Effectiveness Measures *how will we know if we are accomplishing it?*
Downtown access	Maintaining or increasing person-trip access to Downtown
	Improving linkages to other locations/destinations within the City
	Supporting planned redevelopment
Airpark access	Maintaining or improving person-trip access to the Airpark
	Improving internal circulation
	Reducing traffic congestion
Environmental Sustainability	Reducing energy consumed for transportation per capita
	Reducing auto trips and/or vehicle miles traveled per capita
	Reducing acreage of pavement and parking lots
	Reducing the transportation air pollution emissions per capita
Neighborhood Preservation	Supporting neighborhood character
	Improving access to transit, pedestrian, bicycle, and trail systems
	Implementing, where appropriate, neighborhood traffic management measures
	Preserving emergency access
	Avoiding increases in local residential and local collector street volume
	Minimizing negative impacts from truck traffic by effective truck policy and enforcement
Cost/benefit	Focusing on life cycle cost
	Maximizing the ability to leverage other funding
	Ensuring sound cost/benefit considerations in land acquisition decisions
Compatibility with McDowell Sonoran Preserve Plan	Increasing transit access to the McDowell Sonoran Preserve
	Increasing non-motorized access to the McDowell Sonoran Preserve
Public Awareness	Increasing awareness of transportation choices and consequences
	Seeking opportunities to promote transportation choices and change travel behavior
Economic Viability	Maintaining workforce access
	Maintaining visitor access and mobility
	Maintaining freight mobility

3 POLICY ELEMENT

3 POLICY ELEMENT

1.0 INTRODUCTION

The Scottsdale *General Plan* is the policy foundation for the *Transportation Master Plan* goals and elements. The *Transportation Master Plan* is intended to be an implementation tool to accomplish the goals and vision of the *General Plan*. The foundation of the *General Plan* is the community vision built from a series of citizen-driven processes that formed and shaped that vision. A comprehensive review of the Scottsdale *General Plan* called CityShape 2020 was completed in the late 1990s and the vision, themes, and principles were validated through the *General Plan* update public participation process. CityShape 2020 was intended to be an extensive educational and community outreach process to reaffirm and improve the Scottsdale *General Plan* as an expression of the Shared Vision (created through the Scottsdale Visioning process two years earlier). The recommendations from CityShape 2020 included Six Guiding Principles, intended to highlight and organize in the *General Plan* the most important goals of the community. One of these Guiding Principles (Advance Transportation) specifically focuses on goals for transportation in Scottsdale:

The transportation system must be the backbone of the City, supporting its economy and serving and influencing its land use patterns in a positive way. Scottsdale's commitment to transportation planning will be reflected in both development and redevelopment decisions. Historically, Scottsdale has grown up with the automobile as the primary mode of transportation. Although the automobile will likely remain the primary mode of transportation, Scottsdale shall provide alternatives to diversify the City's transportation system. The alternatives will provide greater accessibility for residents and visitors, alleviate pollution and congestion, and serve and influence land use patterns.

Strategies identified in CityShape 2020 for achieving these goals include:

- Maintain a continuous and integrated land use and transportation planning process to ensure that development and infrastructure planning accurately reflect the travel demands and complement each other;
- Provide for adequate transportation corridors by allocating enough land during the planning process to allow for HOV lanes, bike lanes, shared-use paths, and transit facilities for future travel demands;
- Encourage land use patterns that reduce the amount of travel by the development of neighborhoods where mixed-use centers and services are easily accessible from residences;
- Expand and enhance pedestrian, bicycle, and transit access by considering safe and inviting access to shopping, offices, schools, etc. From multi use paths and transit facilities in all development decisions; and
- Ensure that the physical location and design of our transportation corridors are environmentally sensitive to our desert, mountains, scenic corridors, and neighborhoods.

One of the twelve interrelated elements of the *General Plan* is the Community Mobility Element. The Community Mobility Element's policies concentrate on providing safe, efficient, and accessible choices for the movement of people, goods, and information.

The introduction to the Community Mobility Element makes clear statements acknowledging that the automobile is expected to remain an important way of travel in Scottsdale. The Community Mobility Element strives to expand the field of mobility to fully integrate non-automotive modes, such as public transit, cycling, walking, trip reduction strategies, and telecommunications. It also recognizes the inter relationships among transportation, land use, and neighborhoods. To maintain mobility, land use and transportation policies must emphasize work, live, and play relationships and more efficient and accessible/walkable transportation options must be provided. To reduce traffic congestion and impact on the natural and built environment, appropriate land use decisions must be sought which help reduce the length and number of automobile trips (typically expressed as vehicle miles traveled or VMT). In addition, mobility alternatives to the automobile that can be efficient, accessible, and comfortable, can challenge the reliance on the automobile, and can further help reduce congestion and improve safety on our streets.

There also is a strong recognition that different areas within the City may have unique mobility needs requiring solutions that, while part of a larger system, are designed for specific areas of the City. The policies of the Community Mobility Element are designed to recognize these unique needs and find solutions for them. Those policies are further refined and defined through the policies and goals of the *Transportation Master Plan*, especially through developing context-sensitive design and transportation solutions to local issues.

The Policy Element of the *Transportation Master Plan* addresses general, citywide policies that are not specific to a particular transportation mode, or confined to a specific area within the City. While some of these policies will be reiterated in the modal elements or area circulation studies, this document is intended to provide a global view of policies that will affect transportation and transportation facilities throughout the community.

In addition to the *Transportation Master Plan*, other policies and programs are underway. Information from the neighborhood traffic management program and local area infrastructure plans will be included and referenced in the *Transportation Master Plan* Policy Element. The *Downtown Plan* update is currently being coordinated by the Planning and Development Services Department and will include updates to the Downtown land use and circulation sections. This effort is anticipated to be complete in 2008.

2.0 COMPLETE STREETS

POLICY OBJECTIVES: To design, operate, and maintain Scottsdale's streets to promote safe and convenient access and travel for all users: pedestrians, bicyclists, transit riders, and equestrians, as well as cars, trucks, and buses.

Improve community quality of life in Scottsdale neighborhoods by implementing strategies that reduce the negative impacts created by automobile traffic on neighborhood streets, as well as increase the pedestrian and bicycle options for the neighborhood.

A complete street is one that is designed and operated to enable safe and comfortable access for all users. Pedestrians, bicyclists, motorists, and transit riders of all ages and abilities are able to safely move along and across a complete street. Various streets in the community are currently without sidewalks or paths or have inadequate sidewalks; are too narrow to safely share with bikes; may be intimidating to cross as a pedestrian; or are uninviting for transit users. Incomplete streets are often less safe for multiple users than complete streets.

While the City's current design guidelines are very consistent with the complete streets concept, instituting a complete streets policy ensures that the entire ROW is designed and operated to enable safe access for all users. Ingredients that may be found on a complete street include: sidewalks and/or paths, bike lanes, frequent crosswalks, wide shoulders, medians, bus pullouts, special bus lanes, raised crosswalks, audible pedestrian signals, sidewalk bulb-outs, and more.

Complete streets policies recognize that there is a need for flexibility as all streets are different and user needs will be balanced. All road projects should result in a complete street appropriate to local context and needs. The following policies will apply to both new and retrofit projects, including design, planning, maintenance, and operations, for the entire ROW.

2.1 Policies and Strategies

2.1.1 Multi-modal Approach

- Promote a multi-modal approach for all City of Scottsdale new and retrofit roadway projects through formal adoption of a complete streets policy. A multi-modal approach includes all users (pedestrians, bicyclists, transit vehicles and users, equestrians, and motorists of all types) of all ages and abilities. This approach aims to create a comprehensive, integrated, connected network. Understand that a universal "rule" on all streets cannot be applied. For example, pedestrian and bicycle access on highways or freeways is not generally encouraged.
- Provide facilities and amenities that are recognized as contributing to complete streets, including: roadway and pedestrian-level street lighting; pedestrian and bicycle safety improvements; access improvements in accordance with ADA; transit facilities accommodation, including but not limited to, pedestrian access improvement to transit stops; street trees and landscaping; and street furnishings that are sensitive to the local context.

2.1.2 Systematic Implementation

- Implement policies and procedures with the construction, reconstruction, or other changes of transportation facilities on arterial streets to support the creation of complete streets including capital improvements and major maintenance.
- Revise the DS&PM where necessary to address equitable mobility. Ensure that the City balances the needs of diverse users in public and private project review.
- Collect data to track the performance of complete streets.

2.1.3 Context-sensitive Design

The Federal Highway Administration (FHWA) defines context-sensitive design as an approach to developing and redesigning transportation facilities that fit into the physical and human environment while preserving the aesthetic, historic, community, and natural environmental values.

- Design, operate, and maintain the transportation network to improve travel conditions for bicyclists, pedestrians, transit, vehicles, and equestrians, in a manner consistent with and supportive of the *General Plan* and *Transportation Master Plan* goals, and adapted to the localized context within the different areas of the City as described in:
  - The area plans for the North Area, Central/Downtown, and the Scottsdale Airpark contained within those sections of the *Transportation Master Plan*; and
  - Relevant provisions of adopted character area plans for neighborhoods or other localized plans or standards.

2.1.4 Roadway Restriping

This restriping guideline is intended to accommodate bicycle lanes on existing roadways, through optimized use of existing rights-of-way, pavement and facilities. Detail of this guideline can be found in the Bicycle Element.

- Adopt roadway restriping guidelines as part of the Bicycle Element of the *Transportation Master Plan* which consider existing and forecasted motor vehicle traffic, existing pavement and lane widths, American Association of State Highway and Transportation Officials (AASHTO)'s *A Policy on Geometric Design of Highways and Streets*, AASHTO's *Guide for the Planning, Design, and Operation of Pedestrian Facilities*, and AASHTO's *Guide for the Development of Bicycle Facilities*.

3.0 TRANSPORTATION MODE CHOICE

Policy Objective: Provide and support increased transportation mode choices by improving access to, and the function of, the pedestrian, bicycle, vehicle, and transit network in Scottsdale, thus carrying out the mode choice goals in the Community Mobility Element of the *General Plan* and in the Vision, Values, and Goals section of this *Transportation Master Plan*.

3.1 Policies and Strategies

3.1.1 Mode Split and Vehicle Miles Traveled Targets

Creating targets for transportation mode splits and/or annual VMT are methods used throughout the nation to promote and support transportation options. In some urban areas, the mode split is as much as 45 percent to 55 percent non-single occupant vehicle (non-SOV). For Scottsdale, a mode split for its most active areas (e.g., Downtown, Scottsdale Road/Loop 101) could approach 25 percent by 2030. Strategies for achieving this mode split include: improving bicycle, pedestrian, fixed-route transit and local circulator transit facilities and services; and working within the *General Plan* Land Use Element to promote live, work, play, and pedestrian-oriented development types. In time the combination of land uses and non-SOV facilities should positively increase the percentage of trips using transit, walking, and biking as the mode of choice.

- Adopt a non-SOV mode split target of 25 percent by 2030 in the City's most developed and active centers, such as Downtown. (Current citywide mode split during peak hours is approximately 20 percent, including carpooling.)
- Adopt a target of a 10 percent reduction in annual VMT per capita by 2015 and a 20 percent reduction in VMT per capita by 2030.
- Support these targets by evaluating land use decisions for the ability to incorporate and promote non-SOV facilities and mixed uses in development, per the *General Plan* and/or *Downtown Plan*.
- Develop a transit network that improves transit accessibility from neighborhoods to fixed route transit.
- Improve transit stops with seating, shade, bicycle storage, lighting, and more detailed route information.
- Implement the *Downtown Pedestrian Mobility Study* recommendations.
- Complete the pedestrian and bicycle priority projects listed in the Bicycle and Pedestrian Elements of the *Transportation Master Plan*.

- During each five-year capital improvement program budget, dedicate a minimum of one-third of available funding to projects that primarily serve transit, bicycle, and pedestrian system enhancements. (Currently approximately 26 percent of the transportation capital improvement program budget is available for transit, bicycle, and pedestrian system enhancements)

3.1.2 Public Information

- Provide ongoing, relevant, and timely public information about transportation options and choices (such as transit, bicycling, walking, car sharing, horseback riding, and hiking) available to citizens and visitors of the City of Scottsdale. Make this information available through available media including Web sites, City newsletters, public service announcements, and other means. Specific modal information is contained in the Streets, Bicycle, Transit, and Pedestrian elements.
- Collaborate with homeowner associations, schools, businesses, major employers, and healthcare agencies to develop marketing strategies to promote the benefits of walking, cycling, and transit.
- Continue to promote events such as the annual Walk/Bike to School and Cycle the Arts events which encourage and promote the benefits of walking and cycling.

3.1.3 Transportation Management Associations

Scottsdale, although large in land area and generally low-density, contains several areas where, due to concentration of employment (Airpark or Scottsdale Healthcare campuses) or a combination of residential, employment, retail, and entertainment uses (Downtown, SkySong), may benefit from a district-specific approach to transportation demand management, that is, through the use of transportation management associations (TMAs).

One of the region's first TMAs was formed in the late 1980s to serve Scottsdale area businesses, using grant funding for staff resources. More recently, TMAs throughout the metropolitan area were staffed by the regional public transportation authority's regional Rideshare staff. Although typically city-assisted, TMAs could be formed as independent nonprofit corporations. Other organizations or entities, such as the Scottsdale area chamber or Airpark area business groups, could serve as parent organizations for TMAs. Often, TMA membership is open to any interested party in a given district or area, but should seek to include major employers.

The goals of the TMA should be relevant to the problems of the district, such as maintaining or improving employee access to the district, improving mode choice and mode split among commuters, or reducing demand for parking. Typically, the goals of the TMA would be to reduce congestion, improve employee recruitment/retention, and alleviate parking issues through strategies that reduce reliance on SOV travel. A TMA could provide informational materials and public information events, support localized shuttle service, organize car pools, provide bike-to-work and walk-to-work incentives, Rideshare incentives, transit pass subsidies, and regional/local advocacy.

- Support the formation of TMAs in areas of the City which have the need and capacity for utilizing this tool. Assist interested citizens with technical support and start-up grants from city, regional, or state funds.

4.0 TRANSPORTATION SYSTEM EFFICIENCY

POLICY OBJECTIVES: Improve the efficiency of transportation system operations by maximizing the use of existing facilities, using enhanced technologies, calibrating system level of service measures to the local environment, and promoting an emphasis on transportation mode choice, making person capacity of the City's rights-of-way a measure of efficiency.

Guide the deployment and operation of advanced traffic management technology in an integrated fashion while preserving regional relations, to create a sustainable Scottsdale advanced traffic management system.

Transportation's most essential function is to provide mobility for people and goods. Mobility is the ease with which people can move through their community or region and is valuable because it provides access to jobs, services, and shopping. The efficiency of a transportation system can be determined through performance measures and analysis of traffic volumes and other data. Transportation performance measures are used to: improve the efficiency of system operations; to manage a given road or corridor; to prioritize funding of projects; and to measure the achievement of transportation goals. One of the most frequent measurements of traffic flow is level of service (LOS) of roadway segments or intersections for automobiles, bicycles, pedestrians or transit. However, measurement of person capacity is a more balanced measure which looks at the entire transportation network. In many cases, system capacity can be improved by better using existing facilities rather than simply adding lanes. Improving signing, striping, traffic control, technology, or sight distance should be considered in order to get the full benefits from an existing facility before new or expanded facilities are implemented.

4.1 Policies and Strategies

4.1.1 Congestion and Congestion Management

Virtually everyone who has ever traveled on regional roadways in their own vehicle or on a transit vehicle has had the experience of waiting in traffic. When asked what traffic congestion is, people often have very differing views. To some it is waiting at a signal for more than one cycle, for others it is inconsistent travel time, others say they don't want to have to travel below posted speed limits, and some say they have a problem walking across the street.

To define congestion broadly, congestion is the level at which transportation system performance is not acceptable due to traffic interference. The level of acceptable performance can vary by the type of transportation facility, by location, and by time of day. For instance, commuters typically expect and are generally willing to accept a certain amount of traffic during morning and evening "rush hours." However, they may not be willing to accept that same level of performance in the middle of the day.

Congestion management programs are frequently implemented by establishing LOS standards, travel demand management policies, working with planning entities on long-term land use analyses, identifying congested corridors, recommending multi-modal approaches, and capital improvements programming.

Level of Service Standard

Level of service (LOS) is a term used to qualitatively describe the operating conditions of a roadway based on factors such as speed, travel time, maneuverability, delay, and safety. Level of service is most frequently a measure of intersection efficiency, but can be used for roadway segments as well. Sidewalk or pedestrian LOS is measured in square feet per pedestrian. Transit LOS is measured in passengers per available seat. Traditionally, the LOS of a facility is designated with a letter, A to F, with A representing the least amount of delay and F the greatest. Each letter, A to F, includes a range of values rather than a single figure indicating signal timing delay, capacity-to-demand ratios, or other measures of flow.

Congestion at a given location will vary throughout the day and is usually measured and analyzed during peak travel times, when most congestion occurs. The vehicular LOS standard adopted in the 2003 *Streets Master Plan* throughout the City of Scottsdale is LOS D. The following policies add measures of person capacity and modify the citywide service standard to recognize the local area environment where lower vehicle LOS is preferred because of higher person capacity or other factors.

- Vehicular LOS D or better should be maintained at all signalized intersections with the exception of those intersections located within a designated core, a roadway with an urban character designation, or mixed-use area where lower levels of service are acceptable if other factors such as walkability, transit access, and aesthetic or right-of-way (ROW) considerations are overriding.
- Mitigation measures and intersection improvements should be considered if LOS conditions are not met.
- At non-signalized intersections with moderate traffic volumes, levels of service below D may be appropriate. Where low volume locations intersect with high volume locations, LOS F is not unusual, but should be considered for mitigation if alternative access is not available.
- Continue to refine the City's travel demand modeling capabilities to develop a measure of person capacity versus the traditional tool of vehicular capacity.

Travel Time Reliability and Travel Time Index

Travel time is the time it takes a person (in a vehicle, on foot, or on a bicycle) to move from the beginning to the end or between points of a corridor. Travel time is a function of both time and distance and should be representative of a typical traveler's experience in that corridor. The reliability of a system is the percent of travel that takes no longer than the expected travel time plus a certain acceptable delay or additional time. Travel time index is a term used in the *Texas Transportation Institute's Biennial Urban Mobility Report* and refers to the difference between average peak-hour travel time in a corridor versus free-flow conditions. For the most recent calculated year, 2005, the average travel time index for the country's 13 very large urban areas was 1.38, with the Phoenix area's index calculated at 1.31. This means that a trip in the Phoenix area that would take 20 minutes during off-peak conditions would take an average of 25 minutes during the peak period.

- Use the City's intelligent transportation system (ITS) to measure travel time in specific corridors and record consistency of trip and mitigate inconsistencies of travel in a given corridor.
- In corridors where ITS equipment is not available, use the traffic demand model to estimate the travel time index for corridors and develop mitigation strategies when the index exceeds 1.25.
- Coordinate with our regional neighbors to maintain travel time indexes appropriate for regional freeway facilities.

4.1.2 Access Management

Access management seeks to limit and consolidate access along major roadways at the same time providing a street system and access to support businesses and residential development along the roadway. The result is a corridor that functions safely and efficiently, as well as a more attractive corridor.

Some aspects of access management can be addressed at the development review stage, in response to a request for a development or connection permit. This may be accomplished through the subdivision or site plan review process. Larger developments are often required to submit a traffic impact assessment to assist the City in its review and access management can be implemented at this time.

Benefits of access management include the following: improving safety for drivers accessing properties or traveling in a through-travel lane; maximizing roadway capacity; reducing congestion and delay; and making pedestrian and bicycle travel safer.

- Define acceptable levels of access for each roadway classification to preserve its function, including criteria for the spacing of signalized and unsignalized access points.
- Apply appropriate geometric design criteria and traffic engineering analysis to each allowable access point.
- Enforce existing access management regulations that address access spacing and design.

Existing Access Management Policies

The City of Scottsdale has a number of existing access management policies which were incorporated in the 2003 *Streets Master Plan*. These include policies for Shea Boulevard, Via Linda, Scottsdale Road, Pima Road, Dynamite Boulevard, and Frank Lloyd Wright Boulevard. In addition to the specific access management policies for these streets, there are several other policies which control access, including the expressway policy, parkway policy, arterial median break policy, and the scenic corridor policy. These policies are all aimed at controlling the level of access to and from major streets to improve overall traffic safety and capacity.

Shea Boulevard Policy (former Expressway Policy)

In January 1995, the Transportation Commission adopted this policy for Shea Boulevard east of Pima Road (at this time the only designated expressway within Scottsdale). The expressway classification was merged into the arterial classification in the 2003 *Streets Master Plan*; however, this policy still applies as defined to Shea Boulevard. Deviation from this expressway policy requires approval of the Transportation Commission.

Arterial Median Break Policy/Arterial policy

The arterial median break policy outlines the goal of mobility over access on all arterial roadways. The arterial policy details drive separation from streets, number of drives, spacing between private drives, exclusive side street access, side-street access location, residential access, deceleration, traffic signals, intersection control, and access by alternative modes of transportation for all major or minor arterial roadways identified by the *Streets Master Plan*. Deviation from the arterial policy requires approval of the Scottsdale City Council. Dynamite Boulevard, Frank Lloyd Wright Boulevard, Pima Road north of the Loop 101, and Scottsdale Road north of Frank Lloyd Wright Boulevard are subject to the arterial policy, and deviation from these specific policies requires approval of the City Council. Via Linda east of 90th Street to

136th Street is also subject to the policy; however, deviation from this policy requires approval of the Transportation Commission.

On August 21, 2007 the City Council approved a new land divisions ordinance which authorized the Development Review Board to adopt, review, and amend the DS&PM. On August 23, 2007 the Development Review Board adopted the 2007 DS&PM. Access management direction is provided in the DS&PM, making specific access policies redundant.

- Follow the DS&PM access guidelines for access management on Scottsdale's streets.
- For consistency, consider transportation general manager or Transportation Commission level of approval for deviation from all access management policies, including the arterial policy or the Shea Boulevard policy. Appeals would be heard by the Transportation Commission.

4.1.3 Intelligent Transportation Systems (ITS)

ITS can be defined as the integration of advanced communications technologies into the transportation infrastructure and in some areas, vehicles. Its encompass a broad range of wireless and wire line communications-based information and electronics traffic management technologies, including traffic signals, computers, integrated software systems, graphics, video walls, fiber optic cable, closed circuit TV cameras, variable message signs, ramp meters, and vehicle detectors. Its is used to coordinate signals, integrate freeway and arterial operations, improve traffic progression, reduce incident clearance times, improve bus progression, and enhance special event traffic management.

The City's ITS automates traffic signal control and roadway congestion response. Scottsdale ITS devices are integrated with a central coordinated electronic traffic signal system in the City's traffic management center (TMC). The ITS includes 46 pan-tilt-zoom cameras at intersections allowing TMC personnel to view traffic conditions and make adjustments to approximately 285 signals remotely. Integrating ITS devices with a centrally coordinated electronic traffic signal system results in significant benefits to Scottsdale residents.

The City's ITS strategic plan was developed in 2003 and serves multiple purposes. It guides the deployment, management, and operation of advanced traffic management technology in Scottsdale and strives to improve safety and efficiency of roadways by using this technology. In addition, the ITS strategic plan serves as a tool for education and providing information to the public. The objectives of the Scottsdale ITS strategic plan are as follows:

- Hold travel time on City streets steady, and where possible, reduce travel time, even as traffic volume increases due to growth;
- Reduce traffic incident delay;
- Communicate rapidly among the Police Department, emergency services, ADOT, Fire Department, vehicle drivers, and TMC to enhance roadway safety; and
- Coordinate between adjacent municipalities and jurisdictions along arterials, crossing borders and at interchanges with freeways.

ITS Benefits

An April 2003 "Indian School Road Corridor Intelligent Transportation System Evaluation" conducted by a consultant for the City evaluated many of the benefits of ITSs. The following was found based upon the Indian School Road corridor study:

- Travel time was reduced by 64 seconds per vehicle over a 3 mile area;
- The use of technology potentially doubles the TMC staff capability for output of basic timing changes (from 50 to 100 as of the time of the report);
- The use of closed circuit TV cameras allows for the TMC staff to make additional real time signal adjustments annually (400 at the time of the report); and
- The Scottsdale Police Department was documented as saving the equivalent of 30 traffic control officers during events such as the Barrett-Jackson Classic Auto Auction and the FBR Open.

Although ITSs are locally based, ITS also has nationwide benefits, when used. The following information is available through FHWA.

- Implementing advanced traffic surveillance and signal control systems reduces travel time by 8 to 25 percent.
- Ramp meters and other freeway management systems reduce crashes by 24 to 50 percent and increase highway capacity 8 to 22 percent at speeds 13 to 48 percent faster that existing conditions.
- Incidents related to traffic congestion were reduced by 10 to 45 percent.

As technology continues to evolve, so will the need for more advanced operational plans. Management of the City's ITS strategic plan requires coordination and partnerships with the Transportation Department, Police and Fire departments, emergency services, and information systems. When properly deployed and operated, ITS decreases congestion common to high traffic volumes, incidents, and special events.

The following ITS policies should be adopted through the *Transportation Master Plan*:

- Continue to support the ITS strategic plan and the objectives of the ITS strategic plan listed above, by ensuring adequate staffing, personnel training, operations and maintenance, as well as timely equipment updates;
- Expand the use of ITS for future transportation modes such as BRT corridors programmed in the RTP (Proposition 400); and
- Explore additional uses of ITS such as applications that show real-time traffic conditions on the internet or real-time transit vehicle speed and estimated trip timing through vehicle sensors.

4.1.4 Rights-of-Way Management

The primary purpose of the City's emerging Right-of-Way Management Program (RWMP) is to effectively and efficiently manage and coordinate activities that occur within the public ROW in a way that enhances safety, coordinates multiple activities, and preserves mobility.

The following are examples of the type of activities that occur within in the ROW (excluding public safety emergencies):

- Transportation: personal vehicles; transit (public and private); commercial vehicles (product and service delivery); bicycles; pedestrians; shared-use trails;
- Construction: capital projects; developer improvements; utilities;
- Maintenance (scheduled and unscheduled): street and sidewalk/path repair; utility maintenance; and
- Special events.

The RWMP establishes a central point of coordination and management of the often competing activities in the public ROW. This central point of contact will review and schedule activities to avoid conflicts, and will attempt to consolidate similar activities that are scheduled to occur in the same vicinity to avoid multiple lane closures and restrictions. The RWMP proposes to include revisions to City code and ordinances, and introduce new policies and procedures which will facilitate management of the ROW. Field inspections and enforcement of proposed code will reduce unauthorized or ineffective closures and restrictions.

4.1.5 Traffic Control Devices

The way in which intersection travel is controlled is important to the efficiency of the transportation system. There are many ways to control intersections to provide safe, efficient movement of multi-modal traffic including minor street yield, minor street stop, multi-way stop, multi-way yield, roundabouts, traffic signals, and grade separations. Choosing these differing alternatives must be done in accordance with the federal and state guidance and as described in the *Manual on Uniform Traffic Control Devices* (MUTCD). These decisions should also consider new and developing ideas and guidelines, as well as best practices in planning and engineering.

Different intersection traffic control options yield varying intersection capacity. For example, side-street stop control typically has more capacity than a multi-way stop. A roundabout also has greater capacity than a multi-way stop but may have less capacity than a side-street stop with low side-street volume. Traffic signals also typically have more capacity than a multi-way stop, and may or may not have more capacity than a roundabout of side-streets stop depending upon the traffic patterns. Federal standards have been established for the installation of both multi-way stops and for traffic signals. While roundabouts standards have not yet been established, there are design tools which are used that can determine the capacity of a particular roundabout design. In general a single lane roundabout can handle 20,000 to 25,000 vehicles per day (vpd) with multiple lane roundabout capacity varying depending upon the design and the particular traffic patterns.

4.1.6 Roadway Modification Guidelines

In order to address congestion issues, communities are often faced with the need to add additional travel lane capacity to the transportation network. This need must also be weighed against neighborhood impacts and community character or context issues. In Scottsdale, the primary roadway network consists of two-lane collectors, four-lane collectors and arterials and six-lane arterials. The City currently limits local roadway widths to six lanes, and this plan proposes to continue this long-standing policy. One measure that is often used to assist in making decisions regarding adding travel lanes is the volume to capacity ratio, which compares average daily traffic lanes volumes to a predetermined standard.

Based on historic traffic volume trends it is recommended that:

- There should be no widening beyond six through travel lanes;
- Target average daily traffic volumes on two-lane collectors to no more than 8,000 vehicles per lane per day using 2030 forecasted volumes;
- Target average daily traffic volumes on four-lane collectors to no more than 9,000 vehicles per lane per day using 2030 forecasted volumes;

- Target average daily traffic volumes on four-lane arterials to no more than 10,000 vehicles per lane per day using 2030 forecasted volumes; and
- Use character type considerations for when roadways should be widened.
  - Widening of roadways designated as rural in character would be considered when forecasted volumes reach 90 percent of the target threshold.
  - Widening of roadways designated as suburban in character would be considered when forecasted volumes reach 100 percent of the target threshold.
  - Widening of roadways designated as urban in character would be considered when forecasted volumes reach 120 percent of the target threshold.
- Roadway widening will typically be limited to minimum 1-mile segments.
- To promote sustainability, consider the least impactful solutions for corridor capacity first. The priority for improvements to corridors reaching the target volume thresholds is:
  - Improve use of existing facilities through the efficient implementation of cost effective signing, striping, intersection control, and sight distance improvements
  - Improve access to, and amenities at, transit stops, if transit service is available and review quality of the service
  - Upgrade pedestrian facilities to at least minimum standards
  - Upgrade bicycle facilities to at least minimum standards
  - Consider adding transit service, if not currently available
  - Install ITS equipment, if none existing, and integrate with transit service
  - Increase access management
  - Add right-turn deceleration lanes to commercial and/or multi-family driveways
  - Add turn lanes at intersections
  - Add travel lanes
- Consider a minimum buffering distance from homes on roadways in order to enhance neighborhood preservation and livability when roadway widening may be necessary.
- Four-lane roadways may be considered for lane reductions when forecasted volumes do not exceed a total of 12,000 vpd (3,000 vehicles per lane per day) and where lane reductions will facilitate other transportation improvements.

5.0 TRANSPORTATION SAFETY

POLICY OBJECTIVES: Reduce injuries and deaths from transportation-related causes, protect neighborhood livability, and support the function of commercial areas by prioritizing safety and livability through decreased intersection conflict and improved speed limit policy; by enforcement of safety regulations; and through a coordinated safety education campaign.

Increase the availability of Safe Routes to School for children in Scottsdale and the utilization of these routes by an increasing number and percentage of students over time through the implementation of a citywide Safe Routes to School program.

5.1 Policies and Strategies

5.1.1 Enforcement

Providing traffic enforcement services and the enforcement of traffic laws and ordinances is a responsibility shared by all law enforcement agencies. Among the primary objectives of this function is encouraging motorists, pedestrians, and bicyclists to comply voluntarily with the laws and ordinances.

Speeding reduces the time drivers have to avoid crashes and lengthens stopping distances, increasing both the likelihood of crashing and the severity of the crashes that do occur. According to the National Highway Traffic Safety Administration (NHTSA), speeding is one of the most prevalent reported factors associated with crashes. Speeding is a factor in 31 percent of all fatal crashes, killing an average of 1,000 Americans every month. In 2002, more than 13,000 people died in speed related crashes. NHTSA estimates the economic cost to society of speed-related crashes to be more than $40 billion each year.

The Scottsdale Police Department manages a street level photo enforcement program, and managed a photo enforcement demonstration program on the section of the Loop 101 Freeway in Scottsdale during 2006 and 2007. Fixed speed and red-light cameras are present at several locations on city streets. The specific locations are listed on the City's Web site and are periodically revised.

Four photo enforcement vans are also stationed at varying locations throughout the community. The schedule and location of these vans are posted on the City's Web site. Prioritize high accident locations and school zones for traffic law enforcement.

- Use ITS and communicate rapidly among the Police Department, emergency services, ADOT, Fire Department, vehicle drivers, and traffic management center to enhance roadway safety and enforce traffic regulations.
- Coordinate traffic enforcement between adjacent municipalities and jurisdictions along arterial, crossing borders and at interchanges with freeways.

5.1.2 Public Education and Awareness Programs

Traffic safety education is an important corollary to enforcement activity. The extensive education/public outreach component of the Loop 101 photo enforcement demonstration program was thought to impact the number of photo enforcement detections during the program. Education of motorists, bicyclists, and other users is conducted on a spot basis currently through brochures or maps on such topics as the City's bicycle network and effective use of roundabouts. A more comprehensive program of safety education will target areas of concern based on safety analysis and provide continuing outreach to residents/businesses/visitors regarding safety awareness.

- Provide targeted public information (e.g., brochures, web, public service announcements, other media) about transportation safety topics and other transportation issues.
- Work with the City's CityCable 11 programming to develop and maintain cable information regarding the topics above (examples include driver behavior, sharing the road, use of bicycle helmets, etc).
- Encourage more driver training and testing for those most likely to be involved in causing accidents by working with ADOT, the governor's office of highway safety, and other transportation partners.

5.1.3 Engineering

Lagging Left-turn Arrows

The City implemented lagging left-turn arrow operation in 1989. Lagging left-turn arrows appear after the green indication for adjacent through traffic. For a study reported in the ITE Journal, eight years of collision data for intersections with leading and lagging left-run arrow operation were compared, using collision data from 1995 through 2002. The study considered the City of Scottsdale with predominately lagging left-turn arrow operation and the city of Mesa with predominately leading left-turn arrow operation. The collision experience was compared at 13 intersections with lagging left-turn arrows and nine intersections with leading left-turn arrows. Lagging left-turn arrows had a statistically significant lower collision rate than leading left-turn arrows for all collisions, collisions involving left-turning vehicles, and only collisions involving left-turning vehicles with opposing through vehicles.[1]

Modern Roundabouts

The City of Scottsdale has constructed a number of circular intersections (e.g., roundabouts and traffic circles) and is currently reviewing the safety record of these intersections. Preliminary indications are that accidents have been reduced at these locations. The "modern roundabout" has the following defining characteristics:

- Vehicles approaching must yield to traffic already in the circular portion of the roadway;
- Geometrics should encourage vehicular speeds of 15 to 25 mph around the circle;
- Splitter islands that slow and guide traffic into the circle;
- Splitter islands should provide pedestrian refuges; and
- Pedestrian crossing to the central island is not encouraged.

A modern roundabout can be a tool for providing safe and efficient intersection control, based on safety history and increasing driver familiarity in the United States. The Insurance Institute for Highway Safety indicates that roundabouts are safer than traffic signals because the most serious kinds of crashes at conventional intersections are virtually eliminated at roundabouts. Crashes that do occur tend to be minor because speeds are slower. The U.S. Department of Transportation states that "roundabouts are a proven safety solution that prevents and reduces the severity of intersection crashes…"

The decision to install a roundabout should be made on a case by case basis in accordance with FHWA's MUTCD and established state and national guidelines. These guidelines are still evolving and will continue to improve. In general, roundabout installation should be prioritized at high accident locations, congested locations, and locations where geometry or cost-effectiveness would favor installations.

- Continue to look for innovative engineering solutions that promote safety such as the lagging left-turn arrow, roundabouts, and ITS and technology solutions to reduce both the frequency and severity of accidents.
- Consider implementing safety enhancements such as SRTS program (see Section 4.6) and safety management and performance tracking through additional City staff.

1 Basha, Paul. ITE Jouyrnal (Institute of Transportation Engineers); August 2007.

5.1.4 Collision Analysis and Collision Prevention

The City of Scottsdale publishes a bi-annual report, the traffic volume and collision rate data report. The purpose of this report is to provide Scottsdale collision rate and traffic volume information on major roadway segments and at major intersections within the City. This information is used in a wide variety of traffic engineering studies and applications. The data within the report is comprised of collision data and seasonally adjusted traffic volume data. Collisions that occur on the Loop 101 Freeway or private property are not included in this report.

The data from each bi-annual traffic volume and collision rate data report is summarized in an executive summary report that graphs collision trends by type, level of injury, fatalities, and number of collisions related to alcohol. This summary also documents how the population of the City has changed over the same two-year period.

In addition to the executive summary report, the volume and collision rate information in the traffic volume and collision rate data report is also used to prepare a list of the 20 high collision intersection locations in the City of Scottsdale. The 20 high collision intersections are determined by ranking all intersections based both on the total number of collisions and the collision rate. The collision rate takes into account the vehicle volume present at each intersection.

Detailed reports of each collision type, including time of year and hour of the day that the collisions occurred, are gathered for each one of the 20 high collision intersections. Traffic engineering staff reviews this data to determine the collision trends present at the intersections and identify improvements to address those trends. The analysis begins with the preparation of collision diagrams for each of the top 20 intersection locations. These diagrams detail out the exact location and type of each collision at these locations. Field observations are conducted at each location to evaluate conditions including signing and striping, signal equipment, driveway locations, sight visibility, etc. The list of possible improvements is separated by collision type (e.g., rear-end, left turn, sideswipe, bicycle, pedestrian, etc.) as there are certain solutions for each collision type. Specific improvements are recommended to address the high collision trends at each of the 20 intersections. These improvements are often implemented as elements of larger capital improvement projects or undertaken as individual site specific safety projects.

The data from the bi-annual traffic volume and collision rate data report shows that over the past decade the number of collisions per 1,000 residents has decreased. The number of collisions has remained relatively constant while the population of the City has continued to increase steadily.

- Continue to have the collision rate decrease by having the total number of collisions remain relatively constant or decrease as the population of the City increases.
- Use collision analysis to help prioritize photo enforcement efforts.

5.1.5 Speed Limits

Arizona state traffic law allows local authorities within their respective jurisdictions to determine and/or change the maximum speed limit for all arterial streets, as well as businesses and residential districts, to a reasonable and safe speed based on engineering and traffic investigations.[2] The maximum speed limit per state law is 65 mph and the minimum speed

2 ARS Title 28, Article 6, Section 28-703

limit is 25 mph. Alleyways are set at 15 mph and school crossings may be set at 15 mph in accordance with state law and ADOT's *Guide for Traffic Control in School Areas*.

It is a widely accepted practice among traffic engineers to consider speed characteristics such as the 85th percentile value and the 10-mph pace when determining a safe and reasonable speed. (The 85th percentile speed is the speed at or below which 85 percent of the vehicles are moving. The 10-mph pace is the range of speed at which the greatest number of drivers are driving). Speed limits are typically set for new roadways based on a roadway's design and whether the surrounding area is urban, suburban, or rural. Design speed is defined as the maximum safe speed that can be maintained based on the geometric design features of the roadway. Speed limits are typically set lower than design speeds to provide a margin of safety and to allow for other operation characteristics that may influence safe speeds along the corridor.

In addition to evaluating speed data on existing roadways, speed studies investigate roadway geometry, adjacent land use and development, roadway hazards, bicycle and pedestrian traffic, and accident history. These factors are outlined in the MUTCD, which is the national set of standards for traffic control devices.

A speed limit study will help to determine the appropriate speed for a roadway or roadway segment. The criteria below will help to evaluate the alteration or establishment of speed limits. A speed limit study is not required to include all or should not be limited to these criteria. The study should also include all relevant information pertaining to the segment(s) of roadway being studied to determine the appropriate, legal, speed limit as determined by a qualified professional civil or traffic engineer. All speed limit studies will be conducted in a manner consistent with federal code, Arizona Revised Statutes (ARS), MUTCD, and should consider additional City of Scottsdale policies.

Speed limit study criteria:

1. Characteristics of the road – design speed; classification; number of lanes; left and/or right-turn lanes; condition of the pavement; bicycle lanes, shoulder conditions, curb, guardrail, sidewalk, adjacent paths, adjacent walkways, lighting landscaping and/or vegetation; signalization, sign, and pavement markings; curves and grade; sight distance.

2. Characteristics of vehicle travel speed – posted speed limit; mean, median, mode vehicle travel speed; 85th percentile and 95th percentile vehicle travel speed; 10-mph pace speed; historical speed limits resulting from prior studies; adjacent speed zones to study segment; speed limit enforcement measures.

3. The local environment, roadside development – adjacent land use; adjacent schools; type, frequency, and location of access points to adjacent land; public transportation activity; designated transit stops.

4. Pedestrian and parking characteristics – location of crosswalks and pedestrian activity; child pedestrian activity; roadside parking.

5. Collision characteristics (intersections and segments) – twelve month collision experience including speed related crash experience; similar road segment twelve month collision experience prior to and subsequent to speed limit alteration; additional pertinent collision experience information including trends, and historic collision rate summaries.

6. Additional pertinent information could also be considered such as costs of enforcement, costs of engineering measures and their maintenance, delays to traffic, effect of the current and proposed speed limits on local residents, and expected accident savings.

- Roadway design speeds should be no greater than 55 mph within the City of Scottsdale allowing for maximum safety and to encourage drivers to adhere to the speed limit proposed for the facility based on its function.
- Arterial roadways should facilitate through-travel and limit access to reduce conflicts and improve safety. Design elements should not encourage speeds above 50 mph.
- Roadways classified as collector streets should balance access with through-travel and incorporate design elements that encourage driver compliance with speeds of no more than 40 mph.
- Neighborhood streets should prioritize access over through-travel and should incorporate design elements that encourage driver compliance with speed limits between 25 and 30 mph.
- For specific enforcements of travel speeds, it is appropriate for travel speed statistics to be determined for different time periods of the day and different days of the week. These different sets of travel speed statistics can be utilized to concentrate enforcement to the hours and days when travel speeds are most disparate and therefore most likely to result in collisions.

5.1.6 Safe Routes to Schools

Promoting safe access to and from the schools in Scottsdale is of primary importance to the City. The Transportation Department has taken several steps to improve the safety of children and their parents around schools. A school crossing safety brochure was created and, at the beginning of the 2005–2006 school year, hand delivered to each public school in Scottsdale that has a designated school crossing.

The City also developed a school transportation safety audit program that is intended to proactively identify potential transportation issues and improvements. The school audit program was also intended to provide the schools a City of Scottsdale contact point to exchange information and ideas to help resolve school related transportation issues. The City solicited input from all public schools and their districts, and used the information received to identify transportation safety aspects all of the public schools in Scottsdale. Transportation Department staff conducted on-site observations of school drop off and dismissal during a typical school day. Recommendations were provided to the school principal, school district Transportation Department representative, City of Scottsdale Transportation Department staff (technicians, planners, and engineers) and the school resource officers for their review. Implementation of the recommendations was performed by the City if the project affected the public ROW, and other recommendations were implemented by the districts.

The goal of these activities was to provide a precursor to a comprehensive SRTS program.

Safe Routes to School Program

Many of us remember a time when walking and bicycling to school was a part of everyday life. National research states that in 1969, about half of all students walked or bicycled to school. Today, fewer than 15 percent of all school trips are made by walking or bicycling, one-quarter are made on a school bus, and over half of all children arrive at school in private automobiles.

This decline in walking and bicycling has had an adverse effect on traffic congestion and air quality around schools, as well as pedestrian and bicycle safety. In addition, a growing body of evidence has shown that children who lead sedentary lifestyles are at risk for a variety of health problems such as obesity, diabetes, and cardiovascular disease. Safety issues are a big concern for parents, who consistently cite traffic danger as a reason why their children are unable to bicycle or walk to school. The purpose of the federal Safe Routes to School (SRTS) program is to address these issues head on. At its heart, the SRTS program empowers communities to make walking and bicycling to school a safe and routine activity. The program makes funding available for a wide variety of programs and projects, from building safer street crossings to establishing programs that encourage children and their parents to walk and bicycle safely to school. Each state administers its own program and develops its own procedures to solicit and select projects for funding. The program establishes two distinct types of funding opportunities: infrastructure projects (engineering improvements) and non-infrastructure related activities (such as education, enforcement and encouragement programs).

The purposes of the SRTSs program are:

1. To enable and encourage children, including those with disabilities, to walk and bicycle to school;

2. To make bicycling and walking to school a safer and more appealing transportation alternative, thereby encouraging a healthy and active lifestyle from an early age; and

3. To facilitate the planning, development, and implementation of projects and activities that will improve safety and reduce traffic, fuel consumption, and air pollution in the vicinity of elementary schools.

In 2006, Scottsdale held its first Walk or Bike to School event, partnering with Grayhawk elementary school. A parent's organization worked with the City to advertise the event and encourage participation. Approximately 700 of the 775 Grayhawk elementary school children walked or biked to school on this day, making the event an unqualified success.

- To promote safety in and around schools, transportation projects will be prioritized which:
  - Address an identified safety problem along a major school route;
  - Relieve localized traffic congestion caused by children being driven to and from school;
  - Complete a "gap" in the bicycle and pedestrian system along a major school route
  - Maximize daily uses by students and others; and
  - Demonstrate strong parental and community support.

- Establish an ongoing SRTS program in the City of Scottsdale.

6.0 SUSTAINABLE TRANSPORTATION/SUSTAINABILITY

Sustainable transportation meets the access needs of the current population while protecting the environment, reducing dependence on non-renewable fuels, and accommodating planned, responsible growth. Planning for sustainable transportation involves developing policies that are appropriate for a given area, whether it is an urban area with good public transit or a rural area more dependent on motor vehicles.

By "sustainable transportation" we mean a transportation system that:

1. Allows the basic access needs of individuals to be met safely and in a manner consistent with human and ecosystem health, and with equity within and between generations;

2. Is affordable, operates efficiently, offers choice of transportation mode, and supports a vibrant economy; and

3. Limits emissions and waste, minimizes the use of land and the production of noise, and minimizes the heat build-up due to pavement.

Local governments across the U.S. are taking a variety of energy efficiency and renewable energy actions that can have multiple benefits including saving money, creating jobs, promoting sustainable development, and reducing greenhouse gases and air pollution. Strategies for increasing transportation sustainability include demand management, operations management, pricing policies, vehicle technology improvements, clean fuels, and integrated land use and transportation planning.

- Identify and incorporate site design features in non-residential development proposals that will make them more accessible to those walking, cycling or taking public transit and promote more sustainable modes of passenger transportation.
- Implement a program to install roundabouts at appropriate existing congested intersections and planned new intersections. Studies have shown that roundabouts can significantly reduce maintenance costs, fuel consumption, motorist delay, and vehicle emissions, as well as improve safety for motorists and other users.
- Incorporate environmentally sensitive materials and technologies in transportation projects/improvements and facilities, including the use of solar technology and recycled materials.
- Use the City's *General Plan* process as a tool to promote more sustainable local transportation systems.
- Expand the use of fuel efficient, alternative fuel, or hybrid vehicles in the City's fleet and promote throughout the community.
- Promote and expand the use of car sharing by Scottsdale residents and businesses by providing dedicated parking and other incentives.
- Recognize walking and biking as serious modes of transportation and create pedestrian and bicycle friendly travel routes to potentially decrease the number of vehicles on the road, leading to less congestion, air pollution, and greenhouse gas emissions.
- Create a local action plan for emission reductions by establishing a baseline calculation of greenhouse gas emissions, establish targets to lower emissions, develop a local action plan to reduce greenhouse gas emissions, and monitor, measure, and report performance to the community at large.
- Incorporate opportunities for shading pavements and using "cooler" pavement technologies to reduce localized "heat island" effects.

7.0 UNIVERSAL DESIGN/ADA COMPLIANCE

Universal design (also called inclusive design, accessible design or just accessibility) refers to facility designs that accommodate the widest range of potential users, including people with mobility and visual impairments (disabilities) and other special needs.

Although universal design standards address the needs of people with disabilities, it is a comprehensive concept that can benefit all users. For example, people who are carrying packages or pushing a cart or stroller are not disabled, but their needs should be considered in facility design. Increased walkway widths, low-floor buses, and smooth walking surfaces improve convenience for all travelers, not just those with mobility impairments. Curb ramps are important for people using handcarts, scooters, baby strollers, and bicycles, as well as wheelchair users. Automatic door openers are another example of universal design features that can benefit many types of users.

Universal design should be comprehensive, meaning that it results in seamless mobility options from origin to destination for the greatest possible range of potential users. It should consider all possible obstacles that may exist in buildings, transportation terminals, sidewalks, paths, roads, and vehicles.

- Work with the Planning and Development Services Department to create programs to educate planners, designers, and inspectors on incorporating universal design into planning and transportation facility design and construction. Staff members that are responsible for integrating accessibility features into their designs should seek additional training on ADA requirements and emerging issues including the draft guidelines for accessible public rights-of-way.
- Work with planning and development services to ensure that specifications to meet the guidelines are included on design drawings.
- Identify special projects and funding to reduce barriers and upgrade facilities to meet new accessibility standards.
- Develop multi-modal access guides, which include maps and other information on access by people with disabilities to a particular destination, including availability of transit and taxi services, and the quality of walking conditions.
- Maintain or improve the current Scottsdale bus stop design which provides for a 6-foot deep bus stop and shelter to be located behind the sidewalk. Vertical shade elements should be included in bus shelter design.
- Adopt the technical provisions for recreation trails in outdoor developed areas as proposed in the final report of the regulatory negotiation committee on accessibility guidelines for outdoor developed areas (http://www.Access-board.Gov/outdoor/outdoor-rec-rpt.Htm). In this report, a trail is defined as a route that is designed, designated, or constructed for recreational pedestrian use or provided as a pedestrian alternative to vehicular routes within a transportation system.
- Each year a percentage of all shared-use paths should be assessed or reassessed for accessibility, maintenance, and geographic information system (GIS) mapping using the universal trail assessment process that records objective grades, cross slopes, tread width, surface firmness and stability, and obstruction information.
- Trail access information should be placed at all access points on shared-use paths so that hikers of all abilities have the opportunity to determine the conditions of any particular section of a trail or shared-use path before they start to negotiate the route.
- Consider augmenting the Human Services Commission with a Disability Advisory Committee to create a resource for planning and prioritization of pedestrian and universal access improvements within Scottsdale.
- Develop a comprehensive information source to simplify the process for persons needing to utilize transportation services such as Dial-a-Ride and Cab Connection.

- The provision of shaded bus stops is a critical issue for persons with physical disabilities and every attempt should be made to increase the number of shaded bus stops, including shelters.
- Follow best practice planning and design for pedestrians with disabilities (revised draft guidelines for accessible public rights-of-way) which recommend that marked crosswalks be provided at all signalized intersections.
- Incorporate a walking speed of 3.5 feet per second or slower to calculate pedestrian clearance time as recommended in the revised draft guidelines for accessible public rights-of-way.

8.0 NEIGHBORHOOD TRAFFIC MANAGEMENT

The City is currently in the process of finalizing modifications to a neighborhood traffic management program. This program is a comprehensive set of policies and procedures used by the City in ongoing efforts to assist neighborhoods who identify impacts of speeding or cut-through traffic. The draft neighborhood traffic management program has the following goals which are supported through the Policy Element of the *Transportation Master Plan*:

- Minimize the negative impacts of traffic in neighborhoods through the ongoing monitoring and improvement of the overall transportation system.
- Protect Scottsdale's residential neighborhoods from "unwanted" traffic – defined as either:
  - Excessive vehicle travel speeds or;
  - Vehicles with an origin and destination outside the neighborhood or;
  - Excessive vehicle traffic volumes.
- Balance the often conflicting needs of reducing traffic volumes and travel speeds, while maintaining short emergency vehicle response times.
- Resolve the traffic concerns of a neighborhood without negatively affecting other citizens and neighborhoods.
- Ensure broad-based citizen participation as an essential element in the development of a safe, effective neighborhood traffic management program.

9.0 FREIGHT MOBILITY/TRUCK ROUTES

Commercial truck vehicle traffic is a basic feature of community living. Grocery stores need food deliveries and businesses need their goods delivered or picked up. Most of Scottsdale's arterial streets have residential frontage, making the need for buffering solutions and mitigation imperative. Currently, the City has several designated truck routes, but those designations do not extend north of Indian Bend Road.

It is recommended that all major roadways are considered truck routes. All neighborhood/local system routes will not be considered for truck route designations. Roadways will be considered for truck routes based on the following:

- Connection to a regional freeway;
- Reasonable alternative routes for truck traffic;
- Historical usage by truck traffic;
- Zoning, land uses (commercial, residential, schools) along the route; and
- Noise mitigation measures such as rubberized pavement.

In accordance with the provisions of Scottsdale City Code Article 3, Section 17–60 and when signs are erected giving notice of the adopted truck routes, no persons shall operate any commercial vehicle exceeding 10,000 pounds gross vehicle weight at any time upon any streets or part of a street, except for the purpose of pick-up or delivery of materials or merchandise.

Operators of said commercial vehicles may leave an adopted truck route by the nearest route to travel a distance no greater than 3/4 mile to complete deliveries and pick-ups. At the completion of said delivery and/or pick-up, commercial vehicle operators must return immediately by the nearest route, not to exceed 3/4 mile. However, such travel detours shall not entail crossing another truck route.

- Major roadways will be considered routes for freight delivery with restrictions on the hours of day when deliveries can be made to help mitigate adverse impacts of trucks to residential areas.
- In Downtown and other designated urban character areas, trucks should not block travel lanes especially during peak hours in the morning and evening.

10.0 ROADWAY NOISE MITIGATION

The City of Scottsdale does not provide noise mitigation on roadways that are not being widened or realigned closer to residences. If it becomes necessary to widen a roadway, the City uses ADOT policies for roadway noise levels and when mitigation should occur, excluding the cost ceilings identified in ADOT policies. In addition, the City uses rubberized asphalt on new and major resurfacing roadway paving projects, decreasing the levels of roadway noise on City streets. Often, noise mitigation involves the installation of sound walls, which may conflict with other City policies and practices in the northern area such as the scenic corridor design guidelines, Environmentally Sensitive Lands Ordinance (ESLO), and the foothills overlay zoning district.

- Use rubberized asphalt and other methods to minimize roadway noise.
- Prioritize noise mitigation alternatives to sound walls, such as berming or vegetation. Avoid the use of sound walls where scenic corridor setbacks exist.
- Consider Transportation Commission and Council adoption of a modified version of the ADOT noise mitigation policies (without the cost limitation for roadway mitigation) for use in City roadway projects.

11.0 ROADWAY CONSTRUCTION IMPACTS

Roadway construction has a range of impacts on mobility for autos, pedestrians, bicyclists, and transit users. The City works with contractors doing road construction to maintain through travel and business access during construction. Construction barricading and scheduling is required to be submitted to the City's ROW manager. Through the master plan process there has been some discussion about limiting construction to nighttime hours, to making sure that weekend and special event travel is unimpeded, and ways to limit the duration of travel lane closures. In addition, the City's RWMP works to coordinate construction occurring within the City's rights-of-way.

- Schedule arterial roadway construction so that parallel arterials will not be under construction at the same time.
- During roadway construction avoid limiting through travel to one lane in either direction if possible.

12.0 TRAFFIC INCIDENT MANAGEMENT

Traffic incident management should bring together several City departments to work together to promote, develop, and sustain effective traffic incident management programs. The Transportation Department will coordinate with police, fire, and municipal services to develop a mechanism for achieving the following goals:

- Improved responder safety;
- Safe, quick clearance; and
- Prompt, reliable, interoperable communications.

Traffic incident management will achieve these goals through a series of strategies that will improve operations and communications; provide multidisciplinary training; track performance and progress; promote improved technologies; and provide increased driver awareness and education.

Law enforcement agencies are first responders at traffic incident scenes, providing 24-hour emergency response and operating under a paramilitary command structure. At most traffic incidents, law enforcement officers act alone and are trained to make unilateral command decisions.

Emergency medical services have evolved as primary care givers to individuals needing medical care in emergencies. As with police, emergency medical personnel have a defined set of priorities. They focus on providing patient care, crash victim rescue, and ensuring the safety of their personnel.

Transportation agencies are secondary responders. That is, they are typically called to the incident scene by first responders, usually law enforcement. Transportation agencies are rarely connected directly to public safety emergency communications and dispatch systems.

Towing and recovery companies that respond to highway incidents are indispensable components of all incident management programs. Even programs that include service patrols with relocation capability depend heavily on towing and recovery service providers. Challenges facing this industry are unique because they are not public agencies. As such, they must remain profitable to retain a skilled work force, purchase and maintain expensive and complex equipment, and to stay in business.

Traffic information service providers are primarily private sector companies that gather and disseminate traffic condition information. These private providers are the primary source of information for commercial radio traffic information broadcasts, the most common source of traffic information for motorists. These companies also package specific information on a route or time of day basis to paying clients who subscribe for the information. In recent years, many Internet sites have been created to provide road condition and traffic information. A mixture of public sector agencies and private information service providers maintains these sites.

- The Transportation Department will coordinate with police, fire, municipal services, and Communications and Public Affairs to develop a mechanism for achieving improved responder safety; safe, quick clearance; and prompt, reliable, interoperable communications.

13.0 LOCAL AREA INFRASTRUCTURE PLANS

Local area infrastructure plans have been drafted for some areas of the City outside of master planned communities. The purpose of these plans is to guide local decisions for infrastructure improvements (streets, water, trails, etc.) and related development, and to help coordinate the efforts of various City departments in providing these necessary services. These plans have not been approved or adopted by an official body, but serve as guides for City staff when reviewing development proposals. The goals and policies of the local area infrastructure plans will be adopted as part of the *Transportation Master Plan*. The maps displaying recommended infrastructure will be appended to the Streets Element of the *Transportation Master Plan* and adopted by reference. Significant public outreach will be required prior to finalizing the maps, which will be revised when/if conditions change.

A set of goals and policies were developed for local area infrastructure plans to help guide the need and location of planned service infrastructure and are based on the City of Scottsdale *General Plan* and the City Council's goals:

1. Coordinate infrastructure (streets, water, trails, etc.) so that they are not planned independently of one another.
2. Create a neighborhood design that establishes a balance between accessibility and access control and builds only the streets that are needed to serve each parcel.
3. Coordinate the location of utilities and public access improvements to reduce long-term costs and minimize disruptions to neighborhoods.
4. Provide predictability for City budgeting and maintenance programs.
5. Provide consistency in decision making across the City while also allowing for the ability to make informed site decisions that would alter the plans.
6. Increase public awareness about what may happen in their neighborhood regarding infrastructure.
7. Provide property owners with consistent information as to the planned service infrastructure as it relates to their property.

Additionally, specific goals and objectives were created for each infrastructure area including; transportation, trails, water resources, and environmental. The transportation goals and objectives are:

- Provide a safe and efficient transportation system;
- Maintain and improve traffic flow on the major street network;
- Protect neighborhoods from unwanted through traffic;
- Maintain existing/utilized street layout whenever possible; and
- Minimize the cost of the improvements.

The following policy for local area infrastructure plans should be adopted through the *Transportation Master Plan*.

- Implement local area infrastructure plans for areas of the City outside of subdivisions or master planned communities to guide neighborhood infrastructure planning and development, and to help coordinate the efforts of various City departments in providing these necessary services.

14.0 PARKING

Parking management policies can contribute to sustainable transportation practices as well as land use efficiencies and can make modal choice more convenient.

- Consider landscaping, design and potential for the use of first floor retail to make parking structures more aesthetically pleasing and appropriate for locations in activity centers and urban character areas.
- Work with the all Scottsdale area school districts to assist with parking issues as well as pick-up and drop-off issues.
- Use ITS and other technologies to help mitigate parking issues.
- Work with the Planning and Development Services Department regarding thresholds for the inclusion of parking structures versus parking lots and the design and aesthetics of each type of facility.
- Reinforce walkable, "park once" districts in Downtown and other urban character and activity centers within the City, where multiple trip purposes can be accomplished with a single automobile trip.
- Recognize that City funding for the construction of public parking garages will be considered as a business support function and not a transportation enhancement.

15.0 PUBLIC ART AND TRANSPORTATION

POLICY OBJECTIVE: Reflect Scottsdale's commitment to its public art program in the design and construction of transportation improvements.

Although transportation projects frequently include artists as members of design teams and related public art integration or stand alone components, there is no requirement to do so in the City's ordinances. The purpose of this set of policies/recommendations is to formalize current practice and assure its consistency with other City projects/programs.

15.1 Policies and Strategies

15.1.2 Percentage of Transportation Project Budgets for Public Art

- Ensure that transportation projects incorporate public art elements that promote and support the City's and Scottsdale cultural council's vision and mission.
- Implement a public art program in the City's capital improvement program, dedicated for transportation project. This transportation public art program would be supported by dedication of up to two percent of the total eligible costs of all transportation improvement projects to the selection, acquisition, fabrication, installation, and maintenance of public art.

Transportation improvement project means any transportation project paid for wholly or in part by City funds in which the City's contribution equals $100,000 or more for the construction, rehabilitation, remodeling, improvement or purchase for a public use of any street, sidewalk, parking facility, bicycle or transit facility. Routine maintenance and repair does not constitute a transportation improvement project.

16.0 MAINTENANCE AND LIFE CYCLE PLANNING

Maintenance of the City's streets and alleyways is managed by the municipal services department. The field services division of municipal services handles street resurfacing, alley maintenance, and streetlight and traffic signal maintenance. Schedules of street resurfacing with preservative seals, rubberized asphalt, slurry seal or hot mix asphalt are available on the City's Web site. In 2005 a pavement condition inventory was completed and a map of results is also available on the Web site.

To maintain the health, safety, and appearance of alleys, the City seeks resident cooperation to keep the alleys in the best condition possible by following guidelines provided on the City's Web site for alley maintenance program schedules, construction debris disposal, and brush and large object pick up schedules. The solid waste division and the revitalization program have worked together to promote citizen/city partnerships to help maintain alleys in a neat and sanitary condition.

Annually, the City:

- Treats the center portion of the alley for dust control;
- Removes vegetation from alley perimeters; and
- Treats alley surfaces to inhibit the return of vegetation.

The adjacent property owners are asked to keep the alley behind their property free from litter and debris; construction waste; landscaping granite

The field services division applies dust control treatments to unpaved roadways when average daily traffic counts exceed 100 vpd. The City works closely with Maricopa County to control dust and particulate pollution through these treatments. Unpaved roads that were graded by the county prior to their annexation by the City continue to be graded at approximately six week intervals. Other unpaved roads are graded as needed.

Funding for roadway-related maintenance and operations is provided through the City's share of state Highway User Revenue Funds. Maintenance and operations of existing facilities should continue to be the first priority for the use of Highway User Revenue Funds revenue.

4 STREETS ELEMENT

1.0 INTRODUCTION

The Streets Element of the Scottsdale *Transportation Master Plan* contains a summary of existing streets policy and recommended streets policy, as well as new recommendations for context-sensitive modifications to the City's street functional classifications. Ultimately the Streets Element serves to provide consistent information and guidance to provide an efficient street network. Different strategies may be employed, such as building or widening streets, making existing streets work better and applying technology to improve traffic flow. The Streets Element and the Policy Element of the *Transportation Master Plan* bring overlap and consistent policy guidance regarding a "complete streets" policy, context-sensitive design, mode split targets, VMT per capita reduction goals, use of ITS, and other policies.

Scottsdale's street network is the primary transportation system and serves a variety of modes and vehicular types, including automobile, truck, transit, bicycles, and pedestrians. The street system is largely built out with few major roadways anticipated to be added to the long range plan. This does not mean, however, that all roadways are currently built to their ultimate configuration. The emphasis in the Streets Element is to operate the system as safely and efficiently as possible. As the street system ages, additional emphasis will be needed on maintenance and repair of street sections that have reached the end of their expected life.

2.0 GOALS

The Vision, Values, and Goals section of the *Transportation Master Plan* identifies over-arching goals (based on the *General Plan* Community Mobility Element goals and additional goals regarding sustainability and regional coordination).

- Direct transportation policies, investments, and decisions in ways which support the community's adopted vision and values.
- Increase the range and convenience of transportation choices.
- Direct transportation policies, investments, and decisions to design context-sensitive responses.
- Coordinate transportation policies, investments, and decisions with neighboring communities and the larger region, while effectively managing impacts of increasing demand for regional highway travel.
- Focus investments on improvements which add long-term value; and maintain the transportation system in ways which minimize life cycle cost.

These goals reflect the goals of the *General Plan* Community Mobility Element, as well as a policy of sustainability. Further description of these goals can be found in the Vision, Values, and Goals section of the *Master Plan.* In addition, the following goals apply directly to the Streets Element.

- Maintain and improve citywide traffic circulation by widening roadways where appropriate and in concert with citywide goals of neighborhood protection; by using the ITS and access control to manage traffic flow; by identifying major intersections for improvements;

and by continuing a program of capacity improvements as part of the CIP to respond quickly to capacity restrictions.
- Provide a framework for the development of a transportation system for Scottsdale that is based on the complete streets concept, where streets are designed and constructed in a manner compatible with the surrounding land uses for use by all users.
- Encourage a mix of land uses that reduce overall auto use and are compatible with the function of the adjacent street network.
- Protect neighborhoods from negative impacts of traffic.
- Develop and manage the street network in a manner that places reliance on improving the efficiency of the existing system before expanding that system.
- Pursue development of a highly connected and continuous road system allowing for convenient and efficient travel by all modes.

3.0 COMPLETE STREETS POLICY

The Policy Element of the *Transportation Master Plan* includes the following policy objective on complete streets:

POLICY OBJECTIVE: To design, operate, and maintain Scottsdale's streets to promote safe and convenient access and travel for all users of all ages and abilities: pedestrians, bicyclists, transit vehicles and riders, and equestrians, as well as cars and trucks.

A complete street is one that is designed and operated to enable safe and comfortable access for all users. Pedestrians, bicyclists, motorists, and transit riders of all ages and abilities are able to safely move along and across a complete street. Various streets in the community are currently without sidewalks or paths or have inadequate sidewalks; are too narrow to safely share with bikes; may be intimidating to cross as a pedestrian; or are uninviting for transit users. Incomplete streets are often less safe for multiple users than complete streets.

While the City's current design guidelines are very consistent with the complete streets concept, instituting a complete streets policy ensures that the entire ROW is designed and operated to enable safe access for all users. Ingredients that may be found on a complete street include: sidewalks and/or paths, bike lanes, frequent crosswalks, wide shoulders, medians, bus pullouts, special bus lanes, raised crosswalks, audible pedestrian signals, sidewalk bulb-outs, and more.

Complete streets policies recognize that there is a need for flexibility as all streets are different and user needs will be balanced. All road projects should result in a complete street appropriate to local context and needs. A complete street policy will apply to both new and retrofit projects, including design, planning, maintenance, and operations for the entire ROW.

A complete streets policy:
- Specifies that 'all users' includes pedestrians, bicyclists, transit vehicles and users, and motorists, of all ages and abilities;
- Aims to create a comprehensive, integrated, connected network;
- Recognizes the need for flexibility: that all streets are different and user needs will be balanced;
- Is adoptable by all agencies to cover all roads;
- Applies to both new and retrofit projects, including design, planning, maintenance, and operations for the entire ROW;

- Makes any exceptions specific and sets a clear procedure that requires high-level approval of exceptions;
- Directs the use of the latest and best design standards;
- Directs that complete streets solutions fit in with context of the community; and
- Establishes performance standards with measurable outcomes.

The following implementation strategies are included in the complete streets policy.

3.1 Context-sensitive Design

Design, operate, and maintain the transportation network to improve travel conditions for bicyclists, pedestrians, transit, vehicles, equestrians, and freight, in a manner consistent with and supportive of the *General Plan* and *Transportation Master Plan* goals, and adapted to the localized context within the different areas of the City as described in:

- The area circulation plans for North, Airpark, and Central/Downtown Scottsdale contained within those sections of the *Transportation Master Plan*; and
- Relevant provisions of adopted character area plans for neighborhoods or other localized plans or standards.

3.2 Multi-modal Approach

A multi-modal approach includes all users (pedestrians, bicyclists, transit vehicles and users, equestrian users, and motorists of all types) of all ages and abilities. This approach aims to create a comprehensive, integrated, connected network. Understand that a universal "rule" on all streets cannot be applied – for example, pedestrian and bicycle access on highways or freeways is not generally encouraged.

- Provide facilities and amenities that are recognized as contributing to complete streets, including: roadway and pedestrian-level street lighting; pedestrian and bicycle safety improvements; access improvements in accordance with ADA; transit facilities accommodation, including but not limited to pedestrian access improvement to transit stops; street trees and landscaping; and street furnishings that are sensitive to the local context.

3.3 Mode Split and Vehicle Miles Traveled Targets

Creating targets for transportation mode splits and/or annual VMT are methods used throughout the nation to promote and support transportation options. In some urban areas, the mode split is as much as 45 percent to 55 percent non-SOV. For Scottsdale, a mode split for its most active areas (e.g., Downtown, Scottsdale Road/Loop 101) could approach 25 percent by 2030. Strategies for achieving this mode split include: improving bicycle, pedestrian, fixed-route transit and local circulator transit facilities and services; and working within the *General Plan* Land Use Element to promote live, work, play, and pedestrian-oriented development types. In time, the combination of land uses and non-SOV facilities should positively increase the percentage of trips using transit, walking, and biking as the mode of choice.

3.4 Systematic Implementation

Implement policies and procedures with the construction, reconstruction, or other changes of transportation facilities on arterial streets to support the creation of complete streets, including roadway restriping that considers existing and forecasted motor vehicle traffic, existing pavement and lane widths, per *A Policy on Geometric Design of Highways and Streets* (published by AASHTO), and desired bicycle accommodation. This restriping protocol is intended to accommodate bicycle lanes on existing roadways, through optimized use of existing rights-of-way.

More details on the provision of pedestrian, bicycle, and equestrian facilities within the framework of complete streets, universal access, and context-sensitive design within the City are presented in the Policy Element, Bicycle, and Pedestrian elements of the *Transportation Master Plan*.

4.0 EXISTING STREET SYSTEM/FUNCTIONAL CLASSIFICATION

The street system is defined by a street functional classification, consisting of a hierarchy of streets from the local streets to collector streets to arterial streets. These functional classes establish a common understanding of the use of the street and its character, regulate access from adjacent properties, and determine how the costs of new street construction are shared between the City and surrounding properties.

The functional classification system for the City of Scottsdale has evolved over the years into a set of 20 classifications as shown in Table 4-1. However, only the major and minor arterial and collector street type categories are identified on published maps. The character designations, such as rural, suburban, and urban have been left to the discretion of the design review process.

TABLE 4-1: Functional Classification Categories

Street type	Character
Major arterial	a) rural b) suburban c) urban
Minor arterial	a) rural/ESL b) suburban c) urban
Major collector	a) rural/ESL b) suburban c) urban
Minor collector	a) rural/ESL with trails b) rural/ESL c) suburban d) urban
Local collector	a) rural/ESL with trails b) rural/ESL c) suburban
Local residential	a) rural/ESL with trails b) rural/ESL c) suburban
Local commercial/industrial	

4.1 Street Classifications and Character Definitions

Definitions for the current street classification and character definitions are provided below.

Major and Minor Arterials

Arterial streets with raised medians provide regional continuity and provide for long-distance traffic movements. As defined by the *General Plan* Community Mobility Element, the **regional** street level presents the relationships and coordination of systems that travel through and beyond the City borders. The coordination of these regional networks is important to maintain continuous and useful links between Scottsdale and its neighbors. Major arterials stress traffic movement while minimizing local access. Minor arterials also stress traffic movement, but moderate access is provided to abutting land uses. Access is controlled through frontage roads, raised medians, or continuous left-turn lanes, as well as by the spacing and location of driveways and intersections. Arterial roadways generally serve higher traffic volumes (25,000–55,000 average daily trips [ADT]) than collector streets.

Major and Minor Collectors

Collector streets serve citywide needs and provide for shorter distance traffic movements and traffic movement between arterial and local streets. As defined by the *General Plan* Community Mobility Element, the **citywide** level focuses on policies that efficiently move people, goods, and information through and within our community. They provide connectivity between arterials and local streets. Collectors serve medium traffic volumes (5,000–30,000 ADT) with balanced emphasis on access to abutting commercial and residential land uses and mobility (travel speeds).

Local Collectors, Residential, and Commercial/Industrial Streets

These streets serve local/neighborhood systems. As defined by the *General Plan* Community Mobility Element, the local/neighborhood level seeks to develop choices based upon the dynamics of local neighborhoods. Local systems include neighborhood streets, circulators and shuttle bus systems, shared-use paths, and connections to paths, sidewalks, and traffic calming strategies. Local streets serve lower traffic volumes (usually less than 5,000 ADT) with precedence to direct access to abutting land uses over mobility (travel speeds), and are usually designed to discourage high travel speeds.

Character Types

Urban areas are defined as the activity centers and mixed-use areas such as Downtown, where pedestrian activity is likely to be the highest and alternative modes of transportation are more likely.

Suburban areas are defined as areas where land uses are often auto-oriented and there is separation between residential and commercial or employment uses.

Rural areas and environmentally sensitive lands (ESL) streets (described below) are defined as desert or low density land uses areas.

ESL streets are constructed using standards that minimize the impact on the adjacent topography and landscape. For ESL areas, the basic design vehicle for all non-arterial streets is the single unit truck as defined in AASHTO's *A Policy on Geometric Design of Highways and*

Streets which serves as a policy guide for development of street design. Design of streets in ESL areas includes mountable or ribbon curb, with bike lanes and 8-foot sidewalk or trail optional.

As stated above, the character designations, such as rural, suburban, and urban have been left to the discretion of the design review process.

4.2 Scenic Roadway Designations

Throughout Scottsdale, roadways have been designated scenic roadways through the *General Plan* since 1976, and have been further defined through scenic corridor design guidelines adopted by the development review board in 2003. The *General Plan* Open Space and Recreation Element map designates scenic corridors and buffered roadways.

Existing scenic corridors are:

- Scottsdale Road (north of the CAP Canal);
- Pima Road (north of the Loop 101 Freeway);
- Dynamite Boulevard;
- Shea Boulevard;
- Carefree Highway; and
- Cave Creek Road.

Existing buffered roadways include:

- Via Linda;
- Frank Lloyd Wright Boulevard;
- Hayden Road through the Airpark;
- Thompson Peak Parkway;
- Happy Valley Road;
- Lone Mountain Road;
- Desert Mountain Parkway; and
- Bell Road.

The designation of Scottsdale's scenic roadways (scenic corridors and buffered roadways) is established as a hierarchy. Scenic corridors are the largest roadways, with regional connectivity for both traffic and trails. The scenic setbacks of scenic corridors are also the largest, at 100 feet. Buffered roadways are also major roadways, but smaller in scale (usually minor arterials or major collectors), with citywide rather than regional traffic and trails. The setbacks of buffered roadways are usually 40 to 50 feet. Buffered roadways do not currently have specific design guidelines like the scenic corridor design guidelines.

Throughout 2002–2003, scenic corridor design guidelines were developed and taken through a public process and hearing with the development review board for adoption. These guidelines clearly identify the setbacks (100 feet with some exceptions) and design elements for scenic corridors. The setback is measured from the back of planned ultimate ROW with some exceptions. Development within the setback is limited to revegetation, non-vehicular travel ways (e.g., shared-use paths, walks, and trails with a meandering alignment), regional drainage structures, limited cross-access, and limited signs (as allowed by the sign ordinance). The scenic setback may be used as Natural Area Open Space (NAOS) and counted as required open space. No walls should be located within the scenic setback; walls abutting scenic corridors should be low, meandering, and unobtrusive to enhance the visual open space aesthetic. The guidelines were adopted by the Development Review Board in February 2003.

In October 2004, the City Council adopted a *General Plan* amendment to add Bell Road to the buffered roadway designation and add a third level of scenic roadway designation called "desert scenic roadway." Desert scenic roadways apply to the one-mile and half-mile roads within the City's ESLO district (similar in area to the North area) that are not already designated as a scenic corridor or buffered roadway. The setbacks of these roadways vary based on the topography and specific site conditions and rely on the placement of required NAOS and zoning setbacks to achieve the open space corridor along the roads. The City Council also adopted the application of a 100-foot scenic buffer along streets within and adjacent to the recommended study boundary of the McDowell Sonoran Preserve on undeveloped (as of October 4, 2005) properties of 25 acres or larger.

These scenic roadways have an influence on roadways (especially in the northern area) and provision of non-motorized transportation facilities due to the larger setbacks and design considerations that acknowledge the unique topography and natural features of the desert character northern area.

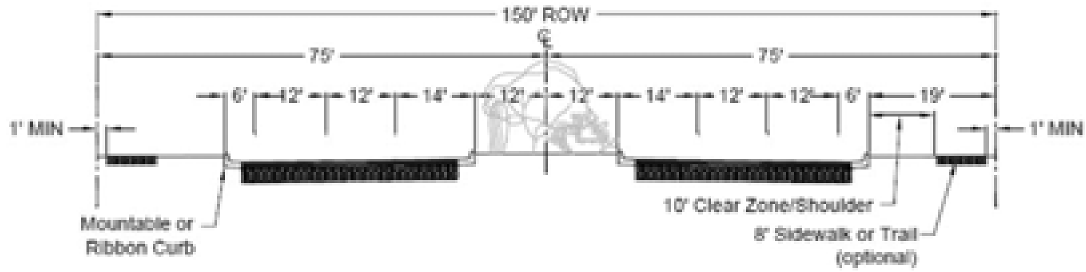
4.3 Existing Cross Sections

Figures 4-1 through 4-4 are graphical representations of the current cross section for each street classification — Figure 4-1: Major Arterials, Figure 4-2: Minor Arterials, Figure 4-3: Major Collectors, and Figure 4-4: Minor Collectors.

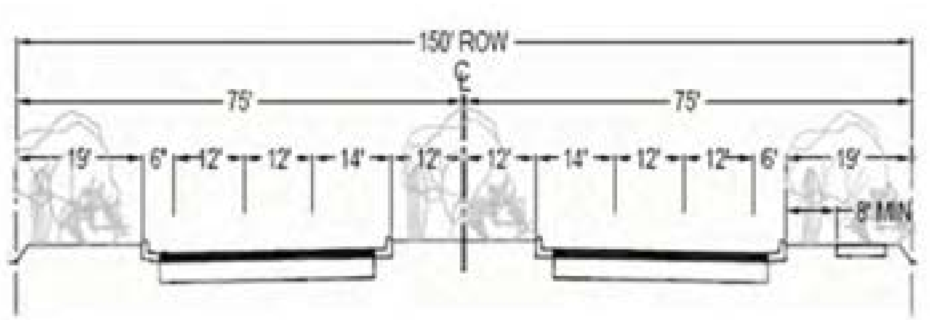
5.0 RECOMMENDED STREET SYSTEM/FUNCTIONAL CLASSIFICATION

The functional classification system that has been developed for the Scottsdale *Transportation Master Plan* focuses on the four major roadway classifications: major arterial; minor arterial; major collector; and minor collector (Figure 4-5).

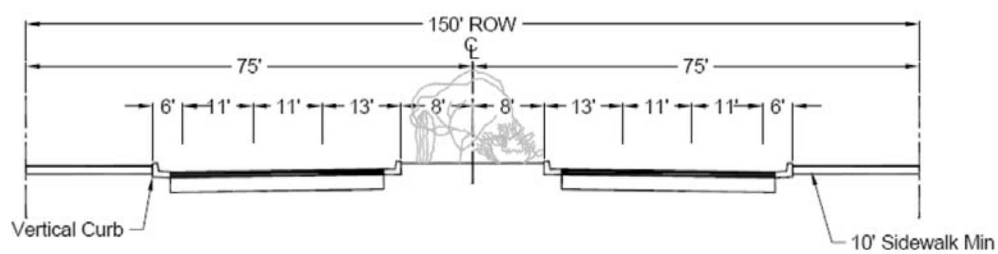
This section details the recommended City of Scottsdale's functional classification that has resulted from work performed during the *Transportation Master Plan* process. Figure 4-5 presents the recommended functional classification system for all arterial and collector streets in the City. Arterials and collectors are also designated as either major or minor. The number of lanes ranges from two on a minor collector to six on a major arterial.



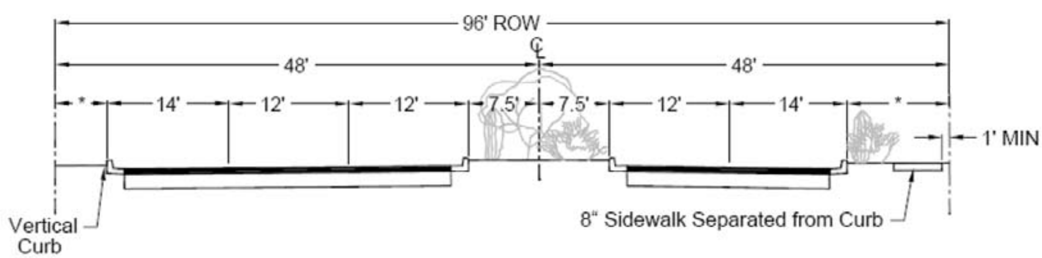
Rural Character



Suburban Character

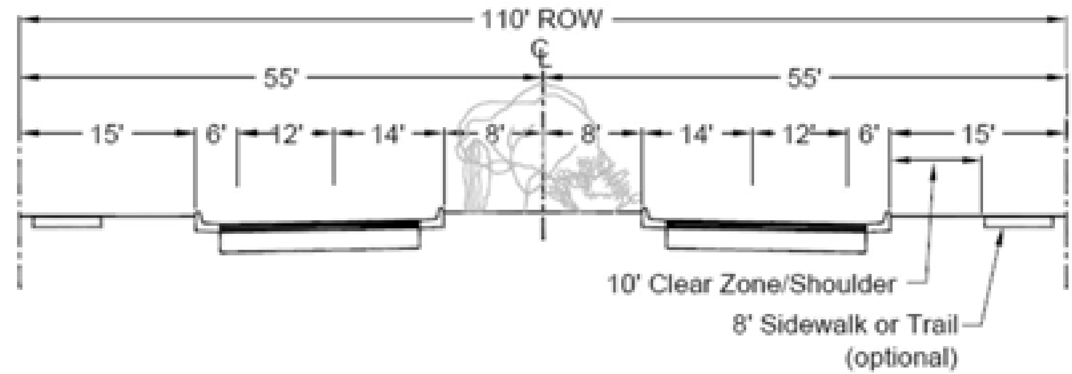


Urban Character

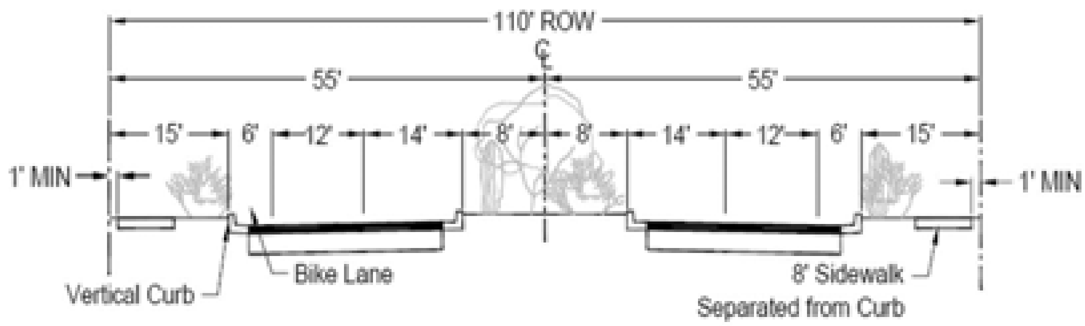


Couplet Streets

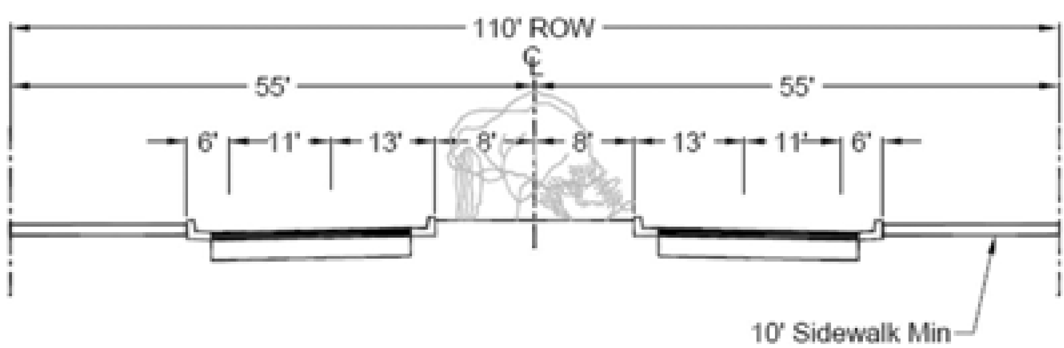
FIGURE 4-1: Major Arterials Typical Cross Sections



Rural/ESL Character

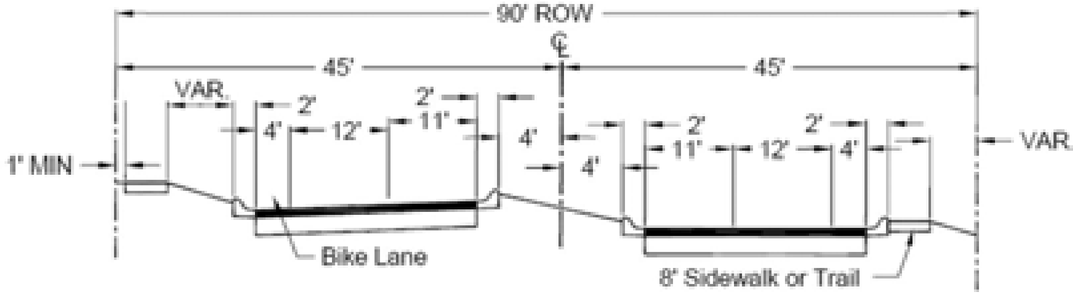


Suburban Character

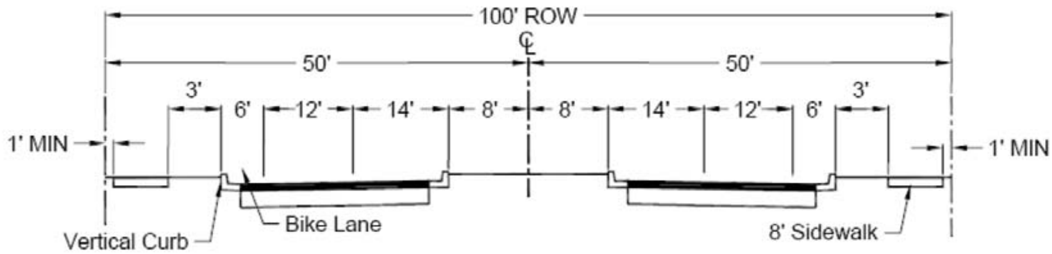


Urban Character

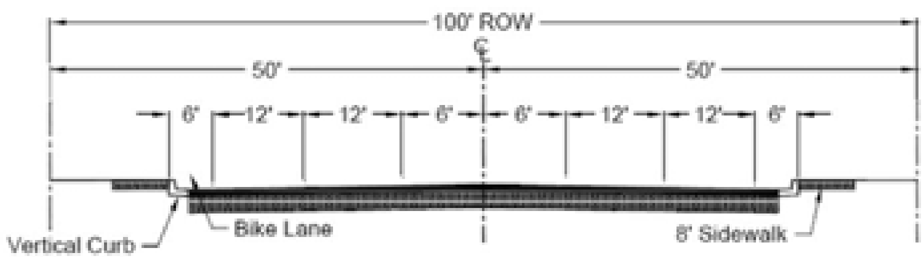
FIGURE 4-2: Minor Arterials Typical Cross Sections



Rural/ESL Character

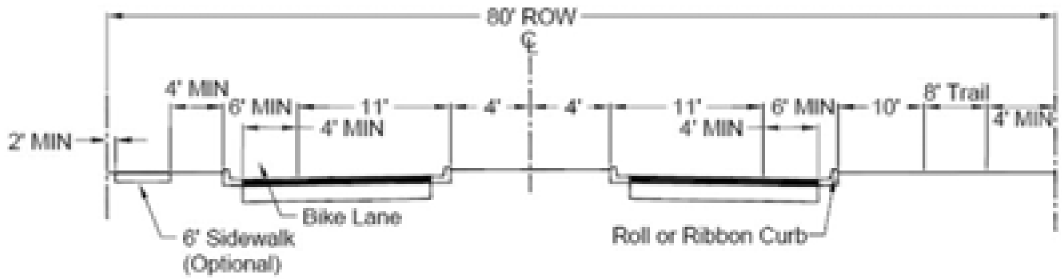


Suburban Character

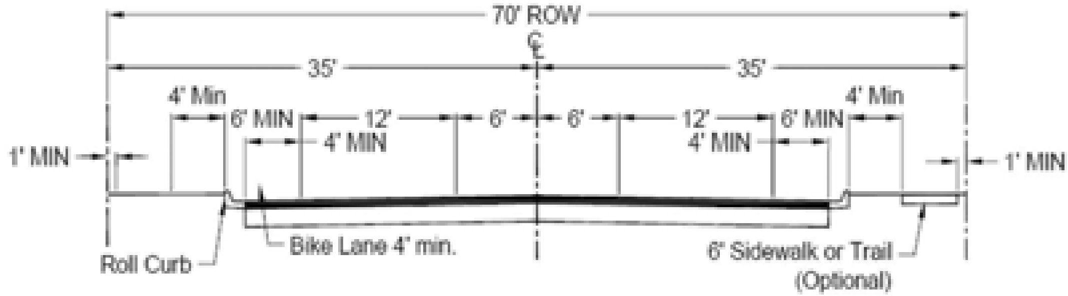


Urban Character

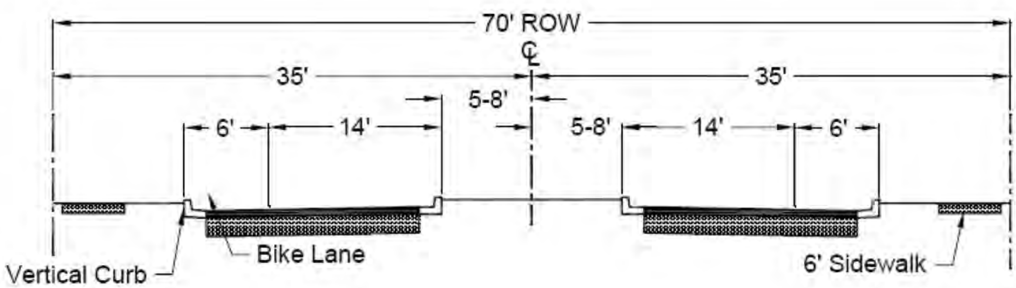
FIGURE 4-3: Major Collectors Typical Cross Sections



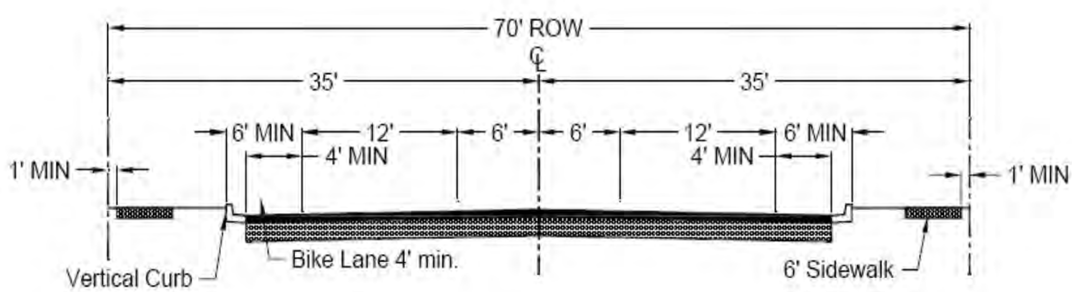
Rural/ESL Character with Trails



Rural/ESL Character



Suburban Character



Urban Character

FIGURE 4-4: Minor Collectors Typical Cross Sections

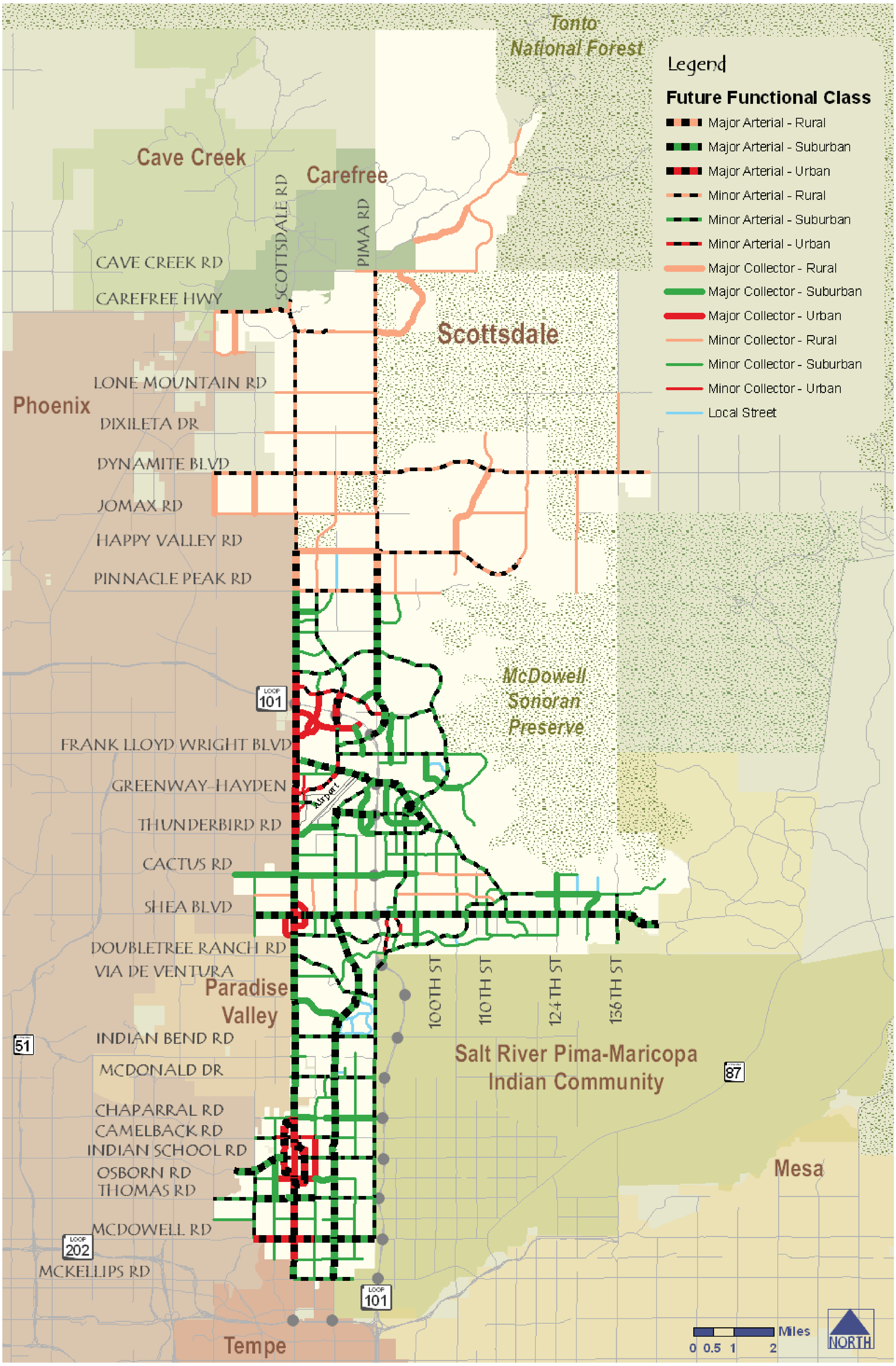


FIGURE 4-5: Recommended Street Functional Classification

Existing Typical Sections				
Street Type	Right-of-way	Lanes	Bike Lane	Sidewalk (Trail Optional in Rural/ESL Character)
Major arterial	150′	6	yes	yes
Minor arterial	110′	4	yes	yes
Major collector	varies	4	yes	yes
Minor collector	varies	2	yes	yes
Minor collector with rural/ESL with trails	varies	2	yes	optional

These dimensions are stated for the roadway corridors themselves. At intersections, a larger dimension may be necessary to accommodate turning lanes. This plan recommends that additional ROW, up to 20 feet, be reserved at intersections to provide these intersection enhancements.

The *Transportation Master Plan* recommends that all sidewalks and walkways shall provide a minimum of 6 feet travel space to accommodate pedestrians using assistive devices. This minimum width does not include additional space that may be required to accommodate landscaping and site furnishings where appropriate. This is intended to ensure compatibility with the recommendations of the *Transportation Master Plan*'s Pedestrian Element and the universal design principles contained therein. The following listing incorporates the character types of rural, suburban, and urban as well as the pedestrian route network identification from the Pedestrian Element.

- Sidewalks and walkways must provide a minimum travel space of 6 feet for rural areas identified on the pedestrian route network maps as low and medium low. A trail could replace a sidewalk or walkway in rural areas identified on the pedestrian route network maps as low.
- Sidewalks and walkways must provide a minimum travel space of 8 feet for suburban areas identified as medium or medium high.
- Sidewalks and walkways must provide a minimum travel space of 10 feet for suburban areas identified as high.
- Sidewalks and walkways must provide a minimum travel space of 10 feet for urban areas, except in urban areas identified on the pedestrian route network maps as high, where a minimum travel space of 12 feet must be provided.

For additional information see the Pedestrian Element of the *Transportation Master Plan*.

The *Transportation Master Plan* recommends future functional classification include the character designation in addition to the street classification.

Character Types

Urban areas are defined as the activity centers and mixed-use areas such as Downtown, where pedestrian activity is likely to be the highest and alternative modes of transportation are more likely. Urban character areas are designated in Downtown, in the Shea/92nd Street area, in the Airpark area, and in the area surrounding One Scottsdale.

Suburban areas are defined as areas where land uses are often auto-oriented and there is separation between residential and commercial or employment uses. Generally, the suburban designation is for roadways south of Pinnacle Peak Road.

Rural areas and ESL streets are defined as desert or low density land uses areas. Consideration should be given to providing a specific "rural" cross section that includes larger rights-of-way to be used to provide additional buffers, and accommodate trails and shared-use paths that may require more horizontal space due to topography and environmental sensitivity of the surrounding desert. Horseback riding, mountain biking, and hiking are generally the predominant non-vehicular methods of transportation in rural areas. Generally the rural designation is for roadways north of Pinnacle Peak Road.

Additional details for each segment of roadway in the City are presented in Appendix 4-A.

Recommendations for street geometrics of major arterials.

- Major arterials should have no greater than 55 mph design speeds (see the Policy Element).
- Most major arterials are designed as divided roadways with six travel lanes in 150-foot ROW.
- Rural major arterials design includes mountable or ribbon curb, 10-foot clear zone or shoulder, 6-foot bike lane, and 8-foot sidewalk or an optional trail (see *Trails Master Plan*).
- Suburban major arterials design includes vertical curb, 6-foot bike lane, and 8-foot sidewalk separated from curb.
- Urban major arterials design includes vertical curb, 6-foot bike lane, and 10-foot minimum sidewalk, which can be located back of curb.
- Five-lane major arterials are to be constructed with 45 mph design speed, five lanes in one direction and two lanes in other direction, divided roadway in 96-foot ROW Their design includes vertical curb, 8-foot wide sidewalk separated from curb on one side of roadway.

Recommendations for street geometrics of minor arterials.

- Minor arterials should have no greater than 55 mph design speeds (see the Policy Element).
- Most minor arterials are designed as divided roadways with four travel lanes in 110-foot ROW.
- Rural minor arterials design includes mountable or ribbon curb, 10-foot clear zone or shoulder, 6-foot bike lane, and 8-foot sidewalk or an optional trail (see *Trails Master Plan*).
- Suburban minor arterials design includes vertical curb, 6-foot bike lane, and 8-foot sidewalk separated from curb.
- Urban minor arterials design includes vertical curb, 6-foot bike lane, and 10-foot minimum sidewalk which can be located back of curb.

Recommendations for street geometrics of major collectors.

- Major collectors have 35–45 mph design speeds.
- Most major collectors are designed as divided roadways with four travel lanes in a 90- to 100-foot ROW.
- Design of rural major collectors includes mountable or ribbon curb, 4-foot bike lane, and 8-foot sidewalk or an optional trail (see *Trails Master Plan*).

- Suburban major collector design includes vertical curb, 6-foot bike lane, and 8-foot sidewalk separated from curb with 3-foot clearance.
- Urban major collector design includes vertical curb, 6-foot bike lane, and 8-foot minimum sidewalk which can be located back of curb.

Recommendations for street geometrics of minor collectors.

- Minor collectors should have no greater than 35 mph design speeds.
- Most minor collectors are designed with two travel lanes in a 70- to 80-foot ROW.
- Rural minor collector design includes roll or ribbon curb, 4-foot bike lane, and 8-foot sidewalk. In some situations rural minor collectors may include an 8-foot trail with 10-foot clearance or shoulder on one side of the roadway and 8-foot sidewalk on the other (see *Trails Master Plan*).
- Suburban minor collector design includes vertical curb, 6-foot bike lane, and 8-foot sidewalk separated from curb.
- Urban minor collector design includes vertical curb, 4-foot minimum bike lane, and 8-foot minimum sidewalk which can be located back of curb.

6.0 STREETS ELEMENT POLICIES

The *Transportation Master Plan* includes a Policy Element that addresses policies on street-related issues such as: speed limits, truck routes, ITS, and access management. As these policies are important to the management of the Streets Element, a brief summary of each policy is included in this section. The Policy Element of the *Transportation Master Plan* contains a more detailed discussion of transportation-supportive policy recommendations.

6.1 Freight Mobility/Truck Routes

Commercial truck vehicle traffic is a basic feature of community living. Grocery stores need food deliveries and businesses need their goods delivered or picked up. Most of Scottsdale's arterial streets have residential frontage, making the need for buffering solutions and mitigation imperative. Currently, the City has several designated truck routes, but those designations do not extend north of Indian Bend Road.

It is recommended that all major roadways are considered truck routes. All neighborhood/local system routes will not be considered for truck route designations. Roadways will be considered for truck routes based on the following:

- Connection to a regional freeway;
- Reasonable alternative routes for truck traffic;
- Historical usage by truck traffic;
- Zoning, land uses (commercial, residential, schools) along the route; and
- Noise mitigation measures such as rubberized pavement.

In accordance with the provisions of Scottsdale City Code Article 3, Section 17-60 and when signs are erected giving notice of the adopted truck routes, no persons shall operate any commercial vehicle exceeding ten thousand (10,000) pounds gross vehicle weight at any time upon any streets or part of a street, except for the purpose of pick-up or delivery of materials or merchandise.

Operators of said commercial vehicles may leave an adopted truck route by the nearest route to travel a distance no greater than 3/4 mile to complete deliveries and pick-ups. At the completion of said delivery and/or pick-up, commercial vehicle operators must return immediately by the nearest route, not to exceed 3/4 mile. However, such travel detours shall not entail crossing another truck route.

- Major roadways will be considered routes for freight delivery with restrictions on the hours of day when deliveries can be made to help mitigate adverse impacts of trucks to residential areas.
- In Downtown and other designated urban character areas, trucks should not block travel lanes especially during peak hours in the morning and evening.

6.2 Intelligent Transportation Systems (ITS)

ITS can be defined as the integration of advanced communications technologies into the transportation infrastructure and, in some areas, vehicles. ITS encompass a broad range of wireless and wire line communications-based information and electronics traffic management technologies, including traffic signals, computers, integrated software systems, graphics, video walls, fiber optic cable, closed circuit TV cameras, variable message signs, ramp meters, and vehicle detectors. ITS is used to coordinate signals, integrate freeway and arterial operations, improve traffic progression, reduce incident clearance times, improve bus progression, and enhance special event traffic management.

The City of Scottsdale ITS automates traffic signal control and roadway congestion response. Scottsdale ITS devices are integrated with a central coordinated electronic traffic signal system in the City's TMC. The ITS includes 46 pan-tilt-zoom cameras at intersections allowing TMC personnel to view traffic conditions and make adjustments to approximately 285 signals remotely. Integrating ITS devices with a centrally coordinated electronic traffic signal system results in significant benefits to residents of Scottsdale.

The objectives of the Scottsdale ITS strategic plan are as follows:

- Hold travel time on City streets steady, and where possible, reduce travel time, even as traffic volume increases due to growth;
- Reduce traffic incident delay;
- Communicate rapidly among the Police Department, emergency services, ADOT, fire, television and radio stations, vehicle drivers, and TMC to enhance roadway safety; and
- Coordinate between adjacent municipalities and jurisdictions along arterial, crossing borders and at interchanges with freeways.

As technology continues to evolve, so will the need for more advanced operational plans. Management of the City's 2003 ITS strategic plan requires coordination and partnerships with the Transportation Department, Police Department, emergency services, and information systems. When properly deployed and operated, ITS decreases congestion common to high traffic volumes, incidents, and special events.

- Support the ITS strategic plan and the objectives of the ITS strategic plan listed above, by ensuring adequate staffing, personnel training, operations and maintenance, as well as timely equipment updates.

- It is recommended that the strategic plan prepared in 2003 be updated to reflect the progress made since that date, and to guide the ITS buildout to 2012.
- Expand the use of ITS for future transportation modes such as BRT corridors programmed in the RTP (Proposition 400).
- Explore additional uses of ITS such as applications that show real-time traffic conditions on the Internet or real-time transit vehicle speed and estimated trip timing through vehicle sensors.

6.3 Speed Limits

Arizona state traffic law allows local authorities within their respective jurisdictions to determine and/or change the maximum speed limit for all arterial streets as well as businesses and residential districts to a reasonable and safe speed based on engineering and traffic investigations. Speed limits are typically set for new roadways based on a roadway's design and whether the surrounding area is urban, suburban, or rural. Design speed is defined as the maximum safe speed that can be maintained based on the geometric design features of the roadway. Speed limits are typically set lower than design speeds to provide a margin of safety and to allow for other operation characteristics that may influence safe speeds along the corridor.

A speed limit study helps to determine the appropriate speed for a roadway or roadway segment. In addition to evaluating speed data on existing roadways, speed studies investigate roadway geometry, adjacent land use and development, roadway hazards, bicycle and pedestrian traffic, and accident history. These factors are outlined in the MUTCD, which is the national set of standards for traffic control devices.

- Roadway design speeds should be no greater than 55 mph within the City of Scottsdale allowing for maximum safety and to encourage drivers to adhere to the speed limit proposed for the facility based on its function.
- Arterial roadways should facilitate through-travel and limit access to reduce conflicts and improve safety. Design elements should not encourage speeds above 50 mph.
- Roadways classified as collector streets should balance access with through-travel and incorporate design elements that encourage driver compliance with speeds of no more than 40 mph.
- Neighborhood streets should prioritize access over through-travel and should incorporate design elements that encourage driver compliance with speed limits between 25 and 30 mph.
- For specific enforcements of travel speeds, it is appropriate for travel speed statistics to be determined for different time periods of the day and different days of the week. These different sets of travel speed statistics can be utilized to concentrate enforcement to the hours and days when travel speeds are most disparate and therefore most likely to result in collisions.

6.4 Access Management

Access management seeks to limit and consolidate access along major roadways at the same time providing a street system and access to support businesses and residential development along the roadway. The result is a corridor that functions safely and efficiently as well as a more attractive corridor.

Some aspects of access management can be addressed at the development review stage, in response to a request for a development or connection permit. This may be accomplished through the subdivision or site plan review process. Larger developments are often required to submit a traffic impact assessment to assist the City in its review and access management can be implemented at this time.

Benefits of access management include the following: improving safety for drivers accessing properties or traveling in a through travel lane, reducing congestion and delay, and making pedestrian and bicycle travel safer.

- Define acceptable levels of access for each roadway classification to preserve its function, including criteria for the spacing of signalized and unsignalized access points.
- Apply appropriate geometric design criteria and traffic engineering analysis to each allowable access point.
- Enforce existing access management regulations that address access spacing and design.

Appendix 4-B contains the current access management policies.

6.5 Roadway Modification Guidelines

In order to address congestion issues, communities are often faced with the need to add additional travel lane capacity to the transportation network. This need must also be weighed against neighborhood impacts and community character or context issues. In Scottsdale, the primary roadway network consists of two-lane collectors, four-lane collectors and arterials and six-lane arterials. The City currently limits local roadway widths to six lanes, and this plan proposes to continue this long-standing policy. One measure that is often used to assist in making decisions regarding adding travel lanes is the volume to capacity ratio, which compares average daily traffic lanes volumes to a predetermined standard.

Based on historic traffic volume trends it is recommended that:

- Target average daily volumes for two-lane collectors be no more than 8,000 vehicles per lane per day using 2030 forecasted volumes.
- Target average daily volumes for four-lane collectors and arterials be no more than 10,000 vehicles per lane per day using 2030 forecasted volumes.
- Widening of roadways designated as rural in character would be considered when forecasted volumes reach 90 percent of the target threshold.
- Widening of roadways designated as suburban in character would be considered when forecasted volumes reach 100 percent of the target threshold.
- Widening of roadways designated as urban in character would be considered when forecasted volumes reach 120 percent of the target threshold.
- Roadway widening will typically be limited to minimum 1-mile segments.
- To promote sustainability, the priority for improvements to corridors reaching the target volume thresholds is:
    - Improve use of existing facilities through the efficient implementation of cost effective signing, striping, intersection control, and sight distance improvements.
    - Improve access to, and amenities at, transit stops, if transit service is available, and review quality of the service.
    - Upgrade pedestrian facilities.
    - Upgrade bicycle facilities.

- Consider adding transit service, if not currently available.
- Install ITS equipment, if none existing, and integrate with transit service.
- Increase access management.
- Add right-turn deceleration lanes to commercial and/or multi-family driveways.
- Add turn lanes at intersections.
- Add travel lanes.

- Consider a minimum buffering distance from homes on roadways in order to enhance neighborhood preservation and livability when roadway widening may be necessary.
- Four-lane roadways may be considered for lane reductions when forecasted volumes do not exceed a total of 12,000 vpd.

6.6 Roadway Noise Mitigation

The City of Scottsdale does not provide noise mitigation on roadways that are not being widened or realigned closer to residences. If it becomes necessary to widen a roadway, the City uses ADOT policies for roadway noise levels and when mitigation should occur, excluding the cost ceilings identified in the ADOT policies. In addition, the City uses rubberized asphalt on new and major resurfacing roadway paving projects, decreasing the levels of roadway noise on City streets. In areas where noise mitigation involves the installation of sound walls and these walls conflict with other City policies and practices, particularly the scenic corridor design guidelines, ESLO, and the foothills overlay zoning district, the City may adopt alternative measures such as rubberized asphalt, berms, a combination of both, or alternatively, the consideration of a modified version of the ADOT noise mitigation policies for use in City roadway projects, as approved by the City's Transportation Commission and Council.

It should also be noted that the decision to mitigate will be tempered by other considerations, such as the financial feasibility and reasonableness of proposed noise walls and other mitigation, including vehicle safety, aesthetics, security, drainage, and emergency vehicle access.

6.7 Roadway Construction Impacts

Roadway construction has a range of impacts on mobility for autos, pedestrians, bicyclists, and transit users. The City works with contractors doing road construction to maintain through-travel and business access during construction. Construction barricading and scheduling is required to be submitted to the City's ROW manager. Through the master plan process there has been some discussion about limiting construction to nighttime hours, to making sure that weekend and special event travel is unimpeded, and ways to limit the duration of travel lane closures.

The City's emerging RWMP establishes a central point of coordination and management of the often competing activities in the public ROW. This central point of contact will review and schedule activities to avoid conflicts, and will attempt to consolidate similar activities that are scheduled to occur in the same vicinity to avoid multiple lane closures and restrictions. The RWMP proposes to include revisions to City code and ordinances, and introduce new policies and procedures which will facilitate management of the ROW. Field inspections and enforcement of proposed code will reduce unauthorized or ineffective closures and restrictions.

- Schedule arterial roadway construction so that parallel arterials will not be under construction at the same time.

- Avoid limiting roadways to one through-lane of traffic in either direction during roadway construction.

6.8 Traffic Signal Timing

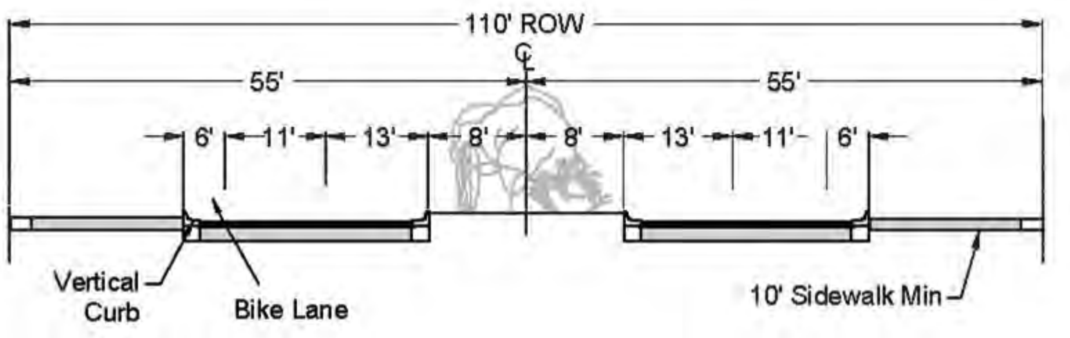
The *Transportation Master Plan* recognizes the need for a comprehensive review of traffic signal timing policies. The City has signal timing plans for all major roadways and intersections for varying times of day; these plans are subject to continuous review and update. At the master plan level, it is recommended that revisions to the signal timing policy be made flexible to mitigate peak-hour congestion, as a cost-feasible alternative to street widening, and also that the signal timing policy accommodate pedestrian crossings, in general, on all streets within the City limits.

6.9 Local Area Infrastructure Plans

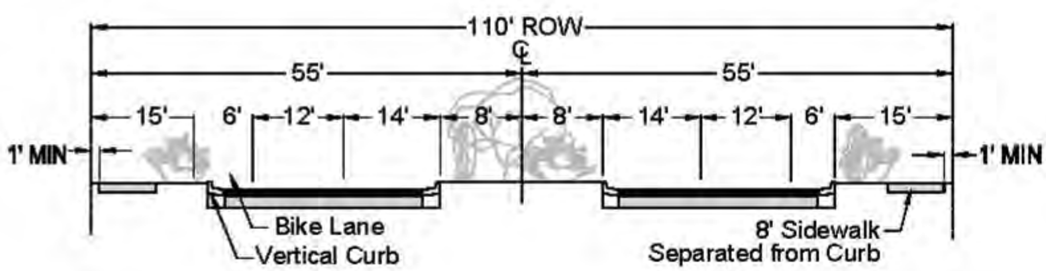
Local area infrastructure plans have been drafted for some areas of the City outside of master planned communities. The purpose of these plans is to guide local decisions for infrastructure improvement (streets, water, trails, etc.) and related development, and to help coordinate the efforts of various City departments in providing these necessary services. These plans have not been approved or adopted by an official body, but serve as guides for City staff when reviewing development proposals. The goals and policies of the local area infrastructure plans will be adopted as part of the *Transportation Master Plan*. The maps displaying recommended infrastructure are located in Appendix 4-C and adopted by reference. Significant public outreach will be required prior to finalizing the maps, which will be revised when/if conditions change. Specific policy guidance is provided in the Policy Element.

6.10 Street Cross Sections and Context-sensitive Design

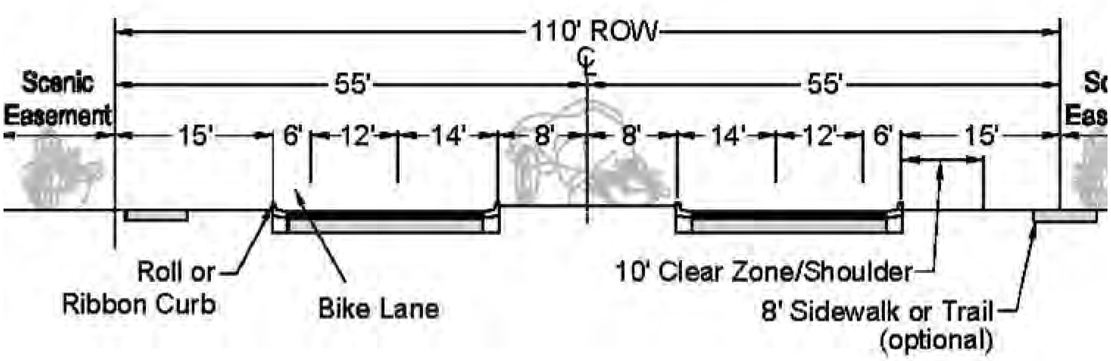
The City's DS&PM was updated in August 2007. The updates are consistent and compatible with the policy recommendations resulting from the *Transportation Master Plan*, that all streets be designed in context of adjacent land uses. Three representative samples of context-sensitive urban, suburban, and rural sections included in the City's DS&PM are shown on the following page.



City of Scottsdale August 2007 DS&PM
Urban Cross Section

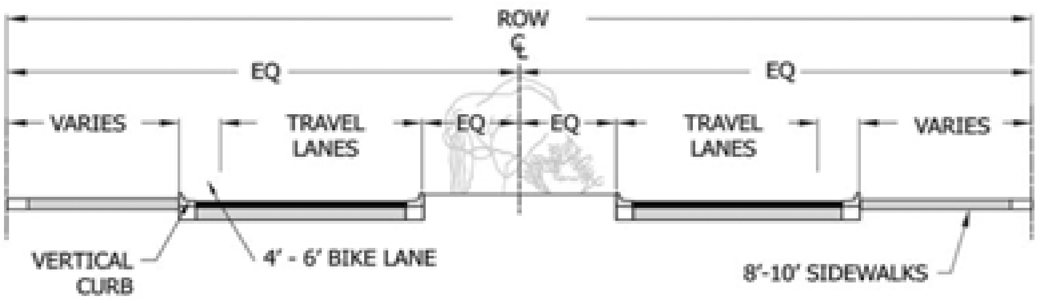


City of Scottsdale August 2007 DS&PM
Suburban Cross Section

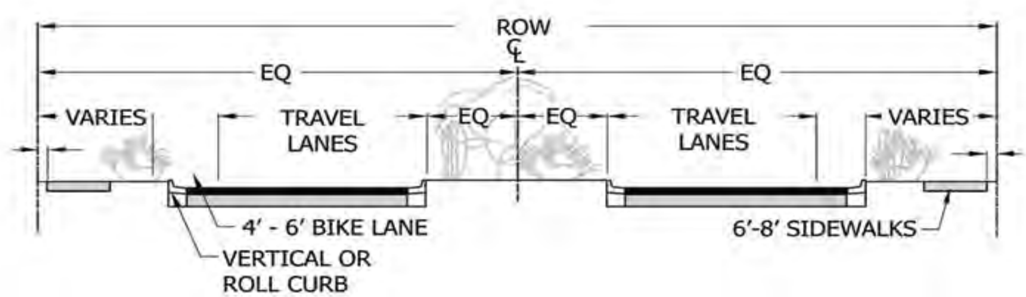


City of Scottsdale August 2007 DS&PM
Rural Cross Section

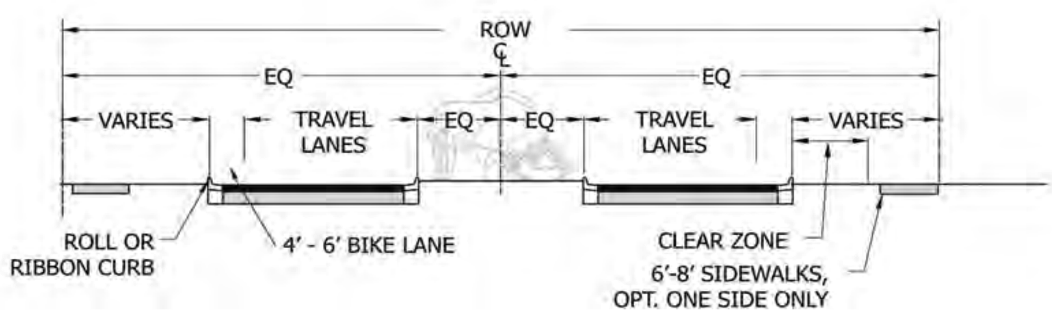
The following three sections represent generalized interpretations of three basic context-sensitive cross sections, developed by the *Transportation Master Plan* team, that are consistent with the updated DS&PM sections above. These *Transportation Master Plan* sections show a range of alternative applications for curb treatments, bicycle lanes, and sidewalks.



Transportation Master Plan Interpretation
Urban Cross Section



Transportation Master Plan Interpretation
Suburban Cross Section



Transportation Master Plan Interpretation
Rural Cross Section

5 TRANSIT ELEMENT

5 TRANSIT ELEMENT

1.0 INTRODUCTION

The Transit Element is one component of the City of Scottsdale's multi-modal *Transportation Master Plan*, and was developed in support of the adopted City of Scottsdale *General Plan* with public input throughout the planning process. The result of this effort will be an update of the Scottsdale *Transit Plan* (February 2003), building on its concepts and further defining it. The Transit Element will meet all applicable federal, state, and local laws and regulations and will follow Federal Transit Administration (FTA) guidelines in determining transit service changes and improvements.

1.1 Understanding

Much like other communities in the region, the City of Scottsdale is experiencing rapid population growth. In parts of the City, growth and redevelopment will continue to transform parts of the community from a suburban to a more urban environment. With this change comes a number of challenges, including the ability to provide transit service that is integrated into a comprehensive multi-modal transportation system. The goal of the Transit Element is to provide a transit network that balances local and regional mobility needs with community character, while fitting into an overall transportation system.

Route 81 in Scottsdale

Forecasted growth and development, decreased land availability to construct new transportation corridors, and anticipated increases in transit-riding populations make it evident that alternative transportation strategies are needed to provide a transportation system that effectively serves the residents and employees of Scottsdale, as well as the many travelers who pass through Scottsdale everyday. Fortunately, opportunities exist in the City of Scottsdale to increase transit options. Voters in Maricopa County approved the RTP though Proposition 400 in 2004, which extended the half-cent sales tax for transportation for 20 years and includes a large number of transit service and facility improvements in Scottsdale.

The purpose of the Transit Element is to develop information in sufficient detail so that citizens, elected officials, City staff, and others can determine the appropriate level of transit investment for the City of Scottsdale. Some of the major issues for transit that are addressed in the Transit Element include:

- Utilizing information from previously completed transit and transportation studies;
- Targeting transit growth areas by analyzing ridership potential, capacity, infrastructure, demographics, land use, and economic development;
- Ensuring compatibility with the regional transit system;
- Developing and evaluating transit service options while formulating an action plan for implementation;
- Identifying funding sources and developing a funding plan for multiple planning horizons; and
- Creating a transit system that is sustainable.

1.2 Vision, Goals, and Objectives

The Vision, Values, and Goals section of the *Transportation Master Plan* identifies many overarching goals (based on the *General Plan* Community Mobility Element goals and additional goals regarding sustainability and regional coordination). The following are directly applicable to the Transit Element.

- Protect the function and form of regional air and land corridors.
- Protect the physical integrity of regional networks to help reduce the number, length, and frequency of private automobile trips, to improve air quality, reduce traffic congestion, and enhance quality of life and the environment.
- Promote regional diversity and connectivity of mobility choices.
- Prioritize regional connections to safely, effectively and efficiently, move people, goods, and information beyond the City boundaries.
- Enhance connectivity to regional transportation facilities; however, these systems need to respect the City of Scottsdale *General Plan*.
- Maintain Scottsdale's high aesthetic values and environmental standards in the City's transportation system.
- Encourage a diversity of links between neighborhood systems, and with citywide and regional systems.
- Recognize the diversity of neighborhoods throughout the City and their different mobility needs.
- Use "green" technologies and processes when possible and practical.
- Reduce emissions that degrade air quality.

In addition to these broader goals, the vision, goals, and objectives for the Transit Element are an extension of those from the City of Scottsdale *Transportation Master Plan* and the voter-approved RTP, and are listed as follows:

Vision

- Provide a balanced, accessible, multi-modal transportation system for the City of Scottsdale that gives Scottsdale residents and visitors choices in how to travel and that supports the safe and efficient movement of people and goods.

Goal

- Improve accessibility, availability, efficiency, and viability of transit services for all users within the City of Scottsdale.

Objectives

- Provide connections to local and regional destinations through a mix of transit services that may include, but are not limited to, fixed route and express bus service, neighborhood circulators, paratransit, and HCT.
- Expand the geographic coverage of transit service by developing a network of fixed route bus service with connections to regional express bus service, regional local service, and regional HCT.
- Offer increased bus frequency and a longer span of service throughout the day.
- Develop and implement a form of HCT along Scottsdale Road that connects to the central Phoenix/East Valley LRT system.

- Develop local bus circulators to provide better connectivity between neighborhoods and activity centers.
- Continue to meet the mobility requirements for persons with disabilities, as required by ADA.
- Continue to offer a variety of alternate paratransit services for patrons who are elderly or have a disability with the purpose of managing Dial-a-Ride costs.
- Develop safe, comfortable, and convenient transit facilities, such as transit centers and park-and-ride lots that are served by local and regional transit services.
- Support the efforts of Valley Metro/Regional Public Transportation Authority (RPTA), other jurisdictions, and other transit providers to expand service in the northeast valley.
- Provide pedestrian connections to complement new and existing transit services.
- Work with the Planning and Development Services Department to provide for a land use mixture of activities and densities near existing and planned major transit routes and facilities.
- Encourage partnerships between residents, businesses, system users, and the City in developing, promoting, and implementing the transit system.
- Use technology to improve passenger convenience, system efficiency, and effectiveness.
- Develop service standards and levels to meet or exceed regional service standards and levels.
- Demand high standards from contractors providing service (e.g., passenger comfort, customer service, and service reliability).
- Actively market transit services and educate consumers to increase ridership and fare revenues.
- Support trip reduction programs.

2.0 TRANSIT BACKGROUND

The Transit Element includes a review of prior and ongoing transportation studies, as well as an overview of existing transit technologies that could be considered during the development and evaluation of transit improvement options.

2.1 Review of Prior and Ongoing Studies

The following is brief summary of some prior and ongoing transportation studies that relate to the Transit Element.

MAG Regional Transportation Plan (RTP)

The MAG RTP was approved by voters in 2004 through Proposition 400 and extended the region's half-cent sales tax for transportation. The RTP includes a number of transit improvements programmed for the City of Scottsdale, including transit operating and facility improvements. The improvements included in the RTP will provide the basis for much of the transit service and capital expansion identified in the Transit Element. The most recent version of the RTP is the draft 2007 update. The RTP plan may be viewed or downloaded at MAG's Web site at http://www.mag.maricopa.gov/detail.cms?item=7091.

Scottsdale Transit Plan (2003)

The Scottsdale *Transit Plan* (February 2003) was prepared by City staff and a working group of residents and the business community and was adopted by the Scottsdale City Council in 2003. The document outlines the City's vision for transit and provides specific transit operating and capital improvements. The Scottsdale *Transit Plan* did not include a long-term regional funding source for transit and focused more on policy direction than implementation. The Scottsdale *Transit Plan* provides the basis for the Transit Element.

Valley Metro/RPTA Regional Transportation Plan Evaluation

Valley Metro/RPTA is responsible for the implementation and oversight of the operating and capital components outlined in the Transit Element of the RTP. The RTP plan evaluation includes a detailed financial analysis and operational feasibility analysis with recommendations of the RTP Transit Element. A summary of the RTP plan evaluation as related to the City of Scottsdale is included as Appendix 5-A.

Valley Metro/RPTA Express Bus Study

The *Valley Metro/RPTA Express Bus Study* is developing an operating plan for the regional express bus improvements that will be implemented as part of the RTP. The study will provide further detail on express bus frequency, hours of service, stop locations, capital improvements, and fleet needs.

MAG Transportation Improvement Program (TIP)

The current MAG FY 2007–2011 TIP identifies highway and transit projects programmed for construction throughout the region in the next five years. The most recent version of the TIP incorporates the near term RTP improvements in the City of Scottsdale.

Scottsdale Capital Improvement Plan (CIP)

The current FY 2008–2012 Scottsdale CIP identifies capital projects programmed for construction throughout the City in the next five years. The CIP is updated on an annual basis and includes capital improvements from the RTP, as appropriate.

Scottsdale General Plan

The Scottsdale *General Plan* was adopted by City Council in 2001 and ratified by the citizens of Scottsdale in 2002. The *General Plan* is a statement of goals and policies that work as the primary tool for guiding the future development of the City. The *General Plan* is divided into six chapters which are based on the six guiding principles of the CityShape 2020 citizen participation process: character and lifestyle, economic vitality, neighborhoods, open space, sustainability, and transportation. The Community Mobility Element of the *General Plan* encourages multi-modal transportation and provision of transportation options. One of those modal options is transit which is defined and implemented through the Transit Element of the *Transportation Master Plan*.

Scottsdale/Tempe North/South Transit Corridor Study

The *Scottsdale/Tempe North/South Transit Corridor Study* (2003) was a transit major investment study that recommended Scottsdale Road as the preferred HCT corridor. The Scottsdale City Council approved Scottsdale Road as the corridor and recommended that BRT, LRT, and modern streetcar be evaluated in future studies. The evaluation of these technologies is part of the HCT component of the *Transportation Master Plan* and will be discussed further in that section.

MAG Park-and-Ride Study

The MAG *Park-and-Ride Study* (2001) identifies a regional system of park-and-rides to support regional express bus service. The study identifies two regional park-and-rides along the Loop 101 corridor in Scottsdale. The site selection for the proposed park-and-ride locations (Shea Boulevard/Loop 101 and Scottsdale Road/Loop 101) is underway.

Phoenix Transit Plan (Transit 2000)

The *Phoenix Transit Plan* was approved by Phoenix residents in March 2000. It included a 4/10 of a percent sales tax for 20 years that will result in improved fixed route and express bus service as well as implementation of LRT. The *Phoenix Transit Plan* is relevant to Scottsdale because many of the east/west routes within the City of Scottsdale connect to and are operated by the city of Phoenix.

Tempe General Plan (2030) – Transportation Chapter

The *Tempe General Plan* was adopted by the Tempe City Council in December 2003. The transportation chapter is designed to guide the further development of a citywide multi-modal transportation system integrated with the City's land use plans. The transit section of this transportation chapter, with its goals of increasing available transit modes and services and to facilitate connections among transportation modes, is relevant to Scottsdale because of the north/south routes within the City of Scottsdale which connect to and are operated by the City of Tempe.

2.2 Transit Technologies

A variety of transit technologies, which range from demand response service to HCT, are incorporated into the transit improvement options for the Transit Element.

Fixed Route Bus

Fixed route bus service is the most common form of transit service in the region. It uses standard size transit vehicles (usually 40-foot buses) and is generally characterized by buses operating along the major arterial grid network. The vehicles make frequent stops and may require passengers to transfer in order to reach their destinations. Route 72 on Scottsdale Road is an example of fixed route bus service.


Valley Metro bus

Limited Stop/Express Bus

Express buses operate as commuter service during the peak-hour and usually connect outlying areas with major activity centers. The routes typically serve park-and-ride lots and may parallel fixed route service with fewer stops. Vehicles may include additional amenities geared toward commuter travel, such as reading lights and reclining seats. Route 510, which travels between Scottsdale and downtown Phoenix, is an example of express bus service.


City of Phoenix RAPID express bus

Neighborhood Circulators/Shuttles

Neighborhood circulators focus on serving a common geographic area with frequent, all-day service. The vehicles are small and enable passengers to connect to a wider transit network from residential neighborhoods and activity centers. Shuttles provide shorter trips at higher frequencies and are usually free or very low fare. The Downtown trolley and Giants shuttle are examples of shuttle service. The Neighborhood Connector is an example of a neighborhood circulator. These services are currently delivered utilizing specialty themed vehicles (trolleys). Routes and schedules for circulators/shuttles should be very easy to use and understand.

Downtown Trolley

Paratransit

Paratransit provides flexible schedule, on-demand transportation for those unable to access traditional fixed route service, such as seniors and passengers with disabilities. ADA requires that complementary paratransit service be provided in all areas within 3/4 mile of fixed route bus service. Extended service hours are usually provided for individuals who qualify under ADA. The East Valley Dial-a-Ride, which provides shared ride, door-to-door service, and Scottsdale's Cab Connection program are examples of paratransit.


Orange Line in Los Angeles, CA

Bus Rapid Transit (BRT)

BRT is a form of higher capacity bus service which combines the advantages of rail transit with the flexibility of buses. It uses a dedicated or shared guideway to provide limited stop service in medium to heavy travel demand corridors. Traffic signal priority is typically given to BRT vehicles as they operate in designated bus or HOV lanes. Phoenix's rapid bus service is the closest to BRT in this region. A better example is the Orange Line in Los Angeles, California.


MAX Light Rail in Portland, OR

Light Rail Transit (LRT)

LRT is electrically powered, high capacity transit service operating on a fixed guideway. It typically operates on two sets of tracks within exclusive or shared ROW and serves stations located approximately every mile. LRT emphasizes speed and travel time savings and can operate using multiple vehicles linked together to accommodate large passenger volumes. The metro central Phoenix/East Valley LRT project is an example of LRT. The 20-mile LRT line connecting Phoenix, Tempe, and Mesa is scheduled to open in 2008.


Portland Streetcar in Portland, OR

Modern Streetcar

Modern streetcar is also electrically powered, HCT service that operates on a fixed-guideway. However, modern streetcar systems typically operate at street level in mixed traffic in existing urban environments. Modern streetcar is usually operated using a single vehicle and can operate safely in high traffic and/or high pedestrian activity areas to link neighborhoods with activity centers. Modern streetcar is distinguished from LRT by smaller, lighter vehicles requiring less infrastructure and lower construction costs. The Portland Streetcar is an example of a modern streetcar system.

3.0 EXISTING TRANSIT CONDITIONS

Existing transit service in the City of Scottsdale is characterized by fixed route bus service operating on the arterial and collector grid system, along with limited express bus service, neighborhood circulators, shuttles, and paratransit service. Most of the fixed bus routes in Scottsdale connect to other jurisdictions, and all of the service is contracted to an outside provider. The majority of transit service is focused on the southern and central portions of the City, where the highest population and land use densities are located.

Since the adoption of the 2003 *Transit Plan*, the City of Scottsdale has made substantial improvements to its fixed route bus service. Service and frequency improvements have been implemented on a number of its routes, including Route 72 on Scottsdale Road. In addition, the City implemented its second neighborhood circulator, known as the Neighborhood Connector, in 2006. The following section documents existing transit conditions in Scottsdale.

3.1 Fixed Route and Express Bus Service

Existing fixed route bus service in the City of Scottsdale includes twelve fixed bus routes, three express bus routes, two neighborhood circulators and two seasonal circulator services. In general, fixed bus routes operate from 5 a.m. to midnight (earlier on some routes) on weekdays and 7 a.m. to 10:00 p.m. (earlier on some routes) on weekends. Further detail is provided in Table 5-1 and Figure 5-1 on the following pages.

TABLE 5-1: Existing Transit Service (as of July 2007)

Route	Name	Headway		
		Weekday (peak/off-peak)	Saturday	Sunday
Fixed Route Bus				
17	McDowell Rd	30/30	30	30
Green	Thomas Rd	20/30	30	30
41	Indian School Rd	15*/30	30	30
50	Camelback Rd	15/30/60	30/60	60
66	68th St	30/30	30	30
72	Scottsdale Rd	15/30	30	30
76	Miller Rd	30/30	30	60
81	Hayden Rd	15/30	60	60
84	Granite Reef Rd	60/60	60	60
106	Shea Blvd	30/60	30	60
114	Via Linda	60/60	60	60
154	Greenway Rd	30/30	30	60
170	Bell Rd	30/30	30	30
Express Bus				
510	Scottsdale	2 trips (peak direction)	n/a	n/a
512	Scottsdale	2 trips (peak direction)	n/a	n/a
532	Mesa	4 trips (peak direction)	n/a	n/a

* Only west of Loloma Station

FIGURE 5-1: Existing Transit Routes

TABLE 5-1: Existing Transit Service (as of July 2007)

Route	Name	Headway		
		Weekday (peak/off-peak)	Saturday	Sunday
572	Surprise/Scottsdale	4 trips (peak direction)/2 trips (non-peak direction)	n/a	n/a
Neighborhood Circulator				
Trolley	Downtown	10	10	10
Trolley	Neighborhood	20	20	20

Source: Valley Metro/RPTA, 2006, City of Scottsdale 2007
* Only west of Loloma Station

Multiple service contractors operating under the name "Valley Metro" provide fixed route transit service in Scottsdale. The Phoenix metropolitan area differs from most other metropolitan areas in that transit service is funded by a combination of city and regional funds, and varies significantly throughout the region. Table 5-2 describes the funding, contractor, and operator by route in Scottsdale.

TABLE 5-2: Funding, Contractor, and Operator By Route

Route	Name	Funded By	Contracted By	Operated By
Fixed Route Bus				
17	McDowell Rd	Phoenix/Scottsdale	Phoenix	Veolia/Phoenix
Green	Thomas Rd	Phoenix/Scottsdale	Phoenix	Veolia/Phoenix
41	Indian School Rd	Phoenix/Scottsdale	Phoenix	Veolia/Phoenix
50	Camelback Rd	Phoenix/Scottsdale/RPTA	Phoenix	Veolia/Phoenix
66	68th St	Scottsdale/Tempe	Tempe	Veolia/Tempe
72	Scottsdale Rd	RPTA	RPTA	Veolia/RPTA
76	Miller Rd	Scottsdale/Tempe	Tempe	Veolia/Tempe
81	Hayden Rd	Chandler/Scottsdale/Tempe/RPTA	RPTA	Veolia/RPTA
84	Granite Reef Rd	Scottsdale	RPTA	Veolia/Tempe
106	Shea Blvd	Phoenix/Scottsdale/Glendale/RPTA	Phoenix	Laidlaw
114	Via Linda	Scottsdale	RPTA	Veolia/Tempe
170	Bell Rd	Phoenix/Glendale/Scottsdale	Phoenix	Laidlaw
154	Greenway Rd	Phoenix	Phoenix	Veolia/Phoenix
Express Bus				
510	Scottsdale	Scottsdale/Phoenix/RPTA	Phoenix	Veolia/RPTA
512	Scottsdale	Fountain Hills/RPTA	Phoenix	Veolia/RPTA
532	Mesa	Mesa/Phoenix/RPTA	Phoenix	Veolia/RPTA

TABLE 5-2: Funding, Contractor, and Operator By Route				
Route	Name	Funded By	Contracted By	Operated By
Neighborhood Circulator				
DT	Downtown trolley	Scottsdale	Scottsdale	Atypical transportation
NC	Neighborhood Connector	Scottsdale	Scottsdale	Atypical transportation

Source: Valley Metro/RPTA and City of Scottsdale, 2006.

3.1.1 Ridership Characteristics

Ridership data for existing routes within the City of Scottsdale is available from Valley Metro/RPTA, which produces an annual ridership report. For the purposes of this Transit Element, the FY 2005–2006 annual ridership report is being used along with the October 2006 monthly ridership report. According to Valley Metro/RPTA, October is the month that best represents average system-wide ridership conditions.

Ridership by Jurisdiction

Ridership data is identified by jurisdiction in the annual ridership report. According to this report, total boardings in Scottsdale for FY 2005–2006 were 1,890,631. This marks a 5 percent increase over the previous fiscal year (FY 2004–2005). Total revenue miles for FY 2005–2006 were 1,653,411 and boardings per mile were approximately 1.1. Table 5-3 shows annual ridership totals in Scottsdale for the last six years.

TABLE 5-3: Total Annual Boardings		
Fiscal Year	Boardings	Percent Change From Prior Year
2006–2007	1,994,651	+5.5
2005–2006	1,890,631	+5
2004–2005	1,797,264	+3
2003–2004	1,748,215	–4
2002–2003	1,832,419	+8
2001–2002	1,680,456	

Note: FY 2003–2004 decrease in annual boardings was the result of a reduction in transit service.
Source: Valley Metro/RPTA, 2007.

Ridership by Individual Routes

The FY 2006–2007 annual ridership report describes the total annual boardings by individual routes in Scottsdale (Table 5-4). According to this report, the routes with the highest annual ridership in Scottsdale are routes 72 (Scottsdale Road), 81 (Hayden Road), 41 (Indian School Road), and the Green Line (Thomas Road).

TABLE 5-4: Total Annual Boardings By Route (not including connector service)		
Route	Description	Annual Boardings
Fixed Route Bus		
17	McDowell Rd	168,323
Green	Thomas Rd	204,463
41	Indian School Rd	202,731
50	Camelback Rd	113,363
66	68th St	82,146
72	Scottsdale Rd	603,368
76	Miller Rd	103,836
81	Hayden Rd	284,643
84	Granite Reef Rd	26,279
106	Shea Blvd	72,097
114	Via Linda	28,962
170	Bell Rd	87,284
Express Bus		
510	Scottsdale	10,197
512	Scottsdale	4,959
	TOTAL	1,994,651

Note: Valley Metro/RPTA does not include route 532 as a Scottsdale route.

Source: Valley Metro/RPTA, 2007.

The annual ridership report does not identify weekday performance characteristics by routes. However, this information is available in the Valley Metro/RPTA monthly ridership report. For this effort, the October 2006 monthly ridership report will be used since it is considered the best month for reporting system-wide transit conditions. Table 5-5 describes the average weekday boardings, revenue miles, and boardings per mile by route in Scottsdale for October 2006.

TABLE 5-5: Average Weekday Boardings By Route				
Route	Name	Weekday Boardings	Revenue Miles	Boardings Per Mile
Fixed Route Bus				
17	McDowell Rd	565	214.7	2.6
Green	Thomas Rd	697	213.5	3.3
41	Indian School Rd	627	361.4	1.7
50	Camelback Rd	405	208.3	1.9
66	68th St	238	354.4	0.7
72	Scottsdale Rd	2,028	1,756.5	1.2
76	Miller Rd	373	670.3	0.6
81	Hayden Rd	999	1,642.6	0.6
84	Granite Reef Rd	84	200.9	0.4

TABLE 5-5: Average Weekday Boardings By Route				
Route	Name	Weekday Boardings	Revenue Miles	Boardings Per Mile
106	Shea Blvd	230	265.2	0.9
114	Via Linda	79	243.4	0.3
170	Bell Rd	284	226.4	1.3
Express Bus				
510	Scottsdale	40	31.0	1.3
512	Scottsdale	22	46.8	0.5

Note: Valley Metro/RPTA does not include Route 532 as a Scottsdale route.
Source: Valley Metro/RPTA, 2006.

Trolley Ridership

Ridership data for the City of Scottsdale connector/trolley services is not collected or reported in the Valley Metro/RPTA annual ridership report or monthly ridership report, but are collected by Atypical Transportation which is the service contractor for the City's trolley services. These services include the Downtown trolley, Neighborhood Connector, resort trolley, and Giants shuttle. According to the City of Scottsdale, there were over 225,000 annual connector and trolley boardings for FY 2006–2007. With the new Neighborhood Connector service, this represents a 100 percent increase over the previous fiscal year. The majority of the boardings (164,084) occurred on the Downtown trolley which showed a 60 percent increase over the previous fiscal year. Table 5-6 shows boardings for each of the circulator/trolley services in Scottsdale.

TABLE 5-6: Total Annual Boardings By Connector/Trolley Service	
Circulator Service	Annual Boardings (FY 2006–2007)
Downtown trolley	164,084
Neighborhood Connector	95,505
Giants spring training shuttle	Approximately 6,300
Resort shuttle	5,153
TOTAL	271,042

Bicycles and Transit

Each year in the Valley Metro system, more than 1.2 million "bike boardings" occur, indicating there is significant bicycle usage of the bus network. All Valley Metro buses are equipped with bike racks. Racks are located at the front of the bus and accommodate up to two bicycles.

3.2 Special Services

Special services are directed at two specific markets: seniors and persons with disabilities.

Mobility training is a personalized training service provided to seniors and persons with disabilities. This training matches an instructor with similar physical abilities to the user and the training is accomplished on the bus routes the consumer is most likely to use. In addition, Valley Metro provides group travel training through senior centers on routes leading to the senior centers. Continued mobility training in all forms encourages citizens to utilize the fixed route system.

Paratransit is a demand responsive transit service that does not follow a fixed route. There are three types of paratransit service in the City of Scottsdale. The East Valley Dial-a-Ride provides service for those unable to access regular transit service (passengers with disabilities and seniors). ADA requires that complementary paratransit service be provided in all areas within 3/4 mile of fixed route transit service. East Valley Dial-a-Ride provides ADA and non-ADA service in Scottsdale every day (including holidays) from 4 a.m. to 1 a.m.

The City of Scottsdale also provides non-traditional transit service through its Cab Connection program. The Cab Connection program offers seniors and persons with disabilities an alternative mode of transportation from Dial-a-Ride. (While important to the regional transportation system, Dial-a-Ride can be expensive and result in lengthy trips for some passengers.) The Cab Connection program offers more flexibility than Dial-a-Ride, and operates at less cost to the City. The program offers 20 cab vouchers per month per user. Vouchers are subsidized by the City of Scottsdale at the rate of 80 percent up to a maximum of $10. All users must be Scottsdale residents and have a disability, be on dialysis, or be age 65 or older.

3.3 Transit Facilities

Existing transit facilities range from on-street passenger facilities such as bus stops to large facilities such as park-and-rides and transit centers. The City of Scottsdale has developed a new standard for bus stop shelters and passenger amenities and has installed new shelters at various locations throughout the City during the past few years. Existing park-and-rides within the City of Scottsdale are joint-use facilities in which informal agreements have been established for shared parking arrangements. Loloma Station in Downtown is the City's transit center. Further detail on these facilities is provided in Table 5-7.

TABLE 5-7: Existing Transit Facilities

Transit Facility	Location	Bus Routes Served
Park-and-rides		
Chaparral Park	Hayden Rd and Jackrabbit Rd, NE corner	81, 50
Costco	Butherus Dr and 83rd Pl, NE corner	81, 170
Dial Tech Center	Scottsdale Rd and Butherus Dr, NE corner	72
Miller Plaza	Montecito Ave and Miller Rd, NW corner	50, 76, 510
Trinity Church	Hayden Rd and McCormick Pkwy, SE corner	81, 510
Transit Center		
Loloma Station	Marshall Way and Second Street, NW corner	41, 66, 72, 76, Downtown trolley, Neighborhood Connector

Source: Valley Metro/RPTA, 2006.

4.0 TRANSIT ISSUES AND POLICIES

The Transit Element includes a discussion of transit issues and policies related to transit service improvements.

4.1 Regional Service Standards

Service (or performance) standards are indicators or measures of the system that trigger further analysis if the parameters are exceeded or are not met. Some standards are objective and are based on industry experience, while others allow services to be compared relative to one another. Generally speaking, the more objective standards are used for effectiveness evaluations, while relative objectives are used for efficient management objectives.

The Transit Element will develop transit service improvements in Scottsdale to meet or exceed regional service standards. Currently there is no regional service standard identified in the RTP. However, there is an “unofficial” service standard that is generally acknowledged to be the following:

Fixed route bus service

- Weekday: 15 minute frequency in the peak and 30 minute frequency in the off-peak from 5 a.m. to midnight
- Weekend: 30 minute frequency from 6 a.m. to midnight

Express bus service

- Weekday: 15 to 30 minute frequency in the peak

High capacity transit

- Weekday: 10 minute frequency in the peak and 20 minute frequency in the off-peak from 5 a.m. to 1 a.m.
- Weekend: 20 minute frequency from 6 a.m. to midnight.

The regional service standards for bus and rail are currently being discussed through the implementation of the RTP. To date, there is no document that explicitly describes the RTP regional service standards in terms of frequency and hours of service by route.

4.2 Service Frequency Versus Service Coverage

Service frequency versus service coverage is an issue that balances the trade-offs between providing higher quality service on a fewer number of streets (more frequency) versus lower quality service on a wider range of streets (greater coverage). Most of the existing transit service in Scottsdale is located on major arterials, with the highest concentration found in the southern and central portions of the City where the highest population and land use densities are located.

It is the approach of this Transit Element to focus on providing frequency before coverage. The reasoning is as follows:

- Frequency has the opportunity to create more total ridership than coverage;
- Frequency has the opportunity to attract more new riders than coverage;

- Frequency can be more cost-effective than coverage creating potentially less capital investment. There is no funding source that is exclusively dedicated for transit in Scottsdale so transit improvements need to be as cost-effective as possible;
- Scottsdale's north/south configuration and unique geography create obvious transit corridors that need frequency improvements. These same geographic features provide barriers to improving coverage elsewhere; and
- Frequency facilitates transfers better than coverage. It is easier to transfer between bus routes if they are operating at a higher frequency.

4.3 Capital Policy

Capital investments directly affect passengers' experience of transit and, as such, should be implemented with the highest quality of experience in mind. The transit system should reflect the high standards for which Scottsdale is known.

4.3.1 Bus Stop Spacing

Existing bus stop spacing in Scottsdale is inconsistent and generally ranges from 1/8 to 1/2 mile spacing on fixed bus routes. As transit improvements are made throughout the City, bus stop spacing will become an issue that affects transit speed and reliability, as well as cost effectiveness. For example, the existing Route 72 on Scottsdale Road has frequent bus stops, often close together, and consequently, often suffers from poor schedule reliability. Many of the bus stops on the Route 72 that are too close together could be combined. This problem is compounded by locations where bus stops are located on both sides of the intersection in the same travel direction.

It is recommended that 1/4 mile spacing be the standard for fixed bus routes, with shorter spacing for neighborhood circulators and longer spacing for limited stop/express bus routes. Quarter mile bus stop spacing is especially appropriate for fixed bus routes when providing increased service frequency. Overall, standard bus stop spacing makes the system more user friendly for riders and allows opportunities for the City to market or "brand" service along a route. Exceptions to this spacing would be:

- Areas of greater demand and/or roadways corridors designated as urban on the street classification map; and
- Areas predominantly used by seniors and persons with disabilities.

4.3.2 Bus Shelters

The City of Scottsdale uses a standard bus shelter kit that includes a bus shelter, seating, trash receptacle, bicycle rack, and signs. Other amenities, including the provision of vertical shade elements, should also be considered as technology and funding becomes available. The City has implemented, with great success, a large number of these bus shelter kits over the past few years. In addition, bus shelters that have unique features or design (often artist designed) have been used in certain areas of the City, such as Downtown and Shea Boulevard. Bus shelters in the City of Scottsdale are located based on bus frequency, ridership, bus operational requirements, pedestrian safety, passenger comfort, and ROW availability. Maintenance at stops (such as shelter cleaning or trash disposal) should be provided commensurate with the level of activity occurring at the stop. It is recommended that the location of future bus shelters consider the following:

- Bus shelters be prioritized for the highest ridership bus stop locations, which are often along the highest ridership bus routes at the one-mile arterial intersections;
- Southfacing bus shelters are a higher priority than northfacing bus shelters. Scottsdale is a narrow city with transit connections primarily oriented to the west for east/west bus routes;
- Shade is at a premium in the late afternoon. Creating shade in the afternoon is of more importance than the morning, especially for north/south bus shelters. The existing bus shelter kit does lack in the provision of shade for north/south bus routes in the afternoon;
- Shade and passenger comfort needs to be the highest priority in the design of future bus shelters. Many of the artist designed bus shelters fall short in these areas; careful design considerations must be given to shade and passenger comfort, as well as ADA requirements for all bus shelters, including those not using the standard bus shelter design; and
- Enhanced bus shelters need to be considered for the Route 72 along Scottsdale Road given existing and future service and ridership.

4.3.3 Bus Bays

Bus bays are pads that are cut into curb lanes that allow traffic to pass while buses are at a bus stop. Existing bus bays are found throughout the City of Scottsdale, especially at major arterial intersections. Bus bays do not increase the speed and reliability of transit, and instead negatively impact transit travel times because buses are usually forced to wait until the entire traffic queue has passed before re-entering the travel lane. Bus bays are often programmed as a "transit" improvement, but in reality provide very little transit benefit. National trends in transit planning advocate against the development of bus bays.

New bus pullouts are not recommended along roadways corridors designated as urban on the street classification map. It is recommended that bus bays only be constructed at bus stops in the City of Scottsdale under the following circumstances:

- The bus stop is a time point where the bus may dwell longer than normal to maintain schedule;
- The bus stop is a high transfer location, where the bus may dwell longer than normal to facilitate transfers between routes (especially if it is a timed transfer);
- The bus stop is a layover location where the bus dwells at the beginning or end of a bus route;
- Safety concerns related to the location of the bus stop prohibit the bus from safely dwelling in the traffic lane; or
- If LOS in suburban corridor segments of bus route is below D.

4.3.4 Bus Bulbs

Bus bulbs are the opposite of bus bays and refer to sections of sidewalk that extend from the curb to the edge of the travel lane. Bus bulbs are typically found in urban areas and prioritize transit travel time over vehicular travel time. Existing curb bulbs (installed as part of a streetscape project) that function similar to bus bulbs are located in Downtown and serve the Downtown trolley. It is recommended that bus bulbs be included as a standard design element at the following locations:

- Downtown and other "urban areas" where pedestrian concentrations are located;
- Roadways with on-street parking; and
- Scottsdale Road in conjunction with enhanced bus service.

4.3.5 Park-and-Rides

The City of Scottsdale will be constructing regional park-and-ride facilities to serve freeway express bus service. It is recommended that the City also continue to pursue joint use park-and-rides in which informal agreements are established for shared parking arrangements. These types of park-and-rides utilize existing parking capacity within the City and can serve fixed route bus service and arterial express bus service.

4.4 Transit Priority Treatments

Transit priority treatments are intended to increase the speed and reliability of the existing transit system through modest capital improvements. Transit priority treatments being considered in the Transit Element that require further dialogue with the Transportation Commission and community before finalizing include:

Transit Signal Priority

Transit signal priority is a technology that allows buses to communicate with an approaching traffic signal via a transponder to provide additional green light time for the bus. Transit signal priority can be used to increase the speed and reliability of transit in high demand corridors. Scottsdale Road will be the first corridor considered for transit signal priority improvements (as discussed in subsequent sections of the Transit Element). Other potential corridors for transit signal priority are Thomas Road, Indian School Road, Shea Boulevard, and Bell Road/Frank Lloyd Wright Boulevard.

Queue Jumps

Queue jumps allow buses or other forms of transit to bypass known congestion points by giving transit exclusive ROW. It can be combined with transit signal priority to give green light time to transit prior to general purpose traffic.

Business Access and Transit Lanes

Business access and transit lanes are restricted lanes that are reserved for transit as well as autos making turns to access businesses. Business access and transit lanes usually exist in the right curb lane but can also be designed to exist in the left median lane.

HOV Direct Access

HOV direct access connections allow express buses to enter/exit the center HOV lane on freeways without having to weave through general purpose traffic and use the general purpose ramps. HOV direct access should be considered at the Mountain View Road and Northsight Boulevard/Thunderbird Road overpasses of the Loop 101 Freeway.

4.5 Travel Demand Management

An effective transit system includes a variety of strategies beyond buses and Dial-a-Ride. These strategies encourage business and personal trip management and implement policies that directly or indirectly influence travel choices. Strategies include:

- Encouraging the coordination of activities occurring through the Maricopa County trip reduction program;
- Support ridesharing; and
- Promote incentives in companies affected by the Maricopa County trip reduction program.

5.0 SHORT-TERM TRANSIT IMPROVEMENT OPTIONS

The transit improvement options for the Transit Element are focused on three planning horizons: short-term (5 year), mid-term (10 year), and long-term (20 year). The short-term (5 year) transit improvement options are primarily focused on improving the level of bus service in Scottsdale to match that of its neighboring jurisdictions. Currently, much of the fixed route bus service in Scottsdale operates with less frequency and a shorter service span when compared to Phoenix and Tempe because it lacks a funding source that is exclusively dedicated for transit other than Proposition 400. However, service levels have improved since the City began allocating up to 50 percent of the 0.2 percent transportation privilege tax to transportation operations. The short-term transit improvement options are described below.

5.1 Fixed Route Bus

The fixed route bus improvements in the short-term planning horizon focus on completing the grid of transit service within the City of Scottsdale. The goal is to meet the "unofficial" regional standard of service, which is 15 minutes in the peak and 30 minutes in the off-peak from 4 a.m. to midnight. Most of the fixed bus routes will meet this standard at the end of the 20 year planning horizon.

The short-term transit improvement option includes additional improvements to Route 72 but also includes several of the east/west routes that operate in the southern part of the City. The approach of the Transit Element is slightly different than the RTP in that it advances segments of routes, rather than entire routes, in the short-term.

For example, transit improvements for Route 17 on McDowell Road are planned for the second phase of the RTP. This improvement will increase the frequency of the entire length of the route through Scottsdale to match the service frequency in Phoenix. However, another approach is to partner with the city of Phoenix to increase the frequency between 44th Street and Scottsdale Road in the short-term and leave the remainder of the route to be improved in subsequent planning horizons. This approach will free up additional service hours that can allow other east/west routes to add service frequency between Phoenix and Scottsdale Road in the short-term. The major benefit to this approach is that Scottsdale Road is the major transfer point for bus routes in Scottsdale. Improving multiple routes to Scottsdale Road will provide far more benefit to transit riders than improving the frequency of a single east/west route through the length of the City.

The fixed bus routes identified in the short-term transit improvement option are described below.

- Route 17 (McDowell Road): No route change will occur but service frequencies will be improved to 15 minutes in the peak between 44th Street and Scottsdale Road (requires participation from the city of Phoenix).
- Green line (Thomas Road): No route change will occur but service frequencies will be improved to 10 minutes in the peak and 20 minutes in the off-peak, between 44th Street and Scottsdale Road (requires participation from the city of Phoenix).

- Route 50 (Camelback Road): Service frequencies will be improved to 15 minutes in the peak and 30 minutes in the evening, from 5 a.m. to midnight, between 44th Street and SCC in order to service evening classes (requires participation from the city of Phoenix).
- Route 66 (68th Street): This route will be modified to serve Scottsdale Fashion Square via 68th Street and Camelback Road before returning to Loloma station via Goldwater Boulevard.
- Route 72 (Scottsdale Road): This route has recently been extended north from its former terminus at Princess Boulevard to the Loop 101. Service frequencies will be increased to 15 minutes in the off-peak and the route will be further extended to Thompson Peak Parkway to service Scottsdale Healthcare (requires participation from the City of Tempe).
- Route 84 (Granite Reef) and Route 114 (Via Linda): These routes should be further analyzed to determine whether they should be combined into a single route (requires participation from the SRPMIC), continue as realigned individual local routes, or be replaced by local circulator service. Minimum service frequencies should be enhanced to 30 minutes minimum under any of the options.
- Route 106 (Shea Boulevard): No route change will occur but service frequencies will be improved to 15 minutes in the peak and 30 minutes in the off-peak, from 5 a.m. to midnight, between Paradise Valley Mall and 92nd Street (requires participation from the city of Phoenix).
- Route 154 (Greenway Road): Service frequencies will be increased to 15 minutes in the peak.

5.2 Express Bus

The short-term transit improvement option includes additional trips on the existing express bus routes in Scottsdale. Currently, routes 510 and 512 only provide two trips in the peak direction whereas four trips are the minimum based on the unofficial regional planning standard of 30 minute express bus frequency. The existing boardings per trip on the routes 510 and 512 justify an increase in the number of trips.

The short-term transit improvement option includes the new north Loop 101 express bus route which is identified in the RTP for implementation in 2007. This is a two-way express bus route operating between Surprise and the Airpark that will use the programmed HOV lanes on the Loop 101. Eventually, this route will connect to the future Loop 101/Scottsdale Road park-and-ride or to the east side of the Airpark.

The short-term also includes the new east Loop 101 connector which is identified in the RTP for implementation in 2009. This is a two-way express bus route operating between the Airpark and Chandler that will use the programmed HOV lanes on the Loop 101. Similar to the north Loop 101 connector, this route will eventually connect to the future Loop 101/Scottsdale Road park-and-ride or to the east side of the Airpark.

5.3 Neighborhood Circulator

The short-term planning horizon does not include major changes to the Downtown trolley and Neighborhood Connector. Downtown trolley service was recently improved and the Neighborhood Connector began service between Downtown and the Granite Reef Senior Center in 2006. The Neighborhood Connector service will be extended in January 2008 following public input and recommendations. It is proposed that the Neighborhood Connector be extended to the future SkySong Transit Center upon its completion, which will enable the Scottsdale neighborhood circulator to connect to Tempe's circulator service. Currently, the neighborhood circulator is using trolley fleet identical to the Downtown trolley. The short-term planning horizon proposes transitioning to a low-floor bus or trolley for the Neighborhood Connector that better serves the needs of passengers. This transition would occur as the existing trolley fleet reaches the end of its useful life. While the existing trolleys are ADA accessible, they do not provide for level boarding and are not as convenient as a low-floor bus.

Downtown Trolley sign

5.4 Paratransit

The short-term transit improvement option includes the gradual expansion of paratransit services available in Scottsdale through the East Valley Dial-a-Ride. The East Valley Dial-a-Ride allows for a single service area and provides services for ADA-certified passengers, seniors, and passengers with disabilities. Dial-a-Ride service will need to be expanded as new fixed route service is added in Scottsdale. ADA requires that complementary paratransit service be provided in all areas within 3/4 mile of fixed route bus service. It is not recommended that Scottsdale expand its Dial-a-Ride service area beyond what is required by ADA. Additional paratransit service would be more effectively provided through the expansion of the Cab Connection program.

5.5 Transit Facilities

The short-term transit improvement option includes two transit facilities as well as general passenger facility improvements.

5.5.1 SkySong Transit Center

The short-term transit improvement option includes the future SkySong Transit Center at Scottsdale Road and McDowell Road. This facility will provide a new hub for transit services in the southern portion of the City and provide convenient transfers between routes 72 (Scottsdale Road), 17 (McDowell Road), 66 (68th Street), 76 (Miller Road), and the Neighborhood Connector. The design of the transit center is currently underway and will be developed to include the following amenities:

- Bus bays;
- Bus loading platform;
- Shelters and seating;
- Variable message signs;
- Bicycle and pedestrian access;
- Bicycle storage;
- Ticket sales and information;
- Restrooms;
- Landscaping and lighting; and
- Opportunities for joint development or joint use.


An example of a shade structure at Loloma Station

5.5.2 Mustang Transit Center and Park-and-Ride

The short-term transit improvement option also includes the new Mustang Transit Center and Park-and-Ride, which is being planned near the Mustang Library and Scottsdale Healthcare-Shea campus in the vicinity of Shea Boulevard and 90th Street. This facility will provide a new hub for transit services in the central portion of the City, and provide convenient transfers between routes 81 (Hayden Road), 106 (Shea Boulevard), 114 (Via Linda), 512 (Fountain Hills express), and future express bus service on the Loop 101. The planning and site selection of the transit center is currently underway and will be developed with a lower scale set of amenities to the SkySong Transit Center. The park-and-ride is expected to have approximately 250 spaces.

5.5.3 Passenger Amenities

The short-term planning horizon also focuses on improving passenger amenities at existing and new bus stops. These improvements will include the new standard bus shelter and corresponding passenger amenities (seating, trash receptacles, bicycle racks, and other amenities) that will enhance the safety and comfort of transit patrons. Special consideration will be given to improving passenger amenities at high transfer locations where multiple bus routes converge. As service and ridership increase, new amenities such as electronic display boards and real-time passenger information will be introduced.

5.6 Summary

The short-term transit improvement options for the Transit Element are summarized in Table 5-8 and illustrated in Figure 5-2.

TABLE 5-8: Short-term Transit Improvement Options

			Headway	
Route	Name	Improvement	Existing (peak/off-peak)	Short-term (peak/off-peak)
Fixed Route Bus				
17	McDowell Rd	Increase service frequency between 44th St and Scottsdale Rd	30/30	15/30 to Scottsdale Rd.
Green	Thomas Rd	Increase service frequency between 44th St and Scottsdale Rd	20/30	10/20 to Scottsdale Rd
41	Indian School Rd	No change	15*/30	No change
50	Camelback Rd	Increase service frequency and service span between 44th St and Scottsdale Rd	15/30	15/30 to Scottsdale Rd
72	Scottsdale Rd	Extend route to Thompson Peak Parkway and increase service frequency	15/30/60	15/15
76	Miller Rd	No change	30/30	No change
81	Hayden Rd	No change	15/30	No change
84	Granite Reef Rd	Extend route north on Pima Rd/92nd S. to Via Linda and combine with Route 114. Increase service frequency and service span.	60/60	30/30

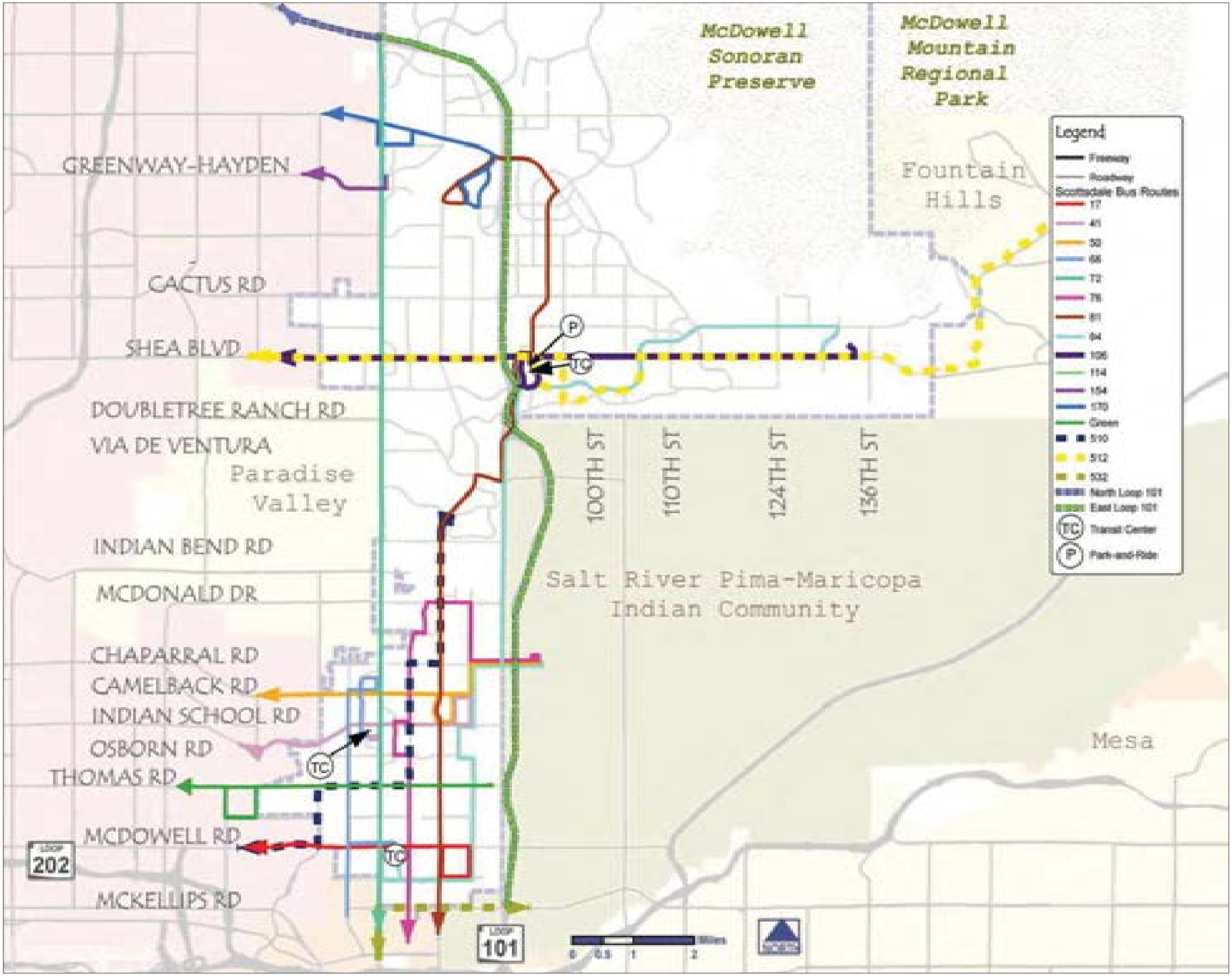


FIGURE 5-2: Short-term Transit Improvement Options

TABLE 5-8: Short-term Transit Improvement Options

Route	Name	Improvement	Headway Existing (peak/off-peak)	Headway Short-term (peak/off-peak)
106	Shea Blvd	Increase service frequency and service span between PV Mall and 92nd St	30/60	15/30 to 92nd St
114	Via Linda	Eliminated (replaced by Route 84 extension)	60/60	n/a
154	Greenway Rd	Increase peak service frequency.	30/30	15/30
170	Bell Rd	No change	30/30	No change
Express Bus				
510	McCormick Ranch	Add two new trips	2 trips (peak direction)	4 trips
512	Fountain Hills	Add two new trips	2 trips (peak direction)	4 trips
572	North Loop 101	New two-way route between Surprise and Airpark	----	8 trips
TBD	East Loop 101	New two-way route between Airpark and Chandler	----	8 trips
Neighborhood Circulator				
DT	Downtown trolley	No change	10	No change
NC	Neighborhood Connector	Extend route to serve SkySong Transit Center	20	No change

Source: HDR | SRBA, 2007
* only west of Loloma Station.

6.0 MID-TERM TRANSIT IMPROVEMENT OPTIONS

The mid-term (10 year) transit improvement options continue to focus on improving the overall level of fixed route bus service in Scottsdale. In addition, the mid-term planning horizon introduces substantial new express bus service in the Loop 101 Freeway corridor. The mid-term transit improvement options are described below.

6.1 Fixed Route Bus

The goal of the mid-term transit improvement option is to continue to improve transit service in Scottsdale to meet the "unofficial" regional standard of service, which is 15 minutes in the peak and 30 minutes in the off-peak from 5 a.m. to midnight. The mid-term transit improvement option follows the same approach as the short-term, in that it advances segments of routes, rather than entire routes.

Valley Metro buses at Loloma Station

The fixed bus routes identified in the mid-term transit improvement option are described below.

- Route 41 (Indian School Road): This route will be extended to SCC from Granite Reef Road so that it connects with Loop 101 express bus service.
- Route 66 (68th Street): No route change will occur but service frequencies will be improved to 15 minutes in the peak along the entire route in Scottsdale.
- Route 76 (Miller Road): No route change will occur but service frequencies will be improved to 15 minutes in the peak.
- Route 170 (Bell Road/Frank Lloyd Wright Boulevard): Extend route to Shea Boulevard via Frank Lloyd Wright Boulevard. Improve service frequencies to 15 minutes in the peak.

6.2 Express Bus

The mid-term transit improvement option includes the addition of the Pima express bus route which is identified in the RTP for implementation in 2013. This is a peak-hour, peak-direction-only express route that operates in the same corridor as the east Loop 101 connector and will use the programmed HOV lanes on the Loop 101. This route will connect the Airpark and downtown Phoenix via downtown Tempe.

6.3 Enhanced Bus

The mid-term transit improvement option includes the addition of "enhanced" bus service to the Scottsdale Road corridor between SkySong and Loop 101. Ideally, this service would extend the entire length of the Scottsdale Road/Rural Road corridor from Tempe/Chandler. Enhanced bus service will provide additional frequency, service span, and passenger amenities and accommodate the following characteristics:

- Limited stops (major arterials and/or major destinations only);
- 10-minute peak-hour frequency (no schedule needed);
- Enhanced shelters with real-time passenger information;
- Unique branding (bus, shelters, signs); and
- Transit signal priority.

The primary benefit of the enhanced bus service is that it will offer a faster peak-hour travel time through the corridor by only stopping at major arterials and/or major destinations to increase travel time and facilitate transfers. Existing travel times on the Route 72 (Scottsdale Road) are slow due to frequent stop spacing.

Other potential enhanced bus corridors are Indian School Road, Shea Boulevard, and Bell Road/Frank Lloyd Wright Boulevard. However, these three corridors would require a similar LOS in Phoenix to warrant the investment.

6.4 High Capacity Transit

The RTP includes funding for arterial BRT on Scottsdale Road in 2016. The design and implementation of arterial BRT will be the subject of further regional study. In the interim, BRT funding could be used for the enhanced bus routes described in the previous section. The funding levels of the BRT is more akin to enhanced bus service.

6.5 Neighborhood Circulator

The mid-term planning horizon includes enhancements and expansions to the existing neighborhood circulator.

Neighborhood circulators will be considered for use in non-grid areas and in areas where urban development makes typical fixed route service cumbersome.

Potential areas of use include residential areas north and east of Downtown, Indian School Park, McCormick Ranch, McDowell Mountain Ranch, Chaparral Park, DC Ranch, and in the area of Shea Boulevard and 132nd Street. The specific routing has not been identified, and will be dependent on a public involvement process similar to other trolley improvements.

Circulators will also be considered to replace fixed route service on routes that are deemed easier and more cost effective to operate as circulators.

Another planning option includes the addition of a new Airpark circulator. The implementation of this circulator will be dependent on a number of factors, including the consolidation of transit services at a single location in the Airpark, the completion of the Loop 101/Scottsdale Road park-and-ride, and the ability to connect Loop 101 express bus service with specific employment and activity centers.

No changes are proposed to the Downtown trolley other than to make schedule and route adjustments, as needed.

6.6 Paratransit

The mid-term transit improvement option includes the gradual expansion of paratransit services available in Scottsdale through the East Valley Dial-a-Ride. The East Valley Dial-a-Ride allows for a single service area and provides services for ADA-certified passengers, seniors, and passengers with disabilities. Dial-a-Ride service will need to be expanded as new fixed route service is added in Scottsdale. ADA requires that complementary paratransit service be provided in all areas within 3/4 mile of fixed route bus service. It is not recommended that Scottsdale expand the Dial-a-Ride service area beyond what is required by ADA. Additional paratransit service would be more effectively be provided through the expansion of the Cab Connection program.

6.7 Transit Facilities

The mid-term transit improvement option includes a second regional park-and-ride, three HOV direct access connections in the Loop 101 corridor, and general passenger facility improvements.

6.7.1 Loop 101/Scottsdale Road Park-and-Ride

The Loop 101/Scottsdale Road park-and-ride will serve the north Loop 101 connector, east Loop 101 connector, and Pima express bus routes. The preferred location for the park-and-ride is between the Loop 101/Scottsdale Road and Loop 101/Hayden Road interchanges. The park-and-ride will accommodate a minimum of 500 vehicles and will be developed to include the following amenities:

- Parking spaces for transit riders and carpools (100 percent covered);
- Bus loading platform;
- Shelters and seating;
- Variable message signs;
- Drop-off zone (kiss-and-ride);
- Bicycle and pedestrian access;
- Bicycle storage;
- Landscaping and lighting, and
- Opportunities for joint development or joint use.

6.7.2 Loop 101 HOV Direct Access (Scottsdale Road/Hayden Road)

The mid-term transit improvement option includes HOV direct access connections to the Loop 101/Scottsdale Road park-and-ride as well as to the Airpark. HOV direct access connections allow express buses to enter/exit the center HOV lane on freeways without having to weave through general purpose traffic and use the general purpose ramps. These facilities add travel time savings for transit/carpools in the peak and additional general purpose capacity in the off-peak.

It is proposed that a full HOV direct access interchange be constructed in the median of the Loop 101 at the half-mile point between Hayden Road and Scottsdale Road. As described above, the preferred location for the park-and-ride is between the Loop 101/Scottsdale Road and Loop 101/Hayden Road interchanges. This HOV facility will have the dual benefit of serving as both an origin and a destination; an origin for park-and-ride users and a destination for the Airpark, One Scottsdale, etc.

6.7.3 Loop 101 HOV Direct Access (Raintree Drive or Northsight Boulevard/Thunderbird Road)

A second full HOV direct access interchange is proposed in the median of the Loop 101 to serve the Airpark directly. There are two potential options:

- Add a new HOV direct access connection to the existing Raintree Drive interchange with median HOV ramp connections to the north and south; or
- Construct a new HOV direct access connection at Northsight Boulevard/ Thunderbird Road with ramps to the north and south.

Both of these options provide direct access to the Airpark on the west side of the Loop 101 at this location.

6.7.4 Loop 101 HOV Direct Access (Scottsdale Community College)

A third full HOV direct access interchange is proposed in the median of the Loop 101 to serve SCC. This location will allow Loop 101 express bus service to provide efficient transfer opportunities to Downtown from SCC without having to deviate from the Loop 101 corridor. SCC will be served by routes 41, 50, 76, and 84 as well as the east Loop 101 connector and the Pima Express. There are two potential options:

- Construct a new HOV direct access connection at Jackrabbit Road with ramps to the north and south; or
- Construct a new HOV direct access connection at Camelback Road with ramps to the north and south.

Both of these options provide direct access to SCC and Pima Road and will require participation from the SRPMIC.

6.7.5 Passenger Amenities

In addition, the mid-term planning horizon continues to focus on improving passenger amenities at existing and new bus stops. These improvements will include the new standard bus shelter and corresponding passenger amenities (seating, trash receptacles, bicycle racks, and other amenities) that will enhance the safety and comfort of transit patrons. Special consideration will be given to improving passenger amenities at high transfer locations where multiple bus routes converge. As service and ridership increase, new amenities such as electronic display boards and real-time passenger information will be introduced.

6.8 Summary

The mid-term transit improvement options for the Transit Element are summarized in Table 5-9 and illustrated in Figure 5-3.

TABLE 5-9: Mid-term Transit Improvement Options

			Headway	
Route	Name	Improvement	Short-term (peak/off-peak)	Mid-term (peak/off-peak)
Fixed Route Bus				
17	McDowell Rd	No change	15/30	No change
Green	Thomas Rd	No change	10/20	No change
41	Indian School Rd	Extend route to Scottsdale Community College	15*/30	No change
50	Camelback Rd	No change	15/30	No change
66	68th St	Increase service frequency	30/30	15/30
72	Scottsdale Rd	No change	15/15	No change
76	Miller Rd	Increase service frequency	30/30	15/30
81	Hayden Rd	No change	15/30	No change
84	Granite Reef Rd/Via Linda	No change	30/30	No change
106	Shea Blvd	No change	15/30	No change
154	Greenway Rd	No change	15/30	No change
170	Bell Rd	Extend route to Shea Blvd and increase service frequency	30/30	15/30

* only west of Loloma Station.

FIGURE 5-3: Mid-term Transit Improvement Options

TABLE 5-9: Mid-term Transit Improvement Options				
			Headway	
Route	Name	Improvement	Short-term (peak/off-peak)	Mid-term (peak/off-peak)
Express Bus				
510	McCormick Ranch	No change	4 trips	No change
512	Fountain Hills	No change	4 trips	No change
572	North Loop 101	No change	8 trips	No change
TBD	East Loop 101	No change	8 trips	No change
TBD	Pima	New peak-hour, peak direction route on Loop 101 between the Airpark and downtown Phoenix	----	8 trips
Enhanced Bus				
TBD	Scottsdale Rd.	SkySong (or Tempe/Chandler) to Loop 101	----	10 (peak only)
Neighborhood circulator				
DT	Downtown trolley	No change	10	No change
NC	Neighborhood Connector	Extend route to serve other areas	20	No change

Source: HDR | SRBA, 2006
* only west of Loloma Station.

7.0 LONG-TERM TRANSIT IMPROVEMENT OPTIONS

The long-term (20 year) transit improvement options continue to focus on improving the overall level of fixed route bus service in Scottsdale. In addition, the long-term planning horizon includes HCT on Scottsdale Road. Some of these improvements are conceptual in nature and will be refined in later years. The long-term transit improvement options are described below.

7.1 Fixed Route Bus

The goal of the long-term transit improvement option is to complete the transit network in Scottsdale so that it meets or exceeds the regional standard of service, which is 15 minutes in the peak and 30 minutes in the off-peak from 5 a.m. to midnight. The long-term transit improvement option fills in the remainder of the gaps from the short- and mid-term options.

The fixed bus routes identified in the long-term transit improvement option are described below.

- Route 17 (McDowell Road): No route change will occur but service frequencies will be improved to 15 minutes in the peak between Scottsdale Road and Pima Road.
- Green line (Thomas Road): No route change will occur but service frequencies will be improved to 10 minutes in the peak and 20 minutes in the off-peak between Scottsdale Road and Pima Road.
- Route 41 (Indian School Road): No route change will occur but service frequencies will be improved to 15 minutes between Scottsdale Road and Pima Road.

- Route 50 (Camelback Road): No route change will occur but service frequencies will be improved to 15 minutes in the peak between Scottsdale Road and SCC.
- Route 72 (Scottsdale Road): This route will be extended north from Loop 101 to Carefree Highway.
- Route 76 (Miller Road): This route will be modified to serve Hayden Road between McDonald Drive and future Airpark transit center.
- Route 81 (Hayden Road): Reroute to serve future Airpark transit center.
- Route 84 (Granite Reef/Via Linda): No route change will occur but service frequencies will be improved to 15 minutes in the peak along the entire route.
- Route 106 (Shea Boulevard): No route change will occur but service frequencies will be improved to 15 minutes in the peak between 92nd Street and Mayo Clinic Scottsdale.
- Route 138 (Thunderbird Road): This route will be extended from Paradise Valley Mall to the Airpark.
- Route 170 (Bell Road): Reroute to serve future Airpark transit center.

7.2 Express Bus

The long-term transit improvement option includes a new express bus route that will connect SkySong with downtown Phoenix. It is proposed that this route operate all day in both directions. The primary function of this route will be to complete the "triangle" of transit service between Tempe, Phoenix, and Scottsdale that house Arizona State University's (ASU) three campuses (ASU main, ASU downtown Phoenix, and ASU SkySong). Phoenix and Tempe will be connected by the metro central Phoenix/East Valley LRT line while Tempe and Scottsdale will be connected by some form of HCT. The connection between Phoenix and Scottsdale is a logical one and could best be served by an all-day, two-way express bus route. This route is not identified in the RTP and is currently unfunded.

The long-term transit improvement option also includes a new express route on Shea Boulevard that will essentially replace the existing Route 512. The new route will be funded regionally and offer a higher frequency of service than the existing Route 512.

7.3 Enhanced Bus

No major changes will occur to the enhanced bus service on Scottsdale Road in the long-term transit improvement option. Enhanced bus service will continue to operate on Scottsdale Road between SkySong (or points south if partnered with Tempe/Chandler) and Loop 101. Enhanced bus service will provide additional frequency, service span, and passenger amenities and accommodate the following characteristics:

- Limited stops (major arterials and/or major destinations only);
- 10-minute peak-hour frequency (no schedule needed);
- Enhanced shelters with real-time passenger information;
- Unique branding (bus, shelters, signs); and
- Transit signal priority.

Enhanced bus service will be overlaid on existing fixed route bus service and future HCT service on Scottsdale Road. The introduction of HCT (as discussed in Section 6.4) does not preclude the need for enhanced bus in the corridor, since they serve different trip lengths and travel markets. The need for peak-hour limited-stop bus service on Scottsdale Road will remain given that the service limits will generally extend farther north and south than the HCT investment.

7.4 High Capacity Transit (HCT)

The long-term transit improvement option could include the implementation of HCT in the City of Scottsdale. The HCT technology for this corridor has yet to be determined and could range from BRT to modern streetcar or LRT. It could also include a combination of technologies throughout the corridor. Potential HCT alternatives will be the subject of further study.

A conceptual level of discussion regarding HCT is included in Section 8.0 of the Transit Element. This discussion does not evaluate HCT alternatives, but rather discusses some of the opportunities and constraints of HCT alignments and technologies.

7.5 Neighborhood Circulator

The long-term planning horizon will monitor the existing Downtown trolley and the Neighborhood Connectors and make schedule and route adjustments, as needed.

7.6 Paratransit

The long-term transit improvement option includes the gradual expansion of paratransit services available in Scottsdale through the East Valley Dial-a-Ride. The East Valley Dial-a-Ride allows for a single service area and provides services for ADA-certified passengers, seniors, and passengers with disabilities. Dial-a-Ride service will need to be expanded as new fixed route service is added in Scottsdale. ADA requires that complementary paratransit service be provided in all areas within 3/4 mile of fixed route bus service. It is not recommended that Scottsdale expand Dial-a-Ride service beyond what is required by ADA. Additional paratransit service would be more effectively provided through the expansion of the Cab Connection program.

7.7 Transit Facilities

The long-term transit improvement option includes HCT infrastructure, a transit center, and general passenger facility improvements.

7.7.1 Airpark Transit Center

The long-term transit improvement option includes the future Airpark transit center. This facility will provide a new hub for transit services in the northern portion of the City, and could provide convenient transfers between routes 72 (Scottsdale Road), 81 (Hayden Road), 138 (Thunderbird Road), 154 (Greenway Road), 170 (Bell Road), and the future Airpark circulator, as well as express bus services. Potential site locations have yet to be determined but it is anticipated the transit center will be developed to include the following amenities:

- Bus bays;
- Bus loading platform;
- Shelters and seating;
- Variable message signs;
- Bicycle and pedestrian access;
- Bicycle storage;

- Ticket sales and information;
- Restrooms;
- Landscaping and lighting; and
- Opportunities for joint development or joint use.

7.7.2 Passenger Amenities

In addition, the long-term planning horizon continues to focus on improving passenger amenities at existing and new bus stops. These improvements will include the new standard bus shelter and corresponding passenger amenities (seating, trash receptacles, bicycle racks, and other amenities) that will enhance the safety and comfort of transit patrons. Special consideration will be given to improving passenger amenities at high transfer locations where multiple bus routes converge. As service and ridership increase, new amenities such as electronic display boards and real-time passenger information will be introduced.

7.8 Summary

The long-term transit improvement options for the Transit Element are summarized in Table 5-10 and illustrated in Figure 5-4.

TABLE 5-10: Long-term Transit Improvement Options

			Headway	
Route	Name	Improvement	Short/Mid-term (peak/off-peak)	Long-term (peak/off-peak)
Fixed Route Bus				
17	McDowell Rd	Increase service frequency and service span between Scottsdale and Pima roads	15/30 to Scottsdale Rd	15/30 along entire route
Green	Thomas Rd	Increase service frequency and service span between Scottsdale and Pima roads	10/20 to Scottsdale Rd	10/20 along entire route
41	Indian School Rd	Increase service frequency and service span between Scottsdale and Pima roads	15/30	15/30 along entire route
50	Camelback Rd	Increase service frequency and service span between Scottsdale Rd and SCC	15/30 to Scottsdale Rd	15/30 along entire route
66	68th St	No change	15/30	No change
72	Scottsdale Rd	Extend route from Thompson Peak Pkwy to Carefree Hwy	15/15	No change
76	Miller Rd	Reroute to serve Hayden Rd between McDonald Dr and Airpark Transit Center	15/30	No change
81	Hayden Rd	Reroute to serve Airpark Transit Center	15/30	No change
84	Granite Reef Rd/ Via Linda	Increase service frequency	30/30	15/30
106	Shea Blvd	Increase service frequency and service span between 92nd St and Mayo Clinic	15/30	15/30 along entire route

TABLE 5-10: Long-term Transit Improvement Options				
			Headway	
Route	Name	Improvement	Short/Mid-term (peak/off-peak)	Long-term (peak/off-peak)
138	Thunderbird	Extend route from PV Mall to Airpark	----	15/30
154	Greenway	No change		
170	Bell	Reroute to serve Airpark Transit Center	15/30	No change
Express Bus				
510	McCormick Ranch	No change	4 trips	No change
512	Fountain Hills	Eliminated and replaced by Shea/ SR 51 express	4 trips	Eliminated
572	North Loop 101	No change	12 trips	No change
TBD	East Loop 101	No change	8 trips	No change
TBD	Pima Airpark	No change	8 trips	No change
TBD	Loop 202	New all-day, two-way route between SkySong and downtown Phoenix	----	15/30
TBD	Shea/SR 51	Replaces Route 512	----	8 trips
Enhanced Bus				
TBD	Scottsdale Road	SkySong (or Tempe/Chandler) to Loop 101	10 (peak only)	No change
Neighborhood circulator				
DT	Downtown trolley	No change	10	No change
NC	Neighborhood Connector	No change	20	No change
AC	Airpark circulator	New Airpark circulator	----	10/20

Source: HDR | SRBA, 2006.

FIGURE 5-4: Long-term Transit Improvement Options

8.0 HIGH CAPACITY TRANSIT

A feasibility study of potential HCT service in Scottsdale was prepared as one component of the *Transportation Master Plan*. HCT options were evaluated for the Scottsdale Road corridor to connect major activity centers, including Downtown, SkySong, downtown Tempe, and ASU. The feasibility study was the first step in the transit planning process; subsequent planning efforts will likely be based on this study and could follow the FTA Alternatives Analysis process. The HCT Feasibility Study was not federally sponsored and was being initiated by the City of Scottsdale only to identify recommendations for the Scottsdale Road HCT corridor. Because Scottsdale Road was recommended as the preferred HCT corridor in the *Scottsdale/Tempe North/South Transit Corridor Study* (2003), this study focuses on this corridor as a logical evolution of the HCT planning process.

The HCT Feasibility Study examined HCT transit within the City of Scottsdale only. The primary study area was bounded by Chaparral Road to the north, McKellips Road to the south, and the City limits to the east and west (Figure 5-5). Potential HCT options north of Chaparral Road were considered in the evaluation of the HCT alternatives and should be examined in regional studies or as part of an FTA Alternatives Analysis.

This HCT Feasibility Study analyzed mobility needs and identified and compared the costs, benefits, and impacts of three HCT technology alternatives:

- Bus Rapid Transit;
- Light Rail Transit; and
- Modern Streetcar.

The study included input from the general public, project stakeholders, (e.g., adjacent neighborhoods, business owners, etc.) and local, regional, state, and federal agencies.

8.1 Purpose and Need

8.1.1 What is the Transportation Problem?

From 2000–2003, the Scottsdale/Tempe North/South Transit Corridor Study examined the feasibility of a HCT system to serve travel in selected north/south corridors in Scottsdale and Tempe. Given anticipated travel demand on the Loop 101 Freeway and limited opportunities to expand the existing roadway system, transit options represented the most feasible method to serve the traveling public and increase person capacity in these corridors. The purpose of the 2003 study was to identify improvements that could reduce existing and future traffic congestion, while improving mobility options in the study corridor. While there may be some public perception that the HCT Feasibility Study section of the *Transportation Master Plan* is

FIGURE 5-5: High Capacity Transit (HCT) Primary Study Area
Source: HDR | SRBA, 2006

intended only to identify options to relieve traffic congestion, the purpose of this feasibility study is also to provide a new mobility option that provides frequent, all day service to employment, residential, commercial, retail, entertainment, educational, civic, and cultural activities in the Scottsdale Road corridor. The Scottsdale Road fixed-route bus service (Route 72) is the City's strongest transit corridor. Using the Scottsdale Road corridor for HCT capitalizes on this route with expanded service and ridership possibilities.

Scottsdale Road HCT Corridor

The HCT Feasibility Study evaluated alternatives for the Scottsdale Road corridor as recommended by the Scottsdale City Council in their approval of the Scottsdale/Tempe North/South Transit Corridor Study on February 25, 2003. The Council designated Scottsdale Road as the primary corridor and recommended that BRT, LRT, and modern streetcar be evaluated in future studies. At that time, the City Council also approved Loop 101 as a secondary corridor, to serve commute activity. Proposition 400 (countywide transportation sales tax) funding was provided for services in both corridors, but at a lower LOS than identified in the 2003 study recommendations.

During the study period, some of the public discussion centered on whether the Loop 101 should be the preferred HCT corridor instead of Scottsdale Road. The primary reasons for the selection of Scottsdale Road over Loop 101 include the following:

- The Loop 101 Freeway is planned and funded in the RTP as an express bus/BRT corridor, which will provide peak-hour express service using HOV lanes during the times of day when the freeway is most congested and be consistent with the types of trips generated by the predominantly commercial land use in this corridor. Preliminary stops in or near Scottsdale include SCC, Scottsdale Healthcare Shea campus, and the Scottsdale Airpark;
- Scottsdale Road is the City's greatest activity corridor, with all-day and evening employment, residential, commercial, retail, entertainment, educational, civic, and cultural uses. MAG socioeconomic projections for 2030 indicate that these higher concentrations of both population and employment will continue to follow the Scottsdale Road corridor in the future;
- The Scottsdale/Rural Road corridor is identified as an HCT corridor in the MAG RTP and is currently funded for enhanced transit services through Proposition 400 funds available in 2014. This corridor extends the length of Scottsdale/Rural Road between Shea Boulevard and Chandler Boulevard, through the cities of Scottsdale, Tempe, and Chandler. Initial funding is proposed for BRT during peak hours;
- HCT in the Scottsdale Road corridor would provide transfer opportunities with most major east/west bus routes in the region. If HCT were located on Loop 101 to serve Scottsdale, additional transit investment (buses, shuttles, etc.) would be needed to connect the Loop 101 corridor with these bus routes and Scottsdale Road activity centers and places of employment;
- Loop 101 transit improvements, while helping meet regional mobility needs and potentially providing an important transit connection to the Scottsdale Airpark, will be placed outside of the City's most populated and pedestrian-oriented core area. Transit provided along the Loop 101 corridor misses a key regional destination/connection opportunity between Downtown Scottsdale and downtown Tempe, and does not connect the two major research centers at SkySong and ASU; and

- Freeway widening for HOV lanes (beginning in 2007) and general purpose lanes (beginning in 2014) will provide additional capacity for automobile travel on the Loop 101. Widening Scottsdale Road to provide additional vehicular capacity would be costly and require significant additional ROW, creating detrimental impacts to the City's character and Downtown.

Previous Transportation/Transit Initiatives

There has been a wide range of approaches to transportation initiatives in Maricopa County and the City of Scottsdale over the past 20 years. In both 1989 and 1994, proposals to provide regional transportation funding for transit were defeated by Maricopa County voters. At this point, Valley cities began to seek transit funding on a city-by-city basis, with a few cities being successful in this approach. Also in 1989, a 0.2 percent Transportation PrivilegeTax was approved by Scottsdale voters. In 1997, voters rejected the City of Scottsdale "Transit Plus" proposal, which included expanded fixed route bus service, express bus service, neighborhood circulators, Dial-a-Ride service and capital infrastructure improvements.

The Scottsdale City Council allows up to 50 percent of the 0.2 percent Transportation Privilege Tax to be utilized for operations such as transit service. The portion of the privilege tax not used for operations can be used for various transportation capital improvements, including transit infrastructure. The 0.2 percent privilege tax currently generates approximately $21 million per year in Scottsdale.

The MAG RTP was approved by voters in 2004 through Proposition 400 which extended the region's half-cent sales tax for transportation. The RTP includes a number of transit improvements programmed for the City of Scottsdale, including local bus, express bus, and HCT improvements, as well as transit capital facility improvements. As more transit services are provided through the RTP and Proposition 400, local funding will be freed up to put towards other transit services as well as new routes that will be created through the RTP.

8.1.2 Statement of Purpose

The purpose of the HCT Feasibility Study is to identify potential HCT alternatives for the Scottsdale Road corridor. The overall long-range transportation goal is to provide an efficient, appropriate, and integrated transit connection that offers convenient, accessible, and affordable mobility within the study area and maximizes connectivity to the regional HCT and transit system.

Goals and Objectives

Goal 1: Improve transportation mobility and capacity along the Scottsdale Road corridor.

Objectives

- Provide convenient access to major employment, commercial, retail, residential, educational, recreational, medical, civic, and cultural activity centers along the Scottsdale Road corridor.
- Provide a connection between Downtown Scottsdale and downtown Tempe, and between the two major research centers at SkySong and ASU.
- Provide better connectivity between neighborhoods and activity centers.

- Provide improved access to an employee workforce for Scottsdale employers, and convenient access for employees to their workplaces.
- Increase north/south travel capacity in and to Scottsdale.
- Provide future access to the regional HCT system.
- Improve access for students and transit-dependent populations.

Goal 2: Maximize the efficiency, effectiveness, and compatibility of the transit investment.

Objectives

- Provide expanded and reliable transit service, including increased frequency and a longer span of service.
- Provide multi-modal (pedestrian, bicycle, bus, and automobile) access to the transportation system.
- Provide transit service that is user-friendly and attractive to daily users and occasional users, such as visitors.
- Develop safe, comfortable, and convenient transit facilities, such as stations and stops.
- Ensure compatibility with existing transit services.
- Attract new riders to the transit system.
- Provide a sustainable transit investment that is consistent with the City's environmental policies.
- Promote travel demand management and parking management strategies.

Goal 3: Coordinate the transit investment with land use.

Objectives

- Ensure consistency with the *General Plan.*
- Ensure consistency with local and regional plans developed by the City of Scottsdale, and partner jurisdictions.
- Accommodate a mixture of activities and densities per the *General Plan.*
- Support economic development and pedestrian/transit oriented development per the *General Plan.*

Goal 4: Promote a transit investment that is environmentally sustainable and compatible with the built environment.

Objectives

- Implement a project that minimizes adverse impacts during construction and operation.
- Minimize impacts on historic, archaeological, traditional cultural places, parklands, and other sensitive uses.

Goal 5: Provide a transit investment that can be implemented within budget constraints.

Objectives

- Minimize capital costs.
- Provide opportunities for public-private partnerships.
- Minimize operating and maintenance costs.
- Maximize cost effectiveness.

Methodology

The HCT Feasibility Study has compiled project information in sufficient detail so that citizens, stakeholder groups, local and federal agencies, elected officials, and other study participants can make informed decisions on the HCT alternatives along the Scottsdale Road corridor and about future steps to advance those alternatives into project development. This information will include, but is not limited to, the following:

- Development of HCT alternatives;
- Evaluation of HCT alternatives using a variety of criteria, including rider benefits, land use, economic development, traffic issues, populations served, environmental issues, design issues, costs, and community support; and
- Definition of the supporting transit system that integrates with the HCT alternatives.

On February 6, 2007, in response to citizen petitions, the Scottsdale City Council voted to allow a public vote on HCT in the event that rail transit is proposed.

On December 11, 2007, the City Council opted to join METRO to enable the City's participation in the north/south HCT study currently underway among METRO, Tempe, and Chandler.

8.1.3 HCT Study Area Description

The following is a description of the study area's existing conditions, including land use, demographics, physical barriers and features, and transportation facilities and services.

Land Use

Existing land use in the study area includes two major activity centers, Downtown and SkySong, along with local business districts, employment centers, entertainment venues, residential areas, historic neighborhoods, resorts, community facilities, and other uses along the Scottsdale Road corridor. The *General Plan* land use map for this area is included as Figure 5-6.

Downtown Scottsdale

Downtown Scottsdale ranks among the top major activity centers in the region. Downtown includes a diverse range of employment, residential, commercial, retail, entertainment, educational, civic, and cultural facilities.

- Mixed-Use – Downtown has experienced significant new and revitalization projects that have either recently been built or are planned for construction during the next five years (Figure 5-7). The nearly $3 billion in public and private investment includes a mix of residential, retail, and office uses. Developments with more than $10 million in investment include Scottsdale Waterfront, W Hotel, Main Street Plaza, Hotel Valley Ho, Third Avenue Lofts, Galleria Corporate Center, Scottsdale Oasis, Scottsdale Healthcare Osborn, Stetson Plaza/South Canal Bank Project, Main Street Residences, Portales Residential, and Optima Camelview (Figure 5-7).
- Residential – Downtown includes a wide variety of residential units, including new development and older single-family and multi-family residential. New residential and mixed-use projects, including those listed above, are expected to result in 2,000–2,500 additional residential units in the near future.

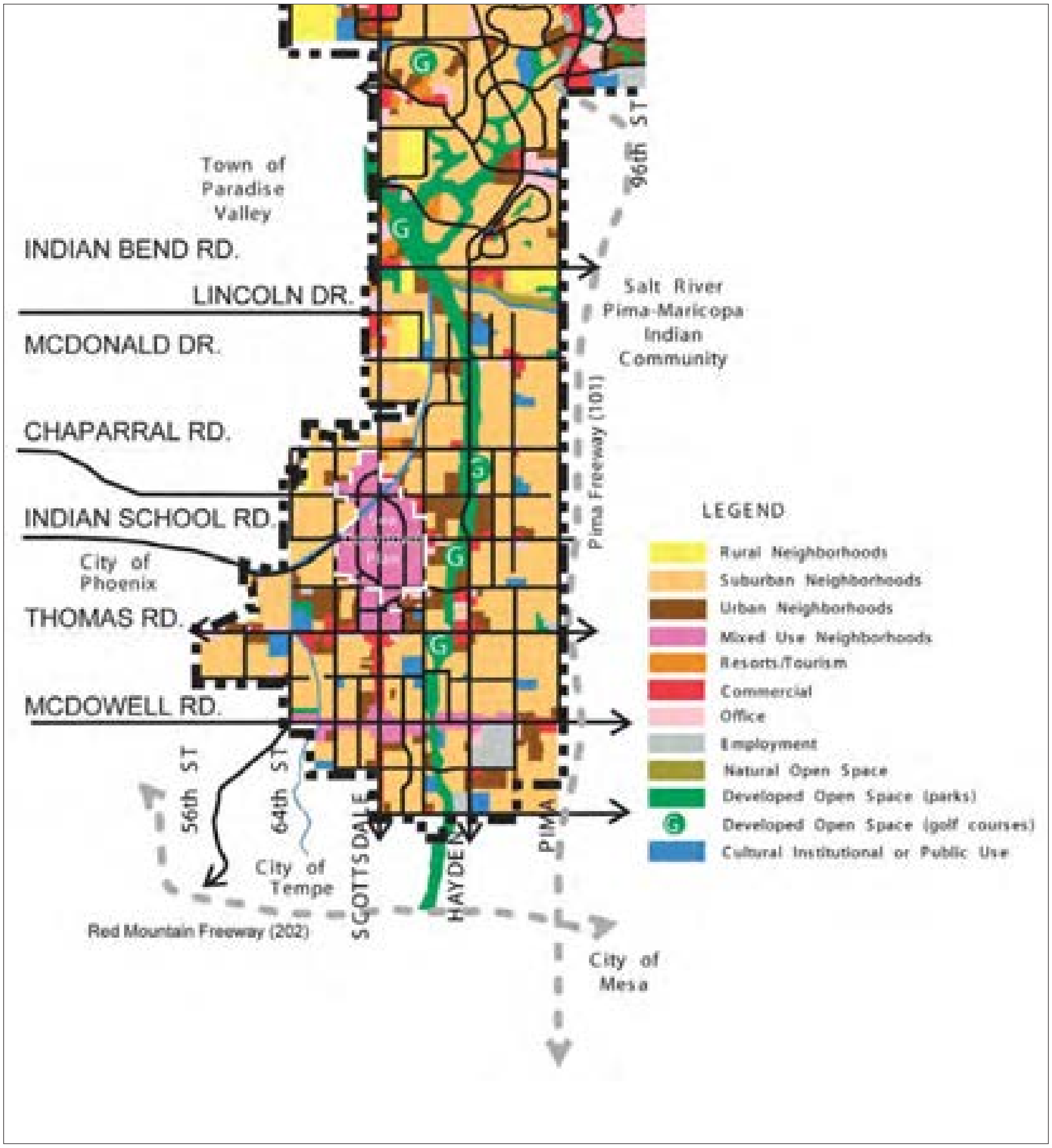


FIGURE 5-6: Scottsdale General Plan Land Use Map
Source: City of Scottsdale, General Plan, Conceptual Land Use Map, 2005.

- Retail – The Downtown districts are known for their unique retail opportunities. Scottsdale Fashion Square in the northwest quadrant of Downtown has approximately 1.8 million square feet of gross floor space including Nordstrom's, Macy's, and an upcoming Barneys of New York. The Fifth Avenue Shops, Old Town, and the Arts District provide upscale retail and art gallery shopping opportunities. The Scottsdale Waterfront (Figure 5-8) is currently under construction and includes 1.1 million square feet of mixed-use retail, office, and residential. These combined areas are regional trip generators for tourists and residents.

1 **Scottsdale Waterfront:** An 11-acre residential, retail, office and residential project approved located along the northern banks of the Arizona Canal between Scottsdale Road and Goldwater Boulevard. Phase 1 retail, office condo and two level underground parking structure currently under construction. Phase 2 includes 366 planned residential condominium units.
Total Investment: $250 million

2 **Main Street Plaza:** A mix of 250 residential condo units and retail uses south of Main Street between Marshall Way and Goldwater Boulevard.
Total Investment: $47 million

3 **Hotel Valley Ho:** A comprehensive remodel of one of Scottsdale's original resorts with 194 boutique hotel rooms, 36 new residential units, a ballroom, meeting rooms, integrated health club and spa, interior restaurant and bar, and a freestanding restaurant . Set to open Fall 2005.
Total Investment: $70 million

4 **James Hotel:** The completely remodeled 200 room hotel located on the Scottsdale Civic Center Mall reopened January 2004.
Total Investment: $7 million.

5 **Third Avenue Lofts:** An upscale loft residential community located at Third Avenue and Buckboard Trail was completed Summer 2004. 88 Units.
Total Investment: $31 million

6 **Galleria Corporate Center:** This former retail mall is now a completely remodeled Class A office complex. Completed 2001.
Total Investment: $65 million

7 **Scottsdale Oasis Retail:** A specialty retail center at the northeast corner of Scottsdale and Camelback Roads. Completed 2002.
Total Investment: $11 million

8 **Scottsdale Healthcare:** Scottsdale's hometown medical provider is adding parking structures and a major hospital expansion featuring a new critical care unit. Completed 2004.
Total Investment: nearly $90 million

9 **Hacienda Resort:** New construction of a 54 room boutique hotel located north of Camelback Road between Scottsdale and Miller Roads.
Total Investment: $6.5 million

10 **CVS Drug:** New construction of a drug store located northwest corner of Miller and Indian School Roads. Currently under construction.
Total Investment: $940,000

11 **Bischoff Residence:** A private residence addition above the existing Bischoff retail store located at Civic Center Mall and Brown Avenue. Completed 2004. Total Investment: $235,000.

12 **Clayton Companies Office/Residential Project:** New construction of a mixed-use office residential project located at the northwest corner of Main Street and McKnight. Completed 2004.
Total Investment: $380,000

13 **Clayton Companies Office/Retail Project:** New construction of a combined office and retail project located at the southwest corner of Indian School and Miller Roads. Completed 2004.
Total Investment: $600,000

14 **Clayton Companies The Park Project:** Planned renovation of an existing two-story building located on Civic Center Mall. Proposed new uses include 5,000 sq. feet of restaurant/retail, 5,000 sq. feet of second story office space and four loft residential units.
Total Investment: $1.1 million

15 **Clayton Companies 1st Street Project:** Planned new construction of a combined office and residential project located on 1st Street, east of Miller Road. Total Investment: $375,000

16 **Scottsdale Area Association of REALTORS®:** Renovation of 1968 building at 4221 North Scottsdale Road. Project included extensive exterior and interior redesign and remodeling. The office supports the largest trade association in Scottsdale, with over 6,500 members. Completed 2004.
Total Investment: $750,000

17 **Spring Creek Development Stetson + 6th Mixed-use Project:** Planned construction of a mixed-use office/restaurant/retail project located just south of the Arizona Canal along Stetson Avenue, between Scottsdale Road and Marshall Way. Projected completion date is 2006.
Total Investment: $14.5 million

18 **Portales Residential:** Proposed new construction of 126 residential units located at the southwest corner of Chaparral and Scottsdale Roads.
Total Investment: $64.5 million

19 **Main Street Residences/Main Street Mews:** New construction of 100 condominium units, 62 townhomes and 3,000 sq. feet of retail/restaurant uses between 68th and 69th Streets just south of Main Street. Estimated project completion date is 2006.
Total investment: $60 million.

20 **Optima Camelview Village:** Planned new construction of 750 residential units and 38,000 sq. feet of retail uses bounded by East Highland Avenue to the south, Scottsdale Road to the east, and Goldwater Boulevard to the north.
Total Investment: $250 million

21 **Loloma 5:** New construction of five live-work units designed by renowned architect Will Bruder, located at the southeast corner of 2nd Street and Marshall Way. Completed 2004.
Total Investment: $997,000

22 **X Lofts:** Planned new construction of 88 residential lofts located at the northwest corner of Osborn Road and Bishop Lane.
Total Investment: $12 million.

23 **E4:** New construction of a multi-themed dining and nightlife establishment located at 4282 N. Drinkwater Boulevard.
Total Investment: $3 million.

24 **W Hotel:** Planned 225 room boutique hotel and 25 residential condominium units located at the southwest corner of Camelback Road and Buckboard Trail. Grand opening anticipated for January 2008.
Total Investment: $80 million.

A **Arizona Canal at Scottsdale & South Canal Plaza Project:** Construction in progress on the plaza, landscaping, pedestrian paths, bridges and other public amenities. Estimated completion date is scheduled for Spring 2005.
Total Investment: $11 million

B **Main Street Southwest Museum:** Proposed art museum.
Total Investment: $7.5 million

C **Main Street Plaza:** Public plaza space integrated into the privately funded residential and retail complex.
Total Investment: $700,000.

D **Artist Bus Shelters:** Artist Kevin Berry has been selected to design a number of artist bus shelters throughout the downtown area.
Total Investment: $210,000

E **Parking Projects:** The construction of four new public parking structures will add hundreds of new parking spaces to the downtown. Completion of the structures is set for 2005.

- 1 **5th Avenue Parking Structure:** $5.3 million
- 2 **Old Town Parking Structure:** $4.6 million
- 3 **Main Street Plaza Structure:** $2.4 million
- 4 **South Canal Bank Parking Structure:** $5.0 million

Total Private Investment: Approximately $1 billion
Total Public Investment: Approximately $39 million
Total Public & Private Investment: Approximately $1.1 billion

FIGURE 5-7: Downtown Scottsdale Redevelopment
Source: City of Scottsdale, 2006.

FIGURE 5-8: Scottsdale Waterfront
Source: City of Scottsdale, 2006.

- Civic – The Scottsdale Civic Center Mall lies in the southeast quadrant of Downtown and includes the Scottsdale City Hall and City offices, the Civic Center Public Library, cultural and museum space, open space, and event gathering space. The Civic Center Mall area is bordered by restaurants, bars, and a hotel.

SkySong

SkySong (formerly called the ASU-Scottsdale Center for New Technology and Innovation), is a 42 acre site located two miles south of Downtown at the southeast corner of McDowell Road and Scottsdale Road (Figure 5-9). The initial phase of the center will be completed in summer 2008 and will include up to 300,000 square feet of research and office space with street level retail, service facilities, and a 325-unit apartment complex. It is anticipated that the full build-out of this site will include over 1 million square feet of research and office space, employment for 4,000 people, and a total of $300 million in capital investment. Entertainment and retail at SkySong are envisioned to keep the center active after 5 p.m. by providing unique live/work/play opportunities. SkySong has the potential to serve as a southern anchor to Downtown and support development in the approximately two-mile area between the southern boundary of Downtown (Osborn Road) and SkySong (McDowell Road). The circulation impact of SkySong is being evaluated as part of the traffic modeling process used for the *Transportation Master Plan*. A transit center is planned and funded, with a combination of Federal grants and local dollars, adjacent to SkySong.

Arizona State University (ASU) Tempe Campus and Downtown Tempe

While outside the City of Scottsdale and the primary study area, the ASU Tempe campus and downtown Tempe are important future connections for the HCT alternatives in the Scottsdale Road corridor. Both are located approximately two miles south of the study area, with the ASU Tempe campus adjacent to Scottsdale/Rural Road and downtown Tempe located approximately a half mile west. The ASU Tempe campus includes a planning area of approximately 700 acres (Figure 5-10). ASU is an internationally recognized metropolitan Research I University and the Tempe campus offers a wide range of degrees and programs. Currently, there are approximately 51,000 students and 15,000 faculty/staff on the ASU Tempe campus. Several thousand of these students and faculty/staff live in Scottsdale. downtown Tempe includes 1.2 million square feet of office space with 7,500 employees and offers an entertainment district that includes restaurants, bars, shopping, and major hotels. Like Downtown Scottsdale, it is experiencing an influx of residential and mixed-use projects.

Historic Properties and Neighborhoods

Downtown includes seven significant historic structures that represent the early development of the community from 1892 to 1933. Figure 5-11 shows the location of Scottsdale's historic properties. Six of these are located in the Old Town area on or near Main Street and Brown Avenue. These Downtown Historic Register structures include a bank, post office, pool hall, two schools, one church, and a blacksmith shop. Also on the Register is a territorial residence built in 1892 on Hayden Road south of the Downtown. Six properties placed on the Scottsdale Historic Register because of their importance to Scottsdale's development as an arts and tourism destination during the 1950s include two restaurants, one complex of art/retail buildings on Fifth Avenue, one retail store, one resort hotel on the western edge of the Downtown, and one motor court apartment of adobe construction. There are two residential neighborhoods within the study area that have received historic preservation overlay zoning and that represent postwar subdivision practices. They are Village Grove 1-6 and Town and Country Scottsdale.

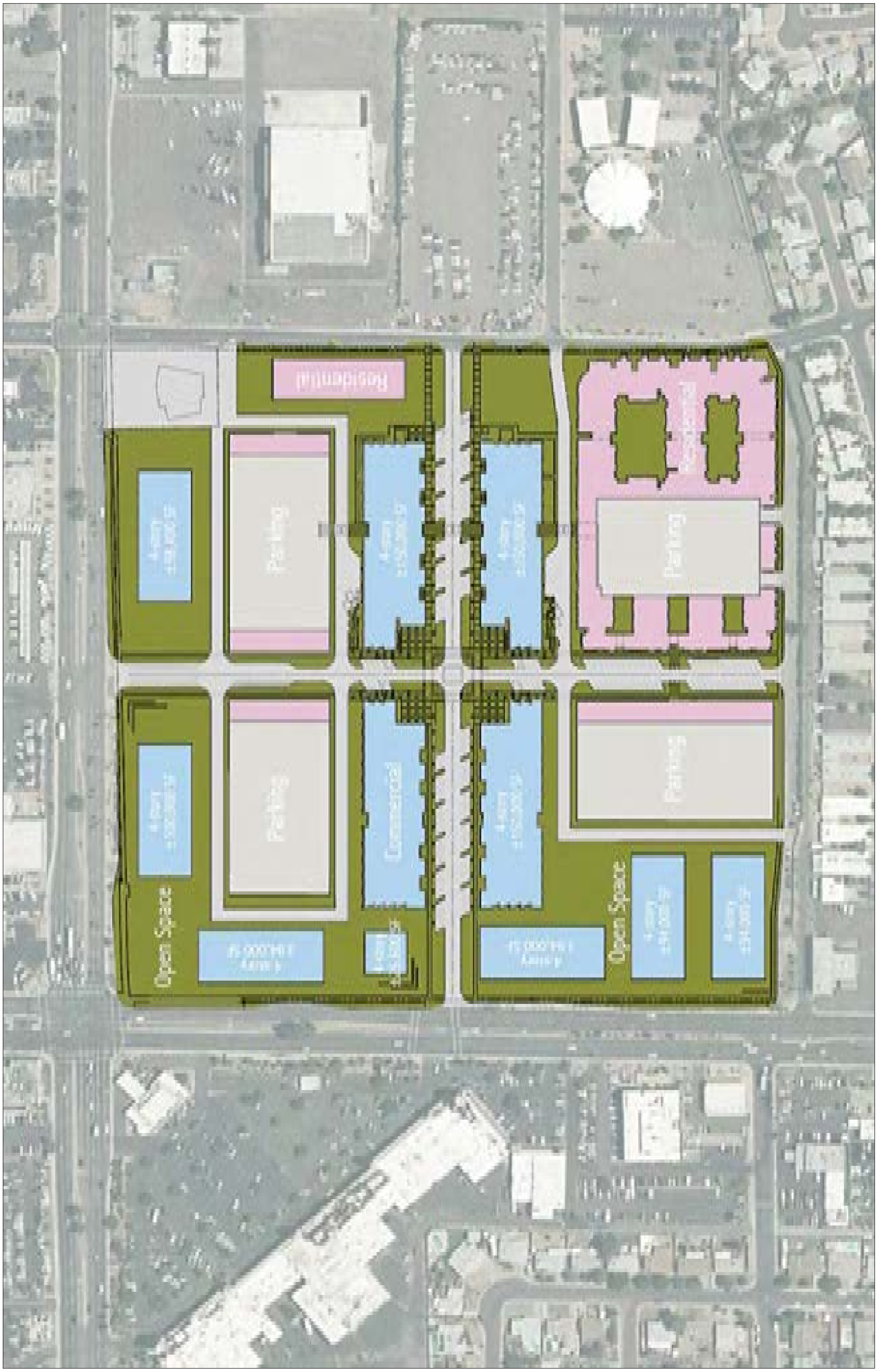


FIGURE 5-9: SkySong Master Plan
Source: SkySong, 2006

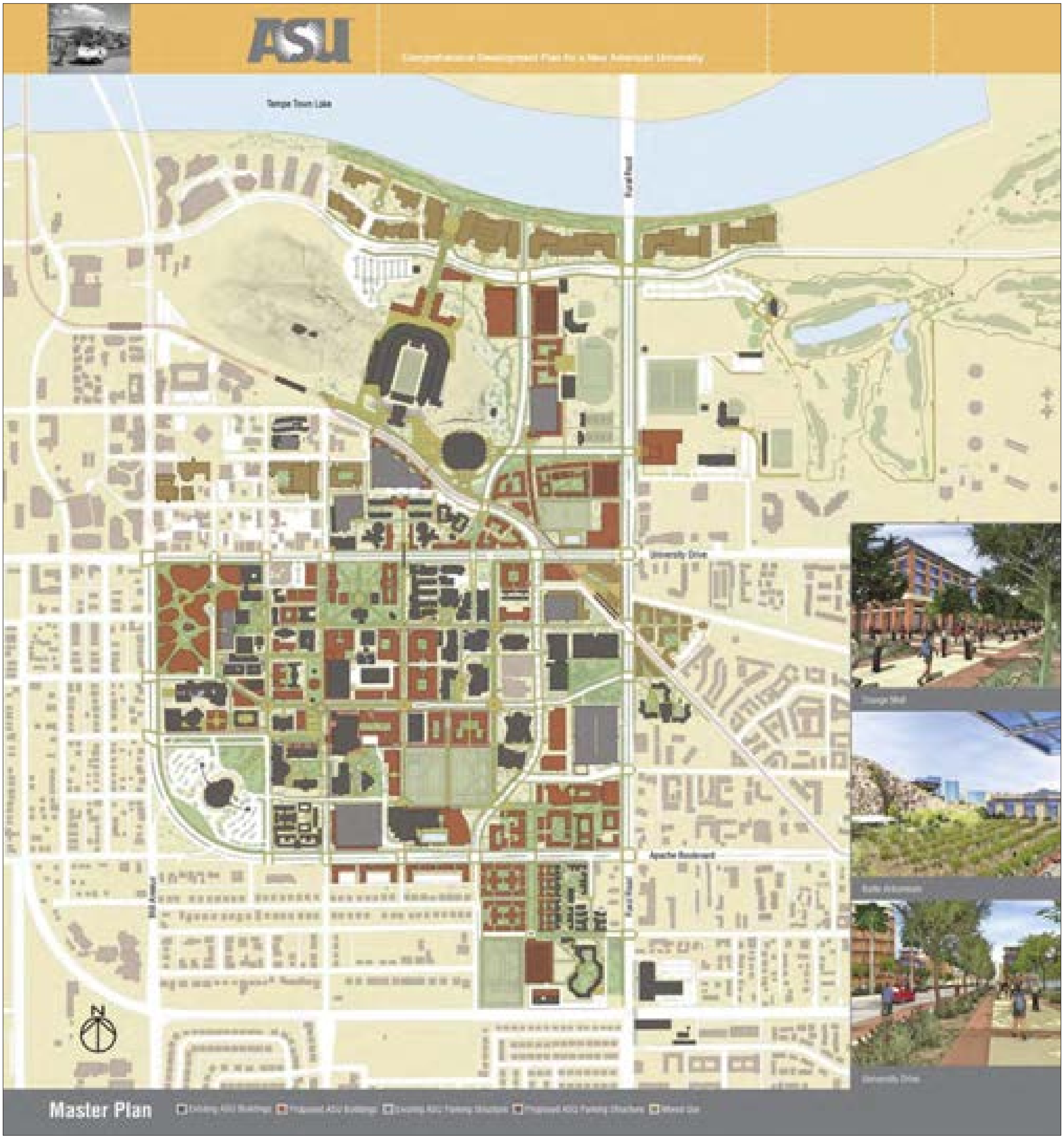


FIGURE 5-10: ASU Tempe Campus
Source: Arizona State University, 2005.

FIGURE 5-11: Scottsdale Historic Properties within the HCT Study Area

Source: City of Scottsdale, 2006.

These two neighborhood historic districts are on either side of Scottsdale Road over one mile south of the Downtown.

Population and Employment

Existing population and employment data is available by Maricopa County Traffic Analysis Zone (TAZ) from MAG. According to MAG, the 2000 population (based on the 2000 Federal Census) in the study area is approximately 65,000. The projected 2030 population in the study area is 70,000, which represents a 9 percent increase. The 2000 employment is approximately 50,000 employees while the projected 2030 employment is 55,500, representing an 11 percent increase. These population and employment growth rates are similar to trends occurring throughout the more mature areas in the region, where land is for the most part developed and the future population and employment growth will need to integrate into the existing built environment.

Physical Constraints and Features

The City of Scottsdale is a narrow city with a north/south orientation that is constrained by unique physical features and natural barriers. The study area is bounded on the west, south, and east by the jurisdictional boundaries of the city of Phoenix, the town of Paradise Valley, the city of Tempe, and the SRPMIC. In addition, the Loop 101, Indian Bend Wash, the Crosscut and Arizona canals, Papago Park, Camelback Mountain, and the Salt River/Tempe Town Lake can disrupt the existing roadway network and place additional strain on the major transportation corridors.

Transportation Facilities – Roadways and Parking

Roadway Facilities

The roadway facilities in or near the study area range from freeways to the arterial and collector street grid network, as shown in Figure 5-12. Roadway options in Scottsdale have changed over the last 10 years with the completion of the Loop 101 (Pima) freeway. The freeway is located east of Scottsdale (and the study area) on the SRPMIC south of 92nd Street and in the city of Scottsdale north of 92nd Street. Interchanges near the study area are located at one-mile intervals at McKellips Road, McDowell Road, Thomas Road, Indian School Road, and Chaparral Road. With the exception of Chaparral Road, these roads are all major or minor arterials in the study area. Chaparral Road is a major collector roadway that is primarily residential in character and narrows to two lanes for a quarter mile section between Miller Road and 78th Street. In May 2007, the City Council directed staff to remove the consideration of widening the narrowest section of Chaparral Road from *Transportation Master Plan* deliberations.

Scottsdale Road, McDowell Road, and Hayden Road are the only continuous major arterials in the study area. Pima Road currently operates as a continuous collector adjacent to the Loop 101. Granite Reef Road, Miller Road, 68th Street, and 64th Street primarily operate as collectors within the study area and are residential in character. Reflecting a mixture of commercial and residential uses, 68th Street is primarily a residential collector that is a minor arterial between Thomas Road and Indian School Road. Osborn Road and Oak Street operate as collector streets as well, however, these roadways are not continuous, with Osborn Road converting to a residential street east of Hayden Road and Oak Street diverting around El Dorado Park.

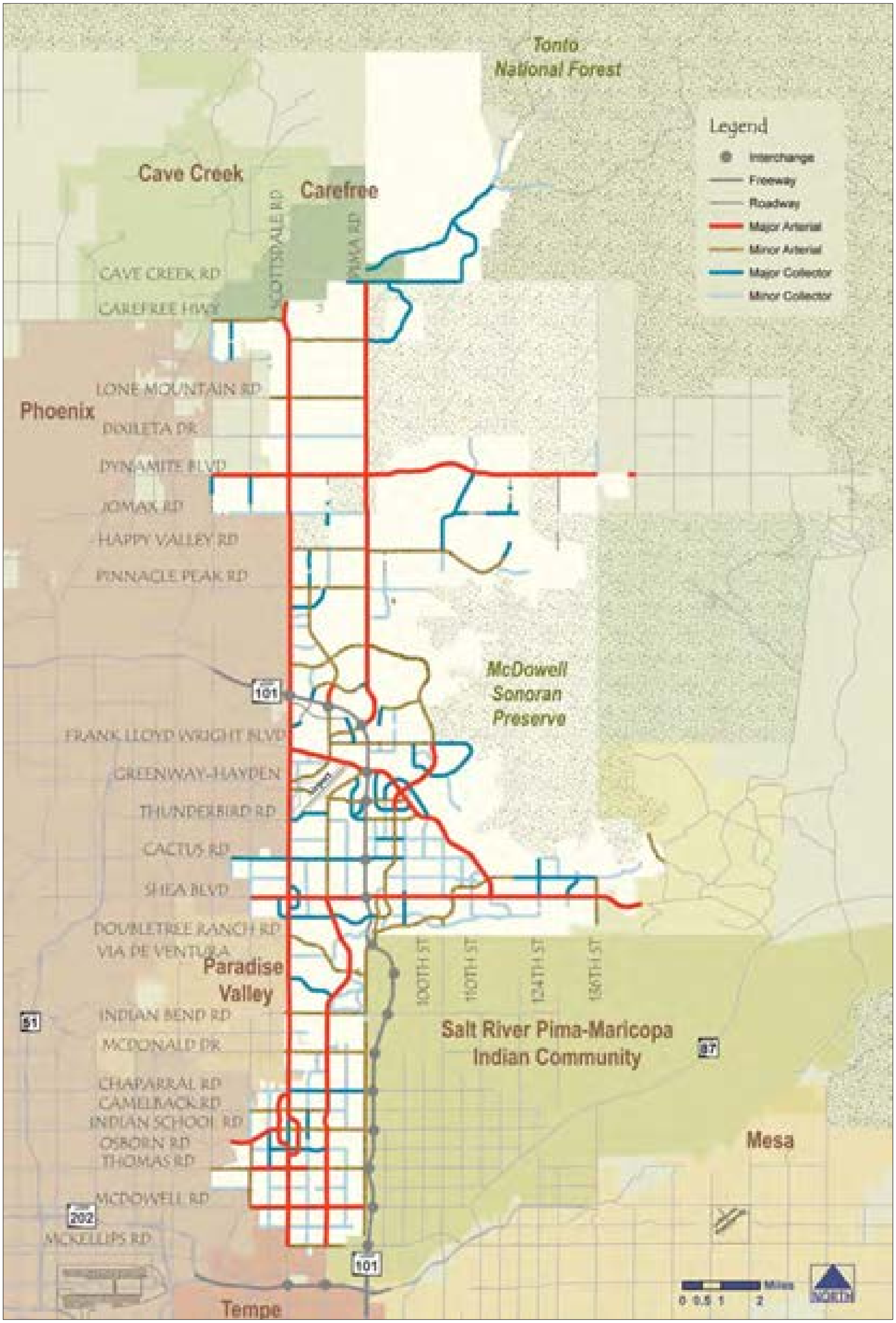


FIGURE 5-12: Preliminary Functional Street Classification Map
Source: HDR, 2006.

The roadway network also includes the Goldwater Boulevard and Drinkwater Boulevard couplet, which is designed to provide an alternative to Scottsdale Road through Downtown. Because Goldwater Boulevard is approximately a half-mile longer than Drinkwater Boulevard and crosses Camelback Road, it functions more efficiently than Drinkwater Boulevard. Scottsdale Road and Drinkwater Boulevard traffic merges one block south of Camelback Road adding to congestion at the Camelback Road intersection. The southern transition of traffic merge of Drinkwater Boulevard to Scottsdale Road is not at a signalized intersection, making the travel option south (turning left onto Scottsdale Road from Drinkwater Boulevard) more difficult. There appears to be excess capacity on both Scottsdale Road and the couplet in and through Downtown.

Several major transportation facilities improvements are planned and/or programmed in southern Scottsdale. Street projects to complete roadways with pedestrian improvements and/or traffic capacity improvements include sections of Indian School, Camelback, McDonald and Indian Bend roads. There are several streetscape projects to improve pedestrian and bicycle amenities along existing roadways, including Scottsdale, McDowell, and Thomas roads. In addition, shared-use bike path projects are programmed along the Crosscut Canal and Indian Bend Wash paths. Pima Road has been identified in the RTP to be widened to function as a minor arterial and a study is underway to complete roadway design south of 92nd Street. The Loop 101 Freeway has been identified for planned improvements in the RTP that include one general purpose and one HOV lane in each direction throughout Scottsdale.

Parking

Following are descriptions for existing parking conditions for Downtown and SkySong. The ASU Tempe campus is also discussed given its relevance to the HCT Feasibility Study.

Downtown Scottsdale

The City has commissioned various consulting groups and citizen committees over the years to analyze parking in the Downtown. The most recent study was conducted in 2003 by Walker Parking Consultants. In response to the various study recommendations, parking facilities have been built over time. Today, Downtown parking is comprised of approximately 8,000 public spaces and 30 public parking facilities. Seven of the facilities are public garages, four of which were built within the last three years. Approximately 60 percent of the public spaces Downtown are signed with three-hour time limits and are enforced with two parking enforcement personnel sharing one full time equivalent position. Public parking Downtown is free during the day. The City currently provides valet service only at one parking garage in the Northeast Quadrant (north of Indian School Road, east of Scottsdale Road). The City allows valet services to operate and a City license is required for each location served. In exchange for using 40 public curbside spaces, valet companies add approximately 600 spaces to the parking supply by leasing private spaces that would otherwise be closed to use at night.

SkySong

There will be approximately 4,000 parking spaces to serve 1.2 million square feet of development at SkySong. Parking guidelines for the site include a desire to integrate with the community and to preserve the pedestrian nature of the site. The parking will be made available through on-street parking (particularly for retail establishments), surface parking lots, and parking structures. The design guidelines call for parking management incentives and shared parking through mixing of uses with different time of day needs. In addition, active promotion of alternative modes of transportation (transit, bicycles, and pedestrians) is encouraged to minimize the reliance on automobiles. To accommodate future transit use and shuttles to SkySong, the City is developing a transit center in the vicinity.

ASU Tempe Campus
The ASU Tempe campus has up to 60,000 people accessing the campus each day and currently has 20,000 parking spaces. With a range of alternative transportation mode options, primarily the use of bicycles, the current parking has been sufficient. However, the planned ASU Rio Salado development of several existing large surface lots will result in the loss of approximately 25 percent of available parking. This significant parking reduction is expected to encourage transit and pedestrian access to the campus. Because the ASU campus master plan calls for no net increase in parking, ASU has recognized that a mix of innovative strategies will be required to meet mobility demand. An ASU Parking and Transit Task Force has been formed and is in the process of completing recommendations that include continuation of the one-year pilot unlimited access student transit pass program, parking rate modifications, the maximum use of existing bus and future LRT service, and the building of remote parking lots with shuttle service or biking opportunities.

Transportation Facilities and Service - Transit

Existing transit service in the City of Scottsdale is characterized by fixed route bus service operating on the arterial and collector grid system, along with express bus service, neighborhood circulators, and paratransit. Almost all of the fixed bus routes in Scottsdale connect to other jurisdictions and the service is contracted to an outside provider. The majority of transit service is focused south of Frank Lloyd Wright Boulevard, where the highest population and land use densities are located.

The City of Scottsdale has made recent improvements to its fixed route bus service. Service and frequency improvements have been implemented on a number of its routes, including Route 72 on Scottsdale Road. In addition, the City implemented its second circulator route, known as the Neighborhood Connector, in 2006. The following section documents existing transit conditions in Scottsdale.

Fixed Route and Express Bus Service

Existing fixed route bus service in the City of Scottsdale includes twelve fixed bus routes, three express bus routes, and two neighborhood circulators. In general, fixed bus routes operate from 5 a.m. to midnight (earlier on some routes) on weekdays and 7 a.m. to 10:00 p.m. (earlier on some routes) on weekends. Further detail is provided in Table 5-11 and Figure 5-13.

TABLE 5-11: Existing Transit Service (as of July 2007)

		Headway		
Route	Name	Weekday (Peak/Off-Peak)	Saturday	Sunday
Fixed Route Bus				
17	McDowell	30/30	30	30
Green	Thomas	20/40	30	30
41	Indian School	15*/30	30	30
50	Camelback	15/60	30/60	60
66	68th Street	30/30	30	30
72	Scottsdale	15/30	30	30
76	Miller	30/30	30	60
81	Hayden	15/30	60	60
84	Granite Reef	60/60	60	60
106	Shea	30/60	30	60
114	Via Linda	60/60	60	60
154	Greenway	30/30	30	60
170	Bell	30/30	30	30
Express Bus				
510	Scottsdale	2 trips (peak direction)	n/a	n/a
512	Scottsdale	2 trips (peak direction)	n/a	n/a
532	Mesa	4 trips (peak direction)	n/a	n/a
572	Surprise/Scottsdale	4 trips (peak dir./2 trips (non-peak dir.)	n/a	n/a
Neighborhood Circulator				
Trolley	Downtown	10	10	10
Trolley	Neighborhood	20	20	20

Source: Valley Metro/RPTA, City of Scottsdale 2007
*only west of Loloma Station

Multiple service providers that operate under the name "Valley Metro" operate fixed route transit service in Scottsdale. The Phoenix metropolitan area differs from most other metropolitan areas in that transit service is funded by a combination of city and regional funds and varies significantly throughout the region. Generally, transit service is funded by the communities where the route runs. Table 5-12 describes the funding, contractor, and operator by route in Scottsdale.

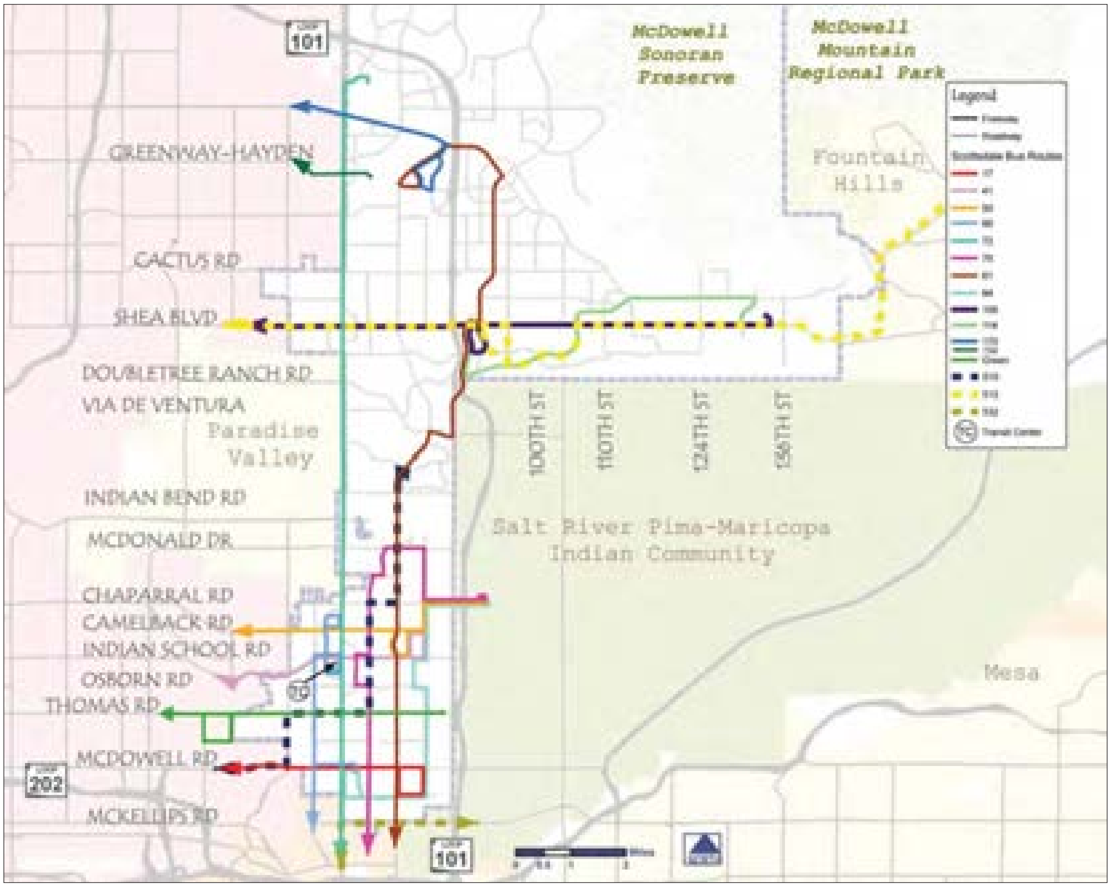


FIGURE 5-13: Existing Transit Routes

Source: Valley Metro/RPTA, 2006.

TABLE 5-12: Funding, Contractor, and Operator by Route

Route	Name	Funded By	Contracted By	Operated By
Fixed Route Bus				
17	McDowell	Phoenix/Scottsdale	Phoenix	Veolia/Phoenix
Green	Thomas	Phoenix/Scottsdale	Phoenix	Veolia/Phoenix
41	Indian School	Phoenix/Scottsdale	Phoenix	Veolia/Phoenix
50	Camelback	Phoenix/Scottsdale/RPTA	Phoenix	Veolia/Phoenix
66	68th Street	Scottsdale/Tempe	Tempe	Veolia/Tempe
72	Scottsdale	Chandler/Scottsdale/Tempe/RPTA	RPTA	Veolia/RPTA
76	Miller	Scottsdale/Tempe	Tempe	Veolia/Tempe
81	Hayden	Chandler/Scottsdale/Tempe/RPTA	RPTA	Veolia/RPTA
84	Granite Reef	Scottsdale	RPTA	Veolia/Tempe
106	Shea	Phoenix/Scottsdale/Glendale/ RPTA	Phoenix	Laidlaw
114	Via Linda	Scottsdale	RPTA	Veolia/Tempe
170	Bell	Phoenix/Glendale/Scottsdale	Phoenix	Laidlaw

TABLE 5-12: Funding, Contractor, and Operator by Route				
Route	Name	Funded By	Contracted By	Operated By
Express Bus				
510	Scottsdale	Scottsdale/Phoenix/RPTA	Phoenix	Veolia/RPTA
512	Scottsdale	Scottsdale/Fountain Hills/RPTA	Phoenix	Veolia/RPTA
532	Mesa	Mesa/Phoenix/RPTA	Phoenix	Veolia/RPTA
Neighborhood Circulator				
DT	Downtown Trolley	Scottsdale	Scottsdale	Atypical Transportation
NC	Neighborhood Connector	Scottsdale	Scottsdale	Atypical Transportation

Source: Valley Metro/RPTA and City of Scottsdale, 2006.

Ridership Characteristics

Ridership data for existing routes within the City of Scottsdale is available from Valley Metro/RPTA, which produces an Annual Ridership Report, and from the City. The FY 2006–2007 Annual Ridership Report is being used along with the October 2006 Monthly Ridership Report. According to Valley Metro/RPTA, October is the month that best represents average system-wide ridership conditions.

Ridership data is identified by jurisdiction in the Annual Ridership Report. According to this report, total boardings in Scottsdale for FY 2006–2007 were 1,994,651. This marks about a 5.5 percent increase over the previous fiscal year (FY 2005–2006). Total revenue miles for FY 006–2007 were 2,050,357. Table 5-13 shows annual ridership totals in Scottsdale for the last six years.

TABLE 5-13: Total Annual Boardings (not including the Connector service)		
Fiscal Year	Boardings	Percent Change (%)
2006–2007	1,994,651	+5.5
2005–2006	1,890,631	+5
2004–2005	1,797,264	+3
2003–2004	1,748,215	-4
2002–2003	1,832,419	+8
2001–2002	1,680,456	

Note: FY 2003–2004 decrease in annual boardings was the result of a reduction in transit service.
Source: Valley Metro/RPTA, 2006.

The FY 2006–2007 Annual Ridership Report describes the total annual boardings by individual routes in Scottsdale (Table 5-14). According to this report, the routes with the highest annual ridership in Scottsdale are routes 72 (Scottsdale Road), 81 (Hayden Road), 41 (Indian School Road), and the Green Line (Thomas Road).

TABLE 5-14: Total Annual Boardings by Route (not including the Connector service)		
Route	**Description**	**Annual Boardings**
Fixed Route Bus		
17	McDowell	168,323
Green	Thomas	204,463
41	Indian School	202,731
50	Camelback	113,363
66	68th Street	82,146
72	Scottsdale	603,368
76	Miller	103,836
81	Hayden	284,643
84	Granite Reef	26,279
106	Shea	72,097
114	Via Linda	28,962
170	Bell	87,284
Express Bus		
510	Scottsdale	10,197
512	Scottsdale	4,959
	Total	1,994,651

Note: Valley Metro/RPTA does not include Route 532 as a Scottsdale route.
Source: Valley Metro/RPTA, 2006.

Ridership data for the City of Scottsdale connector/trolley services are not collected or reported in the Valley Metro/RPTA Annual Ridership Report or Monthly Ridership Report. These services include the Downtown Trolley, Neighborhood Connector, Resort Trolley, and Giants shuttle. According to the City of Scottsdale, there were over 255,000 annual connector and trolley boardings for FY 2006–2007. With the new Neighborhood Connector service, this represents a 100 percent increase over the previous fiscal year. The majority of the boardings (161,116) still occur on the Downtown Trolley which showed a 60 percent increase over the previous fiscal year. Table 5-15 shows boardings for each of the circulator/trolley services in Scottsdale.

TABLE 5-15: Total Annual Boardings by Connector/Trolley Service	
Circulator Service	**Annual Boardings (FY 2006–2007)**
Downtown Trolley	164,084
Neighborhood Connector	95,505
Giants Spring Training Shuttle	Approximately 6,300
Resort Shuttle	5,153
Total	271,042

The Annual Ridership Report does not identify weekday performance characteristics by routes. However, this information is available in the Valley Metro/RPTA Monthly Ridership Report. For this effort, the October 2006 Monthly Ridership Report will be used since October is considered the best month for reporting system-wide transit conditions. Table 5-16 describes the average weekday boardings, revenue miles, and boardings per mile by route in Scottsdale for October 2006

TABLE 5-16: Average Weekday Boardings by Route

Route	Description	Weekday Boardings	Revenue Miles	Boardings Per Mile
Fixed Route Bus				
17	McDowell	565	214.7	2.6
Green	Thomas	697	213.5	3.3
41	Indian School	627	361.4	1.7
50	Camelback	405	208.3	1.9
66	68th Street	238	354.4	0.7
72	Scottsdale	2,028	1,756.5	1.2
76	Miller	373	670.3	0.6
81	Hayden	999	1,642.6	0.6
84	Granite Reef	84	200.9	0.4
106	Shea	230	265.2	0.9
114	Via Linda	79	243.4	0.3
170	Bell	284	226.4	1.3
Express Bus				
510	Scottsdale	40	31.0	1.3
512	Scottsdale	22	46.8	0.5

Note: Valley Metro/RPTA does not include Route 532 as a Scottsdale route.
Source: Valley Metro/RPTA, 2006.

Paratransit

Paratransit is demand responsive transit service that does not follow a fixed route. There are two types of paratransit service in the City of Scottsdale. The East Valley Dial-a-Ride provides service for those unable to access regular transit service (passengers with disabilities and seniors). ADA requires that complementary paratransit service be provided in all areas within 3/4 mile of fixed route transit service. East Valley Dial-a-Ride provides ADA and non-ADA service in Scottsdale every day (including holidays) from 4 a.m. to 1 a.m.

In November 2000, the City of Scottsdale implemented Cab Connection, a voucher program enabling seniors and people with disabilities the opportunity to control and manage their own special service transportation. All participants must be Scottsdale residents and have a disability or be age 65 or older. This program is offered in addition to traditional Dial-a-Ride service in the southern portion of the City and as a basic LOS in the northern portion (Dial-a-Ride does not operate north of the CAP Canal). In this program, after completing an application process, participants are provided up to 20 vouchers per month (16 with specific destinations and four left unspecified for participants to use for last minute or unplanned trips). Once in the program, participants call participating taxicab companies and arrange trips on their own. The City pays

80 percent of the cost of the cab up to a maximum of $10.00; participants pay the remainder. At present there are over 3,500 enrollees.

With the increase in connector/trolley service over the last fiscal year, average Dial-a-Ride and Cab Connection ridership has decreased by 27 percent between FY 2001 and FY 2007.

Transit Facilities

Existing transit facilities range from on-street passenger facilities such as bus stops to large facilities such as park-and-rides and transit centers. The City of Scottsdale has developed a new standard for bus stop shelters and passenger amenities and has installed new shelters at various locations throughout the City during the past few years. Existing park-and-rides within the City of Scottsdale are joint-use facilities in which informal agreements have been established for shared parking arrangements. Loloma Station in Downtown is the City's transit center. Further detail on these facilities is provided in Table 5-17.

TABLE 5-17: Existing and Planned Transit Facilities

Transit Facility	Location	Bus Routes Served
Park-and-Rides		
Chaparral Park	Hayden and Jackrabbit, NE Corner	81, 50
Costco	Butherus and 83rd Place, NE Corner	81, 170
Dial Tech Center	Scottsdale and Butherus, NE Corner	72
Miller Plaza	Montecito and Miller, NW Corner	50, 76, 510
Trinity Church	Hayden and McCormick Parkway, SE Corner	81, 510
Mustang Library/SHC	90th Street and Shea area	TBD
Loop 101/Scottsdale Rd	TBD	TBD
Airpark	TBD	TBD
Transit Center		
Loloma Station	Marshall and 2nd Street, NW Corner	41, 66, 72, 76, Downtown Trolley, Neighborhood Connector
SkySong	Scottsdale and McDowell area	TBD
Mustang Library/SHC	90th St and Shea Blvd area	TBD

Note: Planned facilities are in blue

Source: Valley Metro/RPTA, 2006. City of Scottsdale, 2007

8.2 Need for the Proposed Action

The purpose and need for the HCT Feasibility Study is based on the following themes:

- Connect major activity centers
- Create a transit priority corridor
- Address changes in travel patterns
- Recognize geographic constraints
- Provide alternatives to single occupant vehicles
- Support revitalization
- Create a sustainable transportation investment

Connect Major Activity Centers

The proposed HCT investment will link together existing and future major activity centers along the Scottsdale Road corridor. Many of these major activity centers, including Downtown Scottsdale, SkySong, downtown Tempe, and the ASU Tempe campus, are linked with trips between them during all parts of the day. Long-term plans will include linking Downtown to points north, including the resort corridor, Shea Boulevard/Scottsdale Road, and Scottsdale Airpark.

Downtown Scottsdale

Downtown Scottsdale ranks among the top major activity centers in the region. The Downtown area includes a diverse range of employment, residential, commercial, retail, educational, civic, and cultural facilities. The proposed HCT alternatives serve a variety of major activity centers, including Scottsdale Healthcare Osborn, Old Town, Fifth Avenue Shops, Scottsdale Arts District, Scottsdale Fashion Square, Scottsdale Waterfront, Scottsdale Civic Center, Scottsdale Center for the Performing Arts, Scottsdale Museum of Contemporary Art, Scottsdale Stadium, and Loloma Transit Station. In addition, there is nearly three billion dollars in new public and private investment planned or under construction. Much of this development is residential development in the form of condos or townhomes.

SkySong

SkySong is an important revitalization effort in the Scottsdale Road and McDowell Road area. This development will require a high level of transit service to provide a connection north to Downtown and south to the ASU Tempe campus. SkySong will be a mixed-use research center with 300,000 square feet of office space in Phase I and over 300 apartments. It is anticipated that there will be 4,000 employees that will work at this location. Transit is anticipated to be a key component of circulation to and from SkySong and the project master plan includes a transit center and alternative transportation strategies.

ASU Tempe Campus and Downtown Tempe

The HCT investment is proposed to provide a connection between Downtown Scottsdale and downtown Tempe and ASU. HCT will support connections to the ASU Tempe campus, which currently includes 51,000 students and 15,000 faculty and staff. The ASU campus master plan anticipates a 6 percent increase in enrollment for the ASU Tempe campus, with approximately 35 percent of the students living on campus. Several thousand ASU students, faculty, and staff live in Scottsdale and commute to the ASU Tempe campus. The ASU campus master plan calls for no net increase in parking and, therefore, an innovative mix of transit and other alternative transportation strategies to accommodate university growth will be needed. Conversely, there are many students, faculty, and staff that live in Tempe but travel to Scottsdale for entertainment, shopping, and employment. Like Downtown Scottsdale, downtown Tempe is experiencing an influx of residential and mixed-use projects.

Create a Transit Priority Corridor

The HCT investment will serve as the transit priority corridor for Scottsdale. This corridor is one of the most important corridors for transit in the region, as it has the highest ridership in Scottsdale, it is the longest continuous transit corridor in Scottsdale, and it connects with most major east/west bus routes in the regional transit system. The HCT transit priority corridor offers the benefit of providing direct access to origin/destinations within the Scottsdale Road corridor, but also serving as a central spine through which east/west transit services connect.

The proposed HCT alternatives, as planned, would intersect with the METRO regional LRT line and five of the top ten bus ridership routes in the region:

- Green Line (Thomas Road);
- Red Line (to be replaced by METRO Central Phoenix/East Valley LRT line);
- Route 41 (Indian School);
- Route 17 (McDowell); and
- Route 50 (Camelback).

The implementation of the METRO regional LRT line, which is scheduled for completion in 2008, will change the way transit trips are distributed throughout the region. Increased emphasis will be placed on making connections to the system, including the proposed HCT investment along the Scottsdale Road corridor.

The HCT investment will improve transit service in the corridor by providing increased service hours (18 to 20 hours per day) with a higher frequency (at least 10 minute frequency during the peak). These service characteristics will allow riders to access the system most of the day at their convenience without detailed schedule planning. The improved service will link key activity centers, businesses, and neighborhoods and provide an alternative for commute and discretionary trips. The vehicles used by the HCT investment will be low-floor and have a larger passenger capacity than existing bus service in the study area. This allows for increased comfort by passengers as well as the ability to accommodate higher load factors from increased patronage and special events. Transit stations will be uniform in design with regional stations and as user-friendly as possible.

Address Changes in Travel Patterns

The HCT investment will address changes in travel patterns along the Scottsdale Road corridor. Foremost among these changes is reinvestment including mixed-use development in Downtown and at SkySong that will create the need to move more people between major activity centers seven days a week, outside of peak commute hours. Current transit service along Scottsdale Road has frequent stops and does not yet operate at a high enough capacity/frequency, and extended hours are necessary to fully develop the market to employees, residents, students, and visitors. These groups are all underserved markets that will see expanded use as transit service improves in the corridor. The HCT investment can provide improved transit service to existing riders and would attract new riders seeking the convenience, comfort, and reliability of a new type of transit service.

Recognize Geographic Constraints

Scottsdale is a narrow city with a north/south orientation that is constrained by its surrounding geographic features. Papago Park, Camelback Mountain, and the Crosscut and Arizona canals limit transportation corridors to the west and the SRPMIC limits corridors to the east. In addition, the Indian Bend Wash is a north/south linear park and flood control facility that runs through the heart of the City. Most north/south roadways do not run contiguously through the City because of geographic constraints. With few choices for north/south transportation options, Scottsdale needs to maximize multi-modal capacity through one of its existing corridors.

Geographic constraints reinforce Scottsdale Road as the preferred HCT corridor because it is the only uninterrupted major north/south arterial roadway in Scottsdale.

Provide an Alternative to Single Occupant Vehicles

Population and employment growth has increased travel demand in Scottsdale at many locations on the arterial roadway network. Although the City has widened arterials and intersections over the years, most streets are now built-out to their maximum cross section. The typical cross section for a major arterial roadway in Scottsdale includes six travel lanes—three travel lanes in each direction. The daily VMT has been forecasted to continue to increase on Scottsdale Road, Hayden Road, and Pima Road over the next 25 years.

Historically, traffic demand in Scottsdale was primarily found on north/south arterials. However, with the completion of the Loop 101 Freeway there has been a shift to increased traffic demand on the east/west streets that feed the Loop 101. The Loop 101 Freeway is often at capacity in the peak hours in this section of the freeway. With the addition of an HOV lane and another general purpose lane, volumes will remain the same in this section or increase slightly. However, the congestion will extend farther north. As the Loop 101 continues to become more congested, more traffic is diverted to arterial, collector, and local streets in Scottsdale. Over time, the roadway system will balance itself again with as much traffic on the north/south roadways as is on the east/west roadways.

Support Revitalization

The proposed HCT investment supports revitalization in Scottsdale. Downtown and the McDowell Road corridor are areas identified as "growth areas" in the Scottsdale *General Plan* Growth Areas Element. The policies outlined in the Growth Areas Element are designed to identify areas of the community that will best accommodate future growth and allow increased focus on creating or enhancing transportation systems and infrastructure coordinated with development activity. Growth Areas are designed to accommodate a variety of land uses that will benefit from improved access to transit and multi-modal transportation. A likely outgrowth of the transit investment will be pedestrian- or transit oriented development, characterized by mixed-use and a pedestrian-friendly environment near transit stations. The concentration of residential and business activity around transit stations can translate into economic gains, depending on the mode technology, resulting from increased accessibility and the introduction of new types of development into the community.

The *General Plan* supports mixed-use, multi-modal transportation systems, and pedestrian-oriented development, in that the ideas of balanced land use and transportation choices that conserve natural resources, contribute to the character of the community, and reduce dependence on the automobile are actively fostered. The specific applicable *General Plan* Land Use and Community Mobility Element goals and approaches are listed below and provide a foundation supporting the implementation of the HCT investment.

General Plan Element Goals

Land Use Element Goal

- Develop land use patterns that are compatible with and support a variety of mobility opportunities/choices and service patterns
  - Integrate the pattern of land uses and mobility systems in ways that allow for shorter and fewer automobile trips and greater choices for mobility

- Encourage non-motorized (pedestrian and bicycle) access/circulation within and to mixed-use centers to reduce reliance on the automobile
- Provide a balance of live, work, and play land uses and development intensities that enable convenient non-automotive trips (pedestrian, cycling, and transit) where environmentally and physically feasible
- Support the physical integration of residential uses with retail uses to provide opportunities for pedestrian oriented development
- Ensure Scottsdale's transportation choices respond to the land use patterns and local neighborhood lifestyles
- Provide an interconnected open space system that is accessible to the public, including pedestrian and equestrian links, recreation areas, and drainage ways
- Ensure that basic levels of environmental health and human services are provided for all socioeconomic levels within the community
- Encourage that land uses with the highest intensity be located in areas conducive to alternative modes of transportation

Community Mobility Element Goal

- Emphasize live, work, and play land use relationship to optimize the use of citywide systems and reduce the strain on regional and local/neighborhood systems.
  - Emphasize the relationship and balance of land uses within general areas of the City to determine if an appropriate mixture exists that will reduce the demand on regional and local systems.
  - Encourage the development or redevelopment of areas that support a balance of live, work, and play land use relationships and alternative modes of transportation that reduce the reliance on the automobile.
  - Encourage, where appropriate, mixed-use developments that physically incorporate residential, shopping, and work environments within one area or project and place strong emphasis on connectivity with non-motorized access (pedestrian-oriented development).
  - Encourage access to technology by supporting the expansion of telecommunications services and choices throughout the City.

The HCT investment supports policies identified in the *General Plan*, which outline specific ways that land use patterns should integrate with mobility options.

Create a Sustainable Transportation Investment

The HCT investment will provide multi-modal transportation options that are sustainable both from an operating and environmental perspective. The HCT alternatives offer advantages over existing transit service in the region and are more sustainable in the long term than roadway capacity improvements. HCT alternatives (BRT, LRT, modern streetcar) have the ability to move more people with smaller impact on the overall transportation system. This efficiency is magnified when using HCT technologies that offer larger passenger capacities than traditional fixed route bus service. In addition, all of the HCT alternatives being evaluated are powered by "clean" technologies. LRT and modern streetcar are both electrically powered and BRT would be powered by diesel-electric hybrid engines.

8.2.1 Purpose and Need Summary

The purpose of the HCT Feasibility Study is to identify potential HCT alternatives for the Scottsdale Road corridor to serve major activity centers in the corridor. The HCT Feasibility Study study area is between the Scottsdale/Tempe border and Chaparral Road, which includes Downtown and SkySong, but also considers connectivity to downtown Tempe and ASU. The HCT Feasibility Study analyzes mobility needs and identifies and compares the costs, benefits, and impacts of three HCT technology alternatives: BRT, modern streetcar, and LRT.

While there may be some public perception that the HCT Feasibility Study section of the *Transportation Master Plan* is intended only to identify options to relieve traffic congestion, the purpose of this feasibility study is also to provide a new mobility option that provides frequent, all-day service to employment, residential, commercial, retail, entertainment, educational, civic, and cultural activities in the Scottsdale Road corridor. The Scottsdale Road fixed-route bus service (Route 72) is the City's strongest transit corridor. Using the Scottsdale Road corridor for HCT capitalizes on this route with expanded service and ridership possibilities. Overall, the purpose and need of the HCT Feasibility Study is based on the following:

- There is a significant need and benefit in connecting major activity centers in the Scottsdale Road corridor;
- The transit system has an opportunity to capture more ridership through a solution that consolidates and improves transit in a priority corridor;
- There is a change in travel patterns in the study area, as land use and transit opportunities take a localized mixed-use arrangement and preference;
- The geographic constraints of Scottsdale limit the range of applicable transportation solutions;
- Transportation demand continues to grow along with population and employment growth in the Scottsdale Road corridor and study area; and
- The proposed HCT investment supports continued revitalization along the Scottsdale Road corridor.

8.3 Evaluation Methodology

8.3.1 Evaluation Process

The HCT Feasibility Study evaluation process (Figure 5-14) includes only a Tier 1 conceptual screening at this time; the report recommends alternatives for Tier 2 detailed evaluation in a subsequent phase which should include regional stakeholders/partners. The first phase (Tier 1) includes a conceptual level evaluation that analyzes the advantages and disadvantages of the HCT alternatives. The purpose of the Tier 1 evaluation is to determine which technology alternatives and combinations would be the most feasible, and thereby narrow the range of alternatives to be considered for more detailed analysis in Tier 2. The Tier 1 evaluation criteria are qualitative in nature and seek to eliminate technology options that have fatal flaws, do not meet project goals, or do not have public support. Since Scottsdale Road is already designated as the HCT corridor, the evaluation methodology for Tier 1 does not consider corridor alternatives. Alternatives may have minor alignment deviations that can be evaluated quantitatively in Tier 2. The alternatives advancing from conceptual screening (Tier 1) will be evaluated in more detail in a subsequent Tier 2 analysis.

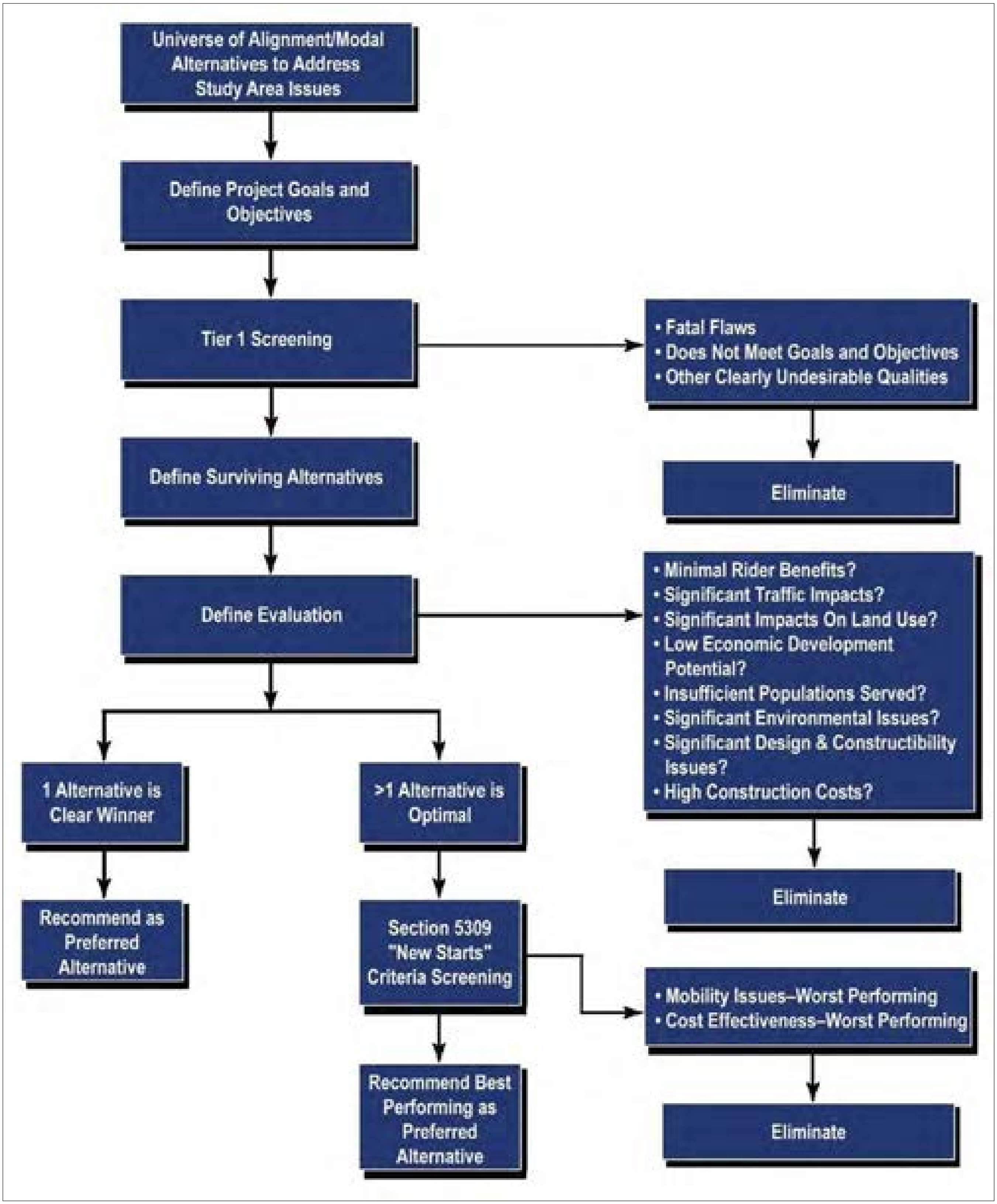


FIGURE 5-14: HCT Alternatives Evaluation Process
Source: HDR | SRBA, 2007.

It should be noted that an essential component throughout the evaluation process is the public involvement component for the HCT Feasibility Study. This aspect, integrated with the public engagement plan of the *Transportation Master Plan* is necessary to gain an understanding of the public's perception of need, value, priority, and location of the possible transit investment. The major groups to be targeted include: the general public; study area residents, businesses, and property owners; agency staff; and elected officials. The engagement plan is designed to inform and obtain representative input from all affected residents in the area, including Title VI and environmental justice populations.

8.3.2 Tier 1 Conceptual Screening Evaluation

Tier 1 of the evaluation process analyzes the initial list of HCT alternatives being considered. The criteria developed for this portion of the process are qualitative in nature, and their purpose is to eliminate alternatives that have fatal flaws, do not meet project goals, or do not have public support. The Tier 1 criteria are focused on the evaluation of technologies, in the context of the Scottsdale Road corridor.

Tier 1 Evaluation Criteria

Table 5-18 illustrates the criteria to be used in the Tier 1 analysis to evaluate potential HCT technologies, including BRT, LRT, and modern streetcar. The HCT alternatives will be rated "low", "medium", or "high" for each criterion, with "low" indicating sub-standard performance and "high" meaning optimal performance.

TABLE 5-18: Tier 1 Evaluation Criteria

Criteria	Measure
Mobility	Ability to enhance mobility between major activity centers in the study area.
Travel times competitiveness	Ability to offer transit investment that is competitive relative to existing travel times in the study area.
Ridership potential	Ability to attract new riders, based on experiences of peer Downtown/activity areas.
Capacity	People carrying capacity of each technology.
Capital costs	Comparison of the capital investment needed for each technology.
Operation and maintenance costs	Comparison of operation and maintenance costs required for ongoing operation.
Cost effectiveness	Comparison of the cost effectiveness based on operating costs per passenger.
Ease of implementation	Ease of implementation, based on operational requirements, capital costs, construction timeframe, and community support.
Consistency with local plans	Consistency with adopted local land use and transportation plans, local land use patterns, and study goals.
Compatibility with existing transit system	Ability to be integrated with the existing transit system.
Expandability	Ability to expand beyond the study area.
Community support	Community support for the technology/technologies.
Roadway Impact	Ability to co-exist with projected traffic volumes and multi-modal facilities (bike lanes, sidewalks, etc.)

8.3.3 Components of a Future Tier 2 Detailed Evaluation

Although Tier 2 evaluation will not be completed as part of this study, the HCT alternatives advancing from this Tier 1 conceptual screening should be evaluated in more detail in a Tier 2 detailed evaluation. The Tier 2 evaluation is intended to recommend a preferred HCT alternative that will be advanced into future phases of the project. The criteria for both Tier 1 and Tier 2 evaluations are established by the FTA. While this study is not part of a Federal Alternatives Analysis, in the future it will be helpful to have followed the process closely so as not to have to duplicate effort in any future Alternatives Analysis. To demonstrate what will be incorporated in a subsequent analysis phase, the Tier 2 evaluation criteria is provided in this document.

Tier 2 Evaluation Criteria

To meet federal requirements, the Tier 2 alternatives should be evaluated based on the following criteria:

- Rider benefits;
- Land use;
- Economic development;
- Traffic issues;
- Populations served;
- Environmental issues;
- Design issues;
- Costs; and
- Community support.

A ranking of "low", "medium", and "high" should be used to indicate the relative performance of the alternative to the specific criteria. The specific method to be used to determine the ranking within each category will be determined after the alternatives are developed. Table 5-19 lists the individual evaluation criteria and summarizes the method in each should be measured. The remainder of this section details the methodology for the evaluation criteria.

TABLE 5-19: Tier 2 Evaluation Criteria

Criteria	Measure
Rider Benefits	
Connectivity	Number of major activity centers served in the study area.
Travel time savings	Travel time through the study area compared to No-Build Alternative.
Ridership	Amount of new riders attracted to the system.
Compatibility with existing transit system	Ability to be integrated into the existing transit system.
Land Use	
Proximity to major activity centers	Number of major activity centers served in the study area.
Proximity to medium and high density residential areas	Acreages of medium and high density residential areas within 1/2 mile of transit stations.
Economic Development	
Economic development	Extent of opportunities for economic development based on proximity to areas targeted for new development or intensification of existing development.
Transit oriented development	Extent of opportunities for transit oriented development based on land use patterns and plans along alignment.

TABLE 5-19: Tier 2 Evaluation Criteria

Criteria	Measure
Traffic Issues	
Roadway capacity impacts	Number of intersections with diminished level of service.
Left-turn movements	Number of residential and commercial locations with diminished left-turn access.
Traffic signals	Number of new traffic signals required.
Parking spaces	Number of parking spaces eliminated.
Populations Served	
Total population	Total population located within 1/2 mile of transit stations.
Total employment	Total employment located within 1/2 mile of transit stations.
Minority population	Total minority population located within 1/2 mile of transit stations.
Low-income population	Total low-income population located within 1/2 mile of transit stations.
Zero-car households	Total zero-car households located within 1/2 mile of transit stations.
Environmental Issues	
Property acquisitions	Number of property acquisitions required.
Environmental justice	Estimated property acquisitions within areas of high concentration of minority and low-income populations.
Historic resources	Number of potential historic resources along alignment.
Parklands or other Section 4(f) resources	Number of Section 4(f) resources along alignment.
Noise and vibration-sensitive uses	Number of sensitive uses within specified noise and vibration screening distances.
Endangered and threatened species	Existence of critical habitat and endangered or threatened species along alignment.
Floodplains and riparian areas	Existence of floodplains or riparian areas along the alignment.
Contamination sites	Number of potentially contaminated sites along the alignment.
Design Issues	
Right-of-way	Amount of right-of-way needed along alignment.
Utility conflicts	Proximity to major utilities and potential for conflicts requiring utility relocation.
Operational constraints	Extent of operation constraints, such as difficult turning radii or grade changes.
Compatibility with existing transit system	Ability to be integrated into the existing transit system.
Expandability	Physical ability to extend the alternative beyond the minimum operable segment.
Costs	
Capital costs	Estimated capital costs to construct the transit investment.
Operation and maintenance costs	Estimated operation and maintenance costs required for ongoing operation.
Community Support	
Community support	Extent of community support for the transit alternative.

Rider Benefits

The rider benefits for each alternative should be evaluated based on connectivity, travel time savings, ridership, and compatibility with the existing transit system. Connectivity involves the ability to meet the primary goal of the HCT Feasibility Study, which is to connect major activity centers in the corridor and to consolidate and improve transit service into a transit priority corridor. Travel time through the study area will be evaluated to identify potential time savings compared to the No-Build Alternative. Ridership, and more specifically the ability to attract new riders to the system, will also be estimated in comparison to the No-Build Alternative. In addition, the compatibility of alternatives to the existing and future transit system will be estimated from both the customer and City standpoint.

Land Use

Land use criteria should be used to evaluate the HCT alternatives proximity to major activity centers, proximity to medium and high density residential areas, and consistency with local plans. Each alternative's proximity and ease of access to activity centers will be assessed. An activity center is defined as a concentration of employment, retail, housing, and recreation opportunities within a relatively small area. Examples in the study area include: Downtown, SkySong, Scottsdale Healthcare Osborn campus, Scottsdale Fashion Square, and Scottsdale Waterfront. The alternatives should be evaluated based on the number of activity centers that they connect.

The effectiveness of a major transit investment is enhanced when there are a large number of housing units within walking distance of the alignment. The alternatives will be ranked according to the proximity to medium and high density residential, which is typically composed of condominiums, townhouses, apartments, and houses on small lots. Those alternatives having more acres of medium and high density residential uses near transit stations will be ranked higher. Finally, the alternatives will be evaluated based on how well each addresses or conflicts with the goals of local land use and transportation plans. Examples include the City of Scottsdale *General Plan* and *Downtown Plan*.

Economic Development

Economic development criteria include the extent of opportunities for economic development as well as pedestrian/transit oriented development. The economic development potential of each alternative will be measured by the number of vacant land parcels available to develop, amount of employment (location of major employers, future job creation, job growth), and future land use shifts to business, office, commercial, and high density residential land uses.

Opportunities for pedestrian/transit oriented development, which is development characterized by a mixed-use, high density, and pedestrian-friendly environment around transit stations, will also be evaluated for each alternative. The concentration of residential and business activity around transit stations can translate into economic gains resulting from increased accessibility and the introduction of new types of development into the community.

Traffic Issues

The alternatives will be evaluated for traffic issues using the following criteria—roadway capacity impacts, left-turn movements, traffic signals, and parking spaces. Roadway capacity involves capacity at intersections, which should be analyzed by calculating the LOS at affected intersections. The number of intersections with diminished LOS as a result of the alternative should be estimated. The effect on left-turn access to residential and commercial properties should be calculated by counting the number of existing driveways that would no longer have full movement access because of potential conflicts with a fixed-guideway alternative. The number of potential new traffic signals should also be estimated. In addition, the number of parking spaces removed because of the alternative should be calculated.

Populations Served

The detailed evaluation criteria include an evaluation of populations served in the study area around transit stations. More specifically, the criteria should be used to evaluate the total population, total employment, minority population, low-income population, and zero-car households within a half mile of proposed transit stations. It should be noted that Title VI of the Civil Rights Act of 1964 and Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, require consideration of minority and low-income populations in major transportation investments. Information to evaluate overall population and employment should be obtained through MAG, while information to evaluate minority population, low-income population, and zero-car households should be obtained from the most recent Federal census.

Environmental Issues

Environmental issues for the alternatives should be evaluated based on the potential impacts on the following—property acquisitions, environmental justice, historic resources, parklands or other Section 4(f) resources, noise and vibration-sensitive uses, endangered and threatened species, floodplains, and riparian areas. In addition, the potential for the alternative to be affected by hazardous materials sites should be evaluated.

Property Acquisitions

The extent of property acquisitions needed to accommodate each alternative should be estimated based on the cross section of each alignment in relation to the existing street rights-of-way. The additional properties required to accommodate the transit investment while still maintaining acceptable traffic capacity should be estimated.

Environmental Justice

As discussed earlier, Title VI of the Civil Rights Act and Executive Order 12898 require consideration of minority and low-income populations in major transportation investments. In addition to considering potential benefits, they require evaluating if disproportionately high adverse environmental effects on these populations could potentially occur. One potential indicator is the extent of property acquisitions potentially affecting minorities and low-income populations. This should be estimated based on the extent of property acquisitions within areas with high concentrations of these populations.

Historic Resources

The National Environmental Policy Act and Section 106 of the National Historic Preservation Act of 1966, as amended, stipulate that federal agencies work to preserve not only natural resources but also important historical and cultural aspects of our national heritage. Potential historic resources should be identified for each alternative.

Section 4(f) Resources

Section 4(f) of the Department of Transportation Act of 1966, as amended, restricts the use of any publicly-owned land in a park, recreation area, wildlife or waterfowl refuge, or land from historical sites for transportation purposes unless there is no feasible and prudent alternative to the use of such land, and the project includes all possible planning to minimize harm. Parks, recreation areas, trails, and wildlife and waterfowl refuges adjacent to the alternatives should be identified.

Noise and Vibration Impacts
Sensitive land uses (e.g., residences, schools, recreation areas, active sports areas, libraries, and hospitals) that are within regulated screening distances should be identified for each alternative.

Endangered and Threatened Species
To aid in determination of impacts on threatened and endangered species, the U.S. Fish and Wildlife Service Web site should be reviewed to determine the potential for threatened or endangered species to occur within the project limits. The Arizona Game and Fish Department should be contacted to request a check of the Heritage Management Database to determine what species have been recorded within the vicinity of the project study area. In addition, critical habitat in proximity of the alternatives should be identified based on information obtained from the U.S. Fish and Wildlife Service Arizona Ecological Services.

Floodplains and Riparian Areas
Floodplains and riparian areas within or adjacent to the alternatives should be identified through Federal Emergency Management Agency data obtained from the Maricopa County Flood Control District and from the State Lands Department.

Hazardous Materials
Sites along the corridor should be identified for potential contamination concerns. In addition, current land use should be identified to determine if there is the potential for environmental issues associated with property uses such as automobile repair and dry cleaning facilities.

Design Issues
The alternatives should be evaluated for design issues based on the following criteria—available ROW, utility conflicts, operational constraints, compatibility with existing transit system, and expandability. The availability of ROW for each alternative should be estimated and compared, with those requiring less acquisition of ROW ranking higher. Maps of major utilities should also be reviewed in the vicinity of each alternative to determine if the alignment location could conflict with existing major utilities. Those alternatives having the least impact on major utilities should be preferred.

Operational constraints should be evaluated for each alternative and should include physical considerations such as turning radii, grade changes, and operation in mixed-traffic flow. The compatibility of the alternative with the existing transit system should also be evaluated, including the physical integration between modes on streets and at transit stations. In addition, the expandability of the alternative should be evaluated in terms of its ability to extend beyond the study area and serve other areas in Scottsdale and the metropolitan region.

Costs
Capital costs and operation and maintenance costs should be evaluated for each alternative. Capital costs should include construction costs and other fixed costs such as vehicle procurement. Construction costs should be estimated based on the cross section of each mode and the overall length of the alignment alternative. Construction costs should also consider the cost of associated project elements such as transit stations, maintenance and storage facilities, signalization and service equipment, and ROW costs. Operating and maintenance costs should be estimated based on costs from peer systems throughout the country. Typical operating costs include energy costs, labor costs, repair costs, and preventative maintenance costs.

Community Support

Community support for each of the alternatives from various stakeholders in the study area, including residents, employers, business owners, students, and others, should be evaluated. The alternatives with the most public consensus should be ranked the highest.

8.4 Tier 1 Evaluation

8.4.1 HCT Technologies

The Tier 1 evaluation seeks to determine the best technology or mix of technologies within the Scottsdale Road HCT corridor. Transit technology refers to the mode used for travel, such as BRT, LRT, and modern streetcar.

Orange Line in Los Angeles, California

Bus Rapid Transit

BRT is a form of advanced bus service which combines the advantages of rail transit with the flexibility of buses. It can operate in semi-exclusive ROW or in mixed traffic on city arterials. Vehicles are usually diesel/electric hybrids. BRT can use ITS technology, traffic signal priority, rapid and convenient fare collection, and integration with existing and future land use to optimize bus system performance. By requiring dedicated ROW only where congestion is encountered, BRT provides maximum flexibility in using the existing roadway network and serves a variety of travel patterns. However, the level of transportation investment for BRT varies widely across the country. The following characteristics are examples of what is the most realistic form of BRT that could be implemented in this region. These characteristics are similar to the Orange Line BRT system in Los Angeles, California.

Vehicles

BRT vehicles are rubber tired vehicles approximately 60 feet long with a vehicle capacity of approximately 80 passengers. BRT vehicles are articulated to allow for tight turns in urban intersections. The vehicles are low-floor and ADA compliant, however some form of precision docking is required to allow passengers to enter at the same height as the station platform; otherwise the vehicles need to use a standard kneeling low-floor bus and ADA ramp.

Stations

BRT stations can vary in spacing, with stations every mile but closer together at major activity centers. The station platforms typically include shelter canopies, benches, trash receptacles, bicycle storage, and real-time transit information. BRT stations offer consistent amenities along the route and can be designed so that they can be used by other bus service.

Signals

BRT systems can operate using traffic signal priority, allowing priority for green time to the BRT vehicle. Traffic signal priority would be used at specific intersections along the alignment to increase the speed and reliability of the BRT vehicle.

Maintenance and Storage

A maintenance and storage facility is required to accommodate BRT fleet. This facility can be a stand alone facility or the fleet could be maintained and stored at an existing Valley Metro operating facility, depending on space availability.

Light Rail Transit

LRT is electrically powered, HCT service operating on a fixed guideway. It operates on two sets of tracks within exclusive or shared ROW and serves stations located approximately every mile. LRT emphasizes speed and travel time savings and can operate using multiple vehicles linked together to accommodate large passenger volumes. The METRO Central Phoenix/East Valley LRT Project is an example of LRT. The 20-mile LRT line connecting Phoenix, Tempe, and Mesa is scheduled to open in late 2008.

Simulation of Future METRO Central Phoenix/East Valley LRT

Vehicles

LRT vehicles are electric rail cars approximately 93 feet long with a vehicle capacity of approximately 150 passengers (450 passengers in a three car train). The vehicles can operate in both directions, thereby eliminating the need to turn the train around at the end of the line. LRT vehicles are articulated to allow for tight turns in urban intersections. The vehicles are low-floor and ADA compliant, allowing passengers to enter at the same height as the station platform.

Stations

LRT stations are usually located every mile, with closer spacing at major activity centers. Stations include platforms level with the LRT vehicle to facilitate boardings and alightings. The station platforms typically include shelter canopies, benches, trash receptacles, bicycle storage, and real-time transit information. LRT stations offer consistent amenities along the route.

Signals

LRT systems can operate using traffic signal priority, allowing priority for green time to the LRT vehicle. Traffic signal priority would be used at specific intersections along the alignment to increase the speed and reliability of LRT.

Trackwork

LRT technology requires two sets of tracks with trains operating in both directions in semi-exclusive ROW. Track placement for LRT can serve stations located in the median or on the curb side of the roadway. In areas where there is significant bicycle travel or curb cut access, curb side track alignments are discouraged for safety reasons.

Power Substations

LRT requires traction power substations to provide consistent levels of electricity to power the trains. A traction power substation is a small building that contains electrical equipment that distributes electricity to the overhead wires, which powers the LRT vehicles.

Maintenance and Storage

A maintenance and storage facility is required to accommodate a LRT fleet. Efforts would be made to use the maintenance and storage facility constructed for the METRO Central Phoenix/East Valley LRT line. This would require an interlined track at some location to connect to the METRO Central Phoenix/East Valley LRT mainline.

Modern Streetcar in Portland, Oregon

Modern Streetcar

Modern streetcar is an electrically powered, HCT service that operates on a fixed-guideway. Modern streetcar systems typically operate at street level in mixed traffic in existing urban environments. Modern streetcar can operate as a single vehicle or as part of multi-car train and can operate safely in high traffic and/or high pedestrian activity areas to link neighborhoods with activity centers. The Portland Streetcar is an example of a modern streetcar system.

Vehicles

Modern streetcar vehicles are electric rail cars approximately 66 feet long with a vehicle capacity of approximately 130 passengers. The vehicles can operate in both directions, thereby eliminating the need to turn the train around at the end of the line. Modern streetcars are articulated to allow for tight turns in urban intersections. The vehicles are low-floor and ADA compliant, allowing passengers to enter at the same height as the station platform.

Stations

Modern streetcar stations can vary in spacing from an eighth of a mile to a half-mile. Stations include platforms level with the streetcar to facilitate boardings and alightings. The station platforms typically include shelter canopies, benches, trash receptacles, bicycle storage, and real-time transit information. Modern streetcar stations offer consistent amenities along the route and can be designed so that they can be used by buses as well if bus doors are located on the same side as the station platforms.

Signals

Modern streetcar systems can operate using traffic signal priority, allowing priority for green time to the streetcar. Traffic signal priority would be used at specific intersections along the alignment to increase the speed and reliability of the modern streetcar.

Trackwork

Modern streetcar technology requires two sets of tracks with trains operating in both directions in shared travel lanes with automobiles or semi-exclusive ROW. Track placement for the modern streetcar is primarily in the middle of the traffic lane, with stations located in the median or on the curb side of the roadway.

Power Substations

Similar to LRT, modern streetcar requires traction power substations to provide consistent levels of electricity to power the trains.

Maintenance and Storage

A maintenance and storage facility is required to accommodate a modern streetcar fleet. Efforts would be made to use the maintenance and storage facility constructed for the METRO Central Phoenix/East Valley LRT line. This would require an interlined track at some location to connect modern streetcar to the METRO Central Phoenix/East Valley LRT mainline. It is more likely that modern streetcar would require the construction of a new maintenance and storage facility.

HCT Technology Summary

A summary of the HCT technologies is provided in Table 5-20.

TABLE 5-20: HCT Technology Summary

	LRT	Modern Streetcar	BRT
Operating Characteristics	Semi-exclusive	Mixed traffic and/or semi-exclusive	Mixed traffic and/or semi-exclusive
Power	Electric powered (overhead)	Electric powered (overhead)	Diesel/electric hybrid
Vehicles	150 passengers per vehicle	130 passengers per vehicle	80 passengers per vehicle
Stations	Larger station facilities	Simple stations (comparable to high end bus stop)	Simple stations (comparable to high end bus stop)
Maintenance and Storage	Most likely uses METRO CP/EV LRT maintenance and storage facility	Most likely requires new facility	Most likely uses an existing Valley Metro operating facility
Capital Cost/Construction	\$65–\$70 million per mile	\$25–\$30 million per mile	\$10–\$15 million per mile[1]

Source: HDR | SRBA, 2006.

[1] Depends on the design of the BRT system and associated capital facilities.

8.4.2 HCT Alternatives (Tier 1)

Initial HCT alternatives have been developed for Scottsdale Road between McKellips Road and Chaparral Road. There is an assumption that each of the HCT alternatives would provide a connection (via interline or transfer) to the METRO regional LRT line in Tempe. The HCT alternatives will also consider the opportunity to extend north in Scottsdale in the future, particularly to serve the Scottsdale Airpark, the City's major employment center and a regional travel demand generator.

The HCT alternatives evaluated in Tier 1 include:

- A1 - LRT to McDowell (Median) (Figure 5-15)
- A2 - LRT to Chaparral (Median) (Figure 5-16
- B1 - Modern Streetcar to Chaparral (Left Lane) (Figure 5-17)
- B2 - Modern Streetcar to Chaparral (Left Lane/Curb Lane) (Figure 5-18)
- C1 - BRT to Chaparral (Left Lane/Curb Lane) (Figure 5-19)
- C2 - BRT to Chaparral (Curb Lane) (Figure 5-20)

FIGURE 5-15: A1 - LRT to McDowell (Median)
Source: HDR | SRBA, 2007.

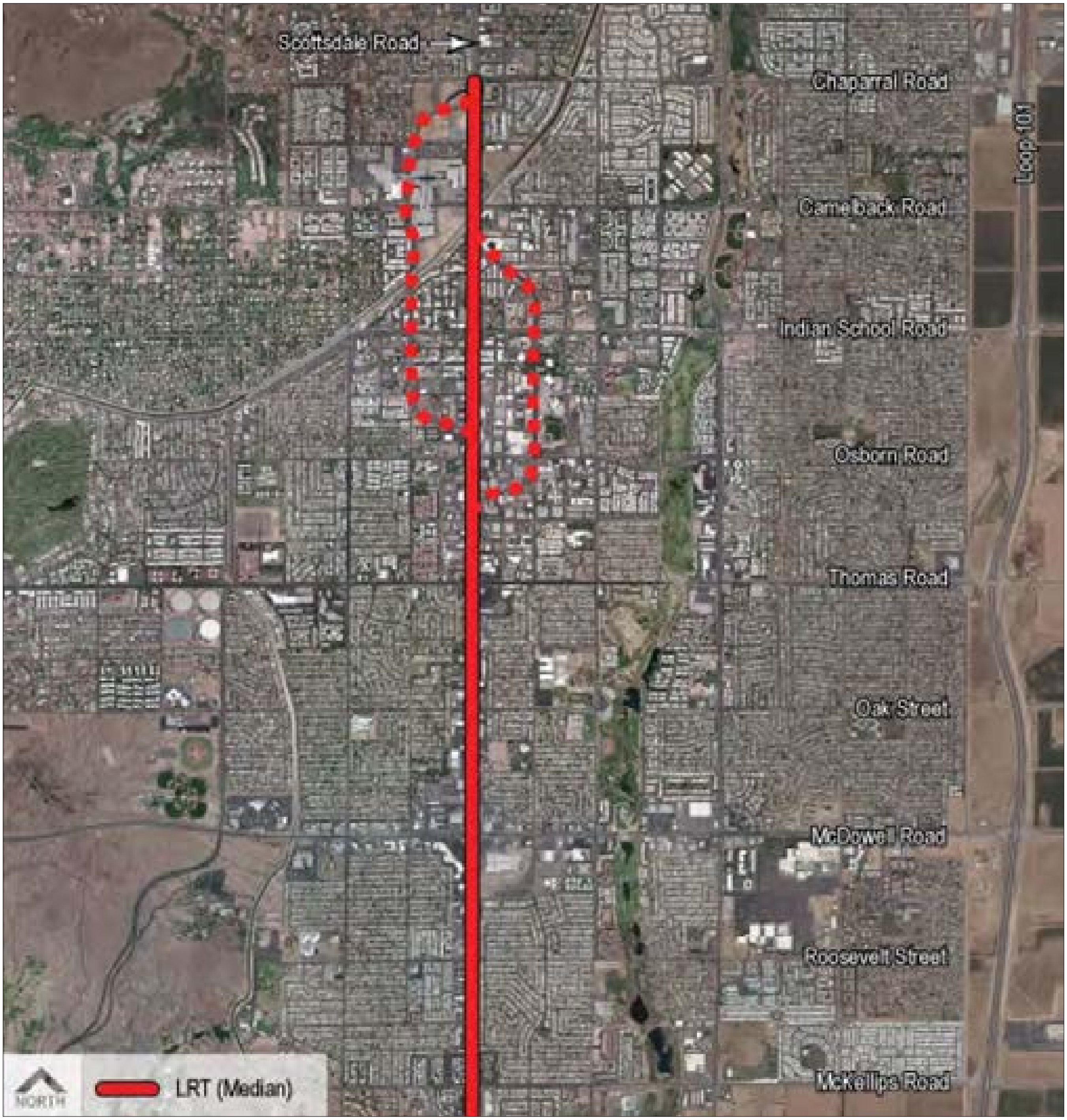


FIGURE 5-16: A2 - LRT to Chaparral (Median)
Source: HDR | SRBA, 2007.

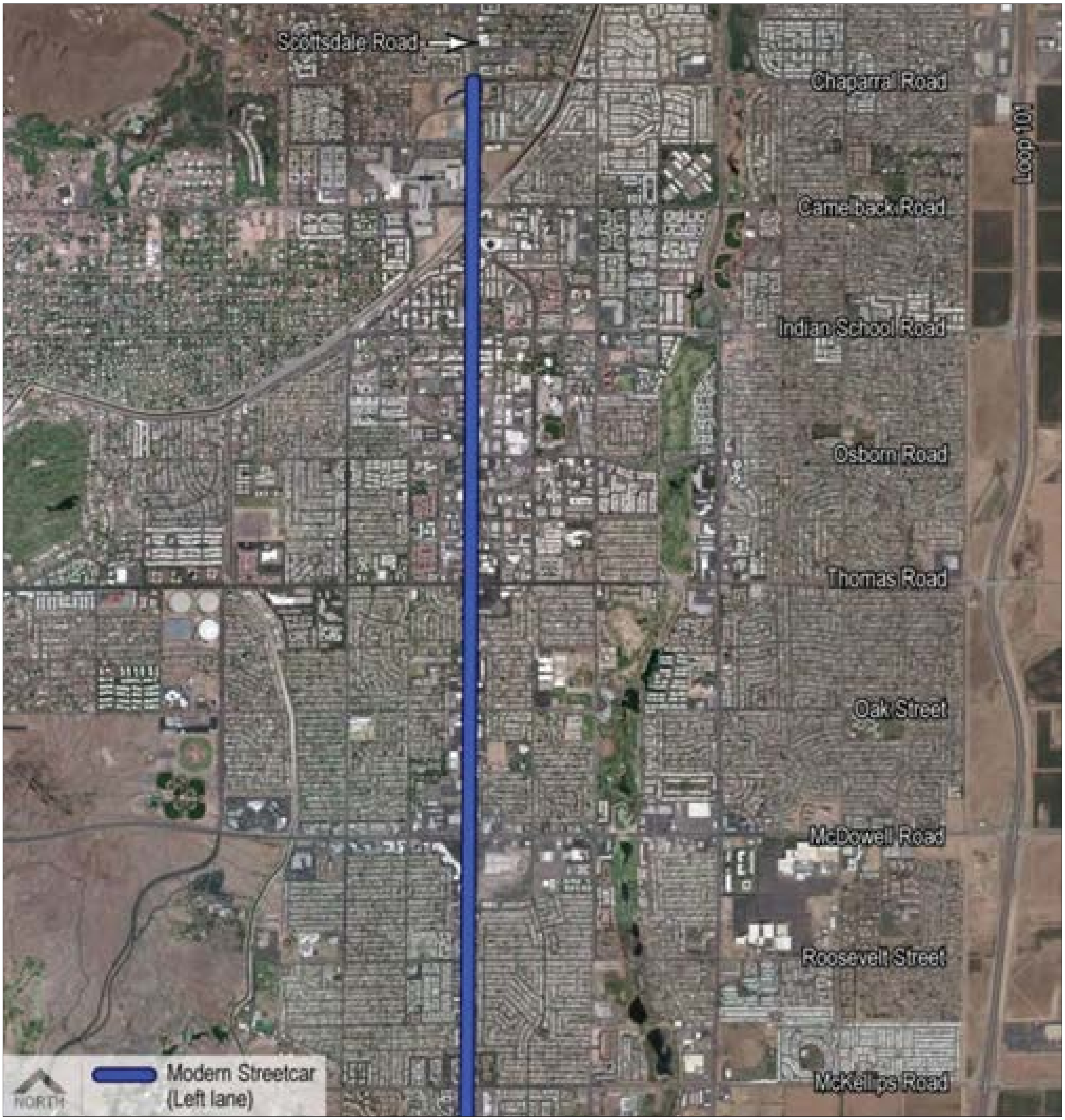


FIGURE 5-17: B1 - Modern Streetcar to Chaparral (Left Lane)
Source: HDR | SRBA, 2007.

FIGURE 5-18: B2 - Modern Streetcar to Chaparral (Left Lane/Curb Lane)
Source: HDR | SRBA, 2007.

FIGURE 5-19: C1 - BRT to Chaparral (Left Lane/Curb Lane)
Source: HDR | SRBA, 2007.

FIGURE 5-20: C2 - BRT to Chaparral (Curb Lane)
Source: HDR | SRBA, 2007.

A1 - LRT to McDowell (Median)

The A1 HCT alternative includes LRT from McKellips Road at the Scottsdale/Tempe border to McDowell Road adjacent to SkySong. Because LRT operates in semi-exclusive ROW, A1 requires a one-lane reduction in each direction on Scottsdale Road between McKellips Road and McDowell Road. An LRT station would be located in the median of Scottsdale Road just south of McDowell Road. This would be the only LRT station located in the City of Scottsdale. BRT would continue north to Chaparral Road. The A1 HCT alternative is illustrated in Figure 5-15.

A2 - LRT to Chaparral (Median)

The A2 HCT alternative includes LRT from McKellips Road at the Scottsdale/Tempe border to Chaparral Road at the north end of Downtown. Because LRT operates in semi-exclusive ROW, the A2 LRT alternative requires a one-lane reduction in each direction on Scottsdale Road or on the couplet between McKellips Road and Chaparral Road. LRT stations would be located in the median of the roadway in the vicinity of McDowell Road, Thomas Road, Osborn Road, Indian School Road, Camelback Road, and Chaparral Road. The A2 HCT alternative is illustrated in Figure 5-16.

B1 - Modern Streetcar to Chaparral (Left Lane)

The B1 HCT alternative includes modern streetcar from McKellips Road at the Scottsdale/Tempe border to Chaparral Road at the north end of Downtown. Modern streetcar would operate on tracks in mixed traffic in the left lane along Scottsdale Road. It would move into semi-exclusive ROW at station locations outside the Downtown area. Modern streetcar stations would be located in the median of the roadway in the vicinity of McDowell Road, Oak Street, Thomas Road, 2nd Street, Indian School Road, Camelback Road, and Chaparral Road. The B1 HCT alternative is illustrated in Figure 5-17.

B2 - Modern Streetcar to Chaparral (Left Lane/Curb Lane)

The B2 HCT alternative includes modern streetcar from McKellips Road at the Scottsdale/Tempe border to Chaparral Road at the north end of Downtown. Modern streetcar would operate on tracks in mixed traffic in both the left lane and curb lane along Scottsdale Road. It would move into semi-exclusive ROW at station locations outside the Downtown area. The B2 modern streetcar alternative would operate in the left lane between McKellips Road and Downtown (approximately Osborn Road). Once in Downtown, the B2 modern streetcar alternative would transition to the curb lane through Downtown until Drinkwater Boulevard where it would transition back to the left lane. This maneuver preserves left-turn movements in the Downtown area. Modern streetcar stations would be located in the vicinity of McDowell Road, Oak Street, Thomas Road, 2nd Street, Indian School Road, Camelback Road, and Chaparral Road. The B2 HCT alternative is illustrated in Figure 5-18.

C1 - BRT to Chaparral (Left Lane/Curb Lane)

The C1 HCT alternative includes BRT from McKellips Road at the Scottsdale/Tempe border to Chaparral Road at the north end of Downtown. BRT would operate in mixed traffic in the left lane and curb lane along Scottsdale Road. It would move into semi-exclusive ROW at station locations outside the Downtown area. The C1 BRT alternative would operate in the left lane between McKellips Road and Downtown (approximately Osborn Road). Once in

Downtown, the C1 BRT alternative would transition to the curb lane through Downtown until Drinkwater Boulevard where it would transition back to the left lane. This maneuver preserves left-turn movements in the Downtown area. BRT stations would be located in the vicinity of McDowell Road, Oak Street, Thomas Road, 2nd Street, Indian School Road, Camelback Road, and Chaparral Road. The C1 HCT alternative is illustrated in Figure 5-19.

C2 - BRT to Chaparral (Curb Lane)

The C2 HCT alternative includes BRT from McKellips Road at the Scottsdale/Tempe border to Chaparral Road at the north end of Downtown. BRT would operate in mixed traffic in the curb lane along Scottsdale Road. BRT stations would be located in the vicinity of McDowell Road, Oak Street, Thomas Road, 2nd Street, Indian School Road, Camelback Road, and Chaparral Road. The C2 HCT alternative is illustrated in Figure 5-20.

8.4.3 Tier 1 Recommendations

The following is a summary of the Tier 1 recommendations. Overall, the B1 Modern Streetcar to Chaparral (Left Lane), B2 Modern Streetcar to Chaparral (Left Lane/Curb Lane), and C1 BRT to Chaparral (Left Lane/Curb Lane) HCT alternatives are recommended for further analysis in Tier 2, as well as alternatives which consider LRT to McDowell (A1) and LRT to Highland/Chaparral via Drinkwater or Goldwater (modified A2). It is also recommended that the B1 and B2 modern streetcar alternatives be combined into a single alternative in Tier 2 with a design option in Downtown. The remaining HCT alternatives will be eliminated from further consideration. Table 5-21 summarizes the recommendations.

TABLE 5-21: Tier 1 Recommendations

Advance into Tier 2 Detailed Evaluation	Eliminate from Further Consideration
A1 – LRT to McDowell Rd (Median)	A2 - LRT to Chaparral Rd (Median)[1]
A2 – LRT to Highland/Chaparral Rd via Drinkwater/Goldwater Blvds[1]	C2 - BRT to Chaparral Rd (Curb Lane)
B1 - Modern Streetcar to Chaparral Rd (Left Lane)[2]	
B2 - Modern Streetcar to Chaparral Rd (Left Lane/Curb Lane)[2]	
C1 - BRT to Chaparral Rd (Left Lane/Curb Lane)[3]	

Source: HDR | SRBA, 2006.

[1] It is recommended that alternative A2 be modified to remove consideration of a Scottsdale Road alignment through Downtown, instead using Drinkwater or Goldwater, and carried through into Tier 2 with a design option focusing on Drinkwater.

[2] It is recommended that the B1 and B2 modern streetcar alternatives be combined into a single alternative in Tier 2 with a design option in Downtown.

[3] Service standards for BRT in the *Regional Transportation Plan* have not been finalized for arterial corridors. Tier 2 analysis of C1 should reflect the results of a regional study to define the arterial BRT system parameters.

The A1, modified A2, combined B1/B2, and C1 HCT alternatives (Figures 5-21 to 5-24) are being advanced because they offer the best opportunity for HCT in the Scottsdale Road corridor.

The primary reasons include:

- Travel time savings by using semi-exclusive station locations along Scottsdale Road outside of Downtown. These semi-exclusive stations will serve as "queue jumps" that will allow the non-exclusive lane alternatives to bypass intersection congestion;
- Providing frequent, all-day access to major activity centers in the corridor;
- High ridership potential because of new service, travel time savings, regional connectivity, and frequency/service span;

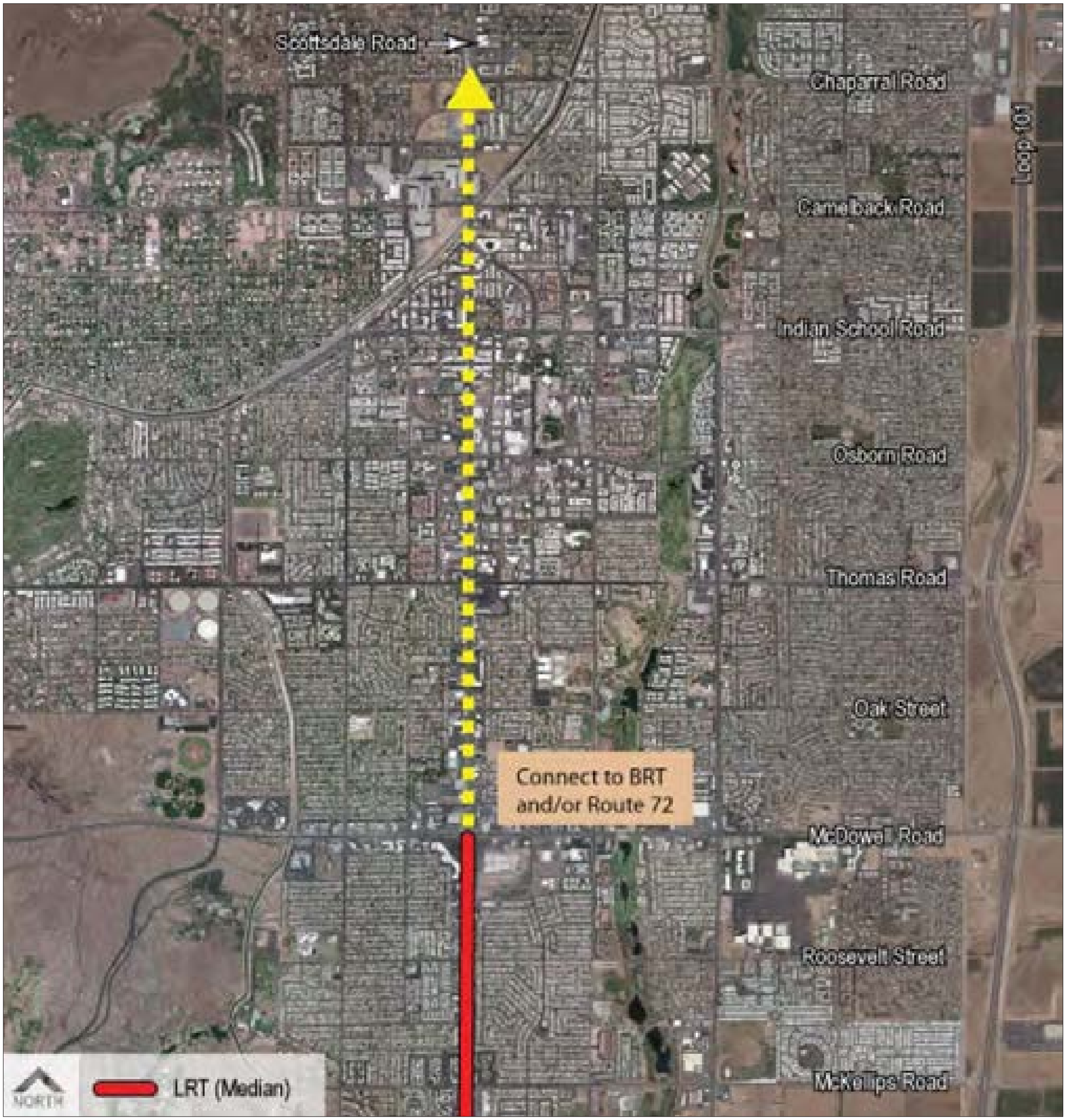


FIGURE 5-21: LRT to McDowell (Median)
Source: HDR | SRBA, 2007.

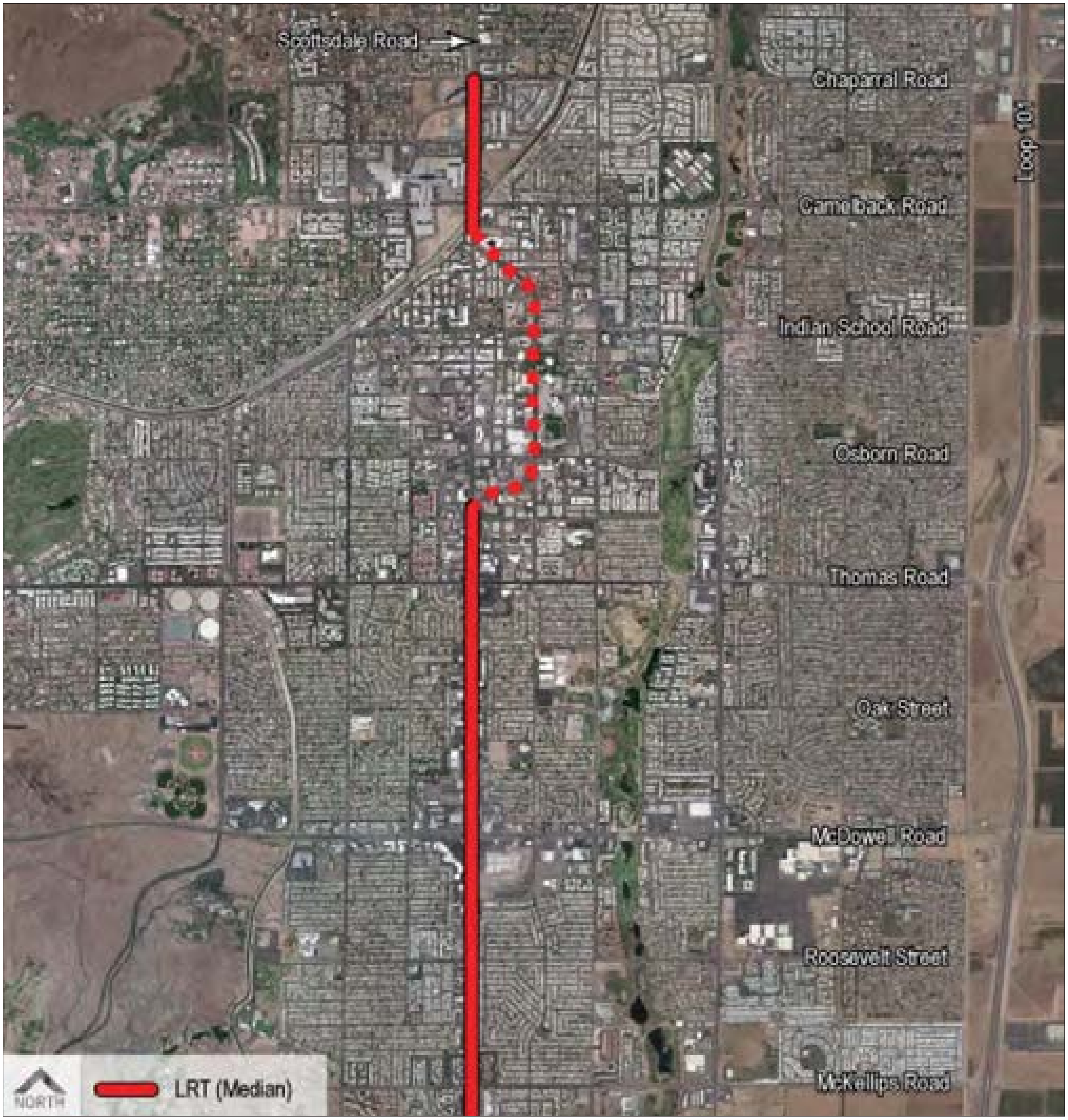


FIGURE 5-22: LRT to Highland/Chaparral (median) via Drinkwater
Source: HDR | SRBA, 2007.

FIGURE 5-23: Modern Streetcar to Chaparral (Left Lane/Design Option through Downtown)
Source: HDR | SRBA, 2007.

FIGURE 5-24: BRT to Chaparral (Left Lane/Curb Lane through Downtown)
Source: HDR | SRBA, 2007.

- Reduced roadway impacts to Scottsdale Road, primarily at station locations, and use of available capacity on Drinkwater/Goldwater boulevards; and
- Appropriate "scale" for the Scottsdale Road corridor.

The A2 LRT to Chaparral (Median) on Scottsdale Road through Downtown HCT alternative is eliminated from further consideration. The primary reasons include:

- Unacceptable lane reductions and ROW impacts through Downtown on Scottsdale Road;
- Left turn restrictions in Downtown because of median operation; and
- Inappropriate "scale" for Downtown.

The C2 BRT to Chaparral (Curb Lane) HCT alternative is being eliminated from further consideration. The primary reasons include:

- Does not offer travel time savings because of curb lane operation outside of Downtown; and
- Very little distinction from existing Route 72 service on Scottsdale Road.

Based on the goals set forth in Scottsdale's *General Plan*, the Scottsdale Road corridor is the appropriate corridor in Scottsdale for high-capacity transit. Any of the three technology modes could be made to fit in a way that works for the community from a design, functionality, and livability standpoint. As development continues and more interest develops in alternative modes, the need and appropriateness for high-capacity transit will also grow.

8.5 Recommended Further Analysis and Considerations

The HCT section of the *Transportation Master Plan* was designed to take the next steps in the Scottsdale/Tempe Major Investment Study that was adopted in February 2003. At that time, the City Council approved the Scottsdale Road corridor as the most appropriate corridor for the first Scottsdale HCT system, while identifying the need for regional commuter-oriented service on Loop 101 using express bus/BRT technology. This report has detailed the background information required for an alternatives analysis and provided a Tier 1 conceptual analysis of alternatives. Recommended alternatives to move through the next phase are included in Section 4.3 above.

Community and stakeholder discussion during the course of the *Transportation Master Plan* included the desire for consideration of several additional issues: options for additional, high frequency and amenity regional transit service along the Loop 101 corridor; an interest in the results of implementation of the region's first light rail corridor, the Central Phoenix/East Valley line scheduled for opening in December 2008; regional consideration of updates to the RTP to better integrate the current and proposed high capacity services (express, BRT, LRT, and commuter rail); and current and proposed fixed route and circulator services.

To follow the FTA's process, the next steps are to conduct a Tier 2 analysis and an Alternatives Analysis for the alternatives resulting from the Tier 1 conceptual analysis. Care was taken during the Tier 1 analysis to ensure that the findings could be incorporated into a future Alternatives Analysis. It is recommended that an Alternatives Analysis should be undertaken after or as a part of several regional studies that are underway or scheduled to occur within the next three months, as described below. Studies underway or scheduled that affect the outcome of any future Alternatives Analysis include: regional arterial BRT study (RPTA); regional freeway express/

BRT study (RPTA); regional transit framework study (MAG); and Tempe south alternatives analysis (Valley Metro Rail).

Within the RTP, Scottsdale is identified for inclusion in a high capacity corridor along Scottsdale Road from McKellips Road to Shea Boulevard. The corridor overlays a two plus mile light rail corridor within Tempe and extends south through the communities of Tempe and Chandler to Chandler Boulevard, with a connection to the regional Central Phoenix/East Valley light rail system in Tempe in the vicinity of the intersection of University Drive and Rural Road. It is recommended that this designated regional HCT corridor be extended to the Scottsdale Airpark to capture additional potential ridership at this employment center, which generates high regional and local demand, and that the hours of operation and bus amenities be expanded as necessary to provide high quality service. These modifications will be addressed through the RTP amendment process and documented in the RPTA's regional arterial BRT study. Service standards and other features of arterial BRT in the Phoenix region are also currently undefined and will be established in this study and will affect the outcome of Tier 2 analysis for a BRT option in the Scottsdale Road corridor. RPTA's regional freeway express/ BRT study performed analysis based on the current level of RTP funding and currently-planned freeway lane configurations and did not examine improvements to the system based on need; updates to the RTP in the MAG regional transit framework study will address this and other discrepancies in the data needed to evaluate Loop 101 transit options, including the provision of HOV on- and off-ramps.

In an effort to address connectivity among the various transit modes in the region, update the system for current and planned growth in the region, and to prepare for potential opportunities for statewide transit funding, MAG is beginning a regional transit framework study in January 2008. Scottsdale has asked that the information on the Loop 101 and Scottsdale Road corridors from this HCT feasibility study and prior efforts be integrated in the MAG study.

Since September 2007, METRO and its member cities of Tempe and Chandler have been engaged in an Alternatives Analysis to determine the direction of Tempe's light rail extension, with a study area boundary from (north) Loop 202 to (south) Loop 202, and (east) Loop 101 to (west) I-10. On December 11, 2007, the City Council opted to join METRO to enable the City's participation in the Alternatives Analysis underway among METRO, Tempe, and Chandler.

9.0 FUNDING SOURCES

Transit service in Scottsdale is funded with a combination of passenger fares and federal, state, regional, and local funds. This section describes the existing and future funding sources for the proposed transit improvements.

9.1 Existing and Future Funding Sources

The following is an overview of the existing financial resources potentially available to fund transit operating and capital improvements in the City of Scottsdale. Included are federal, state, regional, and local funding programs.

9.1.1 Federal Funding Sources

Federal funding for public transportation comes through the U.S. Department of Transportation (USDOT). USDOT programs and funding for public transportation were established under the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991, which established authorizing levels and programs for transit and highways projects and institutionalized the ability to shift funds from one program to another depending on local priorities. ISTEA expired in 1997 and was replaced by the Transportation Equity Act of the 21st Century (TEA-21). TEA-21, which was effective from 1998 to 2003, generally maintained previously established programs and raised the overall level of funding. TEA-21 was reauthorized in August 2005 and is known as the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy For Users (SAFETEA-LU). SAFETEA-LU authorizes the federal surface transportation programs for highways, highway safety, and transit for 2005 until 2009. SAFETEA-LU provides funding for USDOT and its subsidiary agencies, the FTA and FHWA.

FTA Section 5307 Funds

The Federal Section 5307 formula program is allocated to urbanized areas over 50,000 in population, according to a tiered formula based on size. FTA has traditionally only awarded grants to one recipient per urbanized area (in this case the city of Phoenix), leaving that recipient to then pass funds through to other qualified users. The program is structured to provide total flexibility to end-users regarding use of the funds for operations and capital facilities, except for urbanized areas over 200,000 in population which cannot use funds for operating assistance. A 50 percent local match for operating assistance and a 20 percent local match for capital facility assistance is required.

FTA Section 5309 Funds

Section 5309 is the primary federal funding program for capital investment in new transit facilities and equipment. Unlike other FTA funding categories that allocate money on a formula basis, Section 5309 funds are awarded on a discretionary basis for a particular project. In practice, all Section 5309 funds are allocated to projects through earmarks in annual federal appropriations legislation. The eligible federal share is 80 to 83 percent. The FTA encourages applicants to develop a non-federal match to secure Section 5309 funds.

Section 5309 funds are authorized based on the results of alternatives analysis and preliminary engineering that justify the project based on a variety of criteria. Funds are allocated by statute categories, including "new starts" and "small starts."

New Starts

As described in the FTA guidance on new starts, the FTA discretionary new starts program is the federal government's primary financial resource for supporting locally planned, implemented and operated major transit investments. The new starts program funds new and extensions to existing fixed guideway systems. These projects include commuter rail, heavy rail, LRT, BRT, modern streetcar, and ferries. New starts projects, like all transportation investments in metropolitan areas, must emerge from a regional, multi-modal transportation planning process that has three phases: Phase I (alternatives analysis); Phase II (preliminary engineering); and Phase III (final design).

New starts projects must undergo evaluation by FTA throughout the entire project development process. Based on these evaluations, FTA makes decisions about moving projects forward, from preliminary engineering to final design, to annual funding recommendations to Congress, and to the execution of a full funding grant agreement (FFGA). In the annual report on new starts, FTA applies these evaluations to recommend funding for projects anticipated to be ready for an FFGA before the end of the budget fiscal year, and to recommend funding for other meritorious projects.

FTA evaluates the project justification and the local financial commitment according to the following measures:

- Mobility improvements;
- Environmental benefits;
- Cost effectiveness;
- Operating efficiencies;
- Transit supportive land use and future patterns; and
- Local financing.

Small Starts

Small starts is intended for smaller projects where the project must seek less than $75 million in new start monies and have a total cost of no more than $250 million. According to the FTA small starts interim guidance, FTA intends to scale the planning and project development analysis to the size and complexity of the proposed projects. To be eligible, a project must meet the definition of "fixed guideway" for at least 50 percent of the project length during peak period, or be a corridor-based bus project with the following minimum elements:

- Transit stations;
- Traffic signal priority/pre-emption, to the extent, if any, that there are traffic signals in the corridor;
- Low-floor buses or level boarding;
- Branding of the proposed service; and
- 10 minute peak/15 minute off-peak headways or better while operating at least 14 hours per weekday (not required for commuter rail or ferries).

Congestion Mitigation and Air Quality (CMAQ) Funds

CMAQ provides federal transportation funds to support state and local projects that reduce transportation related air pollution. A portion of the funds are apportioned to the state of Arizona annually based on a legislated formula and coordinated through MAG. CMAQ projects are selected for implementation from the approved regional TIP and are submitted to FTA or FHWA, as appropriate, for final approval and authorization to proceed. The types of projects eligible for CMAQ funds include:

- Travel demand management strategies;
- Transit improvements;
- Shared ride services;
- Traffic flow improvements; and
- Pedestrian and bicycle programs.

The start-up of new transit services (e.g., new express bus routes or new shuttle service linking major activity centers) is supported under the CMAQ program in an effort to tap new markets for transit. While CMAQ cannot be a permanent source of funding for transit service, the goal is to encourage experimentation to determine what new types of services are viable.

Surface Transportation Program (STP) Flexible Funding

FHWA STP funds are flexible funds that may be used by states and localities for transit and highway projects. Under TEA-21, FHWA funds provided a substantial new source of funds for transit projects. Since 1999, the state transportation board annually transferred $5 million of TEA-21 STP funding to transit. However, there is no long-term commitment from the state transportation board to maintain this funding source for transit. In order to compete for the $5 million in STP funding, cities must use 100 percent of the funding for transit purposes and the project must be included in the current MAG TIP.

9.1.2 State Funding Sources

Local Transportation Assistance Fund (LTAF)

Under present law, LTAF is funded from net state lottery proceeds at a flat $23 million per year, with no provision for escalation. Funds are apportioned to cities and towns on the basis of population as determined by the Arizona Department of Economic Security, though each city is guaranteed a minimum apportionment of $10,000. Cities may use funds for either roadway or transit purposes, with the exception that cities with a population greater than 300,000 in Maricopa County must use the funds for transit purposes only. Cities that are members of Valley Metro/RPTA with a population greater than 60,000 must commit at least one-third of their LTAF funds to transit services while those with a population of less than 60,000 must commit three-quarters of their LTAF funds to transit services.

9.1.3 Regional and Local Funding Sources

Proposition 400

Proposition 400 was approved by voters in Maricopa County in 2004 and extends the region's half cent sales tax for transportation. Proposition 400 will fund freeway, street, transit, and non-motorized transportation improvements over the next 20 years. As previously described, there are number of transit operating and capital improvements in the City of Scottsdale as part of Proposition 400.

City of Scottsdale Transportation Sales Tax

The City of Scottsdale currently funds transit services through a 2/10 sales tax for transportation. This dedicated sales tax allows the City to fund transit and other transportation improvements without the use of general funds. In the past, the 2/10 sales tax was able to fund both operating and capital improvements. However, the revenue produced by this sales tax is unable to keep up with operating and capital expenses throughout the City. In the future, it is possible that most of the operating expenses (including transit) will be funded by the transportation sales tax while capital improvements will be funded through bond.

Other Local Funding Options

While a sales tax increase is a standard tool for funding local transportation improvements, other potential funding sources exist which are more speculative in nature (Table 5-22).

TABLE 5-22: Local Funding Source Options

Category	Funding Source	
General taxes	Sales tax	Income tax
	Property tax	Payroll/head tax
Special taxes	Fuel tax	Parking tax
	Auto registration fee (flat rate)	Rental car tax
	Auto license tax (value based)	Hotel room occupancy tax
	Driver's license tax or fee	Excise taxes ("sin")
	Utility excise tax	Business license/fee
Growth related mechanisms	Impact fees	Tax increment financing
	In-kind contributions	
Public-private partnerships	Turnkey/full service delivery	Vendor financing
	Joint development	
Other mechanisms	Special financing districts	Advertising
	Tax-exempt financing	Congestion pricing

Source: HDR | SRBA, 2006

Many of the mechanisms for local funding are self-explanatory. Descriptions of some of the less-common approaches are summarized below.

- **Payroll/head tax**: A flat rate assessment per employee within a jurisdiction.
- **Parking tax:** Assessment per parking space levied on commercial property owners to discourage free parking and single-occupant behavior.
- **Impact fees:** Assessments on new development intended to offset the cost of new infrastructure. They are often calculated as a fixed amount per residential unit or square foot of commercial/industrial space.
- **In-kind contributions:** Alternatives to the impact fee, but typically assessed (negotiated) for the same basic purpose, to fund new infrastructure.
- **Turnkey/full service delivery:** Involves full delegation of project development responsibilities to a single design/build or design/build/operate entity, for a fixed price.
- **Joint development:** Involves co-location of public improvements (e.g., a transit station) and private, for profit, development (e.g., a mixed-use development) in a coordinated manner on the same site or on adjacent sites.
- **Vendor financing:** Involves the extension of credit by an equipment vendor, typically at favorable terms.
- **Special financing districts:** Funds specific activities or projects in a defined geographical area that is typically smaller than the jurisdiction.
- **Tax-exempt debt financing:** Translates the federal tax exemption into lower interest cost and is therefore an implicit federal subsidy.
- **Congestion pricing:** Involves a schedule of tolls on a presently "free" facility, or on an existing toll road, with the objective of discouraging use during peak periods.

Those mechanisms that have historically received the greatest attention for funding transit service and capital facility improvements include:

- County or city sales tax;
- Countywide fuel tax or other auto-related fees or assessments;
- Hotel room occupancy tax;
- Development fees, assessments, or other exactions; and
- General or special obligation bonds (property or sales tax based).

Of these, the sales tax, fuel tax, and the hotel occupancy tax offer the greatest potential revenue yield, along with the greatest potential for acceptance by the public. However, the use of fuel taxes is currently restricted to highway and roadway projects under Arizona law.

6 BICYCLE ELEMENT

6 BICYCLE ELEMENT

1.0 INTRODUCTION

The purpose of the Bicycle Element of the *Transportation Master Plan* is to identify goals and make recommendations for the implementation of those goals, which make bicycling a safe, convenient, and more comfortable travel option. The Bicycle Element describes the City's existing bicycling conditions, makes prioritized recommendations for the identified potential on-street bicycle network, provides other bicycle-related recommendations, and explores potential expansions to the City's off-street bicycle network.

1.1 Goals

The Vision, Values and Goals component of this *Transportation Master Plan* identifies many over-arching goals. The recommendations contained in the Bicycle Element directly support several of these goals, including the following:

- Direct transportation policies, investments, and decisions in ways which support the community's adopted vision and values;
- Increase the range and convenience of transportation choices;
- Focus investments on improvements which add long-term values;
- Maintain the transportation system in ways which minimize life cycle cost.

In addition to supporting these broader goals, three bicycle-specific goals have been identified:

- Provide a safe, connected, and convenient on-road bicycle network throughout the City of Scottsdale;
- Expand the network of off-street shared-use paths and trails within the City of Scottsdale;
- Achieve a Bicycle Friendly Community ranking of Gold from the League of American Bicyclists (LAB).

Finally, the goals set forth in the City's 1994 *Bicycle/Pedestrian Transportation Plan* apply and should remain a guiding force in current and future bicycle-related planning initiatives. These are:

1. Incorporate the needs of human-powered transportation into the policy-making, planning, design, construction, and maintenance phases of all existing and new City policies, plans, programs, projects, facilities, and operations.

2. Devise and adopt design guidelines and standards needed to implement a safe, functional, convenient, accessible, and pleasurable walking and cycling environment for recreation and transportation.

3. Develop and implement comprehensive and proactive safety, education, and enforcement programs for all bicyclists, pedestrians, and motorists.

4. Employ comprehensive and proactive programs to promote cycling as a viable, economically desirable form of transportation and recreation for both residents and visitors.

Through the process of achieving these goals, progress will be made toward the bicycle-related effectiveness measures identified in the *Transportation Master Plan*: reducing gaps in the bicycle system; improving the citywide bicycle LOS; and reducing conflicts with other modes. Specific measurable components of the network include:

1. Miles of bike lanes, routes, paved paths, and unpaved trails.
2. Percentage of arterial streets with bike lanes.
3. Number of grade-separated crossings.
4. Percentage of address locations within 0.25 and 0.5 miles of a path.
5. Percentage of traffic signals on bike routes that can be actuated by a bicyclist.

The subsequent sections of the Bicycle Element describe the processes by which the identified goals should be pursued.

1.2 History

Many previous planning efforts have included bicycle provisions. These processes have been underway for several decades and steady progress has been achieved. Historical milestones and previous documents with bicycle components include:

- 1965 and 1974 Scottsdale Town Enrichment Program Forum initiated the Indian Bend Wash project and a bicycle planning document for the Indian Bend Wash and connections to it;
- 1971 Parks and Recreation Department study to determine public interest level in cycling and an expanded path system;
- 1975 Bikeway Planning Criteria and Design Guidelines;
- 1978, 1981, and 1991 *General Plan* Circulation Element including a Bikeways Plan with some design standards;
- 1984 Design Procedures and Criteria: Section 8, Bikeways and Horse Trails;
- 1988 Scottsdale Bicycle Task Force Final Report;
- 1994 City of Scottsdale Bicycle Pedestrian Transportation Plan (adopted in January 1995); and
- 2004 City of Scottsdale *Trails Master Plan*.

2.0 EXISTING BICYCLING CONDITIONS

The City of Scottsdale currently maintains a wide network of on-street and off-street bicycle facilities. This combined on- and off-street bicycle network is shown in the Existing Bicycle Facilities Map (Figure 6-1) and described below. The mileage of each of the component parts of the City's existing bicycle network are as follows:

- Bike Lanes = 86 miles
- Paved Shoulders = 10 miles
- Bike Routes = 50 miles
- Paved Paths = 61 miles
- Unpaved Trails = 238 miles

A **bike lane** is a striped portion of a roadway with pavement markings and signs. It is for the exclusive use of bicyclists but bicyclists are not required to ride in it. Cyclists may leave a bike lane to pass other cyclists, avoid debris, and make left turns.

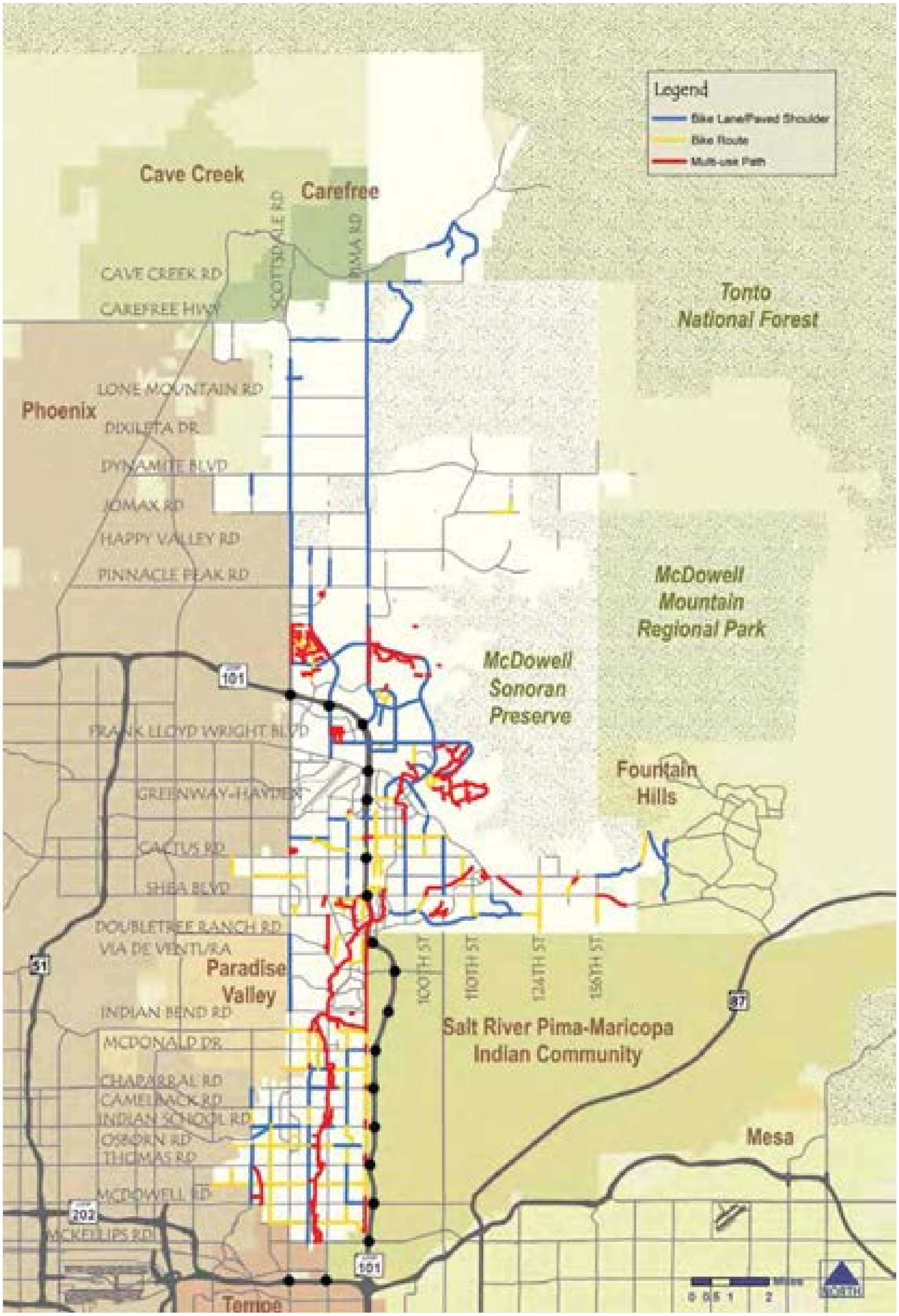


FIGURE 6-1: Existing Bicycle Facilities

A **paved shoulder** is the roadway to the right side of an edge line. Shoulder widths of 5 feet or more are suitable for bicycle travel. An edge line is used to mark the outside edge of the travel lane for cars.

A **bike route** is any combination of paths, lanes, trails, or streets that are designated for bicycle travel by mapping or signing. Bike routes are typically used to help cyclists identify preferential travel routes.

A **paved path** is a shared-use facility not open to motorized devices. It can be used by pedestrians, bicyclists, skaters, joggers, and other non-motorized users. An **unpaved trail** is a shared-use facility for use by equestrians, pedestrians, bicyclists, and other non-motorized users.

Further definitions are listed in the Glossary of this *Transportation Master Plan*. Definitions and specific design guidelines for bicycle facilities are listed in the DS&PM. Bicycle parking requirements are included in the Scottsdale Revised Code, Appendix 6-B, Basic Zoning Ordinance, Article IX.

The on-street and off-street bicycle networks are not mutually exclusive and both are necessary. Since homes, offices, and employment centers are located along streets, we should anticipate that cyclists and pedestrians need to use those streets to reach their destinations. A commute-to-work bicycle trip will typically begin on a residential street and end on an arterial street. Many experienced cyclists prefer to bicycle on the streets where they can travel greater distances in a shorter time.

The off-street network provides a more relaxed environment and fewer interactions with motorized traffic, although path users must still watch for cars at driveways, street crossings, and intersections. Paths like the Indian Bend Wash Path have grade-separated crossings at many roadways and can provide uninterrupted travel for long distances. Paths are appropriate locations for casual cyclists and children, as well as faster cyclists when few other users are present. Since bicyclists share paths with pedestrians, runners, inline skaters, and dogs, they must adjust their speeds to share the path or to safely pass other users. Many commuter cyclists will use a path for part of their ride to work, combining the use of on-street and off-street facilities to reach their destinations.

2.1 League of American Bicyclists Bicycle Friendly Community Designation

In 2005 and 2007, Scottsdale was a recipient of a Silver Level Award from the LAB as a Bicycle Friendly Community. This award recognizes municipalities that actively support cycling and encourage residents to use bicycles as an alternative mode of transportation and for recreation. Two year awards range from Honorable Mention, to Bronze, Silver, Gold, and Platinum. In addition, many communities apply and receive no designation whatsoever. The process involves a screening application followed by a more in-depth application for those communities that qualify. A committee at LAB, using feedback from LAB members in the local community, scores the application. In 2005, Scottsdale became the first community without a university to reach the Silver level and in 2007 Scottsdale achieved Silver level again. Review and recommendations from LAB provide insights into what Scottsdale could do to achieve a Gold level in a future application. The 2007 application is included as Appendix 6-A.

2.2 Bicycle Crash Analysis

An analysis was performed using complete City of Scottsdale crash data files. These files contained data on the report number, date and time of the crash, crash location, injury severity, date of birth, physical condition, violations, action, travel direction, and manner of collision. Bicycle crashes were extracted from the overall database for review.

The reported bicycle-vehicle collisions from 1994 through 2004 were divided into total collisions, injury collisions, and fatal collisions. The lowest number of bicycle-vehicle collisions occurred in 2003 with 40 total collisions, 35 of which resulted in injury and one in a fatality. The highest number of bicycle-vehicle collisions occurred in 1995 with a total of 88 crashes, 77 of which resulted in injury and one in a fatality. The majority of bicycle-vehicle collisions resulted in injury.

In addition to the computerized crash dataset, 33 crash reports were reviewed in detail. The crash reports were reviewed to determine root causes for the crashes, similar characteristics among the crashes, and potential counter measures to prevent like crashes in the future. The review of the crashes yielded a clear trend. Sixty-four percent of the crashes reviewed in detail (21 of 33) involved motorists colliding with bicyclists riding against traffic on the sidewalk. An additional 15 percent (5 of 33) involved motorists colliding with cyclists riding against traffic on the roadway. In these crashes, motorists were most often exiting a side street or driveway onto the main road and failed to scan to the right for any approaching bicyclists or pedestrians coming from that direction. In one of these crashes, the cyclist crossed a side street against a Don't Walk signal. This preponderance of crashes where cyclists rode against traffic illustrates the potential hazards associated with riding where motorists are not scanning for conflicting traffic.

The complete collision analysis and recommended countermeasures are included in Bicycle Element Appendix 6-B. A summary of the recommended countermeasures follows.

2.2.1 Educational Countermeasures

Educational countermeasures will have the greatest effect if they are implemented across the City, rather than solely on specific streets or at specific intersections. A broad application of these campaigns, with greater saturation within the high crash areas is appropriate.

Riding Against Traffic

Riding against traffic, either on the sidewalk or on the roadway, appears to be common practice in Scottsdale. As indicated above, 64 percent of the detailed crashes analyzed involved motorists colliding with bicyclists riding against traffic on the sidewalk. An additional 15 percent (5 of 33) involved motorists colliding with cyclists riding against traffic on the roadway. It is imperative that cyclists who choose to ride on the sidewalk be aware of the hazards associated with this practice. Driver and cyclist-targeted campaigns are recommended. Graphics would include Scottsdale locations, demographics, and language. It is also important to target motorists with these campaigns to make drivers aware that they need to scan for traffic on the sidewalk in addition to looking where they expect to see other vehicles. These education campaigns must be run concurrently to maximize the potential for reducing crashes.

Riding at Night Without Lights

Bicyclists operating at night without lights are nearly invisible to motorists. Informational posters showing sight distances for various colors of clothing and illustrating the limitations of reflectors may provide cyclists and pedestrians the information they need to make better choices when choosing gaps to cross the road or when anticipating driver behavior at driveways and intersections.

2.2.2. Enforcement Countermeasures

The effort to enforce the traffic laws as they relate to bicycle safety should be addressed in an overall, coordinated, citywide or countywide bicycle enforcement campaign.

The following behaviors should be targeted for enforcement:

- Riding against traffic on the roadway;
- Failure to yield to pedestrians and cyclists riding on the sidewalk;
- Riding at night without lights; and
- Violating traffic signals.

3.0 ON-STREET BICYCLE NETWORK

The City of Scottsdale's street system provides the most direct access to nearly all destinations in the City. This section provides a strategy for creating new bicycle facilities on the City's roadways to improve bicycling accommodation for the area's cyclists. Since the City's design guidelines and cross sections for arterial and collector streets include bike lanes, sidewalks, and trails, these facilities are typically included with new construction and major reconstruction projects. Creating bike lanes on existing streets can often be challenging and expensive. One of the most cost-effective ways to create new bicycle facilities is to restripe roadways to include bike lanes.

3.1 Roadway Restriping Guidelines

This section outlines recommended guidelines for identifying potential locations for roadway restriping to better accommodate bicyclists. These guidelines were used to recommend roadways from the study network for restriping (see Section 3.3). On roadways where restriping is not a viable option, widening the roadway, adding paved shoulders, or removing travel lanes could be considered on a case by case basis (with the approval of the Traffic Engineering and Operations Director). The guidelines take into account the effect of restriping on both the motor vehicle and bicycle modes, using guidance from the following documents:

- *A Policy on Geometric Design of Streets and Highways*, AASHTO;
- *Guide for the Development of Bicycle Facilities*, AASHTO;
- *Manual on Uniform Traffic Control Devices* FHWA; and
- *Highway Capacity Manual*, Transportation Research Board.

Using the criteria and analysis techniques found in these referenced documents, candidate projects for potential restriping can be identified and their benefits to bicyclists' safety and comfort can be measured for eventual prioritization.

3.1.1 Applicability of Restripe Projects

One of the most cost-effective and easily implemented solutions for improving roadway bicycle accommodation within existing curbed roadways is to identify roads with "surplus" pavement. Restriping these roads to accommodate bicycles involves reduction of lane widths, or (in limited cases after careful analysis) removal, of travel lanes to create space for striped paved shoulders or designated bike lanes. Because delineated lateral space is the predominant factor in creating a sense of safety and comfort for bicyclists, restriping can significantly improve a roadway's level of accommodating bicycling without the expenses associated with adding pavement to roads, or completely reconstructing them. Restriping can often be done at the same time as slurry seals or regular pavement maintenance.

The type of cross section restriping that will be most generally applicable to Scottsdale roadways is through targeted reductions in existing lane widths. This opportunity usually presents itself on curbed multi-lane roadways where existing lanes are at least 12 feet wide. In many such cases, enough width can be removed from existing lanes to create an effective space for bicyclists without significantly affecting motor vehicle operations.

A primary concern associated with roadway restriping is the potential effect on motor vehicle capacity and operations. As roadway lanes are narrowed, capacity has been shown to be marginally reduced. In addition, roads with higher speeds and greater volumes of heavy vehicles do not operate as well with lanes of less than 12-feet as low-speed, low-truck volume roads do. There is an abundance of existing national guidance regarding appropriate lane widths for both motor vehicles and bicyclists, outlined below.

3.1.2 Identifying Restripe Candidates

Restripe candidates are those roadways where posted speeds are 50 mph or less, no current bicycle lane or paved shoulder exists, and where a paved shoulder or bike lane at least 3 feet wide can be created while typically maintaining other travel lane widths of at least 11 feet (as approved by the Traffic Engineering and Operations Director). There will be some roadway segments on which one or both of these dimensions is able to be larger and a very few circumstances where smaller lane widths may be considered. The minimum recommended lane widths are based on the 2004 AASHTO *A Policy on Geometric Design of Highways and Streets*. The AASHTO policy states in its foreword that its intent is to recommend a "range of values for critical dimensions." These ranges allow for flexibility, as the policy describes:

> Minimum values are either given or implied by the lower value in a given range of values. The larger values within the ranges will normally be used where the social, economic, and environmental impacts are not critical (emphasis added).[1]

With regard to the width of lanes on Urban Arterials, the policy states:

> Lane widths may vary from 10 to 12 feet. Lane widths of 10 feet may be used in highly restricted areas having little or no truck traffic. Lane widths of 11 feet are used quite extensively for urban arterial street designs. The 12-foot lane widths are

1 AASHTO Policy, 2004. xliii

most desirable and should be used where practical, on higher speed, free flowing, principal arterials.[2]

The policy clarifies further,

> Under interrupted-flow operating conditions at low speeds (45 mph or less), narrower lane widths are normally adequate and have some advantages.[3]

A number of major roadways in Scottsdale have narrower than 12-foot lanes. They include Scottsdale Road north of Indian Bend Road, Hayden Road north of McKellips Road, Shea Boulevard east of 64th Street, Thomas Road, McDowell Road, and others.

When designating dimensions for the restriping of existing pavement cross sections to include ridable shoulders, a minimum 3-foot wide shoulder is recommended. Where more than 3 feet is available, the wider space is recommended, but three-foot shoulders have been shown to provide a tangible sense of comfort to cyclists.[4] While the AASHTO *Guide for the Development of Bicycle Facilities* (1999) expresses a preference for 4-foot wide shoulders, it also states, "… where 4-foot width cannot be achieved, any additional shoulder width is better than none at all." In order for a restriped shoulder to be signed and marked as a bike lane in a location with curb and gutter, the new space should provide a minimum of 5 feet between the face of the curb and the bike lane stripe, at least 3 feet of which consist of a ridable surface. The City currently increases the ridable surface in some locations by making the gutter pan flush with the pavement. On open shoulder roadways, 4 feet of pavement is recommended to designate a bike lane.[5]

An example of a restripe candidate is a six-through-lane roadway with a posted speed limit of 40 mph where all lanes are currently 12 feet wide. In this case, each lane could be reduced to 11 feet, thereby creating 3 feet of bicycle space in each direction of travel. Alternatives would be to provide a lane width for two of the lanes of 10.5 feet to provide a 4-foot bike lane or to make the outside lane wider and not stripe an edgeline. Each project must be carefully evaluated to determine the best alternative and be approved by the Traffic Engineering and Operations Director.

3.1.3 Evaluating Restripe Candidates

Once candidate roadways have been identified, the next step is to evaluate the level of accommodation provided to both motorists and bicyclists before and after the potential restriping occurs. Planning-level analysis tools for urbanized arterials are available that estimate motor vehicle LOS based on certain readily available inputs, including the class and location of the roadway, traffic volumes, number of lanes, and signal spacing. For the purpose of these guidelines, the analysis should consider forecast traffic volumes.

According to the *Highway Capacity Manual* (HCM)[6], a one-foot reduction in lane width can cause, in some cases, up to a 3 percent reduction in capacity depending on signal spacing. Based on the amount of width needed to create the desired bicycle facility, a corresponding reduction

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2 AASHTO Policy, 2004. page 472

3 AASHTO Policy, 2004. page 473

4 Landis, Bruce W. et.al. "Real-Time Human Perceptions: Toward a Bicycle Level of Service" *Transportation Research Record 1578*, Transportation Research Board, Washington DC 1997.

5 AASHTO *Guide for the Development of Bicycle Facilities*, 1999, pp. 22-23.

6 *Highway Capacity Manual*, Transportation Research Board. Washington, DC, 2000, p. 16-11.

in capacity can be measured to determine whether desired motor vehicle LOS is still met. If desired motor vehicle LOS is met, lane restriping should be pursued.

3.2 Bicycle Level of Service

The Bicycle Level of Service Model, a bicycling conditions performance measure, is a "supply-side" criterion or an objective measure of the bicycling conditions of a roadway. The Bicycle LOS Model uses an evaluation of bicyclists' perceived safety and comfort with respect to motor vehicle traffic. This bicycling conditions performance measure or criterion is classified as the LOS for bicyclists that currently exists within the roadway environment. With statistical analysis, the Bicycle LOS Model can reflect the effect on bicycling suitability or "compatibility" due to factors such as roadway width, bike lane widths and striping combinations, traffic volume (some network segments within the City of Scottsdale were not evaluated because of the unavailability of volume data), pavement surface condition, motor vehicle speed and type, and the presence of on-street parking. Based on these data, a numerical bicycle LOS score is calculated and converted to a readily understood pseudo-academic (A-F) scale, with A representing the most compatible bicycling conditions and F representing the least compatible.

3.3 Facility Recommendations

Geometric and operational data were collected for the City's identified potential bicycle facility roadway segments. This data was used to produce an On-Street Bicycling Conditions Map (Potential Network) (Figure 6-2), showing the results of a bicycle LOS analysis for the study network (also shown in tabular format in Appendix 6-C). The restriping analysis was carried out based on these data and the guidelines set forth above. Restriping is a viable option for many of the evaluated segments. In cases where restriping would not be appropriate, alternative options were evaluated, and a recommended improvement type was identified. (These alternative options would be costlier than roadway restriping.) Each of the improvement types is defined and discussed below and shown in Figure 6-3: On-Street Bicycle Facility Restripe Guide.

3.3.1 Restripe Candidates

Based on the lane widths set forth in the restriping guidelines, many segments included in the evaluation have been deemed restripe candidates (Figure 6-3). Most of these roadways have enough pavement width to reduce vehicle travel lane widths, thereby creating space for a new bike lane or a paved shoulder. Additional restripe candidates were identified wherein the general lane widths would be reduced to 10.5 or 10 feet. These candidate roadways, which should be examined further only in cases where truck volumes are very low, are shown with their secondary recommendation (described below) in Figure 6-3, in the event that restriping is ultimately deemed infeasible. Two additional segments (Greenway-Hayden Loop south of Frank Lloyd Wright Boulevard and 94th Street between Thunderbird Road and 100th Street) are restripe candidates if one general use lane in each direction could be removed and an acceptable motor vehicle LOS (based on forecast traffic volumes) will be maintained. These restriping candidates should undergo additional review and analysis. Restriping roadways, where feasible, is a relatively inexpensive solution for improving bicycling conditions and should be considered before any other solutions. Seventy-six miles of potential restripe roadways have been identified (see Appendix 6-C for a list of these segments). For the remaining roadways where restriping is not a viable option, other alternatives have been explored; these alternatives are described in the sections below.

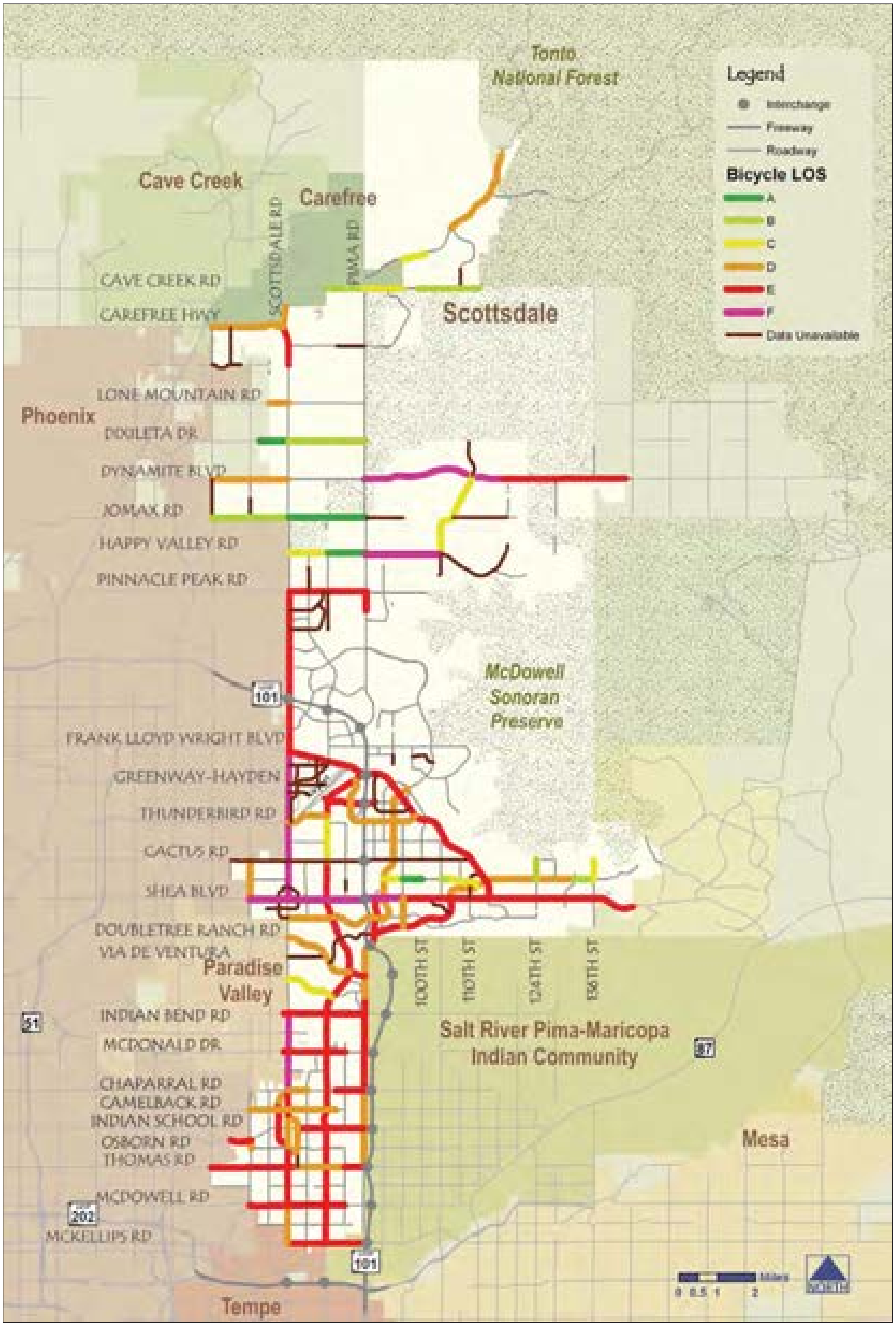

FIGURE 6-2: On-street Bicycling Level of Service (Potential Network)

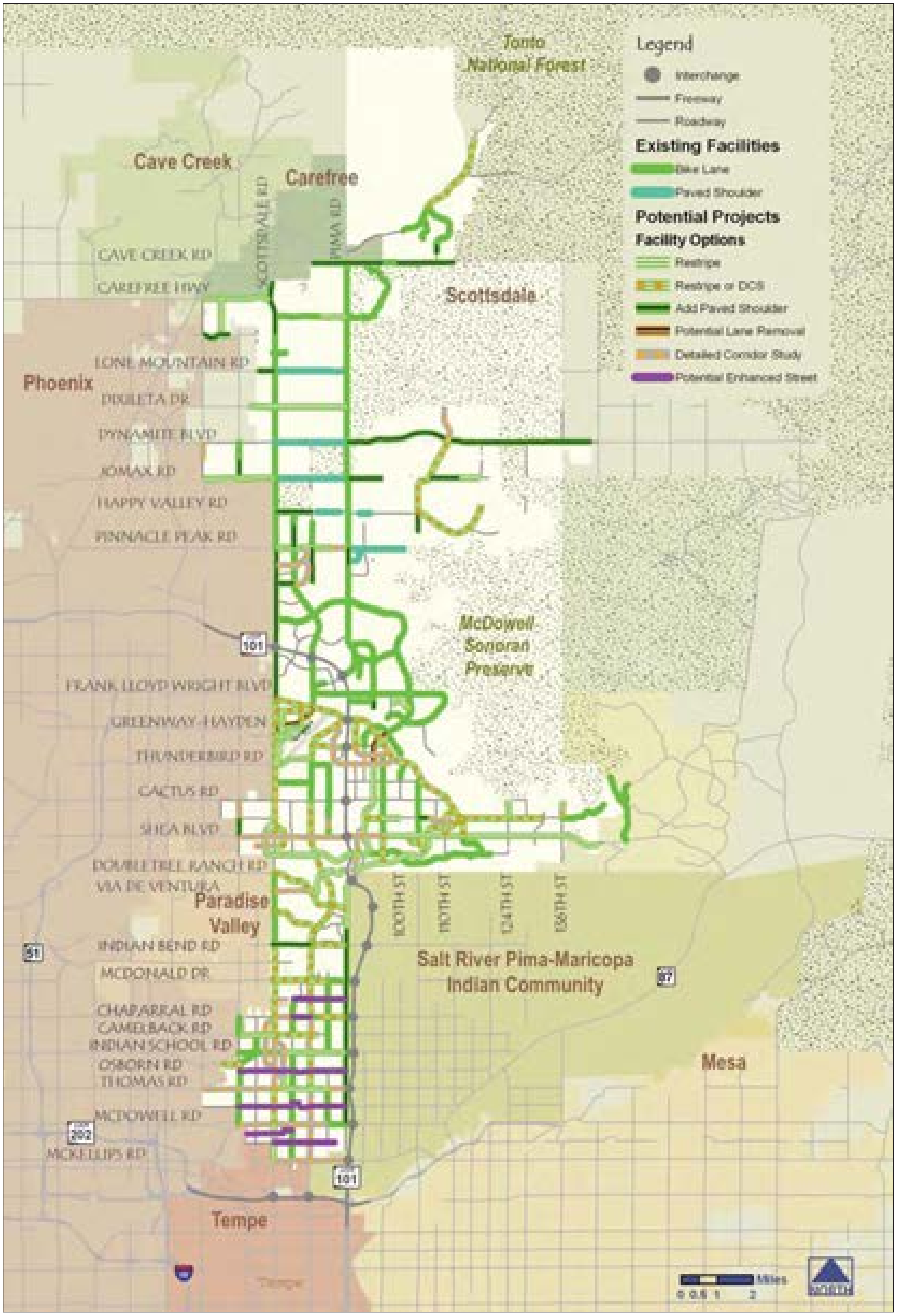

FIGURE 6-3: On-street Bicycle Facility Restripe Guide

3.3.2 Paved Shoulders

There are many miles of roadway in Scottsdale that are not equipped with curbs and gutters. Some of these roadways presently have low traffic volumes and are therefore already well suited for bicycling, and others have been named as "restripe candidates" because there is available width in the existing cross section to re-position the edge stripe. There are many of these open-shoulder roads that have no more room to give from the travel lane to the shoulder. Bicycling conditions on these roads could be improved, however, by the relatively inexpensive widening of their paved shoulders. If shoulders are developed on these segments, they should extend to a minimum of 5 feet beyond the existing outside lane edge striping. There are approximately 25 miles of roadway for which adding to the shoulder is the recommended strategy.

As these open-shouldered roads usually lie along undeveloped parcels (either at the margin of present development patterns or in an infill situation), it is very important that the City pay close attention to these segments over time. Given the continued growth expected in Scottsdale in the coming decades, it is likely that many of these roadway segments will be widened and lined with curbs. When this occurs it will be important to include adequate space for bicyclists in the altered cross section as is currently required in the DS&PM. Improved bicycle accommodation through the relatively simple act of broadening roadway shoulders will give the residents of and visitors to Scottsdale and the East Valley the opportunity to reveal the demand for more "complete" streets in the future.

3.3.3 Detailed Corridor Study

Many segments present minimal opportunity for improving bicycling conditions through either of the strategies mentioned above. Any tangible improvement to these segments will require extensive and detailed operational-level investigations of the constraints and opportunities along these corridors. Individual corridor studies will be needed to verify the extent of available rights-of-way as well as the design options which should be considered. There are approximately 26 miles of roadway that represent detailed corridor study segments.

3.3.4 Pedestrian/Bicycle Enhanced Street

There are no off-street corridors south of McDonald Drive that can easily be used for east-west pathway connections. Several streets provide conditions that may allow for a significant improvement to the pedestrian and bicycle facilities along them. These streets are primarily half-mile collectors between the major arterials. They include: Roosevelt, Belleview, Oak, Osborn, Chaparral, and Jackrabbit. No specific recommendations are being made at this time but improvements could include wide sidewalks, bike lanes, shared-use paths, additional shade, and traffic calming. A detailed plan for each street would be developed with significant input from residents and businesses along each of the corridors.

3.4 Prioritization Procedure

An objective prioritization procedure helps ensure that resources are allocated in a way that best serves the needs of the City's residents and visitors. One of the leading ways to prioritize candidate bicycle facility improvements is a neo-traditional Benefit-Cost Index. This is built upon standard benefit-cost ratios used in infrastructure investment planning and programming. It provides an indication of the relative value of improving a transportation facility with respect to other (candidate) transportation facilities. The results of a neo-traditional Benefit-Cost Index provide the City with an effective and easily defensible ranking list of improvements.

To evaluate potential bicycle facility improvements in Scottsdale, two measures of benefits have been incorporated into the analysis: the improvement to the roadway segment's bicycling conditions and the bicycling demand around the segment. For segments that have been identified as restripe candidates, the first benefit is measured by comparing the existing bicycle LOS score to the score resulting from the creation of a bike lane through the reallocation of existing pavement. The same approach is used to measure the improvement gained through the addition of paved shoulders. Measuring the potential improvement to bicycle conditions for segments identified as either detailed corridor study or Pedestrian/Bicycle Enhanced Streets is more challenging because the future outcome is less certain. In each case, an average assumed bicycle LOS was used. Specifically, a score of 2.0 (B on the assessment scale) was used for each segment. For detailed corridor study segments, it is assumed that any detailed study would involve significant roadway reconfiguration, and would therefore likely include standard-width bike lanes in the future scenario, leading to a better bicycle LOS. Pedestrian/Bicycle Enhanced Street segments would require specific evaluation of facilities, opportunities, and substantial public involvement in the design of these streets, but it could be assumed that the facilities would be enhanced, also leading to a better bicycle LOS.

Bicycle LOS addresses the "supply side" of bicycling conditions by quantifying whether bicyclists are accommodated. It does not, however, measure whether there is any demand for bicycling in a particular area. To measure potential bicycle demand, the latent demand method was used. Latent demand identifies how many people would likely use non-motorized modes to travel, if effective accommodation were universally provided, based on the proximity (and mix) of origins and destinations to study network segments (a more detailed explanation of the latent demand method is included in the Pedestrian Element of this *Transportation Master Plan*). By combining the improvement to bicycling conditions gained by making a facility improvement with the potential for bicycling in a given area, a complete picture of the likely benefits emerges.

In a situation where all bicycle facility improvement types have the same cost or when maintenance can implement improvements, those segments with the highest level of benefits (significantly improved bicycling conditions and high latent demand) would have the highest priority. However, the costs associated with the recommended improvements vary greatly. Specifically, roadway restriping is a very cost-effective way to better accommodate bicyclists, whereas constructing a sidepath or performing a detailed corridor study is much more costly. The assumed per-mile construction costs (2007) of the facility recommendations, which are based on costs estimated by communities throughout Arizona and the United States, are shown below:

- Roadway restriping - $8,500/mile (less when completed with standard maintenance)
- Addition of paved shoulders - $200,000/mile
- Detailed corridor study and rebuilt street – up to $2,000,000/mile

The ranked prioritization list contained in Appendix 6-C is designed to indicate where the City can get the most "bang for its buck." The list is shown in descending order of benefit-cost, such that the highest projects on the list should receive the most immediate consideration when funding becomes available. Naturally, if funding for a particular project becomes available through private development, or State or Federal sources, or if the project is a key "missing link" in the system, or can be accomplished through standard maintenance, that project should be pursued regardless of its placement on the prioritization list.

To create a viable long-term on-street bicycle network in the City of Scottsdale, two approaches are needed: retrofitting existing roadways and ensuring accommodation on future roadways. The prioritized facility recommendations above will help enable the City to retrofit existing roadways to improve bicycling conditions. To ensure accommodation on future networks, policies that ensure the inclusion of bicycle facilities are critical. Fortunately, many of these policies are already in place. According to the standard cross sections contained in the DS&PM, bike lanes are included in the design of all roadways classified as minor collector and above. One revision to the major arterial cross section would be to provide 6-foot bicycle lanes excluding curb and gutter on streets with speed limits of 50 mph or greater. A narrower bicycle lane would be allowed in retrofit situations. In addition, the Policy Element of this plan includes a Complete Streets Policy to further ensure that sufficient bicycle facilities will be provided.

4.0 OFF-STREET BICYCLE NETWORK

The off-street network consists of paved shared-use paths and unpaved shared-use trails. The unpaved trails were most recently addressed in the 2004 Scottsdale *Trails Master Plan*: On the Right Trail. All paved and unpaved facilities are open to all non-motorized users. Typically, equestrians avoid the paved paths, and roller bladers (in-line skaters) and cyclists on road bikes avoid the unpaved trails.

Shared-use paths[7] represent an important component of the overall bicycle network. They provide opportunities for riding among user groups who are not comfortable riding in the roadway (casual cyclists, children, families, and the elderly). There are two primary goals for the network of shared-use paths (or off-street facilities) in the City of Scottsdale: circulation and connectivity. The circulation goal is built on a vision of the network growing into a fully circulating (looped) network of shared-use paths that connect various priority trip origin points and destinations within the City, and also connect to major shared-use paths in neighboring communities. The connectivity goal is to build "spur" facilities that provide access from individual commercial districts or neighborhoods to the larger circulating system. The paths of this circulating and connected network will be designed to accommodate the mix of bicyclists, pedestrians, and other users who benefit from Scottsdale's existing shared-use path network. Circulation corridors and connectivity spurs have been selected based on their potential to connect certain priority origins and destinations to this system.

4.1 Priority Connections

Priority Trip Origins to be connected to this system are derived from the character types outlined in the City's *General Plan* Character and Design Element, and will be refined through the Streets Element of this *Transportation Master Plan*. These origins are the areas from which a high number of residents and visitors could begin their travels on the system of shared-use paths. They have been selected because their land use designations provide the density of residents or concentration of visitors whose use of the network will provide an optimum return on the investment in the network. The priority origin areas to be connected by this network include:

7 Scottsdale's City Code currently refers to such facilities as "multiuse paths" (Chapter 17, Article IV, Division 3). However, the term "shared-use paths" has become the national standard, as evidenced by its use in the AASHTO *Guide for the Development of Bicycle Facilities*. For consistency, it is therefore recommended that the City adopt the use of "shared-use path."

- Urban Character Residential Areas;
- Suburban and Suburban Desert Character Residential Area; and
- Resort Corridor and Resort Village Character Areas.

Priority Trip Destinations to be connected to the system are similarly derived from the character areas of the City of Scottsdale *General Plan*. These areas encompass Scottsdale's retail, entertainment, arts, and cultural districts. The priority destination areas include:

- Employment and Regional Cores;
- Tourism and Recreation Corridors;
- Downtown;
- Urban Character Areas;
- *General Plan*-indicated "Activity Centers";
- Regional off-street bicycle facilities as they enter Scottsdale from neighboring jurisdictions; and,
- McDowell Sonoran Preserve trailheads.

This system will consist of several fully circulating primary corridors, stretching the length and breadth of the City, with "spur routes" connecting the primary loops into neighborhoods and other districts. Development of future pathways on the circulation system can be evaluated based on various factors, including:

- calculating how much connected mileage they contribute to the system;
- connecting a new priority origin character area to the network;
- connecting a new priority destination character area to the network; and
- closing a circulating loop within the larger existing system.

Spur routes can similarly be prioritized to connect the circulating system to local destinations within individual neighborhoods or character areas. Such spur route priorities can include:

- improving access within a neighborhood to a school;
- improving access within a neighborhood to a park;
- connecting a school or park to the circulating system;
- extending a connection from the circulating network into a retail district;
- extending a connection from the circulating network into a Suburban or Suburban Desert Character Area;
- extending a connection from the circulating network into a Resort Corridor or Village; and
- extending a connection from the circulating network into an Urban Character Area, Downtown, or to a *General Plan*-indicated "Activity Center."

By concentrating the development of off-street bicycle facilities towards these parallel goals of circulation and connectivity, the City of Scottsdale can strengthen its position as one of the Southwest's great places to live, work, and play.

4.2 Primary Path Corridors

4.2.1 Indian Bend Wash Path

The Indian Bend Wash Path is the most popular and well-known shared-use path in Arizona. It begins in Tempe at the Salt River and travels north in the Indian Bend Wash to Indian Bend Road. At this point it follows several street and drainage corridors to the northeast and reaches the CAP Canal at Horizon Park. Scottsdale's section of the Indian Bend Wash Path (north of McKellips Road) is roughly 14 miles. There is an unfinished gap between Shea Boulevard and Cactus Road that is currently under design. This path serves as the backbone of the City's off-street network. Nomenclature for the path is confusing north of Indian Bend Road. One segment is called the Camelback Walk Path and another is referred to as the 96th Street Path. This entire corridor should be assigned one name with the likely choices being the Indian Bend Wash Path or the Indian Bend Path.

4.2.2 Crosscut Canal Path/Arizona Canal Path

The Crosscut and Arizona canals are components of the Salt River Project canal system. The Crosscut Canal flows from the Arizona Canal at Indian School Road and 64th Street south to Canal Park at McKellips Road and College Avenue in Tempe. A paved path was constructed from Oak Street to Papago Park in the 1970s and featured the Valley's first grade-separated bicycle/pedestrian tunnel under McDowell Road. The reconstruction of this path and the tunnel approaches has just been completed and the next phase from Thomas Road to Indian School Road is currently in design.

The Arizona Canal runs over 38 miles from Granite Reef Dam on the Salt River to the New River in Peoria. Approximately 6 miles of the facility are located in Scottsdale. The Maricopa County Board of Supervisors designated it as a segment of the Sun Circle Trail in 1964. All the cities along the corridor have committed to maintain equestrian access along the route. The segment from Pima Road to the Indian Bend Wash has a completed paved path and other projects are in some phase of planning, design, or construction throughout the route within Scottsdale.

The City recently completed the *Draft Canal Corridor Study*[8] to provide guidance for developing the paved pathway along the Arizona and Crosscut canals. It identifies which bank the path should be located on, the locations for potential pedestrian bridges, and other issues related to the pathway and corridor development.

4.2.3 Central Arizona Project (CAP) Aqueduct Path

The CAP Aqueduct system was constructed by the Bureau of Reclamation (BOR) and is operated by the Central Arizona Water Conservation District (CAWCD). The CAP is a 336-mile-long system of aqueducts, tunnels, pumping plants, and pipelines and is the largest single source of renewable water supplies in the state of Arizona. The CAP is designed to bring about 1.5 million acre-feet of Colorado River water per year to Pima, Pinal, and Maricopa counties. This water delivery system reaches from Lake Havasu to south of Tucson. As part of recreational planning for the CAP Aqueduct, BOR committed itself to maintain a 20-foot recreation corridor throughout the project.

In April 2004, the *Feasibility Study for a Multi-use Path along the CAP Aqueduct System*[9] was completed through the participation of the state of Arizona, BOR, Maricopa County, and the cities of Mesa, Peoria, Phoenix, and Scottsdale. This study provides a detailed analysis of the pathway corridor from the Waddell turnout in Peoria to the southern boundary of Mesa.

The Scottsdale segment comprises approximately 9.2 miles of the total 53-mile study corridor length and is primarily developed land along the existing adjoining properties to the Aqueduct

8 City of Scottsdale, Draft *Canal Corridor Study*, 2007

9 Initiated by the Governor's Arizona Bicycle Task Force in 1986. For copies contact Reed Kempton at the City of Scottsdale or any of the participating agencies.

ROW. In general, along the south side of the Aqueduct within the Scottsdale segment, there is one CAP check control structure within the CAWCD security fence to go around, six existing major arterial roadway crossings (Scottsdale Road, Greenway-Hayden Loop, Thompson Peak Parkway, Cactus Road, Via Linda, Shea Boulevard, and 124th Street), one highway/freeway crossing (Loop 101), and an existing 1.1-mile retaining wall along the existing CAWCD security fence line.

4.2.4 Power Line Path

The Power Line Path begins at WestWorld and follows the power line corridor northwest to Scottsdale Road just north of Deer Valley Road. The segment between Thompson Peak Parkway and Deer Valley Road already exists. Grade-separated crossings for the future path were provided during major roadway construction of Pima and Hayden roads.

4.2.5 Pima Path

The Pima Path is a unique combination of bike routes and paths that provides nearly 9 miles of bicycle facilities along a north/south corridor south of Shea Boulevard. By providing short sections of pathways near the arterial intersections, Scottsdale was able to connect the residential access roads parallel to Pima Road for use by bicyclists and pedestrians. A major section of this corridor has just been rebuilt with a widened path and a new bridge over Via Linda. Sections of the Pima Path also exist north of the Loop 101.

4.3 Shared-use Path Prioritization Criteria

Nearly 300 shared-use path segments have been identified as potential locations and prioritized for future construction. The segments include both circulation corridors and spur corridors, as defined in Section 4.1, as well as even shorter connections. Some of the proposed facilities would be sidepaths (located within the ROW of an adjacent roadway), while others would be independently aligned paths (located outside of any existing roadway ROW). Each of the identified corridors has been prioritized based on three criteria: the potential demand in the vicinity of the corridor, the existing bicycling conditions on parallel roadways, and the potential for connections to the City's existing bicycle network. These criteria are discussed in greater detail below.

> While this plan recommends sidepaths in some locations, it is important to note that any sidepath project must be considered with a great deal of caution. While sidepaths are popular with some cyclists and appear to many as an appropriate bicycle facility alternative, crash statistics and operational challenges from across the United States and around the world provide ample warning that, in many settings, they are not. The AASHTO *Guide for the Development of Bicycle Facilities* identifies potential problems associated sidepaths that should be considered when these facilities are being designed.[10]

4.3.1 Potential Demand

Higher priority should be given to paths that will likely attract a significant number of users and that are located within urban, employment, and suburban *General Plan*-identified Character Areas. This criterion is measured by the latent demand[11] immediately surrounding the corridor.

10 AASHTO *Guide for the Development of Bicycle Facilities*, 1999, pp. 33-35.

11 The theory and methodology of the latent demand analysis are explained in detail as part of the Pedestrian Element of this Plan.

The latent demand analysis was originally performed for on-road segments that are part of the bicycle study network. In cases where a potential shared-use path corridor coincides with an on-road study network segment, the demand score is simply applied. In all other cases, potential demand for off-street corridors is estimated by interpolating the latent demand results of the bounding on-street segments. Among other factors, the latent demand method takes into account the proximity (hence connectivity) of a corridor to parks and schools. In addition, the latent demand results have been found to coincide closely with the priority character areas. As such, corridors with high levels of potential demand are also those that provide connections to identified priority destination areas.

4.3.2 Existing Bicycling Conditions

Where on-road bicycling conditions are poor, shared-use paths can frequently offer travelers a more comfortable way to reach their destinations. In these cases, a well-designed path (whether a sidepath or otherwise) has greater potential for increased use because of the lack of viable alternatives. The quality of existing conditions is measured by the bicycle LOS provided on the nearest parallel collector/arterial route (or a combination of multiple routes, if appropriate).[12] In this prioritization analysis, those corridors with the worst parallel on-road bicycling conditions receive the highest score for this criterion.

4.3.3 Connectivity to the Existing Network

Although certain components of a potential corridor's benefit to the transportation system's "connectivity" are covered by the latent demand criterion (e.g., connectivity to parks, schools, and priority destinations), connectivity to the existing bicycle network is a separate issue. Accordingly, this component of the prioritization addresses whether and to what degree proposed path corridors would connect to existing bicycle facilities of various types. Specifically, each corridor segment has been evaluated to see whether it would intersect with other shared-use paths (4 points, if yes), bike lanes and paved shoulders (3 points), existing bike routes (1.5 points), local streets (1.0 point), and future paths (0.5 points). Naturally, longer segments have a greater potential to intersect other existing facilities; however, this situation is appropriate because longer segments have a greater ability to provide long-distance connections and they frequently are part of the important circulating network of potential paths.

4.3.4 Shared-use Path Prioritization Procedure Results

All potential paths received a score between 10 (high) and 0 (low) for each of the designated criteria. The scores were then weighted based on the relative significance of the criteria (50 percent for potential demand, 30 percent for existing bicycling conditions, and 20 percent for connectivity to the existing network). The results were used to create three priority "tiers," with Tier I having a higher priority than Tier III. These are shown in tabular format in Appendix 6-D (sorted by Path ID) and Appendix 6-E (sorted by Tier); both appendices are included in this section. They are shown in graphical format in Figure 6-4. These tiers represent the relative benefit[13] of the paths and give the City an approximation of construction priorities, keeping in mind that opportunities to construct specific paths should always be taken when opportunity arises, regardless of the path's placement in this prioritization analysis.

12 While levels of service were not calculated for on-road segments with existing bike lanes, such roadways are assumed to have an ideal ("A") condition for this analysis.

13 Unlike the on-road prioritization process, which incorporates a facility cost based on the various identified facility types, all paths are assumed to have the same unit construction cost.

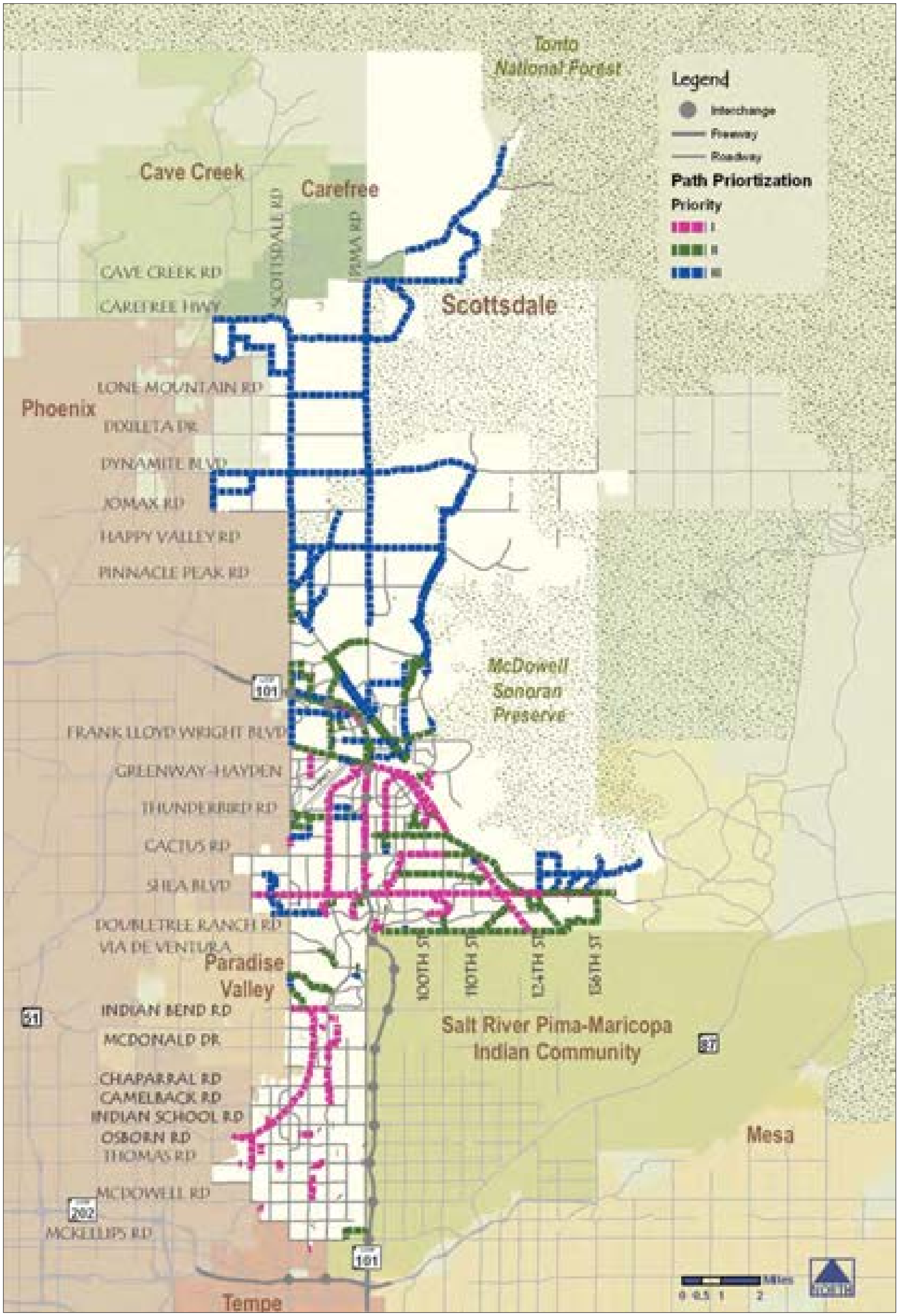

FIGURE 6-4: Path Priority Tiers

4.4 Grade-separated Crossings

A grade-separated crossing is an underpass, overpass, or bridge that allows motorized and nonmotorized traffic to avoid any interaction at street crossings or intersections. Grade-separated crossings are encouraged where paths and trails intersect major streets.

Grade-separated crossings should be required on new construction where major roadways cross a trail or path. When new drainage culverts are designed, the design should accommodate a path and trail and should consider the needs of bicyclists, pedestrians, and equestrians.

4.5 At-grade Crossings

Where grade-separated crossings are not viable or necessary, at-grade crossings can be used.

4.5.1 Signalized At-grade Crossings

In the absence of a grade-separated crossing, a signalized crossing should be considered if warranted. The MUTCD provides warrants for the installation of traffic signals. Any of the warrants described in the MUTCD can be used for pathway/roadway intersections. When using vehicular warrants, however, only bicyclists should be considered as volume on the path. Alternatively, bicyclists can be counted as pedestrians for the application of the Pedestrian Volumes warrant.

4.5.2 Unsignalized At-grade Crossings

In many locations and for many reasons, grade separation and/or signalization may not be feasible or warranted. There are several specific treatments that can be incorporated at designated crossings that will give path and trail users a greater sense of security, comfort, and convenience. These treatments are considerably less costly than grade-separated crossings. Two primary criteria are used to determine if a designated mid-block pathway crossing may be appropriate at a given location:

- Roadway geometric characteristics:
  - sight distance
  - proximity to intersections
- Pathway user volumes converted to:
  - pedestrian delay represented by the additional distance the pathway user is required to travel to an intersection crossing.

If a designated mid-block pathway or trail crossing is therefore determined to be the appropriate solution, specific intersection characteristics must be further evaluated to determine the appropriate crossing treatment(s). The intersection characteristics include:

- the number of lanes
- presence of a median
- motor vehicle travel speed
- traffic volume

Streets with many lanes, higher traffic speeds, and higher traffic volumes would better accommodate bicyclists and pedestrians with the use of a greater number of design treatments such as:

- raised median
- pedestrian refuge
- ladder or continental style marked crosswalks
- staggered crosswalks or Danish offsets
- pedestrian crossing warning
- advanced pedestrian crossing warning signs
- yield to pedestrian signs
- advance yield lines
- appropriate pedestrian scale lighting
- experimental treatments and devices

4.6 Improving Existing Facilities

Scottsdale has a number of existing paths and bridges that were built prior to the Americans with Disabilities Act and using a different set of guidelines than those in place today. These facilities should be evaluated for widths, slope, cross slope, access ramps, and other accommodation issues.

By 2009, the City shall complete an analysis regarding public restrooms in areas where commercial facilities are not available for use by business patrons. Items to examine include construction and maintenance costs as well as available alternatives.

5.0 EDUCATION, ENCOURAGEMENT, AND ENFORCEMENT

Education is an important element in increasing bicycling while improving safety. As discussed in Section 2.2 Bicycle Crash Analysis, educational and enforcement countermeasures can be effective in reducing the number and severity of bicycle/motorist crashes. Education goes hand-in hand with encouragement to increase cycling; together they improve skills and raise awareness. The greater the presence of bicyclists on the road, the more aware motorists will become.

5.1 City of Scottsdale "Bike Map"

Scottsdale's bike map provides guidelines for cyclists using on- and off-street bicycle facilities, along with information about existing bicycle facilities. The bike map is frequently updated providing a regular opportunity to update safety and educational information. The following information is on the current City of Scottsdale Bike Map (October 2006).

5.1.1 On-street Bikeways – Share the Road

- Ride defensively – prepare for the unexpected and plan alternative maneuvers to avoid conflict. Rules alone do not always protect bicyclists from injury. Be alert. Be visible. Be safe. Ride predictably.
- Obey traffic signals and signs – As a vehicle, bicycles must obey all the rules of the road. Cyclists have the same privileges and duties as other traffic.
- Use appropriate lane – Avoid being in a right-turn-only lane if you plan to proceed straight through. Move into the through lane early.
- Beware of car doors – Be wary of parked cars. Motorists can unexpectedly open doors. Be sure your bike is a car door length away from parked cars.

- Use lights at night – Always use a strong white headlight, rear light, and red reflector at night or when visibility is poor.
- Scan the road behind – Look over your shoulder to check behind you regularly and use a mirror to monitor traffic. Although bicycles have equal right to the road, be prepared to maneuver for safety.
- Ride on the right – Ride on the right with the flow of traffic. Never ride against traffic on the road, in a bike lane, or on a sidewalk.
- Turning left – two options – As a vehicle, signal your intentions in advance. Move to the left-turn lane and complete the turn when safe. As a pedestrian, ride to the far crosswalk and walk your bike across.
- Use hand signals – Signal all turns and stops ahead of time. Check over your shoulder, then make your turn/stop when safe to do so.
- Make eye contact – Confirm that you are seen. Establish eye contact with motorists to ensure that they know you are on the road. Share the road in a polite and courteous manner.
- One person per bike – Riding double is only permitted when carrying a child in an approved carrier or when riding on a tandem bicycle.

5.1.2 Shared-use Paths

- Keep to the right on paths – All path users must keep to the right except when passing or turning left. Move off the path to the right when stopping.
- Signal to others – Cyclists, when approaching others, sound your bell or horn early, then pass safely on the left. Pedestrians, acknowledge with a wave when someone is overtaking.
- Right of way – Cyclists and in line skaters must yield to pedestrians. Pedestrians always have the right of way.
- Control your pet – Scottsdale ordinances require pets to be leashed while on the path and owners to clean up after their pets.
- Earphone dangers – Keep the volume sufficiently low to be able to hear other path users approaching.
- Merge correctly – Look both ways. Yield to through traffic at intersections.
- Respect nature – Do not disturb or feed wildlife. Keep to well established paths to protect habitats. Do not collect plant or animal material.
- Where to skate – Follow the same rules as cyclists. Ensure your stride does not cross the center of the path.
- Be visible – Outfit your bicycle with a headlight, rear light, and reflectors as you would for riding on the road.
- Flooded paths – Many of our paths are in flood channels. Do not enter when water is present.

5.1.3 Sharing the Trail

- Respect the land, stay on designated trails.
- Avoid wet or muddy trails. Save them for future trips when they are dry.
- When approaching horses, announce your presence, STOP, and ask if it is safe to pass, but don't make any sudden movement or noise that may cause a horse to spook.
- Don't cut switchbacks, take shortcuts, or create new trails.
- Keep to the right of the trail. Save the left for passing. Always announce your intentions when passing.

- Be aware of persons with disabilities and respectful of their needs. All users yield to persons with disabilities.
- Downhill traffic yields to uphill traffic. Listen for other trail users and stand off to the side of the trail to allow uphill users to pass.
- Slow down when sharing the trail. Adjust your pace when approaching other users. Travel at a speed appropriate for the conditions. Always travel at a speed that allows you to be in control.
- When in a group, travel single file and don't block the trail. Allow room for other users.
- Keep pets under control and/or on a leash when on a trail.

5.1.4 Theft Prevention

Most bicycle thefts are due to unlocked or improperly locked bikes. Following these tips will help prevent your bike from being stolen:

- Never leave your bike unlocked, not even for a few minutes.
- Always use a high quality U-lock, chain or cable.
- Always lock the frame and front wheel to either a rack or pole.
- For extra security, remove the front wheel and lock it with the frame and rear wheel.
- Register your bicycle with the Scottsdale police at www.ScottsdaleAZ.gov

5.2 Community Activities That Encourage/Promote Bicycling

Scottsdale has several programs and events in place to actively encourage or promote bicycling. Our B.I.K.E.S. program provides free bikes to City employees who agree to ride them to work. Handlebar Helpers is a community "earn a bike" and apprentice program that recycles bikes and trains young people in bike repair. Cycle the Arts and Bike to Work days promote and celebrate cycling in Scottsdale. The following are current cycling promotions and recommended additional methods to promote and encourage cycling.

5.2.1 Events

Cycle the Arts

Cycle the Arts is a uniquely Scottsdale annual family bike ride which tours part of Scottsdale's extensive public art collection with guides from the Scottsdale Cultural Council. The third annual Cycle the Arts event will be held in 2008.

Bike to Work Day

Bike to work is an annual event with employees riding approximately 4 miles to City Hall with elected Officials, Police Bike Unit members, and peers. Riders are eligible for prizes.

Safe Routes to School (Walk/Bike to School)

As an initial step towards a SRTS program, the City of Scottsdale encourages schools to participate in the annual Walk/Bike to School Day. At the 2006 and 2007 Walk/Bike to School Day events, coordinated with Grayhawk Elementary School, an estimated 75 percent of the students participated. The event is a partnership among City departments, school districts and parents, teachers, and school staff. The Pedestrian Element and Policy Element of the *Transportation Master Plan* encourage additional resources dedicated to this program to expand its scope and encourage more schools to participate citywide.

Bike Rodeos

The City of Scottsdale Police bike unit, working with Scottsdale Unified School District, organizes several bike rodeos and safety presentations each year for school age children. An average of ten schools participate each year. Safety presentations and a bike obstacle course are provided for the students. Safety information brochures and booklets are distributed to all participants

5.2.2 Educational/Promotional Opportunities

CityCable 11

There are several opportunities for educational and promotional announcements regarding cycling on the City of Scottsdale cable television station:

- Chief of Police weekly television show on the City's cable television show
- Public service announcement on Arizona's 3-foot passing law
- Let's Get Moving Transportation program discusses transportation related topics including cycling

Instruction

Local bike clubs, organizations, and shops offer educational opportunities for adult cyclists with instruction by LAB members available.

SCC annually holds a course called Mountain Biking the Southwest which covers basic skills and techniques for mountain biking. The course includes bicycle maintenance techniques, trail etiquette, and safety considerations.

Through the Scottsdale Unified School District parent/teacher handbook, information on school guidelines for bicycle, roller blade, skateboard, and scooter use is provided to each student. The school district requires a signature from parents for each student affirming students received the handbook.

The City of Scottsdale Web page contains information on cycling, bicycling safety, bicycle registration, the City's Bike Map, and a Report a Problem feature which addresses routine bicycling issues.

Additional information about Scottsdale's current cycling activities and information are contained in the LAB application in Appendix 6-A.

5.3 Enforcement

The Scottsdale Chief of Police has met personally with local bicycle advocates to discuss the concerns of cyclists in the community. Police officers get traffic law training in the Police Academy which includes bicycle laws. The City currently has nine officers and two sergeants assigned to the Scottsdale Police Bike Unit and Downtown squads.

Bicycle law enforcement can take any of several forms – citations, written warnings, verbal warnings, and positive reinforcement (to encourage and reward safe riding behavior). Enforcement plays an important role in enhancing overall traffic safety – this applies to all travel modes.

It is recommended that the City continue to coordinate an effective bicycle law enforcement program to enhance the safety of all users.

6.0 DETECTION OF BICYCLES AT TRAFFIC SIGNALS

This section addresses various issues related to detecting the presence of bicyclists at traffic signals and is augmented by information found in Appendix 6-I. First, the general need for such detection is established by citing relevant portions of the MUTCD. Then this section discusses locations where detection strategies will need to be tailored to detect bicycles.

6.1 Background

The detection of bicycles on the approaches of signalized intersections is an important provision in a bicycle transportation network for multiple reasons. First, the MUTCD requires traffic signals to be adjusted to consider the needs of bicycles.[14] Of equal importance is the fact that signals which cannot detect bicyclists impact both the safety of cyclists and the attitudes of motorists.

The MUTCD states:

> Standard:
> At installations where visibility-limited signal faces are used, signal faces shall be adjusted so bicyclists for whom the indications are intended can see the signal indications. If the visibility-limited signal faces cannot be aimed to serve the bicyclist, then separate signal faces shall be provided for the bicyclist.
>
> On bikeways, signal timing and actuation shall be reviewed and adjusted to consider the needs of bicyclists.

It is undoubtedly important for bicyclists riding on roadways to be able to see the traffic signals for their approaches. This discussion, however, focuses on the second part of the MUTCD standard, the requirement to review and adjust signal actuation in consideration of the needs of bicyclists.

Non-responsive signals, at which cyclists cannot get a green signal, can cause unsafe behavior by cyclists. Bicyclists can be frustrated by traffic signals which will not detect their bicycles. Non-responsive signals can cause significant delays, and when delayed long enough bicyclists will typically ride through the red signal. While this is not an illegal behavior[15], it can contribute to cyclists choosing to disregard other signals which might actually be responsive to their presence. This conditioned disregard for signals can lead to crashes. Signals which do not respond to the presence of bicycles can also adversely affect motorists' attitudes toward bicyclists as followers of the rules of the road.

Traffic signals are usually installed because there are relatively high traffic volumes on both the main road and side street. This means that throughout most of the day, and most of the week, there is an adequate volume of motor vehicles on any particular approach to call the green signal.

14 *MUTCD*, Section 9D.02 Signal Operations for Bicycles, FHWA, Washington, D.C., 2003.

15 28-645. Traffic control signal legend. (ARS) -- C. The driver of a vehicle approaching an intersection that has an official traffic control signal that is inoperative shall bring the vehicle to a complete stop before entering the intersection and may proceed with caution only when it is safe to do so. If two or more vehicles approach an intersection from different streets or highways at approximately the same time and the official traffic control signal for the intersection is inoperative, the driver of each vehicle shall bring the vehicle to a complete stop before entering the intersection and the driver of the vehicle on the left shall yield the right-of-way to the driver of the vehicle on the right.

However, at some intersections, or during off-peak times (i.e., at night, in the early morning, on weekends) this may not be the case. In these situations, the signal detection hardware should be configured so that bicyclists can be detected. The following identifies situations where the detection of bicyclists is an important consideration, how signal loops detect bicyclists, and how signalized intersections can be improved to consider the needs of bicyclists.

6.2 Important Locations for Bicyclist Detection

Just as detection of motor vehicles is not necessary for all movement approaches to signalized intersections, the same is true for the detection of bicycles. A discussion of which approaches may or may not need to be able to detect bicycles is provided below.

Through Movements

Typically, signals along arterial roadways are programmed to "rest on green" for the arterial roadway. This means that if the signal hardware does not detect a vehicle on a side street approach, the signal facing the arterial roadway will remain green indefinitely. At other roadway intersections, however, signals are programmed for "automatic recall," which gives each approach through movement a green signal every cycle, whether a vehicle is detected or not. On arterial roadways employing either of these two approaches to signal timing, it is frequently not necessary to be able to detect a bicycle (or any other vehicle) on some through movement approaches for the purposes of providing a green signal. Automatic recall is not the norm for travelers on non-arterial side streets. Consequently, if through-moving cyclists on a side street are not detected by the signal hardware, they will not receive a green light and will then likely treat the signal like a STOP sign type control. Therefore, on signalized intersections without automatic recall, the signal hardware should be adjusted to detect cyclists.

Right-turn Movements

In right-turn lanes it may not be necessary to detect bicyclists; the ability to perform a right-turn-on-red provides ample opportunity for bicyclists to turn. As was described earlier, during those time periods when traffic volumes on the cross street are so high as to prevent a right-turn-on-red, there is also likely to be detectable motor vehicle traffic on the approach the cyclist is using, sufficient to call the green light for that approach. If, however, there is a prohibition against right-turns-on-red, then the detection of bicyclists once again becomes an important consideration.

Left-turn Movements

On roadways with automatic recall, it may not be necessary for hardware to be able to detect bicyclists in left-turn lanes that have a permitted or protected/permitted operation. This is for the same reasons as stated for the right-turn lanes: under low volume conditions, the permitted left turn should provide adequate opportunities to turn and under higher volume conditions motor vehicles will likely be present to call the signal.

In those left-turn lanes that provide for protected-only left turns the signal hardware should be able to detect bicycles; the same is true for left-turn lanes on roadway approaches that are not set up for automatic recall.

Figures 6-5 and 6-6 show those movements where the detection of bicycles is an important consideration.

Additional detailed information regarding bicycle detection is located in Appendix 6-I.

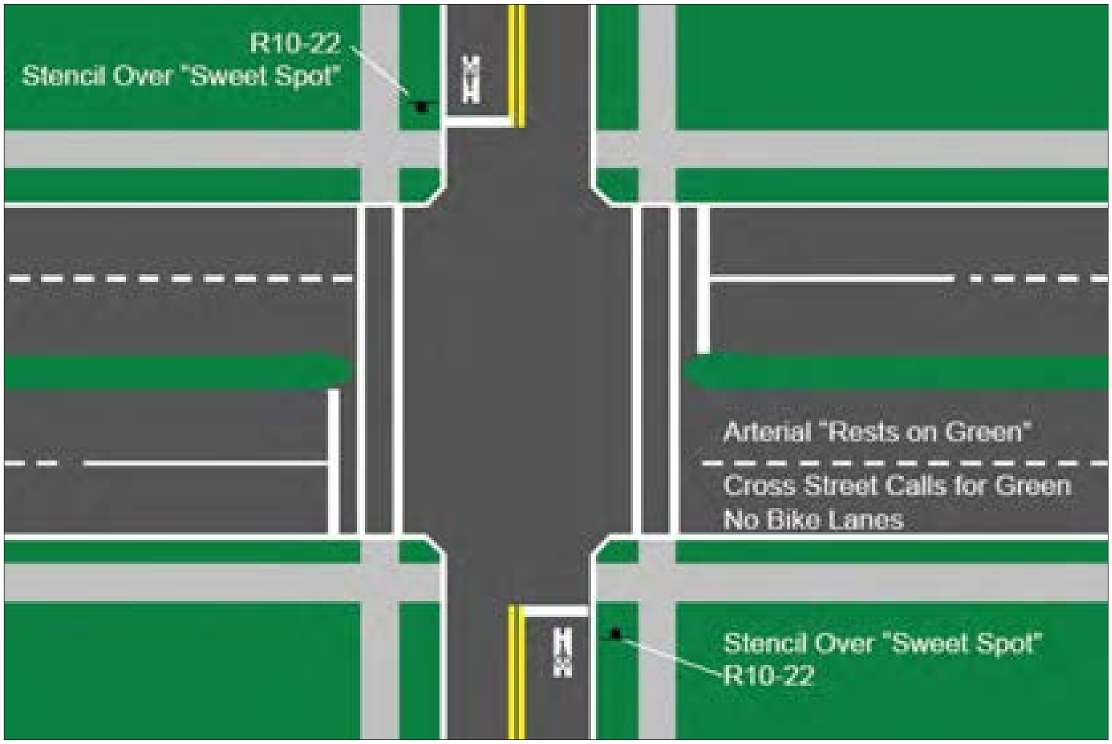

FIGURE 6-5: Detection Considerations on Cross-streets Without Marked Bike Lanes

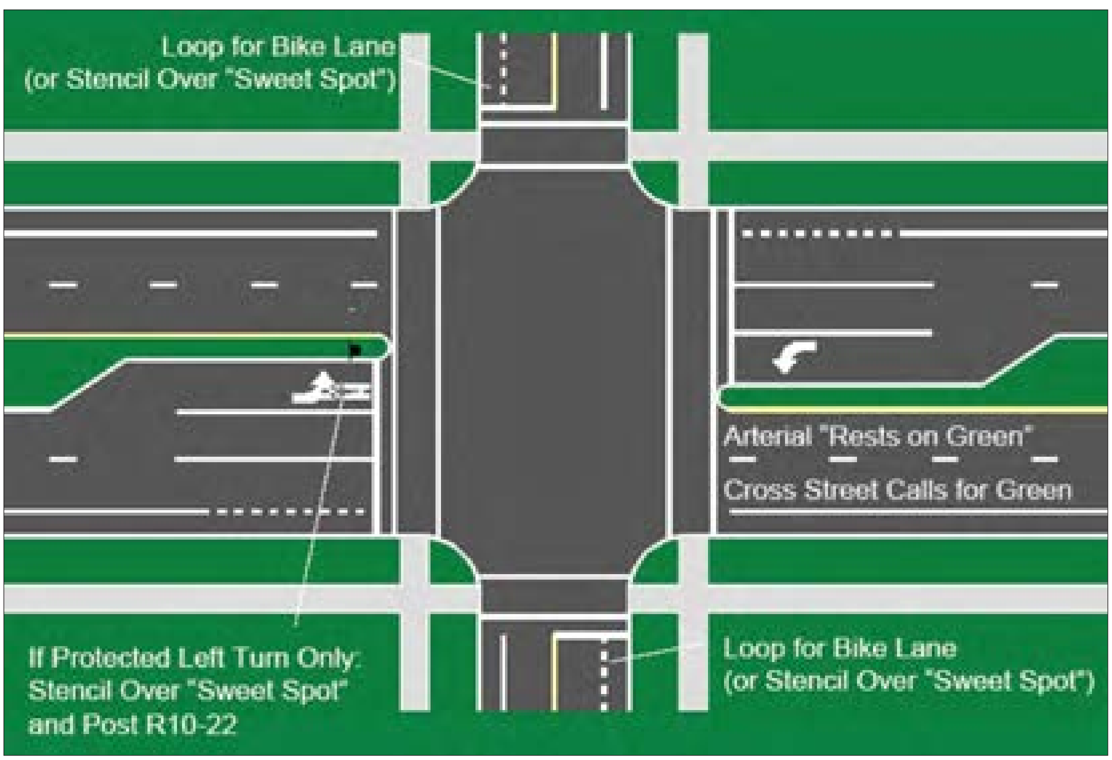

FIGURE 6-6: Detection Consideration on Cross-streets With Marked Bike Lanes and Arterials With Protected Left-turning Movements

7.0 BICYCLE TRAVEL DEMAND MANAGEMENT

Significant portions of this Bicycle Element advance the accommodation of bicycling in the transportation network's public ROW. However advanced this initiative, confined to the public rights-of-way, it is not enough for success in encouraging the use of the bicycle mode or enhancement of the City's aesthetic environment - it will fall short of its investment goals unless it is coupled with changes in Scottsdale's land use, "end of trip" provisions within the destinations of bicycling trips, and transportation choice programs. A quarter century of nationwide research, opinion and behavioral surveys, and Scottsdale's very own experience underscore this fact. Thus, bicycle mode encouragement, in the form of "end of trip" provisions, is outlined herein.

The two most common "end of trip" provisions cited in nationally prominent opinion surveys as influencing the choice to bicycle for transportation are bicycle parking and the workplace provision of locker/showers. In Scottsdale, the first is required in Scottsdale's Zoning Code, specifically **Article IX, Sec. 9.103. Parking requirements, the second as an incentive in Sec. 9.104. Programs and incentives to reduce parking requirements.** Observation of codes throughout the Phoenix vicinity, Arizona, and many metropolitan areas in the United States confirms that bicycle parking being required along with land development is increasingly prevalent. Minimal change is needed in Scottsdale's codes with respect to required amounts of bicycle parking (one U-shaped rack for every 20 auto spaces). However, workplace bicycle lockers, as well as change and/or shower facilities, are not being constructed. It appears that the current incentives, which allow for up to a 5 percent reduction, up to a maximum of 10 vehicular parking spaces, are insufficient. Thus there are two options: increase (or change) the incentives or mandate the facilities. It is recommended that by 2010 the City reassess the current incentives program and determine whether additional incentives, or more extensive mandates, should be developed.

8.0 WAYFINDING

The City of Scottsdale should develop a wayfinding plan for bicycle and pedestrian networks. The existence of wayfinding signs on paths and trails is an important amenity to users. Signs increase comfort, assist navigation, warn of approaching roadway crossings, and guide users through diverse environments. Its purpose is to direct people and provide information about destinations, directions, and/or distances. When applied on a regional level, wayfinding can link communities and provide consistent visual indicators to direct bicyclists to their destinations along the route of their choice. Wayfinding signs can achieve public objectives, such as promotion of community's attractions, education, mile marking, and directional guidance. A good wayfinding system functions to achieve the following purposes:

- Help people find destinations from all travel modes
- Establish clear pathways through the use of signs, maps, and other landmarks
- Carry messages that are user-friendly and understandable

People are the single most important component in developing a wayfinding strategy. By identifying user patterns and destinations, wayfinding users understand how the street or trail system operates and how to move through spaces and get directed to their destinations. In designing a wayfinding strategy or system, the following questions need to be considered:

- Where are the facility users going?
- What do the users or visitors want to see and hear?

- Is the goal navigation, directional information, orientation, location information, or interpretation?
- Who are the people who are going to use the wayfinding system?
- Is a clear message being sent by the signs?

There are three general objectives in a wayfinding signs system. When determining sign locations and messages, achieving these objectives should guide the wayfinding plan.

1. **Get people to the paths or trails.**

Promote the trail system by linking people from the community to the neighborhoods. This promotes the trail system as both a destination to enjoy and a transportation route.

2. **Warn motorists that there may be pedestrians or bicycles on the roadway.**

Use cautionary and safety messages to increase motorists' awareness of pedestrians and bicyclists. Walking and bicycling are an important component of the transportation system and should be respected by other modes of transportation. However, since bicyclists are more vulnerable to injury in a collision with an automobile, motorists should pay particular attention to their presence and safety.

3. **Inform people how to get around the network.**

Guide bicyclists and pedestrians through the trail network, assisting their decision-making ability at intersections and decision points. Show a route or trail's role in larger network visually through maps. Utilizing a sign hierarchy can emphasize certain types of messages.

Information on the latest wayfinding recommendations for bicycles from the National Committee on Uniform Traffic Control Devices (NCUTCD) can be found in Appendix 6-G. Details on their recommendation for mile markers for paths and trails are in Appendix 6-H. Both documents have been approved by the NCUTCD and are expected to appear in the next edition of the MUTCD. The most current versions should be used when they are available.

9.0 RECOMMENDATIONS

This section lists recommendations that will implement the goals and objectives of the Bicycle Element of the *Transportation Master Plan*. Bicycle goals are found in Section 1.0.

9.1 Systematically Implement Bicycle Facility Projects.

Identify projects for the upcoming CIP cycle using the priorities and Tier I, Tier II, and Tier III rankings of potential on- and off-street facilities. Section 2.0 On-Street Bicycle Network and Section 3.0 Off-Street Bicycle Network detail the prioritization process and recommended projects can be found in Appendices 6-C, 6-D, and 6-E.

- Fund and implement a continuous north/south path from the Salt River to the Tonto National Forest.
- Fund and implement a continuous east/west path using the CAP Canal corridor.
- Pursue lane restriping for on-street facilities.
- Implement enhanced bicycle/pedestrian corridors for identified streets in Scottsdale (Section 3.34).

9.2 Revise Terminology to Reflect National Norms.

Scottsdale's City Code currently refers to off-street paved facilities as "multiuse paths" (Chapter 17, Article IV, Division 3). However, the term "shared-use paths" has become the national standard, as evidenced by its use in the AASHTO *Guide for the Development of Bicycle Facilities*. For consistency, it is recommended that the City adopt the use of the term "shared-use path."

9.3 Develop a Bicycle Facility Wayfinding Program.

9.4 Create and Maintain an Inventory of Bike Racks at City-owned Facilities.

The latest design guidelines for bike racks should be used. The City should inventory and replace noncompliant racks at city-owned facilities with inverted "u" style racks.

9.5 Develop a Bicycle Signal Recognition Implementation Program.

9.6 Evaluate the Existing Path Network for ADA Universal Design and Issues.

9.7 Improve Plan Review and Site Development Processes to Incorporate Bicycle Facilities and Accommodate the Needs of Bicyclists.

9.8 Continue to Improve Scottsdale's Bicycle System Using the Following Measures.

- Currently, 33 percent of City of Scottsdale streets with speed limits greater than or equal to 30 mph have on-street bike lanes. By 2015, this percentage should be increased to 50 percent; by 2030 90 percent of Scottsdale's streets with speed limits greater than or equal to 30 mph should have on-street bike lanes.
- Currently, there are no traffic signals on designated bicycle facilities with bicycle actuation in Scottsdale. By 2015, this percentage should be increased to 50 percent, and by 2030 all traffic signals should include some form of bicycle actuation.
- Sixty percent of Scottsdale GIS addresses are within 1/2 mile of a shared-use path. By 2015, that percentage should increase to 75 percent, and by 2030 90 percent of Scottsdale GIS addresses should be within 1/2 mile of a shared-use path.

9.9 Inventory Existing Trails and Trail Easements and Integrate Trails Information Into the Shared-Use Path/Trail System.

Appendix D: City of Scottsdale Path Prioritization Calculations by Path ID

Path ID	Name	From	To	Length (ft)	Length (mi)	Latent Demand	LOS	Connection SUPs	Connection Bike Lanes or Paved Shoulders	Connection Bike Routes	Connection Streets	Connection Future Paths	Connection Total	Connection Score (max 10)	Prioritization Score	Tier
1	South Corp Yard Path	Miller Rd	Indian Bend Wash	671	0.1	8	8	1	1	0	0	0	7.0	7.0	7.8	I
2	Granite Reef Path	McKellips Rd	Granite Reef Rd	1531	0.3	6	8	0	0	0	2	1	2.5	2.5	5.9	II
3	Papago Path	Granite Reef Rd	Pima Path	2732	0.5	6	8	1	0	0	0	1	4.5	4.5	6.3	II
4	Yavapai Path	Yavapai Elementary School	Indian Bend Wash	316	0.1	7	8	1	0	0	0	0	4.0	4.0	6.7	II
5	Crosscut Connection	Belleview St	Crosscut Canal	798	0.2	8	8	1	0	0	1	0	5.0	5.0	7.4	I
6	Indian Bend Path	McDowell Rd	Eldorado Aquatic Center	2726	0.5	9	8	1	1	0	0	1	7.5	7.5	8.4	I
7	Indian Bend Path	Eldorado Aquatic Center	Indian Bend Wash	851	0.2	9	8	2	1	1	1	1	14.0	10.0	8.9	I
8	Elm Dr Connector	Elm Dr	Granite Reef Senior Center	146	0.0	5	8	0	0	0	1	0	1.0	1.0	5.1	III
9	70th St Connection	Virginia Ave	Thomas Rd	1450	0.3	10	8	0	0	0	3	0	3.0	3.0	8.0	I
10	Thomas Rd Path	61st St	62nd St	342	0.1	9	8	0	0	0	2	0	2.0	2.0	7.3	I
11	Crosscut Connector	64th St	Crosscut Canal	426	0.1	10	8	1	1	0	1	0	8.0	8.0	9.0	I
12	Thomas Bike Stop	Thomas Rd	Indian Bend Wash	832	0.2	10	6	1	0	0	1	0	5.0	5.0	7.8	I
13	Thomas Rd Gap	Indian Bend Wash	Thomas Rd	304	0.1	10	6	1	0	0	1	0	5.0	5.0	7.8	I
14	Thomas Rd Path	Pima Park	Pima Path	623	0.1	10	8	1	0	0	0	0	4.0	4.0	8.2	I
15	Paiute Path	Avalon Dr	Osborn Rd	1423	0.3	9	8	0	0	1	1	0	2.5	2.5	7.4	I
16	Earll Path	81st Pl	82nd Pl	111	0.0	9	6	0	0	0	2	0	2.0	2.0	6.7	II
17	Osborn Path	Osborn Rd	Pima Rd	131	0.0	9	6	0	0	1	1	0	2.5	2.5	6.8	II
18	Columbus Path	Columbus Ave	Granite Reef Rd	48	0.0	9	8	0	0	0	2	0	2.0	2.0	7.3	I
19	Civic Center Path	Drinkwater Bl	75th St	666	0.1	9	6	0	0	1	2	0	3.5	3.5	7.0	I
20	2nd St Path	75th St	Indian Bend Wash	1392	0.3	10	6	1	1	0	1	1	8.5	8.5	8.5	I
21	Main Street Path	78th St	Indian Bend Wash	246	0.0	9	8	1	0	0	1	0	5.0	5.0	7.9	I
22	Indian School Path	Bashas Market	81st St	135	0.0	10	2	0	1	0	1	0	4.0	4.0	6.4	II
23	Crosscut Path	Catalina Dr	Thomas Rd	508	0.1	10	8	1	1	0	1	1	8.5	8.5	9.1	I
24	Crosscut Canal Path	Thomas Rd	Indian School Rd	3683	0.7	10	8	0	2	0	0	3	7.5	7.5	8.9	I
25	Arizona Canal Path	60th St	64th St	2765	0.5	10	8	0	1	0	1	3	5.5	5.5	8.5	I
26	Arizona Canal Path	64th St	Goldwater Bl	4694	0.9	10	8	0	0	1	0	4	3.5	3.5	8.1	I
27	68th Street Bridge	Lafayette Bl	Indian School Rd	367	0.1	9	8	0	2	1	0	1	8.0	8.0	8.5	I
28	Arizona Canal Path	Goldwater Bl	Scottsdale Rd	2078	0.4	10	8	0	0	0	4	2	5.0	5.0	8.4	I
29	Arizona Canal Path	Scottsdale Rd	Chaparral Rd	3400	0.6	10	8	0	0	0	3	2	4.0	4.0	8.2	I
30	Arizona Canal Path	Chaparral Rd	McDonald Dr	5444	1.0	10	8	0	1	0	2	5	7.5	7.5	8.9	I
31	Miller Connection	Arizona Canal	Miller Rd	68	0.0	9	8	0	1	0	0	1	3.5	3.5	7.6	I
32	Jackrabbit Path	Arizona Canal	Miller Rd	170	0.0	9	8	0	1	0	0	1	3.5	3.5	7.6	I
33	Jackrabbit Bridge	Arizona Canal at Jackrabbit Rd		181	0.0	9	8	1	1	1	0	2	9.5	9.5	8.8	I
34	San Miguel Path	Arizona Canal	76th Pl	132	0.0	9	8	0	0	0	1	1	1.5	1.5	7.2	I
35	Arizona Canal Path	McDonald Rd	Indian Bend Wash	4148	0.8	8	8	2	0	0	0	3	9.5	9.5	8.3	I
36	Lincoln Path	Arizona Canal	78th St	501	0.1	6	8	1	0	1	0	1	6.0	6.0	6.6	II
37	Lincoln Path	Indian Bend Wash	79th St	822	0.2	7	8	2	0	0	1	0	9.0	9.0	7.7	I
38	Indian Bend Path	Silverado Golf Course	Indian Bend Rd	1661	0.3	6	8	2	0	0	1	1	9.5	9.5	7.3	I
39	Hayden Tunnel 2	Hayden Rd at Coolidge		141	0.0	10	8	1	0	0	0	1	4.5	4.5	8.3	I
40	Hayden Tunnel	Hayden Rd at Chaparral		174	0.0	10	8	1	0	0	0	1	4.5	4.5	8.3	I
41	Indian Bend Path	Chaparral Rd	Jackrabbit Rd	2932	0.6	10	8	2	2	0	0	0	14.0	10.0	9.4	I
42	Vista Path	Chaparral Park	Vista Dr	52	0.0	9	8	1	0	0	1	0	5.0	5.0	7.9	I
43	Jackrabbit Path	Indian Bend Path	Jackrabbit Rd	113	0.0	9	8	0	0	1	1	0	2.5	2.5	7.4	I
44	Chaparral Path	Chaparral Park Path	McDonald	2224	0.4	10	8	1	0	0	1	1	5.5	5.5	8.5	I
45	Chaparral Path	McDonald Dr	Valley Vista Dr	632	0.1	8	8	0	0	0	2	2	3.0	3.0	7.0	I
46	Valley Vista Path	Hayden Rd	82nd St	1223	0.2	8	8	0	0	0	3	2	4.0	4.0	7.2	I
47	82nd St Path	Valley Vista Dr	Redwing Rd	2544	0.5	8	8	1	0	1	4	1	10.0	10.0	8.4	I
48	Agua Linda Path	Agua Linda Park	Pima Path	217	0.0	7	8	1	0	0	0	0	4.0	4.0	6.7	II
49	La Luna Connector	Via de La Luna	Pima Path	29	0.0	6	6	1	0	0	1	0	5.0	5.0	5.8	II
50	Joshua Tree Cnctr	Joshua Tree Ln	Pima Path	21	0.0	6	8	1	0	0	1	0	5.0	5.0	6.4	II
51	Sereno Connector	Via de Sereno	Pima Path	26	0.0	6	4	1	0	0	1	0	5.0	5.0	5.2	III
52	Dorado Connector	Via de Dorado	Pima Path	49	0.0	6	8	1	0	0	1	0	5.0	5.0	6.4	II
53	Inner Circle Cnctr	Inner Circle	Pima Path	12	0.0	6	6	1	0	0	0	0	4.0	4.0	5.6	III
54	Del Arbor Connector	Via del Arbor	Pima Path	54	0.0	6	6	1	0	0	1	0	5.0	5.0	5.8	II

Appendix D: City of Scottsdale Path Prioritization Calculations by Path ID

Path ID	Name	From	To	Length (ft)	Length (mi)	Latent Demand	LOS	Connection SUPs	Connection Bike Lanes or Paved Shoulders	Connection Bike Routes	Connection Streets	Connection Future Paths	Connection Total	Connection Score (max 10)	Prioritization Score	Tier
55	Taz Norte Connector	Via Taz Norte	Pima Path	14	0.0	6	4	1	0	0	1	0	5.0	5.0	5.2	III
56	McCormick Connector	Via de McCormick	Pima Path	19	0.0	6	6	1	0	0	1	0	5.0	5.0	5.8	II
57	Commercio Connector	Ranch Office	Pima Path	30	0.0	6	6	1	0	0	1	0	5.0	5.0	5.8	II
58	Ranch Connector	Ranch Office Park	Pima Path	34	0.0	6	6	1	0	0	0	0	4.0	4.0	5.6	III
59	Ranch Connector	Ranch Office Park	Pima Path	45	0.0	6	6	1	0	0	1	0	5.0	5.0	5.8	II
60	Ranch Connector	Ranch Office Park	Pima Path	19	0.0	6	6	1	0	0	1	0	5.0	5.0	5.8	II
61	Villa Vallarta Path	Villa de Vallarta	Pima Path	37	0.0	6	4	1	0	0	0	0	4.0	4.0	5.0	III
62	Villa Royale Path	Villa Royale	Pima Path	32	0.0	6	4	1	0	0	0	0	4.0	4.0	5.0	III
63	San Esteban Path	San Esteban Dr	Pima Path	78	0.0	6	6	1	0	0	1	0	5.0	5.0	5.8	II
64	87th Wy Connector	87th Wy	Pima Path	219	0.0	6	8	1	0	0	1	0	5.0	5.0	6.4	II
65	San Rafael Connector	San Rafael Dr	Pima Path	23	0.0	6	8	1	0	0	1	0	5.0	5.0	6.4	II
66	Rancho Antiqua Path2	Rancho Antigua	Pima Path	27	0.0	6	8	1	0	0	0	0	4.0	4.0	6.2	II
67	Rancho Antigua Path	Rancho Antigua	Pima Path	57	0.0	6	8	1	0	0	0	0	4.0	4.0	6.2	II
68	Pima Path	Mountain View Rd Crossing		84	0.0	6	6	2	0	0	0	0	8.0	8.0	6.4	II
69	Sun Canyon Connector	Sun Canyon	Pima Path	43	0.0	6	8	1	0	0	1	0	5.0	5.0	6.4	II
70	Casabella Connector	Casabella Condominiums	Pima Path	47	0.0	6	8	1	0	0	0	0	4.0	4.0	6.2	II
71	Mustang Connector	Mustang Tr	Pima Path	49	0.0	6	8	1	0	0	1	0	5.0	5.0	6.4	II
72	Arizona Canal Path	Hayden Rd	82nd St	1282	0.2	7	8	1	0	0	1	0	5.0	5.0	6.9	I
73	Arizona Canal Path	Hayden Rest Stop	Arizona Canal Path	70	0.0	7	8	1	0	0	0	0	4.0	4.0	6.7	II
74	Indian Bend Rd Path	Scottsdale Rd	Hayden Rd	5107	1.0	6	8	1	0	0	2	3	7.5	7.5	6.9	I
75	IBW West Path	Indian Bend Rd	Scottsdale Rd	3752	0.7	5	8	0	1	0	1	2	5.0	5.0	5.9	II
76	Scottsdale Rd Path	Indian Bend Wash	McCormick Py	1692	0.3	4	2	1	1	0	3	3	11.5	10.0	4.6	III
78	Indian Bend Path	Hayden Rd	Indian Bend Path	1178	0.2	5	4	2	0	0	2	1	10.5	10.0	5.7	II
79	McCormick Py Path	Scottsdale Rd	Indian Bend Path	6023	1.1	5	4	1	1	0	3	4	12.0	10.0	5.7	II
81	McCormick Path	Via Bonita	Doubletree Ranch Rd	922	0.2	5	6	1	0	0	4	0	8.0	8.0	5.9	II
82	Via de Ventura Path	Indian Bend Path	Doubletree Ranch Rd	2387	0.5	5	6	2	0	0	1	0	9.0	9.0	6.1	II
83	Paseo Path	Via Paseo Del Norte	Scottsdale McCormick Office Park	349	0.1	5	8	0	0	0	1	1	1.5	1.5	5.2	III
84	Paseo Path	Paseo Path	Via de Negocio	483	0.1	5	8	0	0	0	1	1	1.5	1.5	5.2	III
85	Ventura Path B	85th Wy	86th Pl	329	0.1	6	8	0	0	0	2	0	2.0	2.0	5.8	II
86	Ventura Path	85th Wy	86th Pl	423	0.1	6	8	0	0	0	2	0	2.0	2.0	5.8	II
87	Mountain View Path	68th Pl	Scottsdale Rd	2521	0.5	5	6	0	0	0	2	1	2.5	2.5	4.8	III
88	Mountain View Path	Scottsdale Rd	78th St	4148	0.8	5	6	0	0	1	3	1	5.0	5.0	5.3	III
89	Gainey Ranch Path	Mountain View Rd	Gold Dust Rd	2527	0.5	7	6	2	0	0	2	1	10.5	10.0	7.3	I
90	Gainey Ranch Path2	Mountain View Rd	Gold Dust Rd	2330	0.4	7	8	1	0	0	2	2	7.0	7.0	7.3	I
91	Gold Dust Path	West of Hayden Rd	Arabian Tr	1147	0.2	7	6	1	0	1	1	1	7.0	7.0	6.7	II
92	70th St Path	Mountain View Rd	Gold Dust Ave	1318	0.2	5	6	0	0	0	1	1	1.5	1.5	4.6	III
93	Gold Dust Path	68th Wy	70th St	1253	0.2	5	4	0	0	0	2	2	3.0	3.0	4.3	III
94	68th Pl Path	Gold Dust Ave	Shea Bl	1452	0.3	5	2	0	0	0	4	2	5.0	5.0	4.1	III
95	68th Pl Path	Shea Bl	Cholla St	2875	0.5	6	2	0	0	1	4	4	7.5	7.5	5.1	III
96	Mescal Path	68th Pl	68th Pl	1577	0.3	6	1	0	0	0	2	2	3.0	3.0	3.9	III
97	Cholla Path	66th St	68th Pl	1560	0.3	6	4	0	0	1	3	1	5.0	5.0	5.2	III
98	Gold Dust Gap	Gold Dust Ave	Gold Dust Ave	201	0.0	5	4	0	0	0	2	0	2.0	2.0	4.1	III
99	Mountain View Path	Mountain View Rd	Arabian Tr	2925	0.6	7	8	2	0	1	1	1	11.0	10.0	7.9	I
100	Irish Hunter Path	Mountain View Path	Arabian Tr	1371	0.3	6	6	1	0	1	3	1	9.0	9.0	6.6	II
101	Arabian Path	Irish Hunter Path	Arabian Tr	710	0.1	6	8	0	0	1	0	2	2.5	2.5	5.9	II
102	Arabian Path	Arabian Tr	Shea Bl	519	0.1	7	8	1	0	1	1	1	7.0	7.0	7.3	I
103	90th St Path	Bella Vista Path	Indian Bend Path	2707	0.5	7	8	1	0	0	3	1	7.5	7.5	7.4	I
104	Bella Vista Path	90th St	104th St	8690	1.6	7	8	0	0	0	0	4	2.0	2.0	6.3	II
105	100 Pl Connector	Bella Vista Path	100th Pl	52	0.0	5	4	0	0	0	1	1	1.5	1.5	4.0	III
106	Bella Vista Path	104th St	112th St	5309	1.0	6	8	0	0	0	0	4	2.0	2.0	5.8	II
107	Bella Vista Path	112th St	122nd St	6447	1.2	6	8	0	0	0	0	3	1.5	1.5	5.7	II
108	Bella Vista Path	122nd St	CAP Aqueduct	4625	0.9	6	8	0	0	0	0	3	1.5	1.5	5.7	II
109	Bella Vista Path	CAP Aqueduct	Shea Bl	10230	1.9	5	8	1	0	1	2	2	8.5	8.5	6.6	II
110	96th St Path	Bella Vista Path	Mission Ln	777	0.1	5	6	0	0	0	1	1	1.5	1.5	4.6	III

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Path ID	Name	From	To	Length (ft)	Length (mi)	Latent Demand	LOS	Connection SUPs	Connection Bike Lanes or Paved Shoulders	Connection Bike Routes	Connection Streets	Connection Future Paths	Connection Total	Connection Score (max 10)	Prioritization Score	Tier
111	104th St Path	Bella Vista Path	Mission Ln	581	0.1	5	8	0	0	0	1	2	2.0	2.0	5.3	III
112	104th St Path	Mission Ln	Via Linda	1748	0.3	6	8	0	1	0	2	2	6.0	6.0	6.6	II
113	104th St Path	Via Linda	Scottsdale Ranch Park	180	0.0	6	8	0	0	0	1	2	2.0	2.0	5.8	II
114	Sctsdl Ranch Path	104th St Path	Scottsdale Ranch Path	79	0.0	6	8	1	0	0	0	1	4.5	4.5	6.3	II
115	Via Linda Path	Mountain View Rd	Lakeview Dr	3920	0.7	7	8	1	1	0	2	2	10.0	10.0	7.9	I
116	ScRanchPk 2	Tennis Courts	Path	237	0.0	6	8	2	0	0	0	0	8.0	8.0	7.0	I
117	ScRanchPk 1	Path	Lakeview Dr	349	0.1	5	8	1	0	0	1	0	5.0	5.0	5.9	II
118	Lakeview Path	Via Linda	Laguna Elementary School	1734	0.3	7	8	1	0	0	1	3	6.5	6.5	7.2	I
119	Lakeview Path	Laguna Elementary School	Shea Bl	1709	0.3	6	8	1	0	0	4	1	8.5	8.5	7.1	I
120	Bella Vista Cnctr	Bella Vista Path	Bella Vista	435	0.1	5	8	0	0	0	1	1	1.5	1.5	5.2	III
121	Palomino Path	Bella Vista Path	117th Wy	5521	1.0	5	8	0	2	0	2	2	9.0	9.0	6.7	II
122	Doubletree Path	Power Line Path	Doubletree Ranch Rd	130	0.0	5	8	0	0	0	1	1	1.5	1.5	5.2	III
123	Power Line Path	Bella Vista Path	Shea Bl	6336	1.2	6	8	0	1	0	4	3	8.5	8.5	7.1	I
124	Powerline Path	Shea Bl	Cactus Rd	7064	1.3	5	8	1	0	0	11	3	16.5	10.0	6.9	I
125	CAP Path	Bella Vista Path	Shea	7953	1.5	6	8	0	0	1	3	4	6.5	6.5	6.7	II
126	CAP Path	Shea Bl	Via Linda	4327	0.8	6	8	1	0	0	2	2	7.0	7.0	6.8	II
127	CAP Path	Via Linda	Sweetwater Ave	9245	1.8	6	8	0	0	1	2	3	5.0	5.0	6.4	II
128	CAP Path	Sweetwater Ave	Thompson Peak Py	8784	1.7	8	8	0	1	1	1	3	7.0	7.0	7.8	I
129	CAP Path	Thompson Peak Py	Loop 101	7011	1.3	9	8	1	1	0	1	3	9.5	9.5	8.8	I
130	CAP Path	Loop 101	Hayden Rd	5177	1.0	5	8	0	2	0	0	2	7.0	7.0	6.3	II
131	CAP Path	Hayden Rd	Scottsdale Rd	5417	1.0	5	8	0	2	0	0	2	7.0	7.0	6.3	II
132	124th St Path	CAP Aqueduct	Cochise Dr	1681	0.3	6	8	0	0	1	2	2	4.5	4.5	6.3	II
133	124th St Path	Cochise Dr	Lost Dog Trailhead	6616	1.3	6	2	0	0	1	10	3	13.0	10.0	5.6	III
134	Mt View Connector	Camelback Walk	Mountain View Rd	401	0.1	6	6	1	0	0	1	0	5.0	5.0	5.8	II
135	Shea Path	64th St	Scottsdale Rd	5293	1.0	6	10	0	0	0	8	1	8.5	8.5	7.7	I
136	Shea Path	Scottsdale Rd	Hayden Rd	5263	1.0	5	10	1	0	0	5	2	10.0	10.0	7.5	I
137	Shea Path	Hayden Rd	Loop 101	4155	0.8	6	10	1	1	0	3	3	11.5	10.0	8.0	I
138	Shea Path	Loop 101	96th St	5356	1.0	6	10	2	1	1	4	0	16.5	10.0	8.0	I
139	Shea Path	96th St	104th St	5313	1.0	7	8	1	2	1	1	2	13.5	10.0	7.9	I
140	Shea Path	104th St	Frank Lloyd Wright Blvd	6569	1.2	6	8	0	2	1	3	2	11.5	10.0	7.4	I
141	Shea Path	Frank Lloyd Wright Bl	124th St	6614	1.3	6	8	1	1	1	3	3	13.0	10.0	7.4	I
142	Shea Path	124th St	136th St	8533	1.6	6	8	1	0	3	0	3	10.0	10.0	7.4	I
143	Arabian_Shea Path	Arabian Tr	Shea Bl	522	0.1	6	10	1	0	1	1	1	7.0	7.0	7.4	I
144	Shea Path	120th St	124th St	2634	0.5	6	8	1	0	1	2	2	8.5	8.5	7.1	I
145	Shea Path	124th St	132nd St	3623	0.7	6	8	0	0	1	2	3	5.0	5.0	6.4	II
146	Shea Path	132nd St	140th St	6590	1.2	6	8	0	0	1	2	2	4.5	4.5	6.3	II
147	Hayden Path	Shea Bl	Cactus Rd	5719	1.1	7	8	0	1	0	4	2	8.0	8.0	7.5	I
148	Hayden Path	Cactus Rd	Thunderbird Rd	5324	1.0	7	8	0	2	1	3	2	11.5	10.0	7.9	I
149	Hayden Path	Thunderbird Rd	Frank Lloyd Wright Bl	9941	1.9	5	8	0	1	0	9	4	14.0	10.0	6.9	I
150	Professional Gap	85th Pl	Scottsdale Professional	82	0.0	6	4	0	0	0	1	0	1.0	1.0	4.4	III
151	Pima Path	Shea Bl	Cactus Rd	5462	1.0	7	8	1	0	0	7	2	12.0	10.0	7.9	I
152	Pima Path	Cactus Rd	Thunderbird Rd	5614	1.1	7	6	1	1	1	2	2	11.5	10.0	7.3	I
153	Pima Path	Thunderbird Rd	Frank Lloyd Wright Bl	6728	1.3	7	6	0	1	0	4	3	8.5	8.5	7.0	I
154	Pima Path	Frank Lloyd Wright Bl	Bell Rd	6053	1.1	6	8	0	1	0	0	4	5.0	5.0	6.4	II
155	Pima Path	Loop 101	Power Line Path	3796	0.7	4	4	0	1	0	1	3	5.5	5.5	4.3	III
156	Pima Path	Overlook Dr	Los Gatos Dr	1649	0.3	3	2	1	0	0	1	2	6.0	6.0	3.3	III
157	Pima Path	Los Gatos Dr	Happy Valley Rd	9027	1.7	1	8	0	2	0	2	2	9.0	9.0	4.7	III
158	Pima Path	Happy Valley Rd	Jomax Rd	5190	1.0	1	6	0	1	0	0	2	4.0	4.0	3.1	III
159	Pima Path	Jomax Rd	Dynamite Bl	5192	1.0	1	6	0	2	0	0	2	7.0	7.0	3.7	III
160	Pima Path	Dynamite Bl	Dixileta Dr	5354	1.0	1	6	0	1	0	0	2	4.0	4.0	3.1	III
161	Pima Path	Dixileta Dr	Lone Mountain Rd	5433	1.0	1	4	0	1	0	1	2	5.0	5.0	2.7	III
162	Pima Path	Lone Mountain Rd	Westland Rd	8400	1.6	1	4	0	1	0	1	2	5.0	5.0	2.7	III
163	Pima Path	Westland Rd	Stagecoach Rd	7880	1.5	1	4	0	2	0	0	2	7.0	7.0	3.1	III
164	Indian Bend Path	92nd St	Cactus Rd	6329	1.2	7	6	2	1	1	4	1	17.0	10.0	7.3	I

Appendix D: City of Scottsdale Path Prioritization Calculations by Path ID

Path ID	Name	From	To	Length (ft)	Length (mi)	Latent Demand	LOS	Connection SUPs	Connection Bike Lanes or Paved Shoulders	Connection Bike Routes	Connection Streets	Connection Future Paths	Connection Total	Connection Score (max 10)	Prioritization Score	Tier
165	Cholla Path	94th St	108th St	9034	1.7	7	2	1	2	1	5	2	17.5	10.0	6.1	II
166	Cholla Path	108th St	Cholla Park	3396	0.6	5	6	2	0	1	3	0	12.5	10.0	6.3	II
167	Cactus Path	96th St	104th St	5304	1.0	7	6	1	2	1	3	2	15.5	10.0	7.3	I
168	Cactus Path	104th St	Frank Lloyd Wright Bl	4019	0.8	5	6	0	1	1	2	2	7.5	7.5	5.8	II
169	Bent Tree Path	110th St	Frank Lloyd Wright Bl	1036	0.2	5	6	1	0	0	1	1	5.5	5.5	5.4	III
170	132nd St Path	Shea Bl	Via Linda	3054	0.6	6	2	1	0	1	4	2	10.5	10.0	5.6	III
171	Mayo Path	Shea Bl	Cactus Rd	6224	1.2	6	2	0	1	0	5	2	9.0	9.0	5.4	III
172	Via Linda Path	124th St	136th St	7896	1.5	5	4	0	0	2	4	2	8.0	8.0	5.3	III
173	Via Linda Path	Hidden Hills		6884	1.3	5	4	0	0	1	0	1	2.0	2.0	4.1	III
174	128th St Path	Shea Bl	Cactus Rd	5618	1.1	6	2	0	0	0	5	3	6.5	6.5	4.9	III
175	Cactus Path	124th St	128th St	2542	0.5	6	2	0	0	0	3	2	4.0	4.0	4.4	III
176	Scottsdale Rd Path	Cactus Park	Sweetwater Ave	1478	0.3	8	10	1	0	0	1	0	5.0	5.0	8.0	I
177	Sweetwater Path	Scottsdale Rd	76th St	2568	0.5	8	2	0	0	0	3	2	4.0	4.0	5.4	III
178	76th St Path	Sweetwater Ave	Cotton Dr	1376	0.3	8	1	0	1	0	1	3	5.5	5.5	5.4	III
179	76th St Path	Sutton Dr	Thunderbird Rd	3906	0.7	7	6	0	0	0	4	2	5.0	5.0	6.3	II
180	73rd St Path	Sutton Dr	Thunderbird Rd	1449	0.3	7	8	0	0	0	2	2	3.0	3.0	6.5	II
181	Thunderbird Path	Thunderbird Rd	Redfield Rd	556	0.1	7	6	0	0	0	1	3	2.5	2.5	5.8	II
182	Thunderbird Path	Redfield Rd	Thunderbird Rd	1466	0.3	7	6	0	0	0	2	2	3.0	3.0	5.9	II
183	73rd St Path	Thunderbird Rd	Redfield Rd	1253	0.2	6	8	0	0	0	3	1	3.5	3.5	6.1	II
184	Thunderbird Path	76th St	Hayden Rd	2703	0.5	7	6	0	1	0	0	3	4.5	4.5	6.2	II
185	Thunderbird Path	Hayden Rd	Loop 101	4987	0.9	6	2	0	3	1	2	3	14.0	10.0	5.6	III
186	Northsight Path	Thunderbird Rd	Northsight Path	559	0.1	6	6	1	2	1	0	1	12.0	10.0	6.8	II
187	Redfield Path	Hayden Rd	Northsight Park	2602	0.5	5	6	0	0	0	1	2	2.0	2.0	4.7	III
188	82nd St Connector	82nd St	Redfield Path	309	0.1	5	6	0	0	0	1	1	1.5	1.5	4.6	III
189	Redfield Path	Northsight Park	Gelding Dr	590	0.1	6	6	0	0	0	2	2	3.0	3.0	5.4	III
190	Northsight Path	Northsight Path	Redfield Path	241	0.0	6	6	1	0	0	0	1	4.5	4.5	5.7	II
191	76th St Path	Greenway Rd	CAP Aqueduct	3916	0.7	7	10	0	0	0	6	1	6.5	6.5	7.8	I
192	Northsight Path	Hayden Rd	CAP Aqueduct	2206	0.4	10	8	0	0	0	2	3	3.5	3.5	8.1	I
193	FLW Path	82nd St	Northsight Path	1971	0.4	5	8	0	0	0	2	1	2.5	2.5	5.4	III
194	92nd St Path	Cactus Rd	Larkspur Dr	1311	0.2	7	6	0	0	0	1	1	1.5	1.5	5.6	III
195	Larkspur Path	Larkspur Dr	93rd St	986	0.2	7	6	0	0	0	2	1	2.5	2.5	5.8	II
196	92nd St Path	Larkspur Dr	Sweetwater Ave	1270	0.2	7	6	0	0	1	2	3	5.0	5.0	6.3	II
197	92nd St Path	Sweetwater Ave	Raintree Dr	5251	1.0	9	8	0	1	2	6	2	13.0	10.0	8.9	I
198	92nd St Path	Raintree Dr	Frank Lloyd Wright Bl	3149	0.6	9	8	0	1	1	3	2	8.5	8.5	8.6	I
199	100th St Path	Frank Lloyd Wright Bl	Thompson Peak Py	2499	0.5	9	8	1	2	0	0	0	10.0	10.0	8.9	I
200	FLW Path	Thunderbird Rd	Redfield Path	485	0.1	9	8	0	0	0	1	2	2.0	2.0	7.3	I
201	Sweetwater Path	89th St	96th St	4514	0.9	7	4	2	1	1	6	2	19.5	10.0	6.7	II
202	Sweetwater Path	96th St	Frank Lloyd Wright	5944	1.1	7	4	1	2	1	6	2	18.5	10.0	6.7	II
203	Presidio Path	96th St	97th St Path	1053	0.2	6	6	1	1	0	0	1	7.5	7.5	6.3	II
204	97th St Path	Sutton Dr	Presidio Rd	435	0.1	7	6	0	0	0	2	2	3.0	3.0	5.9	II
205	Presidio Path	Sutton Dr	100th St	2018	0.4	7	6	0	1	0	2	2	6.0	6.0	6.5	II
206	100th St Path	Aztec Elementary School	Frank Lloyd Wright	1559	0.3	7	8	0	1	0	1	2	5.0	5.0	6.9	I
207	100th St Path	Thompson Peak Py	Frank Lloyd Wright Bl	5097	1.0	8	8	0	3	0	0	3	10.5	10.0	8.4	I
208	97th St Path	Presidio Path	Thunderbird Rd	1711	0.3	7	6	0	0	0	1	2	2.0	2.0	5.7	II
209	Thunderbird Path	97th St Path	Frank Lloyd Wright Bl	510	0.1	8	6	0	0	0	2	2	3.0	3.0	6.4	II
210	Redfield Path	Frank Lloyd Wright Bl	100th St	1328	0.3	8	8	0	1	0	2	2	6.0	6.0	7.6	I
211	FLW Path	100th St	CAP Aqueduct	1520	0.3	7	8	0	1	0	0	2	4.0	4.0	6.7	II
212	Desert Canyon Path	WestWorld	Desert Canyon Path	1578	0.3	9	2	1	1	0	0	1	7.5	7.5	6.6	II
213	Desert Canyon Path	Thompson Peak Py	Desert Canyon Middle School	689	0.1	9	4	0	1	1	0	3	6.0	6.0	6.9	I
214	Desert Canyon Path	Desert Canyon Path	102nd St	762	0.1	9	4	1	0	1	0	1	6.0	6.0	6.9	I
215	Ranch Park Path	102nd St	Desert Canyon Path	2060	0.4	9	4	1	0	1	0	1	6.0	6.0	6.9	I
216	Scottsdale Rd Path	CAP Aqueduct	Loop 101	7627	1.4	4	8	0	0	0	4	4	6.0	6.0	5.6	III
217	Scottsdale Rd Path	Loop 101	Thompson Peak Py	3801	0.7	4	8	1	1	0	1	2	9.0	9.0	6.2	II
218	Scottsdale Rd Path	Deer Valley Rd	Pinnacle Peak Rd	5364	1.0	3	8	0	2	0	4	2	11.0	10.0	5.9	II

Appendix D: City of Scottsdale Path Prioritization Calculations by Path ID

Path ID	Name	From	To	Length (ft)	Length (mi)	Latent Demand	LOS	Connection SUPs	Connection Bike Lanes or Paved Shoulders	Connection Bike Routes	Connection Streets	Connection Future Paths	Connection Total	Connection Score (max 10)	Prioritization Score	Tier
219	Scottsdale Rd Path	Pinnacle Peak Rd	Happy Valley Rd	5257	1.0	2	8	0	0	0	4	2	5.0	5.0	4.4	III
220	Scottsdale Rd Path	Happy Valley Rd	Jomax Rd	4939	0.9	1	8	0	2	0	0	2	7.0	7.0	4.3	III
221	Scottsdale Rd Path	Jomax Rd	Dynamite Bl	5283	1.0	1	8	0	2	0	2	3	9.5	9.5	4.8	III
222	Scottsdale Rd Path	Dynamite BL	Dixileta Rd	5271	1.0	1	8	0	0	0	5	2	6.0	6.0	4.1	III
223	Scottsdale Rd Path	Dixileta Rd	Lone Mountain Rd	5205	1.0	1	8	0	0	0	1	2	2.0	2.0	3.3	III
224	Scottsdale Rd Path	Lone Mountain Rd	Carefree Hwy	10692	2.0	1	8	0	3	0	1	2	11.0	10.0	4.9	III
225	Hayden Path	CAP Aqueduct	Copper Basin Park	4008	0.8	5	4	2	2	0	1	3	16.5	10.0	5.7	II
226	Hayden Path	Copper Basin Park	Power Line Path	7693	1.5	5	4	1	1	0	3	4	12.0	10.0	5.7	II
227	Bell Path	Hayden Rd	Copper Basin Park	602	0.1	5	4	1	1	0	0	1	7.5	7.5	5.2	III
228	Bell Path	Copper Basin Park	Loop 101	3479	0.7	5	4	1	0	0	3	1	7.5	7.5	5.2	III
229	Bell Path	Loop 101	Power Line Path	2724	0.5	5	6	0	0	0	4	2	5.0	5.0	5.3	III
230	Bell Path	Power Line Path	Thompson Peak Py	6203	1.2	5	6	0	2	0	0	3	7.5	7.5	5.8	II
231	82nd St Path	Princess Dr	Union Hills Dr	1885	0.4	5	4	2	1	0	4	1	15.5	10.0	5.7	II
232	82nd St Path	Union Hills Dr	Loop 101	1371	0.3	5	4	0	0	0	2	3	3.5	3.5	4.4	III
233	Union Hills Path	Scottsdale Rd	Hayden Rd	5356	1.0	4	4	0	1	0	1	2	5.0	5.0	4.2	III
234	Union Hills Path	Hayden Rd	Loop 101	2855	0.5	5	4	0	1	0	2	4	7.0	7.0	5.1	III
235	Union Hills Tunnel	Loop 101		595	0.1	4	4	0	0	0	2	2	3.0	3.0	3.8	III
236	Union Hills Path	Loop 101	Power Line Path	1387	0.3	4	4	0	0	0	1	2	2.0	2.0	3.6	III
237	Loop 101 Path	Hayden Rd	Bell Rd	5399	1.0	5	8	0	3	0	1	4	12.0	10.0	6.9	I
238	Loop 101 Path	Scottsdale Rd	Hayden Rd	5374	1.0	5	8	0	1	0	1	1	4.5	4.5	5.8	II
239	Loop 101 Path	Hayden Rd	Princess Dr	5798	1.1	5	8	0	2	0	0	3	7.5	7.5	6.4	II
240	Loop 101 Path	Scottsdale Rd	Hayden Rd	5503	1.0	4	8	0	1	0	0	4	5.0	5.0	5.4	III
241	Pima Path	CAP Aqueduct	Bell Rd	3272	0.6	5	8	0	2	0	2	3	9.5	9.5	6.8	II
242	WestWorld Path	Loop 101	Power Line Path	4811	0.9	5	6	0	0	0	3	2	4.0	4.0	5.1	III
243	Power Line Path	WestWorld	Pima Rd	7881	1.5	5	4	1	3	0	0	6	16.0	10.0	5.7	II
244	Power Line Path	Pima Rd	Hayden Rd	7804	1.5	5	4	0	2	0	0	3	7.5	7.5	5.2	III
245	Power Line Path	Hayden Rd	Thompson Peak Py	3018	0.6	5	4	1	2	0	0	0	10.0	10.0	5.7	II
246	Powerline Path	74th St	Scottsdale Rd	4077	0.8	4	4	1	1	1	3	2	12.5	10.0	5.2	III
247	Thompson Peak Path	Hayden Rd	Pima Rd	5893	1.1	5	4	2	2	0	1	1	15.5	10.0	5.7	II
248	76th St Path	Loop 101	Thompson Peak Py	6247	1.2	4	6	1	1	1	1	2	10.5	10.0	5.8	II
249	Center Path	Scottsdale Rd	76th St Path	1192	0.2	4	6	0	0	0	1	2	2.0	2.0	4.2	III
250	94th St Path	Power Line Path	Bell Rd	854	0.2	5	6	0	1	0	0	2	4.0	4.0	5.1	III
251	Thompson Peak Path	Bell Path	Desert Activity Center	1586	0.3	5	4	0	0	0	1	1	1.5	1.5	4.0	III
252	Old Pima Path	Power Line Path	Hualapai Dr	4005	0.8	4	4	1	1	0	0	1	7.5	7.5	4.7	III
253	Horizon Crossing	Indian Bend Path	Horizon Park	193	0.0	9	8	1	1	0	0	0	7.0	7.0	8.3	I
254	Reata Path	Power Line Path	Union Hills Dr	7924	1.5	4	6	0	2	0	0	3	7.5	7.5	5.3	III
255	Reata Path	Union Hills Dr	Thompson Peak Py	7292	1.4	5	6	1	1	0	0	3	8.5	8.5	6.0	II
256	Reata Path	Thompson Peak Py	Adobe Dr	5360	1.0	4	6	0	1	0	0	2	4.0	4.0	4.6	III
257	Reata Path	Adobe Dr	Pinnacle Peak Rd	5257	1.0	3	6	0	1	0	0	2	4.0	4.0	4.1	III
258	Reata Path	Pinnacle Peak Rd	Happy Valley Rd	5909	1.1	1	6	0	1	0	2	2	6.0	6.0	3.5	III
259	Reata Path	Happy Valley Rd	Jomax Rd	6116	1.2	1	6	0	0	0	4	2	5.0	5.0	3.3	III
260	Reata Path	Jomax Rd	Rio Verde Dr	6279	1.2	1	6	0	1	0	2	2	6.0	6.0	3.5	III
261	Hualapai Path	Ironwood Path	Pima Acres Path	2487	0.5	3	1	1	0	0	0	1	4.5	4.5	2.7	III
262	Pima Acres Path	S of Hualapai Dr	Diamond Rim Dr	1810	0.3	4	4	0	0	0	1	1	1.5	1.5	3.5	III
263	Pima Acres Path	Diamond Rim Dr	Desert Camp Dr	1597	0.3	5	6	0	0	0	2	2	3.0	3.0	4.9	III
264	Desert Camp Path	Pima Acres Path	Thompson Peak Py	2195	0.4	5	6	2	1	0	1	1	12.5	10.0	6.3	II
265	94th St Connector	Sierra Pinta Dr	Desert Camp Dr	107	0.0	4	4	0	0	0	2	0	2.0	2.0	3.6	III
266	DC Ranch Path	Alma School Path	Copper Ridge Middle School	377	0.1	4	4	1	0	0	0	1	4.5	4.5	4.1	III
267	DC Ranch Path	DC Ranch Path	Thompson Peak Py	768	0.1	5	4	2	0	0	0	0	8.0	8.0	5.3	III
268	Thompson Peak Path	Thompson Peak Path	Wash Crossing	2772	0.5	5	4	1	1	0	0	1	7.5	7.5	5.2	III
269	Deer Valley Path	Existing sidewalk	Miller Rd	1069	0.2	3	4	2	2	0	0	1	14.5	10.0	4.7	III
270	Milller Path	Deer Valley Rd	Pinnacle Peak Rd	6322	1.2	3	2	2	1	0	5	1	16.5	10.0	4.1	III
271	Miller Path	Williams Dr	Pinnacle Peak Rd	2731	0.5	3	4	0	0	0	2	3	3.5	3.5	3.4	III
272	Miller Path	Pinnacle Peak Rd	Happy Valley Rd	5209	1.0	1	4	0	0	0	2	3	3.5	3.5	2.4	III

Appendix D: City of Scottsdale Path Prioritization Calculations by Path ID

Path ID	Name	From	To	Length (ft)	Length (mi)	Latent Demand	LOS	Connection SUPs	Connection Bike Lanes or Paved Shoulders	Connection Bike Routes	Connection Streets	Connection Future Paths	Connection Total	Connection Score (max 10)	Prioritization Score	Tier
273	Rawhide Path	Scottsdale Rd	Happy Valley Rd	7539	1.4	2	6	0	0	0	4	3	5.5	5.5	3.9	III
274	Happy Valley Path	Scottsdale Rd	Alma School Rd	20704	3.9	1	6	0	3	0	5	6	17.0	10.0	4.3	III
275	Rawhide Path	Happy Valley Rd	Jomax Rd	5222	1.0	1	2	0	1	0	1	1	4.5	4.5	2.0	III
276	Jomax Path	Jomax Rd	Alma School Rd	1421	0.3	1	2	0	0	0	2	2	3.0	3.0	1.7	III
277	Jomax Path	Pinnacle Peak Py	Alma School Rd	1317	0.2	1	2	0	1	0	1	2	5.0	5.0	2.1	III
278	56th St Path	Jomax Rd	Dynamite Bl	5320	1.0	1	1	0	0	0	4	2	5.0	5.0	1.8	III
279	Pinnacle Vista Path	56th St	64th St	5254	1.0	1	1	0	1	0	2	2	6.0	6.0	2.0	III
280	64th St Path	Pinnacle Vista Dr	Dynamite Bl	2580	0.5	1	4	0	0	0	2	2	3.0	3.0	2.3	III
281	Dynamite Path	56th St	Scottsdale Rd	10647	2.0	1	6	0	2	0	4	1	10.5	10.0	4.3	III
282	Dynamite Path	Scottsdale Rd	80th St	5172	1.0	1	2	0	1	0	1	3	5.5	5.5	2.2	III
283	Dynamite Path	80th St	Pima Rd	5389	1.0	1	2	0	1	0	1	3	5.5	5.5	2.2	III
284	Dynamite Path	Pima Rd	97th Pl	6190	1.2	1	10	0	2	0	2	2	9.0	9.0	5.3	III
285	Dynamite Path	97th Pl	Alma School Py	8978	1.7	1	10	0	0	0	4	2	5.0	5.0	4.5	III
286	Lone Mountain Path	Scottsdale Rd	Pima Rd	10360	2.0	1	4	0	2	0	1	2	8.0	8.0	3.3	III
287	Dove Valley Path	56th St	60th St	2798	0.5	3	6	0	0	0	2	2	3.0	3.0	3.9	III
288	60th St Path	Dove Valley Rd	Carefree Hwy	5178	1.0	3	6	0	0	0	6	3	7.5	7.5	4.8	III
289	Border Path	60th St	Scottsdale Rd	12678	2.4	1	8	0	1	0	2	2	6.0	6.0	4.1	III
290	Carefree Path	56th St	Scottsdale Rd	10068	1.9	3	8	0	0	0	4	2	5.0	5.0	4.9	III
291	Westland Path	Scottsdale Rd	Hayden Rd	5378	1.0	1	2	0	1	0	3	2	7.0	7.0	2.5	III
292	Westland Path	Hayden Rd	Pima Rd	5317	1.0	1	2	0	2	0	4	2	11.0	10.0	3.1	III
293	Westland Path	Pima Rd	92nd Pl	4830	0.9	1	2	0	2	0	2	3	9.5	9.5	3.0	III
294	Westland Path	92nd Pl	Stagecoach Rd	9050	1.7	1	2	0	1	0	6	1	9.5	9.5	3.0	III
295	Stagecoach Path	Pima Rd	Lone Mountain Py	13116	2.5	1	4	0	1	0	7	3	11.5	10.0	3.7	III
296	Lone Mountain Path	Stagecoach Rd	Cave Creek Rd	11089	2.1	1	4	0	1	0	6	2	10.0	10.0	3.7	III
297	Cave Creek Path	City Limits	Lone Mountain Py	8631	1.6	1	4	0	3	0	2	2	12.0	10.0	3.7	III
298	Cave Creek Path	Lone Mountain Py	112th Pl	7015	1.3	1	6	0	1	0	3	2	7.0	7.0	3.7	III
299	Cave Creek Path	112th Pl	City Limits	6172	1.2	1	6	0	0	0	1	1	1.5	1.5	2.6	III
300	Camelback Path	Camelback Rd	Chaparral Rd	2651	0.5	10	8	2	0	0	2	0	10.0	10.0	9.4	I
301	Shea Path	142nd St	City Limits	1342	0.3	6	8	1	0	0	1	0	5.0	5.0	6.4	II
302	IBW Osborn Bridge			213	0.0	10	6	2	0	0	1	0	9.0	9.0	8.6	I

Appendix E: City of Scottsdale Path Prioritization Calculations by Tier

Path ID	Name	From	To	Length (ft)	Length (mi)	Latent Demand	LOS	Connection SUPs	Connection Bike Lanes or Paved Shoulders	Connection Bike Routes	Connection Streets	Connection Future Paths	Connection Total	Connection Score (max 10)	Prioritization Score	Tier
41	Indian Bend Path	Chaparral Rd	Jackrabbit Rd	2932	0.6	10	8	2	2	0	0	0	14.0	10.0	9.4	I
300	Camelback Path	Camelback Rd	Chaparral Rd	2651	0.5	10	8	2	0	0	2	0	10.0	10.0	9.4	I
23	Crosscut Path	Catalina Dr	Thomas Rd	508	0.1	10	8	1	1	0	1	1	8.5	8.5	9.1	I
11	Crosscut Connector	64th St	Crosscut Canal	426	0.1	10	8	1	1	0	1	0	8.0	8.0	9.0	I
7	Indian Bend Path	Eldorado Aquatic Center	Indian Bend Wash	851	0.2	9	8	2	1	1	1	1	14.0	10.0	8.9	I
24	Crosscut Canal Path	Thomas Rd	Indian School Rd	3683	0.7	10	8	0	2	0	0	3	7.5	7.5	8.9	I
30	Arizona Canal Path	Chaparral Rd	McDonald Dr	5444	1.0	10	8	0	1	0	2	5	7.5	7.5	8.9	I
197	92nd St Path	Sweetwater Ave	Raintree Dr	5251	1.0	9	8	0	1	2	6	2	13.0	10.0	8.9	I
199	100th St Path	Frank Lloyd Wright Bl	Thompson Peak Py	2499	0.5	9	8	1	2	0	0	0	10.0	10.0	8.9	I
33	Jackrabbit Bridge	Arizona Canal at Jackrabbit Rd		181	0.0	9	8	1	1	1	0	2	9.5	9.5	8.8	I
129	CAP Path	Thompson Peak Py	Loop 101	7011	1.3	9	8	1	1	0	1	3	9.5	9.5	8.8	I
198	92nd St Path	Raintree Dr	Frank Lloyd Wright Bl	3149	0.6	9	8	0	1	1	3	2	8.5	8.5	8.6	I
302	IBW Osborn Bridge			213	0.0	10	6	2	0	0	1	0	9.0	9.0	8.6	I
20	2nd St Path	75th St	Indian Bend Wash	1392	0.3	10	6	1	1	0	1	1	8.5	8.5	8.5	I
25	Arizona Canal Path	60th St	64th St	2765	0.5	10	8	0	1	0	1	3	5.5	5.5	8.5	I
27	68th Street Bridge	Lafayette Bl	Indian School Rd	367	0.1	9	8	0	2	1	0	1	8.0	8.0	8.5	I
44	Chaparral Path	Chaparral Park Path	McDonald	2224	0.4	10	8	1	0	0	1	1	5.5	5.5	8.5	I
6	Indian Bend Path	McDowell Rd	Eldorado Aquatic Center	2726	0.5	9	8	1	1	0	0	1	7.5	7.5	8.4	I
28	Arizona Canal Path	Goldwater Bl	Scottsdale Rd	2078	0.4	10	8	0	0	0	4	2	5.0	5.0	8.4	I
47	82nd St Path	Valley Vista Dr	Redwing Rd	2544	0.5	8	8	1	0	1	4	1	10.0	10.0	8.4	I
207	100th St Path	Thompson Peak Py	Frank Lloyd Wright Bl	5097	1.0	8	8	0	3	0	0	3	10.5	10.0	8.4	I
35	Arizona Canal Path	McDonald Rd	Indian Bend Wash	4148	0.8	8	8	2	0	0	0	3	9.5	9.5	8.3	I
39	Hayden Tunnel 2	Hayden Rd at Coolidge		141	0.0	10	8	1	0	0	0	1	4.5	4.5	8.3	I
40	Hayden Tunnel	Hayden Rd at Chaparral		174	0.0	10	8	1	0	0	0	1	4.5	4.5	8.3	I
253	Horizon Crossing	Indian Bend Path	Horizon Park	193	0.0	9	8	1	1	0	0	0	7.0	7.0	8.3	I
14	Thomas Rd Path	Pima Park	Pima Path	623	0.1	10	8	1	0	0	0	0	4.0	4.0	8.2	I
29	Arizona Canal Path	Scottsdale Rd	Chaparral Rd	3400	0.6	10	8	0	0	0	3	2	4.0	4.0	8.2	I
26	Arizona Canal Path	64th St	Goldwater Bl	4694	0.9	10	8	0	0	1	0	4	3.5	3.5	8.1	I
192	Northsight Path	Hayden Rd	CAP Aqueduct	2206	0.4	10	8	0	0	0	2	3	3.5	3.5	8.1	I
9	70th St Connection	Virginia Ave	Thomas Rd	1450	0.3	10	8	0	0	0	3	0	3.0	3.0	8.0	I
137	Shea Path	Hayden Rd	Loop 101	4155	0.8	6	10	1	1	0	3	3	11.5	10.0	8.0	I
138	Shea Path	Loop 101	96th St	5356	1.0	6	10	2	1	1	4	0	16.5	10.0	8.0	I
176	Scottsdale Rd Path	Cactus Park	Sweetwater Ave	1478	0.3	8	10	1	0	0	1	0	5.0	5.0	8.0	I
21	Main Street Path	78th St	Indian Bend Wash	246	0.0	9	8	1	0	0	1	0	5.0	5.0	7.9	I
42	Vista Path	Chaparral Park	Vista Dr	52	0.0	9	8	1	0	0	1	0	5.0	5.0	7.9	I
99	Mountain View Path	Mountain View Rd	Arabian Tr	2925	0.6	7	8	2	0	1	1	1	11.0	10.0	7.9	I
115	Via Linda Path	Mountain View Rd	Lakeview Dr	3920	0.7	7	8	1	1	0	2	2	10.0	10.0	7.9	I
139	Shea Path	96th St	104th St	5313	1.0	7	8	1	2	1	1	2	13.5	10.0	7.9	I
148	Hayden Path	Cactus Rd	Thunderbird Rd	5324	1.0	7	8	0	2	1	3	2	11.5	10.0	7.9	I
151	Pima Path	Shea Bl	Cactus Rd	5462	1.0	7	8	1	0	0	7	2	12.0	10.0	7.9	I
1	South Corp Yard Path	Miller Rd	Indian Bend Wash	671	0.1	8	8	1	1	0	0	0	7.0	7.0	7.8	I
12	Thomas Bike Stop	Thomas Rd	Indian Bend Wash	832	0.2	10	6	1	0	0	1	0	5.0	5.0	7.8	I
13	Thomas Rd Gap	Indian Bend Wash	Thomas Rd	304	0.1	10	6	1	0	0	1	0	5.0	5.0	7.8	I
128	CAP Path	Sweetwater Ave	Thompson Peak Py	8784	1.7	8	8	0	1	1	1	3	7.0	7.0	7.8	I
191	76th St Path	Greenway Rd	CAP Aqueduct	3916	0.7	7	10	0	0	0	6	1	6.5	6.5	7.8	I
37	Lincoln Path	Indian Bend Wash	79th St	822	0.2	7	8	2	0	0	1	0	9.0	9.0	7.7	I
135	Shea Path	64th St	Scottsdale Rd	5293	1.0	6	10	0	0	0	8	1	8.5	8.5	7.7	I
31	Miller Connection	Arizona Canal	Miller Rd	68	0.0	9	8	0	1	0	0	1	3.5	3.5	7.6	I
32	Jackrabbit Path	Arizona Canal	Miller Rd	170	0.0	9	8	0	1	0	0	1	3.5	3.5	7.6	I
210	Redfield Path	Frank Lloyd Wright Bl	100th St	1328	0.3	8	8	0	1	0	2	2	6.0	6.0	7.6	I
136	Shea Path	Scottsdale Rd	Hayden Rd	5263	1.0	5	10	1	0	0	5	2	10.0	10.0	7.5	I
147	Hayden Path	Shea Bl	Cactus Rd	5719	1.1	7	8	0	1	0	4	2	8.0	8.0	7.5	I
5	Crosscut Connection	Belleview St	Crosscut Canal	798	0.2	8	8	1	0	0	1	0	5.0	5.0	7.4	I
15	Paiute Path	Avalon Dr	Osborn Rd	1423	0.3	9	8	0	0	1	1	0	2.5	2.5	7.4	I

Appendix E: City of Scottsdale Path Prioritization Calculations by Tier

Path ID	Name	From	To	Length (ft)	Length (mi)	Latent Demand	LOS	Connection SUPs	Connection Bike Lanes or Paved Shoulders	Connection Bike Routes	Connection Streets	Connection Future Paths	Connection Total	Connection Score (max 10)	Prioritization Score	Tier
43	Jackrabbit Path	Indian Bend Path	Jackrabbit Rd	113	0.0	9	8	0	0	1	1	0	2.5	2.5	7.4	I
103	90th St Path	Bella Vista Path	Indian Bend Path	2707	0.5	7	8	1	0	0	3	1	7.5	7.5	7.4	I
140	Shea Path	104th St	Frank Lloyd Wright Blvd	6569	1.2	6	8	0	2	1	3	2	11.5	10.0	7.4	I
141	Shea Path	Frank Lloyd Wright Bl	124th St	6614	1.3	6	8	1	1	1	3	3	13.0	10.0	7.4	I
142	Shea Path	124th St	136th St	8533	1.6	6	8	1	0	3	0	3	10.0	10.0	7.4	I
143	Arabian_Shea Path	Arabian Tr	Shea Bl	522	0.1	6	10	1	0	1	1	1	7.0	7.0	7.4	I
10	Thomas Rd Path	61st St	62nd St	342	0.1	9	8	0	0	0	2	0	2.0	2.0	7.3	I
18	Columbus Path	Columbus Ave	Granite Reef Rd	48	0.0	9	8	0	0	0	2	0	2.0	2.0	7.3	I
38	Indian Bend Path	Silverado Golf Course	Indian Bend Rd	1661	0.3	6	8	2	0	0	1	1	9.5	9.5	7.3	I
89	Gainey Ranch Path	Mountain View Rd	Gold Dust Rd	2527	0.5	7	6	2	0	0	2	1	10.5	10.0	7.3	I
90	Gainey Ranch Path2	Mountain View Rd	Gold Dust Rd	2330	0.4	7	8	1	0	0	2	2	7.0	7.0	7.3	I
102	Arabian Path	Arabian Tr	Shea Bl	519	0.1	7	8	1	0	1	1	1	7.0	7.0	7.3	I
152	Pima Path	Cactus Rd	Thunderbird Rd	5614	1.1	7	6	1	1	1	2	2	11.5	10.0	7.3	I
164	Indian Bend Path	92nd St	Cactus Rd	6329	1.2	7	6	2	1	1	4	1	17.0	10.0	7.3	I
167	Cactus Path	96th St	104th St	5304	1.0	7	6	1	2	1	3	2	15.5	10.0	7.3	I
200	FLW Path	Thunderbird Rd	Redfield Path	485	0.1	9	8	0	0	0	1	2	2.0	2.0	7.3	I
34	San Miguel Path	Arizona Canal	76th Pl	132	0.0	9	8	0	0	0	1	1	1.5	1.5	7.2	I
46	Valley Vista Path	Hayden Rd	82nd St	1223	0.2	8	8	0	0	0	3	2	4.0	4.0	7.2	I
118	Lakeview Path	Via Linda	Laguna Elementary School	1734	0.3	7	8	1	0	0	1	3	6.5	6.5	7.2	I
119	Lakeview Path	Laguna Elementary School	Shea Bl	1709	0.3	6	8	1	0	0	4	1	8.5	8.5	7.1	I
123	Power Line Path	Bella Vista Path	Shea Bl	6336	1.2	6	8	0	1	0	4	3	8.5	8.5	7.1	I
144	Shea Path	120th St	124th St	2634	0.5	6	8	1	0	1	2	2	8.5	8.5	7.1	I
19	Civic Center Path	Drinkwater Bl	75th St	666	0.1	9	6	0	0	1	2	0	3.5	3.5	7.0	I
45	Chaparral Path	McDonald Dr	Valley Vista Dr	632	0.1	8	8	0	0	0	2	2	3.0	3.0	7.0	I
116	ScRanchPk 2	Tennis Courts	Path	237	0.0	6	8	2	0	0	0	0	8.0	8.0	7.0	I
153	Pima Path	Thunderbird Rd	Frank Lloyd Wright Bl	6728	1.3	7	6	0	1	0	4	3	8.5	8.5	7.0	I
72	Arizona Canal Path	Hayden Rd	82nd St	1282	0.2	7	8	1	0	0	1	0	5.0	5.0	6.9	I
74	Indian Bend Rd Path	Scottsdale Rd	Hayden Rd	5107	1.0	6	8	1	0	0	2	3	7.5	7.5	6.9	I
124	Powerline Path	Shea Bl	Cactus Rd	7064	1.3	5	8	1	0	0	11	3	16.5	10.0	6.9	I
149	Hayden Path	Thunderbird Rd	Frank Lloyd Wright Bl	9941	1.9	5	8	0	1	0	9	4	14.0	10.0	6.9	I
206	100th St Path	Aztec Elementary School	Frank Lloyd Wright	1559	0.3	7	8	0	1	0	1	2	5.0	5.0	6.9	I
213	Desert Canyon Path	Thompson Peak Py	Desert Canyon Middle School	689	0.1	9	4	0	1	1	0	3	6.0	6.0	6.9	I
214	Desert Canyon Path	Desert Canyon Path	102nd St	762	0.1	9	4	1	0	1	0	1	6.0	6.0	6.9	I
215	Ranch Park Path	102nd St	Desert Canyon Path	2060	0.4	9	4	1	0	1	0	1	6.0	6.0	6.9	I
237	Loop 101 Path	Hayden Rd	Bell Rd	5399	1.0	5	8	0	3	0	1	4	12.0	10.0	6.9	I
17	Osborn Path	Osborn Rd	Pima Rd	131	0.0	9	6	0	0	1	1	0	2.5	2.5	6.8	II
126	CAP Path	Shea Bl	Via Linda	4327	0.8	6	8	1	0	0	2	2	7.0	7.0	6.8	II
186	Northsight Path	Thunderbird Rd	Northsight Path	559	0.1	6	6	1	2	1	0	1	12.0	10.0	6.8	II
241	Pima Path	CAP Aqueduct	Bell Rd	3272	0.6	5	8	0	2	0	2	3	9.5	9.5	6.8	II
4	Yavapai Path	Yavapai Elementary School	Indian Bend Wash	316	0.1	7	8	1	0	0	0	0	4.0	4.0	6.7	II
16	Earll Path	81st Pl	82nd Pl	111	0.0	9	6	0	0	0	2	0	2.0	2.0	6.7	II
48	Agua Linda Path	Agua Linda Park	Pima Path	217	0.0	7	8	1	0	0	0	0	4.0	4.0	6.7	II
73	Arizona Canal Path	Hayden Rest Stop	Arizona Canal Path	70	0.0	7	8	1	0	0	0	0	4.0	4.0	6.7	II
91	Gold Dust Path	West of Hayden Rd	Arabian Tr	1147	0.2	7	6	1	0	1	1	1	7.0	7.0	6.7	II
121	Palomino Path	Bella Vista Path	117th Wy	5521	1.0	5	8	0	2	0	2	2	9.0	9.0	6.7	II
125	CAP Path	Bella Vista Path	Shea	7953	1.5	6	8	0	0	1	3	4	6.5	6.5	6.7	II
201	Sweetwater Path	89th St	96th St	4514	0.9	7	4	2	1	1	6	2	19.5	10.0	6.7	II
202	Sweetwater Path	96th St	Frank Lloyd Wright	5944	1.1	7	4	1	2	1	6	2	18.5	10.0	6.7	II
211	FLW Path	100th St	CAP Aqueduct	1520	0.3	7	8	0	1	0	0	2	4.0	4.0	6.7	II
36	Lincoln Path	Arizona Canal	78th St	501	0.1	6	8	1	0	1	0	1	6.0	6.0	6.6	II
100	Irish Hunter Path	Mountain View Path	Arabian Tr	1371	0.3	6	6	1	0	1	3	1	9.0	9.0	6.6	II
109	Bella Vista Path	CAP Aqueduct	Shea Bl	10230	1.9	5	8	1	0	1	2	2	8.5	8.5	6.6	II
112	104th St Path	Mission Ln	Via Linda	1748	0.3	6	8	0	1	0	2	2	6.0	6.0	6.6	II
212	Desert Canyon Path	WestWorld	Desert Canyon Path	1578	0.3	9	2	1	1	0	0	1	7.5	7.5	6.6	II

Appendix E: City of Scottsdale Path Prioritization Calculations by Tier

Path ID	Name	From	To	Length (ft)	Length (mi)	Latent Demand	LOS	Connection SUPs	Connection Bike Lanes or Paved Shoulders	Connection Bike Routes	Connection Streets	Connection Future Paths	Connection Total	Connection Score (max 10)	Prioritization Score	Tier
180	73rd St Path	Sutton Dr	Thunderbird Rd	1449	0.3	7	8	0	0	0	2	2	3.0	3.0	6.5	II
205	Presidio Path	Sutton Dr	100th St	2018	0.4	7	6	0	1	0	2	2	6.0	6.0	6.5	II
22	Indian School Path	Bashas Market	81st St	135	0.0	10	2	0	1	0	1	0	4.0	4.0	6.4	II
50	Joshua Tree Cnctr	Joshua Tree Ln	Pima Path	21	0.0	6	8	1	0	0	1	0	5.0	5.0	6.4	II
52	Dorado Connector	Via de Dorado	Pima Path	49	0.0	6	8	1	0	0	1	0	5.0	5.0	6.4	II
64	87th Wy Connector	87th Wy	Pima Path	219	0.0	6	8	1	0	0	1	0	5.0	5.0	6.4	II
65	San Rafael Connector	San Rafael Dr	Pima Path	23	0.0	6	8	1	0	0	1	0	5.0	5.0	6.4	II
68	Pima Path	Mountain View Rd Crossing		84	0.0	6	6	2	0	0	0	0	8.0	8.0	6.4	II
69	Sun Canyon Connector	Sun Canyon	Pima Path	43	0.0	6	8	1	0	0	1	0	5.0	5.0	6.4	II
71	Mustang Connector	Mustang Tr	Pima Path	49	0.0	6	8	1	0	0	1	0	5.0	5.0	6.4	II
127	CAP Path	Via Linda	Sweetwater Ave	9245	1.8	6	8	0	0	1	2	3	5.0	5.0	6.4	II
145	Shea Path	124th St	132nd St	3623	0.7	6	8	0	0	1	2	3	5.0	5.0	6.4	II
154	Pima Path	Frank Lloyd Wright Bl	Bell Rd	6053	1.1	6	8	0	1	0	0	4	5.0	5.0	6.4	II
209	Thunderbird Path	97th St Path	Frank Lloyd Wright Bl	510	0.1	8	6	0	0	0	2	2	3.0	3.0	6.4	II
239	Loop 101 Path	Hayden Rd	Princess Dr	5798	1.1	5	8	0	2	0	0	3	7.5	7.5	6.4	II
301	Shea Path	142nd St	City Limits	1342	0.3	6	8	1	0	0	1	0	5.0	5.0	6.4	II
3	Papago Path	Granite Reef Rd	Pima Path	2732	0.5	6	8	1	0	0	0	1	4.5	4.5	6.3	II
104	Bella Vista Path	90th St	104th St	8690	1.6	7	8	0	0	0	0	4	2.0	2.0	6.3	II
114	Sctsdl Ranch Path	104th St Path	Scottsdale Ranch Path	79	0.0	6	8	1	0	0	0	1	4.5	4.5	6.3	II
130	CAP Path	Loop 101	Hayden Rd	5177	1.0	5	8	0	2	0	0	2	7.0	7.0	6.3	II
131	CAP Path	Hayden Rd	Scottsdale Rd	5417	1.0	5	8	0	2	0	0	2	7.0	7.0	6.3	II
132	124th St Path	CAP Aqueduct	Cochise Dr	1681	0.3	6	8	0	0	1	2	2	4.5	4.5	6.3	II
146	Shea Path	132nd St	140th St	6590	1.2	6	8	0	0	1	2	2	4.5	4.5	6.3	II
166	Cholla Path	108th St	Cholla Park	3396	0.6	5	6	2	0	1	3	0	12.5	10.0	6.3	II
179	76th St Path	Sutton Dr	Thunderbird Rd	3906	0.7	7	6	0	0	0	4	2	5.0	5.0	6.3	II
196	92nd St Path	Larkspur Dr	Sweetwater Ave	1270	0.2	7	6	0	0	1	2	3	5.0	5.0	6.3	II
203	Presidio Path	96th St	97th St Path	1053	0.2	6	6	1	1	0	0	1	7.5	7.5	6.3	II
264	Desert Camp Path	Pima Acres Path	Thompson Peak Py	2195	0.4	5	6	2	1	0	1	1	12.5	10.0	6.3	II
66	Rancho Antiqua Path2	Rancho Antigua	Pima Path	27	0.0	6	8	1	0	0	0	0	4.0	4.0	6.2	II
67	Rancho Antiqua Path	Rancho Antigua	Pima Path	57	0.0	6	8	1	0	0	0	0	4.0	4.0	6.2	II
70	Casabella Connector	Casabella Condominiums	Pima Path	47	0.0	6	8	1	0	0	0	0	4.0	4.0	6.2	II
184	Thunderbird Path	76th St	Hayden Rd	2703	0.5	7	6	0	1	0	0	3	4.5	4.5	6.2	II
217	Scottsdale Rd Path	Loop 101	Thompson Peak Py	3801	0.7	4	8	1	1	0	1	2	9.0	9.0	6.2	II
82	Via de Ventura Path	Indian Bend Path	Doubletree Ranch Rd	2387	0.5	5	6	2	0	0	1	0	9.0	9.0	6.1	II
165	Cholla Path	94th St	108th St	9034	1.7	7	2	1	2	1	5	2	17.5	10.0	6.1	II
183	73rd St Path	Thunderbird Rd	Redfield Rd	1253	0.2	6	8	0	0	0	3	1	3.5	3.5	6.1	II
255	Reata Path	Union Hills Dr	Thompson Peak Py	7292	1.4	5	6	1	1	0	0	3	8.5	8.5	6.0	II
2	Granite Reef Path	McKellips Rd	Granite Reef Rd	1531	0.3	6	8	0	0	0	2	1	2.5	2.5	5.9	II
75	IBW West Path	Indian Bend Rd	Scottsdale Rd	3752	0.7	5	8	0	1	0	1	2	5.0	5.0	5.9	II
81	McCormick Path	Via Bonita	Doubletree Ranch Rd	922	0.2	5	6	1	0	0	4	0	8.0	8.0	5.9	II
101	Arabian Path	Irish Hunter Path	Arabian Tr	710	0.1	6	8	0	0	1	0	2	2.5	2.5	5.9	II
117	ScRanchPk 1	Path	Lakeview Dr	349	0.1	5	8	1	0	0	1	0	5.0	5.0	5.9	II
182	Thunderbird Path	Redfield Rd	Thunderbird Rd	1466	0.3	7	6	0	0	0	2	2	3.0	3.0	5.9	II
204	97th St Path	Sutton Dr	Presidio Rd	435	0.1	7	6	0	0	0	2	2	3.0	3.0	5.9	II
218	Scottsdale Rd Path	Deer Valley Rd	Pinnacle Peak Rd	5364	1.0	3	8	0	2	0	4	2	11.0	10.0	5.9	II
49	La Luna Connector	Via de La Luna	Pima Path	29	0.0	6	6	1	0	0	1	0	5.0	5.0	5.8	II
54	Del Arbor Connector	Via del Arbor	Pima Path	54	0.0	6	6	1	0	0	1	0	5.0	5.0	5.8	II
56	McCormick Connector	Via de McCormick	Pima Path	19	0.0	6	6	1	0	0	1	0	5.0	5.0	5.8	II
57	Commercio Connector	Ranch Office	Pima Path	30	0.0	6	6	1	0	0	1	0	5.0	5.0	5.8	II
59	Ranch Connector	Ranch Office Park	Pima Path	45	0.0	6	6	1	0	0	1	0	5.0	5.0	5.8	II
60	Ranch Connector	Ranch Office Park	Pima Path	19	0.0	6	6	1	0	0	1	0	5.0	5.0	5.8	II
63	San Esteban Path	San Esteban Dr	Pima Path	78	0.0	6	6	1	0	0	1	0	5.0	5.0	5.8	II
85	Ventura Path B	85th Wy	86th Pl	329	0.1	6	8	0	0	0	2	0	2.0	2.0	5.8	II
86	Ventura Path	85th Wy	86th Pl	423	0.1	6	8	0	0	0	2	0	2.0	2.0	5.8	II

Appendix E: City of Scottsdale Path Prioritization Calculations by Tier

Path ID	Name	From	To	Length (ft)	Length (mi)	Latent Demand	LOS	Connection SUPs	Connection Bike Lanes or Paved Shoulders	Connection Bike Routes	Connection Streets	Connection Future Paths	Connection Total	Connection Score (max 10)	Prioritization Score	Tier
106	Bella Vista Path	104th St	112th St	5309	1.0	6	8	0	0	0	0	4	2.0	2.0	5.8	II
113	104th St Path	Via Linda	Scottsdale Ranch Park	180	0.0	6	8	0	0	0	1	2	2.0	2.0	5.8	II
134	Mt View Connector	Camelback Walk	Mountain View Rd	401	0.1	6	6	1	0	0	1	0	5.0	5.0	5.8	II
168	Cactus Path	104th St	Frank Lloyd Wright Bl	4019	0.8	5	6	0	1	1	2	2	7.5	7.5	5.8	II
181	Thunderbird Path	Thunderbird Rd	Redfield Rd	556	0.1	7	6	0	0	0	1	3	2.5	2.5	5.8	II
195	Larkspur Path	Larkspur Dr	93rd St	986	0.2	7	6	0	0	0	2	1	2.5	2.5	5.8	II
230	Bell Path	Power Line Path	Thompson Peak Py	6203	1.2	5	6	0	2	0	0	3	7.5	7.5	5.8	II
238	Loop 101 Path	Scottsdale Rd	Hayden Rd	5374	1.0	5	8	0	1	0	1	1	4.5	4.5	5.8	II
248	76th St Path	Loop 101	Thompson Peak Py	6247	1.2	4	6	1	1	1	1	2	10.5	10.0	5.8	II
78	Indian Bend Path	Hayden Rd	Indian Bend Path	1178	0.2	5	4	2	0	0	2	1	10.5	10.0	5.7	II
79	McCormick Py Path	Scottsdale Rd	Indian Bend Path	6023	1.1	5	4	1	1	0	3	4	12.0	10.0	5.7	II
107	Bella Vista Path	112th St	122nd St	6447	1.2	6	8	0	0	0	0	3	1.5	1.5	5.7	II
108	Bella Vista Path	122nd St	CAP Aqueduct	4625	0.9	6	8	0	0	0	0	3	1.5	1.5	5.7	II
190	Northsight Path	Northsight Path	Redfield Path	241	0.0	6	6	1	0	0	0	1	4.5	4.5	5.7	II
208	97th St Path	Presidio Path	Thunderbird Rd	1711	0.3	7	6	0	0	0	1	2	2.0	2.0	5.7	II
225	Hayden Path	CAP Aqueduct	Copper Basin Park	4008	0.8	5	4	2	2	0	1	3	16.5	10.0	5.7	II
226	Hayden Path	Copper Basin Park	Power Line Path	7693	1.5	5	4	1	1	0	3	4	12.0	10.0	5.7	II
231	82nd St Path	Princess Dr	Union Hills Dr	1885	0.4	5	4	2	1	0	4	1	15.5	10.0	5.7	II
243	Power Line Path	WestWorld	Pima Rd	7881	1.5	5	4	1	3	0	0	6	16.0	10.0	5.7	II
245	Power Line Path	Hayden Rd	Thompson Peak Py	3018	0.6	5	4	1	2	0	0	0	10.0	10.0	5.7	II
247	Thompson Peak Path	Hayden Rd	Pima Rd	5893	1.1	5	4	2	2	0	1	1	15.5	10.0	5.7	II
53	Inner Circle Cnctr	Inner Circle	Pima Path	12	0.0	6	6	1	0	0	0	0	4.0	4.0	5.6	III
58	Ranch Connector	Ranch Office Park	Pima Path	34	0.0	6	6	1	0	0	0	0	4.0	4.0	5.6	III
133	124th St Path	Cochise Dr	Lost Dog Trailhead	6616	1.3	6	2	0	0	1	10	3	13.0	10.0	5.6	III
170	132nd St Path	Shea Bl	Via Linda	3054	0.6	6	2	1	0	1	4	2	10.5	10.0	5.6	III
185	Thunderbird Path	Hayden Rd	Loop 101	4987	0.9	6	2	0	3	1	2	3	14.0	10.0	5.6	III
194	92nd St Path	Cactus Rd	Larkspur Dr	1311	0.2	7	6	0	0	0	1	1	1.5	1.5	5.6	III
216	Scottsdale Rd Path	CAP Aqueduct	Loop 101	7627	1.4	4	8	0	0	0	4	4	6.0	6.0	5.6	III
169	Bent Tree Path	110th St	Frank Lloyd Wright Bl	1036	0.2	5	6	1	0	0	1	1	5.5	5.5	5.4	III
171	Mayo Path	Shea Bl	Cactus Rd	6224	1.2	6	2	0	1	0	5	2	9.0	9.0	5.4	III
177	Sweetwater Path	Scottsdale Rd	76th St	2568	0.5	8	2	0	0	0	3	2	4.0	4.0	5.4	III
178	76th St Path	Sweetwater Ave	Cotton Dr	1376	0.3	8	1	0	1	0	1	3	5.5	5.5	5.4	III
189	Redfield Path	Northsight Park	Gelding Dr	590	0.1	6	6	0	0	0	2	2	3.0	3.0	5.4	III
193	FLW Path	82nd St	Northsight Path	1971	0.4	5	8	0	0	0	2	1	2.5	2.5	5.4	III
240	Loop 101 Path	Scottsdale Rd	Hayden Rd	5503	1.0	4	8	0	1	0	0	4	5.0	5.0	5.4	III
88	Mountain View Path	Scottsdale Rd	78th St	4148	0.8	5	6	0	0	1	3	1	5.0	5.0	5.3	III
111	104th St Path	Bella Vista Path	Mission Ln	581	0.1	5	8	0	0	0	1	2	2.0	2.0	5.3	III
172	Via Linda Path	124th St	136th St	7896	1.5	5	4	0	0	2	4	2	8.0	8.0	5.3	III
229	Bell Path	Loop 101	Power Line Path	2724	0.5	5	6	0	0	0	4	2	5.0	5.0	5.3	III
254	Reata Path	Power Line Path	Union Hills Dr	7924	1.5	4	6	0	2	0	0	3	7.5	7.5	5.3	III
267	DC Ranch Path	DC Ranch Path	Thompson Peak Py	768	0.1	5	4	2	0	0	0	0	8.0	8.0	5.3	III
284	Dynamite Path	Pima Rd	97th Pl	6190	1.2	1	10	0	2	0	2	2	9.0	9.0	5.3	III
51	Sereno Connector	Via de Sereno	Pima Path	26	0.0	6	4	1	0	0	1	0	5.0	5.0	5.2	III
55	Taz Norte Connector	Via Taz Norte	Pima Path	14	0.0	6	4	1	0	0	1	0	5.0	5.0	5.2	III
83	Paseo Path	Via Paseo Del Norte	Scottsdale McCormick Office Park	349	0.1	5	8	0	0	0	1	1	1.5	1.5	5.2	III
84	Paseo Path	Paseo Path	Via de Negocio	483	0.1	5	8	0	0	0	1	1	1.5	1.5	5.2	III
97	Cholla Path	66th St	68th Pl	1560	0.3	6	4	0	0	1	3	1	5.0	5.0	5.2	III
120	Bella Vista Cnctr	Bella Vista Path	Bella Vista	435	0.1	5	8	0	0	0	1	1	1.5	1.5	5.2	III
122	Doubletree Path	Power Line Path	Doubletree Ranch Rd	130	0.0	5	8	0	0	0	1	1	1.5	1.5	5.2	III
227	Bell Path	Hayden Rd	Copper Basin Park	602	0.1	5	4	1	1	0	0	1	7.5	7.5	5.2	III
228	Bell Path	Copper Basin Park	Loop 101	3479	0.7	5	4	1	0	0	3	1	7.5	7.5	5.2	III
244	Power Line Path	Pima Rd	Hayden Rd	7804	1.5	5	4	0	2	0	0	3	7.5	7.5	5.2	III
246	Powerline Path	74th St	Scottsdale Rd	4077	0.8	4	4	1	1	1	3	2	12.5	10.0	5.2	III
268	Thompson Peak Path	Thompson Peak Path	Wash Crossing	2772	0.5	5	4	1	1	0	0	1	7.5	7.5	5.2	III

Appendix E: City of Scottsdale Path Prioritization Calculations by Tier

Path ID	Name	From	To	Length (ft)	Length (mi)	Latent Demand	LOS	Connection SUPs	Connection Bike Lanes or Paved Shoulders	Connection Bike Routes	Connection Streets	Connection Future Paths	Connection Total	Connection Score (max 10)	Prioritization Score	Tier
8	Elm Dr Connector	Elm Dr	Granite Reef Senior Center	146	0.0	5	8	0	0	0	1	0	1.0	1.0	5.1	III
95	68th Pl Path	Shea Bl	Cholla St	2875	0.5	6	2	0	0	1	4	4	7.5	7.5	5.1	III
234	Union Hills Path	Hayden Rd	Loop 101	2855	0.5	5	4	0	1	0	2	4	7.0	7.0	5.1	III
242	WestWorld Path	Loop 101	Power Line Path	4811	0.9	5	6	0	0	0	3	2	4.0	4.0	5.1	III
250	94th St Path	Power Line Path	Bell Rd	854	0.2	5	6	0	1	0	0	2	4.0	4.0	5.1	III
61	Villa Vallarta Path	Villa de Vallarta	Pima Path	37	0.0	6	4	1	0	0	0	0	4.0	4.0	5.0	III
62	Villa Royale Path	Villa Royale	Pima Path	32	0.0	6	4	1	0	0	0	0	4.0	4.0	5.0	III
174	128th St Path	Shea Bl	Cactus Rd	5618	1.1	6	2	0	0	0	5	3	6.5	6.5	4.9	III
224	Scottsdale Rd Path	Lone Mountain Rd	Carefree Hwy	10692	2.0	1	8	0	3	0	1	2	11.0	10.0	4.9	III
263	Pima Acres Path	Diamond Rim Dr	Desert Camp Dr	1597	0.3	5	6	0	0	0	2	2	3.0	3.0	4.9	III
290	Carefree Path	56th St	Scottsdale Rd	10068	1.9	3	8	0	0	0	4	2	5.0	5.0	4.9	III
87	Mountain View Path	68th Pl	Scottsdale Rd	2521	0.5	5	6	0	0	0	2	1	2.5	2.5	4.8	III
221	Scottsdale Rd Path	Jomax Rd	Dynamite Bl	5283	1.0	1	8	0	2	0	2	3	9.5	9.5	4.8	III
288	60th St Path	Dove Valley Rd	Carefree Hwy	5178	1.0	3	6	0	0	0	6	3	7.5	7.5	4.8	III
157	Pima Path	Los Gatos Dr	Happy Valley Rd	9027	1.7	1	8	0	2	0	2	2	9.0	9.0	4.7	III
187	Redfield Path	Hayden Rd	Northsight Park	2602	0.5	5	6	0	0	0	1	2	2.0	2.0	4.7	III
252	Old Pima Path	Power Line Path	Hualapai Dr	4005	0.8	4	4	1	1	0	0	1	7.5	7.5	4.7	III
269	Deer Valley Path	Existing sidewalk	Miller Rd	1069	0.2	3	4	2	2	0	0	1	14.5	10.0	4.7	III
76	Scottsdale Rd Path	Indian Bend Wash	McCormick Py	1692	0.3	4	2	1	1	0	3	3	11.5	10.0	4.6	III
92	70th St Path	Mountain View Rd	Gold Dust Ave	1318	0.2	5	6	0	0	0	1	1	1.5	1.5	4.6	III
110	96th St Path	Bella Vista Path	Mission Ln	777	0.1	5	6	0	0	0	1	1	1.5	1.5	4.6	III
188	82nd St Connector	82nd St	Redfield Path	309	0.1	5	6	0	0	0	1	1	1.5	1.5	4.6	III
256	Reata Path	Thompson Peak Py	Adobe Dr	5360	1.0	4	6	0	1	0	0	2	4.0	4.0	4.6	III
285	Dynamite Path	97th Pl	Alma School Py	8978	1.7	1	10	0	0	0	4	2	5.0	5.0	4.5	III
150	Professional Gap	85th Pl	Scottsdale Professional	82	0.0	6	4	0	0	0	1	0	1.0	1.0	4.4	III
175	Cactus Path	124th St	128th St	2542	0.5	6	2	0	0	0	3	2	4.0	4.0	4.4	III
219	Scottsdale Rd Path	Pinnacle Peak Rd	Happy Valley Rd	5257	1.0	2	8	0	0	0	4	2	5.0	5.0	4.4	III
232	82nd St Path	Union Hills Dr	Loop 101	1371	0.3	5	4	0	0	0	2	3	3.5	3.5	4.4	III
93	Gold Dust Path	68th Wy	70th St	1253	0.2	5	4	0	0	0	2	2	3.0	3.0	4.3	III
155	Pima Path	Loop 101	Power Line Path	3796	0.7	4	4	0	1	0	1	3	5.5	5.5	4.3	III
220	Scottsdale Rd Path	Happy Valley Rd	Jomax Rd	4939	0.9	1	8	0	2	0	0	2	7.0	7.0	4.3	III
274	Happy Valley Path	Scottsdale Rd	Alma School Rd	20704	3.9	1	6	0	3	0	5	6	17.0	10.0	4.3	III
281	Dynamite Path	56th St	Scottsdale Rd	10647	2.0	1	6	0	2	0	4	1	10.5	10.0	4.3	III
233	Union Hills Path	Scottsdale Rd	Hayden Rd	5356	1.0	4	4	0	1	0	1	2	5.0	5.0	4.2	III
249	Center Path	Scottsdale Rd	76th St Path	1192	0.2	4	6	0	0	0	1	2	2.0	2.0	4.2	III
94	68th Pl Path	Gold Dust Ave	Shea Bl	1452	0.3	5	2	0	0	0	4	2	5.0	5.0	4.1	III
98	Gold Dust Gap	Gold Dust Ave	Gold Dust Ave	201	0.0	5	4	0	0	0	2	0	2.0	2.0	4.1	III
173	Via Linda Path	Hidden Hills		6884	1.3	5	4	0	0	1	0	1	2.0	2.0	4.1	III
222	Scottsdale Rd Path	Dynamite BL	Dixileta Rd	5271	1.0	1	8	0	0	0	5	2	6.0	6.0	4.1	III
257	Reata Path	Adobe Dr	Pinnacle Peak Rd	5257	1.0	3	6	0	1	0	0	2	4.0	4.0	4.1	III
266	DC Ranch Path	Alma School Path	Copper Ridge Middle School	377	0.1	4	4	1	0	0	0	1	4.5	4.5	4.1	III
270	Milller Path	Deer Valley Rd	Pinnacle Peak Rd	6322	1.2	3	2	2	1	0	5	1	16.5	10.0	4.1	III
289	Border Path	60th St	Scottsdale Rd	12678	2.4	1	8	0	1	0	2	2	6.0	6.0	4.1	III
105	100 Pl Connector	Bella Vista Path	100th Pl	52	0.0	5	4	0	0	0	1	1	1.5	1.5	4.0	III
251	Thompson Peak Path	Bell Path	Desert Activity Center	1586	0.3	5	4	0	0	0	1	1	1.5	1.5	4.0	III
96	Mescal Path	68th Pl	68th Pl	1577	0.3	6	1	0	0	0	2	2	3.0	3.0	3.9	III
273	Rawhide Path	Scottsdale Rd	Happy Valley Rd	7539	1.4	2	6	0	0	0	4	3	5.5	5.5	3.9	III
287	Dove Valley Path	56th St	60th St	2798	0.5	3	6	0	0	0	2	2	3.0	3.0	3.9	III
235	Union Hills Tunnel	Loop 101		595	0.1	4	4	0	0	0	2	2	3.0	3.0	3.8	III
159	Pima Path	Jomax Rd	Dynamite Bl	5192	1.0	1	6	0	2	0	0	2	7.0	7.0	3.7	III
295	Stagecoach Path	Pima Rd	Lone Mountain Py	13116	2.5	1	4	0	1	0	7	3	11.5	10.0	3.7	III
296	Lone Mountain Path	Stagecoach Rd	Cave Creek Rd	11089	2.1	1	4	0	1	0	6	2	10.0	10.0	3.7	III
297	Cave Creek Path	City Limits	Lone Mountain Py	8631	1.6	1	4	0	3	0	2	2	12.0	10.0	3.7	III
298	Cave Creek Path	Lone Mountain Py	112th Pl	7015	1.3	1	6	0	1	0	3	2	7.0	7.0	3.7	III

Appendix E: City of Scottsdale Path Prioritization Calculations by Tier

Path ID	Name	From	To	Length (ft)	Length (mi)	Latent Demand	LOS	Connection SUPs	Connection Bike Lanes or Paved Shoulders	Connection Bike Routes	Connection Streets	Connection Future Paths	Connection Total	Connection Score (max 10)	Prioritization Score	Tier
236	Union Hills Path	Loop 101	Power Line Path	1387	0.3	4	4	0	0	0	1	2	2.0	2.0	3.6	III
265	94th St Connector	Sierra Pinta Dr	Desert Camp Dr	107	0.0	4	4	0	0	0	2	0	2.0	2.0	3.6	III
258	Reata Path	Pinnacle Peak Rd	Happy Valley Rd	5909	1.1	1	6	0	1	0	2	2	6.0	6.0	3.5	III
260	Reata Path	Jomax Rd	Rio Verde Dr	6279	1.2	1	6	0	1	0	2	2	6.0	6.0	3.5	III
262	Pima Acres Path	S of Hualapai Dr	Diamond Rim Dr	1810	0.3	4	4	0	0	0	1	1	1.5	1.5	3.5	III
271	Miller Path	Williams Dr	Pinnacle Peak Rd	2731	0.5	3	4	0	0	0	2	3	3.5	3.5	3.4	III
156	Pima Path	Overlook Dr	Los Gatos Dr	1649	0.3	3	2	1	0	0	1	2	6.0	6.0	3.3	III
223	Scottsdale Rd Path	Dixileta Rd	Lone Mountain Rd	5205	1.0	1	8	0	0	0	1	2	2.0	2.0	3.3	III
259	Reata Path	Happy Valley Rd	Jomax Rd	6116	1.2	1	6	0	0	0	4	2	5.0	5.0	3.3	III
286	Lone Mountain Path	Scottsdale Rd	Pima Rd	10360	2.0	1	4	0	2	0	1	2	8.0	8.0	3.3	III
158	Pima Path	Happy Valley Rd	Jomax Rd	5190	1.0	1	6	0	1	0	0	2	4.0	4.0	3.1	III
160	Pima Path	Dynamite Bl	Dixileta Dr	5354	1.0	1	6	0	1	0	0	2	4.0	4.0	3.1	III
163	Pima Path	Westland Rd	Stagecoach Rd	7880	1.5	1	4	0	2	0	0	2	7.0	7.0	3.1	III
292	Westland Path	Hayden Rd	Pima Rd	5317	1.0	1	2	0	2	0	4	2	11.0	10.0	3.1	III
293	Westland Path	Pima Rd	92nd Pl	4830	0.9	1	2	0	2	0	2	3	9.5	9.5	3.0	III
294	Westland Path	92nd Pl	Stagecoach Rd	9050	1.7	1	2	0	1	0	6	1	9.5	9.5	3.0	III
161	Pima Path	Dixileta Dr	Lone Mountain Rd	5433	1.0	1	4	0	1	0	1	2	5.0	5.0	2.7	III
162	Pima Path	Lone Mountain Rd	Westland Rd	8400	1.6	1	4	0	1	0	1	2	5.0	5.0	2.7	III
261	Hualapai Path	Ironwood Path	Pima Acres Path	2487	0.5	3	1	1	0	0	0	1	4.5	4.5	2.7	III
299	Cave Creek Path	112th Pl	City Limits	6172	1.2	1	6	0	0	0	1	1	1.5	1.5	2.6	III
291	Westland Path	Scottsdale Rd	Hayden Rd	5378	1.0	1	2	0	1	0	3	2	7.0	7.0	2.5	III
272	Miller Path	Pinnacle Peak Rd	Happy Valley Rd	5209	1.0	1	4	0	0	0	2	3	3.5	3.5	2.4	III
280	64th St Path	Pinnacle Vista Dr	Dynamite Bl	2580	0.5	1	4	0	0	0	2	2	3.0	3.0	2.3	III
282	Dynamite Path	Scottsdale Rd	80th St	5172	1.0	1	2	0	1	0	1	3	5.5	5.5	2.2	III
283	Dynamite Path	80th St	Pima Rd	5389	1.0	1	2	0	1	0	1	3	5.5	5.5	2.2	III
277	Jomax Path	Pinnacle Peak Py	Alma School Rd	1317	0.2	1	2	0	1	0	1	2	5.0	5.0	2.1	III
275	Rawhide Path	Happy Valley Rd	Jomax Rd	5222	1.0	1	2	0	1	0	1	1	4.5	4.5	2.0	III
279	Pinnacle Vista Path	56th St	64th St	5254	1.0	1	1	0	1	0	2	2	6.0	6.0	2.0	III
278	56th St Path	Jomax Rd	Dynamite Bl	5320	1.0	1	1	0	0	0	4	2	5.0	5.0	1.8	III
276	Jomax Path	Jomax Rd	Alma School Rd	1421	0.3	1	2	0	0	0	2	2	3.0	3.0	1.7	III

7 PEDESTRIAN ELEMENT

1.0 INTRODUCTION

The purpose of the Pedestrian Element is to encourage walking as a sustainable form of transportation; to make walking a safer, more convenient and a more comfortable travel option; and to provide policy guidance and standards regarding the type, quality, and locations of pedestrian facilities throughout the City. This element is designed to be implemented through the City of Scottsdale's DS&PM, *Standard Details for Public Works Construction* (*Standard Details*), and land use and zoning decisions of the City Council, Transportation Commission, planning commission, and City transportation and planning staff.

The Pedestrian Element has been divided into eight major sections: (1) goals and objectives for the Pedestrian Element; (2) background of pedestrians and walking (3) an overview of existing conditions including existing policies and documents; (4) discussion of future pedestrian demand using a latent demand model; (5) opportunities to enhance and improve the comfort, safety and convenience of walking; (6) a pedestrian route network based on the results of future pedestrian demand; (7) design guidelines to ensure that pedestrian areas meet the needs of all pedestrians; and (8) recommendations to implement the goals and objectives of the Pedestrian Element.

2.0 GOALS AND OBJECTIVES

This section lists all goals and objectives for the Pedestrian Element of the *Transportation Master Plan*. For purposes of this section, a goal is defined as a long-term vision to which programs, activities, and actions are directed. An objective is a specific, measurable task that provides progress toward achievement of a goal.

2.1 Pedestrian safety and security goal: Create a street environment that is safe and secure for pedestrians.

- Objective 1: Develop and implement a SRTS program.
- Objective 2: Create and systematically implement design guidelines that enhance pedestrian safety, including ways to enhance the abilities of pedestrians to cross roadways.
- Objective 3: Create a pedestrian safety action plan using recent guidance developed by FHWA and ADOT.
- Objective 4: Consistently maintain existing pedestrian facilities so they remain clear of debris, overgrown vegetation, and poor conditions (such as heaved or broken pavement), responding to complaints and working with City crews and private homeowners.
- Objective 5: Establish patrols in areas with high pedestrian use and enforce traffic laws for pedestrians and motorists.

2.2 Pedestrian access and connectivity goal: Create a street environment that allows pedestrians to directly access key destinations by walking.

- Objective 1: Create and systematically implement design guidelines that address key pedestrian concerns of directness, capacity, and continuity.

- Objective 2: Connect pedestrian facilities to link to other pedestrian supportive facilities, such as transit routes and shared-use paths.
- Objective 3: Design pedestrian facilities using universal design principles and the draft guidelines for accessible public rights-of-way published by the public rights-of-way access advisory committee of the access board.[1]

2.3 Streetscape and land use goal: Provide pedestrian amenities and promote land uses that enhance public spaces, neighborhoods, commercial, and employment areas – amenities that will entice more people to walk.

- Objective 1: Create and systematically implement design guidelines that provide guidance to enhance visual interest and identify the appropriate level of amenities that responds to anticipated use by pedestrians as identified by the latent demand model.
- Objective 2: Encourage land use that increases pedestrian activity by providing residential and neighborhood commercial and employment uses within close proximity.
- Objective 3: Require all development proposals to include a pedestrian circulation element.
- Objective 4: Promote school site design that encourages non-motorized travel for students and personnel by accommodating direct links between schools and neighborhoods in a manner that minimizes exposure to vehicles.

2.4 Education and promotion goal: Educate citizens, community groups, school children and parents, businesses, and developers on safety, health, and civic aspects of walking.

- Objective 1: Develop and implement comprehensive and proactive pedestrian safety programs for pedestrians and motorists.
- Objective 2: Promote pedestrian travel as an alternative to driving for short neighborhood trips such as from home to schools, parks, libraries, retail centers, and civic spaces.
- Objective 3: Encourage and promote walking as a way to improve health and reduce vehicle emissions.
- Objective 4: Sponsor educational opportunities to keep City staff and elected officials informed of recent advances in pedestrian planning and facility design.

2.5 Implementation goal: Incorporate pedestrian needs into the policy-making, planning, design, construction, and maintenance of existing and new policies, plans, programs, projects, facilities, and operations.

- Objective 1: Create and adopt design guidelines and standards that create a safe, functional, convenient, accessible, and pleasurable walking environment.
- Objective 2: Continue to provide dedicated funding sources for pedestrian improvements.
- Objective 3: Construct appropriate pedestrian facilities in new development, and retrofit existing areas to meet pedestrian needs.

1 Available from www.access-board.gov/prowac/draft.htm.

- Objective 4: Prioritize pedestrian improvements based on potential usage by the highest number of pedestrians as identified by the latent demand model.
- Objective 5: Create and update a comprehensive pedestrian facilities inventory, including existing sidewalks and accessibility features (such as curb cuts, accessible pedestrian signals, etc.).
- Objective 6: Identify a staff person responsible for reviewing all development proposals and site plans to ensure that all planning and design projects appropriately incorporate pedestrian needs.

3.0 BACKGROUND

3.1 Benefits of Walking

Walking is the most basic form of transportation. All trips begin and end with walking, even for those who use a vehicle for the majority of their trip. Because it generally requires no special equipment, walking is the easiest and most convenient transportation mode. According to the pedestrian and bicycle information center, walking has a number of economic, environmental, health, quality of life, and transportation benefits.[2]

Walking is one of the oldest and most basic forms of transportation.

Walking is one of the most affordable forms of transportation since no special equipment is required beyond assistive devices for persons with mobility impairments. Walking is ideal for short-distance trips and could replace short-distance motor-vehicle trips. According to the 1995 national personal transportation survey, approximately 40 percent of all trips are less than two miles in length – which represents an approximately 30 minute walk.

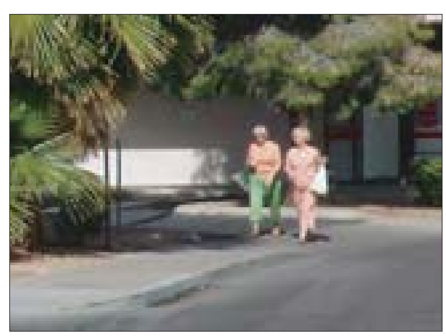
Walking is an ideal form of exercise that can help contribute to improved health and well-being. Regular exercise can help manage and reduce a wide range of common diseases, such as heart disease, hypertension, obesity, diabetes, and depression. Improving walking conditions helps to improve quality of life in communities as well. The ability of people to walk safely and comfortably is a key factor in community livability. Communities with higher livability are better able to attract businesses, workers, and tourists.

Walking can also help to meet congestion management goals as well. Some roadways carry more traffic than they were designed to handle, resulting in wasted time and energy, pollution, and driver frustration. Increased walking can help offset the costs of providing new roads and parking.

3.2 What is a Pedestrian?

According to Arizona state law, a pedestrian is:

> … Any person afoot. A person who uses an electric personal assistive mobility device or a manual or motorized wheelchair is considered a pedestrian unless the manual wheelchair qualifies as a bicycle. (A.R.S.28-101)



Pedestrians walk in Downtown (3rd Avenue)

2 Pedestrian and Bicycle Information Center, www.walkinginfo.org.

Pedestrians also include rollerskaters, in-line skaters, and skateboarders, as well as users of "electric personal assistive mobility devices" which means a self-balancing two nontandem wheeled device with an electric propulsion system that limits the maximum speed of the device to 15 mph or less and that is designed to transport only one person" (A.R.S. 28-101). One common brand of these types of devices is the Segway human transporter.

The needs of pedestrians vary depending on their age, physical ability, and travel purpose. Children generally require adult supervision and educational programs to increase their awareness of traffic and safe walking behavior. Common age-related characteristics of pedestrians are shown in Table 7-1.

TABLE 7-1: Common Pedestrian Characteristics By Age Group

Age 0 to 4	Learning to walk.
	Requires constant parental supervision.
	Developing peripheral vision, depth perception.
Age 5 to 9	Lower eye height; 1/3 narrower side vision than adults.
	Not able to determine direction of sounds.
	Have difficulty judging speed and distance.
	Smaller (not as tall); drivers may not see them.
	Have short attention span and will grow impatient if they have to wait too long to cross the street.
	Assume that if they see a vehicle, it can see them.
	Do not understand complicated situations. If one vehicle slows or stop, they may assume that others will do the same.
Age 9 to 12	Increasing independence, but still requiring adult supervision.
	Poor depth perception.
	Susceptible to darting out into traffic and intersection dash behavior.
	Crash rates are highest for 5- to 9-year old males.
Age 13 to 18	Sense of invulnerability.
	Runs through intersections without looking first.
Age 19 to 40	Active, fully aware of travel environment.
Age 41 to 65	Slowing of reflexes.
Age 65 +	Street crossing difficulty.
	Poor vision.
	Difficulty hearing vehicles approaching from behind; reduced ability to detect and differentiate sounds.
	Limited attention span, memory, and cognitive abilities.
	Reduced endurance and tolerance for extreme temperature and environments.
	Decreased range of joint motion, balance, and stability.
	Excessive trust that drivers will obey traffic rules.
	High fatality rate.

Sources: Washington State Bicycle Transportation and Pedestrian Walkways Plan, 1994, as cited in the pedestrian facilities guidebook, Washington state Department of Transportation, September 1997, available at www.Wsdot.Wa.Gov/walk/designinfo.Htm; toolbox to address safety and operations on school grounds and public streets adjacent to elementary and middle schools in Iowa, Iowa Department of Transportation, August 2006; designing sidewalks and trails for access, FHWA, July 1999.

Physical ability will vary with age, but also varies with the individual.[3] For example, medical conditions, such as cardiac disease and degenerative joint disease, may limit a person's ability to walk, and to move quickly out of the path of an oncoming vehicle. Also, parents pushing children in strollers, bicyclists walking with their bicycles, and adults carrying packages or other items will likely not react as quickly to potential hazards due to inattention and limited physical ability caused by taking care of another person. Tourists and people walking in groups may be distracted. All of these pedestrians are likely to walk more slowly and require more maneuvering space than other pedestrians. Walking speeds of different types of pedestrians are shown in Table 7-2.

Parents pushing children in strollers (the pedestrian is on Scottsdale Road) will like not react as quickly to potential hazards, and require more maneuvering space than other pedestrians.

TABLE 7-2: Pedestrian Walking Speeds

Pedestrian Type	Average Walking Speed, Feet Per Second
Average adult	4.00
Wheelchair user	3.55
Pedestrian with immobilized knee	3.50
Older/senior adult	2.80
Cane or crutch user	2.62
Below-knee amputee	2.46
Pedestrian with knee arthritis	2.46
Pedestrian with hip arthritis	2.24 to 3.66
Pedestrian with walker	2.07
Above-knee amputee	1.97

Source: FHWA course on bicycle and pedestrian transportation (for planners and designers),FHWA, Lesson 8, available at http://safety.FHWA.Dot.Gov/pedbike/univcourse

People with disabilities[4] need a pedestrian environment free of barriers. An environment designed with the principles of universal design helps to create pedestrian areas that function well for people with disabilities (see Section 6.8 Design Facilities That Are Universally Accessible). Pedestrian areas that are designed to be accessible to people with disabilities are generally safer and more user-friendly for all pedestrians. The needs of a pedestrian with a disability will depend on the type of disability, the level of impairment, and the capability of the individual. In general, elements that are helpful to pedestrians with disabilities are listed in Table 7-3.

3 *Designing Sidewalks and Trails for Access*, FHWA, July 1999, available at www.fhwa.dot.gov/environment/bikeped/access-1.htm

4 *Designing Sidewalks and Trails for Access*, FHWA, July 1999, available at www.fhwa.dot.gov/environment/bikeped/access-1.htm. Also see *Pedestrian and Streetscape Guide*, Georgia Department of Transportation, September 2003, page 15, available at www.walkable.org/download/Georgia_ped_streetscape_guide.pdf.

Pedestrian areas that are designed to be accessible to people with disabilities are generally safer and more user-friendly for all pedestrians.

TABLE 7-3: Elements Helpful For Pedestrians With Disabilities
Curb cuts and ramps
Tactile warnings
Easy-to-reach activation buttons
Audible warnings and message systems
Raised and braille letters for communication
Signal timing at lower than average walking speed
Maximum grade of 1:20 and cross slope of 1:50 (ramps can be 1:12)
Roadway crossing refuges
Reduced roadway crossing distances (bulb-outs and curb extensions)
Traffic calming
Handrails

Source: Pedestrian and Streetscape Guide, Georgia Department of Transportation, September 2003, page 15, available at www.Walkable.Org/download/Georgia_ped_streetscape_guide.Pdf

3.3 What Is a Pedestrian Facility?

Components of the pedestrian transportation system are generally referred to as "pedestrian facilities." Pedestrian facilities include sidewalks, curb ramps, multiuse paths, multiuse trails, crosswalks, traffic calming features, grade-separated crossings, and other elements that encourage pedestrian movement such as landscaping, site furnishings and amenities, and public art. Pedestrian facilities also include design strategies that help make walking safer, more convenient, and more comfortable. Multiuse paths and multiuse trails are discussed in the Bicycle Element of the *Transportation Master Plan*.

3.4 Measuring the Effectiveness of Pedestrian Facilities

The Kansas City Pedestrian Walkability Plan[5] summarizes key factors that affect pedestrian mobility, including directness, capacity, continuity, street crossings, visual interest and amenities, and security. The MAG *Pedestrian Policies and Design Guidelines* also describe common factors found in successful pedestrian environments.[6] Effective pedestrian environments will include the design elements discussed below.

3.4.1 Directness

National research has shown that distance (real or perceived) is the reason most cited as determining whether people walk. In general, people will choose to walk approximately 10-15 minutes (about a 1/4 to 1/2-mile to a destination) if the route is comfortable and safe or if the need is great.

If the sidewalk network is direct and minimizes travel time, a person is more likely to walk. Features such as gated or walled communities can create barriers to nearby transit stops and nearby commercial or entertainment areas. The land use mix and its density influences whether

5 *Kansas City Walkability Plan*, prepared for the City Planning and Development Department, Kansas City, Missouri, by LSA Associates, Inc. Adopted March 20, 2003. This document is available at http://www.kcmo.org/planning.nsf/plnpres/walkability .

6 *Pedestrian Area Policies and Design Guidelines,* Maricopa Association of Governments, 2005, available at www.mag.maricopa.gov.

people walk. People are more likely to walk when a variety of destinations, such as home, transit stops, schools, parks, commercial areas, and employment are placed within close proximity.

While meandering sidewalks may have aesthetic appeal in some situations, they generally add more distance to the pedestrian trip and greater challenges for individuals with physical constraints. Highly meandering sidewalks limit both the efficiency and the effectiveness of the pedestrian trip. People generally want to use the most direct route and may not use a walkway if it does not provide the most direct route.

A direct pedestrian facility provides access to nearby destinations, such as shopping. People are more likely to walk when a variety of destinations, such as home, transit stops, schools, parks, commercial areas, and employment are placed within close proximity.

3.4.2 Capacity

People will choose to walk if the walkway has sufficient capacity. The capacity of a sidewalk will vary based on the number of pedestrians using it, the speed of adjacent traffic, and the number and location of obstacles on the sidewalk. The effective walkway width is the portion of the sidewalk actually used by pedestrians for walking. The walkway needs to be sufficiently wide to account for pedestrians moving away from the curb, building walls, light poles, window shopping, and street furnishings while traveling.

3.4.3 Continuity

Pedestrians require continuous routes, without gaps. Gaps in continuity can be caused by missing sidewalk segments, providing a sidewalk on only one side of the street, or overgrown vegetation.

Another aspect of continuity is the number of driveways along a walkway since pedestrians must pause at each driveway crossing to look for turning vehicles, and may have to wait or move around waiting vehicles. Minimizing driveway crossings and consolidating driveways creates continuous pedestrian routes.

Driveways along the pedestrian route limits continuity (photo taken in Downtown).

3.4.4 Street Crossings

Pedestrians also often face difficulty at intersections where they must cross. At intersections, where pedestrians interface with automobiles, special attention is needed to provide for a safe pedestrian environment. As streets get wider and carry more traffic, crossing conditions become more challenging for pedestrians.

The ability of a pedestrian to safely cross the street is affected by:[7]

- The number of lanes and widths of the lanes to cross;
- Presence of a raised median or refuge island;
- Presence of a marked crosswalk;
- Use of a pedestrian actuated signal or dedicated pedestrian crossing phase;
- Clear sight lines from motorists to pedestrians;

Special attention is needed where pedestrians interface with automobiles at street crossings.

7 *Kansas City Walkability Plan*, prepared for the City Planning and Development Department, Kansas City, Missouri, by LSA Associates, Inc. Adopted March 20, 2003, page 20. This document is available at http://www.kcmo.org/planning.nsf/plnpres/walkability .

- Ramps at corners that align with the crosswalks, in both directions;
- Street lighting.

Public art creates visual interest for pedestrians.

3.4.5 Visual Interest and Amenities

People will often choose to walk if the route is interesting. Many pedestrians, especially tourists or visitors new to an area, will walk further than 1/2 mile if the route is made interesting by other pedestrians, public art, landscaping, storefronts with windows, attractive views and places to rest. Walkers looking for exercise are also more likely to walk further than 1/2 mile.

Pedestrians feel most comfortable in areas that have human scale in design elements and are organized to meet their needs. The features next to the sidewalk can help create a more comfortable traveling environment. Features to consider include the ratio of building height to street; walkway width; frequency and height of windows, doorways or openings; hardscape and landscape; and street furnishings, such as seating. Pedestrian environments should be organized to provide clues about where conflicts with other roadway users may occur, and where amenities like shade and benches are provided to help create a human scaled environment.

On-street parking provides a buffer from traffic for pedestrians (Scottsdale Road Downtown Scottsdale).

3.4.6 Safety and Security

According to FHWA, "pedestrian crashes and the resulting injuries represent a serious problem on our highways." There are a number of risk factors that influence pedestrian crash rates and severity, including:

- Wide roads (pedestrian crash rates are higher on roads with more thanf our lanes);
- Higher speed, higher traffic volume roadways;
- Intersections with wider crossing distances, wide turning radii, multiple turn lanes or confusing or complex traffic control;
- Drug/alcohol use by drivers and/or pedestrians;
- Lack of sidewalks.
- Older persons are more susceptible to injury and death; younger children are more likely to be struck while darting into the street. [8]

Information on pedestrian vehicle collisions in the City of Scottsdale is provided in section 4.0 Existing Conditions and Appendix 7-C.

If people do not feel personally secure, even though the pedestrian route is considered safe from traffic, they will not choose to walk. Pedestrians should be clearly visible to other pedestrians and people participating in adjacent activities. Pedestrian areas should be well maintained to keep them free of debris/litter. Separation from traffic, through landscaping, bike lanes or parking, will help provide a more secure and comfortable walking environment. Providing pedestrian-level lighting in areas used at night also enhances personal security.

8 *How to Develop a Pedestrian Safety Action Plan*, US Dept. of Transportation, FHWA. Publication No. FHWA-SA-05-12, February 2006, Page 1.

4.0 EXISTING CONDITIONS

This section provides an overview of existing policies and plans regarding pedestrians, collision statistics, budgeted pedestrian improvements listed in the City's adopted capital improvement program, and a general discussion of existing pedestrian activity.

4.1 Existing Plans and Policies

Development of pedestrian policy and facilities has been facilitated through a wide range of city, regional, and area plans, listed below and summarized in Appendix 7-B and the Existing Conditions report, an appendix to the *Transportation Master Plan*.

1. City of Scottsdale *Bicycle/Pedestrian Transportation Plan* (January 1995)
2. City of Scottsdale *General Plan* Community Mobility Element (2001)
3. City of Scottsdale *Downtown Plan* and *Downtown Urban Design and Architectural Guidelines* (1986, last updated in 2004)
4. City of Scottsdale *Safe Routes to School Implementation Plan* (2006)
5. MAG *Pedestrian Policies and Design Guidelines* (2005)
6. MAG *Pedestrian Plan 2000* (December 1999)
7. City of Scottsdale and MAG *Downtown Pedestrian Mobility Study* (January 2007)
8. City of Scottsdale *Downtown Circulation Study* (2006)
9. City of Scottsdale DS&PM
10. Traffic Volume and Collision Rate Data Report (2006 – updated bi-annually)

4.2 Pedestrian-vehicle Collisions

Some of the common characteristics of pedestrian collisions include:[9]

- Driver and/or pedestrian inattention
- Struck by vehicle while crossing at an intersection (50 percent of all collisions)
- Struck by vehicle while crossing mid-block (33 percent of all collisions)
- Struck from behind while walking along the roadway in the same direction as traffic (particularly in rural areas)
- Motorist exceeding safe speed (contributes to most pedestrian deaths)
- Darting out into the street at mid-block (most common type of pedestrian collision for children)
- Vehicles backing up (difficult to see children and others walking behind)
- Collisions in urban areas (80 percent of all collisions)

The City of Scottsdale has complete crash data files which contain data on report number, date and time of the crash, crash location (street names and distance and direction from intersection), injury severity, manner of collision (head-on, rear-end, pedestrian, etc.), and other detailed information. The pedestrian crashes were extracted and reviewed from this data.

9 *Pedestrian and Bicycle Crash Types of the Early 1990s*, Snyder et al., as cited in Pedestrian and Streetscape Guide, Georgia Department of Transportation, September 2003, page 10, Table 6, available at www.walkable.org/download/Georgia_ped_streetscape_guide.pdf

Compared to Maricopa County, Scottsdale's pedestrian crash rate in January—December 2005 (crashes per 100,000 population) and pedestrian fatality rate in 2005 (fatalities per 100,000 population) are considerably lower (see Figure 7-1). Scottsdale's pedestrian fatality rate is also much lower than that of Phoenix, Mesa, Glendale, and Tempe, but higher than that of Chandler and Gilbert.[10,11]

The lower pedestrian crash rates in Scottsdale compared to Maricopa County may be the result of safer conditions for pedestrians in Scottsdale, and/or lower levels of pedestrian activity than other communities.

Detailed information, graphics, and maps pertaining to pedestrian collisions are included in Appendix 7-C.

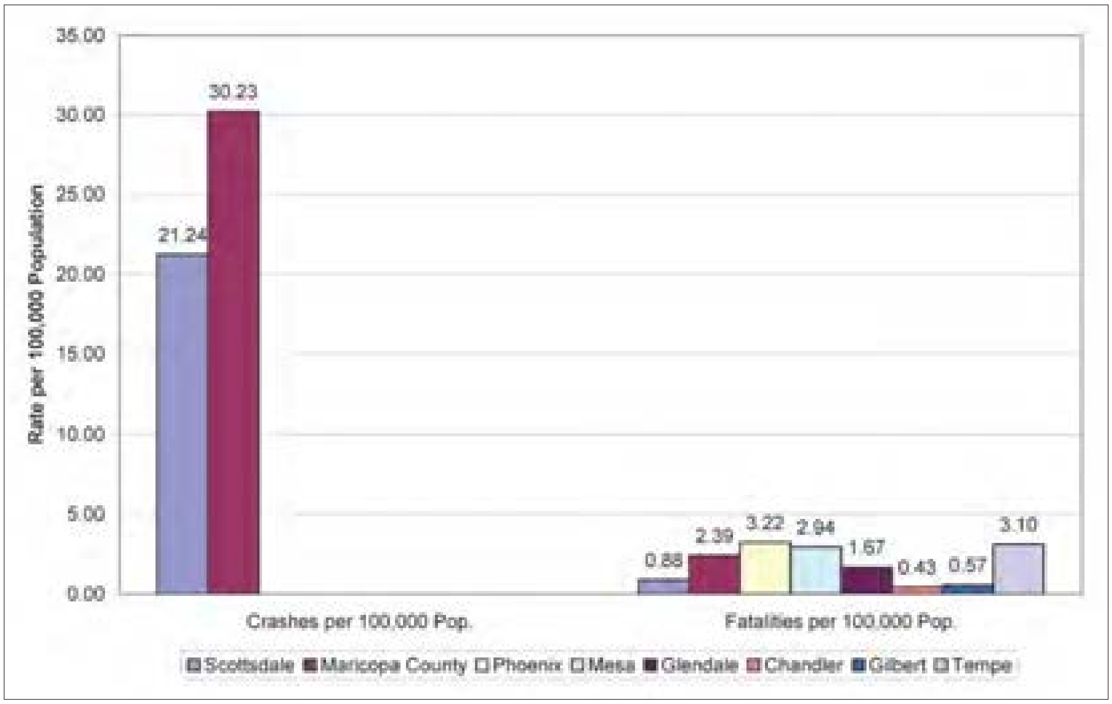


FIGURE 7-1: Pedestrian Crashes and Fatalities in Scottsdale and Surrounding Cities

4.3 Planned Pedestrian Improvements

The projects listed in Table 7-4 list the pedestrian improvements contained in the City of Scottsdale's CIP FY 2008-2012. This list does not encompass all pedestrian or bicycle facility improvements that are planned as many improvements also occur with transit projects and in private developments. Figures in Appendix 7-D show planned bicycle and pedestrian improvements anticipated to occur as part of the City's CIP by planning area.

10 Pedestrian fatality data for Scottsdale and surrounding cities are in *Traffic Safety Facts 2005,* available online at www-nrd.nhtsa.dot.gov/pdf/nrd-30/NCSA/TSFAnn/TSF2005.pdf. This document does not have data on the number of pedestrian crashes.

11 Maricopa County pedestrian crash data are available online at www.mag.maricopa.gov/archive/SafetyWebCrashData/PedCrashTrend99_05.htm

TABLE 7-4: Planned Roadway, Bicycle, and Pedestrian Improvements

Project/Street	Project Description	Estimated Completion
74th St, Belleview to McDowell Rd	Improve pedestrian environment; add on-street parking.	2007
Bell Rd, 94th St to Thompson Peak Pkwy	Construct two travel lanes, landscaped median, bike lanes, sidewalks, and new wash crossing.	2007
Cactus Rd, Pima Fwy to Frank Lloyd Wright Blvd	Construct four-lane major collector between Pima Fwy and 96th St and two-lane neighborhood collector between 96th St and Frank Lloyd Wright Blvd. Entire corridor will include medians/center turn lanes, bike lanes, curb and gutter, sidewalk, and shared-use non-paved trail. A shared-use paved path will also be included between 96th St and Frank Lloyd Wright Blvd.	2009
Crosscut Canal shared-use path system	Completion of the path system from the Tempe border to Indian School Rd	2008
Indian Bend Rd, Scottsdale Rd to Hayden Rd	Construct to four-lane minor arterial standards with landscaped median, turn lanes, bike lanes, curb and gutter, new all-weather crossing of Indian Bend Wash, and sidewalk on south side. A new shared-use path will be installed on north side to connect the Indian Bend path system to McCormick Railroad Park. Additional turn lanes will be constructed at the Scottsdale Rd and Hayden Rd intersections.	2008
Indian Bend Wash shared-use path system	Redesign and widen the Indian Bend Wash multiuse path system to 10–12 feet in areas where the path is currently 8 feet wide between McDowell and Camelback roads. Improvements to existing grade-separated crossings and improved connections from side streets will also be considered.	2011
Indian School Rd, Drinkwater Blvd to Pima Rd	Construct driveway closures, new turn lanes, bus bays, and a landscaped median to maximize through capacity in the existing four travel lanes, relocate and widen sidewalks, where feasible, and add bike lanes.	2008
McDonald Dr, Scottsdale Rd to 78th St	Reconfigure and add turn lanes at McDonald Dr/Scottsdale Rd and McDonald Dr/78th St. Enhance pedestrian features between the Arizona Canal and Miller Rd/Cattle Track Rd	2008
McDowell Rd, Scottsdale Rd to Granite Reef Rd	Add bicycle lanes and enhance sidewalks; add landscaping, site furnishings and pedestrian lighting.	2010
Pima Rd, Deer Valley Rd to Pinnacle Peak Pkwy	Design and construct a six-lane parkway cross section beginning approximately 1,400 feet north of Thompson Peak Pkwy, with landscaped median, turn lanes, grade-separated path crossing, bike lanes, sidewalks, curb and gutter, roadway drainage, intelligent transportation system facilities, and noise mitigation.	2009
Scottsdale Rd, Frank Lloyd Wright Blvd to Thompson Peak Pkwy	Design and construct a six-lane major arterial cross section with landscaped median, turn lanes, bike lanes, sidewalks, curb and gutter, roadway drainage, and intelligent transportation system facilities. Additional turn lanes at Frank Lloyd Wright Blvd and a new pedestrian crossing of the Central Arizona Project canal will also be included.	2008

TABLE 7-4: Planned Roadway, Bicycle, and Pedestrian Improvements		
Project/Street	Project Description	Estimated Completion
Scottsdale Rd, Thompson Peak Pkwy to Pinnacle Peak Pkwy.	Design and construct a six-lane major arterial cross section with landscaped median, turn lanes, bike lanes, sidewalks, curb and gutter, roadway drainage, intelligent transportation system facilities, and a new all-weather crossing of Rawhide Wash.	2010
Scottsdale Rd between Roosevelt St to Earll Dr (Phase 1), and Earll Dr to and Chaparral Rd (Phase 2)	Add bicycle lanes and widen sidewalks. Landscaping, shade, site furnishings, pedestrian lighting, and crosswalk treatments will also be included.	2009
Thomas Rd, 64th St to Pima Rd	Add bicycle lanes and widen sidewalks; add landscaping, shade, and site furnishings. Consider additional turn lanes at intersections.	2010

Pedestrians along Brown Avenue enjoy the activities of Old Town.

4.3 Current Pedestrian Activity

There are three primary methods of assessing pedestrian trip activity:

- Revealed demand;
- Evaluating potential trip generators or attractors; and
- Latent demand.[12]

Revealed demand identifies pedestrian activity by counting existing pedestrians on roadways. However, actual pedestrian counts do not indicate the level of demand for pedestrian travel for several reasons. First, pedestrian travel is more sensitive to impediments than automobile travel. For example, distance between origins and destinations affects the choice to walk more than the choice to drive. In addition, the conditions of the walking environment, such as whether a sidewalk exists, also affect whether a walking trip is made and what route is used. Furthermore, depending on the purpose of the trip, walking may also not be a reasonable choice when compared with driving. For these reasons, existing pedestrian counts do not accurately reflect the amount of pedestrian travel that would occur if there were not as many impediments to the selection of walking as a transportation mode choice.

Despite its weaknesses as a methodology, revealed demand does help to determine current pedestrian activity. Pedestrian counts for 2005, from the federal special census (the most recent year for which statistics are available) show that 1.5 percent of the City's population over 16 years of age walked as a sole means of transportation to work. Another 1.9 percent of the City's population over 16 years of age rode a bus or bicycled to work. Compared to the 2000 and 1990 census, people walking as their only mode of travel to work declined as a percent of the total population. This decline is more than offset by an overall number of people using public transit, and one could speculate that increased transit service throughout Scottsdale from 1990 to 2005 enabled many people who walked and bicycled to work to shift to public

12 See *Pedestrian Plan 2000* Technical Appendix, Maricopa Association of Governments, December 1999, available at www.mag.maricopa.gov.

transit as their primary means of commuting. In addition, most of the recent population growth in Scottsdale has occurred in the northern areas where local employment is more limited.

Pedestrian amenities make Downtown an enjoyable walking environment.

Another way to determine pedestrian travel demand is to assess potential trip starting points and destinations. This method has traditionally been the most common method to estimate pedestrian travel demand. This method of assessing demand also has weaknesses because it tends to focus only on major pedestrian trip destinations, such as schools, parks, and retail centers. Therefore, only a fraction of the potential pedestrian trips are considered. In reality, since most pedestrian trips are relatively short in length, virtually every residence and every destination in the community is a pedestrian starting point or destination.

The third method used to quantify pedestrian activity levels is latent demand. Latent demand considers all potential trip starting points and destinations and identifies the amount of pedestrian travel that could occur if there were no obstacles to pedestrian travel. Latent demand methodology acknowledges that pedestrian trips decline with larger distances between starting points and destinations, and that some types of trips are more likely to be made by pedestrians than drivers. For example, people will generally walk further to work than to a restaurant, since travel to work is perceived as more essential than a trip to a restaurant.

Latent demand is an emerging method to determine pedestrian activity levels. As such, this Pedestrian Element uses latent pedestrian demand to help identify a planned pedestrian facility network and prioritize infrastructure investments as discussed in other sections of the Pedestrian Element.

4.4 Barriers to Pedestrian Travel

Section 3.4 Measuring the Effectiveness of Pedestrian Facilities, discussed important features essential to creating a functional pedestrian environment. These features include directness, capacity, continuity, visual interest and amenities, and safety and security. In addition, roadway and traffic conditions often present barriers to pedestrian movement. These barriers, by increasing the perceived hazards of walking, discourage some individuals from walking. Instead, they will use the automobile mode, contributing to traffic, or not make the trip at all. Therefore, the actual number of people walking in Scottsdale is likely less than the potential number. Additional information on pedestrian latent demand is provided in Section 5.0 Future Pedestrian Demand.

At Drinkwater Boulevard and Scottsdale Road, there is no sidewalk for pedestrians. The provision of a sidewalk or other accessible walking surface is the most important step in providing a safe and comfortable pedestrian environment.

4.4.1 Lack of Sidewalk

The provision of a sidewalk or other accessible walking surface is probably the most important step in providing a safe and comfortable pedestrian environment. Without a walkway, pedestrians may be forced to walk in the roadway or choose not to walk. For roadways with destinations on both sides of the roadway, sidewalks are important to provide on each side of the roadway.

4.4.2 High Volume of Turning Vehicles

Another traffic condition that causes difficulty for pedestrians is a high volume of turning vehicles, either at intersections or at driveways. Turning motorists often do not look for, or yield to, pedestrians. Right-turn-on-red motorists, for instance, scan to the left for gaps in traffic and often fail to scan to the right for pedestrians crossing in front of them in the crosswalk. At some intersections, a continuous stream of motorists turning right on green means that pedestrians may find it difficult to cross even when they have the walk signal (and motorists must yield the right of way). Excluding crashes occurring on private property (for example, parking lots), 40 percent of pedestrian crashes in Scottsdale from January 2005—October 2006 occurred at intersections.

A high volume of turning vehicles at intersections can make it difficult for pedestrians to cross (Brown Avenue and First Avenue).

4.4.3 Lack of Safe Mid-block Crossings

Another difficult situation for pedestrians is caused by the lack of safe mid-block crossing locations. Pedestrians who are at a mid-block location and want to cross the street have to choose between crossing mid-block or going out of their way to cross at a signalized intersection. The further they are from a signalized intersection (and the further out of their way they have to go to reach the signalized intersection), the more likely it is that they will cross mid-block. Depending on traffic speeds and volumes, adequate gaps in traffic may be rare, or pedestrians may misjudge the adequacy of gaps. Moreover, high traffic speeds and volumes will prove daunting to some individuals. Rather than choosing between the inconvenience of going out of their way to cross at a signalized intersection and attempting a mid-block crossing, these individuals may decide not to walk at all. Excluding crashes occurring on private property, 60 percent of pedestrian crashes in Scottsdale from January 2005—October 2006 occurred at mid-block locations.

Pedestrians cross Goldwater Boulevard.

Pedestrians wait on a median for a gap in traffic to complete crossing Scottsdale Road.

The relative exposure (how many crossings occur) of pedestrians at mid-block locations as compared to signalized intersections cannot be determined without an extensive pedestrian mapping study. Also unknown is the degree to which pedestrian error, or possibly cognitive impairments, contributed to the mid-block crash numbers. More detailed crash studies will be required in the future to identify specific locations and roadway improvements which may be appropriate for improving pedestrian mid-block crossing conditions.

4.4.4 Wide Roadways

Another condition that makes pedestrian travel difficult is wide roadways. At a signalized intersection, slower pedestrians may not be able to finish crossing a roadway before traffic on that roadway gets the green light. At an unsignalized intersection or a mid-block location, adequate gaps in traffic may be rare, or pedestrians may misjudge the adequacy of gaps.

Wide roadways, such as Scottsdale Road, with infrequent signalized crossing, can be a challenge for pedestrians.

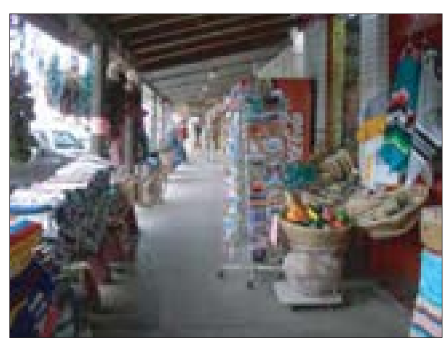
4.4.5 Insufficient Sidewalk Width

Sidewalks serve two primary functions: to accommodate pedestrian travel along the roadway and to provide access to adjoining land uses. Once these basic functions are served, any additional ROW (sidewalk width) should be used for activities or uses that complement the walking environment or adjoining land use. Examples of these activities include sidewalk cafés, information kiosks, and food and merchandise vendors. These activities should be encouraged as vital components of an attractive, active street. Active streets enhance the pedestrian environment and stimulate an area's economic vitality.

While the addition of these pedestrian walkway-based activities can encourage additional pedestrian activity and enhance pedestrian areas, these activities can also impede pedestrian mobility and access within the sidewalk ROW. Communities with active streets that also appropriately accommodate pedestrians generally address three areas when faced with a request to use areas adjacent to sidewalks: adequate clear width for pedestrians, accessibility for pedestrians with disabilities, and level of pedestrian safety and comfort provided by the sidewalk width.

Additional information on recommendations related to this issue is provided in Section 8.20 Sidewalk Cafés/Outdoor Dining.

Outdoor dining can be an important component of an active street environment, but must be placed in appropriate locations so that pedestrian walkways are not blocked.



Retail activity can also limit pedestrian space.

5.0 FUTURE PEDESTRIAN DEMAND

A latent demand model was prepared during the development of the *Transportation Master Plan* to help identify future pedestrian travel demand. This forecast modeling provides a way to estimate the latent, or potential, demand for pedestrian travel. Performing actual counts only reveals how many people currently walk a given segment of sidewalk, path or trail, not how many might walk that segment if the conditions were improved.

The model provides guidance for recommendations for pedestrian improvements by indicating the areas of highest demand for pedestrian facilities in 2020. This section documents the results of the future latent pedestrian demand model in Scottsdale.

5.1 Forecast 2020 Pedestrian Latent Demand

The methodology and basis of this analysis are discussed in the *Transportation Master Plan* latent demand technical report. Latent demand quantifies both ends of the walking trip and considers all origins (i.e., single-family and multi-family residences) and destinations (i.e., work places, shopping opportunities, parks, schools) in a study area for both existing and potential trips. The latent demand model assumes that the trips produced at an origin and attracted to a destination are directly proportional to 1) total trips generated at the origin, 2) total attractions at the destination, 3) a calibrating term, and 4) a socioeconomic adjustment factor. This model is based upon a theory similar to that used in roadway travel demand models. It is generally based on an area's proximity to schools/universities, parks/trails, and transit service, as well as the mix of surrounding population and employment. The latent demand score compares all roadways within Scottsdale to one another. Therefore, a roadway with a score of 10 will have the highest possible number of pedestrians of all roadways in Scottsdale, assuming that obstacles to pedestrian travel do not exist. A roadway with a latent demand score of 1 will have the lowest number of pedestrians when compared with all other roadways in Scottsdale, again assuming that obstacles to pedestrian travel do not exist. Detailed maps of the latent demand analysis findings are in Appendix 7-E.

The results of the latent demand analysis show the highest areas of latent demand, with a latent demand score of 10, are located predominantly in southern Scottsdale (Indian Bend Road south to the Tempe border) including south of Chaparral Road along Scottsdale and Hayden roads and Camelback, Indian School, Thomas, and McKellips roads for the entire breadth of the City. These areas have a relatively high number of residences and employment destinations, as well as schools, parks, trails/paths, and transit service. Hayden Road is adjacent to Indian Bend Wash, and is proximate to a number of schools and higher density housing. Along Scottsdale, Indian School, Thomas, and McKellips roads are areas of high commercial activity and population.

In the City north of Shea Boulevard and Loop 101 north to the City boundary, areas of high future latent demand include: Thompson Peak Parkway, near McDowell Mountain Ranch, south of Bell Road; and Frank Lloyd Wright Boulevard between Pima Road and Thompson Peak Parkway. At build-out, the Thompson Peak Parkway area will include substantial commercial development at the intersection of Bell Road and Thompson Peak Parkway, as well as significant residential development. The Frank Lloyd Wright Boulevard area is currently an active commercial and residential area that has not achieved full build-out.

Central and northern Scottsdale generally have moderate latent demand, with scores ranging from 5 to 8. Moderate areas of latent demand for pedestrian facilities are generally located along Cactus Road and Shea Boulevard. However, there are areas of relatively high latent demand identified by the analysis. They are Scottsdale Road from Shea Boulevard to Butherus (the entrance to the Scottsdale Airpark), Hayden Road from Indian Bend Road through the Airpark, and 90th Street from Shea Boulevard south to the SRPMIC. Shea Boulevard has substantial retail and higher density developments, especially in the area around the Scottsdale Road intersection where schools, retail, and multi-family housing are located. Shea Boulevard, east of Loop 101, includes the Scottsdale Healthcare Shea campus, regional and neighborhood shopping venues, and multi-family residential development. Cactus park, a 17-acre community park is located at Cactus and Scottsdale roads, has high potential for social/recreational trips. The Hayden Road area includes substantial open spaces including the Mountain View Road and Rotary parks, extensive residential development, and smaller areas of commercial and office development.

6.0 OPPORTUNITIES

This chapter discusses some of the opportunities Scottsdale has for improving the pedestrian environment. Overall, the City provides basic pedestrian facilities that generally foster a safe, enjoyable pedestrian environment, including:

- Comfortable sidewalks along many streets;
- Traffic signals with pedestrian actuators at the intersections of arterial and collector streets;
- Landscaping that provides shade and protection from the elements in many cases;
- Convenient transit stops and transit shelters in many locations; and
- An extensive and connected path system that takes advantage of canals, greenbelts, and other open space and recreation features.

Research done for the State of Washington *Pedestrian Facilities Guidebook*[13] identified common characteristics of pedestrian-friendly communities. These qualities are listed below and summarized in Appendix 7-A.

- Coordination between jurisdictions
- Linkages to a variety of land uses/regional connectivity
- Continuous systems/connectivity
- Shortened-trips and convenient access
- Continuous separation from traffic
- Pedestrian supportive land use patterns
- Well-functioning facilities
- Designated space
- Security and visibility
- Automobile is not the only consideration
- Neighborhood traffic calming
- Accessible and appropriately located transit
- Lively public spaces
- Character
- Scenic opportunities
- Pedestrian furnishings

13 *Pedestrian Facilities Guidebook*, Washington State Department of Transportation, September 1997, available at www.wsdot.wa.gov/walk/designinfo.htm

This courtyard in Downtown along First Avenue is an attractive waiting area for pedestrians in a pedestrian-oriented district.

- Street trees and landscaping
- Design requirements
- Proper maintenance

In some areas, such as Downtown, enhanced pedestrian facilities are provided with the goal of encouraging walking. As the community approaches build-out and some areas begin to redevelop, such as the SkySong project at Scottsdale and McDowell roads, new activity, tourist, and employment areas with the potential of attracting pedestrians will emerge. As these areas develop and redevelop, it will be important to address the opportunities described in this section.

6.1 Enhance Existing and Create New Special Pedestrian-oriented Districts and Areas

Walking destinations are areas where people go to walk and explore, and get to by walking. Areas such as Downtown should be designed so that walking is the predominant transportation mode. Areas with more pedestrians require more extensive pedestrian facilities, including increased sidewalk width, themed signs, site furnishings, decorative lighting, shade, and active streets that encourage pedestrians to linger and explore. Creating pedestrian-friendly streets in these areas is an opportunity. Elements of pedestrian-friendly streets are provided in Table 7-5.

TABLE 7-5: Elements of Pedestrian-friendly Streets
Interconnected streets with small blocks provide opportunities for pedestrian access, mobility, and safety.
Narrow streets, scaled for pedestrians, are less conducive to high vehicle speeds (street trees at the edges of the roadway create the perception of a narrower roadway).
Traffic calming.
Median refuge islands and mid-block crossing treatments assist pedestrians crossing roadways.
Public spaces, places to interact and places to rest that are adjacent to the pedestrian walkway enhance comfort and interest.
Awnings, covered building entrances and shade trees provide shelter from the sun and heat.
Landscaping can soften building edges and add softness to the built environment.
Pedestrian level lighting that illuminates the pedestrian walkway, without being harsh or intrusive, improves security.
Wide, smooth, continuous sidewalks that include elements for pedestrians with disabilities enhance mobility for all pedestrians.

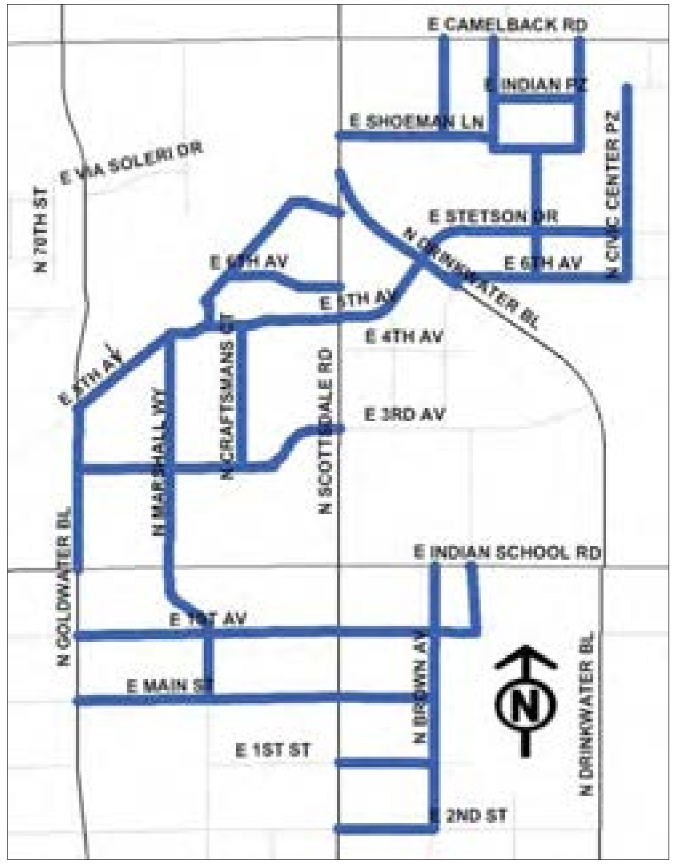
Source: pedestrian and Streetscape guide, Georgia Department of Transportation, September 2003, page 29, available at www.Walkable.Org/download/Georgia_ped_streetscape_guide.Pdf

The latent demand analysis (see Section 5.0 Future Pedestrian Demand) shows that Downtown will remain a popular area for walking. As areas of Downtown intensify and Downtown expands to include distinct neighborhoods (i.e., Waterfront, Scottsdale corridor north of Camelback Road, the Downtown core, and Scottsdale Road south of Indian School Road), the demand for pedestrian facilities will also increase. This implies that a greater range of facilities as well as facilities designed to handle a larger number of pedestrians will be necessary.

Recognizing that pedestrian facilities could be improved in Downtown, the City obtained a grant from MAG in 2005 to measure pedestrian mobility in Downtown, and to determine how and where to make improvements to that mobility. The study used measurable criteria to create a substantial database for the evaluation of mobility. With this database, the City will identify where and what types of impediments or problem areas exist that impede pedestrians' ability to move around Downtown. This information will be the basis for future capital improvement projects. The *Downtown Pedestrian Mobility Study* information can be found in Appendix 7-J.

There are other important areas of the City emerging as destinations for pedestrians. While Downtown will remain an important tourist attraction, the latent demand analysis indicates other areas are, or will become, attractions for pedestrians, including the village center at McDowell Mountain Ranch, One Scottsdale, and the west side of the Scottsdale Airpark.

In some of these areas, it may be appropriate to create a pedestrian-oriented district. The City of Scottsdale already has an existing pedestrian overlay district, which coincides with the Downtown boundary. The current pedestrian overlay district includes provisions for covered walkways, screened side yards on interior side lot line setbacks, and preservation of at least two-thirds of each building's frontage for "openings or clear glass windows providing views of merchandise displays, building interiors, or courtyards."[14]



The Downtown roadways shown in blue have been inventoried to assess the quality of the pedestrian environment.

6.2 Provide Facilities That Enhance Neighborhood Safety and Connectivity

"Providing opportunities for building community through neighborhood mobility" is a goal of the *General Plan* Community Mobility Element. Opportunities to promote neighborhood mobility exist in the implementation of and enhancement to the City's SRTS program and by encouraging "back door access" from neighborhoods to nearby shopping centers. The goal is for pedestrian destinations such as shopping centers to provided gates or openings into their developments from the adjacent neighborhoods so that people are encouraged to walk rather than drive for short trips to the store.

Within the City, pedestrian facilities are often spaced and designed around existing automobile-based networks. Enhancing mid-block crossing opportunities along key corridors of high future latent demand will enhance the overall accessibility of specific areas. Specific opportunities to enhance mid-block crossings exist in areas where the density of pedestrian origins (e.g., residential areas) and destinations (e.g., schools, parks, employment) is the highest. Examples include portions of Frank Lloyd Wright Boulevard, Scottsdale Road south of Indian School Road, near the Scottsdale Road and Shea Boulevard intersection, at 90th Street south of Shea Boulevard, and on the west side of the Scottsdale Airpark.

14 City of Scottsdale Revised Code, Chapter 49, Appendix B, Article V, Section 5.3081, Pedestrian Overlay District.

Employees in Downtown take an opportunity to walk for a mid-morning coffee.

6.3 Provide Facilities That Serve Quick, Focused Pedestrian Trips

As discussed in Section 3.1 Benefits of Walking, walking is ideal for short-distance motor-vehicle trips. According to the 1995 national personal transportation survey, approximately 40 percent of all trips are less than two miles in length – which represents about a 30 minute walk. In addition, increased transit patronage will generate additional demand for pedestrian facilities. Transit use will likely first increase around high-activity areas, such as employment, retail, and entertainment uses. There is an opportunity to design these facilities to aid in direct and quick trips from transit stops to nearby locations and within employment centers such as the Scottsdale Airpark, as they will largely serve an audience with limited time and with specific destinations. These pedestrian-oriented employment centers include the area around the Scottsdale Healthcare campuses, the area at McDowell and Scottsdale roads around SkySong, the Scottsdale Airpark, the area around Shea Boulevard and Scottsdale Road, and the Scottsdale Road/Frank Lloyd Wright Boulevard corridor.

As long-term land uses in Scottsdale continue to change, clear corridors of pedestrian activity are emerging, as shown in the latent demand analysis. With the exception of Hayden Road and portions of Thompson Peak Parkway, these areas are concentrated around corridors that are predominantly employment locations.

6.4 Provide Facilities That Reflect the Character of the Neighborhood

Quality design and application of facility and amenity standards will create comfortable and attractive pedestrian spaces and will reinforce Scottsdale's community character and vision. In areas where many pedestrians are expected, such as Downtown, wide sidewalks and additional facilities, such as shade and street furnishings, are expected. In areas where fewer pedestrians are expected, a basic sidewalk character should be preserved to provide for mobility. Design standards for sidewalks and other pedestrian facilities are provided in Section 8.0 Design Guidelines.

The City of Scottsdale *General Plan* contains a character and design element that discusses various design standards in the context of Scottsdale's collective vision/values and the community's character. One of the stated goals of this element is to "determine the appropriateness of all development in terms of community goals, surrounding area character, and the specific context of the surrounding neighborhood." The definition of surrounding areas/neighborhoods is based in the subdivision of the City into four broad zones, which are further subdivided as well: urban character types, suburban/suburban desert character types, rural/rural desert character types, and ESL and native desert character types.

This paved path along Scottsdale Road between Dove Valley Road and Carefree Highway reflects this area's character.

The typical cross section drawings contained in Section 5-3 of the DS&PM reflect three identified geographic character types. For each roadway functional classification (e.g., minor arterial), a standard cross section is provided for all appropriate area types (generally rural/ESL, suburban, and urban).[15] Street functional classifications in the *Transportation Master Plan* Streets Element also include rural, suburban, and urban character designations.

Not surprisingly, the character types are also reflected in the latent demand analysis. Areas with relatively high latent demand are generally more urban character areas, while relatively low latent demand is typical in the designated rural/ESL areas. There are some exceptions to this situation that result from the additional level of detail that the latent demand analysis provides. For example, employment cores such as the area surrounding the Airpark are classified as having an urban character type, but have only moderate levels of estimated latent demand. This occurs because highly commercial/industrial areas can only possess high levels of pedestrian demand if residential development is mixed in, thereby providing the opportunity for short home-based walking trips. Also, some urban areas have higher latent demand than other urban areas. This aspect of the latent demand analysis provides the opportunity to provide further stratification within each of the area types.

6.5 Provide Facilities and Land Uses That Support a Growing Number of Pedestrians Who Use Public Transportation

Historic transportation data demonstrate that while the number of people who use walking as their sole mode of transportation to work is declining, this decline is more than compensated for by the number of people using public transportation. Pedestrians often arrive to transit stops by walking, and are pedestrians again after de-boarding the transit vehicle. The opportunity exists to encourage more pedestrians to use transit by providing a more extensive range of amenities near transit stops.

Pedestrians can lengthen their trip distance by taking advantage of pubic transportation, such as the bus service on Scottsdale Road.

6.6 Update and Enhance the Pedestrian Standards in the DS&PM

The DS&PM includes recommendations and guidance to create a desirable pedestrian environment. However, this guidance is currently broad and generalized and does not reflect the different areas and characteristics of the City. An opportunity exists to include specific standards for pedestrian facilities in the DS&PM. See Section 8.0 Design Guidelines for details.

6.7 Implement Safety Improvements in the Pedestrian Environment

Section 3.0 described barriers to pedestrian travel and that pedestrian facilities to improve these conditions could reduce the number of pedestrian/vehicle collisions. A pedestrian safety action plan specifically identifies the necessary steps to reduce the number of pedestrian crashes. A pedestrian safety action plan includes: objectives, locations where improvements are needed, selection of techniques to reduce crashes, implementation strategies, changes to planning and design standards, and evaluation.[16]

15 Several roadways in Scottsdale have been designated as "Scenic Corridors". These corridors are subject to an additional set of design guidelines.

16 *How to Develop a Pedestrian Safety Action Plan - Draft,* FHWA, August 2005. Chapter 7, Creating the Pedestrian Safety Action Plan.

Intersections can pose particular safety hazards for pedestrians. Traffic improvements such as wider streets, adding turn lanes or travel lanes, and using traffic engineering solutions that increase vehicular efficiency can decrease pedestrian safety.[17]

> Crash data consistently show that collisions with pedestrians occur far more often with turning vehicles than with straight-through traffic. Left-turning vehicles are more often involved in pedestrian accidents than right-turning vehicles, partly because drivers are not able to see pedestrians to the left as well…pedestrians involved in crashes are more likely to be killed as vehicle speed increases. The fatality rate for a pedestrian hit by a car at 20 mph is 5 percent. The fatality rate rises to 80 percent when vehicle speed is increased to 40 mph…right-turn-on-red contributes to pedestrian crashes because it creates reduced pedestrian opportunities to cross intersections without having to confront turning vehicles.[18]

FHWA suggests an integrated approach when attempting to improve pedestrian safety by including engineering, education, and enforcement professionals. Enforcement efforts should focus on motorist compliance with pedestrian safety laws, pedestrian compliance to traffic laws, and speed enforcement. Educational efforts need a dedication over an extended period of time and should be comprehensive. Education campaigns should target both motorists and pedestrians.[19]

Narrow and cluttered sidewalks can impede pedestrian accessibility and mobility. Heavily textured paving with gaps greater than 1/4-inch can create uneven and bumpy surfaces (Scottsdale Road).

Traffic engineering solutions to improve pedestrian safety include assessing (or reassessing) the adequacy of pedestrian signal timing (see Table 7-2: Pedestrian Walking Speeds) and considering pedestrian-only phasing in traffic signal cycles. Pedestrian push buttons should be accessible. Roadway and traffic hazards should be identified and removed. Improvements could include repair or restriping crosswalks, adding stop lines, improving lighting, providing additional signs, and providing median refuge islands (see section 8.10 Mid-block Crossings). Crosswalk improvements, such as more visible pedestrian crosswalk striping or pedestrian crossing signs may also be appropriate (see Section 8.9.1 Crosswalk Markings). In addition, analysis of pedestrian collisions are completed for each year and this analysis should be used to target high pedestrian collision locations for mitigation proposals.

6.8 Design Facilities That Are Universally Accessible

Designing facilities that are universally accessible improves the environment for all users. Accessibility should be considered at all locations and facilities. Universal design of pedestrian facilities increases the independence of anyone with mobility impairments.

Developed by the Center for Universal Design[20], universal design is an approach to designing pedestrian facilities that help to maximize their use

17 *Pedestrian Safety at Intersections*, FHWA, September 10, 2004, available at http://safety.fhwa.dot.gov/intersections/interbriefing/03ped.htm

18 *Pedestrian Safety at Intersections*, FHWA, September 10, 2004, available at http://safety.fhwa.dot.gov/intersections/interbriefing/03ped.htm

19 *Pedestrian Safety at Intersections*, FHWA, September 10, 2004, available at http://safety.fhwa.dot.gov/intersections/interbriefing/03ped.htm

20 The Center for Universal Design (1997). The Principles of Universal Design, Version 2.0, Raleigh, NC: North Carolina State University. Disclaimer: The Principals of Universal Design were conceived and developed by The Center for Universal Design at North Carolina State University. Use or application of the Principles in any form by an individual or organization is separate and distinct from the Principles and does not constitute or imply acceptance or endorsement

by the greatest number of people, emphasizing the value of designing for a person's entire lifespan and range of abilities. There are seven principles of universal design listed below. The accompanying guidelines that comprise key design elements inherent in the principle are found in Appendix 7-G.

- Principle One - equitable use – the design is useful and marketable to people with diverse abilities.
- Principle Two - flexibility in use – the design accommodates a wide range of individual preferences and abilities.
- Principle Three - simple and intuitive use – use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration levels.
- Principle Four - perceptible information – the design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.
- Principle Five - tolerance for error – the design minimizes hazards and the adverse consequences of accidental or unintended actions.
- Principle Six - low physical effort – the design can be used efficiently and comfortably and with a minimum of fatigue.
- Principle Seven - size and space for approach and use – appropriate size and space is provided for approach, reach, manipulation, and use regardless of user's body size, posture, or mobility.

6.9 Encourage Sidewalk Cafés in Appropriate Locations

Sidewalk cafés add to the vitality of an urban setting and are appropriate in areas where an active street environment is desired. A vibrant street enhances the pedestrian experience by creating interest and can also encourage passersby to pause and explore the area on a more intimate scale. Encouraging visitors to lounge and explore can enhance commerce by creating sales opportunities. Sidewalk cafés should be encouraged as a vital component of an attractive, active street.

While the addition of sidewalk cafés can encourage additional pedestrian activity and Downtown vitality, the presence of sidewalk cafés can also impede pedestrian access and mobility. The goal should be to ensure a safe environment for pedestrians while encouraging the appropriate use of the public ROW for sidewalk cafés.

Communities with active streets that also appropriately accommodate pedestrians generally address three areas when faced with a request to use areas adjacent to sidewalks:

- Would an acceptable level of sidewalk capacity be maintained?
- Would accessibility be preserved for pedestrians with mobility impairments?

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by The Center for Universal Design of the use or application.

- Would the sidewalk continue to provide an acceptable level of pedestrian safety and comfort?

These issues are discussed in further detail below.

Sidewalk capacity is reduced by this outdoor dining. Two person tables would accommodate pedestrian access more easily.

6.9.1 Sidewalk Capacity

Chapters 11 and 18 of the Transportation Research Board's HCM address the capacity of sidewalks and other pedestrian facilities. These chapters present key concepts, define LOS criteria, and describe methodologies to assess the capacity of pedestrian facilities.

The following key concepts relate to pedestrian facility capacity:

- Pedestrian speed – the average pedestrian walking speed, expressed in units of feet per second (ft/s) or feet per minute (ft/min).
- Pedestrian flow rate – the number of pedestrians passing a point per unit of time, expressed as pedestrians per minute (p/min) or pedestrians per 15 minutes (p/15 min). A "point" refers to a perpendicular line of sight across the walkway.
- Pedestrian unit flow rate – the flow rate per unit of effective walkway width, expressed as pedestrians per minute per foot (p/min/ft).
- Pedestrian space – the average area available to each pedestrian, expressed as square feet per pedestrian (ft^2/p).

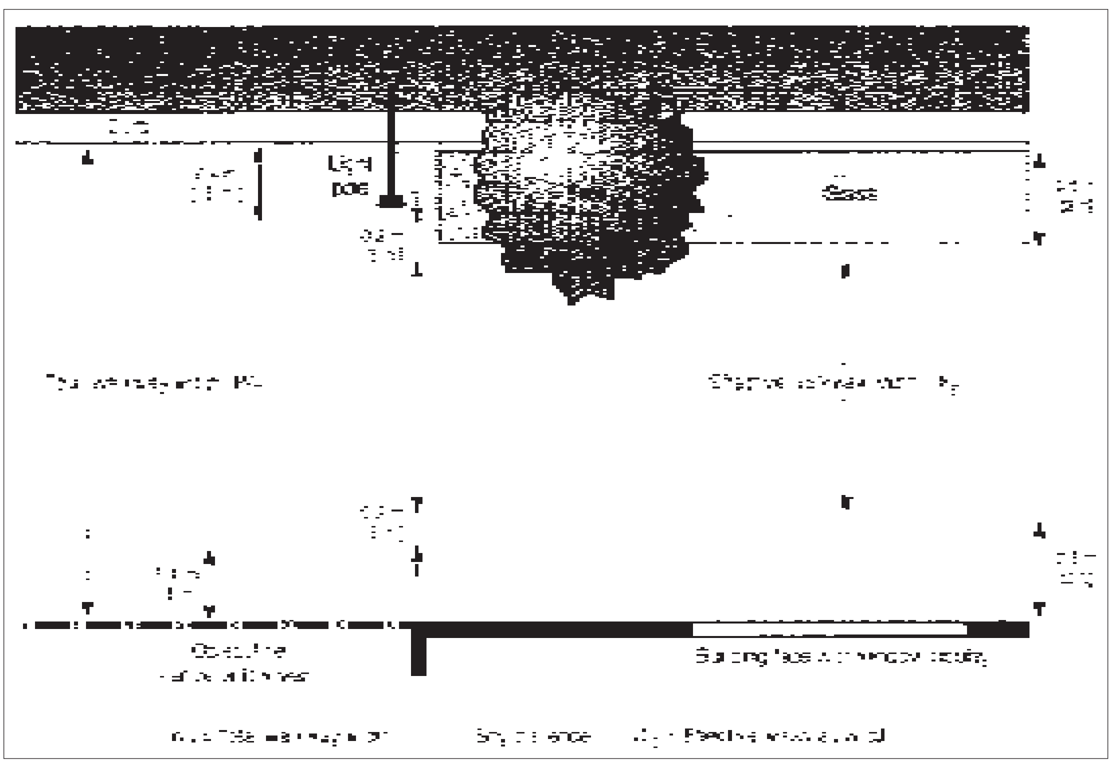


FIGURE 7-2: Effective Walkway Width
(from Exhibit 3-4 of the AASHTO Design Guide for the Planning, Design, and Operation of Pedestrian Facilities)

These concepts are interrelated—as volume increases and space decreases, speed decreases because pedestrians have less space to choose their walking speed.

The HCM defines pedestrian LOS criteria according to the amount of space per pedestrian and the unit flow rate. The LOS is categorized as A through F. LOS A represents the least crowded condition for pedestrians. As the number of pedestrians increases, the amount of space per pedestrian decreases and it becomes more difficult to pass other pedestrians or to avoid conflicts with crossing (i.e., perpendicular) pedestrians. LOS F is the most crowded condition. In some locations, especially more urban character areas and activity centers, more congested pedestrian LOS are desired.

Effective walkway width refers to the usable width of a walkway. While a sidewalk may be, for example, 8 feet wide, pedestrians may not be able to use all of that width. Trees, utility poles, newspaper boxes, and other street furniture may occupy part of the sidewalk. Pedestrians tend to shy away from these obstructions as well as from fences and building faces. Figures 7-2 and 7-3 show that the effective walkway width may be considerably narrower than the total walkway width.

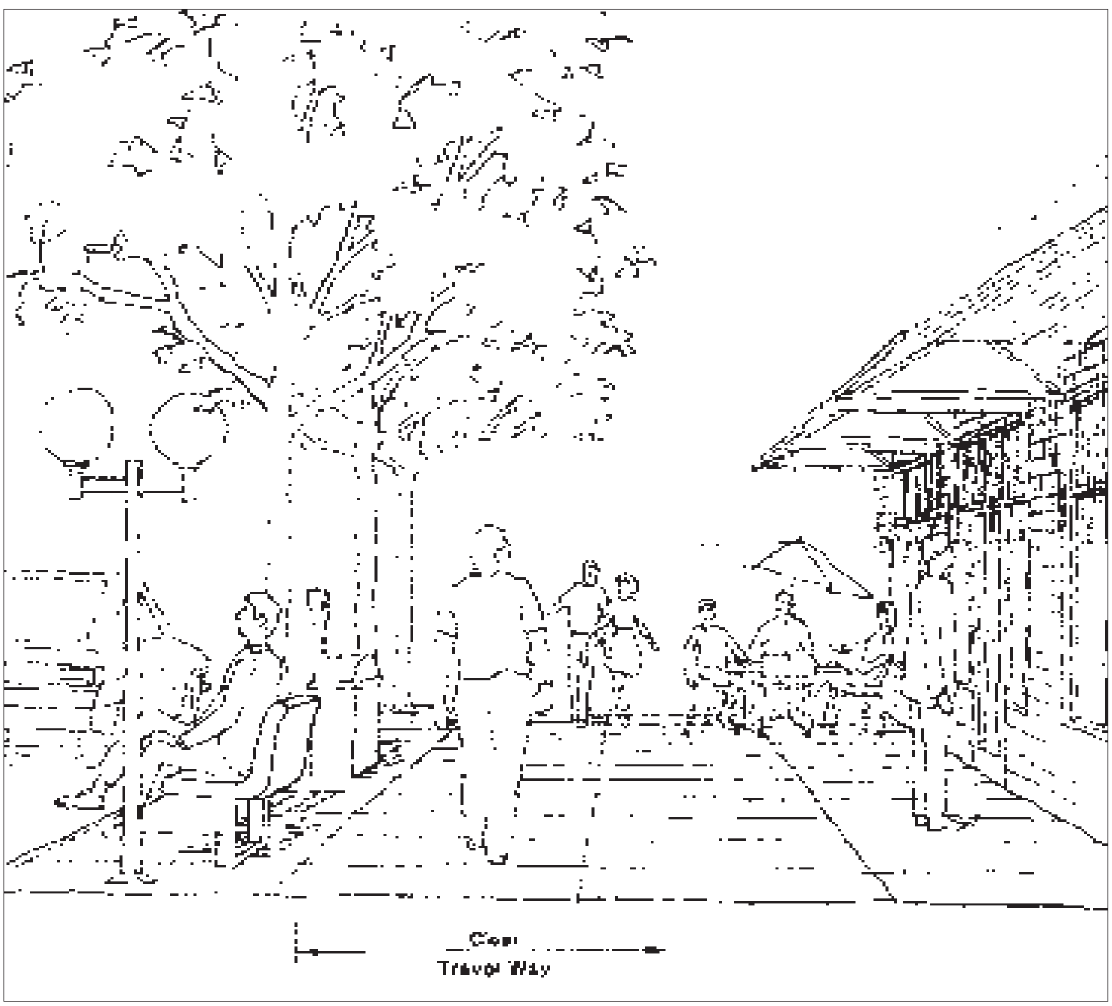


FIGURE 7-3: Pedestrian Travelway Clear of Obstructions
(from Exhibit 3-5 of the AASHTO Design Guide for the Planning, Design, and Operation of Pedestrian Facilities)

By their very nature, sidewalk cafés, kiosks, and vendors occupy part of the sidewalk and reduce the effective width, thereby degrading the LOS. When evaluating requests for sidewalk cafés, the potential impact on LOS as well as the desire for activating an area needs to be analyzed.

6.9.2 Accessibility For Pedestrians With Disabilities

A second consideration in determining appropriate locations for sidewalk cafés is that accessibility needs to be preserved for pedestrians with disabilities. The City wishes to preserve accessible routes along its sidewalks. Current adopted guidance requires a minimum clear width of 3 feet[21]. However, this federal minimum is only for short distances: if an accessible route has less than 5 feet of clear width, then passing spaces of at least 5 feet by 5 feet shall be provided at intervals not to exceed 200 feet.[22] The U.S. Access board is considering the recommendation that sidewalks have a minimum clear width of 4 feet, not including any attached curb. The access board is also considering that where sidewalks are less than 5 feet in width, passing spaces of 5 feet by 5 feet shall be provided at intervals of 200 feet maximum.[23] It is the City of Scottsdale's practice to use the best practice guidelines.

6.9.3 Pedestrian Safety and Comfort

When people around the U.S. are asked why they don't walk more frequently, they often reply, "it's not safe." People universally report that they do not feel safe when they are walking immediately next to traffic. They feel safer when they are not adjacent to traffic, or when there is less traffic, or when the traffic is traveling at slow speeds.

Section 5-8.000 of Scottsdale's DS&PM indicates that "pedestrians like to be separated from moving traffic with a buffer, such as on-street parking, landscaping, or bicycle lanes." In addition, Section 5-8.200 states that "in order to improve safety and encourage use, sidewalks and shared-use paths should be placed away from the back of curb a minimum of 4 feet, with 8 feet desired, and sometimes greater distances based on available rights-of-way or easement." Furthermore, Section 5-3.300, part A states that "generally a minimum 8-foot sidewalk width is required along all major streets (major collector classification or greater); a 6-foot wide sidewalk width is required along all minor streets." The buffer width recommendation acknowledges that Scottsdale's residents and visitors feel safer when they are not immediately next to traffic.

7.0 PROPOSED PEDESTRIAN ROUTE NETWORK

This chapter describes the proposed pedestrian route network in the City of Scottsdale. The network includes common walking routes to schools, transit, recreation areas, and other pedestrian destinations. The network identifies roadways most in need of pedestrian improvements based on their potential to attract pedestrians, as identified in the latent demand analysis described in Section 5.0 Future Pedestrian Demand. It is important to note that roadways not identified in this network may also need pedestrian improvements and that all roadways in Scottsdale are expected to have basic pedestrian facilities to provide for mobility of all residents, employees, and visitors, consistent with each area's character (context-sensitive design).

The latent demand model has been used to identify pedestrian improvements for several reasons.[24] First, the model includes all potential trip starting points and ending points. The

21 *Americans with Disabilities Act Accessibility Guidelines* (ADAAG), Section 4.3.3.

22 ADAAG, Section 4.3.4

23 *Revised Draft Guidelines for Accessible Public Rights-of-Way*, Sections R301.3.1 and R301.3.2, available online at www.access-board.gov/prowac/draft.htm

24 *Pedestrian Plan 2000* Technical Appendix. Maricopa Association of Governments, December 1999.

model also recognizes that whether a pedestrian trip is made depends on the purpose of the trip. The model incorporates several different trip purposes, including work trips, shopping and errands, trips to school, trips to parks and trailheads, and trips to trails/shared-use paths and linear parks.

In addition, the latent demand model also considers the distance between the trip starting point and the trip ending point. In general, people are willing to walk the furthest to get to work, moderately to get to social or recreational trips, and the least for trips to school.

Finally, the latent demand model also accounts for trips that are made partially by walking, such as a transit ride that begins and starts with a pedestrian trip, and for those trips made entirely by walking, such as a walk to a nearby grocery store.

Figures 7-4 through 7-8 identify the proposed pedestrian route network for each planning zone of the City, based on criteria shown in Table 7-6. The network has been divided into priorities based upon where improvements will affect the largest number of potential pedestrians. The identified network should not be interpreted to imply or mean that pedestrian facilities are not needed in lower priority areas, or that budgeted projects should not be implemented with pedestrian facilities in lower priority areas. Other factors such as key missing links in the network must also be considered. Naturally, if funding for a particular project becomes available through private development, or state or federal sources, of if the project is a key "missing link" in the system, or could be accomplished through standard maintenance, that project should be pursued regardless of its classification on the proposed pedestrian route network.

TABLE 7-6: Latent Demand Model Interpretation and the Proposed Pedestrian Route Network

Latent Demand Score	Pedestrian Route Network Classification
10 and 9	High
8 and 7	Medium high
6 and 5	Medium
4 and 3	Medium low
2 and 1	Low

A latent demand score of 10 is the highest possible score when compared with all other roadways in Scottsdale. The roadway with the score of 10 has the highest likelihood of attracting pedestrians, if conditions are improved to encourage pedestrian travel. In contrast, a latent demand score of 1 means that the roadway has the least likelihood of attracting pedestrians. Additional information on the latent demand model is provided in Section 5.0 Future Pedestrian Demand.

8.0 DESIGN GUIDELINES

This chapter outlines pedestrian planning, design, and engineering practices that provide safe and comfortable pedestrian travel conditions and will be integrated into an updated pedestrian chapter of the DS&PM.

These guidelines apply to typical situations encountered during project development. Unique situations will require flexibility in design solutions. In some situations, the current standard

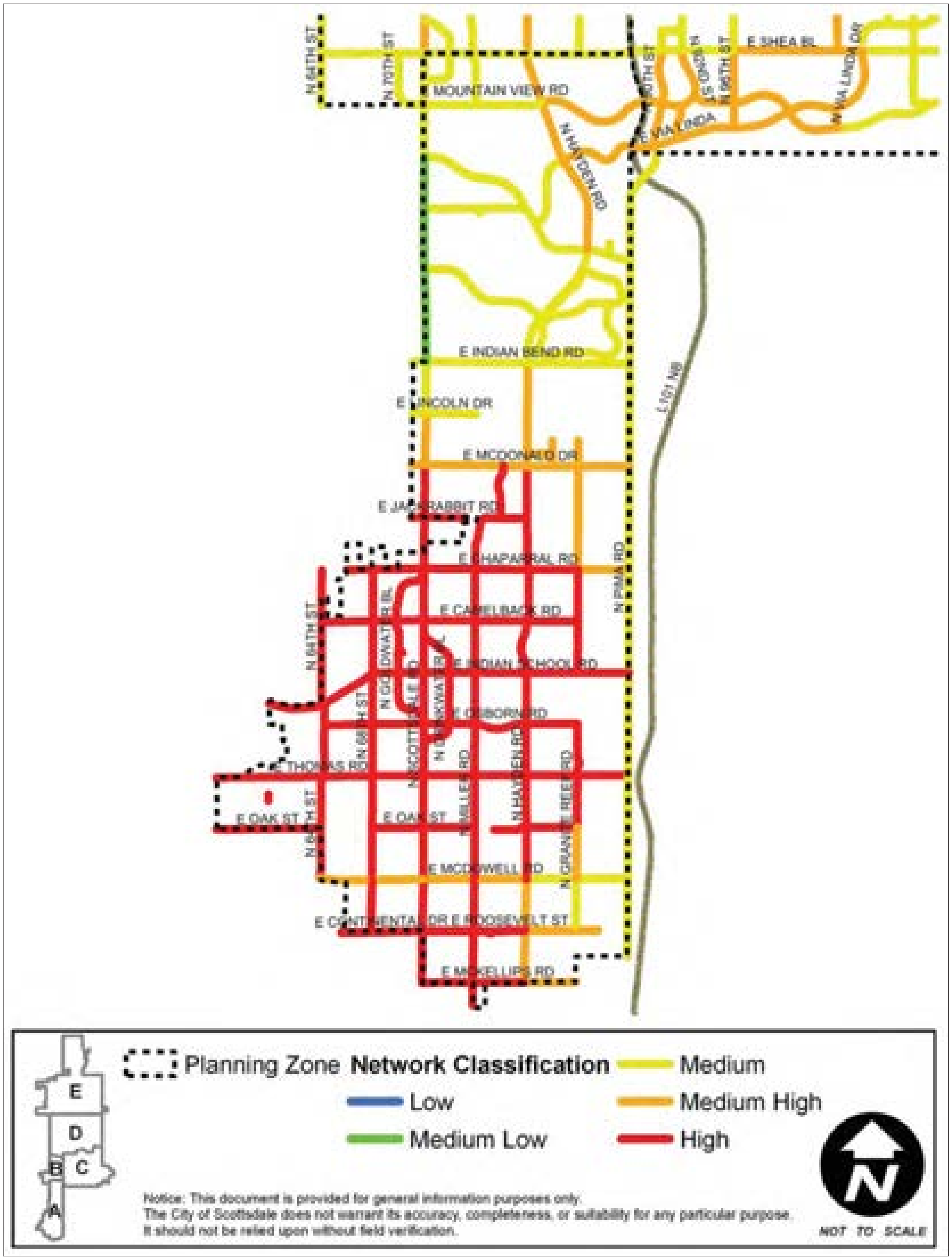


FIGURE 7-4: 2020 Pedestrian Route Network, Planning Zone A

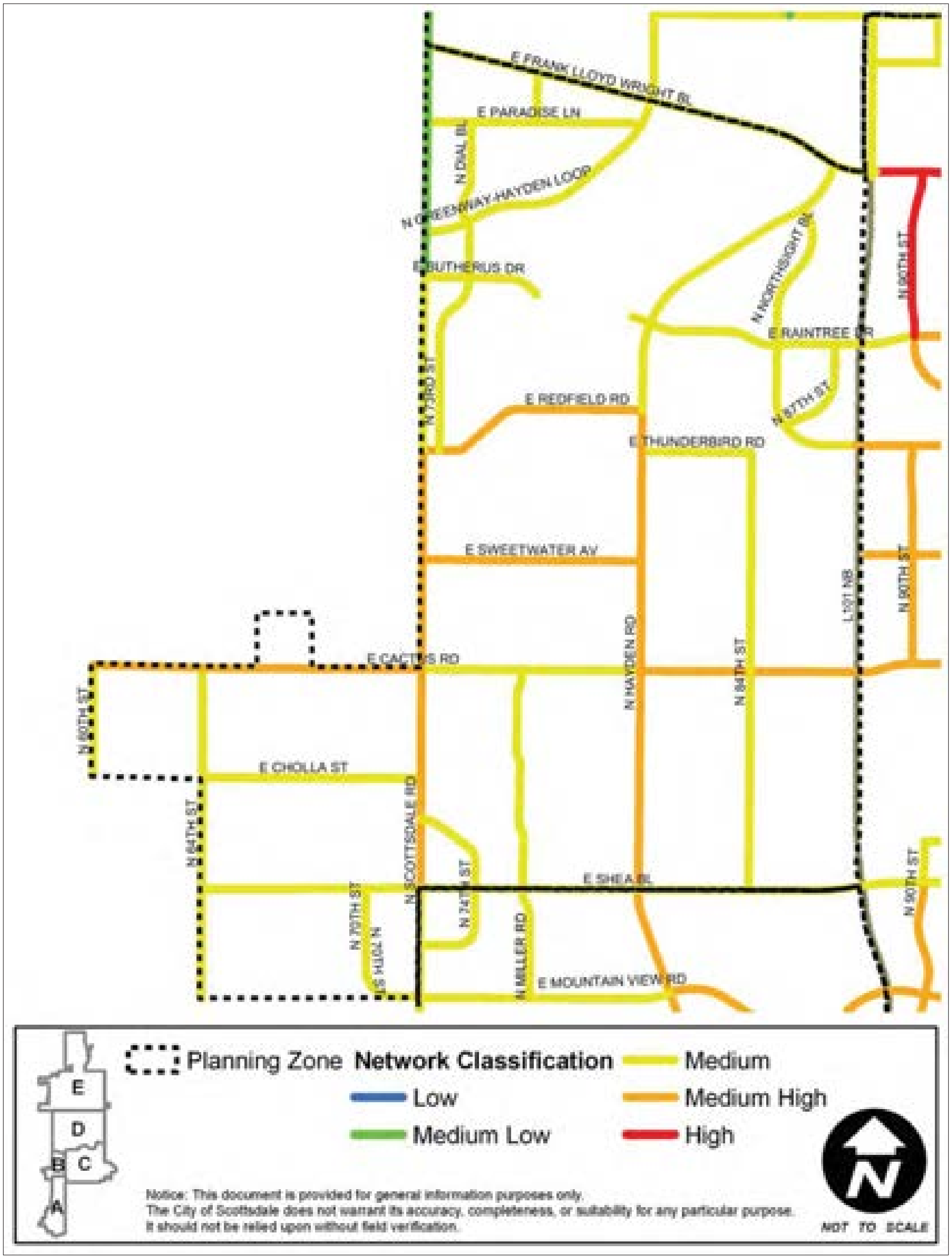


FIGURE 7-5: 2020 Pedestrian Route Network, Planning Zone B

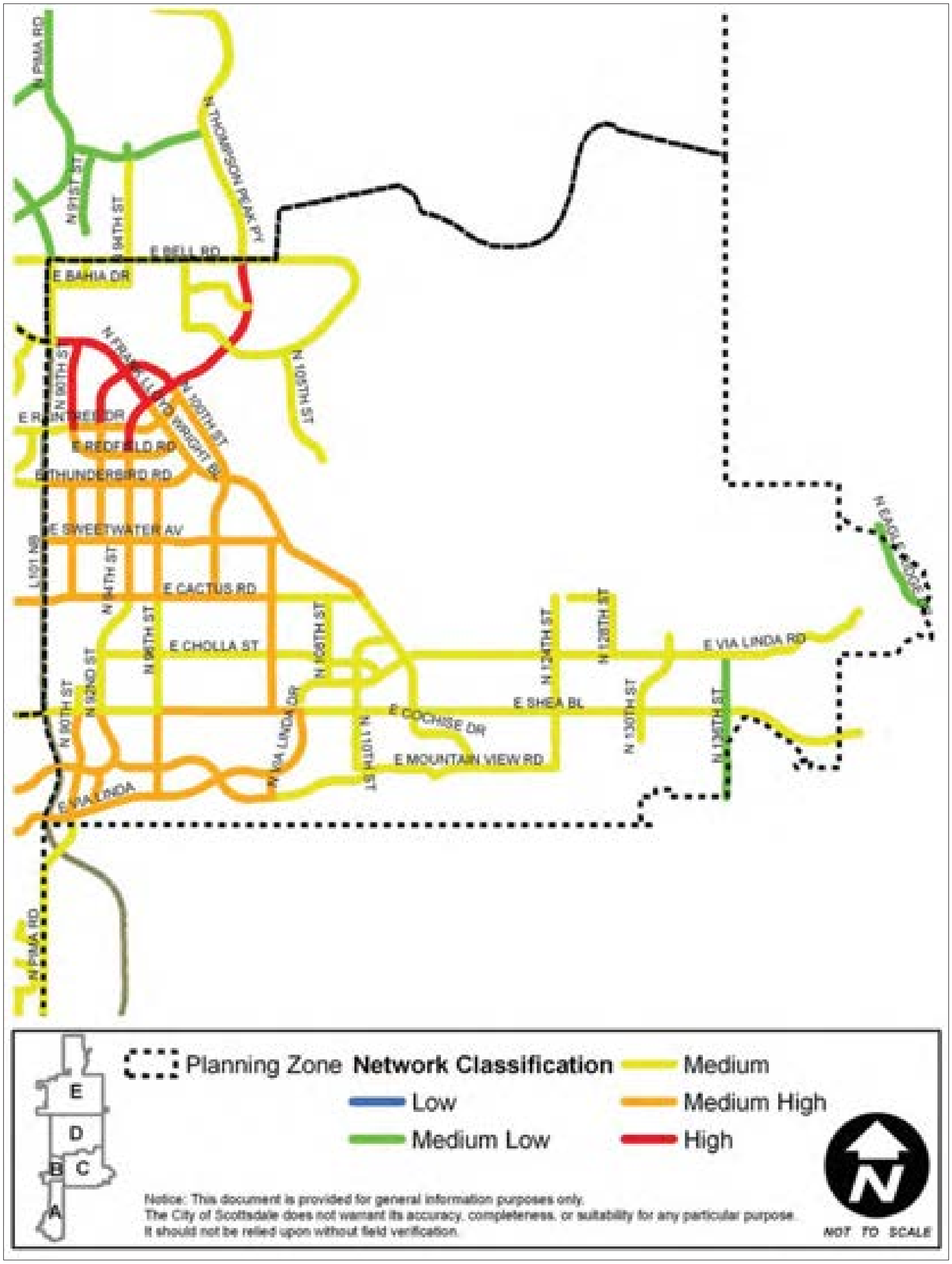


FIGURE 7-6: 2020 Pedestrian Route Network, Planning Zone C

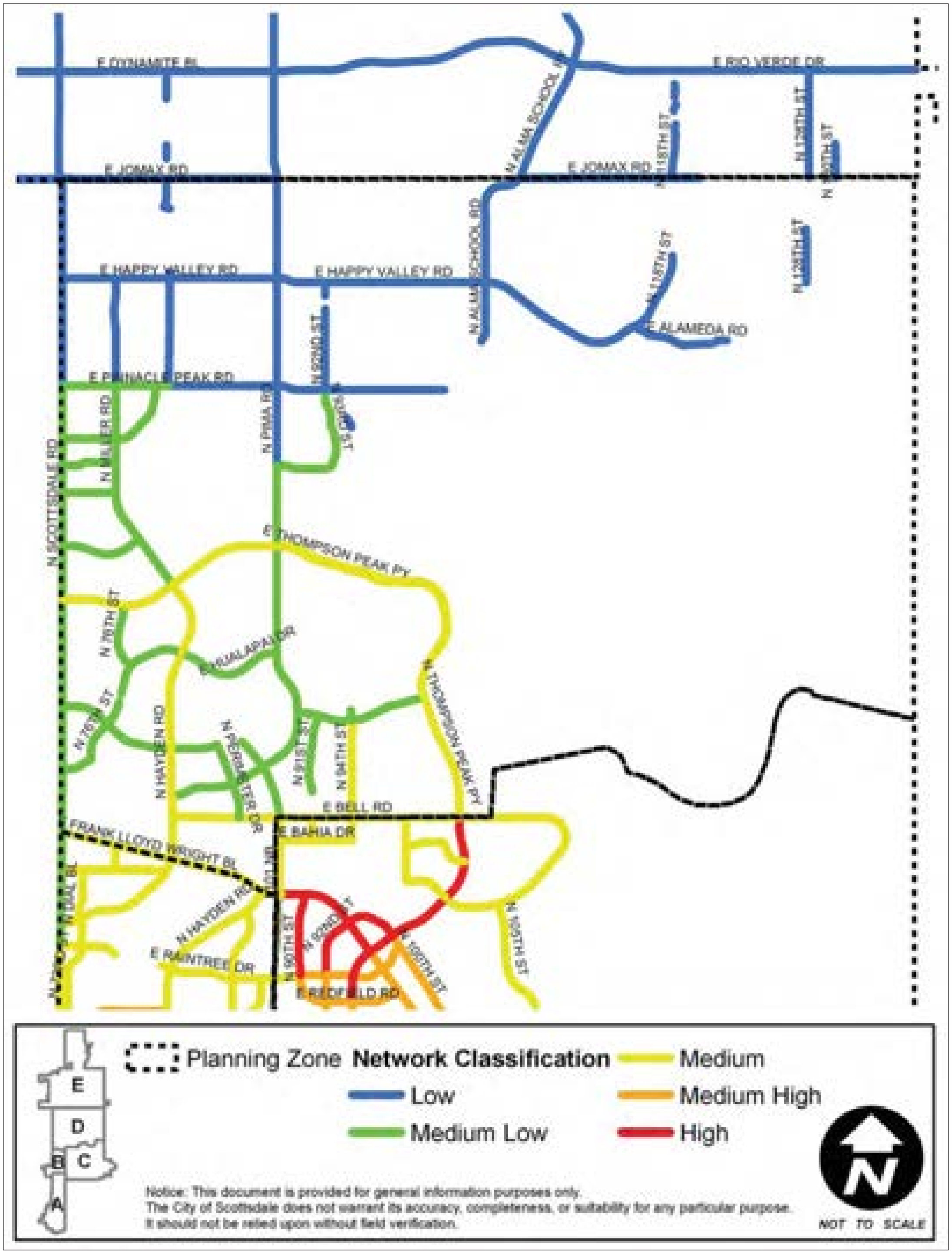


FIGURE 7-7: 2020 Pedestrian Route Network, Planning Zone D

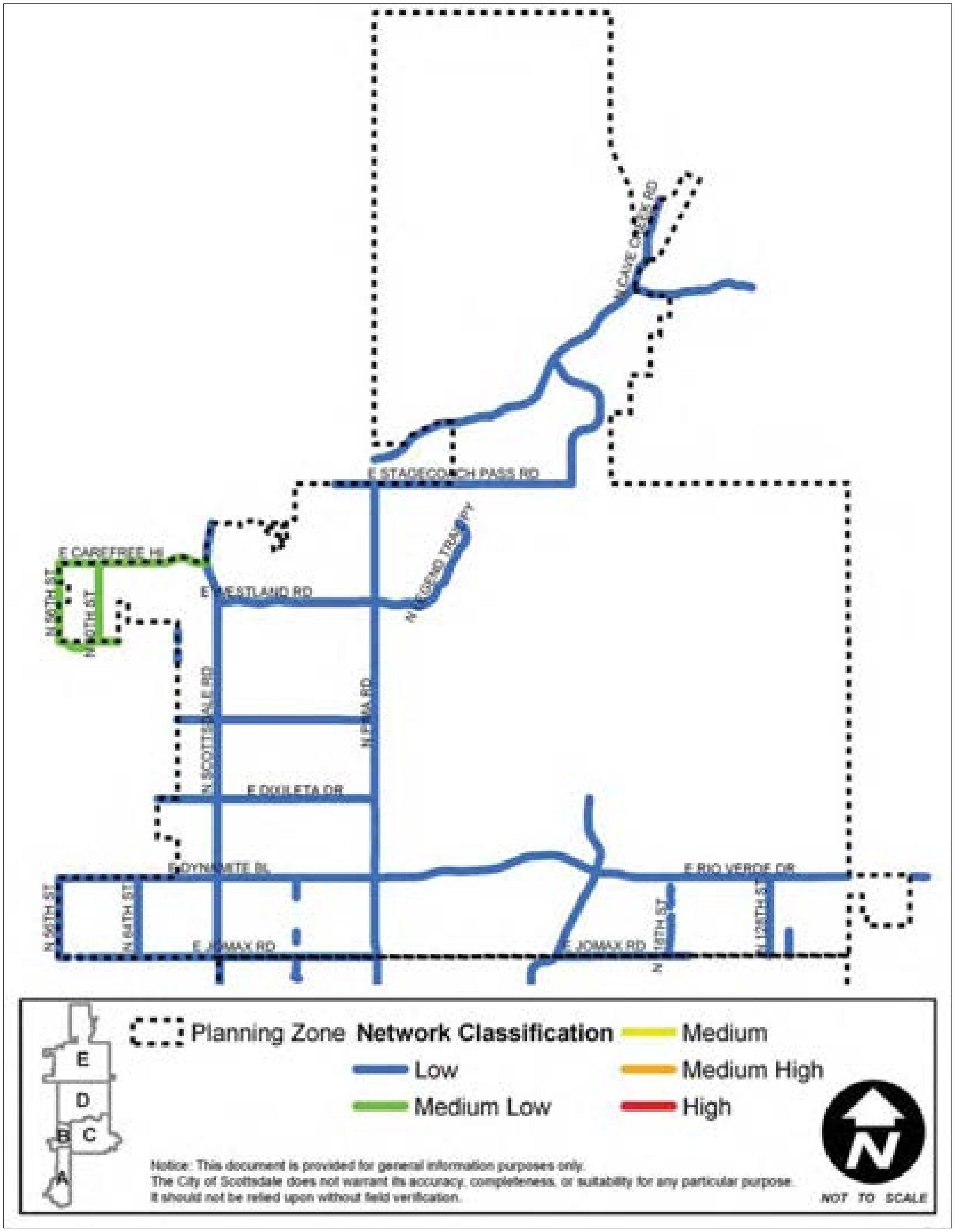


FIGURE 7-8: 2020 Pedestrian Route Network, Planning Zone E

may not be achievable due to geometric, environmental, ROW or other constraints and flexible solutions will be determined by the project designers using appropriate professional judgment. In these circumstances, variances from the guidelines outlined in this section may be acceptable. However, a facility should not typically be built to less than the guidelines described in this section.

Furthermore, pedestrian facilities must be built in accordance with existing federal and state standards, such as the MUTCD, requirements of ADA, and various documents produced by AASHTO, including *A Policy on Geometric Design of Highways and Streets* and *Design Guide for the Planning, Design, and Operation of Pedestrian Facilities*. The City of Scottsdale has adopted and integrated the revised draft guidelines for accessible public rights-of-way, published on November 23, 2005 into planning, design, construction, and reconstruction of transportation facilities. These guidelines provide the best practice for planners and designers and should also be followed when planning and designing pedestrian facilities.

This sidewalk on Scottsdale Road south of Doubletree Ranch Road is visually and functionally separate from vehicle paths, enhancing pedestrian safety. A landscaped buffer between the sidewalk and the curb adds shade, aesthetic appeal, and additional comfort for pedestrians.

8.1 Sidewalk Width (Pedestrian Access Route)

Safe pedestrian travel ways must be defined walkways, visually and functionally separate from the path of vehicles.

Figures 7-4 through 7-8 identify the pedestrian route network for planning zones of the City. All sidewalks and walkways must provide a minimum of 6 feet of travel space to accommodate pedestrians moving in both directions, including pedestrians using assistive devices (see Figure 7-9). This minimum width does not include additional space that may be required to accommodate landscaping and site furnishings.

All sidewalks and walkways adjacent to arterials must provide a minimum travel space to accommodate pedestrians, providing sufficient walking areas, not including for example, landscaping or site furnishings. The following listing incorporates the character types of rural, suburban, and urban, as well as the pedestrian route network identification:

- Sidewalks and walkways must provide a minimum travel space of 6 feet for rural areas identified on the pedestrian route network maps as low and medium low. A trail could replace a sidewalk or walkway in rural areas identified on the pedestrian route network maps as low.
- Sidewalks and walkways must provide a minimum travel space of 8 feet for suburban areas identified as medium or medium high.

FIGURE 7-9: Sidewalks need to accommodate people walking together
(from MAG Pedestrian Policies and Design Guidelines).

- Sidewalks and walkways must provide a minimum travel space of 10 feet for suburban areas identified as high.
- Sidewalks and walkways must provide a minimum travel space of 10 feet for urban areas, except in urban areas identified on the pedestrian route network maps as high, where a minimum travel space of 12 feet must be provided.

A pedestrian access route is a part of the sidewalk that meets minimum accessibility requirements and connects public streets and sidewalks to destinations. A pedestrian access route is not the entire sidewalk; it is the portion of the sidewalk that allows for basic pedestrian movement and circulation. The pedestrian access route may include sidewalks, street crossings, crosswalks, grade-separated crossings (underpasses or overpasses) and other elements of the sidewalk that provide mobility, including curb ramps, courtyards and landing areas. A pedestrian access route must be continuous and clear of obstructions. The minimum width required for a pedestrian access route is 4 feet, excluding the width of the curb.

While meandering sidewalks have aesthetic appeal, they tend to negate an efficient and effective pedestrian travel environment. Meandering sidewalks should be limited to areas where latent demand is low or where topography or site conditions require deviation from a straight configuration. Minimum design speed for sidewalks/walkways should be comparable to minimum design speed for paths.

8.2 Sidewalk Surface, Texture, and Slope

Sidewalks should be even. Sidewalks should not have bumpy or textured surfaces, or cracks or indents greater than ¼ inch in width or depth. The surface should be firm, stable, slip-resistant, and sloped for drainage, but not more than a 12:1 slope ratio. Cross slopes should not exceed two percent.

Avoid overly textured sidewalks with cracks or indents greater than 1/4".

Sidewalks should contrast in color or tone from the surrounding area unless there is a desired character in a specific area that precludes contrasting color. In these situations, texture or materials should provide the contrast as opposed to color. In the northern areas of Scottsdale, colored concrete instead of grey or white is desired. The walkway can be a different material, texture, or color to distinguish it from the vehicular traffic area.

Sidewalks in suburban and urban areas should be concrete. Alternative surfacing of sidewalks are encouraged for parts of the community that desire to have alternative surfaces, provided that those surfaces are firm and stable. A universally accessible surface, as defined by the ADA, may be composed of materials such as compacted earth, stabilized decomposed granite, playground surfacing, asphalt, or brick.

Avoid placing multiple paving surfaces in the walkway.

Surfacing materials and construction methods are available that will provide firm and stable surfacing, and measurement tools can objectively measure outdoor surfaces for firmness and stability.

To provide accent paving that adds aesthetic value and character without negatively impacting the accessibility of the sidewalk, use accent paving as edge treatments only, instead of for the entire surface of the sidewalk.

These treatments should be reviewed by the City's ADA coordinator or Transportation Department general manager for appropriateness.

8.3 Clearances

While site furnishings, street vendors, and outdoor dining areas enhance variety and provide interest to pedestrian areas, they should not be designed or located where they protrude into the primary pedestrian route. Protrusions are hazardous, especially to pedestrians with low vision or pedestrians walking in groups that may not be fully attentive to their surroundings.

Pedestrian space along the edge of the roadway can be divided into three zones: the building frontage zone, the pedestrian zone, and the furnishings zone (see Figure 7-10). The building frontage zone is the area where people enter and exit buildings next to the street and the area where pedestrians may window shop or move more slowly. The building frontage zone could be a pedestrian plaza or include outdoor dining. The width of the building zone varies in width from 2 to 10 feet or more. The building frontage zone is absent in areas where the sidewalk is not adjacent to buildings, such as non-urban areas.

The pedestrian zone is the area where pedestrians travel and varies in width from a minimum of 6 feet to 20 feet.

The furnishings zone is directly adjacent to the street next to the pedestrian zone. This zone includes utilities, street furniture, and landscaping. The width of this zone will vary from 2 feet to 10 feet or more, depending on conditions such as availability of ROW and adjacent land uses.

Specific clearance requirements include:

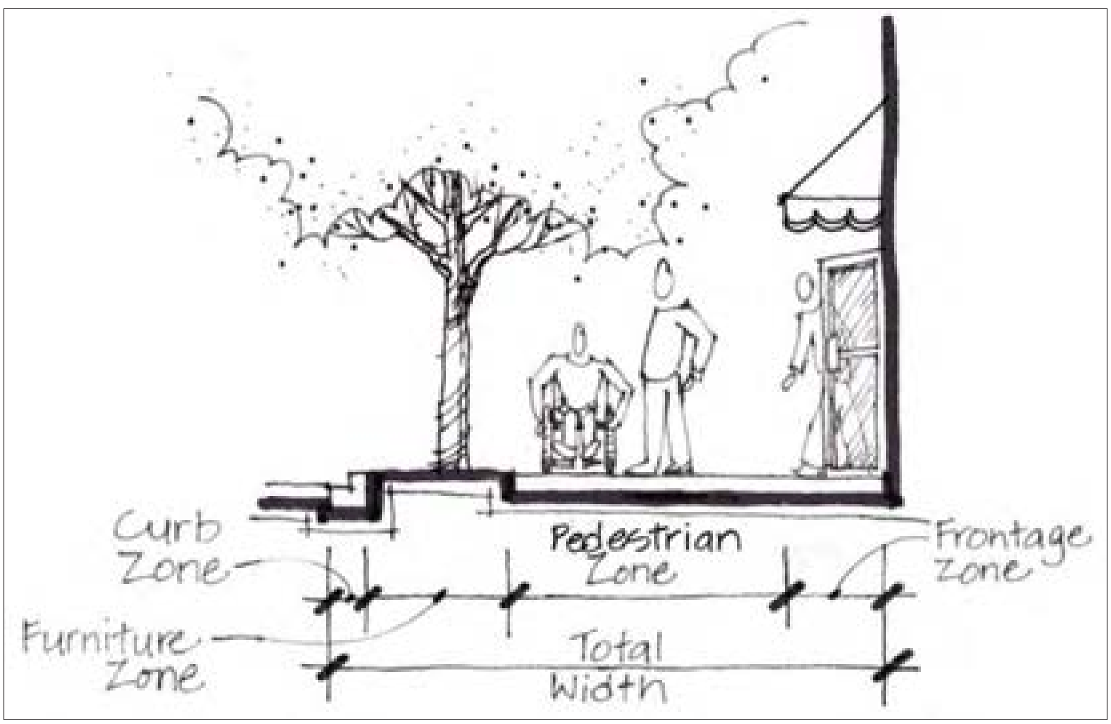


FIGURE 7-10: Pedestrian Space Along the Edge of the Roadway
(from MAG Pedestrian Policies and Design Guidelines)

- A clear circulation path of at least 48 inches should be maintained at all times, free of any obstacles or protruding objects (pedestrian access route). Note that 48 inches of clear circulation is intended only for short distances and a minimum of 6 feet of clear pedestrian travel area is required on all sidewalks and walking surfaces for pedestrians.
- Wall mounted objects shall not protrude more than 4 inches from a wall when located between 27 inches and 7 feet above the walkway.
- Single-post mounted objects shall not overhang more than 4 inches per side of post when located between 27 inches and 7 feet above the walkway.
- The lowest edge of an object mounted on multiple posts having a clear distance between adjacent posts greater than 1 foot shall be no higher than 27 inches or no lower than 7 feet.
- Trees should be trimmed so that the branches are at least 7 feet above the walkway (see the City of Scottsdale DS&PM for more information).
- The understory to trees, shrubs, and groundcovers should be free of thorny plants within 2 feet of the edge of the walkway (see the City of Scottsdale DS&PM for more information).

8.4 Building Facades

The building-height to openings-between-buildings ratio can help to make the pedestrian environment more comfortable. To create a sense of human scale, the street and walkway width should be directly proportional to the height of the buildings. In areas identified on the pedestrian route network as high (see Figures 7-4 through 7-8), provide the following:

- The building-height to openings-between buildings ratio in pedestrian areas (including walkways, sidewalks, trails, and plazas) adjacent to buildings should be as near to 1:1 as feasible.
- On longer storefronts, provide windows every 10 feet to help create a human scale.
- Limit the length of individual storefronts to no greater than 60 feet to create human scale.
- Prohibit reflective glass next to public walkways to reduce glare and heat.

8.5 Driveway Crossings and Access Management

To the extent possible, driveway crossings should be minimized in areas classified as medium high or high on the pedestrian route network maps. Streetscape projects on roadways classified as medium high or high on the pedestrian route network (see Section 7.0) should integrate access management approaches during the project development, planning, and design phase.

Each driveway crossing limits the connectivity of a pedestrian route. In addition, each driveway is a potential point of conflict between pedestrians and turning vehicles (vehicles could be cars, trucks or bicycles). Shared driveways and access management should be encouraged in these areas to improve safety and connectivity. In addition, many of the techniques identified in Section 8.9 Intersections may also help to remove conflicts between pedestrians and motorists at driveway crossings.

Most collisions between pedestrians and motor vehicles occur at points of intersecting movements, such as intersections and driveways. A large number of driveway cuts increases the number of conflict points between pedestrians and vehicles. Table 7-7 lists access management techniques and benefits of access management. In addition, access management can increase the efficiency of operations of the roadway for vehicles, as well as improve the pedestrian travel environment.

TABLE 7-7: Access Management Techniques and Benefits
Techniques
Reduce the number of existing driveways or consolidate driveways.
Provide raised or landscaped medians or concrete barriers to control turning movements in the street (accessible pedestrian crossing opportunities should be included at appropriate locations within medians).
Benefits
The number of conflict points is reduced, particularly with the use of center medians to reduce the number of conflicts between left-turning vehicles and pedestrians.
Pedestrian crossing opportunities are enhanced with an accessible raised median and fewer conflicts with turning cars.
It is easier to accommodate people with disabilities with the reduced need for special treatments at driveways.
Improved traffic flow may reduce the need for road-widening, allowing more space within the right-of-way for use by pedestrians, bicyclists, and enhancements. Fewer travel lanes at intersections will reduce pedestrian crossing distances, pedestrian crossing times and vehicle wait times.

Source: *Pedestrian and Streetscape Guide*, Georgia Department of Transportation, September 2003, Table 41, page 113, available at www.Walkable.Org/download/Georgia_ped_streetscape_guide.Pdf .

During the site design and redevelopment process, the quantity and frequency of driveway access points and entrances to sites from streets to adjacent properties should be minimized along key pedestrian routes. Sites can be designed to allow adjacent properties to share access. Another option may be to separate pedestrian and vehicle access to the site. In addition, emergency vehicle access should be designed to allow for quick access that minimizes conflict with pedestrians.

Driveways that intersect sidewalks and walkways should be designed to minimize conflicts between pedestrians and vehicles. If driveways are designed to be less wide, based on minimum standards, they are easier for pedestrians to cross. Providing clear sight lines between the pedestrian and the turning vehicle is also important. Pedestrians using wheelchairs or walkers and pedestrians with strollers need a relatively flat walking surface. The side flares and cross slopes of a driveway apron can cause tipping or a loss of balance. If possible, driveway crossings should be placed outside the path of the sidewalk. When this is not possible, incorporate the driveway into the walkway but provide a clear, level landing behind the driveway apron. For more information, refer to the City of Scottsdale *Supplements to MAG Specifications and Details* and the City's DS&PM.

8.6 Curb Ramps

Ramps provide access between changes in elevation for people using mobility assistive devices, and people pulling or pushing strollers, suitcases, or other items. Curb ramps are required wherever a pedestrian route crosses a sidewalk/street transition; at intersections, medians, and alleys; and where a public sidewalk ends and pedestrian travel continues on the roadway. Curb ramps should be wholly contained within the crosswalk markings, if they exist. Ramps function best when placed in the center of the crosswalk. Curb ramps should be flush with the street surface, meeting with the surface at grade, without transitions or lips. Alterations in retrofit development areas shall follow guidelines for new construction unless technically infeasible as determined by the Transportation Department.

The City is improving pedestrian access and safety by requiring the use of directional ramps at all intersections. A directional ramp aligns in the direction of the crosswalk; two per corner are needed. Per the City of Scottsdale *Standard Details*, directional ramps are preferred and should be installed at all intersections where there is room for both the ramps and the required 4-foot landing area. Where there is not room for the full directional ramp treatment, diagonal ramps with a minimum 8-foot width and 4-foot landing are acceptable; however, if there is not room for the landing, a blended transition ramp should be used. Detectable warning devices (truncated domes) should be installed in conjunction with these ramps to provide important crossing information to pedestrians who are blind or visually impaired. Diagrams of curb ramp design are included in Appendix 7-F.

This separated sidewalk includes landscaping on both sides of the sidewalk to shade pedestrians and provide a physical separation from traffic (Scottsdale Road near Greenway-Hayden Loop).

8.7 Physical Separation From Traffic

Sidewalks should be separated from adjacent roadways with either vertical or horizontal separation. Vertical separation can be curbs, bollards, parking (parallel or perpendicular), or buildings. Horizontal separation can be an on-street bike lane, a non-paved area (preferably landscaped), or landscaping in tree grates or planters.

Separations that include landscaping to shade pedestrians that also provide softening of the environment are encouraged.

To increase user comfort, sidewalks should be placed away from the back of curb a minimum of 5 feet, with 8 feet desired, and sometimes greater distances based on available rights-of-way or easement. On roadways with transit routes, the sidewalk should be brought closer to the roadway at transit stop locations to allow boarding and deboarding at transit stops.

A bicycle lane or parked cars (preferably parallel parked) also provide separation from traffic. More information on bicycle lanes can be found in the Bicycle Element of the *Transportation Master Plan*.

Vertical curbs shall be a 4-inch minimum height to inhibit cars from climbing curbs. Curbs do not have to be connected to the walkway except at transit stops.

Bollards can be used as a vertical element to separate pedestrians from traffic. (See AASHTO *Roadside Design Guide* for placement).

Buildings act as a vertical separation in situations where the pedestrian facility is completely, or almost completely, separated from roadways by buildings, in areas such as plazas or pocket parks.

8.8 Lighting

Pedestrian level lighting should be provided in all urban areas and in all suburban areas classified as medium high or high in the pedestrian route network (see Section 7.0). Pedestrian level lighting is appropriate in areas where there is pedestrian activity in early morning, evening, and nighttime hours.

If provided, a minimum of 1 foot candle of light from grade to 5 feet above the walking surface, between sunset and sunrise, at vehicular intersections, changes in grade, and at crosswalks is required. Provide points of illumination along the sidewalk or walkway so that users can move comfortably between light to light. Selection of lighting fixtures that contributes to thematic character is encouraged.

8.9 Intersections

Crossing wide roadways is a significant barrier to pedestrian movement (see Section 3.4.4 Street Crossings). Safe intersection design requires that pedestrians have safe and comfortable access while still meeting the needs of drivers. Basic principles that make intersections safer and more comfortable for pedestrians are provided in Table 7-8.

TABLE 7-8: Principles of Intersection Design to Meet Pedestrian Needs
Intersections that work well for pedestrians are compact.
Eliminate free-flowing motor vehicle movements (such as free-right-turn movements), or slow vehicles as they turn through the intersection.
All legs of an intersection are available to pedestrian use (unless doing so creates a significant safety hazard, such as pedestrians crossing in front of left-turning vehicles at a T intersection).
Pedestrians are able to travel in a direct line across the intersection leg.
The direction of travel across the intersection is clearly defined for all pedestrians, including pedestrians with visual impairments.
Avoid increasing potential conflicts or the level of pedestrian exposure to motor vehicles, such as that at multiple and skewed intersections.
Source: *Pedestrian and Streetscape Guide*, Georgia Department of Transportation, September 2003, page 121, available at www.Walkable.Org/download/Georgia_ped_streetscape_guide.Pdf

8.9.1 Crosswalk Markings

Best practice planning and design for pedestrians with disabilities (revised draft guidelines for accessible public rights-of-way) recommends that marked crosswalks be provided at all signalized intersections. Crosswalks are part of the pedestrian access route. There are several different types of crosswalk markings. Research has shown that all crosswalk markings are equally effective, but some are more visible than others. Scottsdale typically uses the horizontal bars marking pattern at stop-controlled intersections. Higher visibility crosswalk markings are generally used at locations where greater motorist warning is required because a crossing pedestrian may not be expected, and at locations where there are larger numbers of crossing pedestrians. Advantages and disadvantages of major crosswalk marking types are provided in Figure 7-11.

There has been some debate in recent years about the potential safety implications of providing crosswalks at uncontrolled intersections (intersections without a traffic signal or stop sign). Several studies regarding unmarked and marked crosswalks have been summarized in the *Pedestrian and Streetscape Guide*.

> According to the research, on smaller roadways with lighter traffic volumes, markings do not decrease the pedestrian crash risk; conversely, on large-high-volume roadways, the risk actually increases… the needs of pedestrians to safely cross streets cannot be ignored and that engineering and roadway treatments should be used to minimize

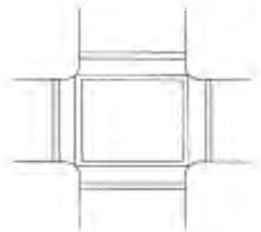
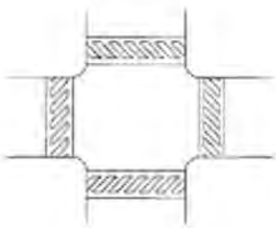
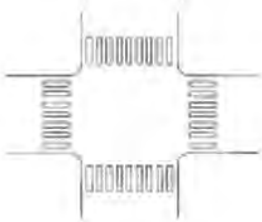
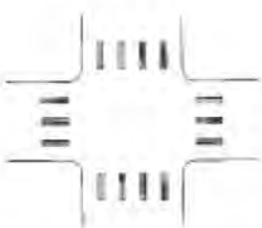
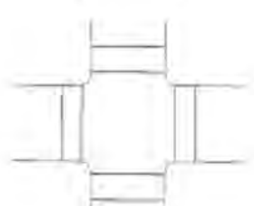
	Marking Pattern	*Advantages*	*Disadvantages*
	Horizontal Bars	Common practice at stop controlled intersections, less expensive, easy to install and maintain	Not as visible as some other marking types; bars tend to wear faster than other types; not appropriate for mid-block locations
	Zebra	Highly visible	More maintenance required since wheel friction rubs off diagonal stripes; surface can be slippery
	Ladder Bar	Highly visible	Wider stripes rub off with wheel friction, but can be placed to minimize this effect; surface can be slippery
	Piano	Highly visible and becoming more commonly used; easy to maintain since stripes can be placed outside the wheel friction areas	
	Dashed (European)	Captures attention because it is not a commonly used pattern	May not define space as well as some of the other choices
	Solid	Visible (but may not be as eye catching as other patterns); not commonly used	Expensive; more difficult to install and maintain; surface can be slippery

FIGURE 7-11: Advantages and Disadvantages of Crosswalk Marking Patterns

> the pedestrian crash risk… it is rarely appropriate to remove crosswalk markings from multi-lane roadways with high average daily traffic. Instead, the markings should be enhanced with appropriate additional pedestrian treatments such as signing, traffic calming, signalization, or other countermeasures.

Mid-block crossings are discussed further, along with the preferred combination for different roadway conditions, in Section 8.10 Mid-block Crossings.

8.9.2 Minimizing Crossing Distances at Intersections

Minimizing crossing distances for pedestrians at intersections helps to increase the safety of slower-crossing pedestrians (see Table 7-2: Pedestrian Walking Speeds) and enhances the comfort of all pedestrians. There are several tools that can be used to minimize the crossing distances at intersections, including reducing the curb return radius, medians and center refuge islands, and curb bulb-outs and extensions. These features, and their applicability in the City of Scottsdale, are described below.

Reduced Curb Return Radius

Reducing the curb return radius reduces the crossing distance at intersections and requires vehicles to slow as they turn, allowing vehicles to be more responsive to the presence of pedestrians in the intersection.

In Scottsdale, the use of reduced curb return radius will be considered along urban segments of the pedestrian route network or in suburban segments classified as high or medium high (see Figures 7-4 through 7-8). A suggested corner radii "is as small as 10 to 15 feet where residential streets intersect to 25 to 30 feet where arterial streets intersect."

Even along corridors with extensive pedestrian use (or potential use), the need for shorter pedestrian crossing distances and reduced vehicle turning speeds will need to be balanced with the need to provide adequate curb turning radius lengths to accommodate the types of vehicles that turn at the intersection. A radius that is too small may cause large vehicles, such as buses or delivery trucks, to jump the curb, which can damage the curb and sidewalk, and can also cause vehicles to enter the pedestrian waiting area at the intersection. Small curb radii may also force large vehicles to enter opposing traffic.

Medians and Center Refuge Islands

Medians and refuge islands (Figure 7-12) at intersections provide waiting areas for pedestrians crossing the roadway, allowing pedestrians to cross in only one direction at a time. Refuge islands are generally smaller than medians, but either one can be used at an intersection.

Table 7-9 lists conditions where refuge islands at intersections are beneficial for pedestrians.

> Medians and refuge islands need to be large enough to provide refuge for several pedestrians waiting at once. They generally should be a minimum of 6 feet wide and preferably 8 feet wide or more

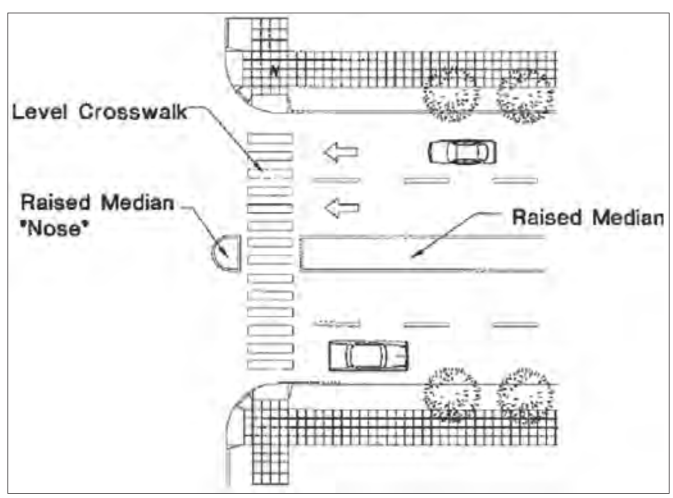


FIGURE 7-12: Median/Refuge Island at an Intersection

where possible, face of curb to face of curb. These areas also need to be accessible, with either curb ramps or at-grade cuts. Cut-throughs are generally easier to construct and easier for pedestrians to negotiate than curb ramps, especially on small islands… refuge islands should be raised to provide a vertical barrier between pedestrians and motor vehicles…the use of medians and refuge islands at intersections also help to provide added protection during left-turning movements. Pedestrian push buttons should be mounted in the islands to provide pedestrians control over the signal phases from their refuge position. Push button posts and other poles need to be located out of the pedestrian travel way, but not inconveniently far from reach.

TABLE 7-9: Locations Where Refuge Islands Benefit Pedestrians
Wide, two-way unsignalized streets (four or more lanes) with high traffic volumes, high vehicle travel speeds and large pedestrian volumes.
Roadways where children, pedestrians with disabilities, elderly pedestrians or other slower-moving pedestrians (including tourists) cross regularly.
Streets where there is insufficient time for slower-moving pedestrians to cross in one cycle.
Minor access/local residential street where islands function both as traffic calming devices and street crossing aids.

Source: *Pedestrian and Streetscape Guide,* Georgia Department of Transportation, September 2003, page 132, available at www.Walkable.Org/download/Georgia_ped_streetscape_guide.Pdf

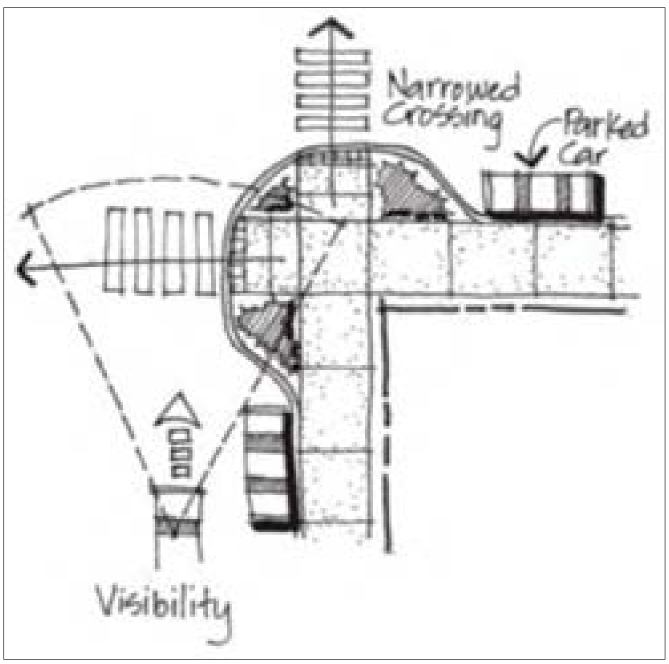


FIGURE 7-13: Curb Extension/Bulb-out

Curb Bulb-outs and Extensions

Curb extensions, which are also referred to as bulb outs, reduce the street crossing distances at intersections and improve sight lines for pedestrians and drivers. Curb extensions are appropriate only where there is on-street parking. Curb extensions also help to slow turning traffic. Extensions may not be appropriate on streets where there are higher numbers of large turning vehicles, such as transit vehicles or delivery vehicles.

In Scottsdale, curb extensions should be considered on corridors where the segment is designated as urban or where the pedestrian route network has a ranking of high or medium high (see Figures 7-4 through 7-8) and where the other criteria listed above are present. Figure 7-13 shows a curb-extension.

8.9.3 Minimizing Pedestrian/Motor Vehicle Conflicts at Intersections

There are many ways to minimize conflicts between pedestrians and motor vehicles at intersections, including enhancing visibility and sight distance, restricting on-street parking, signalizing intersections, grade separation, and regulating turning movements. Many of these techniques also help to reduce conflicts at driveways (see Section 8.5 Driveway Crossings).

Visibility and Sight Distance

Providing visibility at intersection corners is important so that drivers can see pedestrians. Features such as signs, landscaping, and street furnishings can inhibit visibility, so care is needed in locating these elements. See Chapter 5 of the City of Scottsdale DS&PM, Figure 5.3-26:5.3-27, for intersection and driveway sight distance requirements.

On-street Parking Restriction

When cars are parked too close to pedestrian crossings, they may block the line of sight from the driver and the pedestrian, which is an unsafe condition that leads to pedestrian/vehicle collisions. Engineering judgment is required to determine the appropriate distance for parking setbacks from pedestrian crossings.

The ITE *Design and Safety of Pedestrian Facilities Report* recommends that parking be restricted within 50 feet of all intersection crossings where the speed of travel on the street is 35 to 45 mph, and be restricted within 100 feet at intersections on streets where the speed of travel is above 45 mph and at mid-block crossings (see Section 8.10 Mid-block Crossings.)

In some situations, the parking setback may be lessened, such as in a downtown area or other areas where travel speeds are lower. Greater setbacks may be required near schools, at unsignalized intersections, or on higher speed roadways.

Signalized Intersections

The needs of pedestrians are important to address at all intersections where traffic signals are installed. Please refer to Section 8.11 Signal Timing and Pedestrian Actuated Signals, Section 8.12 Pedestrian Count-down signals, and Section 8.14 Accessible Pedestrian Signals for additional information.

Grade Separation

Grade separation is used when traffic conditions require pedestrians to be completely separated from the roadway and may be considered in cases of heavy pedestrian or vehicle volumes. Overpasses and tunnels or underpasses, if designed appropriately, can provide safe pedestrian crossings. Design considerations to make them accessible for people with disabilities (with the use of ramps or elevators) can be expensive and challenging. If using a grade-separated crossing is inconvenient or adds distance to the pedestrian trip, pedestrians may not use them. Grade separations work well when integrated with an overall pathway system, such as the Indian Bend Wash, since they create a continuous path of travel and are convenient and comfortable for pedestrians to use. Grade-separated crossings are also discussed in Section 8.10 Mid-block Crossings.

Turning Movements

There are many approaches that can be considered to reduce turning movement conflicts at intersections (see Table 7-10). Many of these approaches are discussed elsewhere in the design guidelines section of this Pedestrian Element.

TABLE 7-10: Options to Reducing Turning Movement Conflicts for Pedestrians at Intersections
Consider making intersections more compact, with small turning radii – this requires vehicles to turn more slowly, reducing conflict for pedestrians.
Restrict left turns in some high-pedestrian use areas (such as Downtown) during certain hours when there are more pedestrians at intersections. Alternatively, provide left-turn arrows for motorists after allowing pedestrians to cross at signalized intersections.
Shorten crossing distances (and exposure for the pedestrian) by using curb extensions or bulb-outs.
Provide medians and refuge islands at intersections, and appropriate mid-block crossings.
Ensure that pedestrian crossings have appropriate lighting.
Improve marking and visibility of crosswalks.
Use signs to remind motorists to yield to pedestrians in crosswalks.

Source: from the *ITE Design and Safety of Pedestrian Facilities Report,* as cited in the *Pedestrian and Streetscape Guide*, Georgia Department of Transportation, September 2003, Table 51, page 140, available at www.Walkable.Org/download/Georgia_ped_streetscape_guide.Pdf .

8.10 Mid-block Crossings

Given a choice between an inconvenient safe route and a convenient route that may be less safe, many pedestrians will select the more convenient route. In the example shown in Figure 7-14, transportation professionals would prefer that pedestrians use the traffic signal to cross the roadways. However, since this route adds approximately 40 percent to the pedestrians' crossing distance (and hence, their delay), pedestrians will generally prefer to cross at the mid-block location.

8.10.1 Guidelines for Installing Pedestrian Crossing Treatments

The MUTCD and professional engineering judgment can help identify the need for appropriate crossing treatments. Some jurisdictions have adopted local standards and criteria to help identify where crossing improvements are appropriate. The city of Kirkland, Washington, for example, considers the following criteria in evaluating appropriateness of crossing treatments:

- Is the crossing on a route or roadway that is part of a school walking or bicycling route?
- Is the crossing an element of a bicycle or pedestrian route identified in the *Transportation Master Plan*?
- Does the crossing provide a connection to significant retail?
- Does the crossing provide a connection to transit service?
- Do people in the area require a longer time to cross the street (does the area have a large population of persons with disabilities, children, persons who are elderly or tourists?) – See Table 7-2: Pedestrian Walking Speeds.
- Would the improved crossing solve a safety problem?

FIGURE 7-14: Safer (Solid Line) vs Convenient (Dashed Line) Crossings

8.10.2 Existing Guidance for Mid-Block Crossings

Currently, the MUTCD provides several options for mid-block crossings, including: crossing advance and crossing signs, in-pavement flashing lights, and signalized crossings. The MUTCD provides specific guidance in the form of signal warrants for the application of mid-block traffic signals for pedestrians. However, the guidance for use of signs and other treatments is in the form of "when used, do the following." In 1984, Axler created warrants for FHWA addressing the provision of grade-separated crossings.[25]

Figure 7-15 shows the approximate pedestrian and motor vehicle volumes addressed by the MUTCD signal and FHWA grade-separated crossing warrants. There is a significant range of pedestrian volumes for which no substantial guidance is provided; for any pedestrian volumes under 100 per hour (for four hours) more guidance is needed. Accordingly, guidance for implementing traffic control at these numerous unsignalized pathway/arterial crossings is needed.

The crossing guidelines presented in this section answer four basic questions:

- Should a grade-separated crossing be provided? If not, then,
- Is a traffic signal warranted? If not, then,
- Is a designated mid-block crossing appropriate? If so, then,
- What specific measures should be installed?

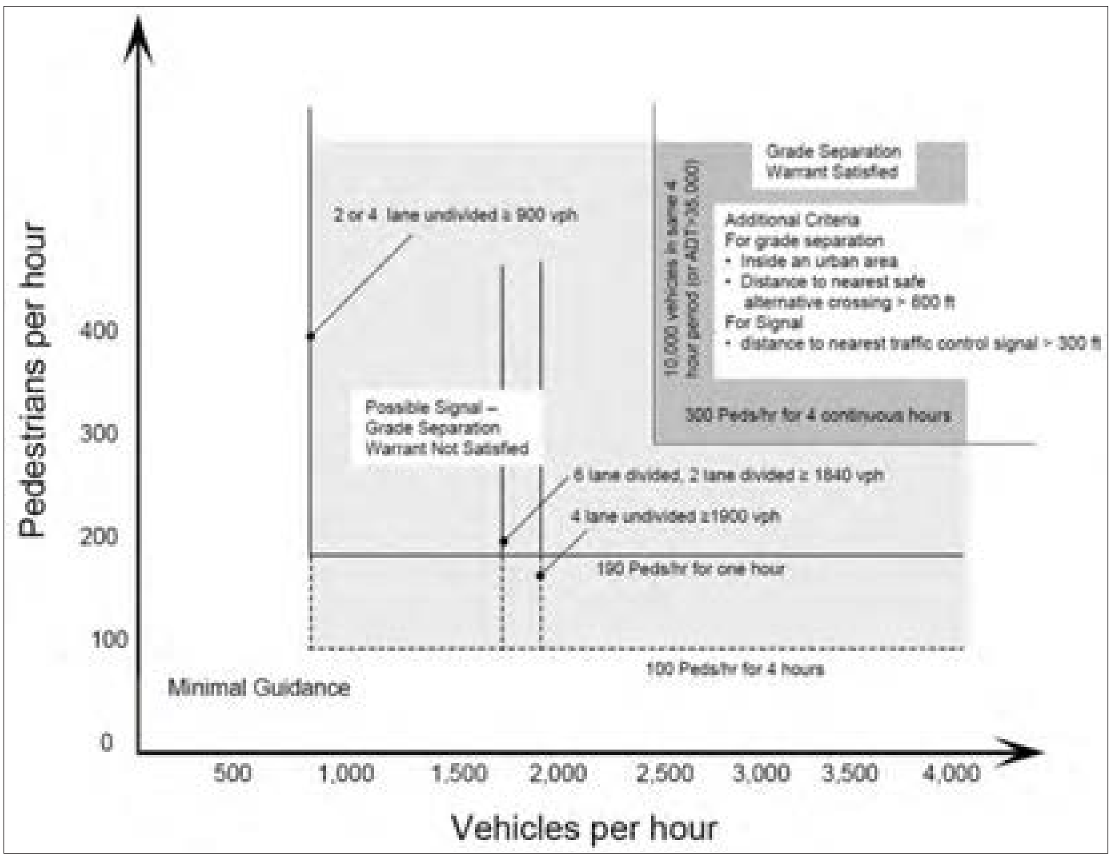


FIGURE 7-15: Range of Existing Guidance for Pedestrian Crossings

25 Axler, E.A., *Warrants for Pedestrian Over and Underpasses*, Report No. FHWA/RD-84-082, U.S. Department of Transportation, Washington, DC, July 1984.

Grade-separated Crossings

According to warrants developed by FHWA, a grade-separated pedestrian crossing is justified if:

- There are at least 300 pedestrian crossings for four consecutive hours inside an urban area with motor vehicle speeds greater than 40 mph;
- The motor vehicle volume during the same time period is greater than 10,000 (or the total daily traffic volume is greater than 35,000); and
- The crossing site is at least 600 feet from the nearest controlled crossing.

If this warrant is met, a grade-separated crossing may be considered to accommodate pedestrians.

Traffic Signals

The MUTCD provides warrants for the installation of traffic signals. Warrant 4, pedestrian volumes, states that a signal for a mid-block or intersection crossing can be considered if an engineering study finds both of the following:

- The pedestrian volume crossing the major street at an intersection or mid-block location during an average day is 100 or more for each of any four hours or 190 or more during any one hour; and
- There are fewer than 60 gaps per hour in the traffic stream of adequate length to allow pedestrians to cross during the same period when the pedestrian volume criterion is satisfied. Where there is a divided street having a median of sufficient width for pedestrians to wait, the requirement applies separately to each direction of vehicular traffic.

The MUTCD goes on to say that, in Section 4C.05, "The pedestrian volume signal warrant shall not be applied at locations where the distance to the nearest traffic control signal along the major street is less than 300 feet, unless the proposed traffic control signal will not restrict the progressive movement of roadway traffic."

A pedestrian volume signal warrant requires actual pedestrian and motor vehicle counts. Additionally, to satisfy the pedestrian warrant the number of adequate gaps in the roadway traffic stream must be counted. Unfortunately, determining the demand for a potential mid-block crossing location is not something that can be done by counting the existing number of individuals crossing the roadway. Some method using a surrogate site, or perhaps latent demand, must be employed to estimate the number of users that would cross at a new signalized crossing.

Designated Mid-block Crossings

At many mid-block crossing locations throughout the U.S., pedestrian volumes are not high enough to satisfy the MUTCD's pedestrian volume warrant for a traffic signal. To determine if a mid-block crossing is appropriate, two criteria will be considered: roadway geometrics and geometric pedestrian delay.

Roadway Geometrics

Roadway geometrics dictate if the mid-block crossing can be designed safely. Two primary factors need to be considered: sight distance and proximity to intersections.

The sight distances available to motorists and pedestrians must be adequate to allow for a safe crossing. A policy on the geometric design of streets and highways states that sight distance provided for motorists should be at least equal to the stopping sight distance for the design speed of the roadway. While motorists are required to yield the right of way to pedestrians, pedestrians are more comfortable crossing the street when they have adequate sight distance for them to see far enough up the approach roadway to identify an adequate gap in traffic.

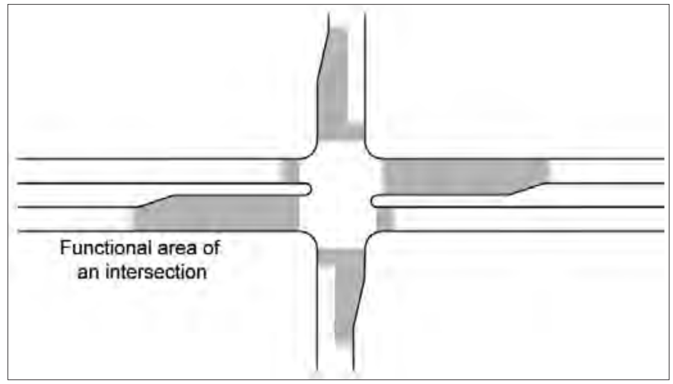


FIGURE 7-16: Functional Area of an Intersection (grey-toned shading)

The proximity to intersections is important because of the complexity of motor vehicle movements on the approach to intersections. Essentially, mid-block crossings should not be placed within the functional area of an intersection. The functional area of an intersection (see Figure 7-16) includes both the approaches to and departures from the intersection and the longitudinal limits of the auxiliary lanes.

Pedestrian Volumes

Pedestrian volumes, the number of pedestrians needing to cross, are the next criterion in determining where crossing treatments should be provided for mid-block locations. Combined with the distance to the nearest intersection crossing, pedestrian volume can be used to determine an overall geometric pedestrian delay resulting from the additional distance the pedestrian is required to walk to use the intersection crossing. The proposed criteria for the consideration of a mid-block crossing are as follows:

The total geometric pedestrian delay at a potential crossing location during an average day is:

- 15 minutes or more for each of any four hours; or
- More than 60 minutes during any one hour.

Figure 7-17 shows the calculated pedestrian-minutes of delay as a function of the volume of pedestrians and the offset distance to the nearest intersection. The delay was based only upon the offset to the intersection and does not include any delay associated with waiting at traffic signals. For purposes of this example, 3.5 feet per second is the assumed walking speed of a pedestrian. The chart shows, for example, that if there are ten pedestrians per hour and the offset to the nearest intersection is 100 feet, the pedestrians will experience a total of ten minutes of delay. If the offset is 200 feet, the pedestrians will experience a total of 20 minutes of delay (instead of ten), because the pedestrians have to walk farther to and from the nearest intersection (200 feet each way instead of 100 feet). If there are 20 pedestrians per hour and the offset is 100 feet, the pedestrians will experience a total of 20 minutes of delay (instead of ten), because there are 20 pedestrians (instead of 10).

If the delay criteria are met (15 minutes or more for each of any four hours or more than 60 minutes during any one hour), a crossing could be considered at the mid-block location.

If it has been determined that a mid-block crossing is appropriate, the appropriate combinations of traffic control devices to be used will need to be identified. Each situation is unique and will need to be examined for efficiencies and safety.

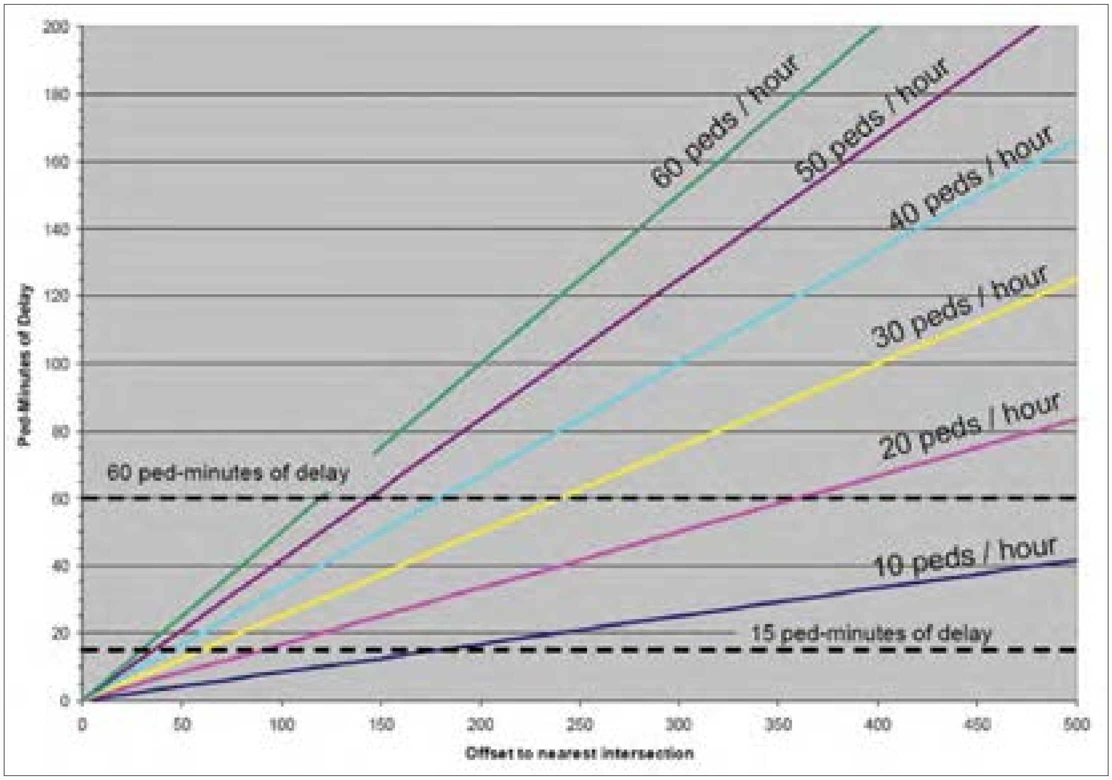


FIGURE 7-17: Geometric Pedestrian Delay as a Function of Number of Pedestrians and Offset to Nearest Intersection

8.11 Signal Timing and Pedestrian Actuated Signals

Signals are typically timed to efficiently move motorized vehicles. Pedestrians usually must stop and wait to cross at every signalized intersection. In Scottsdale, pedestrian actuated signals at intersections are commonplace and at major roadway intersections the pedestrian signal is automatic. At other intersections however, often pedestrians must actuate the signal in order to activate the pedestrian phase and have sufficient time to cross the street – even in areas ranked as high on the pedestrian route network, where there are large numbers of pedestrians (see Figures 7-4 through 7-8). In areas designated as urban corridors or in suburban areas ranked as high or medium high on the pedestrian route network (see Figures 7-4 through 7-8), pedestrians should not be required to actuate the signal to have sufficient time to cross the intersection to enhance the comfort and safety of pedestrians in these areas.

> Signals with excessively long waits may cause pedestrians to cross against the signal, increasing the potential for pedestrian/motor vehicle conflicts. Research indicates that many pedestrians stop watching for the light to change, and instead start looking for gaps to cross streets when their delay exceeds 30 seconds.

Signals should be timed closer to the speed of slower pedestrians rather than the average speed of all users. Table 7-2 identifies walking speeds for a variety of pedestrians ranging from an average of 4.0 feet per second for the average pedestrian to 1.97 feet per second for an above-the-knee amputee. The MAG *Pedestrian Policies and Design Guidelines* recommends using "a walking speed of 3.0 (0.91m) feet per second or slower to calculate clearance time, based on the walking speed of the elderly, children, and other slower users." The ITE manual *Design and Safety of Pedestrian Facilities* also recommends the use of the 3.0 feet per second for signal timing. This

Pedestrian Element of the *Transportation Master Plan* recommends signal timing to allow walking speeds of 3.5 feet per second.

Pedestrian push buttons need to meet the revised draft guidelines for accessible public rights-of-way. Pedestrian push buttons should be a minimum of 2 inches across and need to contrast visually with the mounting surrounding them. Pedestrian push buttons should be placed so that pedestrians can reach them; unobstructed high reach should not exceed 48 inches.

8.12 Pedestrian Count-down Signals

The use of pedestrian count-down signals can help provide additional information on the amount of time available to cross the roadway. The City will consider installing countdown timers at intersections designated as urban corridors or where pedestrians must cross four or more lanes, and will prioritize requests according to the following criteria:

- High existing pedestrian volumes and/or latent demand results
- Traffic volume, traffic speed, number of lanes crossed
- High pedestrian crash locations
- Number of citizens requesting the project
- Significant number of senior citizens, school-age children, pedestrians with disabilities who would be served by the project
- Designated as urban corridors

These criteria are described in further detail below.

8.13.1 High Pedestrian Volumes/Latent Demand Results

The City will consider installing countdown timers at intersections with high existing or potential pedestrian volumes to maximize the number of pedestrians who benefit. The City will consider installing pedestrian countdown signals along all urban corridors or suburban corridors with a ranking of medium, medium high or high on the pedestrian route network identified in Figures 7-4 through 7-8. Figures in Appendix 7-E show the results of the pedestrian latent demand analysis for Scottsdale by planning area, and reveal that areas with relatively high latent demand are generally the urban character areas, while relatively low latent demand is typical in the designated rural/ESL areas.

8.13.2 Traffic Volume, Traffic Speed, and Number of Lanes Crossed

Pedestrians often perceive that crossing wide intersections with high traffic volumes and speeds is less safe than crossing smaller intersections with low traffic volumes and speeds. There are several options to asses how safe pedestrians feel when crossing City intersections.

For example, a simple measure could be the product of the number of through-lanes and turn lanes on each street approach: in a 2 x 2 intersection, both intersecting streets have two through-lanes, with an intersection complexity product of 4. In a 2 x 4 intersection, one street has two lanes and one street has four lanes. In order of increasing complexity, intersections may be described as 2 x 2, 2 x 4, 2 x 5 (with turn lanes), 4 x 4, 4 x 6, and 6 x 6, for intersection complexity products of 4, 8, 10,16, 24, and 36, respectively.

A more precise measure is FHWA's *Pedestrian Intersection Safety Index*.

8.13.3 High Pedestrian Crash Locations

A high number of pedestrian crashes may be a result of several factors. For example, there may be a large number of pedestrians and a large number of vehicles. Other things being equal, a location with many pedestrians and/or motor vehicles would be expected to have more pedestrian crashes than a location with few pedestrians and/or motor vehicles.

Pedestrian crashes may also be caused by barriers to pedestrian movement, such as absence of a sidewalk, the lack of pedestrian signals or lack of a mid-block crossing point. Some areas may have more pedestrian crashes since they attract slower-moving or more vulnerable pedestrians. For example, children going to and from school, intoxicated persons, and pedestrians who are older or who have disabilities may need additional features to help improve the safety of the walking environment.

Another cause of pedestrian crashes may be a feature of the characteristics of the intersection. For example, there may be a large number of turning vehicles, a large number of right-turns-on-red, a wide crossing, complex geometry or limited sight distance. Pedestrian count down signals can be one tool used to improve pedestrian safety.

8.13.4 Number of Citizens Requesting the Project

The number of citizens requesting countdown timers at a specific intersection may be a surrogate measure of actual pedestrian volume, latent demand, and perceived safety at that intersection.

8.13.5 Significant Number of Senior Citizens, School-Age Children, and Pedestrians With Disabilities

Senior citizens, school-age children, and pedestrians with disabilities cross more slowly than the general population (see Table 7-2: Pedestrian Walking Speeds) and therefore stand to benefit from knowing how much time they have to finish their crossing.

A drawback to using numbers of pedestrians is that many intersections may have latent demand that is not reflected in actual numbers of pedestrians because of barriers to pedestrian movement.

8.14 Accessible Pedestrian Signals

An accessible pedestrian signal (APS) is "a device that communicates information about pedestrian timing in non-visual format such as audible tones, verbal messages, and/or vibrating surfaces". APSs provide information to pedestrians about the existence and location of a pedestrian push button, the direction of the crosswalk, and other information about the intersection. Although used commonly throughout Europe, audible crossings have not been widely used in the United States due to concerns about noise pollution and disagreement among people who are blind about the need for and effectiveness of audible signals.

Techniques used by people who are visually impaired will vary by the characteristics of the street crossing and the individual's level of vision. Changes in the travel environment over the past two decades have affected the ability of people who are blind to use traditional street crossing techniques. These changes include intersection design changes, driver behavior and technology of autos, and signalization changes. For example, wider streets require more precise alignment of crosswalks, and wide radius turns make alignment more difficult and increase crosswalk length. Vehicles have become quieter, making it more difficult for pedestrians who are visually impaired to hear them. Intersection signalization has also become more complex, making it more difficult for pedestrians who are visually impaired to recognize the pedestrian phase.

There are four major design types of devices that provide information on the Walk and Don't Walk cycles: (1) pedhead mounted; (2) push button integrated; (3) vibrotactile only; and (4) receiver based. All products produce a sound, vibration, or both, during the walk interval. Pedhead mounted is the most common type of device installed in this country. The push button integrated device has a speaker mounted inside or in the vicinity of the pedhead. Push button integrated APS systems have a speaker integrated into the push button housing, and are commonly used in Europe and Australia. Vibrotactile-only devices have been installed in a few U.S. locations to respond to concerns about noise and misleading information provided by pedhead-mounted signals. Receiver-based systems are still considered experimental.

It is the policy of the City of Scottsdale to apply the best practice guidelines to ensure the accessibility of all public rights of way. According to recent research on APS:

> Currently in the U.S., APS are typically installed upon request along a specific route of travel for a particular individual or group of individuals who are blind or visually impaired. Various states and municipalities have established policies on installation of APS, some of which are not in accordance with ADA requirements.
>
> Title II of ADA requires municipalities and states to make their 'programs' accessible. Pedestrian circulation is considered a program, and APS may be necessary to provide access to certain types of intersections. Some municipalities have considered the addition of APS at intersections as part of their ADA transition plan.
>
> Draft public rights-of-way accessibility guidelines were published on June 17, 2002 for comment. These draft guidelines require APS at all newly constructed or reconstructed intersections where visual pedestrian signals are installed. (See U.S. rules and regulations related to APS.)

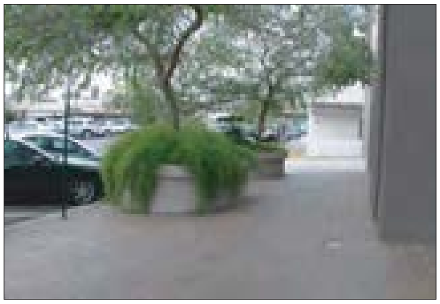
Therefore, APS are to be installed with all new constructed, or reconstructed intersections where pedestrian signals are installed.

City of Scottsdale should continue to monitor the development of this rapidly standardizing technology to obtain the features that are desired beyond the basic APS requirements. Walkinginfo.Org – pedestrian and bicycle information center (http://www.Walkinginfo.Org) will continue to be a valuable source of information.

A preferred approach to APS is still under development. Pedestrian signal devices should comply with PROWAC R-306 (http://www.Access-board.Gov/prowac/draft.Htm). Walkinginfo.Org is currently working on the latest specifications for pedestrian signal devices, and the MUTCD update scheduled to be published by FHWA in 2008, will contain the most recent specifications.

8.15 Shade

Pedestrians in the Phoenix area seek protection from the sun from late spring through fall. For other months of the year, when temperatures are cooler, pedestrians seek filtered or direct sunlight to be comfortable. The most intense sunlight and temperature extreme occur from May



Shade is provided by trees in some areas of Downtown. Note that the landscaping and on-street parking also provide a buffer between pedestrians and the roadway.

to September, from 12:00 noon to sunset. Shade cover can be provided by either an architectural feature, such as a covered walkway or shelter, or the canopy of a tree. In parts of Downtown, structured shade is a component of the walking environment. Where structured shade is provided, providing appropriate lighting will increase security of pedestrians during early morning or late afternoon hours.

Another common method of providing shade is with trees. Continuous shade is best achieved when trees are equally spaced. Concentrated shade is most appropriate at gathering places or nodes such as transit stops. When providing shade through awnings or canopies, follow requirements for clearances identified in Section 8.3 Clearances.

Figures 7-4 through 7-8 identify the pedestrian route network for planning zones of the City. The level of shade required varies with the pedestrian route network map classifications, as shown in Table 7-11 on the next page.

8.16 Seating

Comfortable and frequent seating can help promote walking and create a comfortable pedestrian environment. All benches or other seating surfaces must meet guidelines for accessibility, including a seat surface between 17 and 19 inches above the walkway surface, a length of at least 42 inches, a depth of 20 to 24 inches, and a back support. Figure 7-18 shows minimum seating dimensions.

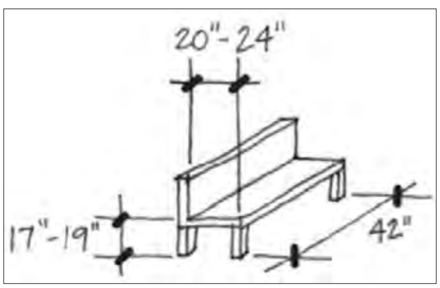


FIGURE 7-18: Minimum Seating Dimensions *(from MAG Pedestrian Policies and Design Guidelines)*

Seating and other furnishings should not protrude into the pedestrian route of travel (see Section 8.3 Clearances). Benches should be placed to allow a person in a wheelchair to have immediate adjacent access (3 foot radius minimum). Seating opportunities can be either fixed or moveable and the seating surface should not be so rough that it is uncomfortable to sit or can damage skin or clothing. Seating opportunities should consider the intense heat and sun of Arizona's climate through appropriate placement, materials, and sensitive designs that mitigate heat retention.

Figures 7-4 through 7-8 identify the pedestrian route network for planning zones of the City. The number of seating opportunties varies with the pedestrain route network map classifications as shown in Table 7-11.

TABLE 7-11: Shade and Seating Requirements

Network Classification	Pedestrian Shade Requirement	Pedestrian Seating Requirement per 660 feet (1/8 mile) of Roadway Frontage
Low	No shade requirement.	No seating requirement.
Medium low	No shade requirement.	No seating requirement.
Medium	50 percent shade coverage in the heat-intense summer months along pedestrian routes and at gathering places. Provide some shade year-round on the walkway.	1

TABLE 7-11: Shade and Seating Requirements		
Medium high	60 percent shade (could be in areas with more elderly persons or more persons with disabilities) continuous coverage.	2
High	Provide 75 percent shade or greater along the walkway.	2

8.17 Parking Lots

Conflicts with motor vehicles in parking lots can be a concern for pedestrians. Clarification of the appropriate pedestrian path of travel is important to address in the site design process to enhance safety and comfort.

Pedestrian access points should be clearly identified with striping, delineation of walking zones, and provision of walkway medians and islands. Drop-off and pick-up zones should be clearly identified and separate from the flow of vehicles.

Separating destinations from nearby streets with large expanses of parking limits pedestrian access.

When possible, locate large parking lots to the rear or underneath the building (instead of between the building and the street), with direct connections to the pedestrian route and provisions for shade or trees. Consider shared parking for multiple businesses (this may also help provide a more continuous pedestrian route by limiting the number of driveways). These design approaches are especially important in areas classified as high or medium high on the pedestrian route maps (see Figures 7-4 through 7-8).

Provide off-street parking in landscaped lots with direct pedestrian access to building entries. Access from the parking area to the building entrance should not exceed one-eighth of a mile.

8.18 Maintenance

Pedestrian surfaces that are clean, smooth, and level are important for all pedestrians, but especially for pedestrians using wheelchairs, older adults, and children. Common maintenance hazards for pedestrians include pavement heaving and cracking, separation of expansion joints, or debris on sidewalks. The maintenance guidelines (Appendix 7-H) can help ensure effective functioning of pedestrian facilities. Poorly maintained pedestrian facilities can create hazards for pedestrians, liability risks for the City and property owners, and negatively impact community image.

As mentioned in Section 8.2 Sidewalk Surface, Texture and Slope, sidewalks should be even, and without heaving, cracks or indents greater than 1/4 inch in width or depth. Changes in vertical elevation greater than ¼ inch require correction or repair.

Adoption of a periodic inspection and maintenance program will help insure the appropriate maintenance and repair of pedestrian facilities. In Scottsdale, citizens and others are able to report potential sidewalk maintenance concerns through the City's Web site. By clicking on "report a problem" on the home page, Web users are directed to a place where they can report damaged sidewalks or other problems. Requests submitted through the Web site are quickly routed to appropriate staff for resolution. Pedestrian facility maintenance requirements are listed in Appendix 7-H.

8.19 Work Zone Safety

Construction activities can have a significant impact on pedestrians by disrupting sidewalks and other curbside areas. Construction plans must specify how pedestrian facilities are kept open and functioning, or identify an appropriate alternative that creates a convenient and accessible option for all pedestrians, including pedestrians with mobility limitations. The removal of a sidewalk, even for a short time, can effectively remove access to a building or transit stop for a pedestrian using a wheelchair, a pedestrian pushing a stroller, or a delivery person using a hand truck. When accessible elements of the pedestrian environment are removed, such as a curb ramp, care must be taken to create a detour route that is not overly lengthy or circuitous. Guidelines for pedestrian accommodation in work zones are located in Appendix 7-I.

8.20 Sidewalk Cafés/Outdoor Dining

Sidewalk cafés/outdoor dining can create a unique environment for relaxation, eating, and exploration. A vibrant street helps to enhance the pedestrian experience by creating interest and can also encourage passersby to pause and explore the area on a more intimate scale. Encouraging visitors to lounge and explore can enhance commerce by creating sales opportunities. Sidewalk cafés should be encouraged as a vital component of an attractive, active street.

While the addition of sidewalk cafés can encourage additional pedestrian activity and Downtown redevelopment, the presence of sidewalk cafés can also impede pedestrian access and mobility. The goal of the guidance in this section is to ensure a safe environment for pedestrians while encouraging the appropriate use of the public ROW for sidewalk cafés.

Due to the need to maintain pedestrian access and mobility, sidewalk cafés/outdoor dining are not appropriate for all areas of the City. In general, outdoor dining:

- May be located within the public ROW only in conjunction with, and adjacent to, a street-level establishment that serves food and/or beverages.
- Must have an approved license agreement for private use of the City's public ROW.
- May need additional parking for sidewalk cafés larger than 500 square feet.
- Must have approved liquor license agreements for businesses serving liquor.
- Must have a minimum 6-foot pedestrian clearance, exclusive of obstructions and landscaped areas, along sidewalks and walkways.

Other requirements are detailed in Appendix 7-K.

9.0 RECOMMENDATIONS

This section lists recommendations that will implement the goals and objectives of the Pedestrian Element of the *Transportation Master Plan*. Pedestrian goals and objectives are listed in Section 2.0 and goals are listed in Table 7-12. Each recommendation is equally important and supports at least one goal and/or objective.

TABLE 7-12: Pedestrian Goals
Safety and security goal: Create a street environment that is safe and secure for pedestrians.
Pedestrian access and connectivity goal: Create a street environment that allows pedestrians to directly access key destinations by walking.

TABLE 7-12: Pedestrian Goals
Streetscape and land use goal: Provide pedestrian amenities and promote land uses that enhance public spaces, neighborhoods, commercial, and employment areas – amenities that will entice more people to walk.
Education and promotion goal: Educate citizens, community groups, businesses, and developers on safety, health, and civic aspects of walking.
Implementation goal: Incorporate pedestrian needs into the policy-making, planning, design, construction, and maintenance of existing and new policies, plans, programs, projects, facilities, and operations.

9.1 Implement a Comprehensive Safe Routes to School Program.

City staff has created a comprehensive SRTS implementation plan to build upon safety audits performed at many public schools in Scottsdale. Work should advance with the Scottsdale, Cave Creek, and Paradise Valley unified school districts to implement SRTS programs for all primary and secondary schools within the City. Approaches to be used should include engineering, enforcement, encouragement, and education. The SRTS implementation plan is provided in Appendix 7-L.

Estimated cost: Additional staff may be required to implement the program, and funding is required for promotional and educational items.

9.2 Implement Design Guidelines in Section 8.0 and Update the Pedestrian Chapter of the DS&PM With the Design Guidelines.

Section 8.0 Design Guidelines outlines pedestrian planning, design, and engineering practices that will create safe and comfortable pedestrian travel conditions. The design guidelines account for the needs of pedestrians for secure, direct, and continuous pedestrian facilities that have sufficient capacity, visual interest, amenities, and comfortable street crossings. The guidelines address all types of pedestrian facilities and other design strategies that help to make walking safer, more convenient, and more comfortable.

These design guidelines should be integrated into an updated pedestrian chapter of the DS&PM. Good design is important for pedestrians because pedestrians are unlikely to use uncomfortable facilities, or facilities that feel unsafe.

Estimated cost: This work can be included in current City staff workloads.

9.3 Create a Pedestrian Safety Action Plan.

A pedestrian safety action plan specifically identifies the necessary steps to reduce the number of pedestrian crashes. A pedestrian safety action plan should include objectives, locations where improvements are needed, specific techniques and tools to reduce crashes, and implementation strategies. A pedestrian safety action plan should also identify changes to planning and design standards that would enhance pedestrian safety, and evaluation measures to be sure that pedestrian safety is being increased by the selected implementation strategies. Stakeholders, including citizens, businesses and developers, community groups, elected officials, media, and City staff, should be involved in the development and implementation of a pedestrian safety action plan.

Data should be collected that helps identify and quantify pedestrian safety deficiencies, and solutions identified to address the problems identified. Solutions could be for individual locations, entire corridors, targeted areas or general problems that affect the entire City. Solutions will likely need to be prioritized to fit within funding constraints.

Estimated cost: This work might be addressed by a staff effort, but consultant assistance could enable quicker production and implementation of a pedestrian safety action plan.

9.4 Systematically Implement Pedestrian Improvements Based on the Priorities Established in the Pedestrian Route Network Maps.

Section 7.0 outlines the pedestrian route network using the results of the latent demand analysis. The network identifies roadways most in need of pedestrian improvements based on their potential to entice pedestrians, as identified in the latent demand analysis described in Section 5.0 Future Pedestrian Demand. It is important to note that roadways not identified in this network may also need pedestrian improvements, and that all roadways in Scottsdale are expected to have basic pedestrian facilities to provide for mobility of all residents, employees, and visitors.

The pedestrian route network divides arterial and collector roadways in the City into five categories based on the latent demand analysis: high, medium high, medium, medium low, and low. While all roadways in Scottsdale are expected to have basic pedestrian facilities, a ranking of "high" means that this corridor has a higher priority for investments in pedestrian facilities than one ranked "medium high." The pedestrian route network should be used to prioritize investments in the City's pedestrian network. The City should also continue its commitment to providing dedicated funding sources through the annual capital budgeting process for pedestrian improvements.

Estimated cost: This work may be addressed by a staff effort.

9.5 Improve Plan Review and Site Development Process to Better Incorporate the Needs of Pedestrians.

Improving the plan review and site development process begins by assigning responsibility for reviewing development proposals and site plans to a particular staff person. This person should assume responsibility for assuring that planning and design projects appropriately incorporate pedestrian needs. Educating City staff, elected officials, and members of City boards and commissions about appropriate pedestrian design is also important to improving developments to meet pedestrian needs.

Good site design for pedestrians will enhance safe and convenient access for pedestrians and help to increase pedestrian travel. Pedestrian travel has a number of community benefits as discussed in Section 3.0. Important considerations for pedestrian friendly site design include:

- Delineated walkways through parking lots.
- Connections to neighborhoods and surrounding areas.
- Easy-to-identify building entrances.
- Building frontages located along streets rather than across parking lots.
- Convenient and safe access to transit and adjacent sidewalks.
- Alignment of walkways for convenience and reduced travel distances.

- Accessible routes of travel to and from the site, as well as throughout the site.
- No barriers (walls, ditches, landscaping, or roads without safe crossings) to pedestrian travel.

Specific recommendations related to site design include:

- Require all developments, new or retrofit, to provide a site master plan showing direct pedestrian routes of one-quarter-mile or less to adjacent arterial and/or collector streets and to prepare a walkability index similar to that used by Kansas City, MO.
- Require all new commercial development to identify opportunities for direct pedestrian access between retail and office buildings within the development and adjacent residential areas. Retrofitting neighborhoods with back-door access should also be considered where possible. In both cases, the Planning and Development Services Department would work with the adjacent neighbors, property owners, or developers to achieve the desired result (see Figure 7-19).
- Link transit stops, building entrances, waiting and drop-off zones, parking facilities, and bicycle parking facilities to appropriately designed (see Section 8.0 Design Guidelines) pedestrian facilities.
- To facilitate pedestrian linkages to transit, provide appropriately designed pedestrian connections from public transportation stops to schools.
- Mix commercial, retail, and residential land uses because people are more likely to walk to their workplace, entertainment venues, or destinations that provide basic necessities if they are within one-half mile.
- Provide incentives for developments that encourage healthy communities, where people can mingle, are flexible in site design, encourage a diversity of people (age, income, culture, race), allow increased residential density, and encourage a range of housing products.
- Provide pedestrian facilities appropriate for areas classified as high or medium high in the pedestrian route network shown in Figures 7-4 through 7-8 on all roadways with transit routes.

Two Scottsdale retail centers provide pedestrian access to their sites from adjacent neighborhoods so customers can walk to their centers—'back door access'.

FIGURE 7-19: Back Door Access

- Provide cross access between commercial developments.
- Follow other recommendations in Section 8.0 Design Guidelines to ensure an attractive and comfortable pedestrian environment, including providing pedestrian access through parking lots, limiting the number and frequency of driveway access points to minimize interruption of the sidewalk, creating building facades that interest pedestrians, and other amenities such as landscaping, seating areas, and distinctive character building elements.

9.6 Implement Pedestrian/Motorist Education and Encouragement Programs.

Public education programs are a vital component of a comprehensive pedestrian transportation program and aim to change behavior. Education is typically considered one of the five E's of a successful pedestrian program: engineering, education, enforcement, encouragement and evaluation.

Education programs begin with the selection of a key message and the target audience. Target audiences could include children, adults, new drivers, children walking to school, transit riders or elderly persons. Identifying the target audience will also help identify the appropriate means of communication, which could be media buys, printed materials, radio buys, or other means.

Some potential education topics for drivers include Arizona law regarding crosswalks, looking for pedestrians before turning right on red, looking for pedestrians before turning left, or watching for pedestrians when entering and exiting driveways.

Pedestrians could be educated on how to use crosswalks, how to use a pedestrian actuated signal, the meaning of pedestrian signal indications, and other safe walking behaviors.

Other education efforts should target City staff and elected officials, along with members of City boards and commissions, to keep them informed about recent advances and best practices in pedestrian planning and facility design.

Additional educational efforts could be targeted toward encouraging people to walk in particular areas, or to walk instead of using another travel mode. Educating people about the health, economic, and environmental benefits of walking can help encourage more people to walk. Promotional efforts can encourage people to walk as an alternative to driving for short neighborhood trips, such as trips from home to school, shopping centers, nearby parks, libraries and other civic spaces.

Another way to encourage people to walk is to sponsor community walking events, such as walk/bike to school events, or walking events to benefit non-profit organizations. People who participate in special events may be inspired by a positive walking experience to begin walking on a more regular basis, or to try walking instead of driving.

Estimated cost: City staff working with Scottsdale Healthcare system and perhaps the Mayo Clinic to promote the health benefits of walking would require staff time and effort.

9.7 Create and Maintain a Comprehensive Pedestrian Facilities Inventory.

Creating and maintaining a comprehensive pedestrian facilities inventory is an important first step in creating an ADA transition plan as well as identifying the need for future pedestrian capital projects. A pedestrian facilities inventory should include existing sidewalks and accessibility features. The information gathered should be recorded electronically for inclusion in a GIS layer within the City's GIS. This will enable processing of the relevant data fields for prioritization of construction, reconstruction, and maintenance according to the magnitude of variation from relevant local, regional, and national standards.

Each year, 20 percent of all sidewalk pedestrian elements should be assessed or reassessed for accessibility, maintenance, and GIS mapping using a sidewalk assessment process that records objective grades, cross slopes, changes in grade or cross slope, clear space dimensions, surface firmness and stability, and obstruction information. The inventory should begin with the southern portion of the community, because employment and residential densities are greater, infrastructure is older, and the pedestrian route network rankings are higher (see Figures 7-4 through 7-8).

Obstruction information collected should include areas where minimum clearance widths are not met, vertical clearances, presence of protruding objects, changes in level, and presence of detectable warnings. Sidewalk elements including sidewalk width, availability and type of curb ramp, accessibility of driveway crossings, presence of roadway medians or pedestrian crossing islands, pork chop islands, bus stops, and sidewalk furniture should all be assessed using specific assessment forms. Photos of obstructions are also important and should be included in the inventory. Generic assessment forms for the measurement of sidewalk elements have been provided in Appendix 7-M.

The actual measurement for each component of a sidewalk element should be recorded during assessments, e.g., 7.8 percent slope, versus recording "meets or does not meet maximum requirement of 8.3 percent slope." Design standards can change and it is important to know the actual conditions that exist. This also assists with planning priorities for reconstruction. For example, a ramp with a maximum slope of 11.3 percent is going to be placed on higher priority for reconstruction than one that has a maximum slope of 8.9 percent slope.

Local schools and universities can be used to recruit students to assist with sidewalk corridor and element assessment. Students can be quickly trained to make these types of measurements accurately and efficiently, and record the information. Cost factors to be considered would include the staff time required to train and manage student interns that are tasked with measuring sidewalk elements and corridors. Training should be provided to staff members and interns who will be responsible for assessment of pedestrian environments on how to properly perform sidewalk assessments.

Proper sidewalk assessment tools need to be purchased to enable accurate measurements to be made. Detailed information about the assessment tools needed for a sidewalk assessment is included in Appendix 7-M.

GIS layers should be created for recording detailed information on each sidewalk element. There are currently layers for medians and for bus stops in Scottsdale. Fields can be added to record the detailed information related to sidewalk width, curb ramps, driveway crossings, roadway medians, pork chop islands, bus stops, and sidewalk corridors. A high efficiency sidewalk assessment chart can help to quickly record all of the information electronically into a database for import in the GIS layer (see Appendix 7-M). Cost factors to be considered would include a one-time cost to set up fields and layers in the City's GIS; ongoing cost to import the data into that system should be minimal, given that appropriate measuring tools are available.

It is also possible to check all sidewalk elements against the aerial photos in the Scottsdale GIS. The information can be located in the field according to the nearest intersection and, if available, using a handheld global positioning system unit. Once the information is in GIS, the coordinates of any sidewalk element can be precisely referenced.

9.8 Update ADA Transition Plan for Pedestrian Facilities on Public Rights-of-Way.

Since early 2007, the City of Scottsdale ADA team has been updating an ADA transition plan for the City of Scottsdale. As a component of the larger team, the sidewalks and bus stops workgroup is focused on public rights-of-way. The workgroup has two main goals:

- Create an ADA transition plan.
- Review and update the DS&PM and *Standard Details* so that new development is constructed to meet ADA.

Major issues to be addressed by the workgroup include:

- Funding. Some areas of the community have mature infrastructure. Funding is needed through the annual budget process to repair and replace aging infrastructure.
- Data collection and uniformity. There is existing data in a variety of formats. There is a desire to have the data uniformly mapped and geocoded so that it can be analyzed and displayed using GIS. Resources are needed for this task, as well as consideration of how data will be maintained, updated, and revised.
- Pedestrian facilities inventory. The pedestrian facilities inventory could focus first on arterial and collector roadways, and focus on areas with more employment and residential density. Roadways with upcoming CIP projects do not need to be inventoried since they will be built using current guidelines. Identifying needs on roadways with bus routes is particularly important.

Several existing data sources have been identified to implement the workgroup's goals, including:

- Transit stops and bus routes. There is an existing inventory of transit stops, and City staff is working to identify if these are ADA accessible. The inventory is occurring on a route-by-route basis and is anticipated to be completed by the end of 2008.
- Sidewalk inventory south of Via de Ventura. The field services division created a sidewalk inventory, begun in 2003, handwritten on quarter-section maps, of sidewalks. The inventory identifies whether a sidewalk exists, but not its width, texture or other features. Curb ramps and other pedestrian facilities are not inventoried in this area.
- Downtown Scottsdale Pedestrian Mobility Study. The Downtown Scottsdale Pedestrian Mobility Study assessed and measured pedestrian mobility, and identified where future improvements were needed in Downtown. Existing conditions were inventoried, mapped,

and analyzed throughout Downtown to assess the quality of the pedestrian environment (see Appendix 7-J). All information has been mapped, but is not geocoded.

An ADA transition plan should include four major elements. The first element is a list of barriers to accessibility, including their precise location and photos documenting the barrier. The second element is detailed information on how the barrier will be eliminated. For example, if the barrier is an inaccessible transit stop, the steps for removing the barrier might include purchasing additional ROW for the transit stop, or adding additional width to the transit stop to allow boarding and deboarding of the transit vehicle. The third element is a reasonable schedule for achieving compliance, including interim milestones for multi-year schedules. Finally, the ADA transition plan should also assign responsibility for implementation of the barrier-removal plan.

The transition plan should address access routes to municipal buildings from public transit, since many people with disabilities use public transit. The transition plan should also include access routes to public buildings from transit stops, routes of travel along transit routes and the presence of curb cuts, ramps, or obstructions.

As part of the implementation of the ADA transition plan, 20 percent of facilities should be reassessed each year after the preliminary assessment of all facilities. A formal input mechanism for the disability community should also be created. The transition plan should be documented in writing. The financial impact of one lawsuit can far outweigh the prevention of such a lawsuit by performing assessments of existing facilities, creating input mechanisms for the disability community to provide input into the pedestrian planning process, and by systematically prioritizing and improving the accessibility of all pedestrian environments.

Estimated cost: Cost factors to be considered would include outside staff assistance needed to draft the initial plan and ongoing staff time to complete assessments, coordinate community input and planning, and to coordinate with other departments. Capital investments would also be required.

9.9 Enhance Pedestrian Facilities in Downtown.

Downtown is one of the most acclaimed tourist areas in the state of Arizona with an eclectic mix of Southwestern and contemporary art galleries, specialty retail, upscale dining, active nightlife, and museum elements for residents and visitors. Downtown, generally bounded by Earll Drive and Chaparral Road, and 68th Street to Miller Road, is known for its distinctive urban design and architectural features. Although comforting features that encourage pedestrian travel, such as shade, public art, aesthetically pleasing elements, vegetation, and seating are characteristic of the area, Downtown was designed without the concepts of universal design in mind. As a result, much of the area is not universally accessible.

New residential and mixed-use developments will create more of a 24-hour, 7 days a week character in Downtown requiring the addition of more pedestrian-friendly features. New destinations like the W hotel, expanding commercial and mixed-use areas such as the Scottsdale Waterfront, and renovations to existing properties such as the Hotel Valley Ho and Mondrian Hotel are being created. These areas will attract more pedestrians into and through Downtown.

In addition, all of the City's current trolley services (Downtown trolley, neighborhood circulator, Giants and resort shuttles) serve Downtown destinations, creating a connection between transit services and higher pedestrian demand.

To address these issues, the City requested funding from MAG to measure pedestrian mobility in Downtown, and to determine how and where to make improvements to that mobility. The study assessed Downtown within its four established districts - Old Town, Main Street, Fifth Avenue, and Marshall Way. Concurrently, the City's Downtown group sponsored a similar effort to assess mobility issues within the northeast quadrant, an emerging district east of Scottsdale Road, south of Camelback, north of Goldwater Boulevard, and west of 75th Street (see Appendix 7-J for a district map). While each established district has its distinct character, the districts have begun to grow together and are within a comfortable walking distance of one another, pointing to a need for a degree of connectivity and cohesion for the pedestrian clientele. After discussion of all the individual district deficiencies, a set of the top three prioritized improvements was formulated for each district (see Table 7-13).

TABLE 7-13: Top Three Prioritized Improvements For Downtown Districts
Old Town
First Priority
Create an accessible entrance to Brown Ave/Main St into Civic Center Mall (a temporary solution to this concern is already in place, but a more permanent solution is desired).
Sidewalk reconstruction (increase sidewalk width; improve sidewalk surface/texture by smoothing surfaces, adding clearance and ramps; modify curb heights).
Sidewalk surface renovation.
Expand western themed improvements.
Make all trolley stops accessible and comfortable.
Second Priority
Fix clearance issue on all streets, minimum 3 foot clearance.
Streetscape installation: Landscaping, pedestrian facilities.
Adjust covered walkway supports (for clearance) or modify design standards.
Replace thorny plants with friendlier vegetation.
Third Priority
Brown Ave: Fix slopes, update ramps, add landscaping and shade.
Add lighting and street amenities.
Upgrade lighting in pedestrian areas.
Improve sidewalk surfaces, ramps, and alleys.
Other suggestions
Main St: Fix surfaces, update ramps.
Buckboard Trail: Widen sidewalk; add shade, seating, and landscaping; and add additional amenities north of Indian School Rd to connect to hotels.
Downtown (overall): Create/adopt guidelines for outdoor dining, sidewalk cafés, and other uses in public right-of-way.
Main Street Arts District

TABLE 7-13: Top Three Prioritized Improvements For Downtown Districts
First Priority
Main St: Widen the sidewalk; fix slopes, curb height and surfaces; create a minimum 3-foot clearance and a continuous path of travel; update ramps; and enhance lighting.
Sidewalk reconstruction (increase sidewalk width; improve sidewalk surface/texture by smoothing surfaces, adding clearance and ramps; modify curb heights).
Improve pedestrian/courtyard areas.
Fix curbs so they are a consistent height.
Second Priority
Marshall Way: Widen the sidewalk, fix irregular surfaces, consolidate materials, establish a minimum 3-foot clearance, create a continuous path of travel, update ramps, add lighting and seating, enhance theme, and add trees or structured shade.
Add landscaping.
Add public seating and improve streetscape (both public and private).
Third Priority
First Ave: Widen sidewalks, fix irregular surfaces, add more seating west of Scottsdale Rd, and add theme and landscaping.
Add amenities.
Upgrade lighting.
Marshall Way/Fifth Avenue Arts Districts
First Priority
Marshall Way: Widen the sidewalks, smooth irregular sidewalk surfaces, lower the curb height, update ramps, enhance signals to include pedestrian countdown signals, and consolidate driveways where possible.
Sidewalk reconstruction (increase sidewalk width; improve sidewalk surface/texture by smoothing surfaces, adding clearance and ramps; modify curb heights).
Redesign the southeast corner of 3rd Ave/Marshall Way to improve accessibility for patrons and pedestrians.
Second Priority
Fifth Ave/Stetson Dr: Widen the sidewalks, smooth irregular sidewalk surfaces, update ramps, improve clearances and doors (doors open outward into pedestrian walking area), and enhance lighting.
Add seating.
Improve lighting and add special lighting for art areas.
Third Priority
Third Ave: Enhance this roadway as a pedestrian corridor by widening the sidewalk, updating ramps, enhancing lighting, and adding landscape character.
Add landscape and amenities.
Repair/replace curbs and building entries where steps intrude into the pedestrian walking area.
Other Suggestions
Sixth Ave: Upgrade this street so it is comparable to other streets in the district (widen the sidewalk, update ramps, enhance lighting, and add landscape character); consider partial or full closure to vehicles at certain times.

TABLE 7-13: Top Three Prioritized Improvements For Downtown Districts
Craftsman Court: Consider partial or full closure to vehicles part or all day.
Arts District: Enhance all features associated with art.
Sixth Ave/Scottsdale Rd: Evaluate need for traffic signal.
Northeast Quadrant
First Priority
Create urban design guidelines for the entire district; add open space areas.
Sidewalk reconstruction (increase sidewalk width; improve sidewalk surface/texture by smoothing surfaces, adding clearance and ramps; modify curb heights).
Complete a plan for the area.
Improve lighting.
Second Priority
This area needs character defining elements (art, landscape, furnishings, seating, etc.). Widen the sidewalks, fix diverse sidewalk textures, and update ramps.
Add shade (trees and structures).
Improve lighting with standard and special fixtures.
Design a streetscape theme for district.
Third Priority
Enhance lighting.
Add amenities (restrooms!).
Improved, more visible street crossings for nighttime safety of pedestrians and drivers are needed.
Add pedestrian countdown timers in this area.

Source: City of Scottsdale *Downtown Pedestrian Mobility Study*, Maricopa Association of Governments and City of Scottsdale, January 2007.

In addition to those concerns listed in Table 7-12, additional specific recommendations for Downtown include:

- Update all roadways in Downtown to meet design standards appropriate for areas ranked as high on the pedestrian route network maps. All roadways in Downtown are ranked as high in Figure 7-4.
- As infill and/or redevelopment occurs, reconfigure Scottsdale Road to accommodate minimum 10-foot sidewalks, landscaping, and parallel parking. Provide two through travel lanes in each direction from Chaparral Road to Earll Drive.
- Reconfigure couplet transitions on Scottsdale Road to accommodate pedestrian and bicycle travel. Possible pedestrian crossing enhancements and bicycle through lanes and crossing movements need to be further evaluated at the Scottsdale/Drinkwater and Scottsdale/Goldwater intersections, and have been explored as part of the Scottsdale Road Streetscape project. This is an area of special study that will continue to be evaluated and addressed as part of the design development of Scottsdale Road improvements.
- Enhance the Camelback/Scottsdale intersection, especially the southeast corner. Provide pedestrian enhancements on the bridge located on the east side of the intersection of Camelback and Scottsdale roads. These enhancements should include minimum 8-foot

sidewalks on both sides of the street and pedestrian enhancements including shade and wayfinding. A mid-block crossing at the south side of the bridge should be evaluated.

- Provide pedestrian activated signals and pedestrian countdown signals throughout Downtown.
- Assess additional mid-block crossings in Downtown, preferably at a maximum distance of one-quarter mile spacing along all major east-west arterials (see Section 8.10 Mid-block Crossings).
- Improve connections and wayfinding to, and through, prominent recreation areas such as the Arizona Canal and the Indian Bend Wash.

9.10 Enhance Pedestrian Facilities in the Scottsdale Airpark to Facilitate Quick, Focused Trips.

- Create pedestrian linkages to connect retail uses at the intersection of Frank Lloyd Wright Boulevard and Scottsdale Road to other substantial retail and employment uses within the Airpark.
- Install appropriately designed, enhanced pedestrian facilities along 73rd Street between Redfield Road and Paradise Lane.
- Add appropriate designed pedestrian facilities to 76th and 78th streets and Paradise Lane.

9.11 Incorporate the Standards in Revised Draft Guidelines for Accessible Public Rights-of-Way in All Alterations and Additions to Existing Facilities.

According to the revised draft guidelines for accessible public rights-of-way:

> Alterations include, but are not limited to, renovation, rehabilitation, reconstruction, historic restoration, resurfacing of circulation paths or vehicular ways, or changes or rearrangement of structural parts or elements of a facility. The U.S. Department of Justice Title II regulation at 28 CFR 35.151(E) requires that curb ramps be installed whenever pedestrian walkways on sidewalks and across streets are newly constructed or altered. A 1993 case, Kinney v. Yerusalim, 9 f.3d 1067 (3d cir. 1993), Cert. Denied, 511 U.S. 1033 (1994), held that resurfacing of a street constitutes an alteration that requires the installation of curb ramps (for text see http://www.Ada.Gov/deldot.Htm). Pavement patching and liquid-applied sealing, lane restriping, and short-term maintenance activities are not alterations.

Any alteration of a roadway or pedestrian facility must meet the requirements listed above.

9.12 Enhance City Web Site Information.

The City's Web site https://www.Scottsdaleaz.Gov/servicerequest/should be enhanced to include additional categories for which a resident may provide input regarding a request for improvement of a given pedestrian design element. One additional major heading should be included for an accessibility improvement or design service request. The sub elements to this heading should include: sidewalk environments, shared-use path environments, crosswalk environments, bus stops, stairways, and street furniture. In addition, elevators and lifts should be included in the maintenance section that is already on the Web site. Additional information should be added to the Web site to explain the accessibility review process that will occur. It may be beneficial to consult other cities' Web sites to get an idea of how other cities are doing this as well.

Always use person first language to reference pedestrians with cognitive, mobility, hearing or vision impairments or disabilities in all publications within the Scottsdale Web site.

Reference to "disabled persons" uses the term "disabled" as an adjective, indicating that the individual is disabled as a person rather than a "person" first that may have a disability or impairment that affects their mobility. Use of the terms "handicapped", "disabled" and "the physically disabled" should be avoided all together. Use of the term "disability" in person first language is acceptable as in "persons with cognitive or physical disabilities". The world health organization has redefined the terminology regarding disability. The term "disabled" defines a person's lack of ability to participate in one or more social functions in a normal manner. Hopefully through good universal design within the City, more people will be able to participate in all community activities. So the term "impairment" is preferred as in "resources for citizens with cognitive, sensory, and physical impairments".

Replace "blind" with "persons with visual impairments."

Replace "deaf" with "persons with hearing impairments."

Replace "developmentally disabled" with "persons with a cognitive impairment or citizens with cognitive disabilities."

8 NORTH AREA CIRCULATION STUDY

8 NORTH AREA CIRCULATION STUDY

1.0 INTRODUCTION

This report, the North Area Circulation Study, documents an analysis of potential transportation improvements to effectively manage traffic circulation and future demand in Scottsdale's predominantly rural, low density northern area. The purpose of this work is to develop and recommend strategic solutions that will maximize safety, travel options, and efficiency, and that will ensure transportation solutions in concert with the environmental sensitivity and aesthetic guidelines of the area. There is a diversity of viewpoints and "visions" for the North Area's transportation future: some residents would like to see speed limits on some streets increased, while others would like to see speed limits decreased. Noise is becoming an increasingly important issue to residents, as is access to Downtown, as well as design aesthetics. Residents of the northern area also recognize that there are trade-offs regarding access and maintaining a rural environment. The recommendations developed in this report are based on analyses that combine community, land use, economic, environmental, and traffic considerations, and will be incorporated into the elements of the Scottsdale *Transportation Master Plan*.

The study area boundary for what is referred to as the North Area is: the City's municipal boundary north of the CAP Canal and the Loop 101 Freeway. Abutting this area is the city of Phoenix to the west; the towns of Cave Creek and Carefree, and the Tonto National Forest to the north; the Maricopa County McDowell Mountain Regional Park, Maricopa County lands, and the Tonto National Forest to the east; and SRPMIC to the south. The study area encompasses approximately 134 square miles, which accounts for approximately 70 percent of the City's entire land area (Figure 8-1). In general, this study area is coordinated with lands that are subject to the ESLO zoning overlay district.

2.0 NORTHERN SCOTTSDALE BACKGROUND

2.1 Scenic and Desert Preservation

The City of Scottsdale annexed much of this area from Maricopa County in the early to mid-980s, with a goal to minimize development and preserve the rural and equestrian character, consistent with the Sonoran Desert. In many respects, this goal has been achieved. For example, Scottsdale Road, north of Happy Valley Road, was designated by Maricopa County in the early 1960s as the Desert Foothills Scenic Drive. Today this 17-mile route runs through four municipalities – Scottsdale, Cave Creek, Carefree, and Phoenix. Residents have created plant identification signs and entry monuments to welcome visitors and residents alike to the "most beautiful desert in the world." This roadway has retained its status as a preeminent scenic corridor for more than four decades, and it is expected that this status will be maintained well into the future. Other scenic roadways will be discussed in more detail later in this report.

The 13,423-acre[1] McDowell Sonoran Preserve (within Scottsdale; 860 acres in Fountain Hills is also protected), deemed a natural preservation area through past City Council action and community support, serves as a natural buffer from development encroachment. An additional 13,000+/- acres of State Trust Land within the Recommended Study Boundary of the McDowell Sonoran Preserve was reclassified as suitable for preservation by the State Land Commissioner

1 As of March 2007; http://www.scottsdaleaz.gov/preserve.asp

FIGURE 8-1: North Area Study Area

in 2001. The total land area desired for the McDowell Sonoran Preserve is 36,400 acres, or approximately one third of the City's entire land area.

2.2 Development Patterns and Planning

The City has grown from south to north, with distinctly different development patterns and characteristics between southern, central, and northern Scottsdale. These differences require transportation improvement responses tailored to the needs of each area.

Northern Scottsdale's land use is predominantly low density, single-family residential, with limited commercial centers. Newer residential development, such as DC Ranch, ranges from three units to the acre to less than one unit per acre, and offers extensive trails and paths within each project. Older subdivisions are predominantly large lot, single family developments. Other development includes metes and bounds lots, usually one acre or larger and often accessed by unpaved roads. Commercial development is predominantly located at arterial intersections, such as the Scottsdale Road/Carefree Highway, Scottsdale Road/Dove Valley Road, Scottsdale Road/Pinnacle Peak Road, and Pima Road/Pinnacle Peak Road intersections.

Key destinations within northern Scottsdale include, but are not limited to the following (Figure 8-2 – reference numbers in parenthesis):

- Shopping opportunities at: El Pedregal, The Summit, Scottsdale and Pinnacle Peak roads, Pima and Pinnacle Peak roads, and Market Street in DC Ranch (identified by red star on map);
- Resort facilities at the Boulders (1), the Four Seasons (3), and Princess (6) resorts ;
- Heard Museum North (2)
- Scottsdale Healthcare Thompson Peak Hospital (4);
- One Scottsdale (planned) (5);
- WestWorld (7);
- McDowell Mountain Ranch Aquatic and Fitness Center and Arabian Library (8);
- Mayo Clinic (9);
- McDowell Sonoran Preserve (10);
- Cave Creek Unified and Scottsdale Unified School District schools (identified by school symbol);
- Parks and trail facilities;
- Golf courses at master planned communities; and access to the McDowell Sonoran Preserve (◆).

Key master planned development areas within northern Scottsdale include McDowell Mountain Ranch, DC Ranch, Troon North, Troon Village, Troon Ridge Estates, Estancia, the Boulders, Terravita, Bellasera,

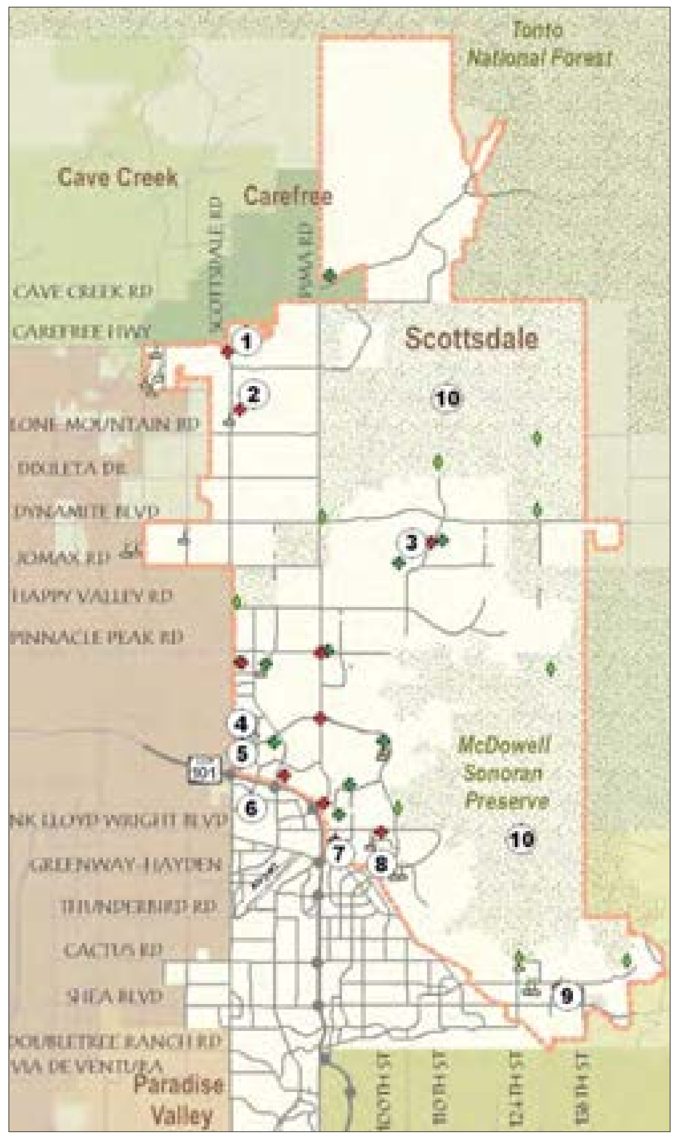


FIGURE 8-2: Key Destinations

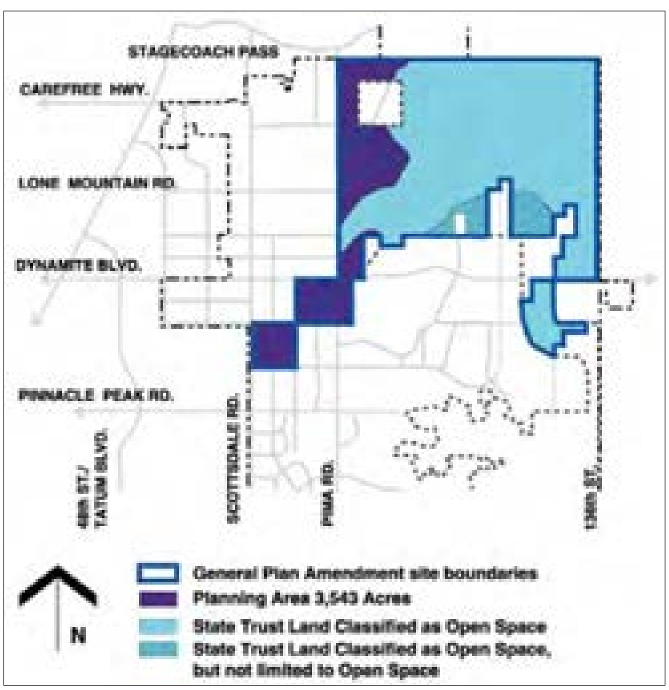
Desert Highlands, Scottsdale Mountain, Winfield, Whisper Rock, Legend Trail, Grayhawk, and Desert Mountain. (Figure 8-3)

2.3 The General Plan and Character Area Plans

Throughout the Scottsdale *General Plan*, an acknowledgement of the diversity of the City is apparent. Different types of land uses, transportation facilities, designated growth areas and activity centers, and character are supported through the goals and policies of the *General Plan*. When looking at the transportation system, the *General Plan* discusses goals of neighborhood mobility in terms of local character and the needs and lifestyle of the area. For example, in much of the North Area the equestrian lifestyle is celebrated and maintained through equestrian facilities, both commercial and residential, and trails for riding. Throughout the *Transportation Master Plan*, context-sensitive design will be encouraged, and its application will be apparent in the North Area.

Character Area Plans were developed following the CityShape 2020 process (1996) which addressed citywide planning issues, development of character areas and neighborhood plans as part of the three-level *General Plan*. Character areas were intended to help guide future development patterns throughout Scottsdale by defining, maintaining, or enhancing a desired "character" for each area. Two of the adopted character areas, Desert Foothills and Dynamite Foothills, are located in the North Area (Figure 8-4).

The Scottsdale City Council adopted the Desert Foothills Character Area Plan in July 1999, and the Dynamite Foothills Character Area Plan in March 2000. Both of the Character Area Plans contain guidelines regarding the design of public roadways (scenic corridors, collector streets, and local streets), shared-use trails and paths, and public school roadways. The implementation of the Desert Foothills Character Area Plan included the establishment of a zoning overlay district that was applied to the Desert Foothills area in March 2003.



General Plan Amendment, October 2002

2.3.1 General Plan Amendment, October 2002

In October 2002, the City Council approved a major *General Plan* amendment for approximately 16,600 acres of State Trust Lands within the Recommended Study Boundary of the McDowell Sonoran Preserve. The project area included State Trust Lands that were the subject of the City's Arizona Preserve Initiative application in 1998 and the State Land Commissioner's decision regarding that application in 2001. The 16,600 acres are located generally between Scottsdale Road on the west, 136th Street on the east, Stagecoach Pass on the north, and Happy Valley Road on the south (see map to the left). In 2001, the State Land Commissioner responded to the City's application by reclassifying 13,021 of the approximately 16,600 acres (in light blue on map) as land "suitable for conservation purposes," and identified the remaining 3,543 acres (in purple on the map) as State Trust Land that can potentially be developed. Through the *General Plan* amendment, a little over 6,200 dwelling

FIGURE 8-3: Master Planned Developments in Northern Scottsdale

FIGURE 8-4: Adopted Character Area Plans

units were approved for the planning area that could be developed. The previous *General Plan* would have allowed approximately 7,850 dwelling units. Exact zoning and dwelling unit count will be determined through any future rezoning and was beyond the scope of this *General Plan* amendment. Through this *General Plan* amendment, Lone Mountain Parkway through the McDowell Sonoran Preserve (from Pima northeast to Stagecoach Pass) was removed from *General Plan* base maps, indicating the Council's desire to remove roads from the McDowell Sonoran Preserve other than those roads designated for McDowell Sonoran Preserve access.

2.3.2 Desert Foothills Character Area Plan (1999) Summary

The Desert Foothills character area is approximately 8 square miles, generally located between Dixileta Drive to the north, Jomax Road to the south, the City's western boundary, and 96th Street to the east. Goals for this area are:

1. Preserve the natural, visual qualities of the lush upper Sonoran Desert by using desert-sensitive building techniques that retain and blend with the natural desert character of the area.

2. Promote connected areas of desert open space and trails through visual and functional linkages within and between local neighborhoods and a regional open space network.

3. Identify and celebrate the rural desert character experienced in the Desert Foothills study area that will result in or maintain a unique desert community distinguished from other parts of Scottsdale and the metropolitan area.

During the process of creating the Desert Foothills Character Area Plan, residents, property owners, and local interests consistently stated their desire to maintain the rustic, rural qualities in the area while preserving the dominance of the lush upper Sonoran Desert. The residents and property owners stated they must be the "caretakers" of this desert to ensure that it can be enjoyed by future generations.

The Design Guidelines and the Foothills Overlay (discussed in the following Section 2.4.2 Foothills Overlay) illustrate building alternatives in the Desert Foothills area that preserve the dominance of the natural desert setting and maintain a low scale, openness to the neighborhoods.

2.3.3 Dynamite Foothills Character Area Plan (2000) Summary

The Dynamite Foothills area is located in northeast Scottsdale between the McDowell Mountains and the Lone Mountain Road alignment, and east of 112th Street to the City boundary primarily at 136th Street. The area contains desert vistas, broad open spaces, and an attractive desert environment. It remains primarily undeveloped. A portion of the area is included in the Recommended Study Boundary of the McDowell Sonoran Preserve. Because of the Dynamite Foothills' remote location, its isolation from urban centers of the Valley, and its environmental features and constraints, the vision for this area is that of a rural desert character. Key to maintaining and achieving this vision is the element of openness, through undisturbed desert, minimal impact of development, open view corridors, low buildings heights, and maintaining natural desert vegetation. Guidelines for the Dynamite Foothills focus on these elements of openness. Goals for the Dynamite Foothills character area are:

1. Preserve the existing rural desert character for the Dynamite Foothills which will result in a unique desert community distinguished from other parts of Scottsdale and the valley.

2. Recognize the topographic diversity of the Dynamite Foothills area and provide guidelines for balancing the relationship of different types of development to the unique environmental nature of the area.

3. Promote open space in accordance with the CityShape 2020 Guiding Principles and the recommendations of the Desert Preservation Task Force, and support the efforts of the McDowell Sonoran Preserve Commission to provide open space.

The Design Guidelines for the Dynamite Foothills Character Area illustrate building alternatives that preserve the natural desert setting and a feeling of openness.

2.3.4 Local Area Master Plans – Local Area Infrastructure Plans

In addition to the Character Area Plans developed for sections of the North Area, local area infrastructure plans have been drafted for some areas of the City outside of master planned communities. The purpose of these plans is to guide local decisions for infrastructure improvement (streets, water, trails, etc.) and related development, and to help coordinate the efforts of various City departments (Transportation, Water Resources, Emergency Services, Preservation, Planning) in providing these necessary services. These plans have not been approved or adopted by an official body, but serve as guides for City staff when reviewing development proposals.

A set of goals were developed for local area infrastructure plans to help guide the need and location of planned service infrastructure and are based on the City of Scottsdale *General Plan* and the City Council's goals:

- Coordinate infrastructure (streets, water, trails, etc.) so that they are not planned independently of one another.
- Create a neighborhood design that establishes a balance between accessibility and access control and builds only the streets that are needed to serve each parcel.
- Coordinate the location of utilities and public access improvements to reduce long-term costs and minimize disruptions to neighborhoods.
- Provide predictability for City budgeting and maintenance programs.
- Provide consistency in decision making across the City while also allowing for the ability to make informed site decisions that would alter the plans.
- Increase public awareness about what may happen in their neighborhood regarding infrastructure.
- Provide property owners with consistent information regarding planned service infrastructure as it relates to their property.

Additionally, specific goals and objectives were created for each infrastructure area including transportation, trails, water resources, and environmental. The transportation goals and objectives are:

Transportation local area infrastructure goals:

- Provide a safe and efficient transportation system;
- Maintain and improve traffic flow on the major street network;
- Protect neighborhoods from unwanted through traffic;
- Maintain existing/utilized street layout whenever possible; and
- Minimize the cost of the infrastructure/street improvements.

Transportation Objectives and Policies

a) Provide at a minimum, one City-maintained access to each lot that meets City emergency access standards. (Goal A, C, D).

b) Reduce the number of access points along the arterial street system to improve safety and increase capacity. (Goal A, B).

c) Promote a local circulation system that creates connections from local streets to collector streets that have controlled access to the arterials. (Goal A, B, C).

d) Limit direct residential access to arterial and collector streets to reduce the negative effects of through traffic to the residents. (Goal A, B, C).

e) Provide short residential streets that do not provide convenient cut through routes for through traffic. (Goal A, C)

f) Use the existing roads, ROW, and Government Land Office patent easements locations, as well as minimize new roads wherever feasible. (Goal D, E)

g) Coordinate streets with existing and planned infrastructure such as water lines, sewer lines, utility lines and trails. (Goal D, E)

h) Avoid street crossings of large washes. (Goal A, D, E)

i) Provide the minimum amount of disturbance to the natural desert and the neighborhood. (Goal B, C, D)

j) In the event of changes to local area infrastructure plan maps or when requests for ROW abandonment occur, the City should maintain existing dedicated street ROW unless alternative street easements have been secured to maintain local circulation needs. (Goal A,D,E)

The general goals and specific transportation goals are also included in the Policy Element of the *Transportation Master Plan* and the goals and policies of the local area infrastructure plans will be adopted as part of the *Transportation Master Plan*. The maps displaying recommended infrastructure will be appended to the Streets Element of the *Transportation Master Plan* and adopted by reference. Significant public outreach will be required prior to finalizing the maps, which will be revised when/if conditions change.

2.4 City Zoning Ordinances and Development Regulations

In the developed portions of northern Scottsdale, the City zoning ordinances and development regulations, such as the ESLO, are more stringent than the ordinances and regulations from when this area was the jurisdiction of Maricopa County. These requirements have resulted in minimal commercial development and primarily large acreage residential property. It is likely that this land would have developed with a greater intensity had the land remained within the jurisdiction of Maricopa County which had an overall zoning category of one dwelling unit per acre. Soon after annexation, the City rezoned a large area of the newly annexed lands to 2-, 3-, and 5-acre lot zoning districts. One of the contrasts in this portion of Scottsdale occurs along Scottsdale Road. Generally, west of Scottsdale Road is the jurisdiction of the city of Phoenix and east of Scottsdale Road is the jurisdiction of the City of Scottsdale. The Phoenix side of

Scottsdale Road is planned to develop greater intensity than the Scottsdale side (development to date in Phoenix is outside of the North Area).

2.4.1 Environmentally Sensitive Lands Ordinance (ESLO)

The ESLO is a set of zoning regulations adopted by the City Council in 1991 (amended in 2001, 2003, and 2004) to guide development throughout the 134 square miles of desert and mountain areas of Scottsdale. These areas are located north and east of the CAP Canal. The intent and purpose of the ESLO is to identify and protect ESL in the City and to promote public health and safety by controlling development on these lands. The ordinance requires that a percentage of each property be permanently preserved as NAOS and that specific environmental features, including vegetation, washes, mountain ridges and peaks, are protected from inappropriate development.

2.4.2 Foothills Overlay (F-O)

The Foothills Overlay (F-O) zoning district provides a means to recognize and preserve the rural desert character in the low density unsubdivided and undeveloped lands of the Desert Foothills area (generally between Dixileta Drive to the north, Jomax Road to the south, 56th Street to the west, and 96th Street to the east). The F-O overlay defines additional standards over and above the base zoning that help to result in minimum visual impact of development and furthers the purposes of the ESLO as it relates to preservation of the desert and blending the built form into the desert environment.

2.5 Population

Although northern Scottsdale's population is projected to increase 150 percent from approximately 45,500 people in 2000 to 113,000 people in 2030, and increased densities are anticipated from .51 persons per developed residential acre in 2000 to a projected 1.27 persons per developed residential acre in 2030, the northern area will still be Scottsdale's least populated area, consisting of smaller households than other sections of the City (Figure 8-5). According to the 2000 Federal Decennial Census, approximately 22 percent of the City's total population, 19 percent of total households, and 12 percent of the City's employment were in the North Area. The community demographics, coupled with the low-density land use patterns imply an area that is less likely to be transit-dependent. Detailed discussion on demographics is contained in the *Transportation Master Plan* Existing Conditions Report.

2.6 Scenic Roadway Designations

Throughout the northern area of Scottsdale, roadways have been designated scenic roadways through the *General Plan* since 1976, and have been further defined through Scenic Corridor Design Guidelines adopted by the Development Review Board in 2003. The *General Plan* Open Space and Recreation Element map designates Scenic Corridors and Buffered Roadways.

Existing Scenic Corridors are:

- Scottsdale Road (north of the CAP Canal)
- Pima Road (north of the Loop 101 Freeway)
- Dynamite Boulevard
- Shea Boulevard
- Carefree Highway
- Cave Creek Road

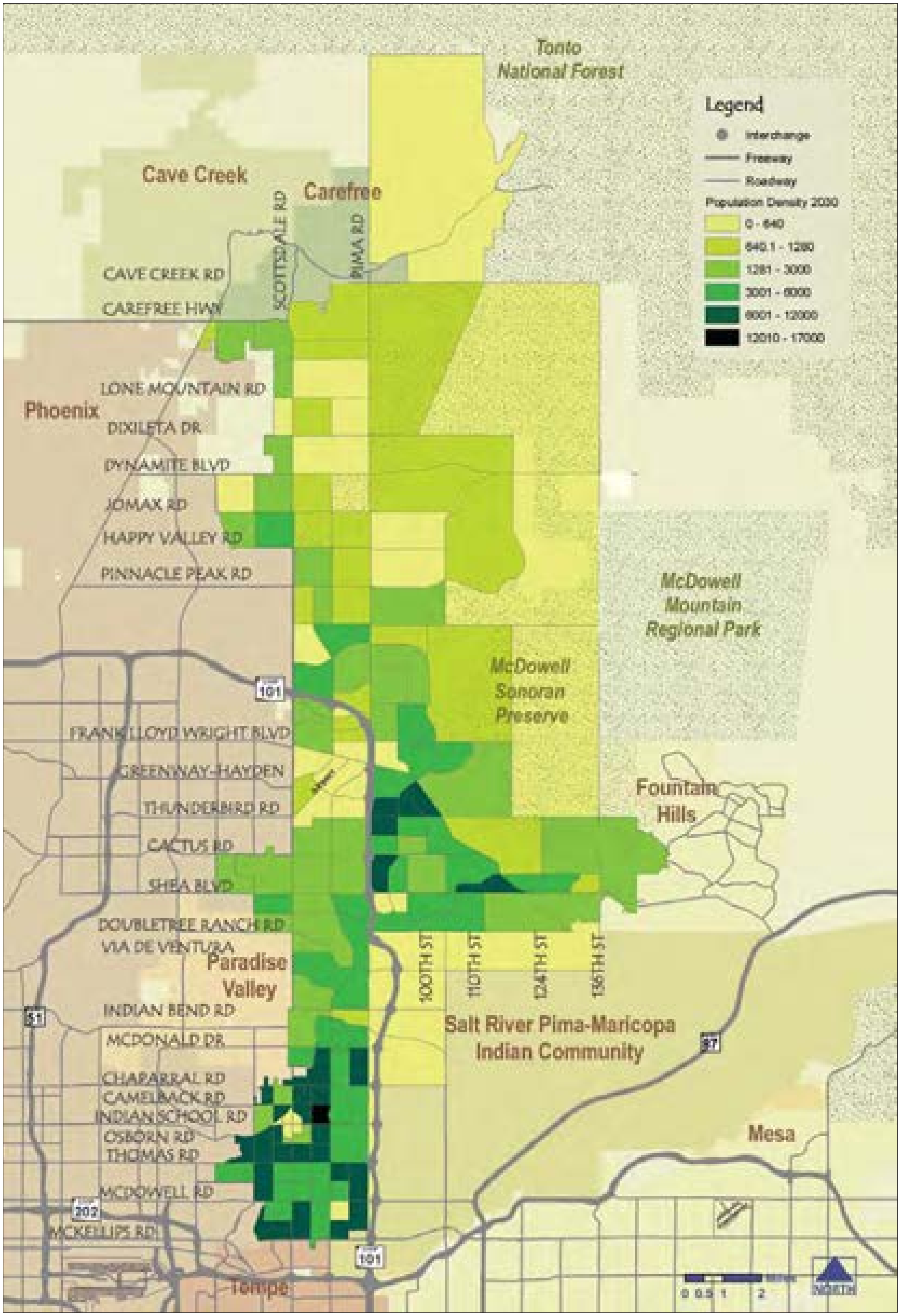


FIGURE 8-5: 2030 Projected Citywide Population

Existing Buffered Roadways include:

- Via Linda
- Frank Lloyd Wright Boulevard
- Hayden Road through the Airpark
- Thompson Peak Parkway
- Happy Valley Road
- Lone Mountain Road
- Desert Mountain Parkway
- Bell Road

The designation of Scottsdale's scenic roadways (Scenic Corridors and Buffered Roadways) is established as a hierarchy. Scenic Corridors are the largest roadways, with regional connectivity for both traffic and trails. The scenic setbacks of Scenic Corridors are also the largest, at 100 feet. Buffered Roadways are also major roadways, but smaller in scale (usually minor arterials or major collectors), with citywide rather than regional traffic and trails. The setbacks of Buffered Roadways are usually 40 to 50 feet. Buffered Roadways do not currently have specific design guidelines like the Scenic Corridor Design Guidelines.

Throughout 2002-2003, Scenic Corridor Design Guidelines were developed and taken through a public process and hearing with the Development Review Board for adoption. These guidelines clearly identify the setbacks (100 feet with some exceptions) and design elements for Scenic Corridors. The setback is measured from the back of planned ultimate ROW with some exceptions. Development within the setback is limited to revegetation, non-vehicular travel ways (e.g., shared-use paths, walks, and trails with a meandering alignment), regional drainage structures, limited cross-access, and limited signs (as allowed by the sign ordinance). The scenic setback may be used as NAOS and counted as required open space. No walls should be located within the scenic setback; walls abutting Scenic Corridors should be low, meandering, and unobtrusive to enhance the visual open space aesthetic. The guidelines were adopted by the Development Review Board in February 2003.

In October 2004, the City Council adopted a *General Plan* amendment to add Bell Road to the Buffered Roadway designation and add a third level of scenic roadway designation called "Desert Scenic Roadway." Desert Scenic Roadways apply to the one-mile and half-mile roads within the City's ESLO district (similar in area to the North Area) that are not already designated as a Scenic Corridor or Buffered Roadway. The setbacks of these roadways vary based on the topography and specific site conditions and rely on the placement of required NAOS and zoning setbacks to achieve the open space corridor along the roads. The City Council also adopted the application of a 100-foot scenic buffer along streets within and adjacent to the Recommended Study Boundary of the McDowell Sonoran Preserve on undeveloped (as of October 4, 2005) properties of 25 acres or larger.

These scenic roadways have an influence on northern area roadways and provision of non-motorized transportation facilities due to the larger setbacks and design considerations that acknowledge the unique topography and natural features of the desert character northern area.

2.7 The Great Sonoran Desert Design Concepts

In October 1996, a group of citizens presented to the City a set of principles and guidelines for planning, landscaping, architectural design, and lighting called The Great Sonoran. These desert design concepts were proposed to achieve minimum visual impact of the built environment on the natural desert setting. The City worked to incorporate these ideas into existing efforts to enhance and elevate desert and mountain preservation, such as the ESLO and the Foothills Overlay.

3.0 EXISTING AND FUTURE CONDITIONS

3.1 Streets and Circulation

The City of Scottsdale currently classifies roadways as major or minor arterials, major or minor collectors, and local streets (collector, residential, and commercial/industrial). This system does not identify roadways more specifically than these general classifications. The *Streets Master Plan* Street Classification Map, adopted in 2003, shows the roadways that are classified major or minor collectors, major or minor arterials, and freeways. The DS&PM identifies sub-classifications of rural, suburban, and urban, but does not indicate the location of these sub-classifications. The following discussion will focus on the general classifications of arterial and collector streets in the North Area of Scottsdale, the characteristics of which are outlined in Table 8-1.

TABLE 8-1: Functional Classification Characteristics

Existing Typical Section				
Street Type	Right-of-Way	Lanes	Bike Lane	Sidewalk (Trail optional in Rural/ESL character)
Major Arterial	150′	6	Yes	Yes
Minor Arterial	110′	4	Yes	Yes
Major Collector	Varies	4	Yes	Yes
Minor Collector	Varies	2	Yes	Yes
Minor Collector with Rural/ESL with Trails	Varies	2	Yes	Optional

Major Arterials

- Serve regional needs
- Travel through and beyond the City borders
- Provide continuous links between Scottsdale and its neighbors
- Serve larger traffic volumes (35,000- 50,000 ADT)
- Limit access to abutting land uses

Minor Arterials and Major Collectors

- Serve citywide needs
- Efficiently move people within the community
- Provide connectivity between regional and citywide streets
- Serve medium traffic volumes (5,000—35,000 ADT)
- Balance emphasis on access to abutting land uses and mobility

Minor Collectors

- Serve citywide and local/neighborhood needs
- Efficiently move people within the community
- Provide connectivity between citywide and local streets
- Balance emphasis on access to abutting land uses and mobility

The DS&PM includes cross sections for each of the sub-classifications of urban, suburban, and rural for each of classifications, with these three sub-classifications defined as follows:

- Urban Areas: downtown, commercial, and industrial
- Suburban Areas: land uses have been generally designed as auto-oriented and distinct from different land uses
- Rural Areas: lower density/intensity areas of the community

The appropriate sub-classification is currently left up to the development review process.

One of the biggest transportation challenges in the North Area is to "right-size" the roadway network. This is a challenge in other parts of Scottsdale too; but in northern Scottsdale it means making sure major streets, especially Pima and Scottsdale roads and Dynamite Boulevard, carry a functional classification that matches future travel demand. Nearly all of the roadway system north of the Loop 101 Freeway to Pinnacle Peak Road is planned to be improved by 2010. Therefore, what happens to the major north/south streets, north of Pinnacle Peak, is a main focus of the North Area Circulation Study. Long-term projections for land use and travel demand in northern Scottsdale have been updated since the current functional classifications were assigned in the 2003 *Streets Master Plan*. Therefore a review of the classifications for road segments north of Pinnacle Peak needs to be made. This review will rely to a great degree on the 2030 traffic volume forecasts produced by Scottsdale's recently developed travel demand model.

The two major north/south roadways in northern Scottsdale are Scottsdale Road and Pima Road. Both Scottsdale and Pima roads north of Loop 101 were constructed prior to the area's annexation by the City of Scottsdale in the mid-1980s. Both roads, initially constructed with one lane in each direction, were widened to two lanes per direction in the late 1980s and early 1990s (except for the portion of Pima Road north of Dynamite Boulevard). Today Scottsdale Road is a four-lane undivided roadway from the Loop 101 to Deer Valley Road. From Deer Valley to Dixileta Drive a two-way left-turn lane is added; and from Ashler Hills Drive to Carefree Highway it is divided by a landscaped median. Pima Road was realigned and widened to six lanes from the Loop 101 to south of Deer Valley Road in the winter of 2007. It is a four lane road, with a two-way left turn lane in some places, from Pinnacle Peak Road to Dynamite Boulevard; north of Dynamite it is still a two-lane road.

At one time Thompson Peak Parkway and Alma School Parkway were considered possible north/south alternatives to Scottsdale and Pima roads. Thompson Peak's curvilinear alignment was developed as an adaptation to local development patterns and to local topography, specifically the McDowell Sonoran Preserve. This roadway alignment serves the residents of DC Ranch, Windgate Ranch, and McDowell Mountain Ranch well, but it does not work as a through route that could reduce the traffic demand on Scottsdale and Pima roads. Alma School Parkway runs parallel to Pima Road from Happy Valley Road to Dynamite Boulevard. Just like Thompson Peak it serves local developments but cannot work as a through route because of Preserve land on both the north and south. Before the McDowell Sonoran Preserve was established Thompson Peak Parkway and Alma School Parkway might have been connected to provide a north/south connection to the east of Pima Road from Shea Boulevard to Dynamite Boulevard. However, such an alignment would have required construction through the foothills of the McDowell Mountains, which is a scenario the City has historically rejected in favor of preservation.

During a 2002 *General Plan* amendment process for the approximately 16,600 acres of State Trust Lands, *General Plan* base maps were revised to remove the Lone Mountain Road extension east of Pima Road. The entire 16,600 +/- acres of this amendment is included within the City's Recommended Study Boundary of the McDowell Sonoran Preserve, which identifies lands the City intends to acquire for permanent open space in the McDowell Sonoran Preserve. The removal of this roadway through the McDowell Sonoran Preserve area was not a *General Plan* Community Mobility Element amendment; however, it was removed from all *General Plan* base maps with the approval of the amendment. Community desire to restrict or prohibit roadways through or abutting the McDowell Sonoran Preserve is an additional consideration for streets in the northern area.

The overall traffic patterns in the North Area are firmly established: traffic flows south toward the Loop 101 during the morning peak and flows north, away from the freeway, in the afternoon. There are localized exceptions to this pattern, mostly around school sites and commercial locations; and the regional east-west streets (Dynamite Boulevard/Rio Verde Drive, Pinnacle Peak Road and Carefree Highway) carry traffic across to Phoenix and unincorporated Maricopa County. But for the most part, on a typical weekday, drivers use local streets to get to east-west collectors and minor arterials (Thompson Peak Parkway, Happy Valley Road, Jomax Road, Dixileta Drive, etc.) that connect them to the major north/south roads (Scottsdale Road, Pima Road and to a lesser extent Hayden Road), to access the freeway.

This general flow of traffic helps explain the high traffic counts on road segments as they approach the Loop 101 corridor and it also helps determine the order in which roadway improvements are done in the North Area, where roadway segments close to the freeway are improved first. For example, Thompson Peak Parkway, Bell Road to Union Hills Drive, was completed in fall 2006; the realigned Pima Road from the freeway to south of Deer Valley was widened to six lanes in early 2007; and Scottsdale Road north of the freeway will be widened to six lanes by summer 2008. Planned improvements on segments farther from the freeway, on the other hand, are not scheduled until 2010 or later. A listing of currently planned projects follows in Section 4.0 Planned Improvements.

3.1.1 Future Roadway and Land Use Conditions

Most of the developable land in the North Area, both residential and commercial, is already built out or will be in the foreseeable future – 10 to 20 years. Large mixed-use developments like One Scottsdale will be located on State Trust lands along the north side of the Loop 101 from Scottsdale Road to Bell Road. Relatively small retail and office developments will occur at a limited number of locations. Any new master planned communities are likely to be smaller than existing ones and the metes and bounds areas, such Desert Foothills and Whisper Rock, have limited potential for increased density, but will likely build low-density residential.

3.1.2 Existing and Forecast Traffic Volumes

In the spring and summer of 2007, the City of Scottsdale developed a stand-alone sub-regional travel demand model. The model was programmed with a base year (baseline) of 2006 and a forecast year of 2030; the model used the latest socioeconomic projections from MAG to estimate growth in population and employment. Those socioeconomic projections included the most up-to-date estimates on the Desert Ridge areas in the city of Phoenix and the employment growth planned for the SRPMIC. In order to reflect voter and Council approved policies, the model assumed that no development will take place within the Recommended Study Boundary of the McDowell Sonoran Preserve.

Table 8-2 lists current and projected traffic volumes for some of the major roadways in the North Area. A complete listing of all street segments can be found in Appendix 4-A.

TABLE 8-2: Existing and Future Traffic Forecasts on Selected Streets in the North Area

	Location			
Street Name	From	To	2006 daily trips (as modeled)	2030 projections
Scottsdale Rd	Loop 101	Thompson Peak Pkwy	48,400	62,200
	Thompson Peak Pkwy	Deer Valley Rd	32,000	58,600
	Deer Valley Rd	Pinnacle Peak Rd	28,800	51,400
	Pinnacle Peak Rd	Happy Valley Rd	29,700	43,500
	Happy Valley Rd	Jomax Rd	29,000	43,300
	Jomax Rd	Dynamite Blvd	26,000	43,200
	Dynamite Blvd	Dixileta Dr	25,200	39,400
	Dixileta Dr	Lone Mountain Rd	24,100	34,200
	Lone Mountain Rd	Carefree Hwy	22,400	26,900
Pima Rd	Princess Dr	Thompson Peak Pkwy	34,900	45,800
	Thompson Peak Pkwy	Pinnacle Peak Rd	39,700	60,500
	Pinnacle Peak Rd	Happy Valley Rd	33,600	55,900
	Happy Valley Rd	Jomax Rd	18,800	30,700
	Jomax Rd	Dynamite Blvd	18,500	31,900
	Dynamite Blvd	Lone Mountain Rd	13,200	26,200
	Lone Mountain Rd	Stagecoach Pass	10,300	19,400
Dynamite Blvd	56th St	64th St	8,400	24,500
	64th St	Scottsdale Rd	8,700	25,300
	Scottsdale Rd	Pima Rd	7,800	20,300
	Pima Rd	Alma School Rd	13,300	30,300
	Alma School Rd	136th St	7,100	26,,200

TABLE 8-2: Existing and Future Traffic Forecasts on Selected Streets in the North Area

Street Name	Location From	Location To	2006 daily trips (as modeled)	2030 projections
Pinnacle Peak Rd	Scottsdale Rd	Pima Rd	12,500	21,500
	Pima Rd	East of Pima Rd	9,000	9,900
Carefree Hwy	56th St	Scottsdale Rd	13,000	26,2900
Shea Blvd	110th St	120th St	39,600	51,800
	120th St	City limits	38,800	50,600

3.2 Equestrian and Shared-use Trails and Paths

Equestrian and shared-use trails contribute to the overall quality and character of life in Scottsdale and provide avenues of appreciation of Scottsdale's natural and cultural resources. Equestrian activity is enjoyed by many residents in the northern area. There are a variety of equestrian facilities, both at residential and commercial scales. Functional connections exist and are desired to be maintained through shared-use trails that provide access to a multitude of non-motorized user groups. These links informally connect local neighborhoods to a regional shared-use trail system and other destinations such as the McDowell Sonoran Preserve.

The City adopted a *Trails Master Plan* in February 2004 which outlines the development and prioritization of a citywide trails network. An inventory of existing and planned trails was mapped to help identify gaps in the trails system and to identify projects and expenditures that maximize the function of the overall system. The trails were analyzed and ranked using different attributes such as use/demand, linkages, safety, etc. Following the assessment of trails, and using public input and firsthand knowledge of the trails, the final trail system plan was produced (see Figure 8-6).

Equestrian connections within the City of Scottsdale, (except for roadway crossings) are off-street, in many instances they are provided adjacent to the street and within the public ROW or scenic corridor. While these off-street trails are not specifically designated for equestrian use only, all unpaved trails in the City's *Trails Master Plan* are designed to accommodate equestrian uses. The McDowell Sonoran Preserve provides extensive opportunities for riding as do several designated trails throughout the City.

As part of the *Trails Master Plan*, focus groups identified key areas of interest. These include requests for trail crossings of Dynamite, Pima and Scottsdale roads, comments that equestrian access is lost when roads are paved and no unpaved path is provided in its place, and an interest in using trails without having to cross major streets at grade. To address some of these concerns, the *Trails Master Plan* recommends equestrian signals and grade-separated crossings throughout the North Area. Through the *Transportation Master Plan* review of the *Trails Master Plan*, it is recommended that equestrian push buttons at existing traffic signals be installed where feasible.

Also relevant to the North Area are key trail corridors identified in the *Trails Master Plan*. These key corridors are important as they may ultimately affect the roadway cross sections designed

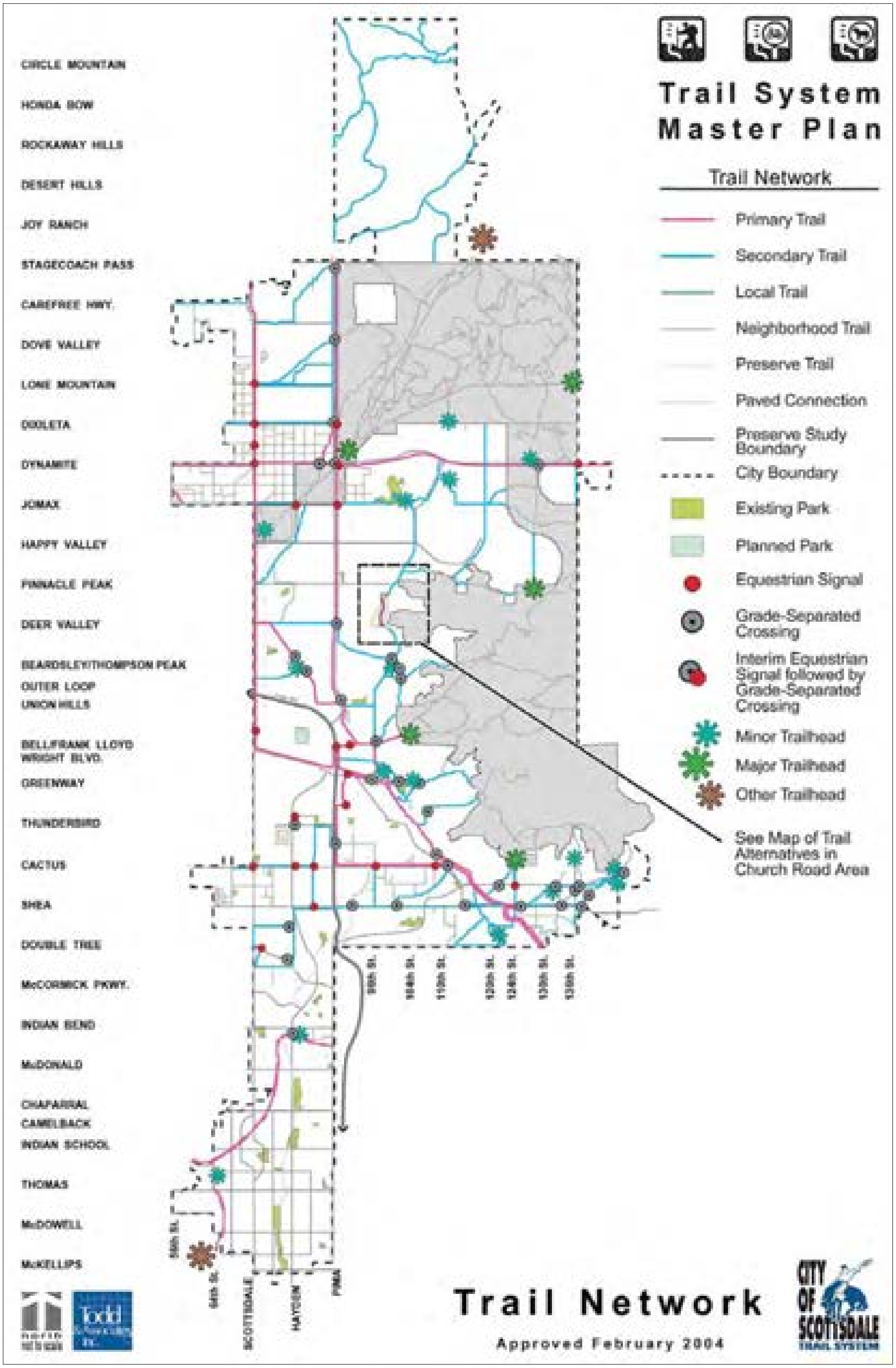


FIGURE 8-6: Trail System, Trail Network

for the North Area. Dynamite Boulevard, Jomax, Scottsdale and Pima roads throughout the North Area are identified as those transportation corridors that also have the highest suitability for trails (Figure 8-7). Other roadways, including Cave Creek, Pinnacle Peak, Deer Valley and Happy Valley roads, are identified as corridors that are moderately suited for trails.

Since the adoption of the *Trails Master Plan*, the City has been tracking the progress of trail development. Figure 8-8 shows the improvement status of trails in the area north of Happy Valley Road. The blue lines indicate existing trails, the orange lines indicate those trails that are soon to be improved, and the yellow lines indicate unimproved trails.

As new communities are constructed, equestrian and other non-motorized trails are often provided as part of master development plans. Once constructed, these additional trails will enhance connectivity between the City's McDowell Sonoran Preserve and equestrian communities.

City-operated equestrian facilities are currently available at:

- Mescal Park, at 11015 N. 68th Place, 1/4 mile north of 68th Place and Shea Boulevard; is a 10-acre park with an equestrian arena. There is also a trail for hikers and horseback riders. This facility is located outside of the North Area.
- Stonegate Park. 9555 N. 120th Street, southeast of Mountain View Road and 120th Street; a 23-acre facility with two equestrian arenas and a round pen area.

Stonegate Park Corral

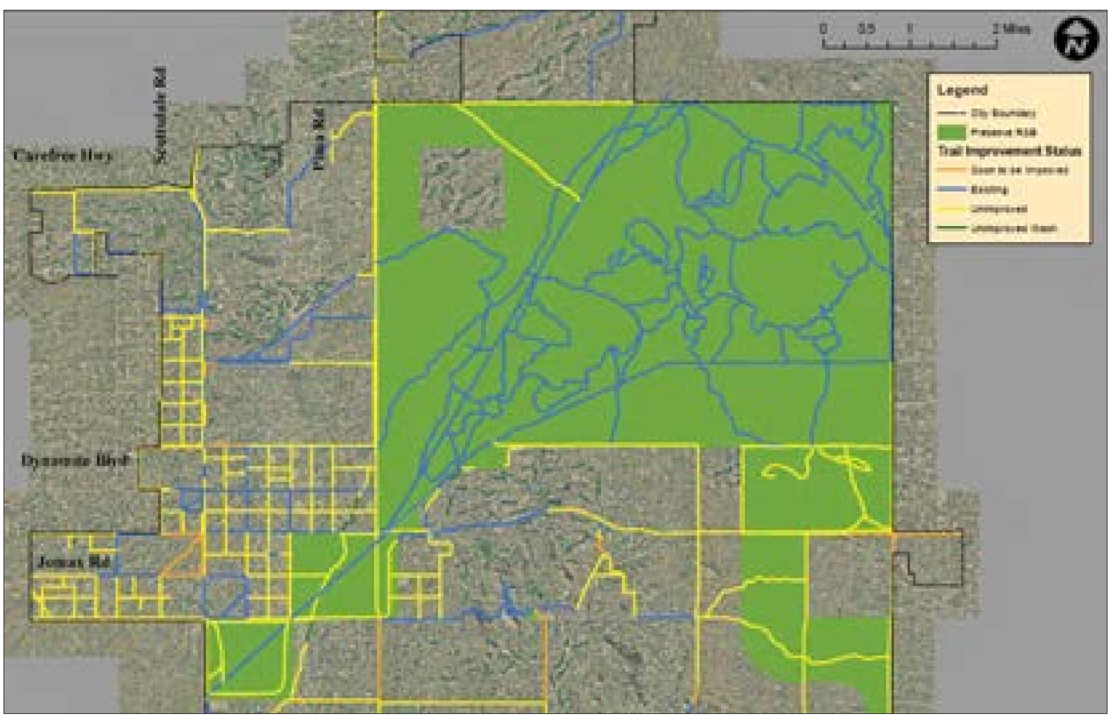


FIGURE 8-8: Trail System, Trail Improvement

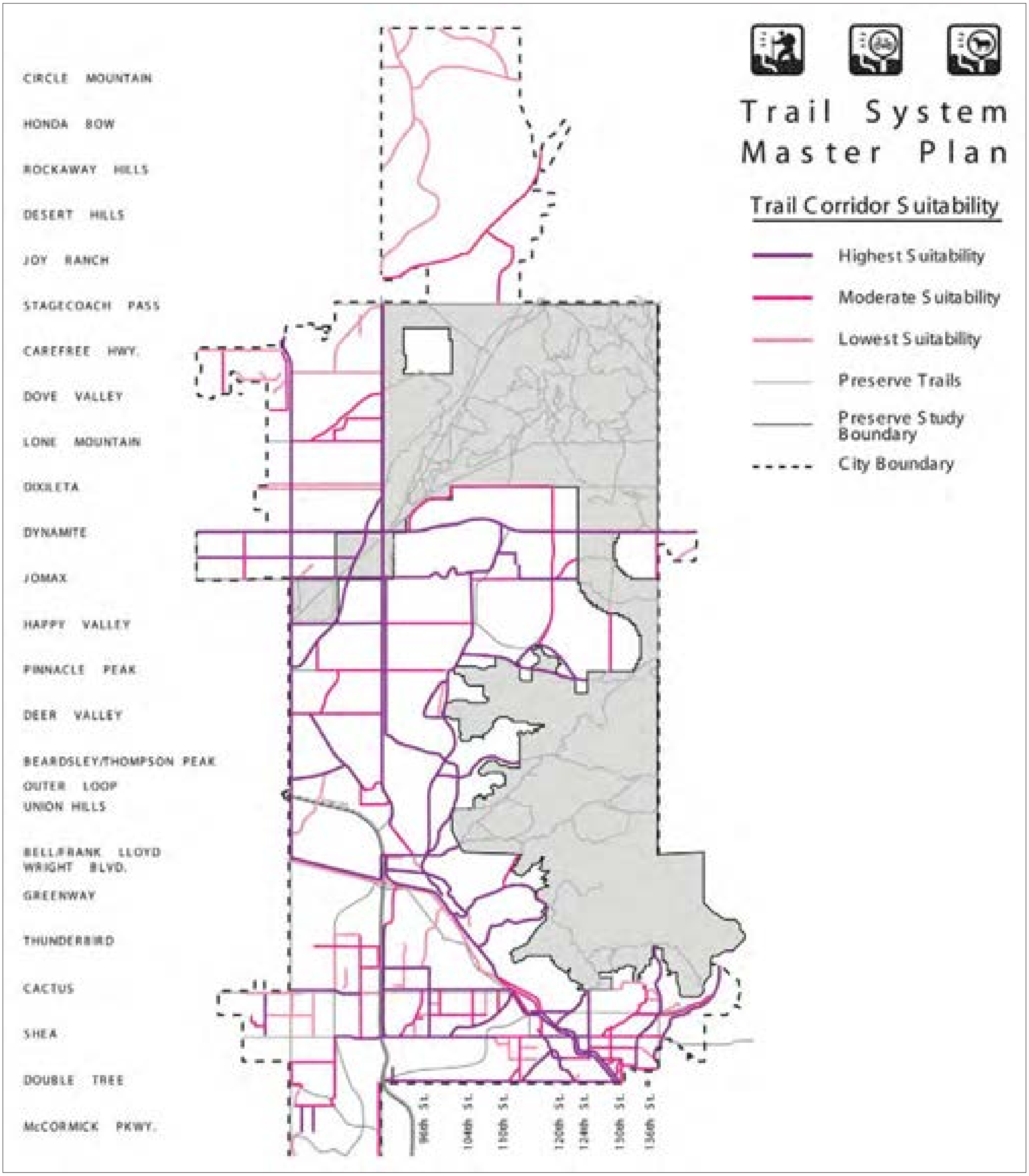


FIGURE 8-7: Trail Corridor Suitability

In addition to these facilities, City park-related trailheads and/or trails can be found at:

- Pinnacle Peak Park at 26802 N. 102nd Way (one mile south of Dynamite and Alma School);
- Rio Montana Park at 11180 N. 132nd Street (southwest of Via Linda and 130th Street) (trailhead to wash only);

and are planned for:

- DC Ranch Community Park;
- DC Ranch Neighborhood Park; and
- Troon North Park.

3.3 Access to the McDowell Sonoran Preserve

Designated points of entry into the McDowell Sonoran Preserve are discussed in the City's Preserve Access Area Design and Site Standards manual. The future access areas will make it possible for Scottsdale residents and visitors to experience the McDowell Sonoran Preserve through hiking, horseback riding, biking, nature studies, bird watching, scenic viewing, picnicking, rock climbing and more. Access areas of differing size and level of amenities are located at strategic and appropriate points in the McDowell Sonoran Preserve (on the periphery) for users' convenience.

Currently, two access areas are open for public use:

- Sunrise Trailhead is located at 144th Street and Via Linda. There is an upper parking lot and a lower parking lot.
- Lost Dog Wash Access Area was the first major access area to be created. It is located north of Via Linda off of 124th Street. Lost Dog Wash contains a full compliment of amenities for users.

There are also additional parking areas outside of but near the McDowell Sonoran Preserve that connect by way of trails to the McDowell Sonoran Preserve trail system. A number of access areas are also planned on State Trust Land that the City has not yet acquired. Access to State Trust Land is restricted to individuals with permits.

3.4 Pedestrian

North of Frank Lloyd Wright Boulevard and the CAP Canal, the pedestrian environment along Scottsdale Road, Pima Road, and Hayden Road becomes more "recreation-oriented" or informal, with meandering, unpaved paths instead of paved sidewalks, set back from the roadway within desert landscaped setbacks adjacent to developed areas, and no sidewalk within undeveloped areas.

Actual pedestrian counts within the North Area are not available. However, anecdotal reports from residents indicate that as the area has developed with more projects that include design elements such as extensive setbacks and landscaping that convey a rural flavor, the potential for meaningful pedestrian activity has increased.

For the *Transportation Master Plan,* a pedestrian latent demand study was conducted along arterial streets in Scottsdale (Figure 8-9). The study shows areas where high concentrations of uses could potentially generate high levels of pedestrian activity, given an appropriate

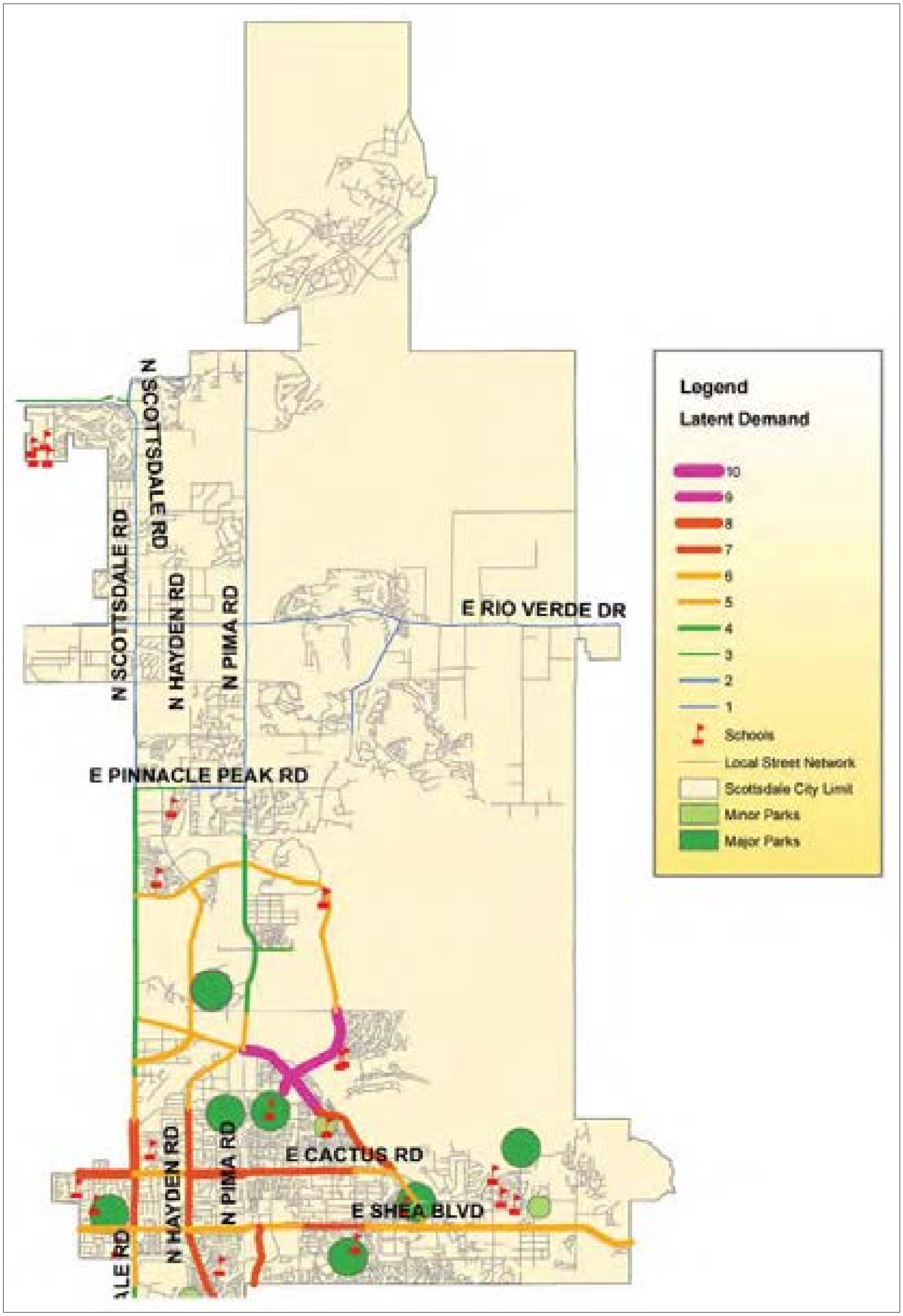


FIGURE 8-9: Pedestrian Latent Demand in Northern Scottsdale

walking environment. The latent demand study indicates that for the North Area the areas along Scottsdale Road, and Thompson Peak Parkway south of Bell Road offer some of the most significant opportunities, on par with areas in Downtown, to encourage pedestrian activity within the City. These areas are the focus of intense commercial and denser residential development.

Areas generally north of Thompson Peak Parkway are shown as areas of lowest pedestrian demand within the City. This finding is commensurate with generalized low density and low intensity land uses within the North Area.

3.4.1 Future Pedestrian Conditions

In addition to the latent demand study, existing and planned commercial and residential development at several northern area intersections (Pinnacle Peak and Pima roads, and Scottsdale Road and Westland Drive) and select road segments (Dove Valley Road to Ashler Hills Drive, Dixileta Drive, Dynamite Boulevard, Pinnacle Peak Road, and Thompson Peak Parkway) could support localized pedestrian activity. The primary pedestrian activities in these areas will likely be local trips from immediately adjacent residential areas as well as trips between commercial developments at each corner of the intersection. In addition, future parks (DC Ranch Community Park, DC Ranch Neighborhood Park, Troon North Park, Desert Mountain Park, and Whisper Rock Park) and schools may show increased pedestrian demand. Continued recreational walking and hiking to and within the McDowell Sonoran Preserve is not specifically noted in a latent demand study for pedestrians, but is a significant activity in the North Area.

3.5 Bicycling

The City of Scottsdale currently maintains a wide network of on-street (designated bike lanes and bike routes) and off-street (shared-use paths) bicycle facilities. The City also has an extensive system of unpaved trails that provide cyclist mobility. Bicycle facilities in the North Area consist primarily of bike lanes usually on major roadways and shared-use paths. There are paved pathways in the major subdivisions of DC Ranch, Grayhawk, and McDowell Mountain Ranch but they do not connect to each other or to the main path network south of the CAP Canal.

The extent of bicycle facilities citywide is shown in the Existing Bicycle Facilities Map (Figure 8-10). The mileages of the component parts of the City's entire existing bicycle network are as follows:

- Bike Lanes = 86 miles
- Paved Shoulders = 10 miles
- Bike Routes = 50 miles
- Paved Paths = 61 miles
- Unpaved Trails = 268 miles

The City's DS&PM and *Standard Details* contain extensive bicycle facility guidelines, including the provision of bicycle lanes on major arterials, minor arterials, major collectors, minor collectors, and certain special neighborhood and rural streets. Regarding Scottsdale's off-street bicycle system, all new shared-use paths must have a minimum width of 10 to 12 feet. In addition, the City's zoning ordinance requires bicycle parking at all businesses within 50 feet

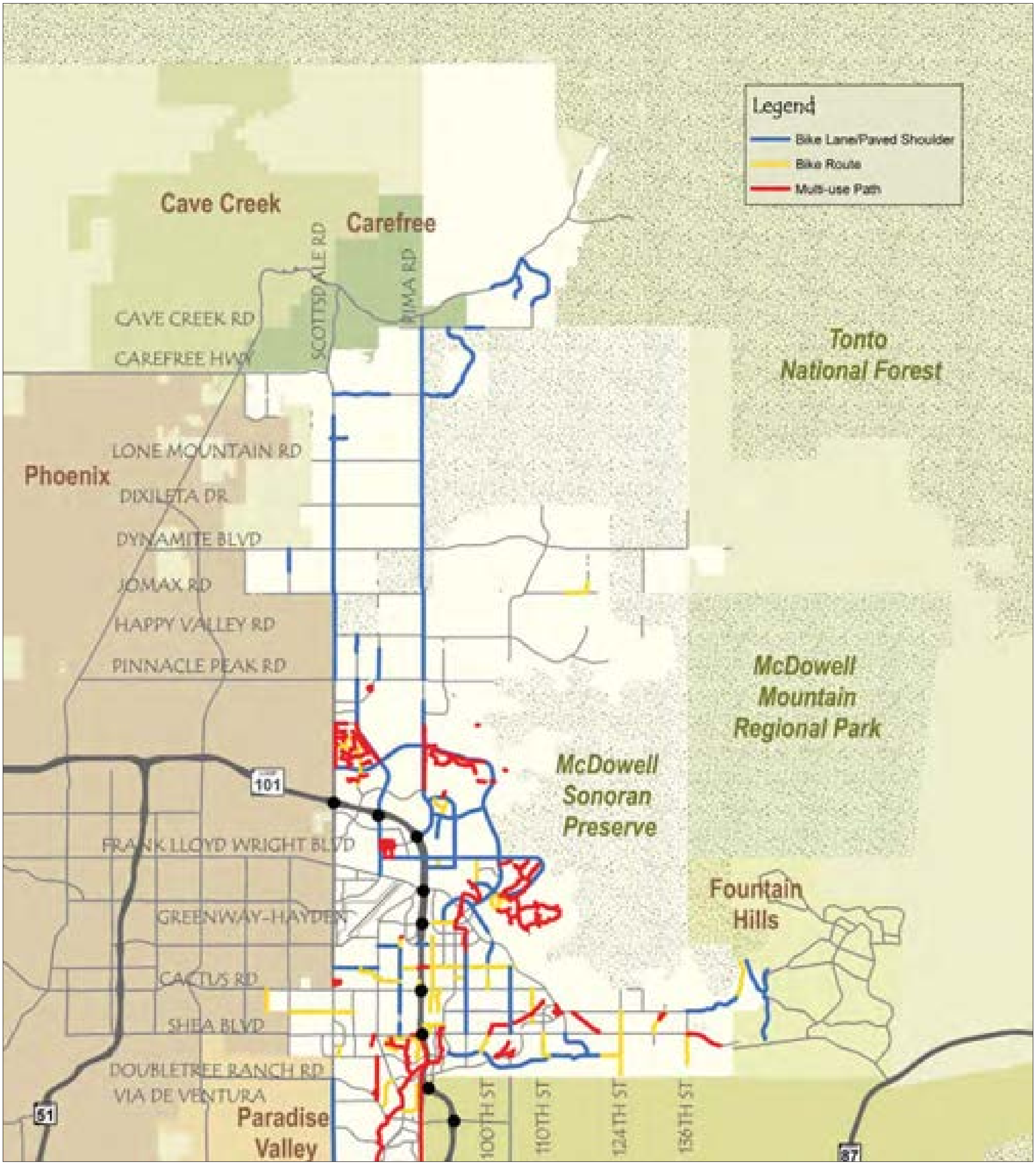


FIGURE 8-10: Existing Bicycle Facilities

of the building entrance, except in Downtown areas where less than 40 spaces are required. The quantity of bicycle parking is based on the number of vehicle spaces required. The City has recently updated its bicycle map, which shows the City's current bicycle facility network as well as other pertinent bike-related information. The MAG *Regional Bikeway Master Plan*, which will be approved soon, will set regional goals and provide bicycle program, policy, and guideline recommendations for local member jurisdictions, including Scottsdale.

3.5.1 Future Bicycling Needs

The idea of providing multi-modal choice through an accessible transportation network encourages bicycling as a mode of transportation. It should be easy and comfortable to bicycle from home to work, school, shopping, trailheads, and other activity centers, accessing many destinations by bicycle. This can be accommodated with a seamless network of streets, paths, and trails. Where they do not already exist, bicycle lanes or paved shoulders should be added over time to all major and minor arterial and collector streets. Paved and unpaved paths and trails should be built along wash and power line corridors. Existing facilities north of the CAP Canal should be connected to each other and to the existing facilities south of the CAP Canal. These connections will be identified further in the Bicycle Element of the *Transportation Master Plan*.

4.0 PLANNED IMPROVEMENTS

4.1 Capital Improvements Plan

Transportation related capital improvement projects are identified by the City based on the extent to which they meet the City Council's goal of providing for the safe, efficient, and affordable movement of people and goods throughout the City. Planned transportation projects meet the desired outcome of providing multi-modal options, and therefore include, but are not limited to, roads, noise mitigation where needed, transit, bicycle, and pedestrian improvements. Northern Scottsdale roadway and intersection programmed projects for fiscal years 2008 through 2012 are shown in Table 8-3. Many of these projects are currently underway or will be underway soon.

TABLE 8-3: Planned Roadway, Pedestrian, and Bicycle Improvements

Project/Street	Project Description
S0501 Bell Road – 94th St to Thompson Peak Pkwy	Construct the remaining two travel lanes, a landscaped median, bicycle lanes, sidewalks, and a new wash crossing.
S0601 Freeway Frontage Rd north Hayden Rd to Pima Rd	Construct a westbound frontage road on the north side of Pima Fwy between the Hayden Rd and Pima/Princess freeway interchanges. The project will include two travel lanes, a bicycle lane, a sidewalk, street lights, and drainage improvements.
NEWB3 Freeway Frontage Rd south Hayden Rd to Pima Rd (see note RE this project on page 32)	Construct an eastbound frontage road on the south side of Pima Fwy between the Hayden Rd and Pima/Princess freeway interchanges. The project will include two travel lanes, a bicycle lane, a sidewalk, street lights, and drainage improvements.
S0602 Pima Rd – Deer Valley Rd to Pinnacle Peak Rd	Design and construct a six-lane parkway cross section with landscaped median, turn lanes, grade-separated path crossing, bicycle lanes, sidewalks, curb and gutter, roadway drainage, intelligent transportation system facilities, and noise mitigation.

TABLE 8-3: Planned Roadway, Pedestrian, and Bicycle Improvements

Project/Street	Project Description
S2104 Pinnacle Peak Rd – Miller Rd to Pima Rd	Design and construct to four-lane minor arterial standards with landscaped median, turn lanes, bicycle lanes, curb and gutter, sidewalks. Additional turn lanes will be constructed at the Pima Rd intersection.
S7005 Scottsdale Rd – Frank Lloyd Wright Blvd to Thompson Peak Pkwy	Design and construct a six-lane major arterial cross section with landscaped median, turn lanes, bicycle lanes, sidewalks, curb and gutter, roadway drainage, and intelligent transportation system facilities. Additional turn lanes at Frank Lloyd Wright Blvd and a new pedestrian crossing of the Central Arizona Project Canal will also be included.
S0311 Scottsdale Rd – Thompson Peak Pkwy to Pinnacle Peak Rd	Design and construct a six-lane major arterial cross section with landscaped median, turn lanes, bicycle lanes, sidewalks, curb and gutter, roadway drainage, intelligent transportation system facilities, and a new all-weather crossing of Rawhide Wash.
S0404 Center Dr - Scottsdale Rd to Hayden Rd (One Scottsdale)	Design and construct a four-lane roadway with landscaped medians, turn lanes, wider outside lanes and curb and gutter, and roadway drainage from the One Scottsdale development boundary to Hayden Rd. Sidewalks are planned to be installed by future developments.
S0405 Pima Fwy north Frontage Rd – Scottsdale Rd to Hayden Rd (One Scottsdale)	Design and construct a frontage road of two westbound lanes, with roadway drainage, on the north side of the Pima Freeway from the Scottsdale Road freeway off-ramp to the Hayden Road freeway on-ramp.
T9902 Loop 101 Park-and-Ride Lot	Complete site selection and environmental clearance process to meet federal grant requirements. Once location is identified, purchase, design and construct park-and-ride lot.

Source: City of Scottsdale Capital Improvement Program FY 2006-2012.

4.2 Other Planned Improvements

In addition to capital improvement projects, the City does intersection modifications and smaller roadway projects. These projects may include turning lanes at intersections, installation of curbs, deceleration lanes, removal of bumps or dips in the roadway, and other intersection modifications to improve traffic flow. These improvements are mainly identified by City staff, but are often requested by citizens. The North Area has approximately 20 such requests in the future work program.

5.0 OPPORTUNITIES/RECOMMENDATIONS

5.1 Street Classification

One of the goals of the *Transportation Master Plan* is to define each segment of roadway at an appropriate street functional classification and sub-classification. In the spring and summer of 2007, the City of Scottsdale developed a stand-alone sub-regional travel demand model. The model was programmed with a base year (baseline) of 2006 and a forecast year of 2030; the model used the latest socioeconomic projections from MAG to estimate growth in population and employment. Based on this travel demand modeling effort, future roadway classification has been determined through 2030. The recommended future classification, which is shown in Figure 8-11 (map and information included in the Streets Element of the *Transportation Master Plan*), includes the recommended sub-classification of urban, suburban, and rural for streets in

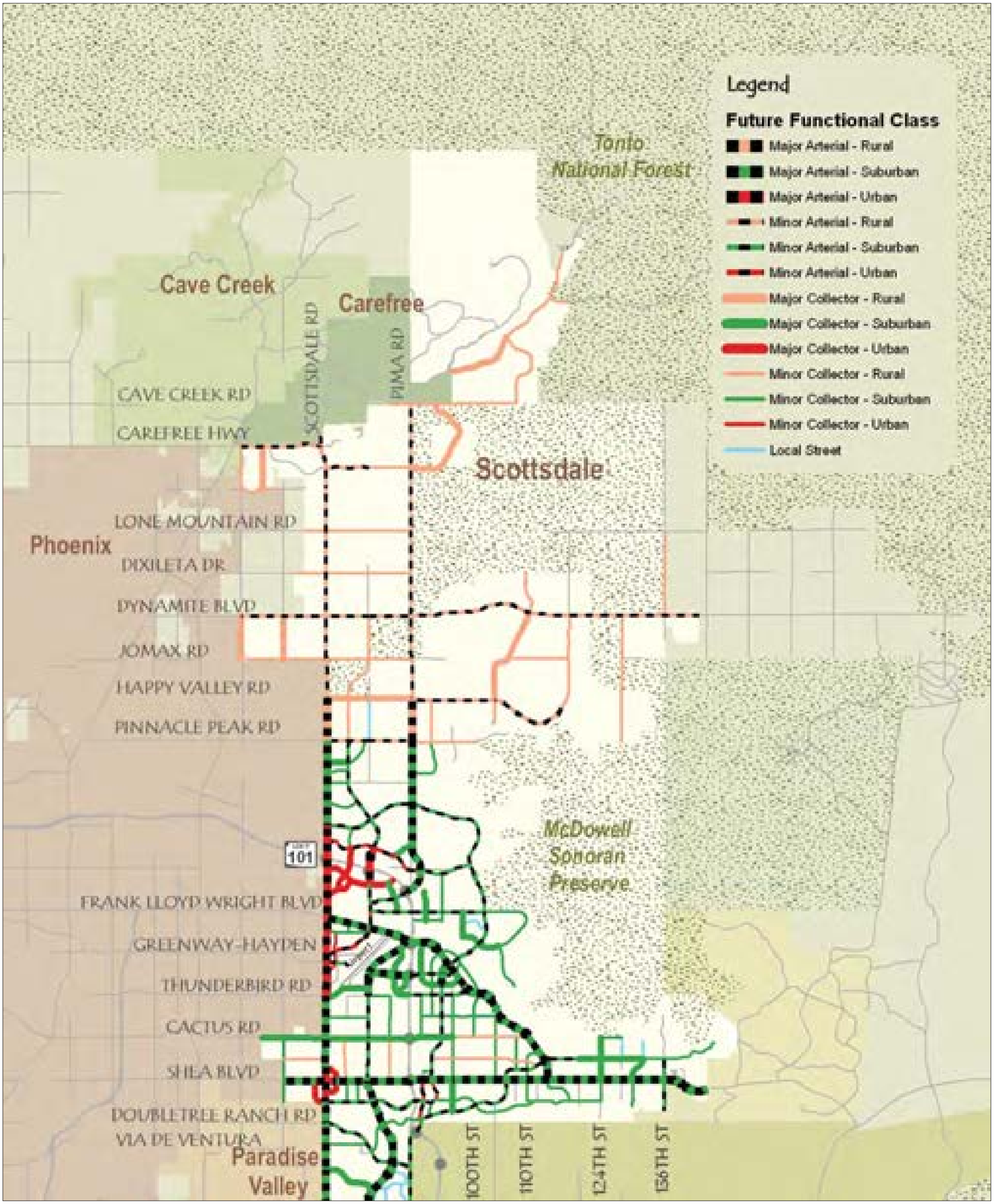


FIGURE 8-11: Recommended Classifications and Subclassifications (North Area)

the northern area. A complete table of each street segment, current classification and number of lanes, recommended classification, and number of lanes, as well as the sub-classification for each street segment, can be found in Appendix 4-A.

All roadways north of Pinnacle Peak Road are designated as "rural" in character and those south of Pinnacle Peak Road are, for the most part, designated as "suburban" in character. Segments of Scottsdale Road (Loop 101 to Thompson Peak Parkway), Hayden Road (Loop 101 to Thompson Peak Parkway), Center Drive (Scottsdale Road to Loop 101), and Union Hills Drive (Scottsdale Road to Hayden Road) are designated as "urban" in character.

Currently, four roadways, Scottsdale Road, Hayden Road, Pima Road, and Dynamite Boulevard, are designated as six-lane major arterials for some of their length in northern Scottsdale. Each of these roadways is discussed briefly below.

Scottsdale Road

Scottsdale Road is a major arterial consisting of six through-lanes south of Frank Lloyd Wright Boulevard and four through-lanes currently north of Frank Lloyd Wright. Widening of the roadway from Frank Lloyd Wright Boulevard to Pinnacle Peak Road to a six-lane cross section with landscaped median, turn lanes, bicycle lanes, sidewalks, a pedestrian crossing of the CAP Canal, roadway drainage, and ITS facilities is included in the FY 2008-2012 Capital Improvement Program. The proposed classification of Scottsdale Road in the northern area of Scottsdale is a six-lane major arterial-urban from Loop 101 to Thompson Peak Parkway, a six-lane major arterial-suburban from Thompson Peak Parkway to Pinnacle Peak Road, a six-lane major arterial-rural from Pinnacle Peak Road to Happy Valley Road, and a four-lane minor arterial-rural from Happy Valley Road to the City's northern boundary with ROW preserved at 150 feet throughout.

Hayden (Hayden-Miller) Road

Hayden (Hayden-Miller) Road is a four-lane roadway from Loop 101 to Pinnacle Peak Road and is partially built to four lanes south of Happy Valley Road. There has been discussion over the years to extend Hayden-Miller Road north as a continuous corridor from Pinnacle Peak Road to Dynamite Boulevard. As there are limited north-south corridors in northern Scottsdale, it is recommended that Hayden-Miller Road be extended as a minor collector-rural to Dynamite Boulevard. The recommended classification is a six-lane major arterial-urban from Loop 101 to Center Drive, a four-lane minor arterial-suburban from Center Drive to Pinnacle Peak Road, and a two-lane minor collector-rural to Dynamite Boulevard. Care will need to be given to specific alignment options of this roadway adjacent to the Recommended Study Boundary of the McDowell Sonoran Preserve. Continuing north of Dynamite Boulevard with the Hayden or Hayden-Miller roadway is not recommended because of the topography and the existing low densities in this area. Parallel to Hayden/Miller Road along the Hayden Road alignment, Hayden Road currently is classified as a minor collector. Given the projected volumes of this roadway segment, Hayden Road in this location should be designated a local collector and removed from the functional classification map.

Pima Road

Pima Road is currently programmed for widening to a six-lane roadway with landscaped median, turn lanes, grade-separated path crossing, bicycle lanes, sidewalks, roadway drainage, ITS facilities, and noise mitigation in the FY 2007-2012 Capital Improvement Program between Loop 101 and Pinnacle Peak Road. The recommended classification on Pima Road is a six-lane major arterial-suburban for Loop 101 to Pinnacle Peak Road, a six-lane major arterial-rural north to Happy Valley Road, and a four-lane minor arterial-rural north from Happy Valley Road to Stagecoach Pass.

Pima Road/Loop 101 Interchange

Pima Road/Loop 101 Interchange currently has a diamond interchange. At this interchange, Loop 101 curves from an east/west direction to a north/south direction and has frontage roads with a forced merge between the frontage road and the westbound off-ramp on the approach to the diamond interchange. The City is working with ADOT to examine feasibility of options to restore the original design concept for the interchange.

Dynamite Boulevard

Dynamite Boulevard is currently two lanes from 56th Street to Pima Road and four lanes from Pima Road to 118th Street. The recommended functional classification is a four-lane minor arterial-rural from 56th Street east to the City limits.

5.1.1 Street Classification Summary Recommendations

Communities are often faced with the need to add additional travel lane capacity to the transportation network to address congestion issues. This need must be weighed against neighborhood impacts and community character or context issues. In Scottsdale, the primary roadway network consists of two-lane collectors, four-lane collectors and arterials, and six-lane arterials. The City currently limits local roadway widths to six lanes, and this plan proposes to continue this long-standing policy. One measure that is often used to assist in making decisions regarding adding travel lanes is the volume to capacity ratio, which compares average daily traffic lane volumes to a predetermined standard. As discussed in the Policy Element of the *Transportation Master Plan*, volumes of 8,000 vehicles per lane per day for two-lane roads and 10,000 vehicles per lane per day for four-lane roads will provide guidance on the threshold for roadway widening. These planning volumes are further adjusted based on adjacent land use, to consider widening of roadways designated as rural in character when forecasted volumes reach 90 percent of the target threshold and widening of roadways designated as suburban in character would be considered when forecasted volumes reach 100 percent of the target threshold. Widening of roadways designated as urban in character would be considered when forecasted volumes reach 120 percent of the target threshold. Roadway widening will typically be limited to minimum 1-mile segments.

Considering the forecast volumes and general capacity guidelines listed above, the following North Area roadways* should maintain the current street classifications from the 2003 *Streets Master Plan*:

- Pima Road from Loop 101 to Happy Valley Road - major arterial
- Hayden Road from Center Drive to Thompson Peak Parkway – minor arterial
- Pinnacle Peak Road from Scottsdale Road to existing four-lane section near Pima Road - minor arterial
- Via Linda between 120th Street and 132nd Street – major collector
- 124th Street north of Shea Boulevard – major collector
- 124th Street south of Shea Boulevard – minor collector

- Jomax Road between 56th Street and Pima Road – minor collector
- Dixileta Drive from 66th Street to Pima Road – minor collector
- Westland Drive between Scottsdale and Pima roads – minor arterial**
- 132nd Street between Shea Boulevard and Via Linda – major collector**

*Not all roadways are listed.
**These corridors were built prior to the McDowell Sonoran Preserve designation within the City and present a possible opportunity for "right-sizing" or reducing the size in the future.

The following North Area roadways should be revised from their current street classifications from the 2003 *Streets Master Plan*. There should be some consideration given to maintaining the required current ROW for these roadway segments to enable provision of drainage and additional non-motorized transportation facilities, such as trails, shared-use paths, and pedestrian walkways in a way more in character with the surrounding desert.

- Scottsdale Road north of Happy Valley Road – minor arterial
- Pima Road north of Happy Valley Road – minor arterial
- Dynamite Boulevard from 56th Street to 136th Street – minor arterial
- 118th Street south of Dynamite Boulevard – minor collector (with phased construction)
- Lone Mountain Road from Scottsdale Road to Pima Road – minor collector (Lone Mountain Road is designated a Buffered Roadway and this designation would not be revised)
- Jomax Road from Alma School Road to 118th Street – minor collector
- Stagecoach Pass – minor collector.
- Lone Mountain Parkway from Cave Creek Road to Stagecoach Pass – minor collector
- Cave Creek Road east of Lone Mountain Parkway – minor collector
- Hayden-Miller from Pinnacle Peak Road to Dynamite Boulevard – minor collector
- Hayden Road from Pinnacle Peak Road to Happy Valley Road – local collector
- Happy Valley Road from Scottsdale Road to Pima Road – major collector
- 92nd Street south of Happy Valley Road – local collector
- Williams Drive east of Hayden Road – minor collector
- Thompson Peak Parkway from the CAP Canal bridge to Bell Road – minor arterial
- Via Linda east of 132nd Street – minor collector.
- 136th Street from Shea Boulevard to Via Linda Road – minor collector

In addition, it appears that the roadway system will have enough capacity to defer or delete capital improvements project NEWB3, to provide an eastbound frontage road on the south side of the Loop 101, between Hayden and Pima roads.

5.2 Transportation Corridor Rights-of-Way

An item for further discussion is the possibility of creating a specific "rural" cross section that includes larger rights-of-way to be used to provide additional buffers, and accommodate trails and shared-use paths that may require more horizontal space due to topography and environmental sensitivity of the surrounding desert.

The 2030 traffic volumes for the northern portions of Scottsdale and Pima roads and all of Dynamite Boulevard are not anticipated to require six-lane roadways; however, additional ROW in a "rural" cross section could provide flexibility for drainage, additional travel lanes, and alternative transportation modes should such measures prove necessary in the future. Where existing ROW accommodates a wider cross section, this ROW should be retained.

5.3 Bicycle and Pedestrian Facilities

A comprehensive list of proposed facilities is included in the Bicycle Element and Pedestrian Element of the *Transportation Master Plan*. Special care will be taken to identify bicycle connections from bike lanes to shared-use paths and trails; to promote pedestrian level lighting; and to make connections from the bike lane and shared-use path system in the North Area to the bicycle and pedestrian systems south of the CAP Canal.

Within the northern area, over 40 miles of roadways have been identified as potential locations for on-street bicycle facilities. This mileage includes locations where paved shoulders could be added and locations where restriping the existing roadway can be performed to include bike lanes. In addition, more than 20 unique shared-use path corridors have been identified in this part of the City. The roadways and shared-use path corridors collectively comprise approximately 60 miles of facilities and make numerous connections to the existing bicycle network. Potential paths have been identified along Scottsdale Road, Pima Road, Cave Creek Road, Dynamite Boulevard, and Via Linda.

By 2009, the City should complete an analysis regarding public restrooms for path/trail users in areas where commercial facilities are not available for use by business patrons. Items to examine include construction and maintenance costs, security needs, as well as other available alternatives. Restroom facilities are currently provided at most City parks.

5.4 Additional Issues and Preliminary Recommendations

A number of issues have been raised during community discussions on the northern area of Scottsdale. These issues and preliminary recommendations are discussed below.

5.4.1 Wildlife Crossings

The low densities and desert environment in northern Scottsdale provide wildlife habitat to many desert wildlife species. To enhance driver awareness of possible wildlife crossing the major roadways, "watch for animals" signs should be placed next to wash corridors.

5.4.2 Managing Event Traffic

WestWorld is a large event center located east of Loop 101 and south of Bell Road. (The general location of WestWorld is shown in Figure 8-2.) This facility hosts large events including the Barrett-Jackson Auto Auction, the Arabian Horse Show, the Parada del Sol Rodeo, and the McDowell Mountain Music Fest. These events generate daily attendance of 10,000 or more. Each event varies as to duration, days of the week, hours of operation, and degree of traffic management. Weekly events generating 1,000 to 5,000 daily attendees occur from October through June. In addition to WestWorld, the Scottsdale Princess TPC golf course is home to the FBR Open in January each year drawing hundreds of thousands of people during the week to the area. A traffic operations plan is developed for each large event to accommodate peak traffic demand for the duration, day of week, and time of day variables.

Through Proposition 400, the City is planning a park-and-ride in the vicinity of Scottsdale Road/ Loop 101. Using this facility to accommodate small events periodically could help alleviate parking needs as well as provide another option for events not suited to other event facilities in this area of Scottsdale.

5.4.3 Emergency Access

Pima and Scottsdale roads are the only two north-south streets that provide continuous service from Loop 101 to the northern City limits of Scottsdale. Thompson Peak Parkway provides a third north-south route east of Pima Road for the southern two miles, but does not extend farther north. Hayden-Miller Road provides a fourth option south of Pinnacle Peak Road. Currently, Tatum Boulevard and Cave Creek Road are the nearest options to the west. Located in the city of Phoenix, they are three to four miles west of Scottsdale Road. As the city of Phoenix builds out, 56th Street and 64th Street will be extended to the north.

The north-south access issue is that when either Pima or Scottsdale Road is closed north of Pinnacle Peak Road for any reason, all traffic is funneled to the other. It is recommended that additional north/south options, such as the extension of Hayden-Miller Road to Dynamite Boulevard, be examined to provide another north/south alternative. Consideration should be given to making the connecting east/west routes one way during an emergency. These details will be coordinated with the City's Emergency Services Division. Until additional options are constructed, travelers will need to travel to Tatum Boulevard or Cave Creek Road further to the west in order to travel north or south in the event of an emergency.

It is critical that emergency services are able to locate homes and it is recommended that house or lot numbers are highly visible.

5.4.4 Circulation Plans to Connect Developments

Northern Scottsdale has a number of communities with perimeter walls whose only access is to adjoining major streets, with no access provided between developments. This tends to force all traffic onto major roadways like Scottsdale or Pima roads. For the most part, these developments are built out and, unless homes are purchased and demolished, the opportunity for providing vehicular connections or access between developments is past.

To support walking as an alternative mode of transportation for short trips, direct pedestrian access between residential subdivisions to arterial streets should be provided at no farther than ¼ mile intervals. This will provide direct pedestrian access to paths, trails, and sidewalk facilities developed along Scottsdale, Pima and Hayden roads as well as other key east-west arterial roads such as Lone Mountain Road, Dynamite Boulevard, Dixileta Drive, Happy Valley Road, and Pinnacle Peak Road.

To support local connections to neighborhood services, "back door" pedestrian access between retail commercial and other development should be provided. Back door access can be provided by way of a local street from an adjacent subdivision, as is further described in the Pedestrian Element of the *Transportation Master Plan*. Oftentimes a gate, locked after hours, is provided and contributes to safety. In the northern area, there is back door access from some of the residential subdivisions in Terravita to the commercial center at Scottsdale Road and Carefree Highway.

To prevent the lack of residential-to-commercial pedestrian access from occurring with new development, the City, during the plan review/approval process, should require that access is provided.

5.4.5 Access to Lands Within the Recommended Study Boundary of the McDowell Sonoran Preserve

The City of Scottsdale intends to acquire all of the lands within the Recommended Study Boundary of the McDowell Sonoran Preserve for mountain and desert preservation and open space. To date, most of the lands within the original boundary have been dedicated or purchased by the City. North of Dynamite Boulevard is State Trust land, the majority of which was designated as "suitable for conservation purposes" by the State Land Commissioner in 2001. Some 1,100 acres of this land was designated as suitable for conservation, however it was not deed restricted. In the *General Plan* amendment that indicated land uses for these areas, these acres, while within the Recommended Study Boundary of the McDowell Sonoran Preserve, were shown on the *General Plan* with very low residential densities (5-acre lots).

If these State Trust Lands are not acquired for the McDowell Sonoran Preserve and develop in this area, 118th and 136th streets should be extended to accommodate traffic generated by the new development. It is recommended that 90 feet of ROW be reserved and, depending upon the traffic impact and mitigation analyses for specific projects, the roadways should be developed as either major or minor collectors. North to Dixileta Drive,118th Street should be designed with an unpaved shared-use path.

Additionally, Dixileta Drive and Dynamite Boulevard should be developed to include a primary trail and access into the McDowell Sonoran Preserve.

5.4.6 Connectivity Across Dynamite Boulevard

In 1997, a Desert Open Space System Plan was created which included ideas of a grade-separated crossing to connect the McDowell Sonoran Preserve north and south of Dynamite Boulevard. At their July 5, 2007 meeting, the McDowell Sonoran Preserve Commission recommended that the community keep open the option of utilizing an appropriate mechanism to maintain connectivity (for wildlife and trails) between the divided sections of the McDowell Sonoran Preserve.

5.4.7 Via Linda Connection to Fountain Hills

In April 2000, the City Council approved a *General Plan* amendment deleting Via Linda as a major collector street from 136th Street to Eagle Ridge Drive (148th alignment). A non-vehicular easement was reserved at this time. During *Transportation Master Plan* discussions, the robustness of the roadway network throughout Scottsdale has been raised and the extension of Via Linda to Fountain Hills was reexamined. This extension would require a circuitous, switch-back route and would penetrate low density developments in both Scottsdale and Fountain Hills. Because of the vertical and horizontal alignment constraints, such a roadway would not provide a feasible alternative to Shea Boulevard, thus it is recommended that the concept be deleted from further consideration.

5.4.8 Roadway Lighting

Roadway lighting in northern Scottsdale should be kept to a minimum, with only major intersections illuminated for safety. Raised pavement markers should be used to delineate the center line and edge of pavement between intersections in lieu of lighting. To maintain dark skies in the North Area, pedestrian lighting (poles no greater than 15 feet in height and directed downward with no greater than 0.5 footcandles) may be more appropriate than street level lighting.

Each major intersection considered for lighting should be the subject of a lighting study, with the following factors considered to reduce the impact on the surrounding land:

- Reducing the pole height;
- Using lower wattage bulbs;
- Shielding the backside to reduce trespass lighting; and
- Use and benefits of pedestrian and ground focused lighting.

5.4.9 Design Aesthetics

Streets in northern Scottsdale should be constructed to respect the environmentally sensitive nature of the area, with gravel shoulders and shared-use paths where appropriate. The two adopted Character Area plans, Desert and Dynamite Foothills, provide specific guidelines about aesthetics, ensuring that the built environment blends with the natural setting and minimizes impacts. In addition, the Scenic Corridor Design Guidelines provide aesthetic guidelines specifically for Scenic Corridors throughout the City, including Scottsdale Road, Pima Road, Dynamite Boulevard, Carefree Highway, and Cave Creek Road in northern Scottsdale.

5.4.10 Sidewalk Requirements/ADA Compliance

To encourage a consistent low intensity, rural environment at roadway crossings, the DS&PM should be revised to provide a North Area arterial intersection cross section that provides key elements of universal access. The following drawings show preliminary ideas of what this crossing may entail (see Figures 8-12 and 8-13).

The texture and location of stabilized decomposed granite paths should be carefully considered. In some cases, it may not be desirable for paths/sidewalks that go to work, school, recreation or commercial destinations. It may be more appropriate for areas of rougher terrain e.g., Lost Dog Wash trailhead.

5.4.11 Equestrian Trail Planning

In addition to the guidelines and trail planning of the *Trails Master Plan*, it is recommended that when new drainage culverts are designed, they be considered for accommodation of a horseback rider.

As an update to the *Trails Master Plan*, it is recommended that an inventory of existing trails facilities and easements be conducted to coordinate with future updates of the *Trails Master Plan* and trails policy for the City.

Note:
Appendices including travel demand forecasts and recommended future functional classification have been included in the Street Element of the *Transportation Master Plan* rather than remaining in the North Area Circulation Study.

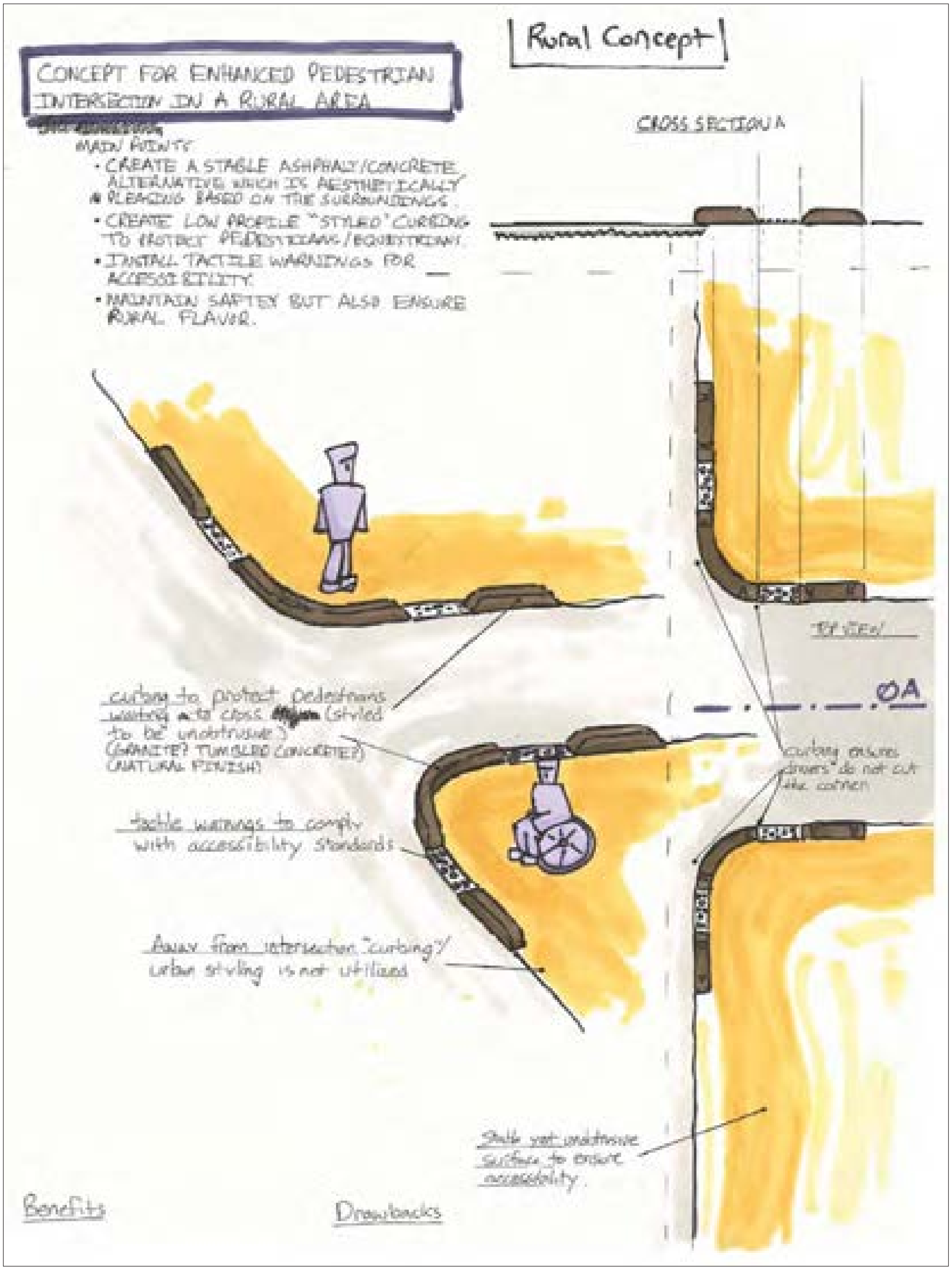


FIGURE 8-12: Rural Concept for Enhanced Pedestrian Intersections

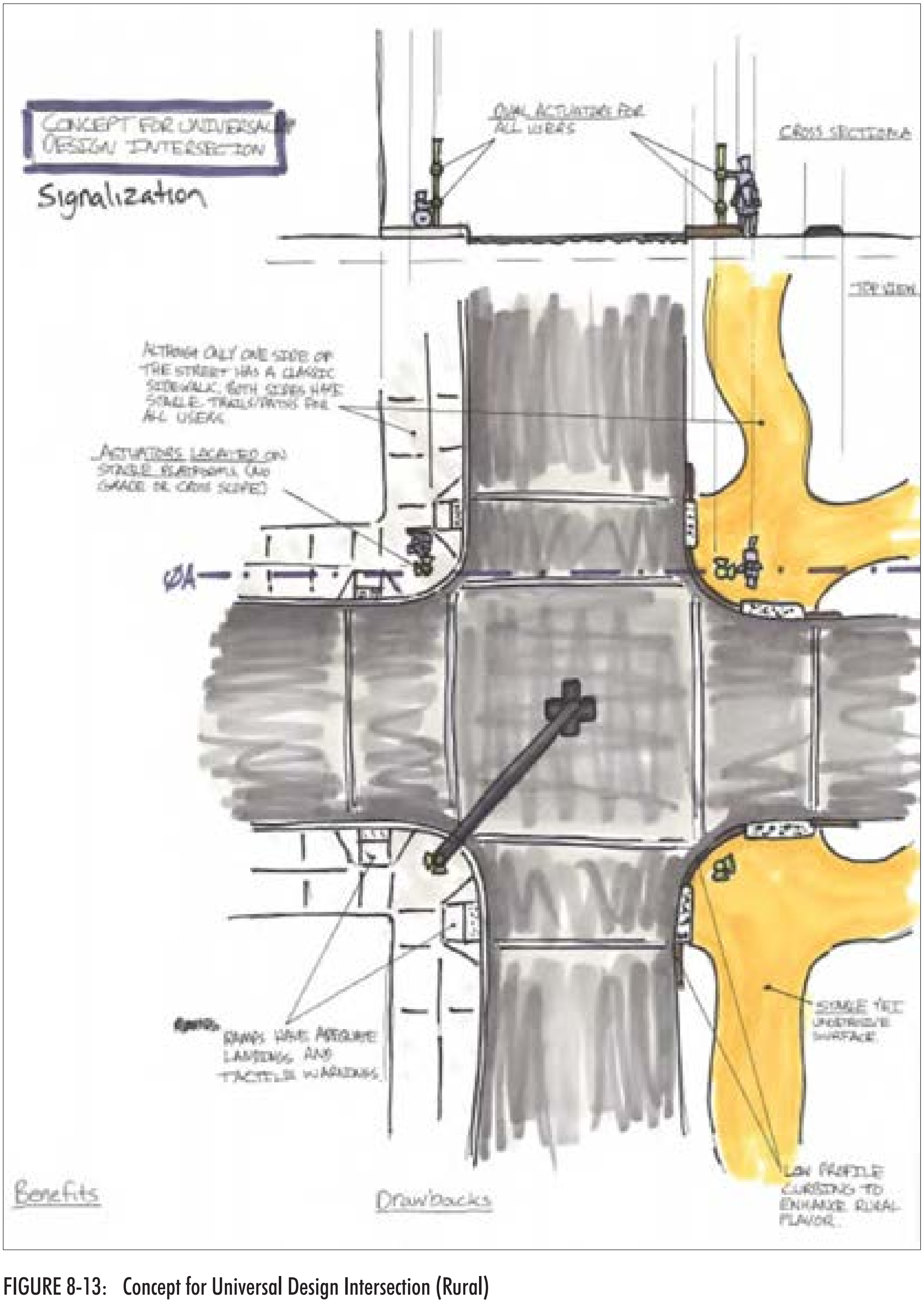


FIGURE 8-13: Concept for Universal Design Intersection (Rural)

9 AIRPARK CIRCULATION STUDY

9 AIRPARK CIRCULATION STUDY

1.0 INTRODUCTION

Scottsdale Airpark is the preeminent employment center in Scottsdale and the third largest in the Phoenix metropolitan area. Access to the Airpark's multiple commercial and employment centers, as well as traffic congestion at key locations throughout the Airpark and immediate vicinity, are the major transportation concerns. The purpose of this circulation study is to identify and analyze potential transportation solutions for through and destination traffic at Scottsdale Airpark. Primary considerations for this area are:

- Through, destination, and local traffic circulation;
- Forecasted traffic volumes along the major streets surrounding and through the Airpark;
- Functionality of transit services connecting to, and circulating throughout, the Airpark; and
- Possible intersection enhancements at Scottsdale Road and Frank Lloyd Wright Boulevard, Hayden Road and Frank Lloyd Wright Boulevard, Pima Road and Frank Lloyd Wright Boulevard in particular.

The primary focus area of the Airpark study area is generally bounded by the Scottsdale/Phoenix jurisdictional boundary on the west and the CAP Canal on the north; the Loop 101 on the east and approximately the Thunderbird Road alignment on the south. Connections on the east-west portion of the Loop 101 (between Scottsdale and Pima/Princess) are being examined, however, the circulation of the area north of the CAP Canal is not being examined in this study (Figure 9-1 and Figure 9-2). The Airpark is also adjacent to two planned development areas: the Scottsdale Road corridor, with the One Scottsdale project, and the substantial continued development of the city of Phoenix Desert Ridge area and the Kierland development.

The Vision, Values, and Goals component of the *Transportation Master Plan* identifies many over-arching goals (based on the *General Plan* Community Mobility Element goals and additional goals regarding sustainability and regional coordination). The following are directly applicable to the Airpark study area:

- Protect the function and form of regional air and land corridors;
- Protect the physical integrity of regional networks to help reduce the number, length, and frequency of automobile trips, to improve air quality, reduce traffic congestion, and enhance quality of life;
- Promote regional diversity and connectivity of mobility choices;
- Prioritize safe and effective regional transportation connections beyond the City boundaries;
- Enhance connectivity to regional transportation facilities;
- Relieve traffic congestion;
- Optimize the mobility of people, goods, and information for the expected buildout of the City;
- Maintain Scottsdale's high aesthetic values and environmental standards in the City's transportation system;
- Emphasize live, work, and play land use relationships to optimize the use of citywide systems and reduce the strain on regional and local/neighborhood systems; and
- Protect neighborhoods from negative impacts of regional and citywide networks.

FIGURE 9-1: Airpark Area Map — City Context

FIGURE 9-2: Airpark Area Map — Immediate Area Context

In addition to these broader goals, Airpark specific goals are as follows:

- Improve arterial flow on streets around the Airpark through capacity and operational improvements of streets bordering the Airpark;
- Create facilities that encourage internal bicycle and pedestrian trips;
- Create bicycle and pedestrian facilities that complement parallel improvements to the transit system;
- Acknowledge the value of private enterprise in the Airpark and minimize unwanted roadway impacts;
- Provide direct freeway access from Loop 101 to the Airpark/Airport if at all possible, working with ADOT, through interchanges on Loop 101 with Northsight Boulevard and Hayden Road;
- Create transit improvements which include new bus service and potentially HCT; and
- Create Transportation Demand Management (TDM) measures to address access and circulation concerns for the Airpark area.

1.1 Scottsdale Airpark Background

Scottsdale Airpark was established in 1966. Today, it is an employment and business center that houses approximately 110 business categories (e.g., accounting, auto, publishing, etc.) in a variety of building types, such as commercial office buildings, warehouses, aircraft hangars, retail stores, and hotels. Some areas within the Airpark are redeveloping from office/warehouse and light manufacturing space to showrooms and retail venues.

Located on approximately 2,900 acres of privately owned land just south and west of Loop 101 and 7 miles north of Scottsdale's Downtown area, the Airpark houses approximately 2,550 businesses and is headquarters to more than 30 national and regional corporations[2]. In addition, construction of approximately 1.6 million square feet of new office space has either been completed, or is under development.

Scottsdale Airpark is a major economic asset that contributes between $2.5 billion and $3 billion annually to the local economy[3], and in Maricopa County, ranks third in employment areas after Phoenix Sky Harbor International Airport and Downtown Phoenix[4]. Employment in the Airpark has been growing by about 3,000 employees per year since 2002, and has more than tripled since 1995, increasing from approximately 14,000 to over 50,000 workers as of December 2006. According to the most recent statistics and studies, current growth rates are being realized about four years earlier than originally anticipated. Should these growth trends continue, the Airpark could become the largest employment center in the Metro-Phoenix area. Continued efficient access to businesses located in the Airpark is critical to ensure vitality and sustainable growth. Another factor of note is that the majority of the Airpark's employees commute from areas east and west of Scottsdale, presenting additional transportation issues for the Airpark[5].

The Airpark area is also near other popular destinations such as hotels/resorts, shopping areas, and golf courses. It is within a mile of WestWorld, a special event and tourist attraction that is home to the Barrett-Jackson Classic Car Auction and the Scottsdale Arabian Horse Show. The

2 Scottsdale Airpark 2010 Report, December 2006
3 November 2003
4 Scottsdale Development Update March 22, 2006 (A weekly newsletter from the City of Scottsdale)
5 Scottsdale Airpark 2010 Report, December 2006

TPC Princess golf course, located north of the CAP Canal, is home to the FBR Open, a PGA golf tournament held in January each year.

1.2 Scottsdale Airport

The Scottsdale Airport was first developed in the remote desert north of Downtown in 1942 as Thunderbird Airfield II, when it was used by the Army Air Corps as a basic training facility for World War II pilots. The civilian-operated airfield provided initial flight training to 5,500 aviation cadets for World War II service. Closed in 1944, it was turned over to Arizona State College (now ASU) for use as a vocational school for veterans. In 1953, when Arizona State College no longer needed the facility, the Arizona Conference of the Seventh-Day Adventists took over the buildings and field for its Thunderbird Adventists Academy high school and missionary pilot training. When Scottsdale's first *General Plan* was drafted in the 1960s, it included land use designations for the Airport and a surrounding industrial park, both seen as potential economic engines for the City. The City of Scottsdale acquired the Airport in September 1966 and continues to manage its operations. The Scottsdale Airport opened in June 1967[5,6]. In 2004, there were more than 450 aircraft based at Scottsdale Airport, from single engine recreational planes to corporate jets. In 2006, the Airport accommodated approximately 200,000 general aviation flights and approximately 6,000 passengers, making it one of the busiest single runway facilities in the nation and the busiest corporate jet facility in the state[6,7].

One of the most significant aspects of the Scottsdale Airport is the major economic stimulus that it provides to the City of Scottsdale and northeast Valley. The facilities of the Airport and the quality of life and amenities of the Scottsdale area have attracted a large number of businesses that locate on or near the Airport. These same facilities and amenities draw general aviation and corporate business travelers from all over the country to visit Scottsdale for business and recreational purposes. The Scottsdale Airport is an ideal choice for vacationers and business travelers because it is near some of the City's annual signature events such as the Barrett-Jackson Classic Car Auction, the FBR Open PGA golf tournament, and the Scottsdale Arabian Horse Show. Based on the *Economic Impact of the Scottsdale Airport/Airpark Report*, the total value-added of all economic activity at Scottsdale Airport is approximately $63 million annually in direct revenues; adding indirect and induced impacts increases that figure to $182 million. This impact comes from a variety of aviation-related activities including charter flight schools, general aviation activities, as well as travel and tourism. These aviation activities create "spin-off" impacts by providing jobs and support structure for other non-aviation business around the community and the state[7,8].

The following plans, listed below in chronological order, have been developed to accommodate anticipated growth at the Scottsdale Airport:

- *Scottsdale Airport Master Plan*, 1974;
- *Master Plan Update*, 1976;
- *Airport Master Plan and Noise Compatibility Program,* 1985;
- Scottsdale Airport Economic Impact Study, 1992;
- Circulation Study for Scottsdale Airport, July 1993
- *Scottsdale Airport Master Plan*, 1997;

6 Fudala, Joan; Scottsdale Airpark News, April 2007
7 www.scottsdaleaz.gov/airport/pdffiles/AirportFacts 102205.pdf
8 www.scottsdaleaz.gov/airport/pdffiles/AirportFacts 102205.pdf

- *FAR Part 150 Noise Compatibility Study*, 1997;
- *Scottsdale Airport Tunnel Feasibility Study*, 1998;
- *Scottsdale Airport Economic Impact Study*, 1998;
- *Traffic and Feasibility Report for Airport Tunnel Study*, 1999;
- *Analysis and Forecast of the Economic Base of Scottsdale, with particular Emphasis on the Hospitality Sector and the Combined Airpark/Sonoran Regional Core Character Areas*, 1999;
- *Development Parcel/Third Street Realignment at Thunderbird Road – Design Concept Report*, May 2003;
- *Scottsdale Airport Economic Impact Study*, 2004;
- *FAR Part 150 Noise Compatibility update*, 2006; and
- *SR101L South Frontage Road and Pima Interchange Connector Ramps- Engineering Feasibility Report,* February 2007.

Note: The Scottsdale Airport Master Plan, 1997 plan update got underway in mid-2007, funded through a grant from the ADOT.

1.3 Airpark Area Prior and Ongoing Study

This section summarizes plans that have been developed to guide Airpark growth and development. It should be noted that some of these plans have been formally adopted; others have been developed for future reference; and some are pending formal adoption. The following documents were reviewed during the development of preliminary transportation improvement concepts.

1.3.1 Scottsdale 2001 General Plan

The Airpark is designated as a Growth Area in the City of Scottsdale 2001 *General Plan*. Growth areas are defined as areas of the community that are most appropriate for development focus, that would best accommodate future growth, and facilitate enhanced transportation systems and infrastructure coordinated with development activity. The City can concentrate on improvements in these growth areas that will support planned concentration of a variety of uses (mixed uses) and are oriented to multi-modal (transit, pedestrian, bicycling, autos, etc.) activity.

1.3.2 1999 Economic Forecast and Analysis Report

The 1999 *Economic Forecast and Analysis Report* addressed the Airpark's continued economic growth[9,8]. The purpose of the study was to define future public infrastructure needs, in anticipation of future development, to facilitate the City's long-term capital improvements planning.

The growth projections in this report, based on a 1989-1995 shift-share analysis, forecast approximately 52,000 employees in 2020. It is expected, however, that this forecast will most likely be realized by 2010 (ten years earlier). This analysis predicted a shift from lower intensity mixed-use warehouse to higher density office buildings and, indeed, this shift appears to be taking place in the Airpark. The report also indicates that this shift should be encouraged to promote Airpark employment growth and sustainability and indicates that it is important to integrate supporting retail services as well as transportation demand management measures (bike routes, car pooling, shuttle routes, etc).

9 *Analysis and Forecast of the Economic Base of Scottsdale,* Gruen Gruen + Associates, June 1999

The 1999 *Economic Forecast and Analysis Report* also concluded that Scottsdale was growing slightly faster in employment than in residential growth; this trend also continues today. Between 2000 and 2005, Scottsdale grew by a rate of 11.7 percent in population and 34 percent in employment growth9,[10]. This demonstrates that Scottsdale is attracting a workforce that extends beyond its jurisdictional boundaries. A survey conducted of Airpark businesses, within the context of the Report, found that 49 percent of employees lived in Phoenix, 31 percent lived in Scottsdale, and 5 percent in both Glendale and Mesa. The primary commute pattern of employees to the Airpark was east-west, not north-south. (This study was completed before the completion of the Loop 101 Freeway.) In that survey, 60 percent of business owners surveyed indicated that their reason for locating in the Airpark was "owners/top management resides there"; 27 percent cited "proximity to customer base." The remaining reasons cited in favor of the Airpark location were "accessibility to the Scottsdale Airport" (8 percent), "close to desirable labor base" (2 percent), and "accessibility to Pima Freeway (Loop 101)" (2 percent). Additionally, the Report points to Scottsdale's successful hospitality industry as another factor of Airpark success, and reiterates the strong positive role that quality of life elements evident in Scottsdale — such as proximity to shopping, restaurants, entertainment, cultural venues, and recreation — play in attracting businesses and investors.

1.3.3 Scottsdale Airpark White Paper, December 2003

Scottsdale Airpark was established in 1966 and developed to its current success through 40 years of supporting land use programs and policies implemented by the City of Scottsdale. The Scottsdale Airpark White Paper, although not currently adopted, identifies key issues and strategies, summarized below, to ensure continued Airpark expansion and economic vitality[10,11].

Key Issue #5 Traffic and Circulation

- The Airpark draws employment regionally.
- Ample capacity and connection are vital to sustainable economic growth. Efficient accessibility is an important factor to attract new businesses to the Airpark.
- The Airport, CAP Canal, and Loop 101 are barriers to the local street network and impact local street connectivity, causing traffic congestion. The primary mode of transportation to the Airpark is private automobile which compounds local roadway congestion. Congestion on the Airpark's internal roadway system is increasing, and more importantly, has spread beyond the usual peak-hour demand.
- Support of Airpark business and property owners is critical to the success of any proposed transportation strategies.

Strategies

- Good connections from the regional bus system to the Airpark are necessary.
- High capacity express bus service should be provided to this area.
- Multiple connections to the region's major arterial street network should be provided and enhanced.
- Accessibility to Pima Freeway (Loop 101) needs to be protected and enhanced where possible.

10 City of Scottsdale Demographic Trends Analysis, October 2005
11 Scottsdale Airpark White Paper, December 2004

- Consider and work toward the installation of additional street connections across and around the existing barriers wherever feasible.
- Improve the capacity of these few links across and around the district.
- Create a local transit service that serves the internal needs of the business center and connects to nearby residential concentrations.
- Provide facilities that enable and encourage bicycling and walking as viable and safe means of travel within this area.
- Encourage all development projects to create strong pedestrian connections to sidewalks from their entries and provide adequate bicycle parking.
- Provide amenities that make the use of alternative modes of transportation comfortable such as shade, lighting, information kiosks, and seating.
- Encourage local business to take advantage of the many ways in which transportation demand can be managed, including car and van pooling, staggered work and lunch hours, telecommuting, etc.
- Encourage larger properties and developments to incorporate on-site shuttles and other services that reduce the need for auto use.
- Discourage over-sized parking facilities and encourage joint parking where nearby land uses have different peak demands for parking.
- Enhance the existing street system wherever possible with right-turn lanes, double left-turn lanes, and other intersection capacity improvements.
- Allow for greater mix of on-site uses in certain areas so that there is less need for employees to get in their cars and drive to dining or services used during the workday.

Key Issue #6 Airport Tunnel

- A tunnel has been under consideration for several years to connect Raintree and Butherus drives, and thereby enhance circulation to sites along these streets.

Strategies

- A corridor land use study should be conducted in order to determine an overall strategy for either changing or keeping the existing land uses within it.
- Any roadway planning for this project should anticipate the increased access desires of property owners and tenants along the route.

1.3.4 Economic Vitality Airpark Area Study

The City of Scottsdale Economic Vitality Department undertook an evaluation of the economic vitality of the Airpark area in 2006.

1.3.5 Greater Airpark Area Planning Study

The City of Scottsdale Advance Planning Division has defined the Greater Airpark as a planning area for further study, building off the 2003 Scottsdale Airpark White Paper and addressing issues including land use mix, revitalization of aging infrastructure and buildings, and area character.

2.0 EXISTING CONDITIONS

2.1 Traffic and Circulation

The traffic analysis presented in this report is based upon traffic forecasts prepared by MAG and the City of Scottsdale. The current MAG model uses data developed in 2005 and was based upon the U.S. Census 2005 which were updated from previous projections and approved in late May/early June 2007. In the spring and summer of 2007, the City of Scottsdale developed a stand-alone sub-regional travel demand model. The model was programmed with a base year (baseline) of 2006 and a forecast year of 2030. The model used the latest socioeconomic projections from MAG to estimate growth in population and employment. In addition, to the MAG data, traffic counts are compiled in Scottsdale every other year. The most recent available information are the 2006 traffic counts.

Scottsdale Airpark contains a network of streets serving the over 2,500 businesses of the Airpark. Access to the Airpark is provided by Loop 101 and the arterial streets of Scottsdale Road on the west, Frank Lloyd Wright Boulevard on the north, and Hayden Road on the east. All of these streets serve citywide and regional traffic. Traffic volumes peak at over 50,000 vpd on Scottsdale Road, between Cactus Road and Thunderbird Road, and 47,000 vpd on Frank Lloyd Wright Boulevard, between Hayden Road and Loop 101.

The change in traffic volumes on arterial streets from 1996 to 2004 is shown in Figure 9-3. Loop 101 was opened to traffic in Scottsdale between July 1998 and April 2002, so the volume changes are impacted by the opening of this freeway. Typically, volumes on arterial streets that are parallel to a new freeway will drop and then gradually increase back to pre-freeway levels. The largest increase in traffic in the Airpark study area, over 50 percent, is on Scottsdale Road, from Paradise Lane to north of Loop 101, and on Frank Lloyd Wright Boulevard, from Hayden Road to Loop 101. The increase is due to growth in the area as well as interchange access to the freeway. A decrease in traffic over the eight-year period was realized on Redfield Road, from Hayden Road to 76th Street, and on Hayden Road, from Raintree Drive south.

Scottsdale Road is a regional facility and is an essential direct link between northern Scottsdale and central/southern Scottsdale. Scottsdale Road and Loop 101 are the only continuous north-south roadways in the vicinity of the Airpark. Consequently, Scottsdale Road is critical to traffic circulation in and around the Airpark.

On-street parking and inadequate parking for business use and employees are issues in some places in the Airpark. In locations where shift work is taking place there can be inadequate parking for both the shift that hasn't left yet and the shift that hasn't started yet. When there is a lack of room for parallel on–street parking, drivers often park head-in, which can block truck access to other businesses in the surrounding area. In some places of the Airpark, delivery trucks while unloading goods and/or waiting for the next cargo to be loaded, will park on-street causing concern about remaining available parking and aesthetics. A solution under consideration for the Airpark is to select key roads that are necessary for circulation and identifying those as no parking areas, allowing parking on alternative roads within the Airpark.

2.1.1 Transit

Existing transit service to the Airpark is characterized by four fixed-route bus lines operating on the arterial grid system. These bus routes operate from 5 a.m. to midnight on weekdays

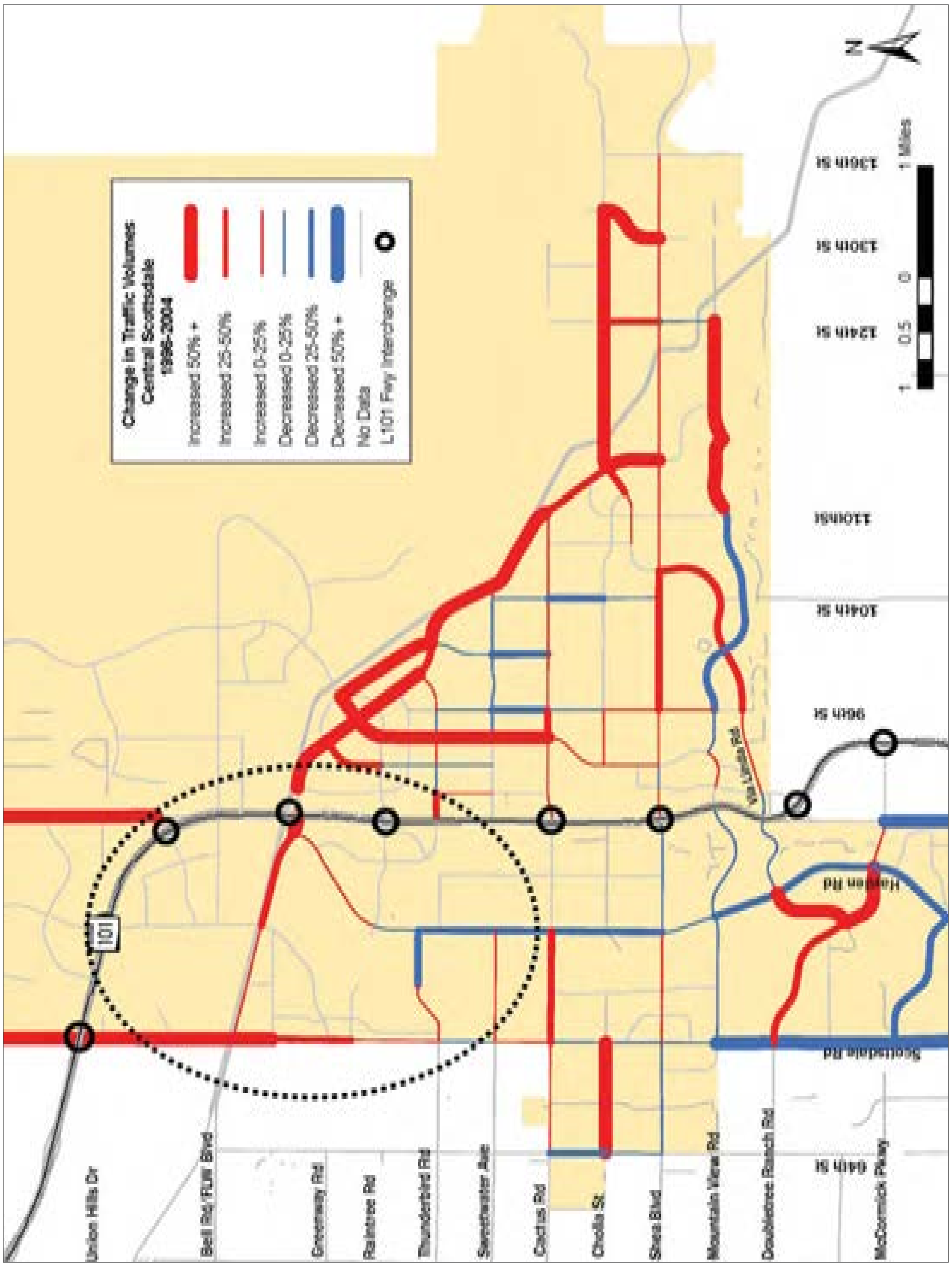


FIGURE 9-3: Change in Traffic Volume, Central Scottsdale 1996-2004

with 15 (peak) to 30 (off-peak) minute headways on the Scottsdale Road and Hayden Road routes, and 30 minute headways both peak and off-peak on the Bell Road/Frank Lloyd Wright Boulevard route. Service is provided at 30 minute headways all day on Saturday and Sunday on the Scottsdale Road and Bell Road/Frank Lloyd Wright Boulevard routes, and with 60 minute headways on the Hayden Road route (Table 9-1).

TABLE 9-1: Existing Transit Services

Route	Name	Origin/Destination	Existing Weekday Headway (peak\off-peak)	Year RTP Funding Begins
Supergrid				
72	Scottsdale/Rural Rd	Loop 101 (July 2007) to Chandler Fashion Center	15 minutes\ 30 minutes	July 2006
81	Hayden Rd/McClintock Dr	Bell Rd to Dobson Rd and Frye Rd	15 minutes\ 30 minutes	July 2014
170	Bell Rd	Hayden Rd to Arrowhead Towne Center	30 minutes	July 2018
154	Greenway Rd	Greenway – 51st Ave to Scottsdale Airport	30 minutes	

Source: HDR | SRBA and TTI RTP Evaluation Reports I, II and II, 2007

2.1.2 Pedestrian and Bicycle Facilities

The Airpark was initially developed as a low-density industrial employment center, and was not designed to readily accommodate pedestrian and bicycle travel. Today, the Airpark is characterized by wide vehicular roadways with narrow sidewalks and no bike lanes. However, the emergence of the Airpark as a major employment center has increased the need for pedestrian and bicycle facilities, especially given the shift from low-density industrial employment to higher density office and commercial development. This shift has resulted in a variety of trip generators that need improved pedestrian and bicycle access. For example, recent developments near the Airpark, such as Kierland Commons, have site layouts that emphasize and encourage internal pedestrian circulation. However, it still remains difficult to access these sites if walking to and from another location. Additionally, the *General Plan* Land Use Map and Character Types Map include areas of urban and mixed-use land uses, primarily to the north and east of the Airpark, to support Airpark employees. These land use categories include single family and multi-family housing that have the potential for providing future transportation options such as a neighborhood circulator, transit or bike routes connecting to, and circulating through, the Airpark. An example of such a project is a 32-acre mixed-use development located between the Greenway-Hayden Loop, Butherus Drive, and Scottsdale Road, called Scottsdale Quarter. This approved project is expected to offer housing, office, and retail opportunities, and a site plan has been approved by the City.

3.0 FUTURE CONDITIONS

3.1 Traffic and Circulation

Forecasted 2030 traffic volumes from the Scottsdale area travel demand model indicate that traffic volumes are expected to closely match proposed roadway capacity for the majority of major roads in and around Scottsdale Airpark. The greatest anticipated problem areas are: Scottsdale Road from Thunderbird Road to Loop 101, and Frank Lloyd Wright Boulevard from Hayden Road to Loop 101. Some segments of Airpark area roadways may be able to expand capacity through roadway improvements such as ITS, access management, expanded transit services, intersection improvements, and other measures.

With the implementation of all projects envisioned within the current CIP or in this proposed City of Scottsdale *Transportation Master Plan*, Scottsdale Road will still remain the only continuous north-south arterial roadway near the Airpark. The traffic forecast shows continued growth, with traffic volumes on Scottsdale Road increasing from approximately 47,000 vpd in 2006 to as high as 52,900-62,200 vpd between Frank Lloyd Wright Boulevard and Thompson Peak Parkway in 2030. Daily volumes on Frank Lloyd Boulevard are also expected to climb from 47,000 vpd near the Hayden Road/Loop 101 area to nearly 50,800 vpd.

4.0 PLANNED IMPROVEMENTS

4.1 City of Scottsdale Capital Improvement Plan (CIP)

Capital improvement projects are identified by the City based on the extent to which they meet the City Council's goal of providing for the safe, efficient, and affordable movement of people and goods throughout the City. Planned transportation projects meet the desired outcome of providing multi-modal options and, therefore, include, but are not limited to, Airpark roads, transit, bicycle, and pedestrian improvements. Table 9-2 contains a listing of roadway improvement projects planned for the Scottsdale Airpark area for fiscal years 2008 through 2012.

TABLE 9-2: Capital Improvement Plan (Airpark area)

Project/Street	Project Description	Estimated Completion
S0304 Frank Lloyd Wright Blvd – Scottsdale Rd to Shea Blvd	Construct a series of localized turn lane improvements and access control modifications, including median modifications, throughout the corridor.	2009
S0317 Thunderbird Rd/Redfield Rd – Scottsdale Rd to Hayden Rd	Build additional turn lanes at Scottsdale Rd and Hayden Rd, and realign 73rd St to the east.	2008
S0601 Loop 101 Frontage Rd north Hayden Rd to Pima Rd	Construct a westbound frontage road on the north side of Loop 101 between the Hayden Rd and Pima Rd/Princess Dr freeway interchanges. The project will include two travel lanes, a bicycle lane, a sidewalk, street lights, and drainage improvements.	2009
NEWB3 Freeway Frontage Rd south Hayden Rd to Pima Rd	Construct an eastbound frontage road on the south side of Loop 101 between the Hayden Rd and Pima Rd/Princess Dr freeway interchanges. The project will include two travel lanes, a bicycle lane, a sidewalk, street lights, and drainage	2010

TABLE 9-2: Capital Improvement Plan (Airpark area)		
Project/Street	Project Description	Estimated Completion
S7005 Scottsdale Rd – Frank Lloyd Wright Blvd to Thompson Peak Pkwy	Design and construct a six-lane major arterial cross section with landscaped median, turn lanes, bicycle lanes, sidewalks, curb and gutter, roadway drainage, and intelligent transportation system facilities. Additional turn lanes at Frank Lloyd Wright Blvd and a new pedestrian crossing of the Central Arizona Project Canal will also be included.	2008
S0405 Loop 101 – North Frontage Rd	Design and construct a frontage road of two westbound lanes, including bike lanes, with roadway drainage, on the north side of Loop 101, from the Scottsdale Rd freeway off-ramp to the Hayden Road freeway on-ramp.	2007
T9902 Loop 101 Park-and-Ride Lot	Complete site selection and environmental clearance process to meet federal grant requirements. Once location is identified, purchase, design, and construct park-and-ride lot.	2009

Although not programmed for construction in the current CIP, an Airport tunnel concept is included in the MAG RTP. There have been two studies prepared for the City of Scottsdale regarding the Scottsdale Airport Tunnel. The *Airport Area: East/West Corridor Feasibility Study* (October 16, 1991) concluded that none of the three east/west alternatives studied appeared to be cost effective and suggested improving the existing transportation system to eliminate the volume/capacity deficiencies; however, the concept of a tunnel continued to have support so an additional study was developed. The *Traffic and Feasibility Report for the Airport Tunnel Study* (November 23, 1999) evaluated "how" to construct the tunnel, not if it was justified. It analyzed two east/west alignments connecting Butherus Drive west of the Scottsdale Airport to Raintree Drive east of the Airport. The northern alignment provides a direct connection between these streets and the southern alignment followed the existing roadway alignments.

The RTP includes $64.5 million (2006 dollars) for the construction of a tunnel underneath the Scottsdale Airport. Scottsdale would have to provide 30 percent matching funds, $19.4 million, in order to receive the $64.5 million in regional funding. Thus, there is nearly $84 million potentially available for tunnel construction or other improvements if they can be shown to provide greater circulation benefits.

In addition to the Capital Improvement Program for Scottsdale roads, transit, bicycle, and pedestrian projects, the Scottsdale Airport also has a capital improvement program, as shown in Table 9-3.

TABLE 9-3: Capital Improvement Program (Scottsdale Airport)

Project	Project Description/Status	Estimate Comple-tion
Taxiway Connector Construction	Out to bid	
Perimeter Rd Construction	Design	
Design and Construct Greenway Connectors	Design	
Airport Terminal Area Renovations	Re-bidding the parking lot	
Airport Security Fencing	Re-bidding with parking lot	
Airport Parking Lot Lighting Upgrades	Re-bidding with parking lot	
Airport Security Lighting (Main Aprons)	Designed/pre-bid phase	
Airport Security System Improvements	Procurement	
Airport Master Plan Update	Underway in March 2007	
Washrack/Pollution Control Expansion	Design	
Airport Pavement Preservation	Phase 1 of 3 completed	
Runway Safety Enhancements Phase 1 (new project)		2007
Terminal Area Parking and Roadway Improvements (amended project)	Increase parking spaces and improve vehicular traffic circulation. Includes landscaping.	2008
Install Apron Lighting (amended project)	Installation of twelve new overhead light poles to increase main apron safety and security	2008
Rotating Beacon Upgrade (amended project)	Raise height of beacon to increase visibility (from 65 feet to approximately 90 feet); replace aging light unit.	2008
Runway Safety Enhancement Phase 2 (new project)		2008
Airport Maintenance Facility (amended project)	Develop suitable storage and workspace for maintenance staff and vehicles.	2008
Pavement Reconstruction – Aircraft Parking Aprons (amended project)	Replace deteriorated pavement; increase weight capacity to accommodate jets	2011
Airpark Taxilanes 1 and 2 Reconstruction (new project)	Replace deteriorated pavement	2009

4.2 Planned (Programmed) Transit Improvements

Planned (programmed) transit service in the Airpark consists of the transit improvements identified in the RTP. The RTP was approved by voters in November 2004 through Proposition 400 and extends the regional half-cent sales tax for transportation for 20 years. The planned transit service in the Airpark in the RTP is provided in Table 9-4. In some cases the routes and operations are the same as existing service, but funding through the RTP will replace or augment City of Scottsdale funding for transit, potentially enabling the City to use funds for other services or routes. The North Loop 101 Connector and the East Loop 101 Connector (express or limited stop bus service) may help to address future commuter needs. In addition, through the RTP the City has a HCT service in the form of BRT for the Scottsdale Road corridor up to Shea Boulevard programmed for 2014.

TABLE 9-4: Planned Transit Service				
Route	Name	Origin/Destination	Planned Weekday Headway (peak\off-peak)	Year RTP Funding Begins
Supergrid				
72	Scottsdale/Rural Rd	Loop 101 (July 2007) to Chandler Fashion Center	10 minutes\ 15 minutes\ 30 minutes	July 2006
81	Hayden Rd/McClintock Dr	Bell Rd to Chandler Fashion Center	15 minutes\ 30 minutes	July 2014
138	Thunderbird Rd	Litchfield Rd to Scottsdale Airpark	30 minutes	July 2019
170	Bell Rd	Hayden Rd to Arrowhead Towne Center	15 minutes\ 30 minutes	July 2018
Express Bus/Bus Rapid Transit				
TBD	Scottsdale Rd Bus Rapid Transit	Chandler Fashion Center to Shea Blvd (recommended in Transit Element of Transportation Master Plan to extend to Airpark area)	TBD	July 2014
TBD	North Loop 101 Connector	Surprise Park-and-Ride to Scottsdale Airpark	12 daily trips	July 2007
TBD	East Loop 101 Connector	Chandler Park-and-Ride (Loop 202 and Germann Rd) to Scottsdale Airpark	8 daily trips	July 2008 (pending the completion of HOV lanes on the Loop 101)
TBD	Pima Express	Tempe CBD and Phoenix CBD to Scottsdale Airpark	8 daily trips	July 2012
TBD	Anthem Express	Scottsdale Airpark to Anthem (I-17 and Anthem Way)	10 daily trips	July 2017

Source: HDR | SRBA and TTI RTP Evaluation Reports I, II and II, 2007

5.0 OPPORTUNITIES/RECOMMENDATIONS

5.1 Internal Circulation

Recommendations to facilitate internal circulation over the long-term *Transportation Master Plan* horizon include an effective multi-component parking management strategy, implementation of a Transportation Demand Management (TDM) Program, and the designation of certain streets internal to the Airpark that would facilitate travel of non-motorized modes, that is, pedestrians and cyclists.

5.1.1 Parking Management and Travel Demand Strategies

The implementation of a sustainable parking management strategy is recommended for the Airpark area, as it continues to establish itself as a regionally significant employment generator, with expected increased densities in office and commercial space. A long-range strategy designed to effectively manage existing and future parking supply is recommended. A parking management program may consist of the following basic components: increase the effective supply of short-term parking; reduce overall demand for parking in the Airpark area; and implement TDM incentives. Currently, there are issues with loading and delivery to businesses in the Airpark as well as the availability of on-street parking in some locations.

The effective supply of short-term parking could be increased by implementation of shared parking solutions into the development approval process. Shared parking is a concept that recognizes the fact that different land uses attract customers, workers, and visitors at different times throughout the day. Airpark commercial property developers could benefit not only from lower construction costs, but also from maximizing the benefits of the emerging commercial character where workers and visitors park together in shared facilities thereby reducing reliance on connections to scattered facilities. Shared parking strategies include:

- Limiting reserved parking for individuals and groups; and
- Encouraging parking requirements that take into account the peak-demand land uses in the surrounding area and encourage common parking facilities to be located near one another.

Overall demand for parking in the Airpark area could be reduced through encouragement of remote sites for long-term users, local area transit circulators, and pedestrian enhancements to improve access to and from such facilities. Demand reduction tactics may include the following measures:

- Reinforce walkable, "park-once" districts in the Airpark area where multiple trip purposes can be accomplished with a single automobile trip (that is, home-to-work trips, mid-day lunch and other short internal area trips); and
- Reinforce pedestrian-scale, context-appropriate streetscape enhancements in each identified "park-once" district.

Travel Demand Management incentives can be implemented that encourage alternative travel modes through development approval incentives for developers agreeing to implement TDM programs, and increased capacity for compact cars, bicycles, and motor bikes.

Many urban and suburban employment centers are successfully managing their parking problems by reducing demand and by encouraging the use of readily available alternatives to the typical commute by single-occupant vehicle. Such demand reduction polices may include employer transit contributions and flexible work schedules. While policies of these types are almost always initiated by local government, their success depends upon strong commitment and partnership with the local business community.

Changes to land development regulations may be developed to support TDM programs. Credits may be allowed for building owners and developers for the provision of bicycle lockers and other related amenities, and floor-area ratio bonuses may be applied for projects that provide lower parking ratios, or for developments that participate in a local area parking management program. The Bicycle Element of the *Transportation Master Plan* recommends that by 2010 the City reassess the current bicycle incentives program and determine whether additional incentives, or more extensive mandates, should be developed.

The location and design of existing and future parking facilities may be managed in a manner that accommodates multiple trip purposes with a single parking space, through the establishment of "park-once" districts at appropriate points throughout the Airpark. These "park once" districts would be located and sized in a manner to maximize the number of pedestrian trip-making opportunities associated with a single parking event.

5.2 Circulation Options

Regional access to the Scottsdale Airport and Airpark is extremely important to support the expectations that the Airpark will likely become the largest employment center in the Valley. Opportunities for potential improvements have been identified and has been evaluated based on its ability to meet the *Transportation Master Plan* Goals and relevant technical criteria established by the Scottsdale Transportation Commission.

Airpark area circulation options.

- Tunnel under the Airport runway
- Add a ring road to provide additional Airpark area circulation with the southern connection of Thunderbird/Redfield Road to Raintree Drive; the northern connection of a frontage road on the south side of Frank Lloyd Wright Boulevard from Northsight Boulevard to Greenway/Hayden Loop; and using Hayden/Northsight Boulevard on the east side; and 73rd Street on the west.
- Improve traffic flow on the east side of the Airport through Raintree Drive modifications in the vicinity of Loop 101
- Improve east/west traffic flow on the west side of the Airport through Paradise Lane modifications
- Greenway/Hayden Loop/Frank Lloyd Wright Boulevard intersection modifications
- Frank Lloyd Wright Boulevard modifications
- Hayden Road/Northsight Boulevard modifications

5.2.1 Tunnel Under the Airport Runway

The Scottsdale Airport runway inhibits roadway connections especially for east-west traffic, but north-south traffic as well. The City has examined the potential to construct a tunnel with two previous studies: The *Airport Area - East/West Corridor Feasibility Study* (October 16, 1991) and the *Traffic and Feasibility Report for the Airport Tunnel Study* (November 23, 1999). The *Airport Area - East/West Corridor Feasibility Study* recommended improvements to the existing transportation system to eliminate the volume/capacity deficiencies, and concluded that tunnel alternatives appeared not to be cost effective given available resources. The *Traffic and Feasibility Report* evaluated potential tunnel construction methods, but did not address financial feasibility of the tunnel concept. This report analyzed two east-west alignments that would connect Butherus Drive west of the Scottsdale Airport to Raintree Drive east of the Airport. The RTP approved by the voters in 2004 includes approximately $65 million (in 2006 dollars) for the construction of a tunnel under the Scottsdale Airport. The City would have to provide 30 percent matching funds or approximately $20 million to receive the regional funding, providing approximately $85 million for tunnel construction.

Considerations: While a tunnel would likely improve circulation within the Airpark and would provide connections for people on the east side of the Airport to Phoenix destinations, the construction and operating costs would be high. There may be Homeland Security issues with a tunnel that have become more critical since 9/11. Tunnel construction would impact Airport operations. The preferred location of the tunnel (Butherus to Raintree) may not be feasible, and moving the location reduces the positive impacts of this connection.

The Transportation Commission recommended removing this option from consideration at their June 21, 2007 meeting

5.2.2 Add a Ring Road to Provide Additional Airpark Area Circulation

Thunderbird Road currently curves north to connect to Redfield Road just east of the Scottsdale/Thunderbird roads intersection. The section line alignment of Thunderbird Road is a residential or minor collector level street from 76th Street to 87th Street. Plans are in the design stages for a realignment of 73rd Street to the east with a signal at Thunderbird Road as part of CIP Project S0317. Northsight Boulevard is a private road west of Hayden Road and has a number of sharp turns which could be smoothed to allow for better traffic flow. The ring road concept would include:

- Building of a frontage road south of Frank Lloyd Wright Boulevard, just north of the Airport runway, connecting Northsight Boulevard to Greenway-Hayden Loop.
- Enhancements to 73rd Street to provide bicycle and pedestrian facilities and potentially on-street parking and enhancing the connections to the frontage road on the north end of 73rd Street.
- An enhanced connection from Thunderbird Road to Raintree Drive either by widening Redfield Road between Scottsdale and Hayden roads to four lanes of travel, or by maintaining the option of building a new road (Thunderbird-Raintree Loop) connecting Raintree Drive to the Scottsdale/Thunderbird Road intersection, as Airpark properties redevelop. This new road could be either east or west of Hayden Road, but is designed to become a new east/west connector to get around the Airport.
- Enhanced turning movements on Thunderbird/Redfield Road to make traffic flow more easily and smoothly.
- Potentially widening Hayden Road between Redfield Road and Raintree Drive to accommodate additional traffic flow.
- Realignment of Northsight Boulevard to allow for smooth transition from Hayden Road to the Frank Lloyd Wright/Airport frontage road.

5.2.3 Additional Roadway Improvements for Airpark Circulation

- Realign 76th Street into 76th Place at Redfield Road, marking by an offset, signalized intersection or could be accomplished by building a skewed intersection.
- Potential widening of Raintree Drive to six-lanes to accommodated additional traffic flow.
- Modification of the four-way stop sign traffic control along Paradise Lane to two-way stops or other traffic control measure such as roundabouts to enhance traffic flow east/west along Paradise Lane, providing an alternative to Frank Lloyd Wright Boulevard.
- Potential right-turn arrows or other intersection modifications at Greenway-Hayden Loop and Frank Lloyd Wright Boulevard intersection modifications.
- Advance storage lanes for westbound left turns to Hayden Road and eastbound and westbound left turns to Loop 101 on-ramps at Frank Lloyd Wright Boulevard.
- Advance storage lane for eastbound right turns from Frank Lloyd Wright to the southbound Loop 101 on-ramp.

- Dual side by side left-turn storage between the Hayden Road and Loop 101 traffic signals on Frank Lloyd Wright.
- Access road south of the CAP Canal from approximately 600 feet west of Hayden Road to the southbound Loop 101 frontage road with a simple "T" intersection on Frank Lloyd Wright Boulevard.

5.2.4 Loop 101 Freeway Connections

In addition to internal Airpark circulation, some recommendations involve the roadway and freeway system external to the Airpark area. The following are some preliminary recommendations that need to be worked out with ADOT.

- Northsight Boulevard/Thunderbird Road to Loop 101 - HOV connections;
- Hayden Road to Loop 101 - potential HOV connection; and
- Miller Road to Loop 101 - enhanced interchange.

With the freeway express bus services to be provided through Proposition 400 in 2007 and 2008, enhancing the connections into the Airpark will benefit area employers and commuters. The East Loop 101 express bus connector is scheduled to begin service following the completion of construction of the HOV lanes on the Loop 101 in summer of 2008. Coordinating HOV interchanges at Northsight Boulevard/Thunderbird Road could enhance the service of this express bus system which terminates at the Scottsdale Airpark.

All of these options would need to be discussed and partnered with ADOT to accomplish.

5.2.5 Bicycle/Pedestrian Improvements for the Airpark Area

Direct connection to Frank Lloyd Wright Boulevard for the CAP Canal path (per the recommendations of the CAP Feasibility Study).

- Future potential grade separation for the CAP Canal path where it meets the Loop 101 Freeway.
- Initial bicycle facility improvements focusing on:
  - Greenway-Hayden Loop
  - Redfield Road
  - 73rd Street
  - Hayden Road
  - Raintree Drive
  - Northsight Boulevard
- Primary pedestrian routes:
  - 73rd Street
  - 76th Street
  - 78th Street

Roadway, freeway interchanges, bicycle and pedestrian improvements are shown in Figure 9-4.

5.2.6 Transit Options

- Service frequency and hours of service improvements on local bus routes.
- Use potential future HOV direct access to serve Airpark from East Loop 101 connector and the Surprise/Scottsdale Loop 101 Connector.
- Connect local and express bus service to park-and-ride located in the vicinity of Scottsdale Road/Loop 101.
- Enhance Scottsdale Road bus service with limited-stop service (extend the Proposition 400 BRT program from Shea Boulevard to the Airpark or Loop 101). Provide 10 minute peak-hour frequency and enhanced shelters.
- Examine the feasibility of an Airpark Area Circulator, partnering with the business community.
- Examine the feasibility of an Airpark transit center.

5.2.7 Transportation Demand Management Options

- Establish a citywide transportation travel demand program per the Policy Element of the *Transportation Master Plan*.

FIGURE 9-4: Airpark Area Roadway System Modifications

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10 CENTRAL/DOWNTOWN SCOTTSDALE CIRCULATION STUDY

10 CENTRAL/DOWNTOWN CIRCULATION STUDY

1.0 INTRODUCTION

The *Transportation Master Plan* was initiated in November 2005 with Council approval of a contract with HDR Engineering, Inc. The scope of this project includes an examination of the Central/Downtown area of Scottsdale to address Downtown area transportation issues such as Chaparral Road, nighttime and daytime congestion, and ways to encourage non-automotive travel.

The Central/Downtown Circulation Area encompasses the most mature and most dense core of the City of Scottsdale, its traditional Downtown and adjacent areas (Figure 10-1). The study area is bounded by 64th Street on the west, McDonald Drive on the north, Loop 101 on the east, and Thomas Road on the south. It is located between the Scottsdale/Phoenix/Paradise Valley jurisdictional boundary on the west, and the Scottsdale/SRPMIC boundary to the east. Scottsdale's Downtown boundary is typically defined as 68th Street on the west, Chaparral Road on the north, Miller Road on the east, and Earll Drive on the south.

The Master Plan area study was designed to provide objective data regarding existing and projected access and travel demand to and from, around, and through Downtown, and options to address future demand. To provide the most accurate data and projections, the project team has worked closely with MAG regarding their socioeconomic projections and the transportation modeling based on those projections. In January 2007, MAG began transferring their modeling system to new software and helped train City of Scottsdale staff in the new modeling software. The MAG transportation model is a regional model for all of Maricopa County. The new model will enable Scottsdale staff to do more precise sub-regional modeling (as opposed to regional modeling) for Scottsdale and specific areas of Scottsdale, including the Central/Downtown area. The modeling data was transferred to Scottsdale in early April and updated by MAG in June; the analysis has been completed for inclusion in the Transportation Commission's master plan deliberations for the Central/Downtown area and the information will continue to updated and refined.

One of the primary reasons for the Central/Downtown study was a resolution of the question of Chaparral Road. The portion of Chaparral Road between Miller Road and 78th Street was built as a two lane roadway and remains so. Through study and traffic analysis in April 2007 of the impacts of maintaining that section of Chaparral Road as a two-lane roadway, it was determined that it is not necessary to widen the road – other nearby roadways can handle the additional future traffic. On May 29, 2007, the City Council, in response to neighborhood requests, removed the concept of adding capacity by widening the roadway from further consideration in the *Transportation Master Plan*. Background information provided to the City Council is included in Appendix 10-A.

2.0 CENTRAL/DOWNTOWN AREA BACKGROUND

2.1 Development Patterns and Planning

When incorporated in 1951, Scottsdale was about two square miles in size and home to about 2,000 residents. The Central/Downtown circulation study area includes those original two

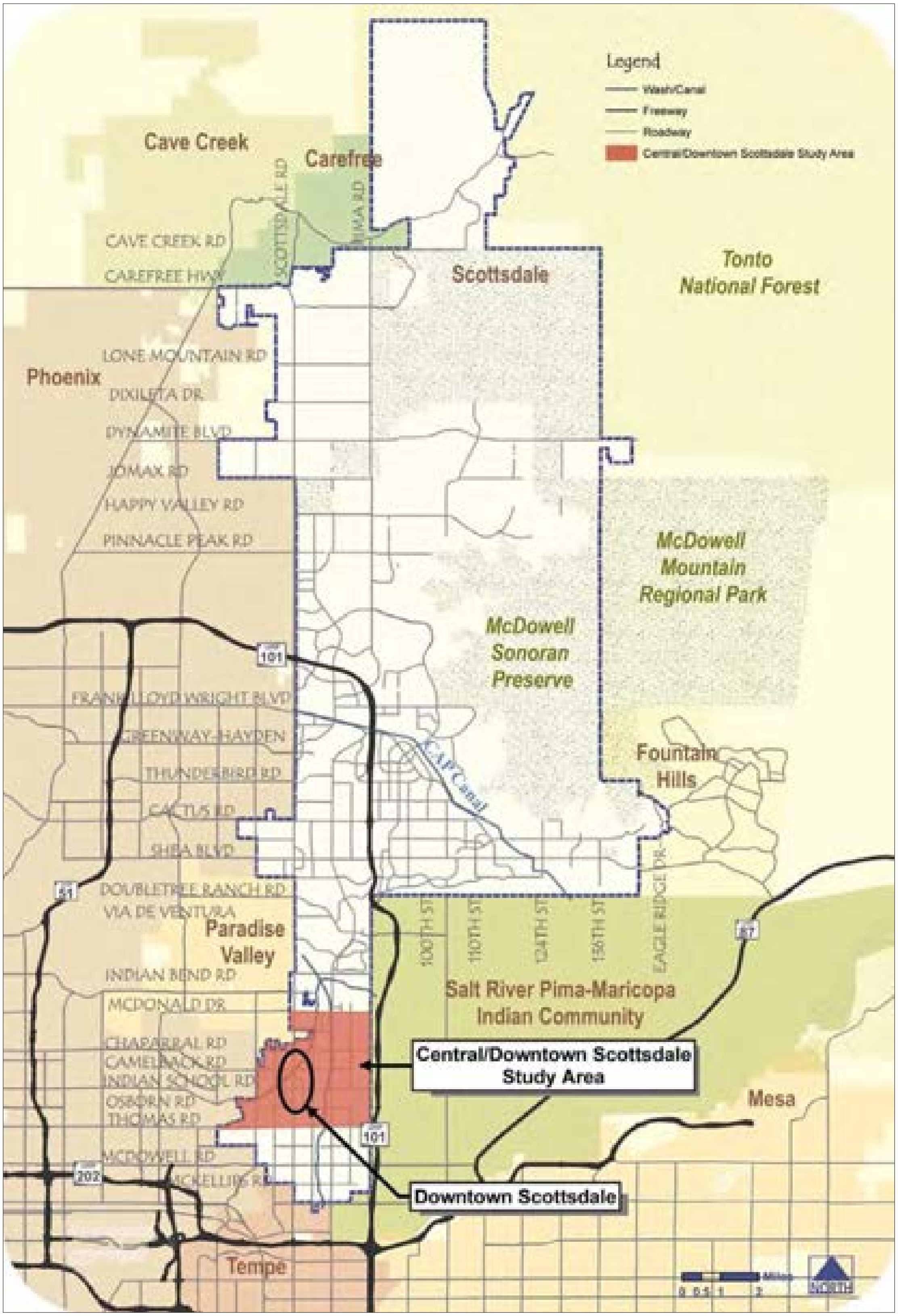


FIGURE 10-1: Central/Downtown Study Area

square miles. The community developed mainly as a commerce center for local agricultural activity near Scottsdale's current Downtown. During the 1950s and 1960s, Scottsdale expanded through annexation from Maricopa County, first south from Downtown and then northward to Deer Valley Road. By 1965, Scottsdale was 60 square miles with nearly 65,000 residents. During the late 1960s, major service uses were established with Los Arcos Mall and the growth of small businesses in and around Downtown. Public amenities were also developed with the beginning of a strong public park system and creation of the Civic Center Complex. This area of Scottsdale contains a traditional development pattern of single family residential homes, with retail, office, and apartment home uses along the arterial roadway network. Frequently, schools are located in the center of the one-mile square grid.

The roadway network in this area of Scottsdale generally follows a grid pattern of streets. These streets are usually arterial roadways on the mile alignment and collector roadways on the half-mile alignment.

2.1.1 Downtown Development

The Downtown area of Scottsdale has served as the functional and symbolic center of the City since its incorporation. As the City grew, the role of Downtown shifted from a country town center serving the surrounding agricultural activity to a community center for a budding array of single family homes. The City's growth has led to continuous change in Downtown.

As the City grew and Downtown was no longer the geographic center of the community, Downtown was redefined as the commercial, cultural, civic, and symbolic center of the community. Downtown's character is defined in a multitude of ways: as a tourist attraction; as a specialty retail environment; as a place where the visual and performing arts flourish; as an employment center; and as a blend of the historic and contemporary.

In 1984, the City Council adopted the *Downtown Plan*, a long-range policy document intended to guide the development decisions for Downtown. The plan encourages Downtown to become a mixed-use center with an emphasis on the integration of historic resources, specialty retail, office, residential, restaurant, and hotel uses. One of the primary components of the *Downtown Plan* was to create residential land uses to ensure "24-hour occupancy" in Downtown – thus preventing the urban decay often experienced in downtown areas. Some milestone projects approved under the *Downtown Plan* include:

- Scottsdale Fashion Square Mall (1986)
- Marriott Hotel (1986)
- Scottsdale Financial Center Office Complex (1986)
- Scottsdale Galleria Mall (1987)
- Scottsdale Stadium Expansions (1990, 2006)
- San Marin Multi-Family Residential (1991)
- Couplet Roadway System (1991)
- Loloma Transit Center (1995)
- Medical Campus Expansion (1996-Present)
- Scottsdale Fashion Square Nordstrom Expansion (1996)
- Finova Office Headquarters (1997)
- Lincoln Towne Center Mixed-Use (1999)
- Scottsdale Waterfront Mixed-Use Commercial/Office (2003)
- Loloma/Main Street Plaza Mixed-Use Commercial/Residential (2004)

- Optima Camelview Residential (2004)
- Hotel Valley Ho/Main Street Residential (2004)
- Stetson/South Canal Mixed-Use Commercial/Office (2004)
- Rose Garden Residential (2005)
- Portales Corporate Center II Office (2005)
- W Hotel (2005)

Since 1984, the *Downtown Plan* and subsequent community efforts have been successful at guiding the growth, both financially and physically, of Downtown. Downtown's more recent successes under the plan include the addition of more than 2,500 new residential units as well as public and private development investment totaling $2 billion.

Downtown ranks among the major activity centers in the region. The Downtown area includes a diverse range of employment, residential, commercial, retail, entertainment, educational, civic, and cultural facilities (Figure 10-2).

Mixed-Use

Significant infill projects have either been built recently or are planned for construction during the next five years. Public and private investment includes a mix of residential, retail, and office uses. Developments with more than $10 million in private investment include: Scottsdale Waterfront, W Hotel, Main Street Plaza, Hotel Valley Ho, Third Avenue Lofts, Galleria Corporate Center, Scottsdale Oasis, Scottsdale Healthcare Osborn, Stetson Plaza/South Canal Bank Project, Main Street Residences, and Optima Camelview.

Residential

Downtown includes a wide variety of residential units, including new development and older single-family and multi-family residential. New projects, including those listed above, are expected to result in 2,500 additional residential units over the next three years.

Retail

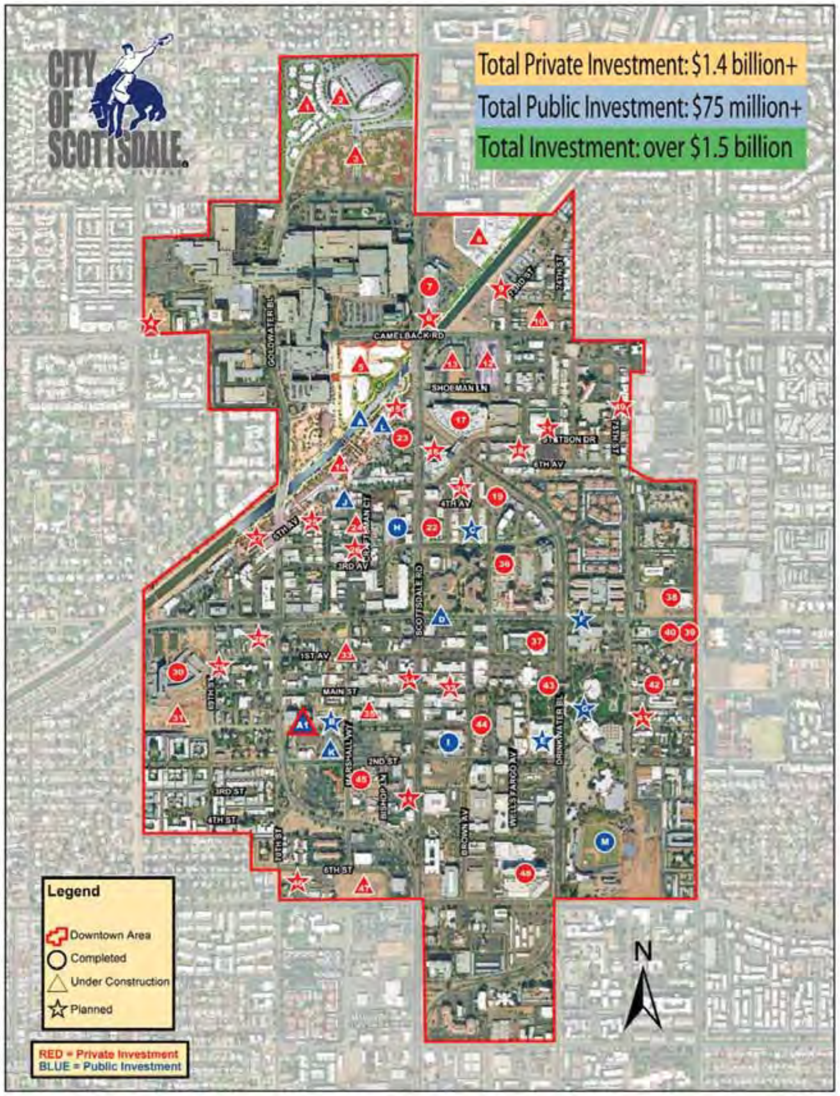
Downtown districts are known for their unique retail opportunities, and Scottsdale Fashion Square in the northwest quadrant of Downtown, has approximately 1.8 million square feet of gross floor area and performs in the top 1 percent of all malls in the nation (gross per square foot). The Scottsdale Waterfront is currently under construction (nearing completion) and includes 1.1 million square feet of mixed-use retail, office, and residential. These combined areas are regional trip generators for tourists and residents.

Civic

The Scottsdale Civic Center Mall lies in the southeast quadrant of Downtown and includes City offices, City Hall, the Civic Center Public Library, Scottsdale Center for Performing Arts, Scottsdale Museum of Contemporary Art (SMOCA), open space, and event gathering space. The Civic Center Mall area is also bordered by restaurants and a hotel.

Cultural/Entertainment

Downtown includes such cultural attractions as the Center for the Performing Arts, the Scottsdale Historical Museum, the SMOCA, and Theater 4301. Scottsdale Public Arts manages a number of outdoor art pieces throughout the Downtown area, including unique bus shelters,



Private Investment

- Portales Residential: New construction of 141 residential units with underground parking. Construction began 2006. Total Investment: $75 million
- Portales II Corporate Center: New construction of 179,000 sf of Class "A" office space with underground parking. Completion late 2006. Estimated Investment: $26.9 million
- Optima Camelview Village: New construction of 750 residential condo units and 38,000 sf of retail space. Opening late 2006. Total Investment: $250 million
- El Paseo: Proposed 20,000 sf neighborhood retail center. Estimated Investment: $2.5 million
- Scottsdale Waterfront: 11-acre retail, office and residential project located along the northern banks of the Arizona Canal. Phase 1 retail, office condo and two level underground parking structure opened late 2005. Phase 2 includes 366 planned residential condominium units. Total Investment: $250 million
- Renaissance II: Proposed mixed-use office/retail project on a former gas station site. Estimated Investment: $3 million
- Scottsdale Oasis Retail: A 38,550 sf specialty retail center at the northeast corner of Scottsdale and Camelback Roads. Completed 2005. Total Investment: $11 million
- Riverwalk Square: New construction of 200 condominium units, in 2 phases, is planned on the former Safari Hotel site. Total Investment: $90 million
- Minnezona Condominiums: Proposed 6-unit housing development on .18 acre. Completion anticipated 2007. Estimated Investment: $3.4 million
- Best Western Sundial: New construction of a three-story, 54 room boutique hotel to begin in early 2006. Total Investment: $12.9 million
- Second Street Commons: Proposed mixed use development with 25 residential units above street-level retail. Estimated Investment: $5 million
- W Hotel: New construction of a 225-room boutique hotel and 25 residential condo units, opening late 2007. Total Investment: $90 million
- The Upton: New construction of 10 condominiums arranged on four levels with a three-story desert oasis courtyard above underground parking. Construction began Summer 2006. Total Investment: $6 million
- Stetson Plaza: New construction of a mixed-use project, with office, restaurant, and retail, located on the south bank of the Arizona Canal along Stetson Avenue. Completion in 2007. Total Investment: $33 million
- Kyoto Restaurant: Proposed new restaurant to replace the existing Kyoto Restaurant. Estimated Investment: $5 million
- Saddle Ranch: Restaurant/bar with western theme. Total Investment: $1 million
- Galleria Corporate Center: Former retail mall completely remodeled into a Class "A" office complex. Completed 2003. Total Investment: $65 million
- Stetson/Wells Fargo: Planned remodel of existing building and second story addition. Estimated Investment: $500,000
- E4: New construction of a multi-themed dining and nightlife establishment. Opened late 2005. Total Investment: $3 million
- 4241 N. Winfield Scott Plaza: Proposed new 2-story office building to replace existing structure. Estimated Investment: $800,000
- Club JP: Proposed restaurant/bar in the downtown. Estimated Investment: $2.5 million
- Scottsdale Area Association of REALTORS®: Renovation of 1968 building at 4221 North Scottsdale Road. Project included extensive exterior and interior redesign and remodeling. Completed 2004. Total Investment: $750,000
- Baker's Square Remodel: Remodel of a restaurant located at Scottsdale Road and Stetson. Completed in early 2005. Total Investment: $100,000
- Pacific Realty Advisors: Replacement of an existing two-story building with a new building for retail/office type uses. Total Investment: $800,000
- The Gallery Residence @ Marshall Way: Proposed parking lot conversion into floor level gallery space and a two level residential unit. Estimated Investment: $1 million
- Janis Leonard Studio: Proposed mixed-use project with studio on first floor and private residence above. Estimated Investment: $1.25 million
- Rose Garden: New construction of a residential mixed-use development of 18,000 square feet of retail/restaurant space, 66 residential units, and public underground parking structure. Estimated Investment: $97 million
- Casa del Encanto: Proposed addition of a second story to an existing building. Estimated Investment: $600,000
- Lofts 69: Proposed new construction of 27 live/work units at 6901 N First Ave. Estimated Investment: $3 million
- Hotel Valley Ho: A comprehensive remodel of one of Scottsdale's original resorts with 194 boutique hotel rooms, 36 new residential units & restaurants. Opened December 2005. Construction ongoing on residential component. Total Investment: $82 million
- Residences on Main: New construction of 84 condo units, 62 townhomes and 3,000 sq. feet of retail. Estimated completion late 2007. Total Investment: $60 million
- Frontier Street Shop: New facade and interior remodel to an existing retail building. Estimated Investment: $2.1 million
- JW Harris: Expansion/remodel of existing building located at the Marshall and First Ave. Estimated Investment: $1 million
- The 4020 Building: Proposed removal of facade and interior of existing building and construction of a 4-story mixed-use building using existing buildings steel frame at Scottsdale Rd & First Ave. Estimated Investment: $4 million
- ASREB: Building upgrades, parking and landscaping improvements. Total Investment: $200,000
- Third Avenue Lofts: New construction of 88 residential loft units. Completed 2004. Total Investment: $31 million
- Mondrian Hotel: Completely remodeled 200-room hotel by prior owners completed in January 2004. Plans for more upgrades are underway. Total 2004 Investment: $7 million Estimated Future Investment: $5 million
- CVS Drug: New construction. Completed 2005. Total Investment: $940,000
- SWC Miller & Indian School: New construction of an office/ retail project. Completed 2004. Total Investment: $600,000
- 1st Street Project: New construction of an office/ residential project. Completed 2005. Total Investment: $375,000
- Studio 7540: Proposed office/residential project with underground parking. Total Investment: $1.5 million
- Main & McKnight: New construction of a mixed-use office/residential project. Completed 2005. Total Investment: $380,000
- The Park: Proposed renovation of a Civic Center Mall property into a 3-story, vertically mixed-use building with residential, office, and retail/restaurant uses. Total Investment: $1.1 million
- Bischoff Residence: Private residence addition above the existing Bischoff retail store. Completed 2004. Total Investment: $235,000
- Loloma 5: New construction of five live-work units designed by renowned architect Will Bruder. Completed 2004. Total Investment: $997,000
- Orange Row: New construction of a three-unit condo project on a vacant parcel. Estimated Investment: $700,000
- X Lofts: Planned new construction of 82 residential lofts located at the NW corner of Osborn Road and Bishop Lane. Total Investment: $20 million
- Scottsdale Healthcare Osborn Campus: A major hospital expansion, the addition of a new critical care unit, and two new parking structures. Completed 2004. Total Investment: $90 million
- Business Security Concepts: Proposed 1,400 sf office addition located just north of 6th Avenue on 75th Street. Estimated Investment: $300,000

Public Investment

- Arizona Canal at Scottsdale & South Canal Plaza Project: Construction in progress on the plaza, landscaping, pedestrian paths, bridges and other amenities. Total Investment: $11 million
- Main Street Southwest Museum: Proposed downtown art museum. Total Investment: $7.5 million
- Downtown Lighting Improvements: Custom street light fixtures for Main Street. Currently in design phase. Total Investment: $630,000
- Artist Bus Shelters: Artist Kevin Berry has been selected to design a number of artist bus shelters throughout the downtown area. Total Investment: $210,000
- SCA Remodel: Proposed addition of signature main entry, mezzanine level over a portion of atrium for conferences/meetings, new interiors, offices and efficiency upgrades to the HVAC system. Estimated Investment: $8 million
- Indian School Road Drainage: Plans to eliminate flooding through the construction of storm drains. Total Investment: $5.1 million
- Civic Center Mall Restroom Renovation: Reconstruction of the existing public restroom facility adjacent to the Scottsdale Historical Society. Total Investment: $467,000
- 5th Avenue Parking Structure: Completed 2005 Total Investment: $5.3 million
- Old Town Parking Structure: Completed 2005 Total Investment: $4.8 million
- Downtown Restrooms: Replacement of the existing 5th Ave restrooms. Currently under construction. Total Investment: $500,000
- Main Street Plaza Parking Structure: Completion in 2006 Total Investment: $2.4 million
- South Canal Bank Parking Structure: Completion late 2006 Total Investment: $5 million
- San Francisco Giants spring training complex: Add training facilities just east of Scottsdale Stadium, reconfiguring and improving portions of the stadium and upgrading the Giants training facilities at Indian School Park. Stadium Completed Spring 2006. Estimated Investment: $23.1 million

Public & Private Investment

- Main Street Plaza: A mix of 250 residential condo units, retail uses and public plaza space. Phase 1 completion in 2006. Total investment: $47.7 million ($700,000 public/ $47 million private)

FIGURE 10-2: Private and Public Downtown Reinvestment and sculpture. In addition, Scottsdale Stadium is at the south end of Downtown and hosts the San Francisco Giants during Cactus League Spring Training. Downtown is also known for active night life with many restaurants, bars, entertainment venues, and movie theaters.

Medical

Scottsdale Healthcare Osborn campus lies at the south end of Downtown and recently opened an expanded 55,000 square foot emergency center on site. The Scottsdale Healthcare Osborn campus employs over 3,300 and had a patient count of over 111,000 in FY 2006. Additionally, there are many supporting medical offices adjacent to the healthcare campus.

SkySong

SkySong is a 42-acre site located two miles south of Downtown at the southeast corner of McDowell Road and Scottsdale Road. The initial phase of the center will be completed by summer of 2008 and will include up to 300,000 square feet of research and office space with street level retail, service facilities, and a 325-unit apartment complex. It is anticipated that the full build-out of this site will include over 1 million square feet of research and office space, employment for 4,000 people, and a total of $300 million in capital investment. Entertainment and retail at SkySong are envisioned to keep the center active after 5 p.m. by providing unique live/work/play opportunities.

Although SkySong is not within the boundary of Downtown and is located outside of the Central/Downtown Study Area, the close proximity and large scale of this project will have some impact on Downtown circulation. SkySong has the potential to serve as a southern anchor to Downtown and support development in the approximately two-mile area between the southern boundary of Downtown (Earll Drive) and SkySong (McDowell Road). The circulation impact of SkySong is being evaluated as part of the traffic modeling process used for the Scottsdale *Transportation Master Plan*. A transit center is planned and funded in the vicinity of SkySong.

The development of a responsive mobility plan is critical to identify and address the demand from the development projects planned or under construction. The *Transportation Master Plan* addresses current and future transportation issues, and presents a planned approach to transportation and mobility that incorporates the demand management issues implied by these growth trends occurring in the Central/Downtown area. Companion Transit, Bicycle, and Pedestrian elements are included in the *Transportation Master Plan*.

2.2 The General Plan

The first Scottsdale *General Plan* was created for the City of Scottsdale by Maricopa County in 1960 and included plans for land use and streets, covering about 15 square miles south of Indian Bend Road. The City updated this plan in 1967, with several updates since that time. The most recent *General Plan* was adopted by the City Council in October 2001 and ratified by the citizens of Scottsdale at a March 2002 special election. The *General Plan* is consistent with existing land uses showing suburban neighborhoods with non-residential uses along the major roadway corridors. The McDowell Road and Scottsdale Road corridors south of Downtown are designated as mixed-use neighborhoods, allowing for greater flexibility in revitalization efforts and development of such projects as SkySong. The Land Use Element of the *General Plan* promotes land use patterns that help conserve natural resources, reduce dependence on the automobile, and alleviate traffic congestion. The opportunities for this kind of land use pattern are most likely in this area of Scottsdale.

The 2001 *General Plan* Community Mobility Element indicates roadways as "Citywide Systems" and "Regional Systems." McDonald Drive, Chaparral Road, 64th Street, Hayden Road, Pima Road, and the eastern halves of Camelback, Indian School, and Thomas roads are all designated as Citywide Systems streets. Scottsdale Road, Goldwater Boulevard, Drinkwater Boulevard, and the western halves of Camelback, Indian School, and Thomas roads are designated as Regional System roadways.

2.2.1 The Downtown Plan

In 1984, the City Council adopted the *Downtown Plan*, a long-range policy document intended to guide the growth and development decisions for 725 acres of Downtown. The plan calls for a unified strategy to raise the quality, character, marketability, and overall viability of Downtown. The plan encourages Downtown to become a mixed-use center with an emphasis on the integration of historic resources, specialty retail, office, residential, restaurant, and hotel uses. For the past 20 years, the *Downtown Plan* has framed public policy with regard to Downtown. The *Downtown Plan* includes Land Use, Circulation, and Downtown Summary sections. "Types" of land use categories – Type 1 and Type 2, indicate degrees of developmental intensity in Downtown. The Circulation Element of the *Downtown Plan* contains discussion of major and local streets, transit, easy-touse pedestrian links, and well-located, shared Downtown parking. One important aspect of the *Downtown Plan* Circulation Element is the two-way couplet system (Drinkwater and Goldwater boulevards), each portion of which emphasizes a particular direction of travel. The couplet of Drinkwater and Goldwater boulevards was built in accordance with the *Downtown Plan* Circulation Element and functions as additional access to and through Downtown.

2.2.2 Downtown Plan Update

In 2006, a comprehensive process to update the *Downtown Plan* was begun. A Scottsdale Downtown Town Hall was held in November 2006 as the "kick-off event" for the update of the *Downtown Plan*. Approximately 100 community leaders, business owners, and residents participated in three days of intense discussion and debate. The final report from this independent process recommended, among other ideas for Downtown enhancement, the widening of Chaparral, Indian School, and Thomas roads to enhance vehicular travel to Downtown. The final report was presented to City Council in February 2007.

The Town Hall report and recommendations are only the first step in process to update the *Downtown Plan* by spring of 2008. While the Town Hall report and recommendations will help form the basis for some of the vision, goals, and objectives to be achieved in an updated *Downtown Plan*, some of the more specific recommendations regarding circulation, cultural facilities, and open space planning will need to be technically analyzed and evaluated through both the *Transportation Master Plan* and *Downtown Plan* update processes, culminating in final adoption by the City Council.

2.3 City Zoning Ordinances and Development Regulations

2.3.1 Downtown Zoning Regulations

The purpose of the Downtown (D) zoning district is to identify Downtown by designation, to delineate special land use subdistricts, and to formulate appropriate development standards toward implementation objectives articulated in the *Downtown Plan*. Specific objectives of the *Downtown Plan* which the D district regulations implement include:

- Preserve and protect the character of the Fifth Avenue, Old Town, and West Main districts as pedestrian-oriented shopping areas;
- Encourage new hotel development to support specialty retailing Downtown;
- Attract new office development to sites suitable for such use;
- Provide opportunities and incentives for residential projects and for mixed-use development;
- Encourage historic preservation;
- Establish incentives for underground parking and off-site parking in order to promote more efficient use of land and to improve the appearance of Downtown;
- Allow latitude for creative design and architectural variety within limits established to preserve solar access, light, and privacy, and to create definitive streetscapes;
- Encourage joint project planning by neighboring property owners; and
- Establish incentive and bonus system to obtain public amenities.

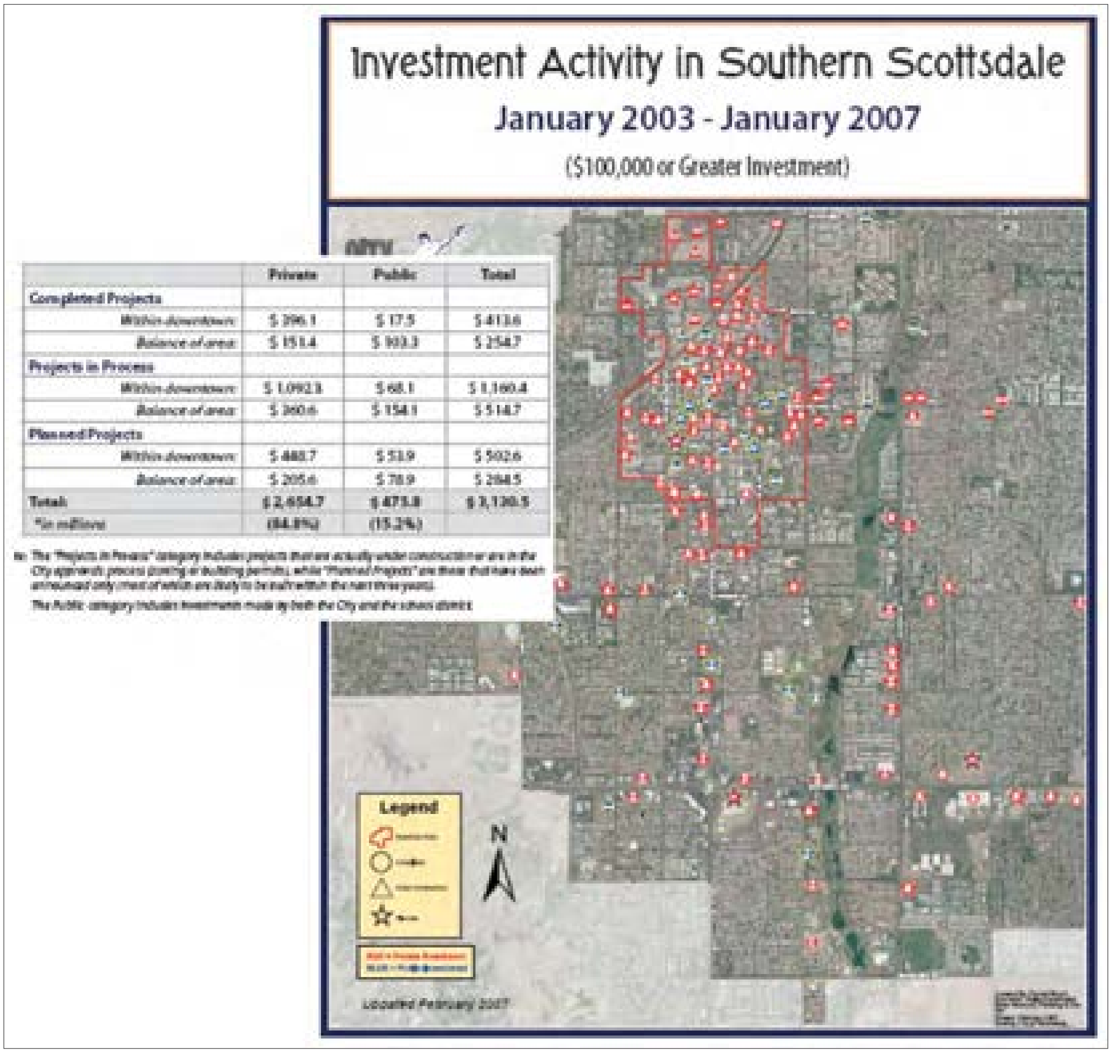
The primary purpose of the Downtown Overlay (DO) zoning district is to create new opportunities for the development or expansion of properties that do not have D (Downtown) zoning. The Downtown Overlay also provides additional regulations for properties with and without Downtown zoning. Specific objectives of the Downtown Overlay include:

- Simplify parking regulations to ease the Downtown development process;
- Provide incentives for new buildings, remodels, for buildings with new tenants, or for building area expansions of smaller Downtown businesses;
- Allow for more residences in Downtown;
- Maintain a mixture of land uses to keep Downtown vital in the day and night;
- Minimize the impact of bars, after hours establishments, tattoo, and related businesses and other similar uses on neighboring properties;
- Enhance the nature of Downtown by encouraging uses that cater to all ages and by requiring greater oversight of potentially detrimental uses; and
- Assure consistent regulation of design and architecture throughout Downtown.

2.4 Population and Growth Trends

By 2030, Central/Downtown's current population of 64,400 residents[12] is projected to increase by 12 percent to about 72,000. The area is expected to remain as the most densely populated area of the City, with the concentration of this density located in Downtown. In addition, employment is expected to increase during that time making this the second largest Scottsdale employment center after the Scottsdale Airpark. As of the 2005 Special Census, approximately 1,600 businesses and 21,000 jobs are located in southern Scottsdale as shown in the figure on the next page.

12 2005 Special Federal Census



Investment Activity

The Scottsdale City Council has made revitalization of the southern Scottsdale area (including the study area) a major priority. Southern Scottsdale has enjoyed a combined private and public investment of over $3 billion since 2003 (over $2 billion in Downtown).

3.0 EXISTING AND FUTURE CONDITIONS

3.1 Streets and Circulation

The existing traffic conditions analysis presented in this report is based on traffic forecasts prepared by MAG. Socioeconomic data, such as population and employment projections, provide key inputs into the model, which uses data developed in 2006, based on the 2005 U.S. Special Census survey.

3.1.1 Regional Area Street Network

The north-south corridors are well defined in this area of the Valley. The Loop 101 Freeway is the main regional roadway for this area with daily volumes exceeding 100,000 vehicles. Scottsdale, Hayden, and Pima roads are all north-south arterial roadways that also accommodate regional traffic (Figure 10-3).

The major east-west corridors in this area are not as well established. Between Shea Boulevard and the Loop 202 Freeway, the primary regional roadways are Lincoln Drive, Camelback Road, Indian School Road, Thomas Road, and McDowell Road. Lincoln Drive and Camelback Road extend west through Paradise Valley and the city of Phoenix to connect to other regional north-south corridors such as the Piestewa Freeway; however, they do not connect to the Loop 101 Freeway in the east. Indian School Road, Thomas Road, and McDowell Road all connect the Loop 101 Freeway to the major north-south corridors to the west; however, this leaves a 6-mile wide section between Shea Boulevard and Indian School Road with no continuous major east-west roadways.

Portions of the Central/Downtown area can be considered one of Scottsdale's "cores" (the Airpark area is another key core). Freeways are located nearby on the southern (Loop 202) and eastern (Loop 101) edges of the core. The community is not bisected nor isolated by these freeways. Scottsdale's street network connects to these freeways via east-west and north-south arterial roadways, for the most part on a mile grid.

3.1.2 Local Area Street Network

In the immediate area, the east-west section line streets McDonald Drive, Chaparral Road, and Indian School Road all have interchanges on the Loop 101 Freeway. Chaparral Road and Indian School Road both extend to the east serving the SRPMIC. McDonald Drive extends west of Scottsdale Road into Paradise Valley, but not as a major street. Similarly, Chaparral Road also extends west of Scottsdale Road, but not as a major street. Indian School Road is the only street that continues as a major street west of Scottsdale Road.

The half mile east-west streets in the immediate area consist of Jackrabbit Road, Camelback Road, and Osborn Road. All of these roadways are somewhat discontinuous; none of them connect Scottsdale Road to Pima Road. Both Camelback Road and Osborn Road connect Scottsdale Road to Hayden Road; Jackrabbit Road does not connect across the Arizona Canal.

3.1.3 Residential Frontage

Most of the major east-west streets in the study area have some segments with direct residential frontage. The term "direct frontage" implies that the building orientation and front yard face the street.

- There are 32 townhouses between 82nd Street and Granite Reef Road with their direct frontage on McDonald Drive. There were 19 single family houses removed along McDonald Drive between Pima Road and 86th Street to accommodate a roadway widening project along this section.
- There are 62 townhouses between 82nd Street and 85th Street with direct frontage along Chaparral Road. There are 27 single family houses between 85th Street and Pima Road with direct frontage along Chaparral Road. All of the single family houses and most of the townhouses along this section of Chaparral Road are separated from the roadway by a frontage road; however, there are 23 townhouses between Granite Reef Road and 85th Street that do not have a frontage road. There are 52 townhouses

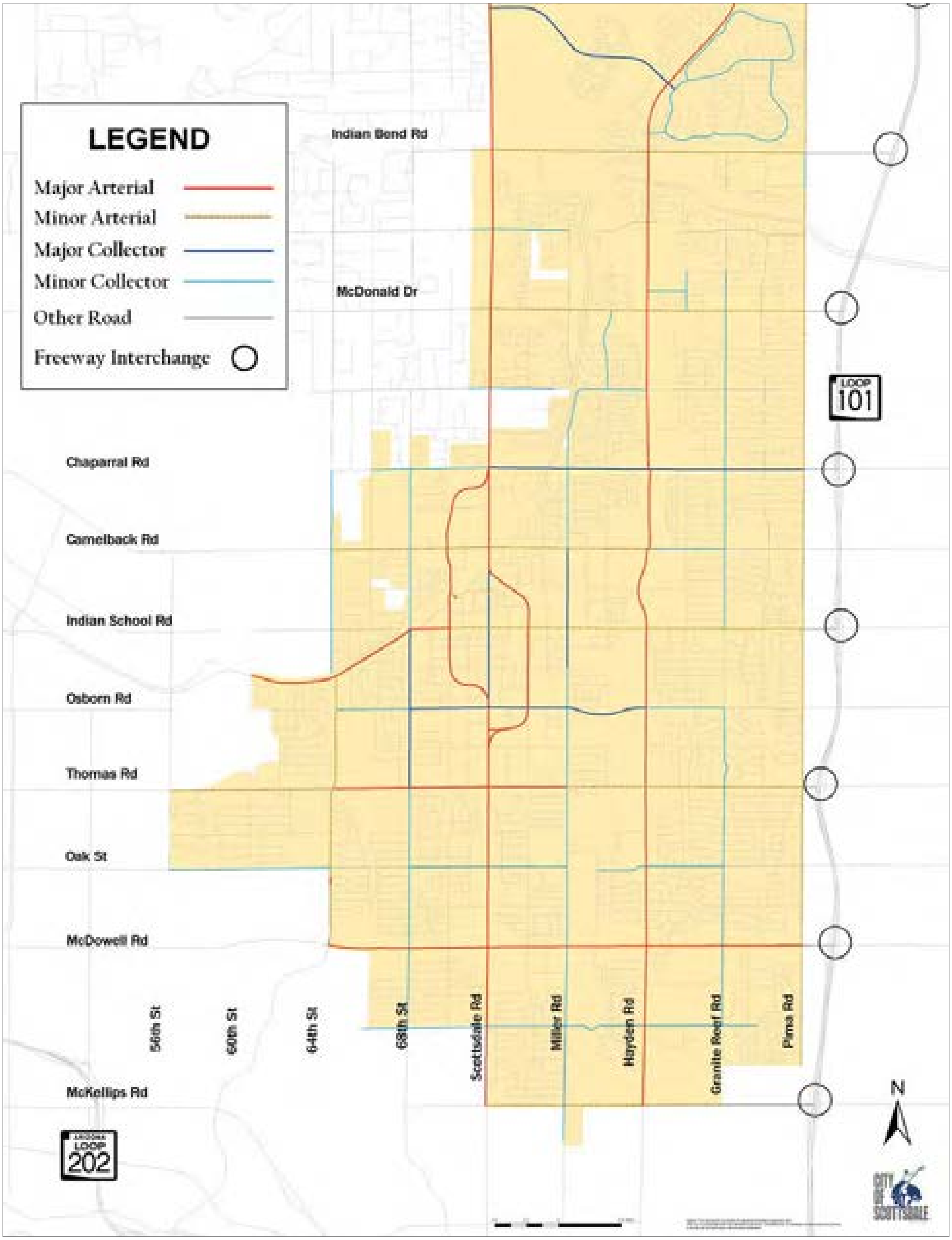


FIGURE 10-3: Existing Roadway Network

between Miller Road and 78th Street with direct frontages, including driveways, along Chaparral Road.
- There are 22 single family houses between 81st Street and Granite Reef Road with direct frontage along Indian School Road; these houses are separated from the roadway by a frontage road.
- There are 17 single family houses between Miller Road and Indian Bend Wash with direct frontage along Thomas Road. There are 36 single family houses between Granite Reef Road and 87th Street with direct frontage along Thomas Road; these houses are separated from the roadway by a frontage road.
- There are 52 townhomes between Miller Road and 78th Street with direct frontage on Chaparral Road.

The half-mile streets in this area all have single family homes or townhouses with direct frontage. There are elementary schools on both Camelback Road and Osborn Road.

Single family residential having direct roadway frontage can create issues of neighborhood livability for homeowners and residents. Traffic levels, access, and roadway noise are often cited as impacting residents' quality of life. In circumstances where a roadway may need to be widened, special care must be taken to enhance rather than detract from the surrounding neighborhood. The Policy Element of the *Transportation Master Plan* recommends a minimum buffering distance from homes on roadways in order to enhance neighborhood preservation and livability when roadway widening may be necessary.

3.2 Traffic Data

The City's Traffic Engineering Division collects traffic volume data on all major street segments and at all major intersections in the City. This data is published every two years along with collision data. In addition to the traffic volume data collected by the City, Otak, a consulting firm, was contracted to do an evaluation of Downtown circulation. The findings of the Otak study are incorporated into the Central/Downtown area circulation study of the *Transportation Master Plan*.

3.2.1 Downtown Traffic Data Study

Data presented in the March 2006 draft of the Scottsdale Road, *Downtown Circulation Study* prepared by Otak, include:

An evaluation of 22 intersections in Downtown found that all signalized intersections operate at LOS D or better, which means the average delay is less than 55 seconds per vehicle during daily peak a.m. and p.m. periods. This average delay per vehicle is less than half the typical cycle length in Downtown at the signalized intersections, thus anyone having to wait through more than one red light is unusual. (Cycle lengths are 120 seconds at Indian School and Scottsdale roads and 102 seconds at other signals in the Downtown area.) Of the 22 intersections analyzed, 17 operate at LOS C or better (less than 35 seconds of delay). LOS D is the generally accepted standard for traffic operations in an urban area and the goal set in the adopted *Streets Master Plan*.

During the peak hours, over half of the traffic (64 percent of the 8345 vehicles during the morning peak and 57 percent of the 9380 vehicles during the evening peak) entering Downtown remains in the area for the duration of the peak period. The proportion of traffic from each direction that enters and stays in Downtown during peak periods is listed below:

- 75 percent of the 3340 vehicles in the a.m. and 73 percent of the 2645 vehicles in the p.m. traffic that enters Downtown from the east (Chaparral, Camelback, Indian School, and Osborn roads) remains in the area.
- 65 percent of the 1835 vehicles in the a.m. and 58 percent of the 2405 vehicles in the p.m. traffic that enters Downtown from the south (68th Street, Scottsdale and Miller roads) remains in the area.
- 58 percent of the 1725 vehicles in the a.m. and 47 percent of the 2875 vehicles in the p.m. traffic that enters from the west (Chaparral, Camelback, and Indian School roads) remains in the area.
- 45 percent of the 1445 vehicles in the a.m. and 43 percent of the 1455 vehicles in the p.m. traffic that enters from the north (Scottsdale Road) remains in Downtown.

Extrapolating the data to a 24-hour period indicates that 156,000 vehicles enter Downtown (from 2004 City of Scottsdale counts, the latest available at the time of the study). Approximately 94,000, or about 60 percent, had destinations in Downtown, while the other 62,000 constituted pass-through traffic.

3.2.2 Traffic Data for East/West Streets

For this study and to prepare the analysis of Chaparral Road for the City Council in May, historic traffic data was reviewed for the McDonald Drive, Camelback Road, Indian School Road, and Thomas Road corridors. For the 1986-2006 period, average vehicle per day counts grew by 20 percent on McDonald Drive, 62.5 percent on Indian School Road, and 31.5 percent on Thomas Road. As with Chaparral Road, each of these corridors is connected to a freeway interchange. Over the same 20-year period, volumes dropped by 23.4 percent on Camelback Road, which does not connect to Pima Road or the Loop 101 Freeway. Further review of changes in traffic volumes on nearby east-west corridors connected to the Loop 101 Freeway shows that growth in travel demand east of Hayden Road has been substantially greater. In large part, this is likely due to the fact that both Camelback Road and Osborn Road each provide four additional travel lanes for east-west travel on the west side of Hayden Road heading into Downtown. Among the corridors connected to the freeway, Indian School Road has become the main conduit to and from Downtown. The greater growth in traffic volumes along Indian School Road is likely due to its more direct access to the Loop 101 and to the fact that traffic flow has been improved through widening of the Hayden Road intersection and the installation of ITS features.

East- West Traffic Volumes

	West of Hayden Road		% Change	East of Hayden Road		% Change
Street	1986	2006	1986 to 2006	1986	2006	1986 to 2006
McDonald Dr	17,500	21,000	20.0	14,000	19,100	36.4
Chaparral Rd	14,800	18,900	27.7	14,8 00	30,900	108.8
Camelback Rd	26,500	20,300	-23.4	no counts – local residential street	no counts – local residential street	no counts – local residential street
Indian School Rd	25,600	41,600	62.5	17,500	38,200	118.3
Thomas Rd	26,000	34,200	31.5	18,600	30,100	61.8

The general trend for traffic volumes in the southern portion of the City has been increases in volumes in the main east-west corridors and decreases in volumes for the main north-south corridors over the past ten years. This reflects a change in travel patterns due to the construction and opening of Loop 101. The freeway has been used for north and south travel, with more drivers traveling east and west to get to and from the freeway. Figures for the roadway segments east of Hayden Road indicate the greatest increases in traffic volumes.

3.3 Circulation Issues

The following traffic circulation issues have been identified for the Central/Downtown area:

- Access to Downtown;
- Circulation within Downtown;
- The role of the couplet (Drinkwater and Goldwater boulevards) in relation to the functioning of a larger and more vibrant Downtown core, whether it is sized appropriately, and whether it should continue to be focused on auto movement;
- The role and character of Scottsdale Road in the Downtown core, particularly given plans and policies supporting a greater role for non-automobile modes in this part of the City; and
- Potential implementation of HCT in the Scottsdale Road corridor. Transit technologies (BRT, LRT, modern streetcar) are under evaluation as part of the HCT Study of the *Transportation Master Plan*.

3.4 Access Into Downtown

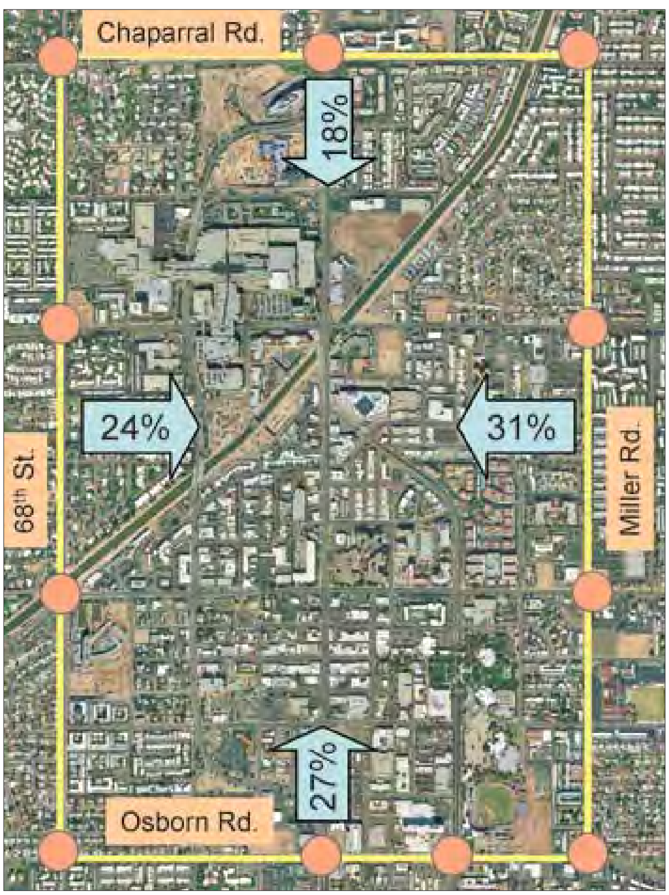


FIGURE 10-4: Downtown Access Directional Splits

Recent intersection counts have been examined to assess the directional splits for access into the Downtown area bounded by Miller Road, Osborn Road, 68th Street and Chaparral Road. Based on these counts, approximately 31 percent of traffic enters Downtown from the east (on Chaparral, Camelback, Indian School, and Thomas roads), 27 percent from the south (on 68th Street, Goldwater Boulevard, Scottsdale Road, Drinkwater Boulevard, and Miller Road), 24 percent from the west (on Camelback, Indian School, and Thomas roads) and 18 percent from the north (on 68th Street, Goldwater Boulevard, Scottsdale Road, Drinkwater Boulevard, and Miller Road) (Figure 10-4).

On a typical day, approximately 24 percent of the traffic crossing Miller Road from the east uses Chaparral Road. This analysis shows that Chaparral Road does not by itself have a significant role in Downtown access, thus modifications to the roadway will have minimal impact on Downtown vitality.

3.5 Forecast 2030 Traffic

Based on forecasts, traffic with destinations in or passing through Downtown is estimated to grow by about 30 percent by 2030. Table 10-1 shows the range of traffic volumes for all segments of each roadway listed for 2006 actual counts and 2030 forecast traffic volumes.

TABLE 10-1: Traffic Volumes				
Road	From	To	2006 Daily Trips (VPD)	2030 Forecast Daily Trips (VPD)
Thomas Rd	56th St	64th St	28,200	33,000
	64th St	Scottsdale Rd	32,000	36,700
	Scottsdale Rd	Miller Rd	27,700	31,700
	Miller Rd	Hayden Rd	30,600	33,800
	Hayden Rd	Pima Rd	33,300	36,900
Osborn Rd	64th St	68th St	5,800	
	68th St	Scottsdale Rd	7,000	6,800
	Scottsdale Rd	Drinkwater Blvd	10,000	8,900
	Drinkwater Blvd	Miller Rd	14,400	16,600
	Miller Rd	Hayden Rd	15,800	19,000
	Hayden Rd	82nd St	2, 800	3,900
	82nd St	Granite Reef Rd	3,300	4,400
Indian School Rd	64th St	68th St	26,200	36,500
	68th St	Goldwater Blvd	34,500	41,600
	Goldwater Blvd	Scottsdale Rd	20,600	23,800
	Scottsdale Rd	Drinkwater Blvd	23,100	24,600
	Drinkwater Blvd	Hayden Rd	34,400	37,200
	Hayden Rd	82nd St	34,700	39,200
	82nd St	Granite Reef Rd	35,600	39,600
	Granite Reef Rd	Pima	39,800	46,400
Camelback Rd	64th St	66th St	34,000	38,200
	66th St	Scottsdale Rd	29,500	33,400
	Scottsdale Rd	Miller Rd	21,500	24,300
	Miller Rd	Hayden Rd	22,800	27,800
	Hayden Rd	Granite Reef Rd	6,500	8,400
Chaparral Rd	66th St	Scottsdale Rd	5,600	6,400
	Scottsdale Rd	Miller Rd	15,600	17,500
	Miller Rd	78th St	15,500	16,700
	78th St	Hayden Rd	18,900	20,800
	Hayden Rd	Granite Reef Rd	22,200	24,300
	Granite Reef Rd	Pima Rd	26,200	30,000

TABLE 10-1: Traffic Volumes

Road	From	To	2006 Daily Trips (VPD)	2030 Forecast Daily Trips (VPD)
McDonald Dr	City limits	Scottsdale Rd	14,900	17,100
	Scottsdale Rd	78th St	18,800	21,400
	78th St	Hayden Rd	20,500	23,600
	Hayden Rd	Granite Reef	17,600	22,000
	Granite Reef Rd	Pima Rd	22,800	28,600
68th St	Continental Dr/Roosevelt St	McDowell Rd	6,100	6,500
	McDowell Rd	Thomas Rd	10,200	11,300
	Thomas Rd	Indian School Rd	15,300	15,900
	Indian School Rd	Camelback Rd	12,000	13,300
	Camelback Rd	Chaparral Rd	6,900	6,800
Goldwater Blvd	Scottsdale Rd	Indian School	14,800	17,300
	Indian School	Camelback Rd	26,000	29,200
	Camelback Rd	Scottsdale Rd	13,000	14,900
Scottsdale Rd	Thomas Rd	Earll Dr	44,300	49,500
	Earll Dr	Osborn Rd	35,600	39,400
	Osborn Rd	Indian School	22,700	24,700
	Indian School	Drinkwater Blvd	20,100	21,100
	Drinkwater Blvd	Camelback Rd	33,200	36,000
	Camelback Rd	Chaparral Rd	40,000	42,700
	Chaparral Rd	McDonald	50,000	51,000
Drinkwater Blvd	Scottsdale Rd	Osborn Rd	9,200	10,400
	Osborn	Indian School Rd	14,100	16,100
	Indian School Rd	Scottsdale Rd	11,100	13,600
Miller Rd	Thomas Rd	Osborn Rd	11,000	12,000
	Osborn Rd	Second St	12,400	14,400
	Second St	Indian School Rd	11,300	12,500
	Indian School Rd	Camelback Rd	15,100	15,200
	Camelback Rd	Chaparral Rd	8,800	8,700
Miller Rd/ Jackrabbit Rd	Chaparral Rd	Hayden Rd	3,500	4,300
Hayden Rd	Thomas Rd	Indian School Rd	32,700	37,200
	Indian School Rd	Camelback Rd	29,700	32,800
	Camelback Rd	Chaparral Rd	35,800	36,700
	Chaparral Rd	McDonald	34,200	35,600
Granite Reef Rd Rd	Thomas Rd	Osborn Rd	1,300	2,600
	Indian School Rd	Camelback Rd	3,600	5,600
	Camelback Rd Rd	Chaparral Rd	5,300	5,000
	Chaparral Rd	McDonald	4,100	4,500

TABLE 10-1: Traffic Volumes				
Road	From	To	2006 Daily Trips (VPD)	2030 Forecast Daily Trips (VPD)
Pima Rd	Thomas Rd	Indian School Rd	8,200	17,700
	Indian School Rd	Chaparral Rd	7,000	14,300
	Chaparral Rd	McDonald	9,000	15,500

3.6 Forecast Access to Downtown

3.6.1 Loop 101 to Downtown

The travel corridor between Loop 101 and Downtown is forecasted to increase from 2006 volumes. A review of current travel demand patterns indicates that 75 percent of westbound traffic is destined for Downtown. Combined with the expected growth, this highlights the need to improve roadway capacity between the Loop 101 Freeway and Downtown.

McDonald Drive, Chaparral, Camelback, Indian School, Osborn, and Thomas roads provide a total of 22 through-lanes between Hayden and Scottsdale roads, and constitute the main access routes to Downtown from the east. On these six streets, traffic volumes are currently estimated to increase from a total of approximately 146,200 vpd in 2006 to a total of 164,400 vpd in 2030 (a 13 percent increase) on the highest forecast segments between Hayden Road and Pima Road and from approximately 126,600 vpd to 158,950 vpd (a 25 percent increase) on the highest forecast segments between Scottsdale Road and Hayden Road.

Four of these streets, McDonald Drive, Chaparral, Indian School, and Thomas roads, also provide direct access to Loop 101. Indian School Road provides direct access to Downtown, while McDonald Drive, Chaparral Road and Thomas Road serve the north or south ends of Downtown. The total volume on these four roadways between Pima Road and Granite Reef Road in 2006 was 112,900 vpd. The 2030 forecast at the same location is 150,900 vpd, an increase of 33 percent.

In addition to the vehicular-based assessment of travel demand, the magnitude of mobility needs may be presented from the perspective of person-trips. Assuming an average occupancy of 1.2 persons per vehicle, which has been the regional trend, person trips are expected to increase by over 50 percent on these four roadways, or from 103,800 to 162,840. These observations support the need for multi-modal transportation, such as public transit, bicycling, and walking, to preserve today's standard of service in the corridor.

3.6.2 Loop 202 to Downtown

Traffic in the corridor between Loop 202 and the Downtown area, which includes 64th Street, 68th Street, Scottsdale Road, Miller Road, Hayden Road, and Pima Road, has an existing volume to capacity ratio of 0.66. The traffic is forecast to increase around 25 percent by 2030, increasing the volume/capacity ratio to 0.75. Thus, even with the growth there is sufficient capacity in the corridor to accommodate future traffic. Therefore, no street widening is being considered in this area of the City in the development of the *Transportation Master Plan*.

3.7 Downtown North-South Traffic Flow

Downtown north-south traffic flow considers traffic operations on Scottsdale Road and the Goldwater/Drinkwater Boulevard Couplet through Downtown, between Thomas Road and Chaparral Road. In the late 1970s, the City Council voted to build the Goldwater/Drinkwater Couplet in lieu of a proposed widening to six lanes on Scottsdale Road between Osborn and Camelback roads, with the intention of accommodating expansion of Downtown and concurrently preserving the existing buildings along Scottsdale Road. The Couplet concept was approved with the 1984 *Downtown Plan*. The Couplet was completed in 1991. Lane configurations for Goldwater and Drinkwater boulevards are five through-traffic lanes on each roadway with:

- Goldwater Boulevard: three southbound and two northbound lanes; and
- Drinkwater Boulevard: three northbound and two southbound lanes.

In 2006, Scottsdale Road and Drinkwater and Goldwater boulevards carried 71,000 vpd north of Indian School Road and 66,000 vpd south of Indian School Road. In both cases, Scottsdale Road carried nearly 50 percent of the traffic even though it has only 29 percent of the lanes (four of the total of fourteen through travel lanes).

The transitions from Goldwater Boulevard and Drinkwater Boulevard to Scottsdale Road present some design issues for bicycles and pedestrians. These transitions will be examined and recommendations for possible enhancements will be included in the opportunities and recommendations section as well as in the Bicycle and Pedestrian elements of the *Transportation Master Plan*.

3.8 Pedestrian Facilities

Since the adoption of the City of Scottsdale *Bicycle/Pedestrian Transportation Plan* in January 1995, many of the action items of this plan have been implemented, including: extensive renovations and improvements to the pedestrian environment Downtown, improvements to signals and crosswalks; and support of the SRTS program. The *Transportation Master Plan* will update this plan in a new Pedestrian Element. Of particular importance is creating a comfortable pedestrian environment and ensuring connections from the main existing corridors (Indian Bend Wash path and the Canal system) to residential areas and destinations like schools, parks, the Civic Center, and commercial uses Downtown.

3.8.1 Pedestrian and Bicycle Plans and Policies

Pedestrian and bicycle issues have been identified and addressed either at the regional or local level in the following plans.

Design Standards and Policies Manual 2007 Update

This manual is designed to assist the public and private sectors though the land development and construction process. The standards and policies included in this manual supplement the various regulations in Scottsdale including the zoning codes, building codes, and subdivision ordinances. Chapter 5, Transportation, addresses pedestrian facilities and bikeways. The pedestrian facilities section addresses safety, connections, and accessibility (including curb ramps). The bikeway section (and multi-use paths) provides information that emphasizes planning, design, traffic controls, bike parking, and bikeway maintenance.

Standard Details

The *Uniform Standard Specifications and Details for Public Works Construction* sponsored and distributed by MAG along with the City of Scottsdale *Supplement to MAG Uniform Specifications and Details* are the standards and details for public works construction in the City of Scottsdale. The City prepares and adopts *Supplements to MAG Uniform Standard Specifications and Details* to provide the highest quality of construction within the public ROW.

City of Scottsdale Bicycle/Pedestrian Transportation Plan (January 1995)

This plan developed recommendations to improve facilities for bicycling and walking. The plan's recommendations are grouped into four areas: planning and implementation; design and standards; safety, education, and enforcement design; and economics. Four levels of implementation were identified within the plan, each with an associated cost. Most of the projects identified have been implemented.

MAG Pedestrian Policies and Design Guidelines (2005)

The MAG *Pedestrian Policies and Design Guidelines* were recently updated in 2005. This document includes information on pedestrian facilities and standards, appropriate to a range of pedestrian areas.

MAG Pedestrian Plan 2000

The MAG *Pedestrian Plan 2000* includes a study of latent demand and roadside conditions. The plan identifies Downtown and the City's resort corridor as areas with some of the highest demand for pedestrian facilities in the region.

Downtown Pedestrian Mobility Study (2007)

The City completed a MAG-funded *Pedestrian Mobility Study* within its Downtown early in 2007. This study identified key pedestrian routes and made recommendations to improve pedestrian circulation within Downtown.

Scottsdale Road Streetscape Design (underway)

In 2005, the City initiated a streetscape project for Scottsdale Road. This project includes the redesign of the Scottsdale Road streetscape to make it more attractive and pedestrian-friendly.

Streetscape Design

In the last three years, design projects for enhanced streetscapes along Indian School Road, Thomas Road, and McDowell Road have been initiated. The McDowell Road streetscape has been implemented along the majority of McDowell Road within Scottsdale. The Indian School Road and Thomas Road projects are pending the recommendations of the *Transportation Master Plan* regarding potential widening of these roadways.

Downtown Plan Circulation Element

This plan is described in the *Downtown Plan* section of this report. The *Downtown Plan* Circulation Element includes a bicycle route system that will be updated through the Bicycle Element of the *Transportation Master Plan*.

3.8.2 Latent Pedestrian Demand

One of the indicators of the intensity of pedestrian activity is a latent demand study, which examines the locations of pedestrian generators relative to streets or other geographic features; pedestrian generators produce latent demand.

A preliminary draft latent pedestrian demand study completed as part of the *Transportation Master Plan* shows that the highest demand for pedestrian facilities within the City is focused in Central/Downtown, especially Camelback, Indian School, Thomas, and Scottsdale roads. All of these major arterials have received rankings of 10, the most conducive for pedestrian activity (Figure 10-5).

Other broad issues and considerations that involve latent pedestrian demand and improving pedestrian facilities in the Central/Downtown area are:

- Downtown pedestrian improvements
    - Mid-block pedestrian crosswalks (supplemented by pedestrian crossings at the locations of the highest pedestrian generators)
    - Pedestrian-oriented traffic signals

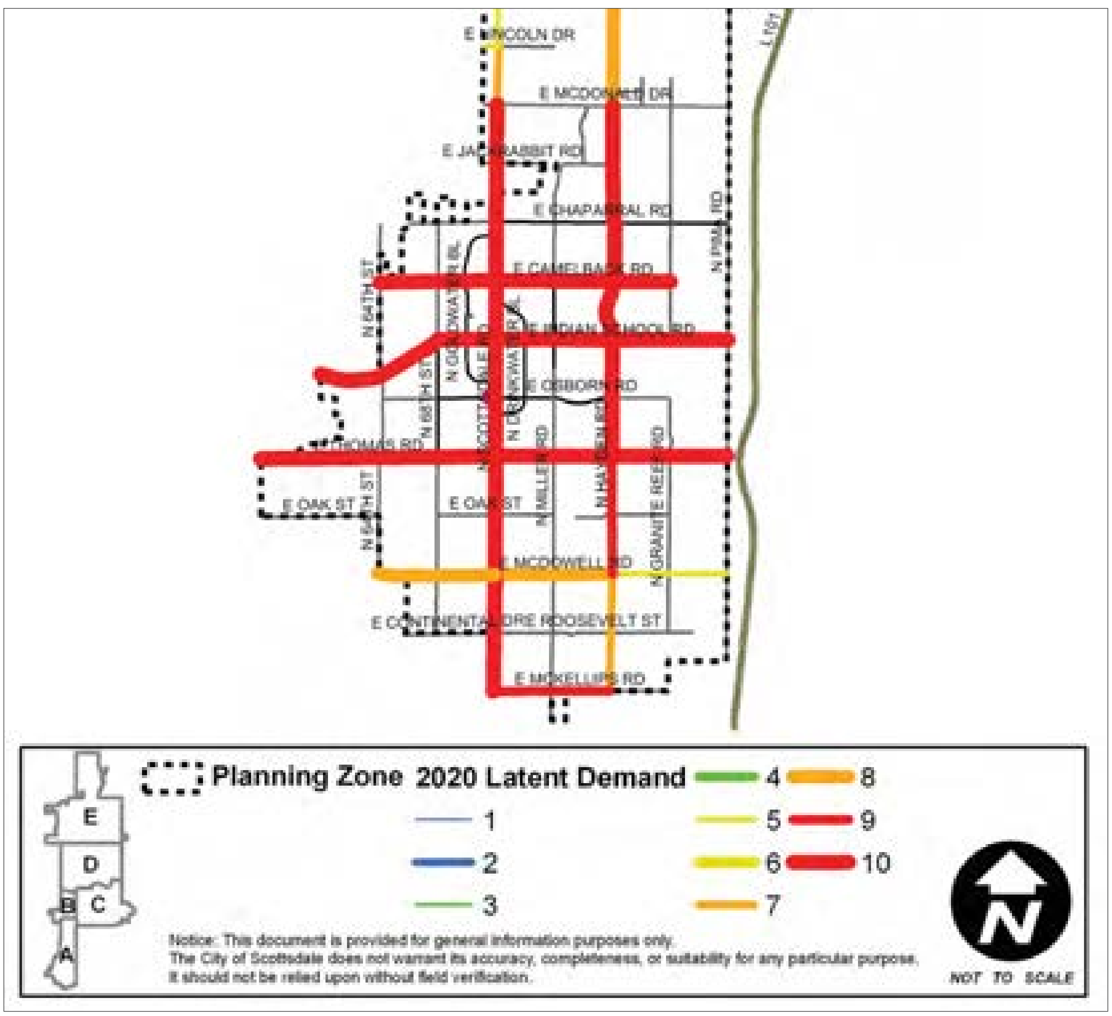


FIGURE 10-5: Latent Pedestrian Demand (Central/Downtown Area)

- Providing for pedestrian comfort
  - Shade through tree canopy or building facades to create overhangs;
  - Complementary street furniture, strategically placed to provide safety buffers between vehicular traffic and pedestrians;
  - Way-finding and lighting between the different Downtown districts.
- Identified Scottsdale Road as a potential HCT corridor.

3.8.3 Existing Conditions: Sidewalks and Curb Ramps

Sidewalks are typically provided on all arterial, collector, and local streets in Central/Downtown. Scottsdale requires a minimum sidewalk width of 6 feet citywide and prefers an 8-foot sidewalk width in high use areas. The City requires sidewalks to be a minimum of 5 feet from the back of curb (8 feet in areas with high vehicular traffic volumes). The exception to this setback rule is when a sidewalk is adjacent to a bus stop or in urbanized areas (described further in the Pedestrian and Streets elements), where wider back of curb sidewalks may be preferred.

To enhance the connectivity and safety of the pedestrian environment, the City encourages reducing curb cuts; providing through-pedestrian access from cul-de-sacs and dead ends, across drainage easements, and between commercial developments to destinations; and to improve pedestrian access and safety by requiring the use of directional ramps at all intersections. The City has also taken substantial steps to improve curb ramp facilities.

The Central/Downtown area includes focus on the following areas for bicycle and pedestrian facilities: 1) historic and older neighborhoods located south of Indian School Road and east of Downtown; 2) newer residential; and 3) Downtown with its well-established base of significant retail, entertainment, and tourist attractions, residential and government office uses. Each area has evolved and grown over time to acquire a unique identity, and, equally important, to merge edges to constitute a larger bicycle/pedestrian-oriented environment.

The 1998 circulation portion of the *Downtown Plan* identified key pedestrian/bicycle linkages. These include Scottsdale Road, Brown Avenue, Main Street, Stetson Drive, Fifth Avenue, and Marshall Way within Downtown. Since the development of the *Downtown Plan*, an additional pedestrian link across the Arizona Canal has been established with the construction of a bridge at Marshall Way. Within the Central Scottsdale area, the Arizona Canal and Indian Bend Wash are also identified as a multiple use paths that provide non-motorized access. Based on a current latent demand study, this study recommends additional pedestrian improvements, such as wider sidewalks, greater pedestrian access, and directional curb ramps.

3.9 Bicycle Networks

The City of Scottsdale has recently updated its bicycle facilities map with the inclusion of extensive bicycle facility guidelines. MAG is also in the process of developing a regional bicycle plan. The City's map, existing standards and policies, and the regional plan are the starting point for the development of an updated citywide Bicycle Element, completed as part of this *Transportation Master Plan*.

3.9.1 Existing Conditions: Routes/Paths/Facilities

The City implements a range of standards for on- and off-street bicycle facilities. Prior plans and practice encourage both on- and off-street bikeways on a one-half mile grid south of Shea Boulevard, a 1-mile grid between Shea Boulevard and the CAP Canal, and a 2-mile grid north of the CAP Canal. Major arterials, minor arterials, major collectors, minor collectors, and certain special neighborhood and rural streets have typical cross sections that include 4-foot to 6-foot bicycle-lanes, depending on parking.

The mileages of the component parts of the City's entire existing bicycle network are as follows:

- Bike Lanes = 86 miles
- Paved Shoulders = 10 miles
- Bike Routes = 50 miles
- Paved Paths = 61 miles
- Unpaved Trails = 268 miles

The City's zoning ordinance requires bicycle parking at all businesses within 50 feet of the building entrance, except in Downtown where less than 40 regular automobile parking spaces are required. The quantity of bicycle parking required is based on the number of vehicle spaces. The City has recently updated its bicycle map, which shows the City's current bicycle facility network as well as other pertinent bike-related information. The MAG *Regional Bikeway Master Plan*, which will be approved soon, will set regional goals and provide bicycle program, policy, and guideline recommendations for local member jurisdictions, including Scottsdale.

While older off-street path bicycle facilities may be 8 feet wide, in accordance with the standards in place at the time they were constructed, new off-street bicycle facilities within the City are to be built as shared-use paths with a minimum width of 10 to 12 feet.

Current Central/Downtown bikeway issues are:

- Providing an east-west connection from Downtown to the Indian Bend Wash (outside of Downtown, the Indian Bend Wash has bicycle connections every mile)
- The Indian School/Lafayette on-street bicycle route stops at Downtown
- The Chaparral Road bike route stops on the east side of the Arizona Canal
- Goldwater and Drinkwater boulevards do not currently have bicycle facilities
- Adopting the *Downtown Plan* bicycle route

3.10 Transit Service

Existing transit service in Central/Downtown is characterized by: fixed route bus service operating on the arterial and collector grid system, with most of the bus routes in Central/Downtown connecting to other jurisdictions (Figure 10-6); and local and neighborhood circulator routes connecting directly to and circulating around Downtown. In general, fixed routes operate from 5 a.m. to midnight (earlier on some routes) on weekdays and 7 a.m. to 10:00 p.m. (earlier on some routes) on weekends, and circulator routes operate year-round at higher frequencies and varying hours. Further detail is provided in Table 10-2.

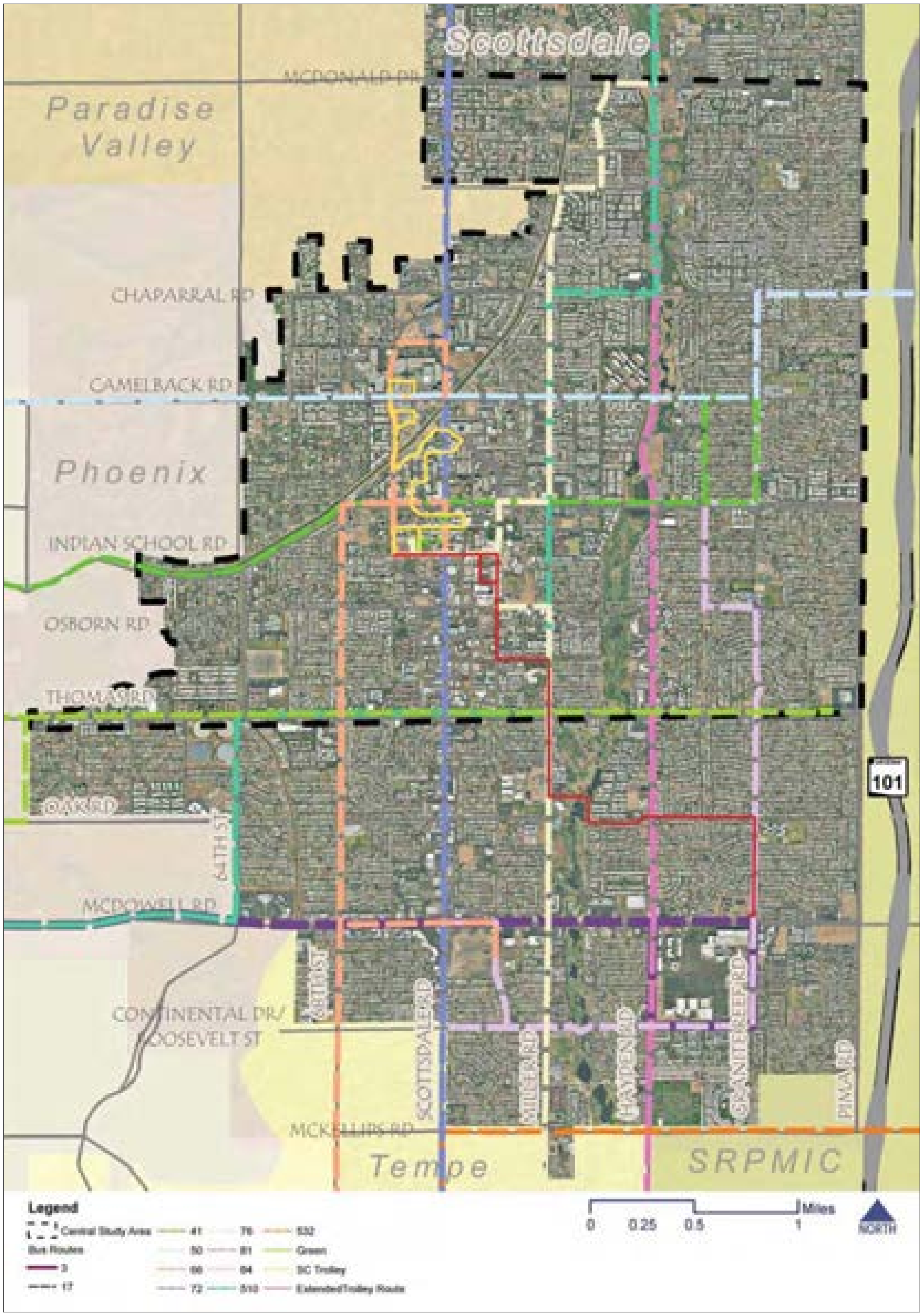


FIGURE 10-6: Existing Transit Service

TABLE 10-2: Existing Central/Downtown Area Transit Service (as of July, 2007)				
		Headway		
Route	Name	Weekday (Peak/Off-Peak)	Saturday	Sunday
Local Bus				
Green	Thomas Rd	20/40	30	30
41	Indian School Rd	15*/30	30	30
50	Camelback Rd	15/60	30/60	60
66	68th St	30/30	30	30
72	Scottsdale Rd	15/30	30	30
76	Miller Rd	30/30	30	60
81	Hayden Rd	15/30	60	60
84	Granite Reef Rd	60/60	60	60
Express Bus				
510	Scottsdale Rd	2 trips (peak direction)	n/a	n/a
Neighborhood Circulator				
Trolley	Downtown Trolley	10	10	10
Trolley	Neighborhood Connector	20	20	20

*only west of Loloma Station
Source: Valley Metro/RPTA.

4.0 PLANNED IMPROVEMENTS

This section documents planned transportation improvements in the City of Scottsdale for roadway, bicycle, pedestrian, and transit services/facilities.

4.1 Roadway, Bicycle, and Pedestrian Improvements

Table 10-3 contains a listing of roadway, bicycle, and pedestrian transportation improvements contained in the City of Scottsdale CIP FY 2006-2011 and affecting the Central/Downtown area. The CIP is updated annually and provides a five year program for transportation projects.

TABLE 10-3: Planned Roadway, Bicycle, and Pedestrian Improvements		
Project/Street	Project Description	Year
Roadway Facilities		
Loop 101 - HOV Lanes From:	Shea Blvd to Loop 202	2007
	Scottsdale Rd to Princess Dr	2007
	Princess Dr to Shea Blvd	2011
Loop 101 - General Purpose Lanes From:	Shea Blvd to Loop 202	2014
	Princess Dr to Shea Blvd	2022
	Scottsdale Rd to Princess Dr	2022
Pima Rd	McDowell Rd to 90th Str	2010

TABLE 10-3: Planned Roadway, Bicycle, and Pedestrian Improvements		
Project/Street	**Project Description**	**Year**
Indian School Rd, Drinkwater Blvd to Pima Rd	Intersection and access management improvements	2008
McDonald Dr, Scottsdale Rd to Hayden Rd	Intersection improvements	2008
Thomas Rd,City limits	Intersection improvements	2008
Bicycle and Pedestrian Facilities		
Indian School Rd	Addition of bicycle lanes, widened sidewalks	2008
Thomas Rd	Addition of bicycle lanes and widened sidewalks	2010
Scottsdale Rd between Osborn Rd and Chaparral Rd	Addition of bicycle lanes and widened sidewalks	2009
Bicycle Path System	Completion of the Crosscut Canal path system, from Tempe border to Indian School Rd	2008
Bicycle Path System	Completion of gaps/retrofits in Indian Bend Wash path system	2010
Pedestrian Mobility Study	Implementation of Downtown pedestrian mobility study recommendations	2008-2009

Source: City of Scottsdale Capital Improvement Program FY 2006-2011, and *Regional Transportation Plan*.

4.2 Transit Improvements

Planned transit service in Central/Downtown consists of the transit improvements identified in the MAG RTP and City-funded services. The RTP was approved by voters in November 2004 through Proposition 400 and extends the regional half-cent sales tax for transportation for 20 years from 2006. Table 10-4 indicates routes in Central/Downtown transit service where local funding will be freed up to put towards other transit services as well as new routes that will be created through the RTP.

TABLE 10-4: Planned Transit Service			
Route	**Name**	**Origin/Destination**	**Year**
Supergrid (all routes funding source change)			
72	Scottsdale/Rural Rd	Loop 101 to Chandler Fashion Center	2006
50	Camelback Rd	Litchfield Rd to Scottsdale Community College	2012
81	Hayden Rd/McClintock Dr	Raintree Dr to Chandler Fashion Center	2014
Green	Thomas Rd	Estrella Mountain Community College to Pima Rd	2019
41	Indian School Rd	Litchfield Rd to Granite Reef/Camelback Rd	2019
Express Bus/BRT (all new routes)			
TBD	East Loop 101 Connector	Scottsdale Airpark to Chandler Fashion Center	2008
TBD	Pima Express	Scottsdale Airpark to Central Station	2012
TBD	Scottsdale/Rural BRT	Shea Blvd to Chandler Fashion Center	2013
TBD	Neighborhood Circulator	New route	

Source: MAG *Regional Transportation Plan*, 2003

5.0 OPPORTUNITIES AND RECOMMENDATIONS

Opportunities exist to improve the transportation system for Central/Downtown. These improvements are multi-modal in nature, and include roadway, bicycle, pedestrian, and transit improvements.

5.1 Roadway Opportunities

Several alternatives for roadway/traffic improvements were identified during the preliminary stages of the *Transportation Master Plan* development. These include opportunities, project concepts, evaluations, and subsequent recommendations for some of the roadways in the Central/Downtown area.

5.1.1 Chaparral Road

One of the primary reasons for the Central/Downtown study was a resolution of the question of Chaparral Road. Since the 1960s, Chaparral Road had been designated as a "major road" and since the 1980s a four lane major collector roadway. The portion of Chaparral Road between Miller Road and 78th Street was built as a two lane roadway and remains so.

Through study and traffic analysis of the impacts of maintaining that section of Chaparral Road as a two-lane roadway, it was determined that it is not necessary to widen the road – other nearby roadways can handle the additional traffic. On May 29, 2007, the City Council, in response to neighborhood requests, removed the concept of adding capacity by widening the roadway from further consideration in the *Transportation Master Plan*.

5.1.2 Camelback Road

Camelback Road is a regional roadway from the White Tank Mountains through the cities of Phoenix and Scottsdale to Hayden Road. In Scottsdale, Camelback Road has a functional classification of minor arterial between 64th Street and Hayden Road, and a minor collector east of Hayden Road to the Pima Road frontage road. Camelback Road does not connect to Pima Road or the Loop 101 Freeway. East of Hayden Road ,Camelback Road serves as a residential street with a volume of approximately 6,000 vpd in 2006.

Some of the suggestions for Camelback Road have included the connection of Camelback Road to Pima Road or to the Loop 101 Freeway. Evaluating the impacts of this suggestion to the single family neighborhoods abutting Camelback Road, Navajo Elementary School, and the potential rights-of way requirement from the SRPMIC, as well as coordinating an interchange of Camelback Road/Loop 101 with ADOT, leads to the recommendation to drop this suggestion from further consideration.

5.1.3 Indian School Road

Indian School Road is also a regional east-west roadway connecting Scottsdale and Phoenix with a traffic interchange with the Loop 101 Freeway. Indian School Road is also designated a truck route. Indian School Road between Pima Road and Drinkwater Boulevard has a functional classification of minor arterial. West of Drinkwater Boulevard, Indian School Road is a major arterial, with a six-lane section only between 64th Street and Goldwater Boulevard. Continuing west into Phoenix, Indian School Road also has a six-lane cross section. In 1994, the Scottsdale City Council determined that Indian School Road should not be widened to six lanes east of Downtown.

The Indian School Road enhancement project will result in operational and capacity improvements, such as bike lanes, enhanced sidewalks, shade, landscaped medians, and enhanced transit stops is recommended to help smooth traffic flow on Indian School Road. Travel demand forecasts indicate that travel demand levels may be on the cusp of needing roadway capacity improvements.

5.1.4 Osborn Road

Osborn Road is classified as a major collector between 68th Street and Hayden Road and a minor collector east of Hayden Road and west of 68th Street. Osborn Road serves as a connector from Hayden Road to the southern end of Downtown, with the Scottsdale Stadium, and the Scottsdale Healthcare Osborn campus facilities. Some suggestions have been made to widen Osborn Road east of Hayden Road and connect it to Pima Road. The benefits of this suggestion do not overcome the impacts to the single family residential neighborhoods and elementary school along this stretch of Osborn Road.

5.1.5 Thomas Road

Thomas Road is a continuous east-west roadway through the region, with a traffic interchange at the Loop 101 Freeway and a truck route designation. In Scottsdale, it is classified as a major arterial between 64th Street and Miller Road, and a minor arterial east of Miller Road and west of 64th Street. East of Civic Center Boulevard, the road cross section is four lanes. West of Civic Center Boulevard, the cross section includes three eastbound and two westbound lanes, plus a two-way left-turn lane. Traffic analysis has shown that traffic impacts are more pronounced on the east end of Thomas Road, bringing about consideration of adding one additional travel lane from Civic Center Boulevard to Pima Road.

The Thomas Road enhancement project will examine this suggestion in greater detail, but the initial impacts of displacement of residents living in single family houses, townhouses, and apartment complexes makes this option potentially costly.

5.1.6 Recommended Intersection Improvements

The Chaparral Road analysis included redistributing traffic that could potentially travel on Chaparral Road to other roadways in the area. There are eight intersections that have approaches operating at LOS E or LOS F during the peak hours under the redistributed Chaparral Road traffic scenario. If Chaparral Road traffic were to be diverted to the other roadways, implementing some minor intersection improvements at these intersections can improve the levels of service. Three of the eight intersections can be improved by installing east-west left-turn arrows to accommodate the increased traffic volumes for those east-west turning movements. Five intersections can be improved by modifying the existing traffic signal timing to redistribute green time from the north-south movements to the east-west movements. These intersections and the suggested improvements are listed below.

East/west left-turn arrows are required for the following intersections:

- Granite Reef and McDonald Drive;
- Granite Reef and Chaparral Road; and
- Indian School Road and Pima Road.

Modified traffic signal timing is required for the following intersections:

- Hayden Road and McDonald Drive;
- Hayden Road and Camelback Road;
- Hayden Road and Jackrabbit Road;
- Miller Road and Camelback Road; and
- Miller Road and Indian School Road.

5.1.7 North-South Traffic

The ultimate configuration of north-south streets in the Downtown area will depend on City of Scottsdale's policy and the adoption of *Transportation Master Plan* recommendations:

- Efficient accommodation of north-south travel in the Downtown area;
- Potential mass transit service enhancements;
- Preservation and enhancement of Downtown and neighborhood character; and
- Loop 202 to Downtown access.

It should be noted that there is sufficient roadway capacity through Downtown to accommodate forecasted traffic even with the increase in traffic volumes. This capacity provides flexibility and a range of options for potential future reconfiguration of the Downtown couplet and/or Scottsdale Road.

It is recommended that the segment of Scottsdale Road located within the couplet would continue to be classified as a "Major Collector Street". This classification would include four lanes, two in each direction.

As part of this recommendation, the couplet would maintain its designation of a "Major Arterial Street." Ideally, provision of bicycle lanes is recommended for bi-directional travel. Based on modeling results and the projected volumes of traffic on the couplet and Scottsdale Road, it is recommended that the third lane of travel on each leg of the couplet be converted to provide bicycle and pedestrian facilities.

There is an assumption of slower speeds through the section of Downtown between the couplet, which facilitates possible bicycle use without designated bicycle lanes or signs.

Potential opportunities related to bicycle/pedestrian modes and transit in the Downtown area are highlighted below and discussed in more detail in the following Sections 5.2 Bicycle and Pedestrian Opportunities and 5.3 Transit Opportunities.

- **Bicycle/Pedestrian:** In general, major roadways in Scottsdale should be designed with bike lanes, and bicycle and pedestrian connections should be optimized. The City could choose to encourage a more bicycle/pedestrian-friendly Downtown by reducing the number of lanes on Scottsdale Road through Downtown (in conjunction with HCT), and using the space for wider sidewalks, landscaping, and/or angled parking. An alternative is to reduce one lane on either segment of the couplet (to two lanes in either direction instead of three in one and two in the other) to better accommodate bicycle and pedestrian mobility.
- **High Capacity Transit (HCT):** The HCT section of the Transit Element of the *Transportation Master Plan* has recommended additional study and participation in regional studies regarding high capapcity transit for the Scottsdale Road corridor. BRT, LRT, and modern streetcar alternatives are still being considered. There are multiple alignment options for operating HCT, ranging from operating in mixed traffic in the existing travel

lane to operating in semi-exclusive ROW in the median of the roadway. It had been recommended that LRT would follow an alignment along the couplet rather than on Scottsdale Road through the Old Town section of Downtown.

In either of these latter two options, both the north and south ends of the Scottsdale Road/ Couplet intersections would be re-configured to encourage more use of the couplet.

5.2 Bicycle and Pedestrian Opportunities

5.2.1 Pedestrian Level of Service Standards

Adoption of a pedestrian LOS model is recommended. This would provide a user perception-based, field-calibrated, and statistically reliable model that has been used in many metropolitan areas and also adopted in Florida, Maryland, and other states[13 14] to prioritize improvements and identify projects. The pedestrian LOS model incorporates the following geometric and operational characteristics that affect pedestrians' perceptions of safety and comfort while walking along roadways.

- Existence (and width) of a sidewalk
- Lateral separation of pedestrians from motorized vehicles – this includes the width of the outside travel lane, the width of paved shoulders or bicycle lanes, on-street parking, buffer width, and the sidewalk width's effect.
- Motorized vehicle volumes
- Motorized vehicle speeds

A latent demand model was prepared during the development of the *Transportation Master Plan* to help identify future pedestrian travel demand and included in the Pedestrian Element. This forecast modeling provides a way to estimate the latent, or potential, demand for pedestrian travel. Performing actual counts only reveals how many people currently walk a given segment of sidewalk, path or trail, not how many might walk that segment if the conditions were improved.

The latent demand analysis shows that Downtown will remain a popular area for walking. As areas of Downtown intensify and Downtown expands to include distinct neighborhoods (i.e., Waterfront, Scottsdale Corridor north of Camelback Road, the Downtown core, and Scottsdale Road south of Indian School Road), the demand for pedestrian facilities will also increase. This implies that a greater range of facilities as well as facilities designed to handle a larger number of pedestrians will be necessary.

5.2.2 Bicycle/Pedestrian Improvement Recommendations

General bicycle and pedestrian recommendations for Central/Downtown area are as follows.

- Osborn is a key east/west connection to and through Downtown. It is currently designated as a bicycle route and has edge striping to accommodate bicycles. This facility should be enhanced for bicycle travel.
- Designate 70th Street, Civic Center Plaza, 68th Street and Miller Road as key pedestrian and bicycle links throughout the Central/Downtown Area. The Pedestrian Element

13 Florida Department of Transportation. 2002 *Quality/Level of Service Handbook*. Florida Department of Transportation, Tallahassee, 2002.

14 Landis, B.W. et al. *Modeling the Roadside Walking Environment: Pedestrian Level of Service*. In Transportation Research Record: Journal of the Transportation Research Board, No. 1773, Transportation

contains details recommendations for areas considered "urban" in character, such as Downtown.

- Build a bridge designated for non-motorized travel across the Arizona Canal at Miller and Jackrabbit roads.
- Implement pedestrian enhancements, such as streetscape improvements, and widened sidewalks on both sides of the street.
- Implement pedestrian signals at all intersection locations within the Central/Downtown Study Area that cross Scottsdale Road and Indian School Road. Specific examples are the Scottsdale Road intersections with Camelback Road, Goldwater and Drinkwater boulevards, Indian School Road, and Osborn Road. The recommendations of the Pedestrian Element contain additional details.
- Provide pedestrian crossings where appropriate, augmented with pedestrian refuges in medians, along major arterials in the Central/Downtown Study Area.
- Connect Drinkwater Boulevard to the Arizona Canal on the north and Osborn Road on the south.
- Connect Goldwater Boulevard to the Arizona Canal on the north and Osborn Road on the south.
- Enhance Goldwater and Drinkwater boulevards with bike and pedestrian facilities.
- Implement east/west bicycle connections (on- and off-street) to Indian Bend Wash.
- Enhance bicycle parking throughout Downtown districts as well as in and around the Scottsdale Healthcare Osborn Campus core area. The City should identify locations for and install secure bicycle parking (e.g., "cages" or lockers in the City parking structures) and bike racks.
- Improve pedestrian level lighting and wayfinding signs between Downtown districts.
- Improve pedestrian connections across streets adjacent to Downtown parking garages.
- Improve connections and wayfinding to (and throughout) prominent recreation areas such as the Arizona Canal and the Indian Bend Wash (specifically where the shared-use path breaks north of Chaparral Road and begins again at Indian Bend Road).
- Reconfigure Scottsdale Road to accommodate pedestrian traffic with minimum of 8-foot wide sidewalk wherever possible. Work with property owners where necessary to acquire easements to accommodate enhanced pedestrian facilities.
- On minor Central/Downtown area streets, adopt a minimum 6-foot wide sidewalk.
- Implement the findings of the *Downtown Pedestrian Mobility Study*.

5.3 Transit Opportunities

Recommended transit service in Central/Downtown includes opportunities beyond what is currently planned for the area. These improvements include further enhancement to the existing local, fixed route, and express bus service, as well as new types of transit service and amenities such as HCT on the Scottsdale Road corridor. The recommended transit improvements in Central/Downtown are summarized in Table 10-5. For additional detail, please refer to the Transit and HCT components of the *Transportation Master Plan*.

TABLE 10-5: Transit Opportunities

Transit Improvement	Description
Circulator	Improvement to Neighborhood Connector to serve additional areas in Central/Downtown. Potential destinations include residential areas north and east of Downtown, Indian School Park, and Chaparral Road. Increase operation hours for more nighttime usage to serve full-time residents.
Local Bus Routes	Service frequency and hours of service improvements: Route 72 (Scottsdale Rd) Green Line (Thomas Rd) Route 41 (Indian School Rd) Route 50 (Camelback Rd)
Express Bus Routes	East Loop 101 Connector: Provide a direct connection to local bus service in Central/Downtown via Chaparral Road, Camelback Road, and/or Indian School Road.
Enhanced Bus Service on Scottsdale Road	Limited stops (major arterials and/or major destinations only) 10-minute peak hour frequency (no schedule needed) Enhanced shelters with real-time passenger information Unique branding (bus, shelters, signs)
High Capacity Transit	The HCT Study of the Transportation Master Plan evaluated HCT options on Scottsdale Road through Central Scottsdale. There are multiple alignment options for operating HCT. These alignments range from operating mixed traffic in the existing travel lane to operating in semi-exclusive right-of-way in the median of the roadway.
Passenger Amenities	Other transit facility improvements in Central/Downtown focus on improving passenger amenities at existing and new bus stops. These improvements will include the new standard bus shelter and corresponding passenger amenities (seating, trash receptacles, bicycle racks, and other amenities) that will enhance the safety and comfort of transit patrons. Special consideration will be given to improving passenger amenities high transfer locations where multiple bus routes converge. As service and ridership increase, new amenities such as electronic display boards and real-time passenger information will be introduced. Public restroom facilities are often provided at transit centers like Loloma, and should be considered in other high transfer location transit centers.

Source: HDR, 2006

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11 IMPLEMENTATION AND FUNDING PLAN

11 IMPLEMENTATION AND FUNDING PLAN

1.0 INTRODUCTION

Implementation addresses key policies and strategies necessary to facilitate implementation of the preferred alternative, which is consistent with the goals of the *Transportation Master Plan* detailed in Chapter 2. The Implementation and Funding Plan chapter presents proposed mechanisms to leverage existing funds, access additional funding sources, and maximize benefits of Proposition 400 funds. Coordination and phasing of the recommended capital improvements resulting from the *Transportation Master Plan* process is presented in Sections 5 and 6 of this Chapter.

2.0 TECHNICAL CRITERIA

Technical criteria to evaluate the proposed projects and programs were developed through the public input process, and through coordination with the City's Transportation Commission and staff. Further, evaluation criteria were developed consistent with the T*ransportation Master Plan* Vision, Goals, and Objectives, which are presented in Chapter 2of this document. As potential project solutions were developed, they were screened, modified, refined, and/or deleted through these technical evaluation criteria, presented in Table 11-1.

TABLE 11-1: Technical Criteria

Criterion	Measure
Mode Choice	**Proximity** to multiple modes of transportation Increase in **non-automobile capacity**
Managing regional impact	Ability to **move regional travel** through Scottsdale while minimizing disruption to travel within Scottsdale
Safety	**Number and location of collisions** Ability to respond to large-scale **emergencies** Accident response time
Automobile access and convenience	Automobile **level of service** Point-to-point **travel time** between selected destinations **Consistency and reliability** of travel times **Alternative routes**
Pedestrian access and convenience	**Pedestrian level of service** to the appropriate level (depending on the location) **Connectivity to transit** **Reduction of conflicts with other modes**
Universal Access	**Principles of universal design**
Bicycle access and convenience	**Bicycle level of service** **Reduction of gaps** in bicycle system **Reduction of conflicts with other modes**
Equestrian access and convenience	**Connectivity of trails** **Reduction of conflict** with roadway system (i.e. **more clearly-delineated crossings**)

TABLE 11-1: Technical Criteria

Criterion	Measure
Transit access and utilization	**Transit level of service** (headways, hours, capacity) **Proximity and access** to high-quality transit service Point-to-point **travel time** between selected destinations Walking distance between destinations and stations
Downtown access	**Person-trip access** to Downtown **Linkages to other locations/destinations within the City** Implements Streetscape plan Promotes/supports redevelopment
Airpark access	**Person-trip access** to the Airpark Internal Access Automobile access
Environmental Sustainability	**Energy consumed** for transportation per capita **Reduction in auto trips and/or vehicle miles traveled per capita** **Acres of pavement and parking lots** per capita Transportation **air pollution emissions** per capita
Neighborhood Preservation	**Access to transit** **Neighborhood traffic management** **Preservation of emergency access** **Residential and collector street volume** **Noise measurements**
Cost/benefit	**Life cycle cost**, and Ability to **leverage other funding**
Compatibility with McDowell Sonoran Preserve Plan	**Increase transit access to Preserve** **Increase non-motorized access to the Preserve** **Land Bridge at 128th Street**
Cost	**Capital costs** **Land acquisition (amount and costs)** **Subsidized vs. 'true' costs** **Leveraged costs**
Public Awareness	**Opportunities to change travel behavior**
Economic Viability	**Freight mobility**

3.0 DEVELOPMENT OF PROJECTS AND PROGRAMS

The consultant team, in conjunction with City staff, developed projects and programs for the City, based on the *Transportation Master Plan* goals and screened through these evaluation criteria. In addition, the Scottsdale traffic model that was developed by the consultant team for the City was also used as a tool to help identify and refine potential projects. These prioritized projects and programs, listed for Streets/Traffic, Street Programs, and Bicycle/Pedestrian/ Streetscape, are presented in Table 11-3, at the end of this chapter.

The recommendations contained in the Transit Element of the *Transportation Master Plan* were considered in the development of prioritized transit projects, which are listed in Table 11-4, at the end of this chapter.

In a collaborative approach, City staff and HDR prioritized the projects in Tables 3 and 4 in accordance with the *Transportation Master Plan* goals and the technical criteria listed in Table 11-1. The project prioritization incorporated input from the Transportation Commission.

The projects are generally separate from the currently adopted (2007/08) Five-Year Capital Improvement Plan with the exception of the projects that are funded by Proposition 400.

4.0 FUNDING SOURCES

The City has a number of dedicated sources of funding for transportation projects. These are:

- Proposition 400 regional transportation sales tax. The voters of Maricopa County approved the extension of the half cent sales tax in 2004. The City of Scottsdale has a number of projects over the next 20 years that will be funded by this source.
- Highway user revenue fund (HURF). These funds represent the City's allocation of HURF and other related revenues received from the State. The amount available is determined by population. These funds have generally been used for maintenance within the City and are thus not available to fund projects for this plan.
- Privilege tax of 0.2 percent. In 1989, the voters of Scottsdale approved a sales tax of 0.2 percent to fund transportation projects. The funds have been used for capital expenditures as well as maintenance. One of the options open to the City is to increase this sales tax for transportation purposes. Table 11-2 shows the reported tax rates for Maricopa County cities and towns.

TABLE 11-2: Tax Rates for Maricopa County Cities and Towns

Jurisdiction	Retail Sales	Utilities/ Telecommunications	Hotel/ Motel	Construction Contracting	Restaurant/Bar	State of Arizona[1]	Maricopa County[2]	Total Retail Sales Tax
Apache Junction	2.2	3.2	4.4	2.2	2.2	5.6	0.7	8.50
Avondale	2.5	2.5	2.5	2.5	2.5	5.6	0.7	8.80
Buckeye	2.0	4.0	2.0	3.0	2.0	5.6	0.7	8.30
Carefree	3.0	3.0	6.0	3.0	3.0	5.6	0.7	9.30
Cave Creek	2.5	3.0	6.5	2.5	2.5	5.6	0.7	8.80
Chandler	1.5	1.5	1.5	1.5	1.5	5.6	0.7	7.80
El Mirage	3.0	3.0	5.0	3.0	3.0	5.6	0.7	9.30
Fountain Hills	2.6	2.6	5.6	2.6	2.6	5.6	0.7	8.90
Gila Bend	3.0	3.0	5.0	3.0	3.0	5.6	0.7	9.30
Gilbert	1.5	1.5	4.5	1.5	1.5	5.6	0.7	7.80
Glendale[3]	1.8	5.0	1.8	1.8	2.8	5.6	0.7	8.10
Goodyear	2.0	2.0	4.0	2.0	4.0	5.6	0.7	8.30

TABLE 11-2: Tax Rates for Maricopa County Cities and Towns								
Jurisdiction	Retail Sales	Utilities/ Telecom-munica-tions	Hotel/ Motel	Construc-tion Contract-ing	Restau-rant/Bar	State of Arizona[1]	Maricopa County[2]	Total Retail Sales Tax
Guadalupe	3.0	3.0	3.0	3.0	4.0	5.6	0.7	9.30
Litchfield Park	2.0	2.0	3.0	4.0	2.0	5.6	0.7	8.30
Mesa	1.75	1.75	1.75	1.75	1.75	5.6	0.7	8.05
Paradise Valley	1.65	1.65	4.65	1.65	1.65	5.6	0.7	7.95
Peoria	1.8	3.3	7.4	1.8	2.8	5.6	0.7	8.10
Phoenix	1.8	4.7	4.8	1.8	1.8	5.6	0.7	8.10
Queen Creek	2.0	2.0	3.0	2.0	2.0	5.6	0.7	8.30
Scottsdale	1.65	1.65	4.65	1.65	1.65	5.6	0.7	7.95
Surprise	2.2	2.2	3.2	2.2	3.2	5.6	0.7	8.50
Tempe	1.8	1.8	4.8	1.8	1.8	5.6	0.7	8.10
Tolleson	2.0	2.0	2.0	2.0	2.0	5.6	0.7	8.30
Wickenburg	1.7	1.7	5.2	1.7	1.7	5.6	0.7	8.00
Youngtown	3.0	3.0	5.0	3.0	3.0	5.6	0.7	9.30
Average Rate	2.2	2.6	4.1	2.3	2.4	5.6	0.7	8.50

[1] State of Arizona transaction privilege tax rate generally = 5.6 percent. Mining, jet fuel tax and other minor categories vary.
[2] Maricopa County sales tax rate generally = 0.7 percent. Mining, jet fuel tax and other minor categories vary.
[3] November 1, 2007, Glendale will increase retail sales tax to 2.2 percent. Several other taxes will increase also.
Note: If AZDOR does not collect on behalf of the jurisdiction, categorical tax rates represent individual Web sites and may not be fully noted.
Source: Arizona Department of Revenue and jurisdiction Web sites.

As can be seen from the table, the City of Scottsdale has a retail sales tax of 1.65 percent. This is composed of 1.00 percent for the General Fund, 0.2 percent for transportation, 0.1 percent for public safety, and 0.35 percent for the McDowell Sonoran Preserve. Scottsdale's rate at 1.65 is less than the average of 2.2 percent for all the cities and towns in Maricopa County. One option for the City to increase this funding source could be to increase this sales tax rate to fund transportation projects. The voters of Scottsdale would need to approve this increase in an election.

Currently, the sales tax levy of 0.2 percent for transportation resulted in $20.578 million being collected for the past year[1]. This amount is closely tied to consumer spending which is directly affected by the overall economy.

A number of other large communities in the Valley also have a portion of their sales tax levy dedicated to transportation, these are:

City of Phoenix	0.4 percent dedicated to transit
City of Tempe	0.5 percent dedicated to transportation
City of Mesa	0.3 percent dedicated to transportation

1 Tax collections for February 2008, for business activity in December 2007; City of Scottsdale

City of Glendale	0.5 percent dedicated to transportation
City of Peoria	0.3 percent dedicated to transportation

- **Bond funds.** In the past, the City has utilized voter-approved bond funds to construct capital improvements for infrastructure in the City, including transportation projects. The last bond election in the City was in 2000 and these funds have generally been expended on improvements over the past seven years. If the City were to opt for a new bond program, an election would need to be held. Given the recent change in legislation that allows bonding based on 20 percent of secondary assessed valuation as opposed to the previous 6 percent limitation, the City would be able to raise a significantly larger amount of bond funds.
- **General fund.** This represents a transfer of funds from the general fund to "pay-as-you-go" contributions for projects. This source has generally not been used for transportation projects
- **Grants.** These represent revenues received from federal and state sources and will generally require a match from the City. Possible funding sources for a number of projects that will improve air quality and congestion could be funded through the CMAQ process.
- **Contributions.** These represent amounts paid by other organizations to fund projects. These funds generally come from the development community.

5.0 FUNDING STRATEGY

Table 5 lists the existing funding sources for transportation projects for the City. As discussed above, these sources include existing sales tax, regional sales tax, Bond 2000 funds, grants, and contributions. In discussions with City staff and the Transportation Commission, it has been determined that the program will be spread over the next 22 years. Table 6 lists these sources from FY 09 to FY 30. The total amount available is $579.455 million. Note that for the years between FY 09 and FY 13 it is assumed that no 0.2 percent sales tax revenue will be available to fund the plan. All sales tax receipts will be used to fund transportation operations. From FY 13 onwards, it is assumed that half of the funds generated by the 0.2 percent sales tax will be utilized to fund the plan and the other half used to fund operations. This amount is $10.289 million per year.

Table 7 is a summary of recommended projects from the Master Plan. These projects include streets, traffic, bike, pedestrian, streetscape, and transit projects. The projects are estimated at a cost of $1,222.518 million.

It should be noted that all of the cost estimates and funding sources are in 2007 constant dollars in order to make valid comparisons. Over the 22 years, adjustments for construction cost increases and funding source variations will need to be accounted for.

Table 8 lists the difference between the recommended projects and the available funding. The difference is a deficit of $643.063 million.

There are two suggested methods that could be utilized to make up this difference in funding versus the cost of projects.

The first would be an increase in the existing sales tax levy (0.2 percent) for transportation. As stated previously, the City of Scottsdale retail sales rate is 0.55 percent lower than the average of 2.2 percent for Maricopa County. At 0.2 percent, Scottsdale's rate is also the lowest for transportation purposes compared to the other major cities in the County.

If the rate was increased to 0.50 percent in FY 10, then, according to the City's tax collections for January 2008, the increase in sales tax would yield an additional $30.870 million per year. These funds would be used for the years from FY 10 to FY 13. From FY 14 on, it is assumed that half of the existing sales tax would be available for the plan. These numbers are shown in Table 6 and the total amount generated by the increase in sales tax plus half of the existing sales tax would be in excess of the difference. The plan could therefore be funded. It should be noted that the estimate in the increased revenue as a result of the sales tax increase to 0.5 percent is pro rata based and this may not be a valid assumption. The general state of the economy and the size of the increase from 0.2 percent to 0.5 percent may result in less revenue being collected.

Another option would be the issuance of new bonds to fund the plan. The City would need to determine the amount of new bonds that can be issued based on its existing debt and the ability to issue new debt based on the increase in the limitation from 6 percent to 20 percent. Table 6 also lists this option with bonds issued in FY 10, FY 18, and FY 24. Again, the amount of bonds issued would exceed the difference.

As discussed previously, both of these options, an increase in the sales tax and a new bond issuance, would need to be approved by the voters of Scottsdale in a special election(s).

Table 3
Project List for Streets/Traffic, Street Programs, Bike/Pedestrian/Trails/Streetscape

					Short Term								Mid Term							Long Term						
	Project		Estimated Cost[1] (in $ millions)	Work Phase[3]	FY09	FY10	FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30
	STREETS/TRAFFIC																									
1	Hayden Road/ Camelback and Chaparral Improvements	Bridge widening on Camelback to add additional left turn lane. Free right turn lane from north bound Hayden to east bound Chaparral. Separate underpass under Chaparral east of Hayden for multi-use path	$4.620	P/D	$0.374																					
				ROW	$0.000																					
				Construction		$4.246																				
2	Improvements to the Frank Lloyd Wright – Loop 101 Traffic Interchange	Signal modifications and traffic operations improvements	$0.590	P/D	$0.052																					
				ROW		$0.000																				
				Construction		$0.538																				
3	Improvements to the Raintree and 101 Interchange	Combination of triple lefts from Raintree onto 101, additional storage and traffic operation improvements	$0.651	P/D	$0.057																					
				ROW		$0.000																				
				Construction		$0.594																				
4	Highland between Scottsdale and Goldwater	Improved intersection capacity on the east end and an improved pedestrian connection between the Portales development (north of Highland) and Fashion Square	$0.800	P/D	$0.070																					
				ROW		$0.000																				
				Construction		$0.729																				
5	Extend Northsight from Hayden to Frank Lloyd Wright (minor collector)	Construct a public roadway on the existing private street. Roadway geometrics to be improved. Right of way aquistion will be required.	$9.012	P/D	$0.210																					
				ROW		$6.619																				
				Construction			$2.184																			
6	Frontage road on the south side of Frank Lloyd Wright from Northsight to Greenway-Hayden Loop	Construct a public roadway on the existing private street. Roadway geometrics to be improved. Right of way aquistion will be required.	$1.382	P/D	$0.078																					
				ROW		$0.495																				
				Construction			$0.809																			
7	Thomas Road 68th-Street Intersection Improvements	Provide full intersection improvements, including left turn bays and right turn deceleration bays, for all directions.	$2.582	P/D	$0.209																					
				ROW		$0.198																				
				Construction			$2.175																			
8	Widen Redfield to four lanes between Scottsdale and Hayden	Improve existing three lane cross section to four lanes with bikelanes, sidewalk and landscaping	$3.526	P/D		$0.309																				
				ROW			$0.000																			
				Construction			$3.216																			
9	Intersection improvements at all mile intersections on Pima; Thomas, McDowell, Indian School, Chaparral, McDonald, Indian Bend, Via de Ventura - assume 1/2 improvements. FY 2011 in RTP	These improvements will be constructed with the improvements that SRPMIC will undertake on Pima Road.	$2.860	P/D		$0.275																				
				ROW																						
				Construction			$2.585																			
10	Advance of funds for General Purpose lanes on freeway.	City to enter into agreement with ADOT in order to advance the construction of general purpose lanes. Section fro Shea Blvd to Loop 202 advanced from 2014 to 2010. Section from Shea Blvd to Scottsdale advanced from 2022 to 2012. City would need to fund cost of advancing.	$37.400	P/D																						
				ROW																						
				Construction		$15.840		$21.560																		
11	Pima Road-Pinnacle Peak to Happy Valley. Widen from 4 to 6 lanes FY 2013 in RTP	Improve existing four lane cross section to six lanes with bikelanes, landscaped median and sidewalks. Roadway will include all drainage structures in order to eliminate existing dip crossings.	$16.536	P/D			$1.146																			
				ROW				$3.485																		
				Construction					$11.905																	

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					Short Term								Mid Term							Long Term						
	Project		Estimated Cost[1] (in $ millions)	Work Phase[3]	FY09	FY10	FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30
12	2nd Bridge at Thompson Peak Parkway @ Reata pass Wash	Construct a new bridge which will match the existing structure. Currently traffic from the existing four lane roadway uses the existing two lane bridge structure	$3.850	P/D				$0.055																		
				ROW					$0.000																	
				Construction					$3.795																	
13	Pinnacle Peak Road Miller Road to Pima Road. Widen from 2 to 4 lanes	Improve existing two lane cross section to four lanes with bikelanes, landscaped median and sidewalks. Roadway will include all drainage structures in order to eliminate existing dip crossings.	$24.787	P/D				$0.495																		
				ROW					$3.315																	
				Construction						$10.489	$10.489															
14	Thomas/Hayden intersection improvements	Provide full intersection improvements, including left turn bays and right turn deceleration bays, for all directions.	$3.410	P/D					$0.341																	
				ROW						$0.000																
				Construction						$3.069																
15	Scottsdale Road Pinnacle Peak to Happy Valley. Widen from 4 to 6 lanes FY 2015 in RTP	Improve existing four lane cross section to six lanes with bikelanes, landscaped median and sidewalks. Roadway will include all drainage structures in order to eliminate existing dip crossings.	$16.060	P/D					$0.683																	
				ROW						$8.276																
				Construction							$7.101															
16	Thomas Road-64th Street Improvements	Provide full intersection improvements, including left turn bays and right turn deceleration bays, for all directions.	$1.729	P/D						$0.143																
				ROW						$0.000																
				Construction							$1.586															
17	Dynamite Boulevard Scottsdale Road to Pima Road, Widen from 2 to 4 lanes	Improve existing two lane cross section to four lanes with bikelanes, landscaped median and sidewalks. Roadway will include all drainage structures in order to eliminate existing dip crossings.	$16.225	P/D					$1.155																	
				ROW						$3.520																
				Construction							$11.550															
18	Miller Road Pinnacle Peak Road to Happy Valley, new 2 lane roadway	Construct a new bridge over the Rawhide wash, improve existing two lane roadway from Pinnacle Peak to the Rawhide Wah and connect to existing roadway in Pinnacle Reserve subdivision.	$4.138	P/D					$0.363																	
				ROW						$0.000																
				Construction							$3.775															
19	Happy Valley Road Pima Road to Alma School Road from 2 to 4 lanes	Improve existing two lane cross section to four lanes with bikelanes, landscaped median and sidewalks. Roadway will include all drainage structures in order to eliminate existing dip crossings.	$16.317	P/D					$1.166																	
				ROW						$3.485																
				Construction							$5.833	$5.833														
20	Carefree Highway 60th Street to Scottsdale Road widen from 2 lanes to 4 lanes FY 2016 in RTP	Improve existing two lane cross section to four lanes with bikelanes, landscaped median and sidewalks. Roadway will include all drainage structures in order to eliminate existing dip crossings.	$24.154	P/D					$1.278																	
				ROW						$9.583																
				Construction							$6.646	$6.646														
21	Hayden Rd-McDowell Rd Intersection Improvements	Provide full intersection improvements, including left turn bays and right turn deceleration bays, for all directions.	$2.640	P/D						$0.264																
				ROW							$0.220															
				Construction								$2.156														
22	Thunderbird-Raintree Loop New 4-lane facility between Raintree and T'Bird Road	Construct a new four lane roadway from Redfield to Raintree along an alignment that generally parallels the runway and provides a more direct link between Redfield and the Raintree/ Hayden intersection. This new route will eliminate the need to go through the Hayden/Redfield intersection	$19.120	P/D						$0.433																
				ROW							$14.183	*Impact on buildings may increase ROW costs.														
				Construction								$4.503														
23	2nd Bridge at Union Hills @ Reata Pass Wash	Construct a new bridge which will match the existing structure. Currently traffic from the existing four lane roadway uses the existing two lane bridge structure	$2.750	P/D							$0.220															
				ROW								$0.000														
				Construction								$2.530														

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					Short Term								Mid Term							Long Term						
24	Dynamite Boulevard 56th Street to Scottsdale Road, Widen from 2 to 4 lanes	Improve existing two lane cross section to four lanes with bikelanes, landscaped median and sidewalks. Roadway will include all drainage structures in order to eliminate existing dip crossings.	$14.410	P/D							$0.990															
				ROW								$3.520														
				Construction									$9.900													
25	Scottsdale Road Happy Valley to Dynamite Boulevard. Improve 4 lane existing FY 2017 in RTP	Improve existing four lane cross section to improved four lanes with bikelanes, landscaped median and sidewalks. Roadway will include all drainage structures in order to eliminate existing dip crossings.	$20.229	P/D							$0.858															
				ROW								$10.454														
				Construction									$4.458	$4.458												
26	Pima Road Happy Valley Road to Dynamite Boulevard. Improve Existing 4 lanes FY 2018 in RTP	Improve existing four lane cross section to improved four lanes with bikelanes, landscaped median and sidewalks. Roadway will include all drainage structures in order to eliminate existing dip crossings.	$21.761	P/D								$1.298														
				ROW									$6.970													
				Construction										$6.746	$6.747											
27	Enhancements to Paradise Lane; install 3 roundabouts	Install a roundabout at 74th St	$0.855	P/D									$0.086													
				ROW										$0.000												
				Construction										$0.769												
28	Scottsdale Road Dynamite Boulevard to Carefree Highway Improve 4 lane existing FY 2018 in RTP	Improve existing four lane cross section to improved four lanes with bikelanes, landscaped median and sidewalks. Roadway will include all drainage structures in order to eliminate existing dip crossings.	$27.262	P/D								$1.474														
				ROW									$10.454													
				Construction										$7.667	$7.667											
29	68th Street; From Osborn to Indian School, install left turn lanes	Install left turn lane in place of the existing median.	$0.359	P/D										$0.044												
				ROW											$0.000											
				Construction											$0.315											
30	Raintree-Widen to 6 lanes between Loop 101 and Hayden Rd	Improve existing four lane cross section to six lanes with bikelanes, landscaped median and sidewalks.	$13.622	P/D									$0.499													
				ROW										$7.919												
				Construction											$5.204											
31	Miller Rd Princes Blvd to Center Drive, includes crossing under Loop 101 FY 2020 in RTP	Construct a new four lane roadway from Princess Blvd to Center Drive. This will include an underpass for the Loop 101.	$33.917	P/D									$1.449													
				ROW										$17.424												
				Construction											$7.522	$7.523										
32	Hayden Rd-Widen to 6 lanes between Redfield and Raintree	Improve existing four lane cross section to six lanes with bikelanes, landscaped median and sidewalks.	$6.413	P/D										$0.333												
				ROW											$2.614											
				Construction												$3.466										
33	Construct a frontage road south of the Central Arizona Project to connect the Loop 101 southbound frontage road to Frank Lloyd Wright west of Hayden	Construct new one way roadway that will allow south bound drivers to by-pass the intersection of 101 and Frank Lloyd Wright Boulevard. Connection to FLWB to align with Northsight	$3.892	P/D										$0.069												
				ROW											$3.098											
				Construction												$0.725										
34	Loop 101 Pima/Princess; construct direct ramp connections to mainline	Construct ramps which will enable drivers to free flow from the Loop 101 directly to Pima Rd, both northbound and south bound	$27.003	P/D										$2.104												
				ROW											$2.580											
				Construction												$11.160	$11.160									
35	Happy Valley between Scottsdale and Pima from 2 to 4 lanes	Improve existing two lane cross section to four lanes with bikelanes, landscaped median and sidewalks. Roadway will include all drainage structures in order to eliminate existing dip crossings.	$21.034	P/D										$1.199												
				ROW											$7.841											
				Construction												$5.997	$5.997									

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					FY09	FY10	FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30
36	Dynamite Boulevard 114th Street to 136th Street Widen from 2 to 4 lanes	Improve existing two lane cross section to four lanes with bikelanes, landscaped median and sidewalks. Roadway will include all drainage structures in order to eliminate existing dip crossings.	$21.161	P/D											$1.436											
				ROW												$4.792										
				Construction													$7.467	$7.467								
37	Pima Road Dynamite Boulevard to Stagecoach Pass. Widen from 2 to 4 lanes. FY 2015 in RTP	Improve existing two lane cross section to four lanes with bikelanes, landscaped median and sidewalks. Roadway will include all drainage structures in order to eliminate existing dip crossings.	$27.601	P/D												$2.420										
				ROW													$0.000									
				Construction													$12.591	$12.591								
38	Miller/Hayden Road Happy Valley Rd to Dynamite Blvd, new 2 lane road	Construct a new two lane roadway that will traverse future Preserve property and the new roadway will terminate at Dynamite Blvd	$18.774	P/D												$0.560										
				ROW													$12.395									
				Construction														$2.910	$2.910							
39	Construct HOV ramps from Loop 101 to Northsight/Thunderbird	HOV Ramps will allow direct access to the HOV lanes that are currently under construction. There are potential constructability issues given the existing walls and limited space.	$18.377	P/D																$1.612						
				ROW																	$0.000					
				Construction																	$8.382	$8.383				
40	Center Drive Hayden to Union Hills, between water campus 4 lane new facility	Construct a new four lane roadway that will connect Center Drive to Union Hills Drive. The new roadway will be located between sections of the Water Campus.	$12.718	P/D																$0.780						
				ROW																	$3.834					
				Construction																		$4.052	$4.052			
41	101 Frontage Rd Hayden Rd to Pima/Princess	Construct a new two lane, one way, frontage road on the north side of the Loop 101.	$10.428	P/D																$0.608						
				ROW																	$3.740					
				Construction																		$6.080				
42	Westland, from Hayden to Pima 2 lanes	Improve existing local roadway to a new two lane facility.	$4.497	P/D																	$0.206					
				ROW																		$2.149				
				Construction																			$2.142			
43	Hayden Road Loop 101 Interchange Improvements	Construct ramps which will enable drivers to free flow from the Loop 101 directly to Hayden Rd, both westbound and south bound	$16.385	P/D																		$1.342				
				ROW																			$1.089			
				Construction																				$6.977	$6.976	
44	Construct HOV Ramps from Loop 101 at Mountain View (1/2 only)	HOV Ramps will allow direct access to the HOV lanes that are currently under construction. There are potential constructability issues given the existing walls and limited space.	$11.000	P/D																			$0.880			
				ROW																				$0.000		
				Construction																				$5.060	$5.060	
45	56th Street – Pinnacle Vista to Jomax (new construction)	Construct new two lane roadway	$3.149	P/D																		$0.195				
				ROW																			$0.871			
				Construction																				$2.083		
46	118th Street (northern extension of Happy Valley) Jomax to Dynamite	Construct new two lane roadway	$9.634	P/D																		$0.438				
				ROW																			$4.646			
				Construction																				$4.550		
47	Hayden Road Union Hills to Center Drive Widen from 4 to 6 lanes	Improve existing four lane cross section to six lanes with bikelanes. The existing landscaped median will remain, widening will occur to the outside.	$7.869	P/D																			$0.283			
				ROW																				$4.646		
				Construction																					$2.940	

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	STREET PROGRAMS																									
48	Shea Boulevard Improvements, in RTP. FY 2007 in RTP. ITS and Intersection Improvements	Improvements will consist of intersection improvements and ITS facilities	$22.075	P/D																						
				ROW																						
				Construction		$4.415					$4.415					$4.415					$4.415					$4.415
49	Traffic signal program	This is an on-going program that will design and install traffic signals city wide	$13.200	P/D																						
				ROW																						
				Construction	$0.600	$0.600	$0.600	$0.600	$0.600	$0.600	$0.600	$0.600	$0.600	$0.600	$0.600	$0.600	$0.600	$0.600	$0.600	$0.600	$0.600	$0.600	$0.600	$0.600	$0.600	$0.600
50	ITS Program	This is an on-going program that will design and install traffic signals city wide	$44.000	P/D																						
				ROW																						
				Construction	$2.000	$2.000	$2.000	$2.000	$2.000	$2.000	$2.000	$2.000	$2.000	$2.000	$2.000	$2.000	$2.000	$2.000	$2.000	$2.000	$2.000	$2.000	$2.000	$2.000	$2.000	$2.000
51	Transportation Demand Management Program (Downtown + Airport)	This is an on-going program whereby the city, working with employers implement programs that will reduce the traffic demand in the downtown and airpark areas.	$12.750	P/D																						
				ROW																						
				Construction	$0.500	$0.500	$0.500	$0.500	$0.500	$0.500	$0.500	$0.500	$0.700	$0.700	$0.700	$0.700	$0.700	$0.700	$0.700	$0.550	$0.550	$0.550	$0.550	$0.550	$0.550	$0.550
52	Intersection Mobility Enhancement Program	This is an on-going program that will design and install intersection improvements consisting of left turn movements, right turn deceleration lanes and other improvements city wide	$42.000	P/D																						
				ROW																						
				Construction		$2.000	$2.000	$2.000	$2.000	$2.000	$2.000	$2.000	$2.000	$2.000	$2.000	$2.000	$2.000	$2.000	$2.000	$2.000	$2.000	$2.000	$2.000	$2.000	$2.000	$2.000
53	Neighborhood Traffic Management	This is an on-going program that will design and install neigborhood traffic calming devices city wide	$11.000	P/D																						
				ROW																						
				Construction	$0.500	$0.500	$0.500	$0.500	$0.500	$0.500	$0.500	$0.500	$0.500	$0.500	$0.500	$0.500	$0.500	$0.500	$0.500	$0.500	$0.500	$0.500	$0.500	$0.500	$0.500	$0.500
	TOTAL		$712.514		$4.651	$39.858	$17.714	$31.195	$29.602	$44.862	$73.466	$44.015	$39.616	$54.533	$50.822	$46.857	$55.409	$28.767	$8.710	$8.650	$26.226	$28.289	$19.613	$28.967	$20.627	$10.065
	BIKE/PEDESTRIAN/TRAILS/STREETSCAPE																									
1	Streetscape Improvements – Downtown/Central area	Streetscape projects will install landscaping, sidewalks, street furniture and other hardscape improvements. The projects will encourage pedestrian movement and will maximize shade opportunities along the street.	$15.400	P/D	$1.540																					
				ROW																						
				Construction		$4.620		$4.620		$4.620																
2	Airpark Streetscape Program Airpark Streetscape Program - Bike Improvements Pedestrian Improvements Other amenity Improvements	Streetscape projects will install landscaping, sidewalks, street furniture and other hardscape improvements. The projects will encourage pedestrian movement and will maximize shade opportunities along the street.	$8.470	P/D	$0.770																					
				ROW																						
				Construction		$3.850		$3.850																		
3	Streetscape improvements on Hayden from McKellips to Indian School	Streetscape projects will install landscaping, sidewalks, street furniture and other hardscape improvements. The projects will encourage pedestrian movement and will maximize shade opportunities along the street.	$12.705	P/D	$1.155																					
				ROW																						
				Construction		$5.775		$5.775																		
4	Streetscape improvements on Osborn from 64th Street to Miller Road	Streetscape projects will install landscaping, sidewalks, street furniture and other hardscape improvements. The projects will encourage pedestrian movement and will maximize shade opportunities along the street.	$5.082	P/D			$0.462																			
				ROW																						
				Construction				$2.310		$2.310																
5	Chaparral Road 68th Street to Scottsdale Road	Streetscape projects will install landscaping, sidewalks, street furniture and other hardscape improvements. The projects will encourage pedestrian movement and will maximize shade opportunities along the street.	$5.390	P/D			$0.000																			
				ROW				$0.000																		
				Construction				$5.390																		

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6	Streetscape on Thomas Rd from 60th to Miller Road Mid Term	Streetscape projects will install landscaping, sidewalks, street furniture and other hardscape improvements. The projects will encourage pedestrian movement and will maximize shade opportunities along the street.	$5.467	P/D				$0.539																		
				ROW																						
				Construction					$2.464		$2.464															
7	Streetscape improvements on Miller Rd between McDowell and Jackrabbit	Streetscape projects will install landscaping, sidewalks, street furniture and other hardscape improvements. The projects will encourage pedestrian movement and will maximize shade opportunities along the street.	$11.858	P/D					$1.078																	
				ROW																						
				Construction						$5.390		$5.390														
8	Streetscape improvements on 68th Street between Roosevelt and Indian School	Streetscape projects will install landscaping, sidewalks, street furniture and other hardscape improvements. The projects will encourage pedestrian movement and will maximize shade opportunities along the street.	$8.470	P/D						$0.770																
				ROW																						
				Construction							$3.850		$3.850													
9	Streetscape Improvements on Chaparral Rd between Miller and Hayden	Streetscape projects will install landscaping, sidewalks, street furniture and other hardscape improvements. The projects will encourage pedestrian movement and will maximize shade opportunities along the street.	$1.694	P/D							$0.154															
				ROW																						
				Construction								$1.540														
10	Streetscape improvements on Oak east of Scottsdale and Miller	Streetscape projects will install landscaping, sidewalks, street furniture and other hardscape improvements. The projects will encourage pedestrian movement and will maximize shade opportunities along the street.	$1.694	P/D									$0.154													
				ROW																						
				Construction										$0.770		$0.770										
11	Streetscape improvements on Roosevelt between Scottsdale Rd and 86th St.	Streetscape projects will install landscaping, sidewalks, street furniture and other hardscape improvements. The projects will encourage pedestrian movement and will maximize shade opportunities along the street.	$5.929	P/D										$0.539												
				ROW																						
				Construction											$2.695		$2.695									
12	NE Quad – Entertainment District – pedestrian/on-street parking improvements	Street parking will be improved in the area and streetscaping will also occur	$3.388	P/D										$0.308												
				ROW																						
				Construction											$1.540		$1.540									
13	Downtown Couplet, lane reductions and Scottsdale Rd transitions, includes bike improvements	The north bound lane for east couplet, and south bound lane for the west couplet will be removed and the roadway modified to include pedestrain and bicycle improvements as well as streetscape elements.	$6.126	P/D										$0.989												
				ROW																						
				Construction											$2.569	$2.569										
14	Streetscape Improvements – 73rd Street, Greenway/Hayden Loop	Streetscape projects will install landscaping, sidewalks, street furniture and other hardscape improvements. The projects will encourage pedestrian movement and will maximize shade opportunities along the street.	$6.776	P/D											$0.616											
				ROW																						
				Construction												$3.080		$3.080								
15	Multi-use paths/roadway restriping	Roadways will be restriped so that bicycles may share the existing asphalt pavement.	$188.760	P/D																						
				ROW																						
				Construction	$8.580	$8.580	$8.580	$8.580	$8.580	$8.580	$8.580	$8.580	$8.580	$8.580	$8.580	$8.580	$8.580	$8.580	$8.580	$8.580	$8.580	$8.580	$8.580	$8.580	$8.580	$8.580
16	Bicycle/Pedestrian Safety Educational Program	Education programs, including mapping, that will encourage the public to utilize the bike system	$2.420	P/D	$0.110	$0.110	$0.110	$0.110	$0.110	$0.110	$0.110	$0.110	$0.110	$0.110	$0.110	$0.110	$0.110	$0.110	$0.110	$0.110	$0.110	$0.110	$0.110	$0.110	$0.110	$0.110
				ROW																						
				Construction																						
17	Sidewalk Improvements	An on-going program to complete and enhance sidewalks city wide	$18.150	P/D																						
				ROW																						
				Construction	$0.825	$0.825	$0.825	$0.825	$0.825	$0.825	$0.825	$0.825	$0.825	$0.825	$0.825	$0.825	$0.825	$0.825	$0.825	$0.825	$0.825	$0.825	$0.825	$0.825	$0.825	$0.825

Note:
1. All Costs in millions $ 2007
2. Prioritization defined in Implementation and Funding Plan
3. P/D is Planning and Design

Table 3
Project List for Streets/Traffic, Street Programs, Bike/Pedestrian/Trails/Streetscape

					Short Term								Mid Term							Long Term						
	Project		Estimated Cost[1] (in $ millions)	Work Phase[3]	FY09	FY10	FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30
18	Trail Improvement Program	An on-going program to complete and enhance unpaved trails city wide	$18.150	P/D																						
				ROW																						
				Construction	$0.825	$0.825	$0.825	$0.825	$0.825	$0.825	$0.825	$0.825	$0.825	$0.825	$0.825	$0.825	$0.825	$0.825	$0.825	$0.825	$0.825	$0.825	$0.825	$0.825	$0.825	$0.825
19	100th Street loop from FLW to FLW Right Sizing	Right sizing projects will remove an existing lane on a street that has traffic volumes that does not justify the existing street width. The resulting narrower street will be constructed to include trails, landscaping and street furniture.	$5.304	P/D																$0.465						
				ROW																	$0.000					
				Construction																		$2.419	$2.419			
20	92nd Street from Sweetwater to FLW Right Sizing	Right sizing projects will remove an existing lane on a street that has traffic volumes that does not justify the existing street width. The resulting narrower street will be constructed to include trails, landscaping and street furniture.	$8.510	P/D																	$0.698					
				ROW																		$0.000				
				Construction																		$3.907	$3.905			
21	Redfield from FLW to 92nd Street Right Sizing	Right sizing projects will remove an existing lane on a street that has traffic volumes that does not justify the existing street width. The resulting narrower street will be constructed to include trails, landscaping and street furniture.	$3.978	P/D																		$0.350				
				ROW																			$0.000			
				Construction																			$1.814	$1.814		
22	Sweetwater from 90th to 96th Street Right Sizing	Right sizing projects will remove an existing lane on a street that has traffic volumes that does not justify the existing street width. The resulting narrower street will be constructed to include trails, landscaping and street furniture.	$3.978	P/D																			$0.350			
				ROW																				$0.000		
				Construction																				$1.814	$1.814	
	SUB TOTAL		$347.699		$13.805	$24.585	$10.802	$32.824	$13.882	$23.430	$16.808	$17.270	$14.344	$12.946	$17.760	$16.759	$14.575	$13.420	$10.340	$10.805	$11.038	$17.016	$18.828	$13.968	$12.154	$10.340
	TRANSIT																									
1	Cosmetic renovation of Loloma Station (maintenance) 15 year building upgrade, in place, no significant remodel, no size increase; include (add) electronic communications, replace kiosks and shelters, replace pavement, restriping, replace and update signal		$1.100	P/D					$0.110																	
				ROW																						
				Construction						$0.990																
	SUB TOTAL		$1.100		$0.000	$0.000	$0.000	$0.000	$0.110	$0.990	$0.000	$0.000	$0.000	$0.000	$0.000	$0.000	$0.000	$0.000	$0.000	$0.000	$0.000	$0.000	$0.000	$0.000	$0.000	$0.000
	TOTAL		**$1,061.312**		**$18.456**	**$64.443**	**$28.516**	**$64.019**	**$43.594**	**$69.282**	**$90.274**	**$61.285**	**$53.960**	**$67.479**	**$68.582**	**$63.616**	**$69.984**	**$42.187**	**$19.050**	**$19.455**	**$37.264**	**$45.305**	**$38.442**	**$42.935**	**$32.781**	**$20.405**

Note:
1. All Costs in millions $ 2007
2. Prioritization defined in Implementation and Funding Plan
3. P/D is Planning and Design

Table 4
Transit Improvements

				Short Term								Mid Term							Long Term						
Project	Scottsdale Estimated Cost[1] (in $ millions)	Other Community Estimated Cost[1] (in $ millions)	Total Estimated Cost[1] (in $ millions)	FY09	FY10	FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30
TRANSIT																									
SHORT TERM IMPROVEMENTS																									
FIXED ROUTE BUS																									
Route 17 - McDowell Increase service frequency between 44th St and Scottsdale Rd	0.440	1.088	1.528	0.055	0.055	0.055	0.055	0.055	0.055	0.055	0.055														
Green - Thomas Increase service frequency between 44th St and Scottsdale Rd	2.776	2.080	4.856	0.347	0.347	0.347	0.347	0.347	0.347	0.347	0.347														
41 - Indian School No change	0.000	0.000	0.000																						
50 - Camelback Increase service frequency and service span between 44th St and Scottsdale Rd	0.656	1.648	2.304	0.082	0.082	0.082	0.082	0.082	0.082	0.082	0.082														
66 - 68th Street Reroute to serve Scottsdale Fashion Square before Loloma Station	0.376	0.000	0.376	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047														
72 - Scottsdale Extend route to Thompson Peak Parkway	0.456	0.000	0.456	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.057														
76 - Miller No Change	0.000	0.000	0.000																						
81 - Hayden No Change	0.000	0.000	0.000																						
84 - Granite Reef Extend route north on Pima Rd/92nd St to Via Linda and combine with Route 114. Increase service frequency and service span.	3.224	0.000	3.224	0.403	0.403	0.403	0.403	0.403	0.403	0.403	0.403														
106 - Shea Increase service frequency and service span between PV Mall and 92nd St	1.704	0.978	2.682	0.213	0.213	0.213	0.213	0.213	0.213	0.213	0.213														
114 - Via Linda Eliminated (replaced by Route 84 extension)	0.000	0.000	0.000																						
154 - Greenway New route extended from City of Phoenix	0.000	0.000	0.000																						
170 - Bell No Change	0.000	0.000	0.000																						
SUB TOTAL	**9.632**	**5.794**	**15.426**	1.204	1.204	1.204	1.204	1.204	1.204	1.204	1.204	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
EXPRESS BUS																									
510 - McCormick Ranch Add 2 new trips	0.216	0.294	0.510	0.027	0.027	0.027	0.027	0.027	0.027	0.027	0.027														
512 - Fountain Hills																									

Note:
1. All Costs in millions $ 2007

Table 4
Transit Improvements

				Short Term								Mid Term							Long Term						
Project	Scottsdale Estimated Cost[1] (in $ millions)	Other Community Estimated Cost[1] (in $ millions)	Total Estimated Cost[1] (in $ millions)	FY09	FY10	FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30
Add 2 new trips	0.328	0.618	0.946	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041														
572 - North Loop 101 New two way route between Surprise and Airpark	0.232	3.653	3.885	0.029	0.029	0.029	0.029	0.029	0.029	0.029	0.029														
TBD - East Loop 101 New two way route between Airpark and Chandler	1.984	1.723	3.707	0.248	0.248	0.248	0.248	0.248	0.248	0.248	0.248														
SUB TOTAL	**2.760**	**6.288**	**9.048**	0.345	0.345	0.345	0.345	0.345	0.345	0.345	0.345	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NEIGHBORHOOD CIRCULATOR																									
DT - Downtown Trolley No Change	0.000	0.000	0.000																						
NC - Neighborhood Connector Extend route to serve Skysong Transit Center	3.928	0.000	3.928	0.491	0.491	0.491	0.491	0.491	0.491	0.491	0.491														
SUB TOTAL	**3.928**	**0.000**	**3.928**	0.491	0.491	0.491	0.491	0.491	0.491	0.491	0.491	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SHORT TERM TOTAL	**16.320**	12.082	28.402	2.040	2.040	2.040	2.040	2.040	2.040	2.040	2.040	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MID TERM IMPROVEMENTS																									
FIXED ROUTE BUS																									
Route 17 - McDowell No change	0.385	0.952	1.337									0.055	0.055	0.055	0.055	0.055	0.055	0.055							
Green - Thomas No change	2.429	1.820	4.249									0.347	0.347	0.347	0.347	0.347	0.347	0.347							
41 - Indian School Extend route to Scottsdale Community College	3.388	0.000	3.388									0.484	0.484	0.484	0.484	0.484	0.484	0.484							
50 - Camelback No change	0.574	1.442	2.016									0.082	0.082	0.082	0.082	0.082	0.082	0.082							
66 - 68th Street Increase service frequency	0.721	0.000	0.721									0.103	0.103	0.103	0.103	0.103	0.103	0.103							
72 - Scottsdale No change	0.399	0.000	0.399									0.057	0.057	0.057	0.057	0.057	0.057	0.057							
76 - Miller Increase service frequency	1.708	0.000	1.708									0.244	0.244	0.244	0.244	0.244	0.244	0.244							
81 - Hayden No Change	0.000	0.000	0.000																						
84 - Granite Reef No change	2.821	0.000	2.821									0.403	0.403	0.403	0.403	0.403	0.403	0.403							
106 - Shea																									

Note:
1. All Costs in millions $ 2007

Table 4
Transit Improvements

Project	Scottsdale Estimated Cost[1] (in $ millions)	Other Community Estimated Cost[1] (in $ millions)	Total Estimated Cost[1] (in $ millions)	Short Term FY09	FY10	FY11	FY12	FY13	FY14	FY15	FY16	Mid Term FY17	FY18	FY19	FY20	FY21	FY22	FY23	Long Term FY24	FY25	FY26	FY27	FY28	FY29	FY30
No change	1.491	0.856	2.347									0.213	0.213	0.213	0.213	0.213	0.213	0.213							
114 - Via Linda No change	0.000	0.000	0.000																						
154 - Greenway No change	0.000	0.000	0.000																						
170 - Bell Extend route to Shea and increase service frequency	16.219	0.000	16.219									2.317	2.317	2.317	2.317	2.317	2.317	2.317							
SUB TOTAL	30.135	5.070	35.205	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.305	4.305	4.305	4.305	4.305	4.305	4.305	0.000	0.000	0.000	0.000	0.000	0.000	0.000
EXPRESS BUS																									
510 - McCormick Ranch No change	0.189	0.257	0.446									0.027	0.027	0.027	0.027	0.027	0.027	0.027							
512 - Fountain Hills No change	0.287	0.541	0.828									0.041	0.041	0.041	0.041	0.041	0.041	0.041							
572 - North Loop 101 No change	0.203	3.196	3.399									0.029	0.029	0.029	0.029	0.029	0.029	0.029							
TBD - East Loop 101 No change	1.736	1.508	3.244									0.248	0.248	0.248	0.248	0.248	0.248	0.248							
TBD - Pima New peak hour, peak direction route on Loop 101 between Airpark and Downtown Phoenix	2.184	1.922	4.106									0.312	0.312	0.312	0.312	0.312	0.312	0.312							
SUB TOTAL	4.599	7.424	12.023	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.657	0.657	0.657	0.657	0.657	0.657	0.657	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ENHANCED BUS																									
TBD - Scottsdale Road Skysong (or Tempe/Chandler) to Loop 101	0.392		0.392									0.056	0.056	0.056	0.056	0.056	0.056	0.056							
SUB TOTAL	0.392		0.392	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.056	0.056	0.056	0.056	0.056	0.056	0.056	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NEIGHBORHOOD CIRCULATOR																									
DT - Downtown Trolley No Change	0.000		0.000																						
NC - Neighborhood Connector Extend route to serve other areas	11.445		11.445									1.635	1.635	1.635	1.635	1.635	1.635	1.635							
SUB TOTAL	11.445		11.445									1.635	1.635	1.635	1.635	1.635	1.635	1.635	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MID TERM TOTAL	46.571	12.494	59.065	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	6.653	6.653	6.653	6.653	6.653	6.653	6.653	0.000	0.000	0.000	0.000	0.000	0.000	0.000
LONG TERM IMPROVEMENTS																									
FIXED ROUTE BUS																									
Route 17 - McDowell Increase service frequency and service span between Scottsdale Rd and Pima Rd)	1.519	0.952	2.471																0.217	0.217	0.217	0.217	0.217	0.217	0.217

Note:
1. All Costs in millions $ 2007

Table 4
Transit Improvements

				Short Term								Mid Term							Long Term						
Project	Scottsdale Estimated Cost[1] (in $ millions)	Other Community Estimated Cost[1] (in $ millions)	Total Estimated Cost[1] (in $ millions)	FY09	FY10	FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30
Green - Thomas Increase service frequency and service span between Scottsdale Rd and Pima Rd	6.517	1.820	8.337																0.931	0.931	0.931	0.931	0.931	0.931	0.931
41 - Indian School Increase service frequency and service span between Scottsdale Rd and Pima Rd	9.289	0.000	9.289																1.327	1.327	1.327	1.327	1.327	1.327	1.327
50 - Camelback Increase service frequency and service span between Scottsdale Rd and SCC	2.107	1.442	3.549																0.301	0.301	0.301	0.301	0.301	0.301	0.301
66 - 68th Street No Change	0.721	0.000	0.721																0.103	0.103	0.103	0.103	0.103	0.103	0.103
72 - Scottsdale Extend route from Thompson Peak to Carefree Highway	11.340	0.000	11.340																1.620	1.620	1.620	1.620	1.620	1.620	1.620
76 - Miller Reroute to serve Hayden Road between McDonald Dr and Airpark TC.	4.130	0.000	4.130																0.590	0.590	0.590	0.590	0.590	0.590	0.590
81 - Hayden Reroute to serve Airpark TC	0.000	0.000	0.000																						
84 - Granite Reef Increase service frequency	5.439	0.000	5.439																0.777	0.777	0.777	0.777	0.777	0.777	0.777
106 - Shea Increase service frequency and service span between 92nd St and Mayo Clinic	3.577	0.856	4.433																0.511	0.511	0.511	0.511	0.511	0.511	0.511
114 - Via Linda Extend route from PV Mall to Airpark	0.000	0.000	0.000																						
154 - Greenway No change	0.000	0.000	0.000																						
170 - Bell Reroute to serve Airpark TC	16.219	0.000	16.219																2.317	2.317	2.317	2.317	2.317	2.317	2.317
SUB TOTAL	60.858	5.070	65.928	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	8.694	8.694	8.694	8.694	8.694	8.694	8.694
EXPRESS BUS																									
510 - McCormick Ranch No change	0.189	0.257	0.446																0.027	0.027	0.027	0.027	0.027	0.027	0.027
512 - Fountain Hills Eliminated and replaced by Shea/SR 51 express	0.000	0.000	0.000																						
TBD - North Loop 101 No change)	0.203	3.196	3.399																0.029	0.029	0.029	0.029	0.029	0.029	0.029
TBD - East Loop 101 No change	1.736	1.508	3.244																0.248	0.248	0.248	0.248	0.248	0.248	0.248

Note:
1. All Costs in millions $ 2007

Table 4
Transit Improvements

				Short Term								Mid Term							Long Term						
Project	**Scottsdale Estimated Cost[1] (in $ millions)**	**Other Community Estimated Cost[1] (in $ millions)**	**Total Estimated Cost[1] (in $ millions)**	FY09	FY10	FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30
TBD - Pima Airpark No change	2.184	1.922	4.106																0.312	0.312	0.312	0.312	0.312	0.312	0.312
TBD - Loop 202 New all day, two way route between Skysong and Downtown Phoenix	1.218	13.416	14.634																0.174	0.174	0.174	0.174	0.174	0.174	0.174
TBD - Shea/SR 51 Replace Route 512	1.141	2.129	3.270																0.163	0.163	0.163	0.163	0.163	0.163	0.163
SUB TOTAL	6.671	22.428	29.099	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.953	0.953	0.953	0.953	0.953	0.953	0.953
ENHANCED BUS																									
TBD - Scottsdale Road Skysong (or Tempe/Chandler) to Loop 101	0.392	0.000	0.392																0.056	0.056	0.056	0.056	0.056	0.056	0.056
SUB TOTAL	0.392	0.000	0.392	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.056	0.056	0.056	0.056	0.056	0.056	0.056
NEIGHBORHOOD CIRCULATOR																									
DT - Downtown Trolley No Change	0.000	0.000	0.000																						
NC - Neighborhood Connector No change	11.445	0.000	11.445																1.635	1.635	1.635	1.635	1.635	1.635	1.635
AC - Airpark Circulator New Airpark Circulator	18.949	0.000	18.949																2.707	2.707	2.707	2.707	2.707	2.707	2.707
SUB TOTAL	30.394	0.000	30.394	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.342	4.342	4.342	4.342	4.342	4.342	4.342
LONG TERM TOTAL (NOTE 2)	**98.315**	27.498	125.813	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	14.045	14.045	14.045	14.045	14.045	14.045	14.045
TOTAL	**161.206**	52.074	213.280	2.040	2.040	2.040	2.040	2.040	2.040	2.040	2.040	6.653	6.653	6.653	6.653	6.653	6.653	6.653	14.045	14.045	14.045	14.045	14.045	14.045	14.045

Note:
1. All Costs in millions $ 2007

Table 5 - from City

Table 6 - Existing Funding Sources

CITY OF SCOTTSDALE
EXISTING FUNDING SOURCES (IN $ MILLIONS)

Fund Source		FY 09	FY 10	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20	FY 21	FY 22	FY 23	FY 24	FY 25	FY 26	FY 27	FY 28	FY 29	FY 30
Transportation 0.2% Sales Tax (CIP)	174.913	0.000	0.000	0.000	0.000	0.000	10.289	10.289	10.289	10.289	10.289	10.289	10.289	10.289	10.289	10.289	10.289	10.289	10.289	10.289	10.289	10.289	10.289
Regional Sales Tax - arterials	291.826	19.798	6.807	26.787	6.154	21.255	25.661	11.904	27.692	23.906	29.775	35.034	22.037	10.643	8.714	3.525	12.134	0.000	0.000	0.000	0.000	0.000	0.000
Regional Sales Tax - transit operations (net of fares)	77.616	0.277	0.277	0.277	0.277	1.177	2.027	5.027	5.027	5.047	5.027	6.187	7.287	7.287	7.287	7.287	7.287	7.287	3.267	0.000	0.000	0.000	0.000
Bond 2000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Grants	35.100	0.000	0.000	0.000	0.000	1.100	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000
Contributions																							
Total	**579.455**	**20.075**	**7.084**	**27.064**	**6.431**	**23.532**	**39.977**	**29.220**	**45.008**	**41.242**	**47.091**	**53.510**	**41.613**	**30.219**	**28.290**	**23.101**	**31.710**	**19.576**	**15.556**	**12.289**	**12.289**	**12.289**	**12.289**

Table 7 - Summary of Recommended Projects

CITY OF SCOTTSDALE
SUMMARY OF RECOMMENDED PROJECTS (IN $ MILLIONS)

Fund Source		FY 09	FY 10	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20	FY 21	FY 22	FY 23	FY 24	FY 25	FY 26	FY 27	FY 28	FY 29	FY 30
Street/Traffic Projects	712.514	4.651	39.858	17.714	31.195	29.602	44.862	73.466	44.015	39.616	54.533	50.822	46.857	55.409	28.767	8.710	8.650	26.226	28.289	19.613	28.967	20.627	10.065
Bike/Pedestrian/ Streetscape	347.699	13.805	24.585	10.802	32.824	13.882	23.430	16.808	17.270	14.344	12.946	17.760	16.759	14.575	13.420	10.340	10.805	11.038	17.016	18.828	13.968	12.154	10.340
Transit Projects	161.206	2.040	2.040	2.040	2.040	2.040	2.040	2.040	2.040	6.653	6.653	6.653	6.653	6.653	6.653	6.653	14.045	14.045	14.045	14.045	14.045	14.045	14.045
Lololma Transit Station Renovation	1.100					0.110	0.990																
Total	**1222.518**	**20.496**	**66.483**	**30.556**	**66.059**	**45.634**	**71.322**	**92.314**	**63.325**	**60.613**	**74.132**	**75.235**	**70.269**	**76.637**	**48.840**	**25.703**	**33.500**	**51.309**	**59.350**	**52.487**	**56.980**	**46.826**	**34.450**

Table 8 - Difference between Totals of Recommended Projects and Existing Funding Sources and Funding Options

CITY OF SCOTTSDALE
DIFFERENCE BETWEEN TOTALS OF RECOMMENDED PROJECTS AND EXISTING FUNDING SOURCES AND FUNDING OPTIONS (IN $ MILLIONS)

Fund Source		FY 09	FY 10	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20	FY 21	FY 22	FY 23	FY 24	FY 25	FY 26	FY 27	FY 28	FY 29	FY 30
Difference	-643.063	-0.420	-59.399	-3.492	-59.628	-22.102	-31.345	-63.094	-18.317	-19.371	-27.041	-21.725	-28.656	-46.418	-20.550	-2.602	-1.790	-31.733	-43.794	-40.198	-44.691	-34.537	-22.161
Option 1. Increase Tax to 0.5% in FY10	**648.270**		30.870	30.870	30.870	30.870	30.870	30.870	30.870	30.870	30.870	30.870	30.870	30.870	30.870	30.870	30.870	30.870	30.870	30.870	30.870	30.870	30.870
Option2. Keep sales tax at 0.2% and issue Bonds FY 10, FY 17 and FY 24	**645.000**		215.000							215.000							215.000						

LIST OF ABBREVIATIONS AND ACRONYMS

ACRONYM	
AASHTO	American Association of State Highway and Transportation Officials
ADA	Americans With Disabilities Act
ADAAG	Americans With Disabilities Act Accessibility Guidelines
ADOT	Arizona Department of Transportation
ADT	average daily trips
APS	accessible pedestrian signal
ARS	Arizona Revised Statutes
ASU	Arizona State University
BOR	Bureau of Reclamation
BRT	bus rapid transit
CAP	Central Arizona Project
CAWCD	Central Arizona Water Conservation District
CIP	Capital Improvement Plan
CMAQ	Congestion Mitigation and Air Quality
CPTED	Crime Prevention Through Environmental Design
DS&PM	Design Standards and Policies Manual
ESL	Environmentally Sensitive Lands
ESLO	Environmentally Sensitive Lands Ordinance
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
GIS	Geographic Information System
HCM	Highway Capacity Manual (prepared by Transportation Research Board)
HCT	high capacity transit
HOV	high occupancy vehicle
ISTEA	Intermodal Surface Transportation Efficiency Act (1991)
ITS	intelligent transportation system
LAB	League of American Bicyclists
LOS	level of service
LRT	light rail transit
LTAF	Local Transportation Assistance Fund
MAG	Maricopa Association of Governments
METRO	Valley Metro Rail
MPH	miles per hour
MUTCD	Manual on Uniform Traffic Control Devices
NAOS	Natural Area Open Space
NCUTCD	National Committee on Uniform Traffic Control Devices

NHTSA	National Highway Traffic Safety Administration
RPTA	Regional Public Transportation Authority
RTP	Regional Transportation Plan (prepared by Maricopa Association of Governments)
ROW	right-of-way
RWMP	Right-of-Way Management Program
SAFETEA	Safe, Accountable, Flexible and Efficient Transportation Equity Act: A Legacy For Users
SCC	Scottsdale Community College
SOV	single occupancy vehicle
SRTS	Safe Routes to School
STP	Surface Transportation Program
TAZ	traffic analysis zone
TEA-21	Transportation Equity Act for the 21st Century
TIP	Transportation Improvement Program
TMA	transportation management association
TMC	traffic management center
TPC	Tournament Players Club
USDOT	United States Department of Transportation
VMT	vehicle miles traveled
VPD	vehicles per day

GLOSSARY

TERM	DEFINITION
accessible	An environment or facility that provides equal access to people with different abilities.
accessible pedestrian signal	A device that communicates information about the WALK phase in audible and vibrotactile formats.
Americans with Disabilities Act	This federal civil rights law was passed in 1990. The law prohibits discrimination against people with disabilities, and requires public entities and public accommodations to provide accessible accommodations for people with disabilities.
arterial roadway	A roadway with partial control of access, with some at-grade intersections, intended to move high volumes of traffic over longer distances and higher speeds than secondary roadways.
bicycle level of service	Level of bicycle access and safety, measured quantitatively; factors that create friction between the bicyclist and the environment.
bus rapid transit	A form of advanced bus service which combines the advantages of rail transit with the flexibility of buses. Bus rapid transit (BRT) uses a dedicated or shared guideway to provide limited stop service in medium to heavy travel demand corridors. Traffic signal priority is given to BRT vehicles as they operate in designated bus or high occupancy vehicle lanes. Phoenix's RAPID bus service is the closest to BRT in this region. Average maximum passenger loads are 60 to 90; maximum operating speeds are 55 to 65 miles per hour.
capital costs	Nonrecurring costs required to construct roadway and transit systems, including costs of right-of-way, facilities, transit vehicles, transit vehicle power distribution, associated administrative and design costs, and financing charges during construction.
collector streets	Streets in which traffic in a particular neighborhood flows to exit or enter the neighborhood.
complete streets	Complete streets are designed and operated to enable safe and comfortable access for all users, particularly non-motorized modes. Pedestrians, bicyclists, motorists and transit riders of all ages and abilities must be able to safely move along and across a complete street.
Crime Prevention through Environmental Design	Crime Prevention through Environmental Design is a series of design principles that can result in an environment being safer and more secure for pedestrians.
cross slope	The grade that is perpendicular to the direction of accessible pedestrian travel.
Crosswalk	According to Arizona State Law (Section 28.601), a crosswalk is "that part of the roadway at an intersection included within the prolongations or connections of the lateral lines of the sidewalks on opposite sides of the highway measured from the curbs or, in absence of curbs, from the edges of the traversable roadway." A crosswalk is also "any portion of a roadway at an intersection or elsewhere that is distinctly indicated for pedestrian crossing by lines or other markings on the surface."
curb ramp	A combined ramp and landing that accomplishes a change in level at a curb. This element provides street and sidewalk access to pedestrians using wheelchairs and other mobility devices.
detectable warning	A surface feature of truncated dome material built in or applied to the walking surface to advise of an upcoming change from pedestrian to vehicular way.

effective walkway width	The portion of the sidewalk that is free from barriers such as utilities, slower pedestrians, people waiting, furniture, building elements or plant material.
feasible	Capable of being accomplished with a reasonable amount of effort, cost, or other hardship. With regard to Americans with Disabilities Act (ADA) compliance, feasibility is determined on a case-by-case basis. For example, it might not be feasible to install a ramp that meets ADA Accessibility Guidelines (ADAAG) specifications on a very steep hill, but it would be feasible to install an ADAAG ramp at the entrance of a building.
grade	The slope parallel to the direction of travel that is calculated by dividing the vertical change in elevation by the horizontal distance covered.
grade-separated crossings	Facilities such as overpasses, underpasses, skywalks, or tunnels that allow pedestrians and motor vehicles to cross a street at different levels.
headway	The time interval between identical points of successive vehicles passing the same point along the way (e.g., 10 minute headways). The frequency of transit service on a particular route or line.
high quality transit	Transit service that provides 15 minute or better headways at peak hours and 30 minute or better service during the rest of the day.
home-based work trips	Work trips having either origin or destination at the home.
human scale	A scale of surroundings that is proportional to the human comfort level.
interchange	The system of interconnecting ramps between two or more intersecting roadways or guideways that are grade-separated.
intelligent transportation systems	A wide range of wireless and wire line communications-based information and electronics technologies, integrated into a transportation system's infrastructure, and in transit vehicles, with the intent to relieve congestion, coordinate traffic signals, improve roadway safety and operational efficiency, and enhance special event traffic management.
intersection	According to Arizona State Law (Section 28.601), an intersection is "the area embraced within the prolongation or connection of the lateral curb lines, or if none, the lateral boundary lines of the roadways of two highways that join one another at, or approximately at, right angles, or the area within which vehicles traveling on different highways joining at any other angle may come in conflict. If a highway includes two roadways thirty or more feet apart, each crossing of each roadway of the divided highway by an intersecting highway is a separate intersection. If the intersecting highway also includes two roadways thirty or more feet apart, each crossing of two roadways of the highways is a separate intersection."
landing	A level area of sidewalk at the top of a curb ramp facing the ramp path.
landscaped strip	The street right-of-way between the constructed curb and the sidewalk.
level of service and flow rates	For bicyclists, a set of characteristics that indicates the quality and quantity of service measured as bicycle access and safety; factors that create friction between the bicyclist and the environment. For transit systems, a set of characteristics that indicates the quality and quantity of transportation service provided including characteristics that are quantifiable (system performance, e.g., frequency, travel time, travel cost, number of transfers, safety) and those that difficult to quantify (service quality, e.g., availability, comfort, convenience, modal image).

For highway systems, a qualitative rating of the effectiveness of a highway or highway facility in serving traffic, in terms of operating conditions. The *Highway Capacity Manual* identifies operating conditions ranging from A, for best operations (low volume, high speed) to F, for worst conditions.

For paratransit, a variety of measure meant to denote the quality of service provided; generally in terms of total travel time or a specific component of total travel time.

For pedestrians, sets of area occupancy classifications, such as recommended sidewalk widths relative to adjacent land uses and densities, to connect the design of pedestrian facilities with levels of service (A for best through F for worst).

level of service - intersection	Level of congestion at intersection measured in delay per vehicle: "A" $\leq$ 0 to 10 seconds "B" $>$ 10 to 20 seconds "C" $>$ 20 to 35 seconds "D" $>$ 35 to 55 seconds "E" $>$ 55 to 80 seconds "F" $>$ 80 seconds
level of service - roadway	**LOS A:** Free-flow operations. Vehicles are almost completely unimpeded in their ability to maneuver within the traffic stream. This LOS affords the motorist a high level of physical and psychological comfort. Incident effects are easily absorbed at this level. **LOS B:** Free-flow operations. The ability to maneuver within the traffic stream is only slightly restricted, and the general level of physical and psychological comfort provided to drivers is still high. Incident effects are still easily absorbed. **LOS C:** Speeds continue to remain high, but freedom to maneuver within the traffic stream is noticeably restricted, and lane changes require more vigilance on the driver's part. The driver now experiences a noticeable increase in tension because of this additional vigilance. Minor incidents may still be absorbed, but the local deterioration in service will be substantial. **LOS D:** Speeds begin to decline slightly. Freedom to maneuver within the traffic stream is more noticeably limited, and the driver experiences reduced physical and psychological comfort level. Even minor incidents can be expected to cause queuing because the traffic stream has little space to absorb disruptions. **LOS E:** Operations at this level become marginal, where traffic flow becomes irregular and speed varies, but rarely reaches posted speed limits. Any disruption to the traffic stream, such as a vehicle entering from a ramp or changing lanes, can cause following vehicles to give way to admit the vehicle. This can establish a disruption wave that propagates throughout the upstream traffic flow. At capacity, the traffic stream has no ability to dissipate even the most minor disruptions, and any incident can be expected to produce a serious breakdown with extensive queuing. Maneuverability within the traffic stream is limited, and the level of physical and psychological comfort afforded the driver is reduced. This level of service is usually experienced when roadway volumes exceed designed capacity. **LOS F:** This is the lowest measurement of service efficiency. Traffic flow breaks down, resulting in stop-and-go conditions. Maneuverability within the traffic stream is extremely limited, and the level of physical and psychological comfort afforded the driver can be severe.

life cycle cost	Life cycle cost is the combined capital and maintenance cost of a capital investment, in this case an individual infrastructure project, applied to the present value of the asset.
light rail transit	Transit mode characterized by an overhead electric power source and by its ability to operate in both an at-grade and/or a grade-separated environment, Light rail may use shared or exclusive rights-of-way, high or low platform loading and multi-car trains or single cars. Average passenger capacity is 120 to150, with maximum operating speeds of 55 to 65 miles per hour.
line haul	A transit system that offers service along a line or corridor with relatively few stops. (A light rail transit or bus rapid transit line operating with stations spaced at least one mile apart would be an example of line haul service.)
local bus	Local bus service consists of standard size transit vehicles (usually 40-foot buses) and is generally characterized by buses operating along the major arterial grid network. The vehicles make frequent stops and may require passengers to transfer in order to reach their destinations. Local bus service is the most common form of transit service in the region; Route 72 on Scottsdale Road is an example of local bus service.
Manual of Uniform Traffic Control Devices (MUTCD)	The Manual of Uniform Traffic Control Devices establishes uniform standards for traffic control devices that regulate, warn, and guide road users along United States roadways.
minimum clear zone	An area, measured from the outermost point of the sidewalk café to the nearest obstruction in the pedestrian travel way that is continuous and free of obstructions, and at least 6-feet wide.
mode	A particular form or method of travel distinguished by vehicle type, operation technology, and right-of-way separation from other traffic.
model	Transportation models are computerized procedures for predicting changes in travel patterns in response to changes in development patterns, transportation systems, and demographics given certain assumptions about travel behavior based on existing conditions.
motorized wheelchair	Any self-propelled wheelchair that is used by a person for mobility.
multimodal	Having or involving several modes of transportation.
multi-use path	Trails that accommodate bicyclists and pedestrians. Preferred term to use is shared-use path.
non-home based trips	Trips having neither origin or destination at the home.
no-build alternative	The baseline alternative of not making any changes to the existing transit system and roadway network, except for those changes already programmed. It is used as a baseline against which the other proposed alternatives are compared.
paratransit	Paratransit provides transportation for those unable to access traditional fixed route service, such as seniors and passengers with disabilities. The Americans with Disabilities Act (ADA) requires that complementary paratransit service be provided in all areas within three-fourths of a mile of fixed route bus service. Extended service hours are usually provided for individuals who qualify under ADA. The East Valley Dial-a-Ride is an example of paratransit.
peak period	A specified period for which the volume of traffic is greater than that during any other similar period (e.g., peak hour, peak five minutes, etc.)

pedestrian	According to Arizona State Law, a pedestrian is "… any person afoot. A person who uses an electric personal assistive mobility device or a manual or motorized wheelchair is considered a pedestrian unless the manual wheelchair qualifies as a bicycle. For the purposes of this paragraph, motorized wheelchair means a self-propelled wheelchair that is used by a person for mobility (A.R.S. 28-101). Pedestrians also include rollerskaters, in-line skaters, and skateboarders. Pedestrians also include users of "electric personal assistive mobility devices", which "means a self balancing two nontandem wheeled device with an electric propulsion system that limits the maximum speed of the device to fifteen miles per hour or less and that is designed to transport only one person" (A.R.S 28-101).
pedestrian access route	A continuous and unobstructed walkway within a pedestrian circulation path that provides accessibility.
pedestrian facility	Pedestrian facilities include sidewalks, curb ramps, multiuse paths, multiuse trails, crosswalks, traffic calming features, grade-separated crossings, and other elements that encourage pedestrian movement such as landscaping, site furnishings and amenities, and public art. Pedestrian facilities also include design strategies that help to make walking safer, more convenient and more comfortable.
pedestrian flow rate	The number of pedestrians passing a point per unit of time, expressed as pedestrians per minute (p/min) or pedestrians per 15 minutes (p/15 min). A "point" refers to a perpendicular line of sight across the walkway.
pedestrian latent demand model	A travel demand model that estimates the potential amount of pedestrian activity that could occur along a roadway if conditions were ideal for walking and impediments to walking were removed.
pedestrian level of service	Level of pedestrian access and safety, measured quantitatively.
pedestrian space	The average area available to each pedestrian, expressed as square feet per pedestrian (ft2/p).
pedestrian speed	The average pedestrian walking speed, expressed in units of feet per second (ft/s) or feet per minute (ft/min).
pedestrian unit flow rate	The flow rate per unit of effective walkway width, expressed as pedestrians per minute per foot (p/min/ft).
person-trip	The movement of one person to one destination, by any mode of travel.
principles of universal design:	**Equitable use:** Usable by people of all capabilities, measurable by the spectrum of capabilities **Flexibility of use:** Measurable by the range of capabilities served **Simple and Intuitive:** The simplicity of information **Perceptible information:** The manner in which the information is communicated **Tolerance for error:** Broad spectrum for operational efficiency **Low physical effort:** Operable with a small amount of force **Size and Space for Approach and Use:** Appropriate size and space provided for approach, reach, manipulation, and use
public right-of-way	Land which by deed, conveyance, agreement, easement, dedication, usage or process of law is reserved for or dedicated to the general public for street, highway, alley, public utility, pedestrian walkway, bikeway or drainage purposes.

pushbutton locator tone	A repeating sound that identifies the pushbutton location and indicates the need to actuate pedestrian timing.
rapid transit	Rail or motorbus transit service operating completely separate from all modes of transportation on an exclusive right-of-way.
right-of-way	Land which by deed, conveyance, agreement, easement, dedication, usage or process of law is reserved for or dedicated to the general public for street, highway, alley, public utility, pedestrian walkway, bikeway or drainage purposes.
roadway	According to Arizona State Law, a roadway is that portion of a highway that is improved, designed or ordinarily used for vehicular travel, exclusive of the berm or shoulder. If a highway includes two or more separate roadways, roadway refers to any such roadway separately but not to all such roadways collectively.
running slope	The grade that is parallel to the direction of travel, expressed as a ratio of rise to run or as a percent.
safety zone	According to Arizona State Law a pedestrian safety zone is the area or space that is both 1) officially set apart within a roadway for the exclusive use of pedestrians and 2) protected or either marked or indicated by adequate signs as to be plainly visible at all times while set apart as a safety zone.
sidewalk	According to Arizona State Law (Section 28.601), a sidewalk is the "portion of the street between the curb lines or lateral lines of the roadway and adjacent property lines intended for use by pedestrians."
sidewalk café	A permitted area within the public right-of-way consisting of tables, chairs and other accessories for the use of consumption of food and/or beverages sold to patrons from, or in, an adjacent cafe or restaurant.
street furniture	Features that enhance the comfort of pedestrians including benches, trash receptacles, transit shelters and other hardscape.
traffic	pedestrians, ridden or herded animals, vehicles, and other conveyances either singly or together while using a highway for purposes of travel.
traffic analysis zones	A traffic analysis zone (TAZ) is a special area delineated by state and/or local transportation officials for tabulating traffic-related data- especially journey-to-work and place-of-work statistics. A TAZ usually consists of one or more census blocks, block groups, or census tracts. The U.S. Census Bureau first provided data for TAZs in conjunction with the 1980 census, when it identified them as "traffic zones."
traffic congestion	Congestion usually relates to an excess of vehicles on a portion of roadway at a particular time resulting in speeds that are slower - sometimes much slower - than normal or "free flow" speeds. Congestion often means stopped or stop-and-go traffic. Previous work has shown that congestion is the result of seven root causes, often interacting with one another. **Traffic volumes exceed roadway design capacity.** **Physical Bottlenecks ("Capacity")** – Capacity is the maximum amount of traffic capable of being handled by a given highway section. Capacity is determined by a number of factors, some of which are listed as: the number and width of lanes and shoulders; merge areas at interchanges; and roadway alignment (grades and curves). **Traffic Incidents** – Events that disrupt the normal flow of traffic, usually by physical impedance in the travel lanes. Events such as vehicular crashes, breakdowns, and debris in travel lanes are the most common form of incidents.

	Work Zones – Construction activities on the roadway that result in physical changes to the highway environment. These changes may include a reduction in the number or width of travel lanes, lane "shifts," lane diversions, reduction, or elimination of shoulders, and even temporary roadway closures. **Weather** – Environmental conditions can lead to changes in driver behavior that affect traffic flow. **Traffic Control Devices** – Intermittent disruption of traffic flow by control devices such as railroad grade crossings and traffic signals also contribute to congestion and travel time variability. **Special Events** – Special cases of demand fluctuations whereby traffic flow in the vicinity of the event will be radically different from "typical" patterns. Special events occasionally cause "surges" in traffic demand that overwhelm the system. **Fluctuations in Normal Traffic** – Day-to-day variability in demand leads to some days with higher traffic volumes than others. Varying demand volumes superimposed on a system with fixed capacity also results in variable (i.e., unreliable) travel times.
transit	Transportation system principally for moving people in an urban area and made available to the public usually through paying a fare. Typical vehicles used for transit include buses, rail cars, and other fixed guideway vehicles. (Transit service available in the City of Scottsdale consists of paratransit, trolleys, and regional bus.)
transit level of service	Measurement of service frequency, length of service, and passenger capacity, valuing higher frequencies (lower "headways"), longer service hours, and higher capacity over their opposites.
transportation demand management	A general term for strategies that encourage more efficient use of existing transportation resources. Transportation Demand Management (TDM) strategies may include ride-sharing, carpooling, vanpooling, transit, telecommuting, walking, bicycling, compressed work weeks, as well as the information network to advise prospective users of available resources, and technical assistance to prospective users to implement TDM programs.
travel time reliability	How consistent travel conditions are from day-to-day and how much travel times vary over the course of time.
truncated domes	Small domes with flattened tops that are used as tactile warnings at transit platforms and curb edges.
vibrotactile	A vibrating surface, located on the accessible pedestrian signal button, that communicates information through touch.
walkway	Transportation facility built for use by pedestrians; walkways include sidewalks and paths.

CITY OF SCOTTSDALE
ARIZONA

Scottsdale
Transportation Master Plan

APPENDICES

January 2008

TABLE OF CONTENTS

Transportation Master Plan
Street Element

Appendix 4-A
Street Functional Classification

Street Functional Classification

The Streets Element Matrix presented in this Appendix includes the following information for all arterial and collector streets in the City:

- **Previous Adopted Future FC– The previously adopted future Functional Classification from 2003 Street Master Plan.**
  - **MJA:** Major Arterial
  - **MNA:** Minor Arterial
  - **MJC:** Major Collector
  - **MNC:** Minor Collector
  - **L:** Local
- **Currently Adopted Future FC – The Future Functional Classification adopted with this Transportation Master Plan .**
  - **MJA – R:** Major Arterial – Rural
  - **MJA – S**: Major Arterial – Suburban
  - **MJA - U:** Major Arterial – Urban
  - **MNA – R:** Minor Arterial – Rural
  - **MNA – S:** Minor Arterial – Suburban
  - **MNA – U:** Minor Arterial – Urban
  - **MJC – R:** Major Collector – Rural
  - **MJC – S:** Major Collector – Suburban
  - **MJC – U:** Major Collector – Urban
  - **MNC- R:** Minor Collector – Rural
  - **MNC- S:** Minor Collector – Suburban
  - **MNC- U:** Minor Collector – Urban
- **Existing Lanes**
- **Recommended Future Lanes (2030)**
- **2006 Average Daily Traffic (ADT)**
- **2006 Volume/Capacity Ratios**
- **2030 Forecast Average Daily Traffic (ADT)**
- **2030 Forecast Volume/Capacity Ratios**

Road Name	From	To	Existing 2030 FC	Recommended 2030 FC	Existing Lanes	Recommended 2030 Lanes	2006 Daily Trips	2006 Volume/ Capacity Rates	2030 Projected Daily Trips	2030 Volume/ Capacity Rates
NORTH-SOUTH STREETS (from west to east)										
56th Street	Jomax	Pinnacle Vista	MJC	MJC-R	0	4	200	0.01	13,600	0.42
56th Street	Pinnacle Vista	Dynamite	MJC	MJC-R	2	4	200	0.01	11,600	0.36
56th Street	Dove Valley	Carefree Highway	MNC	MNC-R	2	2	200	0.01	1,100	0.08
60th Street	Dove Valley	Carefree Highway	MJC	MJC-R	4	4	800	0.03	2,900	0.09
64th Street	McDowell	Thomas	MNA	MNA-S	4	4	17,900	0.45	23,000	0.57
64th Street	Thomas	Osborn	MNA	MNA-S	4	4	10,000	0.25	14,600	0.36
64th Street	Osborn	Indian School	MNA	MNA-S	4	4	13,700	0.34	19,000	0.47
64th Street	Mountain View	Shea	MNC	MNC-S	2	2	10,200	0.64	9,400	0.59
64th Street	Shea	Cactus	MNC	MNC-S	2	2	8,100	0.51	7,800	0.49
64th Street	Jomax	Dynamite	MJC	MJC-R	2/4	4	300	0.01	15,800	0.49
68th Street	Continental/ Roosevelt	McDowell	MNC	MNC-S	2	2	6,100	0.38	6,600	0.41
68th Street	McDowell	Thomas	MNC	MNC-S	2	2	10,200	0.64	12,200	0.77
68th Street	Thomas	Indian School	MJC	MJC-S	4	4	15,300	0.43	16,600	0.46
68th Street	Indian School	Camelback	MNC	MNC-S	2	2	12,000	0.75	13,000	0.82
68th Street	Camelback	Chaparral	MNC	MNC-S	2	2	6,900	0.43	6,800	0.43
70th Street /Mtn View	Scottsdale	Shea	MJC	MJC-U	4	4	13,400	0.31	12,200	0.28
Goldwater Blvd	Scottsdale	Indian School	MJA	MJA-U	5	4	14,800	0.25	16,100	0.27
Goldwater Blvd	Camelback	Scottsdale	MJA	MJA-U	5	4	13,000	0.36	17,800	0.40
Goldwater Blvd	Indian School	Camelback	MJA	MJA-U	5	4	26,000	0.43	30,100	0.50
Scottsdale	McKellips	Continental/ Roosevelt	MJA	MJA-S	6	6	37,800	0.53	46,600	0.65
Scottsdale	Roosevelt	McDowell	MJA	MJA-U	6	6	35,700	0.50	42,200	0.59

Road Name	From	To	Existing 2030 FC	Recommended 2030 FC	Existing Lanes	Recommended 2030 Lanes	2006 Daily Trips	2006 Volume/ Capacity Rates	2030 Projected Daily Trips	2030 Volume/ Capacity Rates
Scottsdale	McDowell	Thomas	MJA	MJA-U	6	6	47,200	0.66	55,500	0.77
Scottsdale	Thomas	Earll	MJA	MJA-U	6	6	44,300	0.62	49,000	0.68
Scottsdale	Earll	Osborn	MJA	MJA-U	5	5	35,600	0.49	38,700	0.54
Scottsdale	Osborn	Indian School	MJC	MJC-U	4	4	22,700	0.49	24,200	0.50
Scottsdale	Indian School	Drinkwater	MJC	MJC-U	4	4	20,100	0.47	21,100	0.49
Scottsdale	Drinkwater	Camelback	MJA	MJA-U	5	5	33,200	0.46	35,600	0.49
Scottsdale	Camelback	Chaparral	MJA	MJA-U	6	6	40,000	0.58	41,500	0.58
Scottsdale	Chaparral	McDonald	MJA	MJA-S	6	6	50,000	0.83	51,100	0.85
Scottsdale	McDonald	Indian Bend	MJA	MJA-S	6	6	47,200	0.79	46,900	0.78
Scottsdale	Indian Bend	McCormick Pkwy	MJA	MJA-S	6	6	35,900	0.60	35,600	0.59
Scottsdale	McCormick Pkwy	Mountain View	MJA	MJA-S	6	6	40,500	0.67	40,900	0.68
Scottsdale	Mountain View	Gold Dust	MJA	MJA-U	6	6	37,900	0.53	39,100	0.54
Scottsdale	Gold Dust	Shea	MJA	MJA-U	6	6	38,100	0.53	40,100	0.56
Scottsdale	Shea	74th Street/Mescal	MJA	MJA-U	6	6	33,700	0.47	34,000	0.47
Scottsdale	74th Street/Mescal	Cactus	MJA	MJA-S	6	6	47,400	0.66	45,000	0.75
Scottsdale	Cactus	Thunderbird	MJA	MJA-S	6	6	44,600	0.62	44,400	0.74
Scottsdale	Thunderbird	Butherus	MJA	MJA-U	6	6	42,800	0.60	44,800	0.62
Scottsdale	Butherus	Bell/FLW	MJA	MJA-U	6	6	39,900	0.66	43,800	0.61
Scottsdale	FLW	Loop 101	MJA	MJA-U	4	6	47,000	0.65	53,800	0.75
Scottsdale	Loop 101	Thompson Peak Pkwy	MJA	MJA-U	4	6	48,400	1.01	58,100	0.81
Scottsdale	Thompson Peak Pkwy	Deer Valley	MJA	MJA-S	4	6	32,000	0.80	56,300	0.94
Scottsdale	Deer Valley	Pinnacle Peak	MJA	MJA-S	4	6	28,800	0.73	50,300	0.84
Scottsdale	Pinnacle Peak	Happy Valley	MJA	MJA-R	4	6	29,700	0.74	41,600	0.77
Scottsdale	Happy Valley	Jomax	MJA	MNA-R	4	4	29,000	0.81	33,200	0.92

Road Name	From	To	Existing 2030 FC	Recommended 2030 FC	Existing Lanes	Recommended 2030 Lanes	2006 Daily Trips	2006 Volume/ Capacity Rates	2030 Projected Daily Trips	2030 Volume/ Capacity Rates
Scottsdale	Jomax	Dynamite	MJA	MNA-R	4	4	26,000	0.73	31,500	0.88
Scottsdale	Dynamite	Dixileta	MJA	MNA-R	4	4	25,200	0.70	31,800	0.88
Scottsdale	Dixileta	Lone Mountain	MJA	MNA-R	4	4	24,100	0.67	28,600	0.79
Scottsdale	Lone Mountain	Westland	MJA	MNA-R	4	4	22,400	0.62	29,500	0.82
Scottsdale	Westland	Carefree Hwy	MJA	MNA-R	4	4	17,700	0.49	23,100	0.64
Scottsdale	Carefree Hwy	Boulder Pass	MJA	MNA-R	4	4	17,700	0.49	25,200	0.70
Drinkwater	Scottsdale	Osborn	MJA	MJA-U	5	4	9,200	0.17	11,800	0.20
Drinkwater	Osborn	Indian School	MJA	MJA-U	5	4	14,100	0.23	15,800	0.26
Drinkwater	Indian School	Scottsdale	MJA	MJA-U	5	4	11,100	0.19	13,600	0.23
73rd Street	Thunderbird	Butherus	MNC	MNC-U	2	2	NA	NA	NA	NA
73rd Street/Dial	Butherus	Paradise	MNC	MNC-U	2	2	NA	NA	NA	NA
74th Street	Gold Dust	Mescal	MJC	MJC-U	4	4	9,500	0.22	12,400	0.29
Miller	McKellips	McDowell	MNC	MNC-S	2	2	5,600	0.35	7,200	0.45
Miller	McDowell	Oak	MNC	MNC-S	2	2	12,900	0.72	14,200	0.89
Miller	Oak	Thomas	MNC	MNC-S	2	2	12,300	0.68	13,100	0.82
Miller	Thomas	Osborn	MNC	MNC-S	2	2	11,000	0.61	12,500	0.78
Miller	Osborn	2nd Street	MNC	MJC-U	2	2	12,400	0.69	13,100	0.61
Miller	2nd Street	Indian School	MJC	MJC-U	4	4	11,300	0.31	11,400	0.32
Miller	Indian School	Camelback	MJC	MJC-U	4	4	15,100	0.42	15,600	0.36
Miller	Camelback	Chaparral	MNC	MNC-S	2	2	8,800	0.55	8,400	0.53
Miller/ Jackrabbit	Chaparral	Hayden	MNC	MNC-S	2	2	3,500	0.22	4,000	0.25
Miller	Mountain View	Shea	MNC	MNC-S	2	2	NA	NA	NA	NA
Miller	Shea	Cactus	MNC	MNC-R	2	2	NA	NA	NA	NA
76th Street	Paradise	FLW	MNC	MNC-S	2	2	5,800	0.36	7,200	0.45
76th Street	Princess	Center	MJC	MJC-U	0	4	NA	NA	13,700	0.32
76th Street	Center	Thompson Peak Pkwy	MNC	MNC-S	2	2	900	0.05	10,600	0.66

Road Name	From	To	Existing 2030 FC	Recommended 2030 FC	Existing Lanes	Recommended 2030 Lanes	2006 Daily Trips	2006 Volume/ Capacity Rates	2030 Projected Daily Trips	2030 Volume/ Capacity Rates
78th Street	Miller/ Jackrabbit	McDonald	MNC	MNC-S	2	2	NA	NA	NA	NA
78th Street	Mountain View	Shea	MNC	MNC-S	2	2	NA	NA	NA	NA
Hayden	McKellips	McDowell	MJA	MJA-S	6	6	31,400	0.52	39,200	0.65
Hayden	McDowell	Thomas	MJA	MJA-S	6	6	32,100	0.53	37,900	0.63
Hayden	Thomas	Indian School	MJA	MJA-S	6	6	32,700	0.45	37,300	0.62
Hayden	Indian School	Camelback	MJA	MJA-S	6	6	29,700	0.41	32,200	0.54
Hayden	Camelback	Chaparral	MJA	MJA-S	6	6	37,300	0.50	37,300	0.62
Hayden	Chaparral	McDonald	MJA	MJA-S	6	6	34,200	0.60	35,900	0.60
Hayden	McDonald	Indian Bend	MJA	MJA-S	6	6	31,600	0.53	32,600	0.54
Hayden	Indian Bend	Via de Ventura	MJA	MJA-S	6	6	33,000	0.55	32,200	0.54
Hayden	Via de Ventura	Mountain View	MJA	MJA-S	6	6	24,900	0.41	28,900	0.48
Hayden	Mountain View	Shea	MJA	MJA-S	6	6	24,700	0.41	25,900	0.43
Hayden	Shea	Cactus	MNA	MNA-S	4	4	20,800	0.52	21,500	0.54
Hayden	Cactus	Thunderbird	MNA	MNA-S	4	4	17,100	0.43	18,000	0.45
Hayden	Redfield	Raintree	MNA	MJA-S	4	6	24,400	0.61	29,300	0.49
Hayden	Raintree	FLW	MNA	MJA-S	4	4	15,400	0.39	17,300	0.43
Greenway-Hayden	FLW	Bell	MNA	MNA-U	4	4	24,900	0.35	27,400	0.57
Hayden	Bell	Union Hills	MNA	MNA-S	4	4	14,100	0.35	18,500	0.46
Hayden	Union Hills	Loop 101	MJA	MJA-U	4	6	19,400	0.38	20,800	0.29
Hayden	Loop 101	Center Drive	MNA	MJA-U	4	6	25,600	0.52	39,500	0.55
Hayden	Center Drive	Thompson Peak Pkwy	MNA	MNA-U	4	4	25,600	0.52	24,700	0.62
Hayden-Miller	Thompson Peak Pkwy	Deer Valley	MNA	MNA-S	4	4	9,800	0.25	20,800	0.52
Hayden-Miller	Deer Valley	Pinnacle Peak	MNA	MNA-S	4	4	8,400	0.24	18,500	0.46
Hayden- Miller	Pinnacle Peak	Happy Valley	MJC	MNC-R	2	2	NA	NA	5,400	0.38

Road Name	From	To	Existing 2030 FC	Recommended 2030 FC	Existing Lanes	Recommended 2030 Lanes	2006 Daily Trips	2006 Volume/ Capacity Rates	2030 Projected Daily Trips	2030 Volume/ Capacity Rates
Hayden	Pinnacle Peak	Happy Valley	MNC	Local	2	2	1,000	0.06	NA	NA
Hayden- Miller	Happy Valley	Jomax	MJC	MNC-R	0	2	NA	NA	5,500	0.38
Hayden- Miller	Jomax	Dynamite	MJC	MNC-R	0	2	NA	NA	3,800	0.26
Perimeter	Bell	Union Hills	MJC	MJC-S	4	4	200	0.01	2,200	0.06
82nd Street	McDonald	Rose Lane	MNC	MNC-S	2	2	NA	NA	NA	NA
Granite Reef	Roosevelt	McDowell	MNC	MNC-S	2	2	2,900	0.18	3,000	0.19
Granite Reef	McDowell	Oak	MNC	MNC-S	2	2	4,000	0.25	4,900	0.30
Granite Reef	Oak	Thomas	MNC	MNC-S	2	2	2,200	0.14	2,600	0.16
Granite Reef	Thomas	Osborn	MNC	MNC-S	2	2	1,300	0.08	3,300	0.21
Granite Reef	Indian School	Camelback	MNC	MNC-S	2	2	3,600	0.23	5,500	0.34
Granite Reef	Camelback	Chaparral	MNC	MNC-S	2	2	5,300	0.33	4,800	0.30
Granite Reef	Chaparral	McDonald	MNC	MNC-S	2	2	4,100	0.26	4,100	0.26
Granite Reef	McDonald	AZ Canal	MNC	MNC-S	2	2	5,600	0.35	5,300	0.33
84th Street	Shea	Cactus	MNC	MNC-S	2	2	NA	NA	NA	NA
84th Street	Cactus	Thunderbird	MNC	MNC-S	2	2	1,200	0.07	1,600	0.10
87th Street	Northsight	Raintree	MJC	MJC-S	4	4	100	0.00	100	0.00
Northsight	Hayden	Raintree	MJC	MJC-S	4	4	8,200	0.23	7,400	0.21
Northsight	Raintree	Loop 101	MJC	MJC-S	4	4	7,700	0.22	9,200	0.26
Pima	McDowell	Thomas	MNA	MNA-S	2	4	7,000	0.35	14,400	0.36
Pima	Thomas	Indian School	MNA	MNA-S	2	4	8,200	0.41	17,800	0.45
Pima	Indian School	Chaparral	MNA	MNA-S	2	4	7,000	0.35	14,900	0.37
Pima	Chaparral	McDonald	MNA	MNA-S	2	4	9,000	0.45	15,500	0.39
Pima	McDonald	Indian Bend	MNA	MNA-S	2	4	9,600	0.48	20,100	0.50
Pima	Indian Bend	Via de Ventura	MNA	MNA-S	2	4	11,100	0.55	22,500	0.56
Pima/90th Street	Via de Ventura	Via Linda	MNA	MNA-S	4	4	24,100	0.60	41,700	1.04
Pima	Loop 101	Thompson Peak Parkway	MJA	MJA-S	6	6	34,900	0.67	45,300	0.75

Road Name	From	To	Existing 2030 FC	Recommended 2030 FC	Existing Lanes	Recommended 2030 Lanes	2006 Daily Trips	2006 Volume/ Capacity Rates	2030 Projected Daily Trips	2030 Volume/ Capacity Rates
Pima	Thompson Peak Parkway	Pinnacle Peak	MJA	MJA-S	4	6	39,700	0.99	59,300	0.99
Pima	Pinnacle Peak	Happy Valley	MJA	MJA-R	4	6	33,600	0.93	55,000	1.02
Pima	Happy Valley	Jomax	MJA	MNA-R	4	4	18,800	52.00	26,000	0.72
Pima	Jomax	Dynamite	MJA	MNA-R	4	4	18,500	0.51	27,700	0.77
Pima	Dynamite	Lone Mountain	MJA	MNA-R	2	4	13,200	0.73	24,400	0.68
Pima	Lone Mountain	Stagecoach Pass	MJA	MNA-R	2	4	10,300	0.57	19,100	0.53
90th Street	Via Linda	Shea	MNA	MNA-U	4	4	15,900	0.33	18,200	0.38
90th Street	Shea	Desert Cove	MNC	Local	2	2	NA	NA	NA	NA
90th Street	Cactus	Thunderbird	MNC	MNC-S	2	2	1,300	0.09	1,500	0.11
90th Street	Raintree	FLW	MJC	MJC-S	4	4	10,000	0.28	7,200	0.20
91st Street	Via Linda	Mountain View	MNC	MNC-S	2	2	NA	NA	NA	NA
91st Street	Bahia	Bell	MNC	MJC-S	2	4	NA	NA	NA	NA
91st Street	Bell	Union Hills	MJC	MJC-S	2	4	300	0.02	7,100	0.20
92nd Street	Sweetwater	Thunderbird	MNC	MNC-S	2	2	1,100	0.07	1,500	0.10
92nd Street	Thunderbird	Raintree	MNC	MNC-S	4	2	1,100	0.03	1,200	0.08
92nd Street	Raintree	FLW	MJC	MNC-S	4	2	800	0.02	1,400	0.09
92nd/94th Street	Shea	Cactus	MNA	MNA-S	4	4	13,900	0.35	14,400	0.36
92nd Street	Pinnacle Peak	Verada Sonada	MNC	MNC-R	2	2	NA	NA	NA	NA
92nd Street	Verada Sonada	Happy Valley	MNC	MNC-R	0	2	NA	NA	NA	NA
Los Gatos/93rd Street	Pima	Pinnacle Peak	MNC	MNC-S	2	2	NA	NA	NA	NA
94th Street	Cactus	Thunderbird	MNA	MNA-S	4	4	12,200	0.30	13,600	0.34
94th Street	Thunderbird	Redfield	MNA	MNA-S	6	6	10,400	0.17	11,400	0.19
Thompson Peak Parkway	Redfield	Raintree	MJA	MJA-S	6	6	6,900	0.16	7,000	0.12
Thompson Peak	Raintree	FLW	MNA	MJA-S	6	6	16,800	0.28	18,400	0.31

Road Name	From	To	Existing 2030 FC	Recommended 2030 FC	Existing Lanes	Recommended 2030 Lanes	2006 Daily Trips	2006 Volume/ Capacity Rates	2030 Projected Daily Trips	2030 Volume/ Capacity Rates
94th Street	Bahia	Union Hills	MJC	MNC-S	2	2	1,900	0.12	3,900	0.25
96th Street	Via Linda	Shea	MJC	MJC-S	4	4	10,400	0.42	11,900	0.33
96th Street	Shea	Cactus	MNC	MNC-S	2	2	4,500	0.28	5,300	0.33
96th Street	Cactus	Thunderbird	MNC	MNC-S	2	2	3,500	0.15	3,700	0.23
98th Street	McDowell Mountain Ranch	Bell	MJC	MJC-S	2	4	1,800	0.10	4,200	0.12
100th Street	Cactus	Sweetwater	MNC	MNC-S	2	2	2,400	0.15	3,700	0.23
100th Street	Sweetwater	FLW	MNC	MNC-S	2	2	1,600	0.10	3,000	0.19
100th Street	FLW	Thompson Peak Pkwy	MJC	MNC-S	4	2	5,300	0.15	2,000	0.12
104th Street	Mountain View	Via Linda	MNA	L-S	2	2	4,600	0.23	5,500	0.34
104th Street	Shea	Cactus	MNC	MNC-S	2	2	2,600	0.16	2,900	0.19
104th Street	Cactus	Sweetwater	MNC	MNC-S	2	2	1,400	0.09	1,800	0.11
Alma School	S of Happy Valley	Happy Valley	MNC	MNC-R	2	2	NA	NA	NA	NA
Alma School	Happy Valley	Jomax	MJC	MJC-R	4	4	6,900	0.21	14,600	0.45
Alma School	Jomax	Pinnacle Vista	MJC	MJC-R	2	4	6,600	0.41	12,600	0.39
Alma School	Pinnacle Vista	Dynamite	MJC	MJC-R	4	4	5,500	0.17	11,000	0.34
Alma School	Dynamite	N of Dynamite	MNC	MNC-R	2	2	NA	NA	NA	NA
105th Street	McDowell Mountain Ranch	Palm Ridge	MNC	MNC-S	2	2	3,600	0.23	5,900	0.37
Lone Mountain Parkway	Stagecoach Pass	Cave Creek	MJC	MNC-R	2	2	200	0.01	700	0.05
108th Street	Via Linda	Cactus	MNC	MNC-S	2	2	1,400	0.09	1,800	0.11
110th Street	Turquoise	Shea	MNC	MNC-S	2	2	4,400	0.27	4,400	0.27
110th Street / Altadena	Shea	FLW	MNC	MNC-S	2	2	2,800	0.18	3,000	0.19

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Turquoise	Mountain View	110th Street	MNC	MNC-S	2	2	NA	NA	NA	NA
114th Street / Cochise/ 117th W	Mountain View	Shea	MNC	MNC-S	2	2	1,500	0.09	2,000	0.13
118th Street	Whispering Wind	Dynamite/ Rio Verde	MJC	MNC-R	0/2	2	600	0.04	4,700	0.32
124th Street	Mountain View	Shea	MNC	MNC-S	2	2	2,700	0.17	4,200	0.27
124th Street	Shea	Via Linda	MJC	MJC-S	4	4	5,500	0.15	6,500	0.18
124th Street	Via Linda	Cactus	MJC	MJC-S	4	4	5,100	0.14	7,900	0.22
128th Street	Via Linda	Cactus	MNC	L-S	2	2	NA	NA	NA	NA
128th Street	S of Alameda	Rio Verde	MNC	MNC-R	0	2	100	0.00	2,500	0.17
130th Street	S of Shea	Shea	MNC	MNC-S	2	2	NA	NA	NA	NA
130th Street	Shea	Via Linda	MJC	MJC-S	2	4	1,700	0.09	1,800	0.05
132nd Street	Via Linda	Paradise	MNC	Local	2	2	NA	NA	NA	NA
136th Street	City Limits	Shea	MNA	MNA-S	2	4	NA	NA	300	0.01
136th Street	Shea	Via Linda	MNA	MNA-S	4	4	5,100	0.13	11,900	0.30
136th Street	Rio Verde	Lone Mountain	MNC	MNC-R	2	2	100	0.00	100	0.01
EAST-WEST STREETS (from south to north)										
McKellips	Scottsdale	Hayden	MNA	MNA-S	4	4	12,000	0.30	13,700	0.34
McKellips	Hayden	Granite Reef	MNA	MNA-S	4	4	26,800	0.67	27,200	0.68
Roosevelt	Scottsdale	Hayden	MNC	MNC-S	2	2	2,300	0.15	2,800	0.17
Roosevelt	Hayden	Granite Reef	MNC	MNC-S	2	2	2,900	0.18	3,600	0.22
Roosevelt	Granite Reef	85th Street	MNC	MNC-S	2	2	NA	NA	NA	NA
McDowell	64th Street	Scottsdale	MJA	MJA-U	6	6	42,300	0.65	48,900	0.68
McDowell	Scottsdale	Miller	MJA	MJA-U	6	6	29,700	0.49	34,500	0.48
McDowell	Miller	Granite Reef	MJA	MJA-S	6	6	34,000	0.57	39,000	0.65
McDowell	Granite Reef	Pima	MJA	MJA-S	6	6	41,900	0.70	50,000	0.83

Road Name	From	To	Existing 2030 FC	Recommended 2030 FC	Existing Lanes	Recommended 2030 Lanes	2006 Daily Trips	2006 Volume/ Capacity Rates	2030 Projected Daily Trips	2030 Volume/ Capacity Rates
Oak	56th Street	64th Street	MNC	MNC-S	2	2	3,700	0.23	4,300	0.27
Oak	68th Street	Scottsdale	MNC	MNC-S	2	2	1,600	0.10	2,300	0.14
Oak	Scottsdale	Miller	MNC	MNC-S	2	2	700	0.04	1,600	0.10
Oak	77th Street	Hayden	MNC	MNC-S	2	2	400	0.02	500	0.03
Oak	Hayden	Granite Reef	MNC	MNC-S	2	2	1,700	0.11	1,500	0.10
Thomas	56th Street	64th Street	MNA	MNA-S	5	5	28,200	0.56	31,900	0.64
Thomas	64th Street	Scottsdale	MJA	MJA-S	5	5	32,000	0.64	36,200	0.72
Thomas	Scottsdale	Miller	MJA	MJA-S	5	5	27,700	0.63	31,200	0.70
Thomas	Miller	Hayden	MNA	MNA-S	4	4	30,600	0.76	33,900	0.85
Thomas	Hayden	Pima	MNA	MNA-S	4	4	33,300	0.83	38,800	0.97
Osborn	64th Street	68th Street	MNC	MNC-S	2	2	5,800	0.37	6,800	0.42
Osborn	68th Street	Scottsdale	MJC	MJC-U	4	4	7,000	0.21	8,500	0.20
Osborn	Scottsdale	Drinkwater	MJC	MJC-U	4	4	10,000	0.23	11,700	0.27
Osborn	Drinkwater	Miller	MJC	MJC-U	4	4	14,400	0.33	16,000	0.37
Osborn	Miller	Hayden	MJC	MJC-S	4	4	15,800	0.44	16,900	0.47
Osborn	Hayden	82nd Street	MNC	MNC-S	2	2	2,800	0.17	4,300	0.27
Osborn	82nd Street	Granite Reef	MNC	MNC-S	2	2	3,300	0.20	5,100	0.32
Indian School	64th Street	68th Street	MJA	MJA-S	6	6	26,200	0.44	34,300	0.57
Indian School	68th Street	Goldwater	MJA	MJA-S	6	6	34,500	0.58	40,500	0.68
Indian School	Goldwater	Scottsdale	MNA	MNA-U	4	4	20,600	0.43	23,000	0.48
Indian School	Scottsdale	Drinkwater	MNA	MNA-U	4	4	23,100	0.49	23,500	0.49
Indian School	Drinkwater	Hayden	MNA	MNA-S	4	4	34,400	0.86	37,800	0.95
Indian School	Hayden	82nd Street	MNA	MNA-S	4	4	34,700	0.86	39,600	0.99
Indian School	82nd Street	Granite Reef	MNA	MNA-S	4	4	35,600	0.89	40,200	1.00
Indian School	Granite Reef	Pima	MNA	MNA-S	4	4	39,800	0.99	46,800	1.17
Camelback	64th Street	66th Street	MNA	MNA-S	4	4	34,000	0.85	38,100	0.95

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Camelback	66th Street	Scottsdale	MNA	MNA-U	4	4	29,500	0.44	33,400	0.53
Camelback	Scottsdale	Miller	MNA	MNA-U	4	4	21,500	0.54	23,700	0.49
Camelback	Miller	Hayden	MNA	MNA-S	4	4	22,800	0.57	28,400	0.71
Camelback	Hayden	Granite Reef	MNC	MNC-S	2	2	6,500	0.41	7,400	0.46
Chaparral	66th Street	Scottsdale	MNC	MNC-S	2	2	5,600	0.35	6,200	0.39
Chaparral	Scottsdale	Miller	MJC	MJC-S	4	4	15,600	0.43	17,900	0.50
Chaparral	Miller	78th Street	MJC	MNC-S	2	2	15,500	0.85	17,100	1.07
Chaparral	78th Street	Hayden	MJC	MJC-S	4	4	18,900	0.53	20,900	0.58
Chaparral	Hayden	Granite Reef	MJC	MJC-S	4	4	22,200	0.62	24,600	0.68
Chaparral	Granite Reef	Pima	MJC	MJC-S	4	4	26,200	0.73	29,700	0.82
McDonald	City limits	Scottsdale	MNC	MNC-S	2	2	14,900	0.37	16,200	0.40
McDonald	Scottsdale	78th Street	MNA	MNA-S	4	4	18,800	0.47	21,500	0.54
McDonald	78th Street	Hayden	MNA	MNA-S	4	4	20,500	0.51	23,900	0.60
McDonald	Hayden	Granite Reef	MNA	MNA-S	4	4	17,600	0.44	22,600	0.57
McDonald	Granite Reef	Pima	MNA	MNA-S	4	4	22,800	0.57	29,300	0.73
Valley Vista	Hayden	82nd Street	MNC	Local	2	2	NA	NA	NA	NA
Lincoln	Scottsdale	Miller	MNC	MNC-S	2	2	1,100	0.03	1,200	0.07
Indian Bend	Scottsdale	Hayden	MNA	MNA-S	2	4	14,400	0.72	21,700	0.54
Indian Bend	Hayden	Pima	MNA	MNA-S	4	4	13,700	0.34	22,000	0.55
McCormick Parkway	Scottsdale	Hayden	MJC	MJC-S	4	4	4,800	0.13	4,500	0.12
McCormick Parkway	Hayden	Via Paseo del Norte	MNC	MNC-S	2	2	NA	NA	NA	NA
Via Paseo del Norte	McCormick Parkway	Via Paseo del Norte	MNC	Local	2	2	NA	NA	NA	NA
Via Paseo del Sur	McCormick Parkway	Via Paseo del Norte	MNC	Local	2	2	NA	NA	NA	NA
Via de la Entrada	Hayden	Via Paseo del Sur	MNC	MNC-S	2	2	NA	NA	NA	NA

Road Name	From	To	Existing 2030 FC	Recommended 2030 FC	Existing Lanes	Recommended 2030 Lanes	2006 Daily Trips	2006 Volume/ Capacity Rates	2030 Projected Daily Trips	2030 Volume/ Capacity Rates
Via del Belleza/Via del Para	Via Paseo del Sur	Via Pasol del Norte	MNC	MNC-S	2	2	NA	NA	NA	NA
Eastwood/Via de Ventura	Scottsdale	Doubletree	MNC	MNC-S	2	2	3,500	0.22	3,500	0.22
Doubletree/Via de Ventura	Scottsdale	Hayden	MNA	MNA-S	4	4	16,800	0.42	18,300	0.46
Via de Ventura	Hayden	Pima	MNA	MNA-S	4	4	28,900	0.72	35,200	0.88
Via Linda	Via de Ventura	Hayden	MNC	MNC-S	2	2	7,100	0.44	6,900	0.43
Via Linda	Hayden	87th Street	MNC	MNC-S	2	2	5,100	0.32	6,300	0.40
Via Linda	87th Street	90th Street	MNC	MNC-S	2	2	7,200	0.37	7,700	0.42
Via Linda	90th Street	96th Street	MNA	MNA-S	4	4	26,800	0.67	33,400	0.84
Via Linda	96th Street	Shea	MNA	MNA-S	4	4	16,000	0.40	23,000	0.57
Via Linda	Shea	FLW	MNA	MNA-S	4	4	10,300	0.26	15,900	0.40
Via Linda	FLW	120th Street	MNA	MNA-S	4	4	19,100	0.49	29,600	0.74
Via Linda	120th Street	124th Street	MJC	MJC-S	4	4	12,600	0.35	21,700	0.60
Via Linda	124th Street	132nd Street	MJC	MJC-S	4	4	5,100	0.14	10,800	0.30
Via Linda	132nd Street	136th Street	MJC	MNC-S	2	2	4,800	0.27	9,200	0.57
Via Linda	136th Street	Canyon Road/145th Way	MNC	MNC-S	2	2	7,800	0.49	12,700	0.79
Mountain View	Scottsdale	Hayden	MJC	MNA-S	4	4	9,400	0.26	7,600	0.21
Mountain View	Hayden	90th Street	MJC	MNA-S	4	4	13,700	0.38	17,000	0.47
Mtn. View/ 92nd Street	90th Street	Shea	MNA	MNA-U	4	4	13,600	0.32	17,400	0.41
Mountain View	92nd Street	96th Street	MNC	MNC-S	2	2	5,400	0.34	7,500	0.47
Mountain View	96th Street	Via Linda	MNC	MNC-S	2	2	3,600	0.22	4,100	0.25
Mountain View	Via Linda	104th Street	MNC	MNC-S	2	2	4,100	0.26	5,100	0.32
Mountain View	104th Street	109th Place	MNC	MNC-S	2	2	5,600	0.35	7,100	0.44

Road Name	From	To	Existing 2030 FC	Recommended 2030 FC	Existing Lanes	Recommended 2030 Lanes	2006 Daily Trips	2006 Volume/ Capacity Rates	2030 Projected Daily Trips	2030 Volume/ Capacity Rates
Mountain View	109th Place	120th Street	MNC	MNC-S	2	2	3,700	0.23	5,100	0.32
Mountain View	120th Street	124th Street	MNC	MNC-S	1	2	2,100	0.13	3,100	0.19
Gold Dust	Scottsdale	74th Street	MJC	MJC-U	4	4	1,300	0.03	2,200	0.05
Shea	64th Street	70th Street	MJA	MJA-S	6	6	51,000	0.85	51,600	0.86
Shea	70th Street	74th Street	MJA	MJA-U	6	6	33,900	0.47	35,500	0.49
Shea	74th Street	Hayden	MJA	MJA-S	6	6	47,000	0.78	47,600	0.79
Shea	Hayden	90th Street	MJA	MJA-S	6	6	55,600	0.93	61,300	1.02
Shea	90th Street	96th Street	MJA	MJA-S	6	6	47,700	0.79	55,700	0.93
Shea	96th Street	104th Street	MJA	MJA-S	6	6	44,800	0.75	54,900	0.92
Shea	104th Street	110th Street	MJA	MJA-S	6	6	41,300	0.69	52,100	0.87
Shea	110th Street	120th Street	MJA	MJA-S	6	6	39,600	0.66	53,400	0.89
Shea	120th Street	city limits	MJA	MJA-S	6	6	38,800	0.65	51,700	0.86
Desert Cove	90th Street	92nd Street	MNC	MNC-S	2	2	NA	NA	NA	NA
Cholla	64th Street	Scottsdale	MNC	MNC-R	2	2	4,500	0.28	4,700	0.33
Cholla	92nd Street	96th Street	MNC	MNC-R	2	2	1,100	0.08	1,900	0.13
Cholla	96th Street	100th Street	MNC	MNC-R	2	2	2,800	0.19	4,600	0.32
Cholla	100th Street	104th Street	MNC	MNC-R	2	2	900	0.06	3,000	0.21
Cholla	104th Street	Via Linda	MNC	MNC-R	2	2	1,400	0.09	4,700	0.33
Cactus	60th Street	64th Street	MJC	MJC-S	4	4	27,700	0.77	27,400	0.76
Cactus	64th Street	Scottsdale	MJC	MJC-S	4	4	26,100	0.73	26,500	0.74
Cactus	Scottsdale	Hayden	MJC	MJC-S	4	4	27,600	0.77	28,000	0.78
Cactus	Hayden	96th Street	MJC	MJC-S	4	4	16,600	0.59	21,700	0.60
Cactus	96th Street	104th Street	MNC	MNC-R	2	2	3,900	0.27	6,200	0.43
Cactus	104th Street	108th Street	MNC	MNC-R	2	2	2,300	0.16	3,900	0.27
Cactus	108th Street	FLW	MNC	MNC-R	4	2	2,200	0.15	2,600	0.18
Cactus	124th Street	128th Street	MNC	MNC-S	2	2	NA	NA	NA	NA

Road Name	From	To	Existing 2030 FC	Recommended 2030 FC	Existing Lanes	Recommended 2030 Lanes	2006 Daily Trips	2006 Volume/ Capacity Rates	2030 Projected Daily Trips	2030 Volume/ Capacity Rates
Sweetwater	Scottsdale	Hayden	MNC	MNC-S	2	2	6,400	0.40	5,200	0.33
Sweetwater	90th Street	96th Street	MJC	MNC-S	2/4	2	1,400	0.05	1,700	0.11
Sweetwater	96th Street	FLW	MNC	MNC-S	2	2	1,700	0.11	2,700	0.17
Thunderbird/ Redfield	Scottsdale	Hayden	MJC	MJC-S	2	4	14,500	0.70	18,300	0.51
Thunderbird	Hayden	84th Street	MNC	MNC-S	2	2	900	0.06	1,200	0.07
Thunderbird	Loop 101	FLW	MNA	MNA-S	4	4	6,400	0.16	7,300	0.18
Redfield	Thompson Peak Pkwy	Raintree	MJC	MJC-S	4	4	9,600	0.27	11,300	0.32
Raintree	78th Way	Hayden	MNA	MNA-S	2	4	NA	NA	NA	NA
Raintree	Hayden	Northsight	MNA	MJA-S	4	6	14,800	0.37	19,300	0.32
Raintree	Northsight	Loop 101	MNA	MJA-S	4	4	23,600	0.51	27,300	0.46
Raintree	Loop 101	Thompson Peak Pkwy	MNA	MNA-S	4	4	26,000	0.61	26,400	0.66
Raintree	Thompson Peak Pkwy	FLW	MNA	MNA-S	4	4	6,000	0.15	7,000	0.18
Raintree	FLW	100th Street	MNC	MNC-S	2	2	NA	NA	NA	NA
Butherus	Scottsdale	Airport Drive	MNA	MNA-S	4	4	9,300	0.23	9,900	0.25
Greenway-Hayden Loop	Scottsdale	73rd Street	MNA	MNA-U	4	4	10,000	0.21	8,700	0.18
Greenway-Hayden Loop	73rd Street	79th Street	MNA	MNA-U	4	4	13,300	0.28	10,500	0.22
Greenway-Hayden Loop	79th Street	FLW	MNA	MNA-U	4	4	13,900	0.29	13,400	0.28
Paradise	Scottsdale	76th Street	MNC	MNC-S	2	2	4,700	0.29	4,400	0.27
Paradise	76th Street	Greenway-Hayden Loop	MNC	MNC-S	2	2	5,400	0.34	4,900	0.31
Paradise	98th Street	Thompson Peak Pkwy	MNC	Local	2	2	NA	NA	NA	NA

Road Name	From	To	Existing 2030 FC	Recommended 2030 FC	Existing Lanes	Recommended 2030 Lanes	2006 Daily Trips	2006 Volume/ Capacity Rates	2030 Projected Daily Trips	2030 Volume/ Capacity Rates
FLW	Scottsdale	76th Street	MJA	MJA-S	6	6	35,000	0.58	38,200	0.64
FLW	76th Street	Greenway-Hayden Loop	MJA	MJA-S	6	6	41,200	0.69	39,700	0.66
FLW	Greenway-Hayden Loop	Loop 101	MJA	MJA-S	6	6	47,600	0.79	48,000	0.80
FLW	Loop 101	Thompson Peak Pkwy	MJA	MJA-S	6	6	39,200	0.65	42,800	0.71
FLW	Thompson Peak Pkwy	Thunderbird	MJA	MJA-S	6	6	28,100	0.46	31,900	0.53
FLW	Thunderbird	Cactus	MNA	MNA-S	4	4	32,500	0.76	35,700	0.89
FLW	Cactus	Via Linda	MNA	MNA-S	4	4	31,700	0.79	37,100	0.93
FLW	Via Linda	Shea	MNA	MNA-S	4	4	15,400	0.39	20,000	0.50
100th Street	Frank Lloyd Wright	Thompson Peak	MJC	MNC	4	2	3,500	0.10	2,000	0.12
McDowell Mountain Ranch	98th Street	Thompson Peak	MJC	MJC-S	2/4	4	3,500	0.10	5,900	0.16
Bahia	Loop 101 frontage	90th Street	MNC	MNC-S	2	2	NA	NA	NA	NA
Bahia	90th Street	94th Street	MNC	MNC-S	2	2	NA	NA	NA	NA
Bell	Hayden	Loop 101	MNA	MNA-S	4	4	7,500	0.19	8,300	0.21
Bell	Loop 101	94th Street	MNA	MNA-S	4	4	14,500	0.35	23,800	0.59
Bell	94th Street	Thompson Peak Pkwy	MNA	MNA-S	2	4	9,400	0.38	11,600	0.29
Bell/McDowell Mtn Ranch	Bell	105th Street	MNC	MNC-S	4	4	4,900	0.16	4,300	0.24
Bell/McDowell Mtn Ranch	105th Street	Thompson Peak Pkwy	MJC	MJC-S	4	4	12,400	0.35	12,300	0.34
Princess	Scottsdale	76th Street	MJC	MJC-U	2	4	300	0.00	9,600	0.24
Princess	76th Street	Union Hills	NA	MJC-U	0	4	NA	NA	800	0.02
Princess	Hayden	Pima	MNA	MNA-S	4/6	4/6	14,000	0.31	13,900	0.31

Road Name	From	To	Existing 2030 FC	Recommended 2030 FC	Existing Lanes	Recommended 2030 Lanes	2006 Daily Trips	2006 Volume/ Capacity Rates	2030 Projected Daily Trips	2030 Volume/ Capacity Rates
Center	Scottsdale	Pima	MNA	MNA-U	4	4	NA	NA	12,400	0.26
Union Hills	Pima	Thompson Peak Pkwy	MNA	MNA-S	4	4	13,400	0.38	11,900	0.30
Union Hills	Scottsdale	Hayden	MJC	MJC-U	2	4	5,400	0.13	12,000	0.29
Union Hills	Hayden	Perimeter	MNA	MJC-U	2	4	1,200	0.05	2,800	0.07
Hualapai	Center	Pima	MJC	MJC-U	2	4	1,000	0.02	6,600	0.15
Thompson Peak Pkwy	Scottsdale	Hayden	MNA	MNA-S	4	4	14,300	0.36	19,300	0.48
Thompson Peak Pkwy	Hayden	Pima	MNA	MNA-S	4	4	15,800	0.39	22,700	0.57
Thompson Peak Pkwy	Pima	Union Hills	MNA	MNA-S	4	4	5,400	0.17	8,600	0.21
Thompson Peak Pkwy	Union Hills	Bell	MNA	MNA-S	4	4	4,600	0.11	7,600	0.19
Thompson Peak Pkwy	Bell	100th Street	MJA	MNA-S	4	4	10,100	0.25	12,700	0.32
Thompson Peak Pkwy	100th Street	FLW	MJA	MJA-S	6	6	15,800	0.26	19,600	0.33
Grayhawk	Scottsdale	Hayden	MNC	MNC-S	2	2	NA	NA	NA	NA
Deer Valley	Scottsdale	Hayden/ Miller	MNC	MNC-S	2	2	2,400	0.15	3,700	0.23
Adobe	Scottsdale	Miller	MNC	MNC-S	2	2	NA	NA	NA	NA
Williams	Scottsdale	Miller	MJC	MJC-S	2	4	2,700	0.15	3,000	0.08
Williams	Miller	Pinnacle Peak	MJC	MNC-S	2	2	3,500	0.19	3,900	0.24
Pinnacle Peak	Scottsdale	Pima	MNA	MNA-R	2	4	12,500	0.66	23,200	0.65
Pinnacle Peak	Pima	E. of Pima	MNC	MNC-R	2	2	9,000	0.48	10,400	0.60
Happy Valley	Scottsdale	Pima	MNA	MJC-R	2	4	3,300	0.18	10,600	0.33
Happy Valley	Pima	Alma School	MNA	MNA-R	2	4	17,400	0.97	35,100	0.97
Happy Valley	Alma School	Whispering Wind	MNA	MNA-R	4	4	3,300	0.09	11,200	0.31
Jomax	56th Street	64th Street	MNC	MNC-R	0	2	600	0.04	5,700	0.40

Road Name	From	To	Existing 2030 FC	Recommended 2030 FC	Existing Lanes	Recommended 2030 Lanes	2006 Daily Trips	2006 Volume/ Capacity Rates	2030 Projected Daily Trips	2030 Volume/ Capacity Rates
Jomax	64th Street	Scottsdale	MNC	MNC-R	2	2	1,800	0.11	6,900	0.48
Jomax	Scottsdale	Pima	MNC	MNC-R	2	2	1,700	0.12	4,800	0.33
Jomax	Alma School	118th Street	MJC	MNC-R	2	2	3,000	0.19	4,400	0.30
Dynamite	56th Street	64th Street	MJA	MNA-R	2	4	8,400	0.42	19,900	0.55
Dynamite	64th Street	Scottsdale	MJA	MNA-R	2	4	8,700	0.43	21,600	0.60
Dynamite	Scottsdale	Pima	MJA	MNA-R	2	4	7,800	0.43	17,900	0.50
Dynamite	Pima	Alma School	MJA	MNA-R	4	4	13,300	0.37	24,800	0.70
Dynamite/Rio Verde	Alma School	128th Street	MJA	MNA-R	4	4	7,100	0.36	25,500	0.71
Rio Verde	128th Street	136th Street	MJA	MNA-R	2	4	7,300	0.40	26,500	0.74
Rio Verde	136th Street	city limits	MJA	MNA-R	2	4	7,200	0.38	26,100	0.72
Dixileta	66th Street	Scottsdale	MNC	MNC-R	2	2	4,200	0.28	5,800	0.39
Dixileta	Scottsdale	Pima	MNC	MNC-R	2	2	1,100	0.07	2,500	0.17
Lone Mountain	68th Street	Scottsdale	MNA	MNC-R	2	2	8,100	0.43	10,800	0.58
Lone Mountain	Scottsdale	Pima	MNA	MNC-R	2	2	4,200	0.23	5,800	0.40
Dove Valley	56th Street	62nd Street	MNC	MNC-R	0	2	500	0.03	2,300	0.16
Westland	Scottsdale	Hayden	MNA	MNA-R	4	4	4,600	0.13	5,300	0.15
Westland	Hayden	Pima	MNA	MNC-R	2	2	3,500	0.15	3,600	0.25
Carefree Hwy	56th Street	Scottsdale	MNA	MNA-R	2	4	13,000	0.72	26,600	0.74
Legend Trail	Pima	Stagecoach Pass	MJC	MJC-R	4	4	2,200	0.07	2,200	0.07
Stagecoach Pass	Windmill	Pima	MJC	MNC-R	2	2	500	0.03	500	0.04
Stagecoach Pass	Pima	Legend Trail	MJC	MNC-R	2	2	1,900	0.12	2,900	0.20
Stagecoach Pass	Legend Trail	Lone Mountain Pkwy	MJC	MNC-R	2	2	100	0.00	100	0.01
Cave Creek	City limits	Lone Mountain Pkwy	MJC	MJC-R	4	4	9,200	0.28	16,200	0.50
Cave Creek	Lone Mountain Pkwy	Bartlett Dam	MJC	MNC-R	2	2	4,000	0.25	5,600	0.39

Road Name	From	To	Existing 2030 FC	Recommended 2030 FC	Existing Lanes	Recommended 2030 Lanes	2006 Daily Trips	2006 Volume/ Capacity Rates	2030 Projected Daily Trips	2030 Volume/ Capacity Rates
Cave Creek	Bartlett Dam	City limits	MNC	MNC-R	2	2	1,000	0.07	1,500	0.10
Bartlett Dam	Cave Creek	N of Bartlett Dam	MNC	MNC-R	2	2	1,000	0.07	1,500	0.10

Transportation Master Plan
Street Element

Appendix 4-B
Access Management Policies

Currently adopted access management/control policies were adopted through the 2003 Streets Master Plan. They are detailed here for reference.

General policies such as the Arterial Median Break Policy apply to all streets classified as arterials. The following streets have specific access control policies:

- Dynamite Boulevard
- Frank Lloyd Wright Boulevard
- Pima Road
- Scottsdale Road
- Via Linda
- Shea Boulevard

1.0 ARTERIAL MEDIAN BREAK POLICY

GENERAL

Freeways are unsignalized and accessed only at interchanges, which do not interrupt traffic flow on the main line. They are designed for maximize mobility, while limiting accessibility. Collector roads are designed to provide access from neighborhoods to the major street network, have many access points and provide for some mobility. Arterials fall between a freeway and collector roads by having limited signals, with primary access from city streets, rather than driveways. The primary function of an arterial road is to favor mobility over access, limiting the number of disruptions to through traffic to critical locations. Arterials have a typical design capacity of 30,000 to 50,000 vehicles per day. The secondary function of an arterial is to protect neighborhoods from cut through travel. By providing little delay and low congestion arterials prevent drivers from looking for alternative routes through neighborhoods.

ARTERIAL POLICY

The following Arterial Policy applies to any major or minor arterial identified by the city's Streets Master Plan. Deviation from the Arterial Policy requires approval of the Scottsdale City Council.

1. Drive Separation from Streets

Driveways accessing an arterial shall be separated from a public street intersection by at least the following distances (Figure 1):

A. Right in, right out drive

i. Upstream of (approaching) a public street - 330 feet

ii. Downstream of (past) a public street - 330 feet

B. Right in only drive

i. Upstream of (approaching) a public street - 330 feet

ii. Downstream of (past) a public street - 330 feet

2. Median Openings

Parkway median openings shall be as follows:

A. A full median opening shall be separated from another full median opening by a minimum of one-quarter mile.

B. A partial median opening, of the type shown in Figures 2 - 5, shall be separated from any other median opening by a minimum distance of one eighth of a mile.

3. Number of Drives

A parcel of land shall have no more than two access locations to an arterial unless capacity on the arterial will be degraded to a lower level of service, without an additional direct access to the arterial. This shall be determined by a comprehensive traffic impact analysis with a design condition including developer attributable road and intersection improvements, as specified by the city.

4. Spacing Between Private Drives

Private drive access to an arterial shall be not less than 330 feet from the nearest adjoining private drive.

5. Exclusive Side Street Access

A parcel, adjoining an arterial, with alternative access via a side street or a cross access easement, shall not have direct driveway access to the arterial, unless:

A. Capacity on the arterial or side street will be degraded to a lower level of service, without direct access from the parcel to the arterial. This shall be determined by a comprehensive traffic impact analysis with a design condition, including developer attributable road and intersection improvements, as specified by the city; or,

B. Satisfactory evidence is provided to the city that the proposed allowable use of the parcel would be economically viable only with a separate entrance from the arterial, because an exclusive non-arterial access is shown to be overly circuitous for the use.

6. Side-Street Access Location

On city side streets that are connected to an arterial, driveways shall be at least 330 feet from the arterial.

7. Residential Access

A parcel for single-family residential use, adjoining an arterial, shall not have access to an arterial, unless there is no alternative access.

8. Deceleration

Any right turn drive from an arterial shall include a deceleration lane.

9. Traffic Signals

Traffic signals on an arterial should be separated by a minimum of one half mile, unless other signal spacing is approved by the city, based on a signal study. If a signal becomes warranted, at a location that has not been identified as a future signal location, a restrictive median approved by traffic engineering will be designed and installed to prevent signalization, improve the operation of the intersection and preserve mobility on the arterial.

10. Intersection Control

An arterial intersection, with an overall average daily entering volume of more than 30,000 vehicles, shall be configured as follows:

A. Four way intersection

i. With median turn bays, left turns in only from the parkway (Figure 2), or;

ii. Signalized based on a signal study and 9, above.

B. Three way "T" intersection

i. With median turn bay, left turn in from (Figure 3), or left hand turn out to the arterial (Figure 4), or;

ii. With median turn bays, left turn in from, and left turn out to the arterial

(Figure 5), or;

iii. Signalized based on a signal study and 9, above.

11. Access by Alternative Modes of Transportation

A. Non-motorized Access

A development, with frontage on an arterial, shall be accessible by pedestrians and bicycles.

B. Multiuse Path

A minimum six-foot wide sidewalk with maximum allowable buffer shall be included along each side of an arterial.

C. Bus Bay

There shall be a far side bus bay at all signalized arterial intersections.

i. New development, fronting a city designated bus bay location, shall provide the bus bay, including shelter, trash can and bike rack. With city approval, the bay may be incorporated into an elongated deceleration lane.

New development with frontage on an arterial shall be responsible for regional bus stop signs.

D. Underpass/Overpass

i. An arterial shall have pedestrian/multi-purpose underpasses at intervals appropriate to projected use. Pedestrian/multi-purpose underpasses shall be incorporated with drainage structures where feasible.

ii. An arterial shall incorporate vehicle underpasses/overpasses where vehicle cross traffic demand indicates capacity on the arterial or side street will be degraded to a level of service (LOS) lower than LOS D. These shall be combined with pedestrian/multi-purpose underpasses where feasible.

DEFINITIONS/STANDARDS

The following apply to the Arterial Policy:

A. Parcel - one or more lots owned or controlled by a single entity

B. Spacing - all drive or roadway spacing distances are centerline to centerline

2.0 DYNAMITE BOULEVARD POLICY

Dynamite Boulevard is classified as an arterial in Scottsdale’s Streets Master Plan.

Deviation from the Dynamite Boulevard Policy requires approval of the Scottsdale City Council.

1. Arterial Policy[1]

The Arterial Policy applies to the entire length of Dynamite Boulevard within the city limits.

2. Driveway Minimization

These provisions are to minimize the number of driveways to Dynamite Boulevard, being applied at specific locations and as developmental conditions warrant:

A. Cross Parcel Easement

A parcel for other than residential use, adjoining Dynamite Boulevard, shall provide a cross parcel access easement to parcels adjoining to the east and west.

B. Shared Drives

A parcel, having frontage and access only to Dynamite Boulevard shall access Dynamite Boulevard only by means of a driveway located along a side property line. The drive should be used as a shared access drive with an adjoining parcel.

3. Traffic Signals

Traffic signals are currently located at Scottsdale Road and Pima Road. Additional signals, if and when warranted, shall be limited to 56th Street, 64th Street, Hayden Road, 97th Street, 103rd OR 108th Street, Alma School Parkway, 118th Street, 128th Street, and 136th Street.

4. Access by Alternative Modes of Transportation

A. Multiuse Trail

There shall be a multiuse trail along at least one side of Dynamite Boulevard, between Pima Freeway and Stagecoach Pass connected by underpasses as indicated by demand and connected to the powerline corridor and all other multi-use paths.

B. Underpass

There shall be multi-purpose grade separated crossings to allow for the safe free flow of pedestrian, bicycle, skate and other non-motorized travel in the vicinity of the powerline corridor paths and other locations as demand and safety dictate.

3.0 FRANK LLOYD WRIGHT BOULEVARD POLICY

Applies only to Frank Lloyd Wright Boulevard (FLWB) from Scottsdale Road east and south to Shea Boulevard. Deviation from the Frank Lloyd Wright Median Break Policy requires approval of the Scottsdale City Council.

BACKGROUND

Arterials fall between a freeway and collector roads by having limited signals, with primary access from city streets, rather than driveways. The primary function of an arterial road is to favor mobility over access, limiting the number of disruptions to through traffic to critical locations. Arterials have a typical design capacity of 30,000 to 50,000 vehicles per day. The secondary function of an arterial is to protect neighborhoods from cut through travel. By providing little delay and low congestion arterials prevent drivers from looking for alternative routes through neighborhoods. If the capacity of an arterial is compromised and/or restricted traffic congestion will increase. As delay increased on the major roads drivers will inevitably look to the lower classified residential roads for alternative routes. Therefore, in order to protect neighborhoods from cut through traffic the primary function of the arterial roads must also be protected.

1. Major Arterial

Frank Lloyd Wright Boulevard (FLWB) is classified as a major arterial in Scottsdale’s General Plan and shall strictly adhere to the access restrictions of the Arterial Road Policy.

2. Driveway Minimization
These provisions are to minimize the number of driveways to FLWB, being applied as specific locations and developmental conditions warrant:

A. Cross Parcel Easement
A parcel for other than residential use, adjoining FLWB, should provide a cross parcel access easement to parcels adjoining to the east and west.

B. Shared Drives
A parcel, having frontage and access only to FLWB, should access FLWB by means of a driveway located along a side property line. The drive should be used as a shared access drive with an adjoining parcel.

3. Traffic Signals
Traffic signals are currently located at Scottsdale Road, the Promanade, 76th Street, Greenway-Hayden Loop, Hayden Road, Pima Freeway, 90th Street, 92nd Street, Thompson Peak Parkway, Raintree Drive, 100th Street, Cactus Road, Altadena Drive, Via Linda and Shea Boulevard. No additional signals shall be located along the roadway. If a signal becomes warranted, at a location that is not currently signalized a restrictive median will be designed and installed to prevent signalization, improve the operation of the intersection and preserve mobility on the arterial.

4. Access by Alternative Modes of Transportation
A. Multiuse Trail
There shall be a multiuse trail along the at least one side of FLWB from Scottsdale Road and Shea Boulevard connected by underpasses as indicated by demand and connected to the power line corridor multi-use path, the Camelback Walk path and to the Central Arizona Project Corridor for future path connections.

B. Park and Ride Lot
As development warrants, there should be park and ride lots along FLWB near Scottsdale Road and near Via Linda.

C. Underpass
There shall be multi-purpose grade separated crossings to allow for the safe free flow of pedestrian, bicycle, skate and other non-motorized travel in the vicinity of Scottsdale Road, Hayden Road, Thompson Peak Parkway, Cactus Road, Shea Boulevard and other locations as determined by need.

4.0 PIMA ROAD POLICY

Applies only to Pima Road from the Pima Freeway to Stagecoach Pass. Deviation from the Pima Road Policy requires approval of the Scottsdale City Council.

1. Arterial Policy
The Arterial Policy applies to Pima Road from the Pima Freeway north to Stagecoach Pass.

2. Driveway Minimization
These provisions are to minimize the number of driveways to Pima Road, being applied at specific locations and as developmental conditions warrant:

A. Cross Parcel Easement
A parcel for other than residential use, adjoining Pima Road, should provide a cross parcel access easement to parcels adjoining to the east and west.

B. Shared Drives
A parcel, having frontage and access only to a parkway, should access the parkway by means of a driveway located along a side property line. The drive should be used as a shared access drive with an adjoining parcel.

3. Traffic Signals
Traffic signals are currently located at Pima Freeway, Downing Olsen, Thompson Peak Parkway, Pinnacle Peak Road, Happy Valley Road, and Dynamite Boulevard. Additional signals, if and when warranted, shall be limited to Union Hills Drive, Hualapai Drive, Los Gatos, Yearling Road OR Desert Highlands Drive, Dixileta Drive, Lone Mountain Road, Westland Drive, and Stagecoach Pass. Within one month of the Signal at Union Hills being activated, the signal at Downing Olsen is to be removed and access should be restricted to ensure that safety and efficiency is maintained.

4. Access by Alternative Modes of Transportation
A. Multiuse Trail
There shall be a multiuse trail along at least one side of Pima Road, between Pima Freeway and Stagecoach Pass connected by underpasses as indicated by demand and connected to the both power-line corridor multi-use paths.

B. Park and Ride Lot
As development warrants, there should be a park and ride lot along Pima Road in the vicinity of the Pima Freeway.

C. Underpass
There shall be multi-purpose underpasses to allow for the safe free flow of pedestrian, bicycle, skate and other non-motorized travel in the vicinity of the power-line corridor paths, Westland Drive and other locations as demand and safety dictate.

5.0 SCOTTSDALE ROAD POLICY

Applies only to Scottsdale Road from Frank Lloyd Wright Boulevard north to Carefree Highway. Deviation from the Scottsdale Road Policy requires approval of the Scottsdale City Council.

1. Arterial Policy
The Arterial Policy applies to Scottsdale Road from Frank Lloyd Wright Boulevard north to Carefree Highway.

2. Driveway Minimization
These provisions are to minimize the number of driveways to Scottsdale Road, being applied as specific locations and developmental conditions warrant:

A. Cross Parcel Easement
A parcel for other than residential use, adjoining Scottsdale, should provide a cross parcel access easement to parcels adjoining to the east and west.

B. Shared Drives

A parcel, having frontage and access only to a parkway, should access the parkway by means of a driveway located along a side property line. The drive should be used as a shared access drive with an adjoining parcel.

3. Traffic Signals

Traffic signals are currently located at FLW, Dana Suites, Princess Drive, Mayo Boulevard, Thompson Peak Parkway, Greyhawk Drive, Pinnacle Peak Road, Jomax Road, Dynamite Boulevard, Lone Mountain Road, Dove Valley and Carefree Highway. Additional signals, if and when warranted, shall be limited to Pima Freeway, Deer Valley Road, Williams Drive, Happy Valley Road, Dixileta Drive, Ashler Hills, and Westland Drive.

4. Access by Alternative Modes of Transportation

A. Multiuse Trail

There shall be a multiuse trail along the both side of Scottsdale Road, between FLW and CFH connected by underpasses as indicated by demand and connected to the both power-line corridor multi-use paths.

B. Park and Ride Lot

As development warrants, there should be a park and ride lots along Scottsdale Road in the vicinity of Mayo Boulevard, Pinnacle Peak Road and Westland Drive.

C. Underpass

There shall be multi-purpose underpasses to allow for the safe free flow of pedestrian, bicycle, skate and other non-motorized travel in the vicinity of Mayo Boulevard, Hualapai Drive, Williams Drive, Happy Valley Road and Westland Drive and other locations as determined by need.

6.0 VIA LINDA POLICY

Applies only to Via Linda from 90th Street to 136th Street. Deviation from the Via Linda Policy requires approval of the Transportation Commission.

BACKGROUND

Arterials fall between a freeway and collector roads by having limited signals, with primary access from city streets, rather than driveways. The primary function of an arterial road is to favor mobility over access, limiting the number of disruptions to through traffic to critical locations. Arterials have a design capacity of 30,000 to 50,000 vehicles per day. The secondary function of an arterial is to protect neighborhoods from cut through travel. By providing little delay and low congestion arterials prevent drivers from looking for alternative routes through neighborhoods. If the capacity of an arterial is compromised and/or restricted traffic congestion will increase. As delay increased on the major roads drivers will inevitably look to the lower classified residential roads for alternative routes. Therefore, in order to protect neighborhoods from cut through traffic the primary function of the arterial roads must also be protected.

1. Major Arterial

Via Linda is classified as a major arterial in Scottsdale's General Plan and shall strictly adhere to the access restrictions of the Arterial Road Policy.

2. Driveway Minimization
These provisions are to minimize the number of driveways to Via Linda, being applied as specific locations and developmental conditions warrant:

A. Cross Parcel Easement
A parcel for other than residential use, adjoining Via Linda, should provide a cross parcel access easement to parcels adjoining to the east and west.

B. Shared Drives
A parcel, having frontage and access only to Via Linda, should access the parkway by means of a driveway located along a side property line. The drive should be used as a shared access drive with an adjoining parcel.

3. Traffic Signals
Traffic signals are currently located at 90th Street, 91st Street, 96th Street, Mountain View Road, 104th Street, Shea Boulevard, Frank Lloyd Wright Boulevard, and 124th Street. Additional signals, if and when warranted, shall be limited to 110th Street, 118th Street, 128th Street, 132nd Street, and 136th Street. If a signal becomes warranted, at a location that has not been identified as a future signal location, a restrictive median will be installed to prevent signalization, improve the operation of the intersection and preserve mobility on the arterial.

4. Access by Alternative Modes of Transportation
A. Multiuse Trail
There shall be a multiuse trail along the at least one side of Via Linda from 90th Street to 136th Street connected by underpasses as indicated by demand and connected to the power-line corridor multi-use path, the Camelback Walk path, the McDowell Mountain Preserve trailheads and to the Central Arizona Project Corridor for future path connections.

B. Underpass
There shall be multi-purpose grade separated crossings to allow for the safe free flow of pedestrian, bicycle, skate and other non-motorized travel in the vicinity of 102nd Street, Shea Boulevard, Frank Lloyd Wright, the CAP Corridor, 120th Street, 126th Street, 136th Street and other locations as determined by need.

7.0 SHEA BOULEVARD POLICY (EXPRESSWAY POLICY)

City of Scottsdale Transportation Commission, Adopted January 5, 1995 (As of the adoption date of this policy, Shea Boulevard, from Pima Road east to the city limits, is the only expressway in the city's General Plan. The expressway classification was merged into the Arterial Classification in the Streets Master Plan, this expressway policy still applies as defined to Shea Blvd.)

GENERAL

A freeway is unsignalized and accessed only at interchanges. A major arterial is signalized, and often accessed by numerous direct driveways. An expressway falls between a freeway and a major arterial, having limited signals, with primary access from city streets, rather than driveways. An expressway has the capacity to carry 50,000 vehicles per day at level of Service C.

EXPRESSWAY POLICY

The following General Expressway Policy applies to any expressway in the city's Streets Master Plan. Deviation from the General Expressway Policy requires approval of the Transportation Commission.

1. Drive Separation from Streets

Driveways accessing an expressway shall be separated from a public street intersection by at least the following distances (Figure 1):

A. Right in, right out drive

i. Upstream of (approaching) a public street – 660 feet

ii. Downstream of (past) a public street – 330 feet

B. Right in only drive

i. Upstream of (approaching) a public street – 330 feet

ii. Downstream of (past) a public street – 330 feet

2. Median Openings

Expressway median openings shall be as follows:

A. A full median opening shall be separated from another full median opening by one mile.

B. A partial median opening, of the type shown in Figures 2 – 5, shall be separated from any other median opening by a minimum distance of one quarter of a mile.

3. Number of Drives

A parcel of land shall have no more than one access location to an expressway unless capacity on the expressway will be degraded to a lower level of service, without an additional direct access to the expressway. This shall be determined by a comprehensive traffic impact analysis with a design condition including developer attributable road and intersection improvements, as specified by the city.

4. Spacing Between Private Drives

Private drive access to an expressway shall be not less than 660 feet from the nearest adjoining private drive.

5. Exclusive Side Street Access

A parcel, adjoining an expressway, with access to another side street, shall have public access exclusively to the side street, unless:

A. Capacity on the expressway or side street will be degraded to a lower level of service, without direct access from the parcel to the expressway. This shall be determined by a comprehensive traffic impact analysis with a design condition, including developer attributable road and intersection improvements, as specified by the city; or,

B. Satisfactory evidence is provided to the city that the proposed allowable use of the parcel would be economically viable only with a separate entrance from the expressway, because an exclusive non expressway access is shown to be overly circuitous for the use.

6. Side Street Access Location

On city side streets that are connected to an expressway, driveways shall be at least 330 feet from the expressway.

7. Residential Access

A parcel for single family residential use, adjoining an expressway, shall not have access to an expressway, unless there is no alternative access.

8. Deceleration Lane

Any right turn drive from an expressway shall include a deceleration lane.

9. Traffic Signals

Traffic signals on an expressway should be separated by one mile, unless other signal spacing is approved by the city, based on a signal study.

10. Intersection Control

An expressway intersection, with an overall average daily entering volume of more than 30,000 vehicles, shall be configured as follows:

A. Four way intersection

i. With median turn bays, left turns in only from the expressway (Figure 2), or;

ii. Signalized pursuant to 9, above.

B. Three way "T" intersection

i. With median turn bay, left turn in from (Figure 3), or left hand turn out to the expressway (Figure 4), or;

ii. With median turn bays, left turn in from, and left turn out to the expressway (Figure 5), or;

iii. Signalized pursuant to 9, above.

11. Access by Alternative Modes of Transportation

A. Non-motorized Access

A development, with frontage on an expressway, shall be accessible by pedestrians and bicycles.

B. Multiuse Path

A ten foot wide multiuse path shall be included along each side of an expressway.

C. Bus Bay

There shall be a far side bus bay at all signalized expressway intersections.

i. New development, fronting a city designated bus bay location, shall provide the bus bay, including shelter, trash can and bike rack. With city approval, the bay may be incorporated into an elongated deceleration lane.

ii. New development with frontage on an expressway shall be responsible for regional bus stop signs.

D. Underpass

An expressway shall have pedestrian/ multi-purpose underpasses at intervals appropriate to projected use. Underpasses shall be incorporated with drainage structures where feasible.

E. Park and Ride Lot

Park and Ride lots shall be located in convenient proximity to an expressway, with size and frequency appropriate to projected area demand.

DEFINITIONS/STANDARDS

The following apply to the Expressway Policy:

A. Parcel - one or more lots owned or controlled by a single entity

B. Spacing - all drive or roadway spacing distances are centerline to centerline

8.0 SHEA BOULEVARD POLICY

Applies only to Shea Boulevard from Pima Road east to the city limits. Deviation from the Shea Boulevard Policy requires approval of the Transportation Commission.

1. Expressway Policy[1]

The Expressway Policy applies to Shea Boulevard, from Pima Road east to the city limits.

2. Driveway Minimization

These provisions are to minimize the number of driveways to Shea Boulevard, being applied as specific locations and developmental conditions warrant:

A. Cross Parcel Easement

A parcel for other than residential use, adjoining Shea Boulevard, should provide a cross parcel access easement to parcels adjoining to the east and west.

B. Shared Drives

A parcel, having frontage and access only to an expressway, should access the expressway by means of a driveway located along a side property line. The drive should be used as a shared access drive with an adjoining parcel.

3. Traffic Signals

Traffic signals are currently located at 90th Street, 92nd Street, 96th Street, Via Linda (106th Street), 110th Street, Frank Lloyd Wright Boulevard (114th Street), and 124th Street. Additional signals, when warranted, shall be limited to 100th Street, 120th Street, 130th Street, 134th Street, 136th Street, and 142nd Street.

4. Median Openings

There shall be no new median openings between Pima Road and 124th Street. For the area between 124th Street east to the county line, there shall be no additional median openings beyond those contained in the construction plans approved in city project #S1707.

5. Left In Only Median Openings

The 89th Place, 93rd Street, and 116th Street median openings shall be reconfigured to be right in, right out and left in from Shea Boulevard. Left turns out to Shea Boulevard shall be discontinued.

6. Access by Alternative Modes of Transportation

A. Multiuse Trail

There shall be a multiuse trail along the south side of Shea Boulevard, between Pima Road and the 114th Street underpass, and along the north side of Shea Boulevard from the 114th Street underpass to the 136th Street underpass.

B. Park and Ride Lot

As development warrants, there should be a park and ride lot in the vicinity of Shea Boulevard and 124th Street and another in the vicinity of 136th Street. These are in addition to the Mustang Transit Center and other transit accommodations in the City of Scottsdale Transit Plan.

C. Underpass

There shall be a multi-purpose underpass in the vicinity of 124th Street.

DEFINITIONS/STANDARDS

The following apply to the Shea Boulevard Policy:

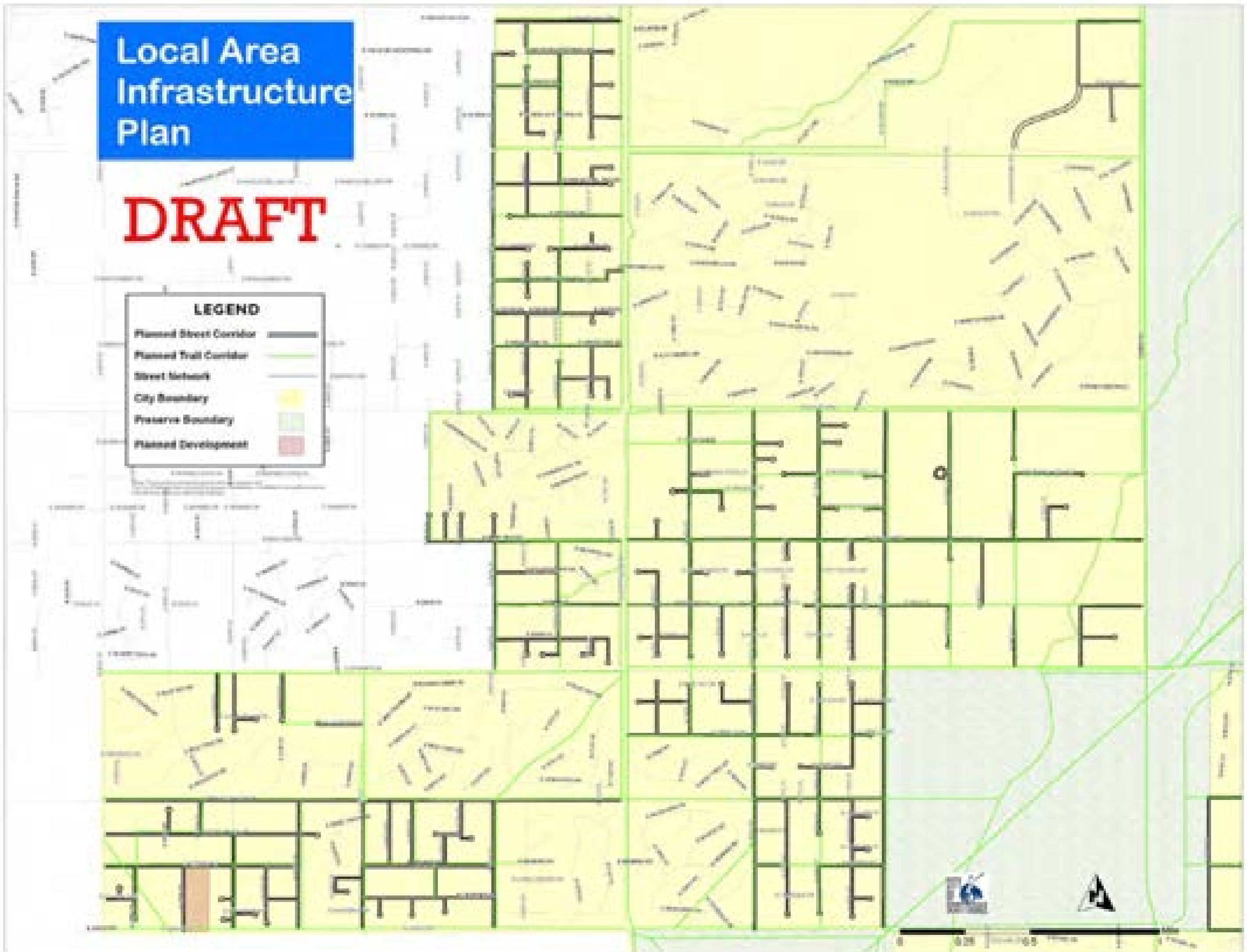
A. Parcel one or more lots owned or controlled by a single entity

B. Spacing all drive or roadway spacing distances are centerline to centerline

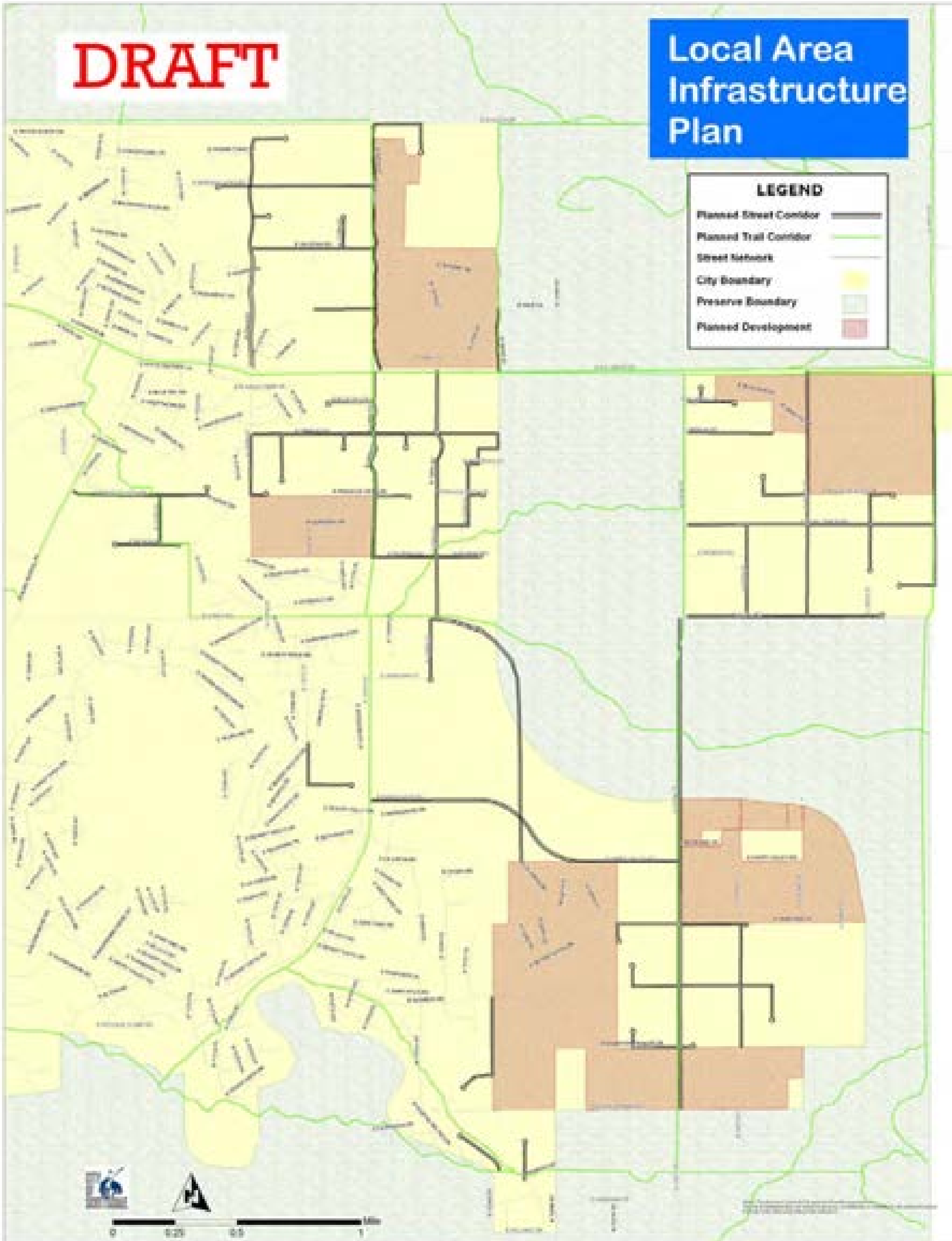
Transportation Master Plan
Streets Element

Appendix 4-C
Local Area Infrastructure Plan Maps

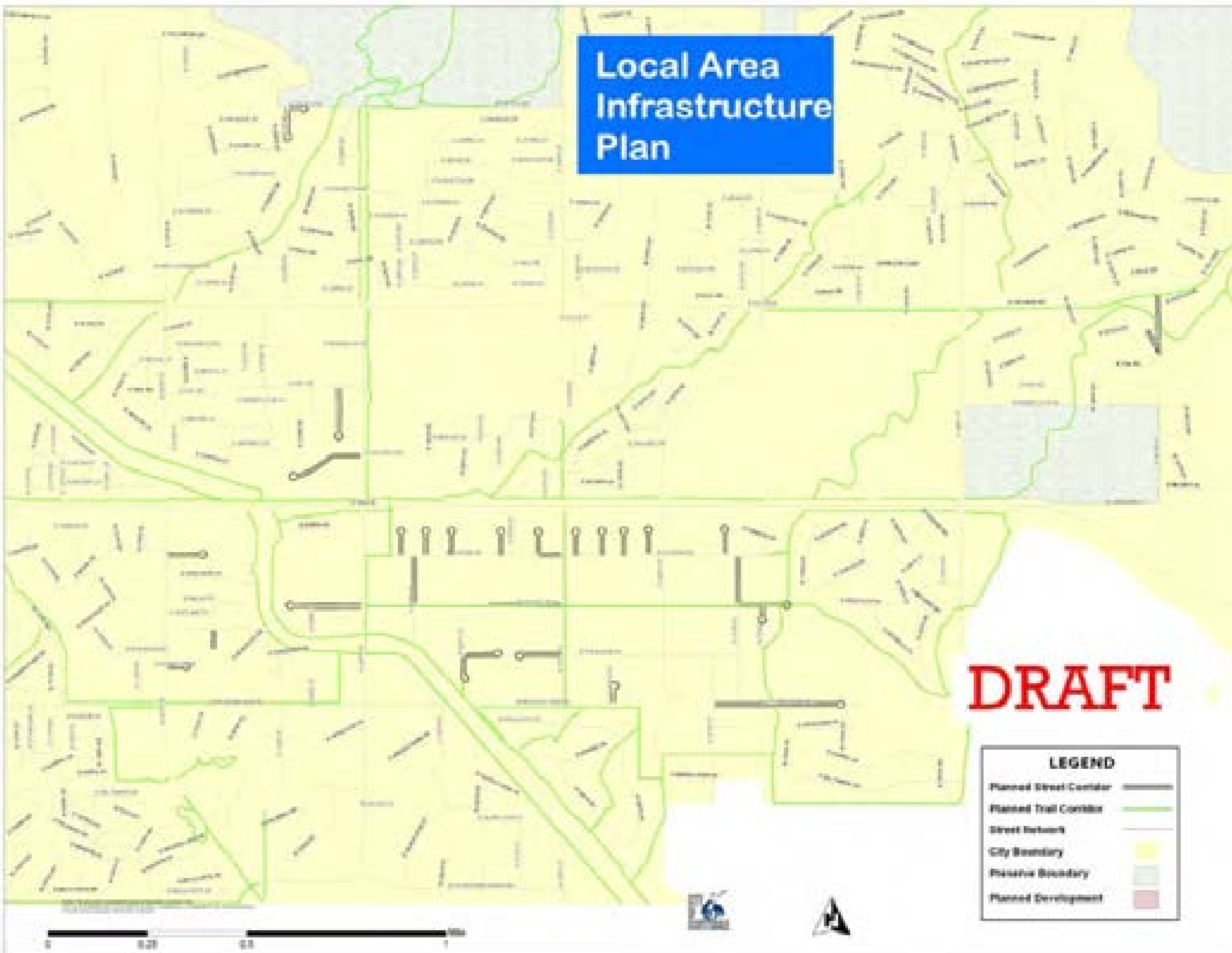
Desert Foothills Area



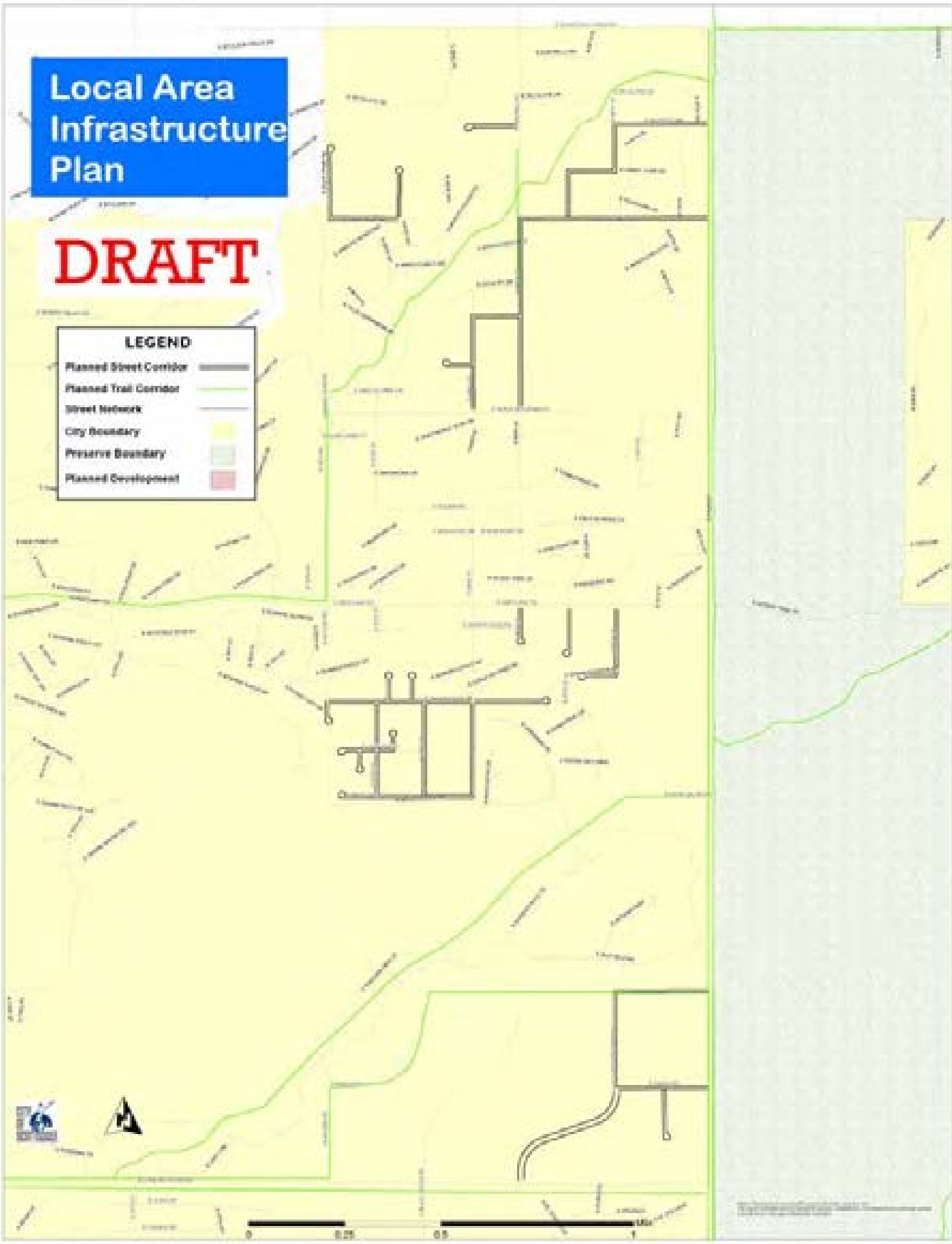
Dynamite Foothills Area



East Shea Area



Whisper Rock Area



Desert Highlands Area (eastern section of Desert Foothills area)

Transportation Master Plan
Transit Element

Appendix 5-A
2007 Regional Transportation Plan Evaluation
City of Scottsdale Summary

City of Scottsdale Operations and Capital Improvements in RTP

4/10/2007

Fixed Route Bus Service

Service	Route	Fiscal Year Start	Fiscal Year Replaced	Replacement Route	Jurisdiction
Existing Express	510	2006		NOT REPLACED	41.9%
Existing Express	512	2006		NOT REPLACED	34.9%
Existing Local	Rt. 106	2006	2015	Peoria/Shea	35.8%
Existing Local	Rt. 50	2006	2013	Camelback	100.0%
Existing Local	Rt. 50 SATURDAY	2006	2013	Camelback	100.0%
Existing Local	Rt. 72	2006	2007	Scottsdale/Rural	54.8%
Existing Local	Rt. 72 SATURDAY	2006	2007	Scottsdale/Rural	50.0%
Supergrid	Scottsdale Rd\Rural	2007			44.7%
New Express	North Loop 101 Connector	2008			
New Express	East Loop 101 Connector	2009			51.9%
Supergrid	Camelback Rd	2013			15.3%
New Express	Pima Express	2013			52.4%
Supergrid	McDowell Rd\McKellips	2014			6.8%
New Express	Scottsdale/Rural Rd Dedicated BRT	2014			40.0%
Supergrid	Hayden Rd\McClintock	2015			52.6%
Supergrid	Peoria Shea	2015			23.5%
New Express	Anthem Express	2018			5.8%
Supergrid	Bell Rd	2019			23.2%
Supergrid	Indian School Rd	2020			15.3%
Supergrid	Thomas Rd	2020			14.6%
Supergrid	Waddell Rd\Thunderbird	2020			1.4%

Source: HDR|SRBA, 2007

General Note: Includes RPTA Board approved jurisdictional reallocation of selected services and capital infrastructure in Paradise Valley and Salt River Pima Maricopa Indian Community to Scottsdale.

Scottsdale Rd Supergrid – Paradise Valley miles to Scottsdale
East Loop 101 Connector – Salt River miles to Scottsdale
Pima Express – Salt River miles to Scottsdale
Scottsdale Rd Dedicated BRT – Paradise Valley to Scottsdale
Hayden Rd Supergrid - Salt River miles to Scottsdale

Fixed Route Bus Capital

<table>
<tr><th rowspan="2">Operations & Maintenance</th><th rowspan="2">Allocated Jurisdiction</th><th colspan="4">HDR | SRBA Proposed Fiscal Year</th><th rowspan="2">TLCP Timeline Modified</th></tr>
<tr><th>Pre-Design</th><th>Design</th><th>Land</th><th>Construction/ Operation</th></tr>
<tr><td>Paratransit O&M Facility (EVDAR)</td><td>EVDAR Jurisdictions</td><td>2017</td><td>2017</td><td>Not Included</td><td>2018</td><td>No</td></tr>
<tr><td>Vanpool Vehicle Maintenance Facility</td><td>Regional</td><td>2018</td><td>2018</td><td>2019</td><td>2020</td><td>No</td></tr>
<tr><td colspan="7">Park-and-Ride</td></tr>
<tr><td>Cactus/101</td><td>Scottsdale</td><td>2007</td><td>2008</td><td>2008</td><td>2009</td><td>Yes</td></tr>
<tr><td colspan="7">Transit Center</td></tr>
<tr><td>Scottsdale Airpark/101 (4-Bay New)</td><td>Scottsdale</td><td>2013</td><td>2014</td><td>2014</td><td>2015</td><td>Yes</td></tr>
<tr><td colspan="7">Dedicated BRT Right-of-Way[1]</td></tr>
<tr><td>Scottsdale Rd</td><td>Scottsdale</td><td>-</td><td>-</td><td>-</td><td>2014</td><td>No</td></tr>
</table>

Source: HDR|SRBA, 2007

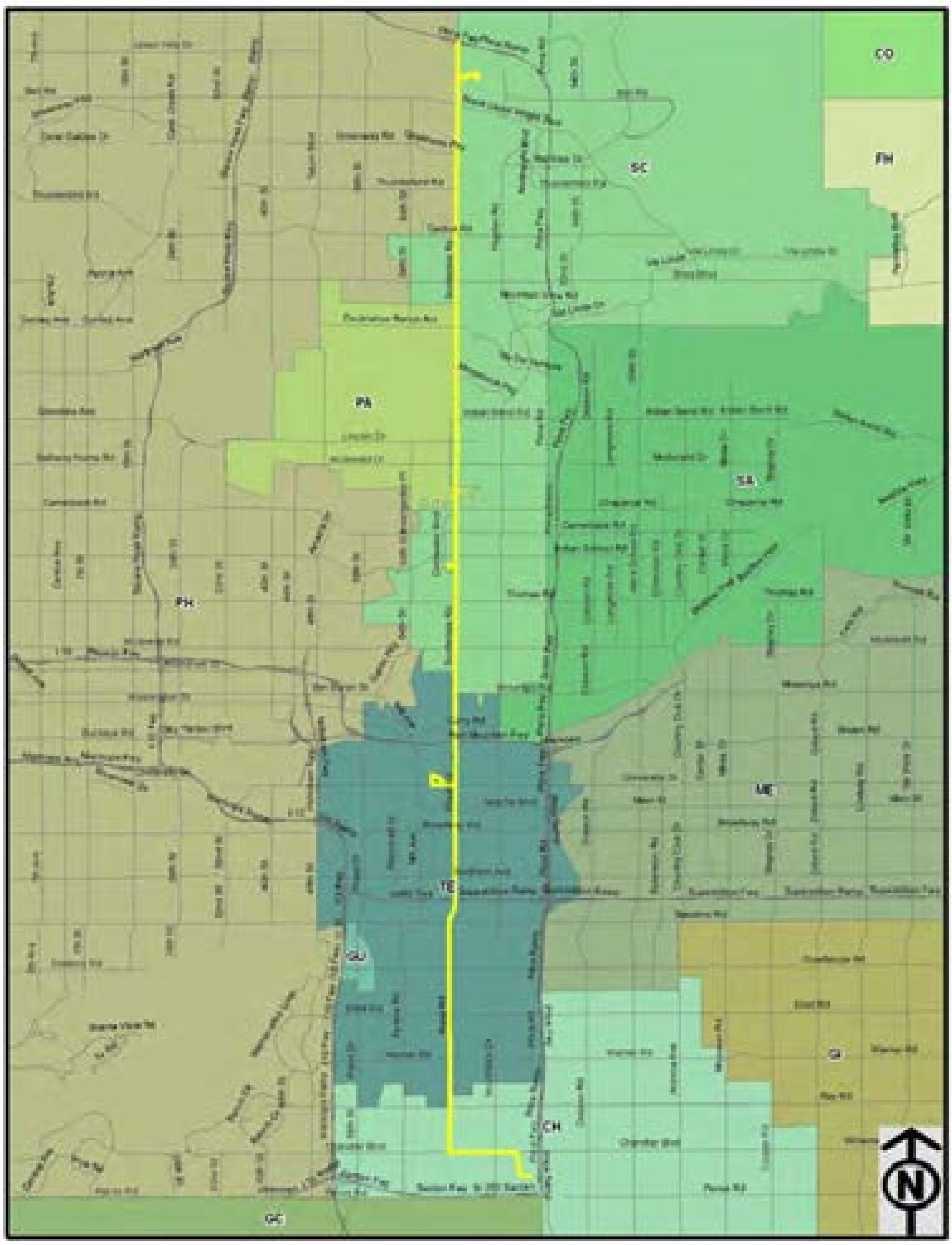
[1] Includes Scottsdale Rd Dedicated BRT reallocation of Paradise Valley share of BRT ROW capital improvements to Scottsdale

Other

1. ADA service reimbursement
2. Bus stop improvements (see Table 3-8)
3. Regional share of transit revenue vehicles
4. Arterial BRT right-of-way improvements (see Table 3-9)

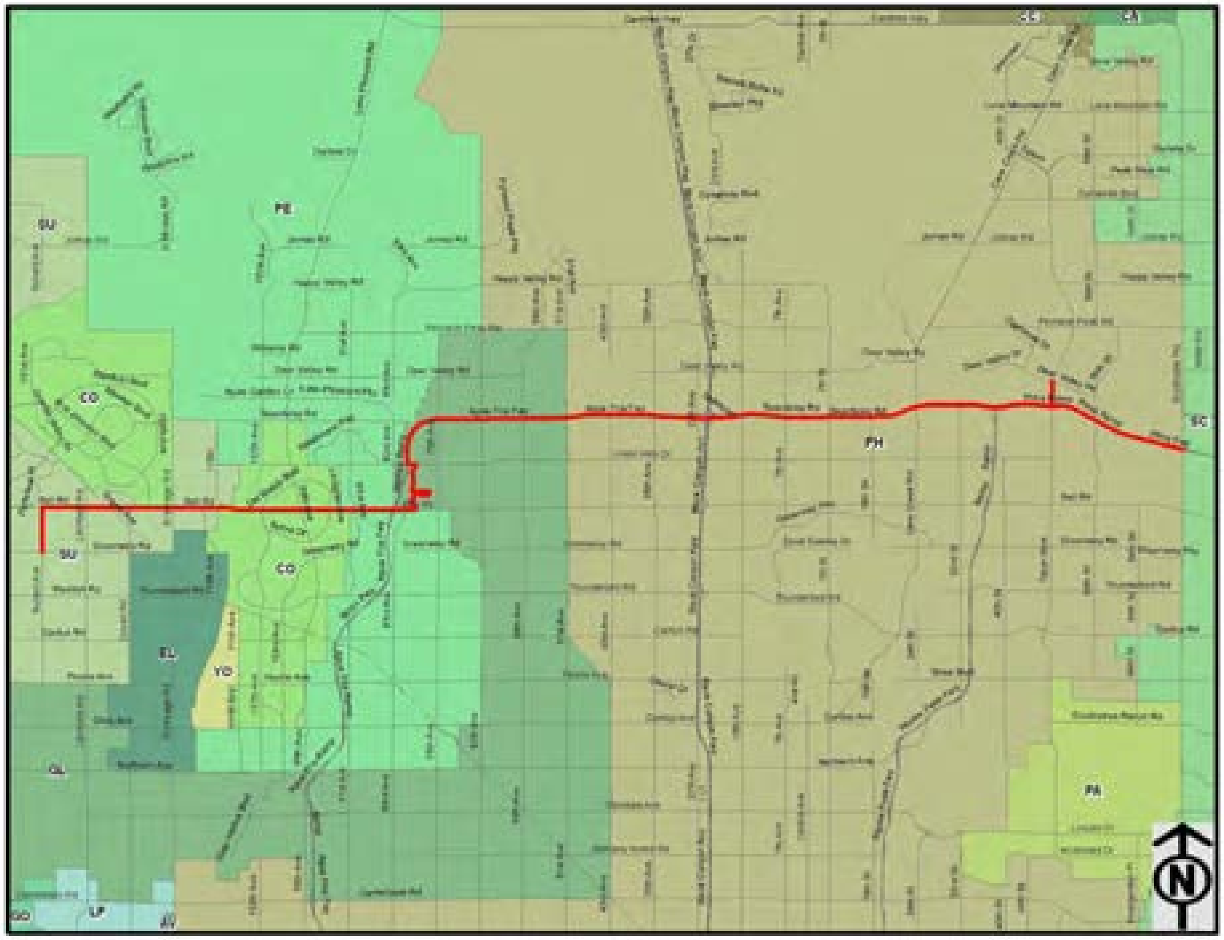
Supergrid Scottsdale/Rural Rd – FY 2007

Year PTF Funding Begins (CY)	2006	
Year PTF Funding Discontinues (CY)	PTF Expiration	
Replaces Existing Route	Yes (local Route 72)	
Service Days	7 Days	
	Weekdays	Weekends
Peak Headways (minutes)	10	NA
Off-Peak Headways (minutes)	20	30
Peak Span of Service (hours)	4	NA
Off-Peak Span of Service (hours)	15	17
Trip Miles	28.9	28.9



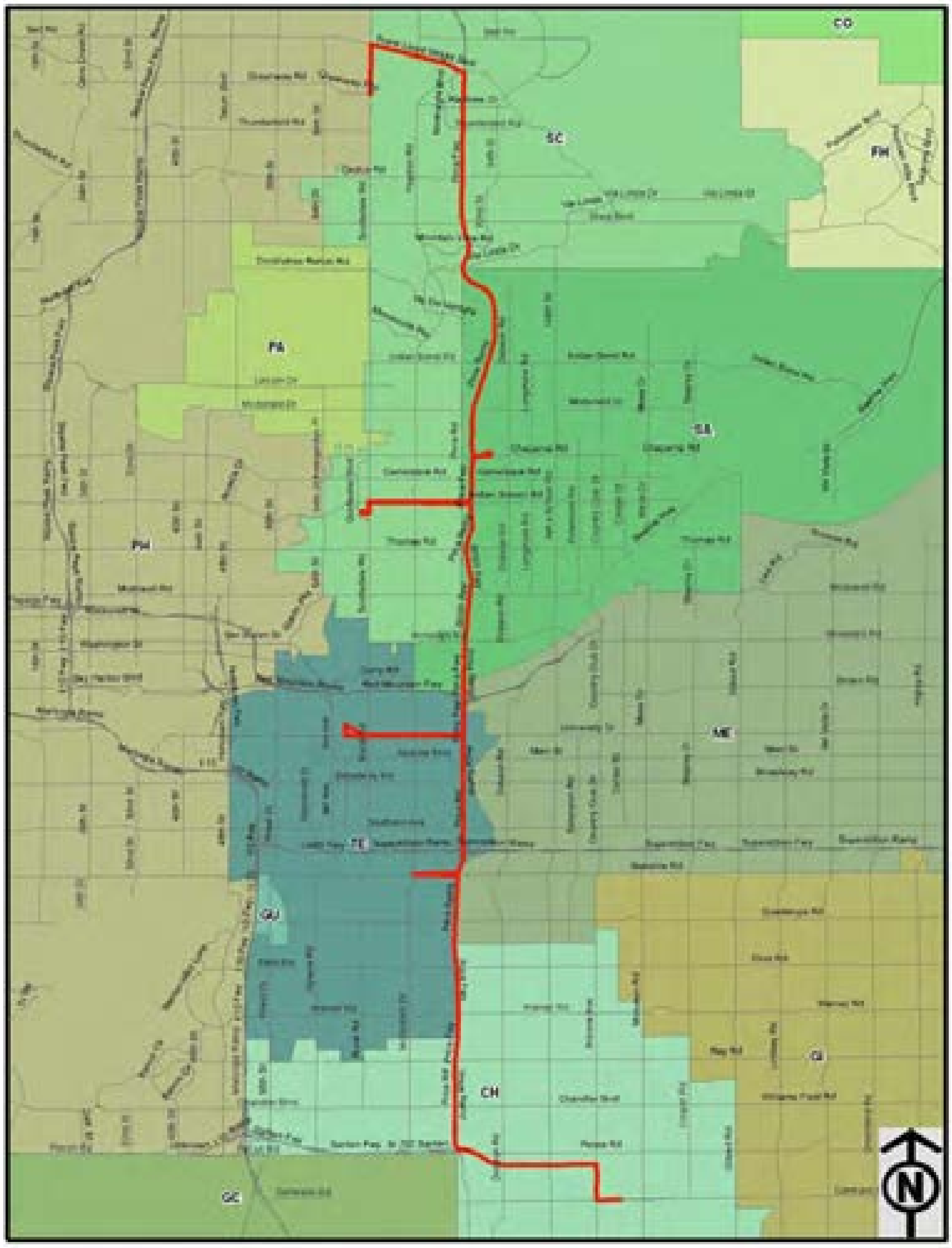
North Loop 101 Connector – FY 2008

Year PTF Funding Begins (CY)	2007
Year PTF Funding Discontinues (CY)	PTF Expiration
Replaces Existing Route	No
Replaced by New Route	No
Service Days	Mon - Fri
Two-way Service	Yes
Trip Miles	31.6
Daily Trips Funded by PTF	12
Annual Trips Funded by PTF	3,060



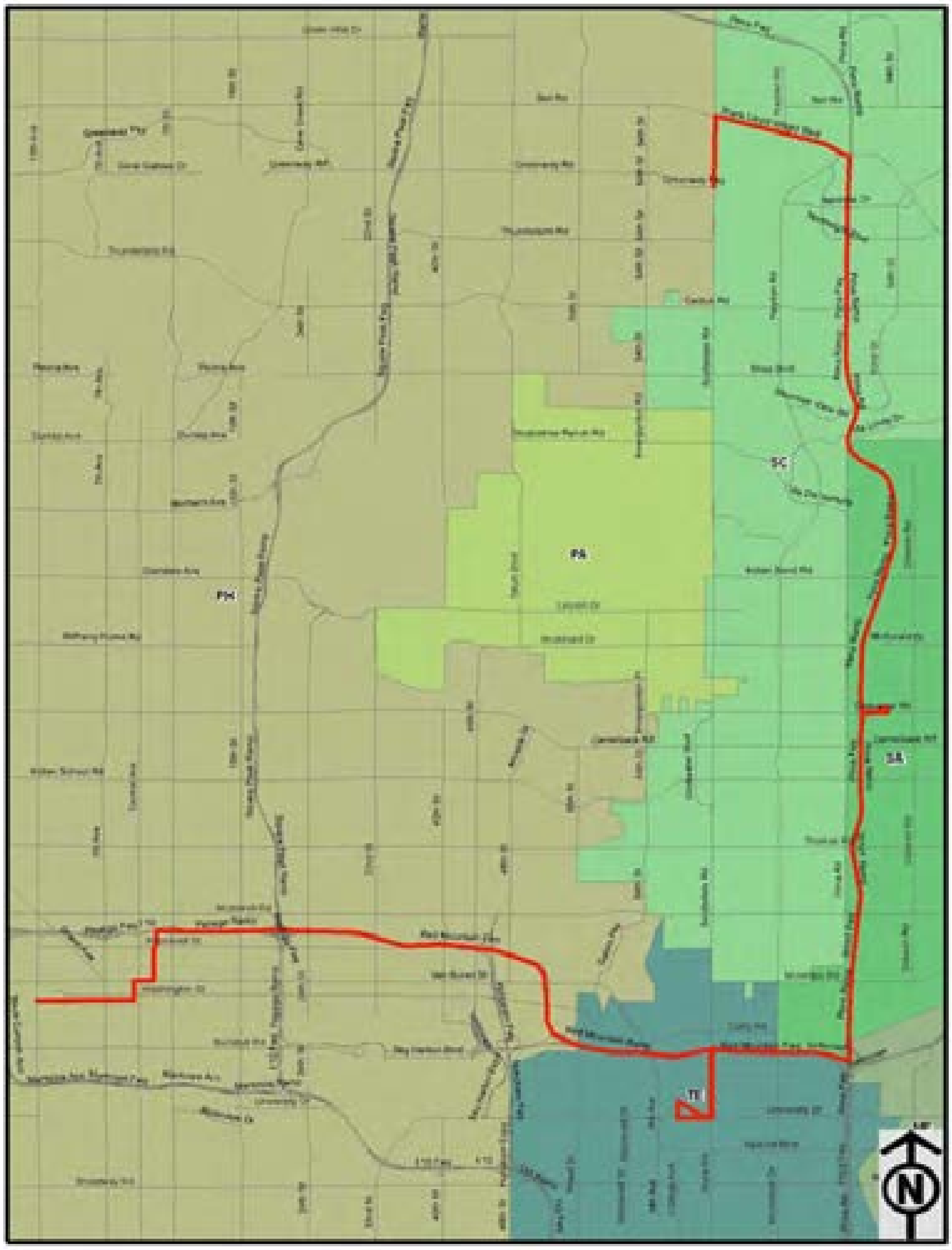
East Loop 101 Connector – FY 2009

Year PTF Funding Begins (CY)	2008
Year PTF Funding Discontinues (CY)	PTF Expiration
Replaces Existing Route	No
Replaced by New Route	No
Service Days	Mon - Fri
Two-way Service	Yes
Trip Miles	44.6
Daily Trips Funded by PTF	8
Annual Trips Funded by PTF	2,040



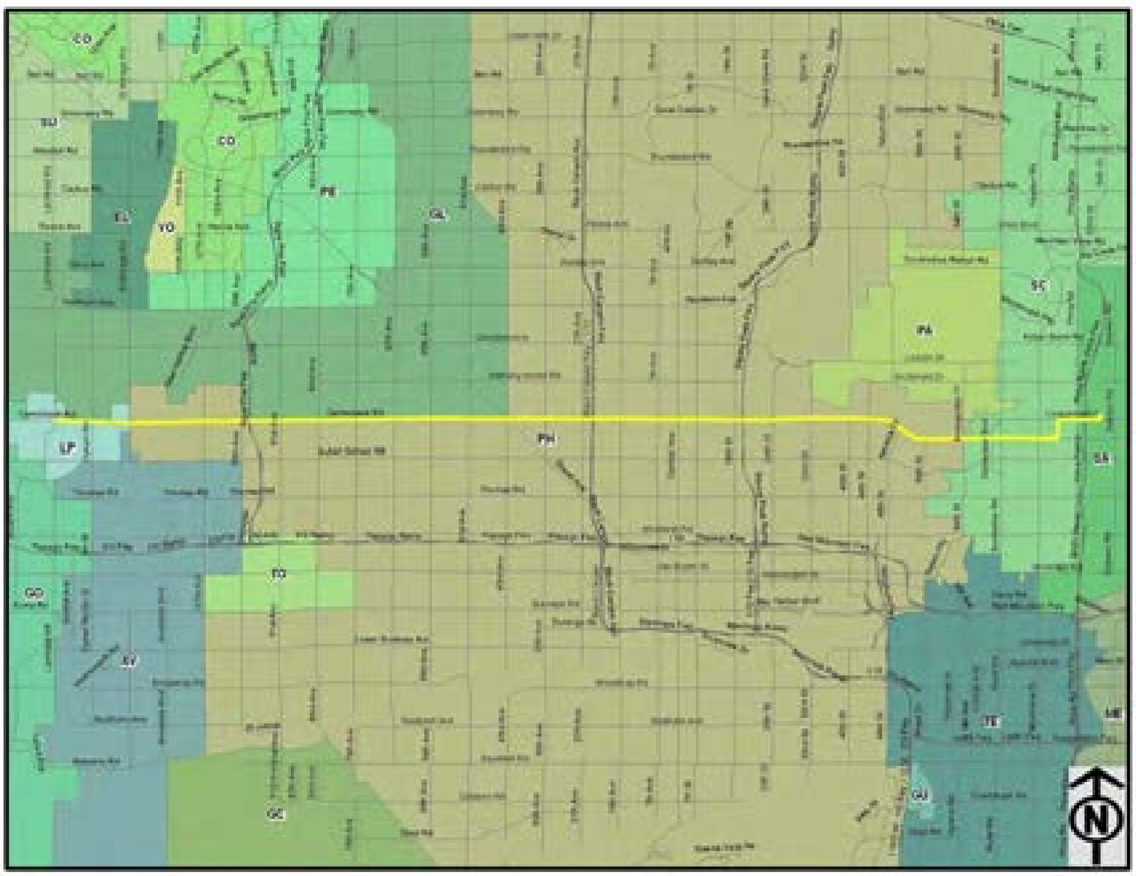
Pima Express – FY 2013

Year PTF Funding Begins (CY)	2012
Year PTF Funding Discontinues (CY)	PTF Expiration
Replaces Existing Route	No
Replaced by New Route	No
Service Days	Mon - Fri
Two-way Service	No
Trip Miles	35.4
Daily Trips Funded by PTF	8
Annual Trips Funded by PTF	2,040



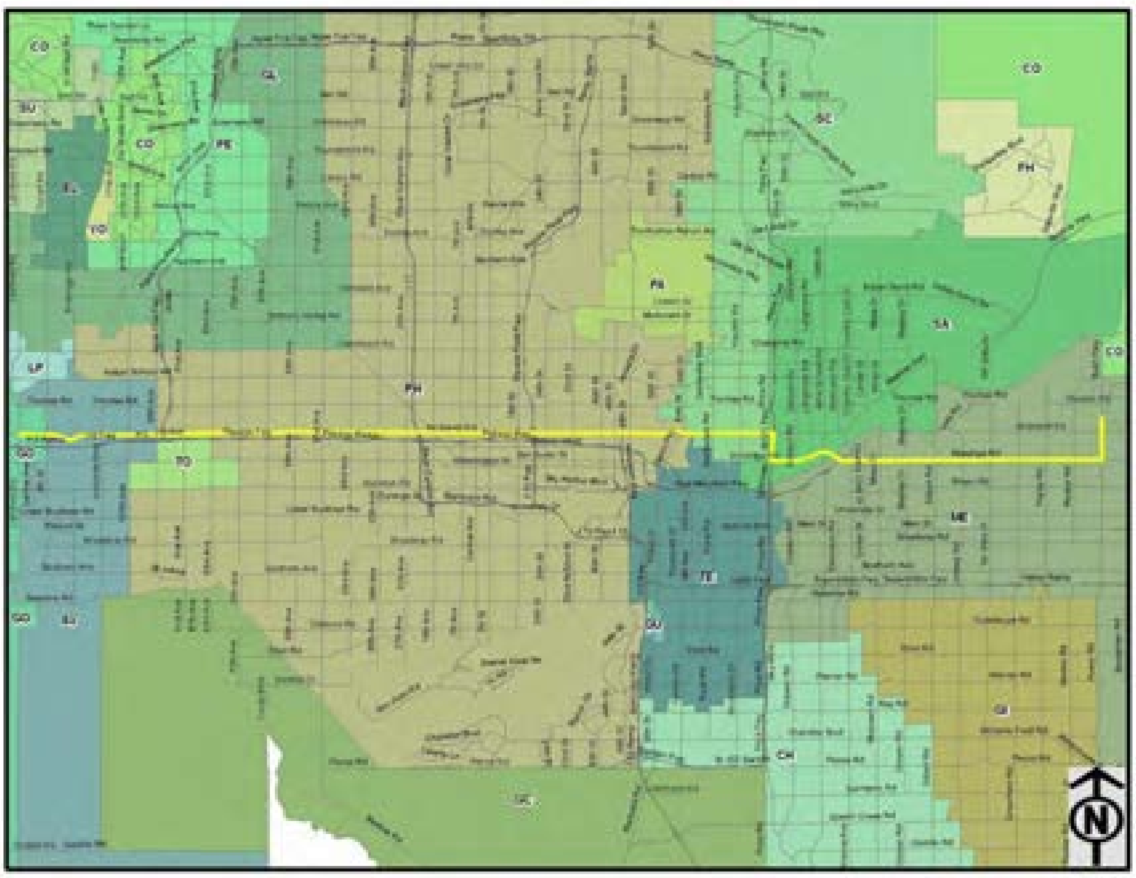
Supergrid Camelback Rd – FY 2013

Year PTF Funding Begins (CY)	2012	
Year PTF Funding Discontinues (CY)	PTF Expiration	
Replaces Existing Route	Yes - (Local Route 50)	
Service Days	7 Days	
	Weekdays	Weekends
Peak Headways (minutes)	15	NA
Off-Peak Headways (minutes)	30	30
Peak Span of Service (hours)	3	NA
Off-Peak Span of Service (hours)	16	17
Trip Miles	28.5	28.5



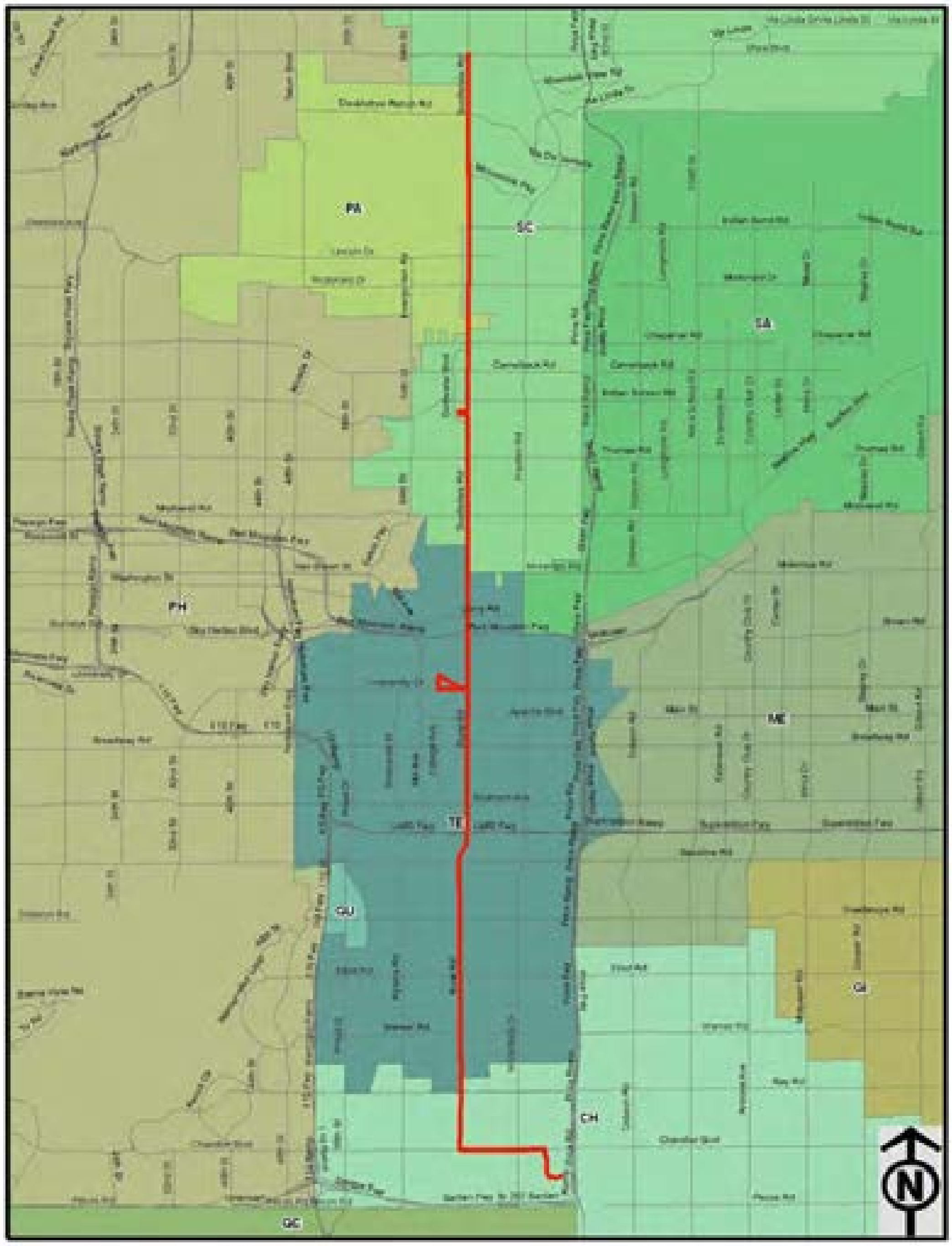
Supergrid McDowell Rd/McKellips Rd - FY 2014

Year PTF Funding Begins (CY)	2013	
Year PTF Funding Discontinues (CY)	PTF Expiration	
Replaces Existing Route	Yes - (Local Route 17)	
Service Days	7 Days	
	Weekdays	Weekends
Peak Headways (minutes)	15	NA
Off-Peak Headways (minutes)	30	30
Peak Span of Service (hours)	4	NA
Off-Peak Span of Service (hours)	14	17
Trip Miles	41.8	41.8



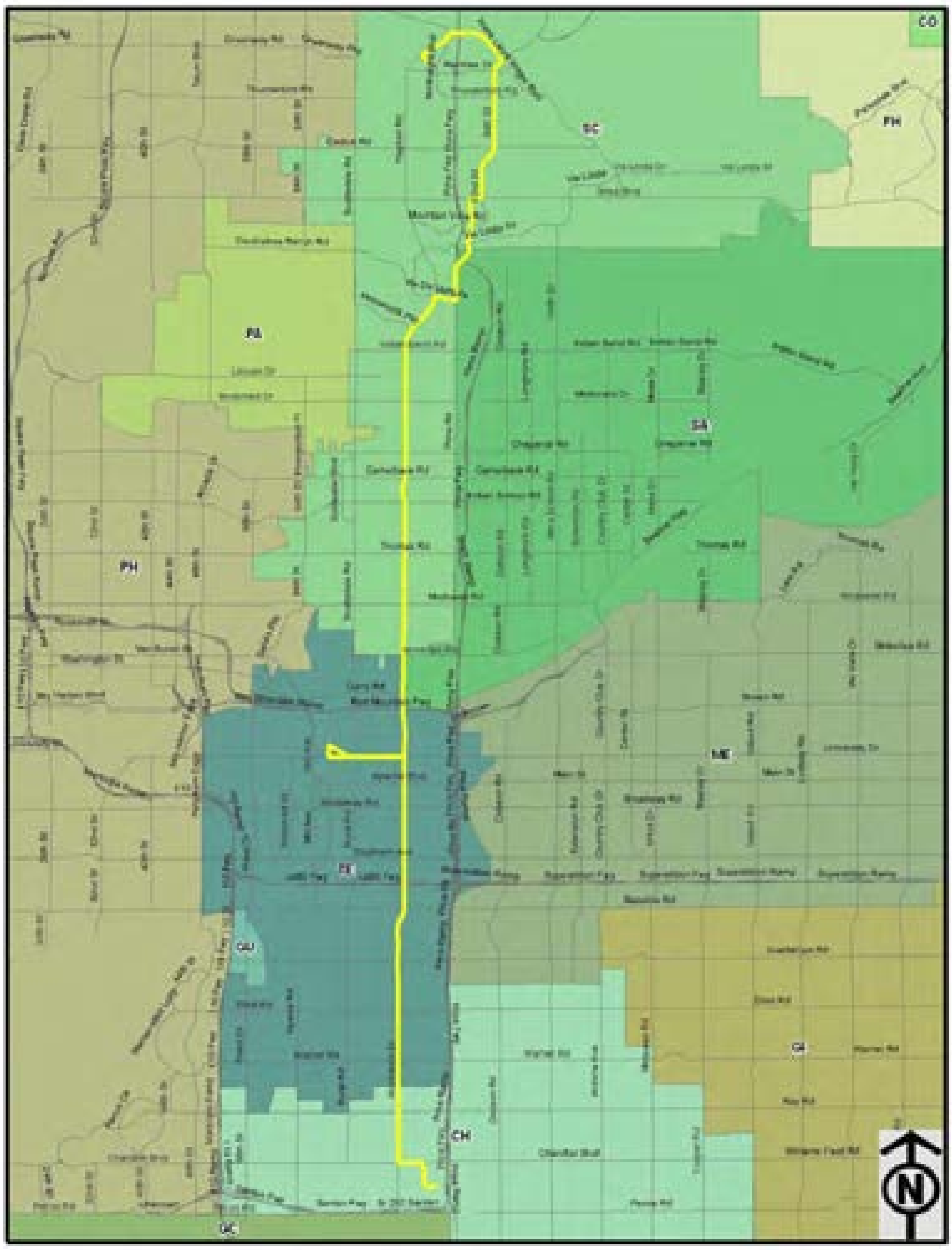
Scottsdale/Rural Rd Dedicated BRT – FY 2014

Year PTF Funding Begins (CY)	2013
Year PTF Funding Discontinues (CY)	PTF Expiration
Replaces Existing Route	No
Replaced by New Route	No
Service Days	Mon - Fri
Two-way Service	Yes
Trip Miles	23.1
Daily Trips Funded by PTF	48
Annual Trips Funded by PTF	12,240



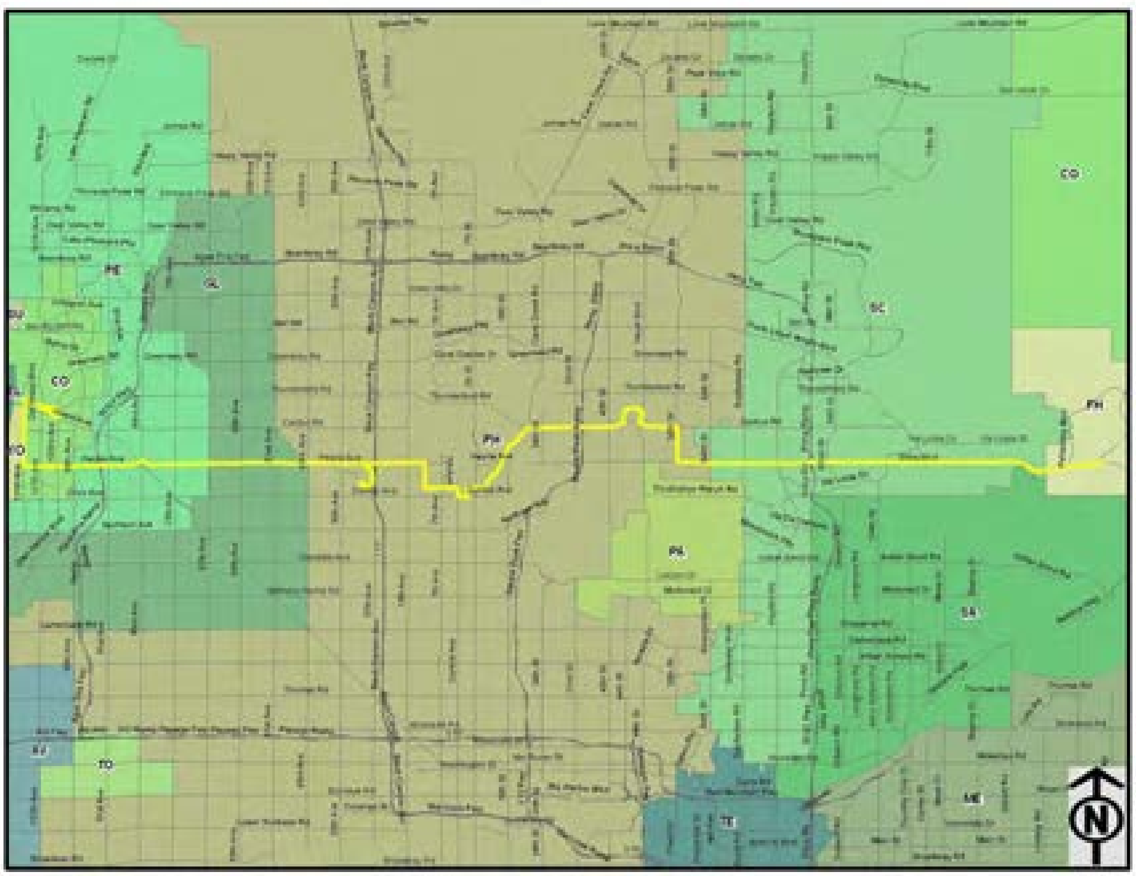
Supergrid Hayden Rd/McClintock Dr – FY 2015

Year PTF Funding Begins (CY)		2014
Year PTF Funding Discontinues (CY)		PTF Expiration
Replaces Existing Route		Yes - (Local Route 81)
Service Days		7 Days
	Weekdays	Weekends
Peak Headways (minutes)	15	NA
Off-Peak Headways (minutes)	30	30
Peak Span of Service (hours)	3	NA
Off-Peak Span of Service (hours)	14	17
Trip Miles	29.7	29.7



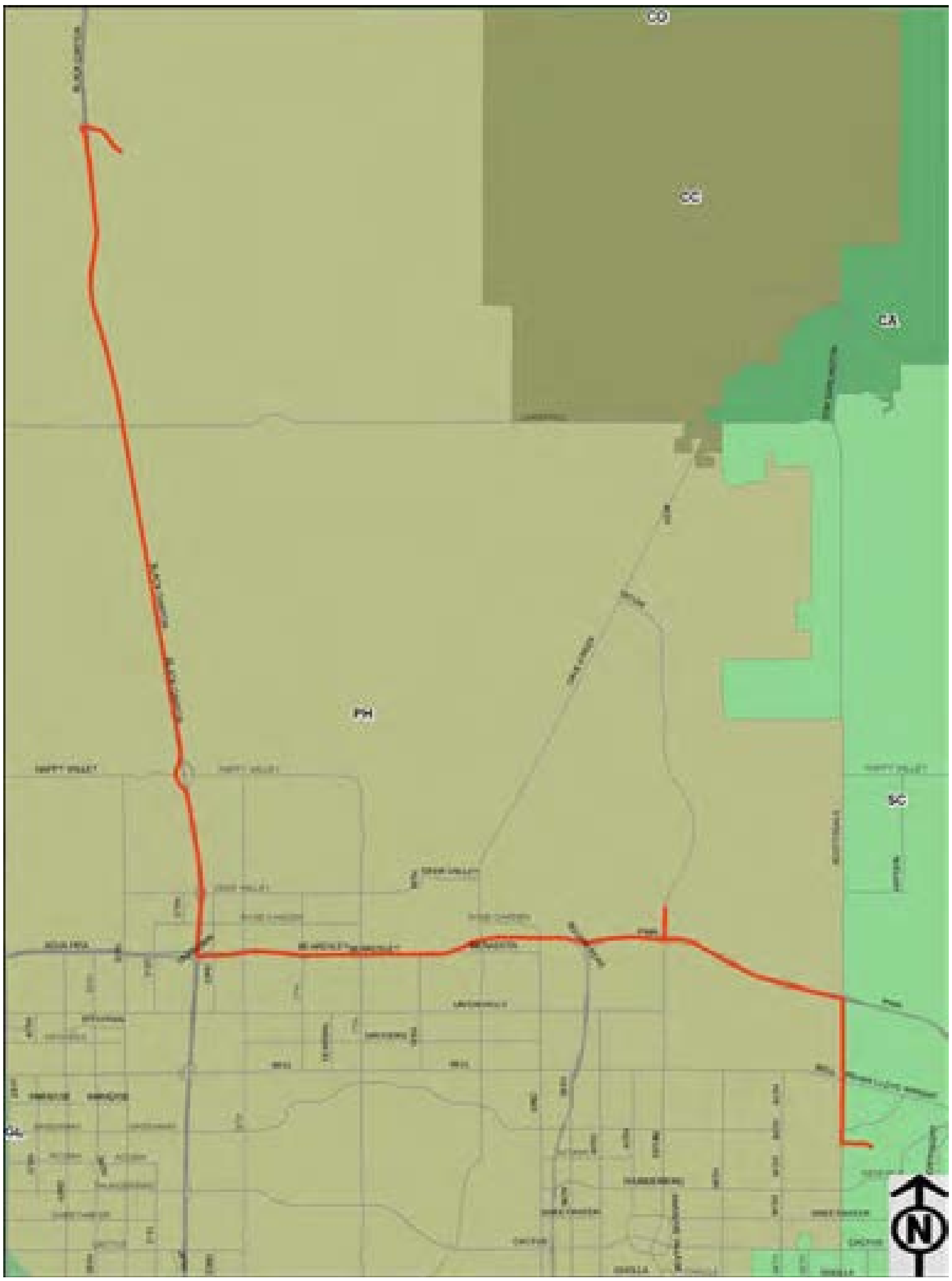
Supergrid Peoria Ave/Shea Blvd – FY 2015

Year PTF Funding Begins (CY)	2014	
Year PTF Funding Discontinues (CY)	PTF Expiration	
Replaces Existing Route	Yes - (Local Route 106)	
Service Days	7 Days	
	Weekdays	Weekends
Peak Headways (minutes)	NA	NA
Off-Peak Headways (minutes)	20	30
Peak Span of Service (hours)	NA	NA
Off-Peak Span of Service (hours)	18	17
Trip Miles	43.0	43.0



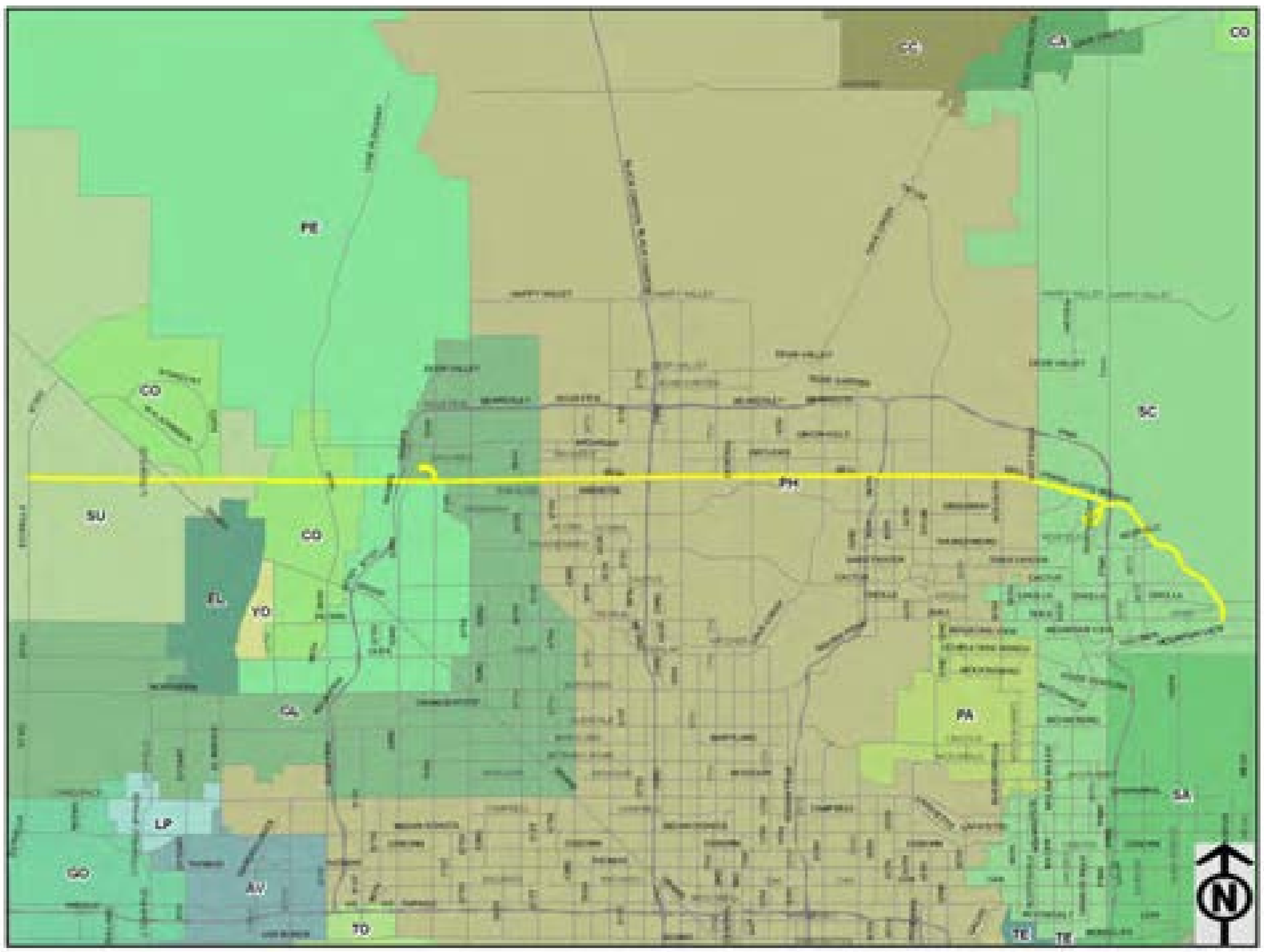
Anthem Express – FY 2018

Year PTF Funding Begins (CY)	2017
Year PTF Funding Discontinues (CY)	PTF Expiration
Replaces Existing Route	No
Replaced by New Route	No
Service Days	Mon - Fri
Two-way Service	No
Trip Miles	30.4
Daily Trips Funded by PTF	10
Annual Trips Funded by PTF	2,550



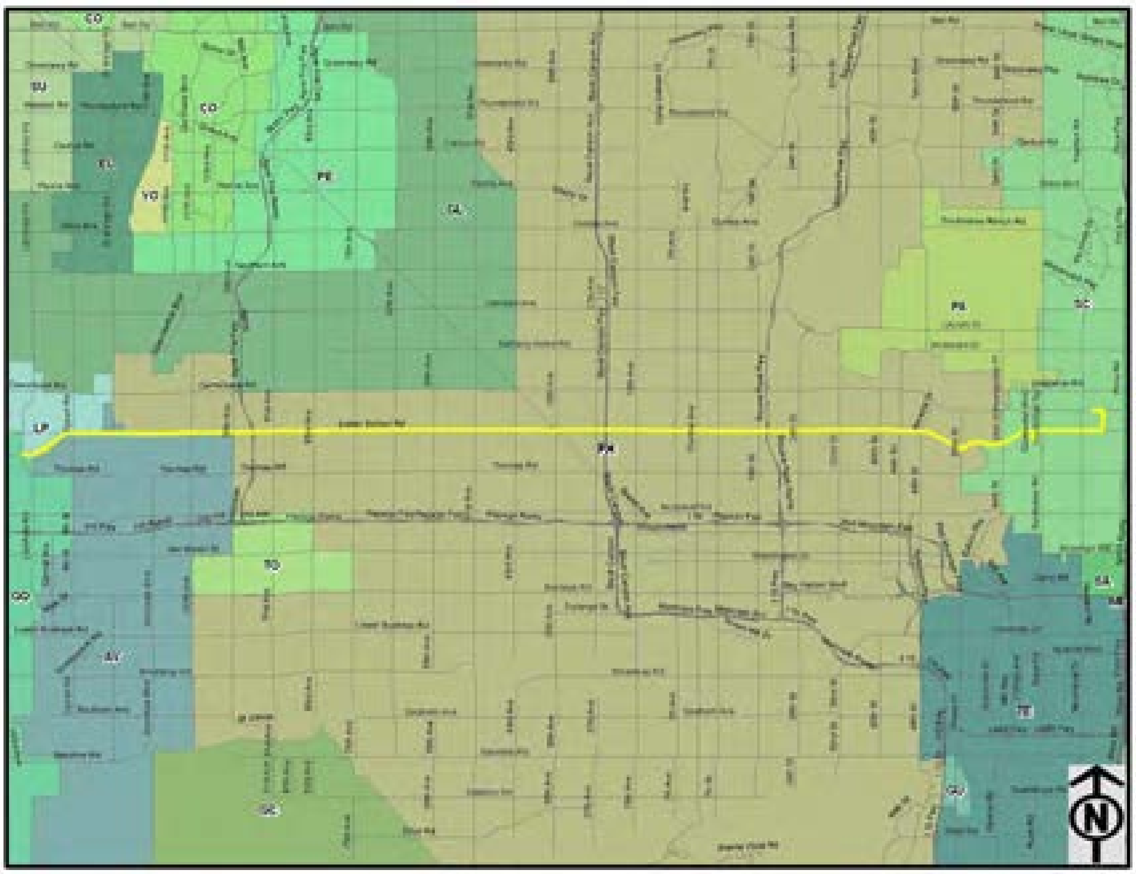
Supergrid Bell Rd (via 303) – FY 2019

Year PTF Funding Begins (CY)		2018
Year PTF Funding Discontinues (CY)		PTF Expiration
Replaces Existing Route		No
Service Days		7 Days
	Weekdays	Weekends
Peak Headways (minutes)	15	NA
Off-Peak Headways (minutes)	30	30
Peak Span of Service (hours)	4	NA
Off-Peak Span of Service (hours)	14	17
Trip Miles	38.0	38.0



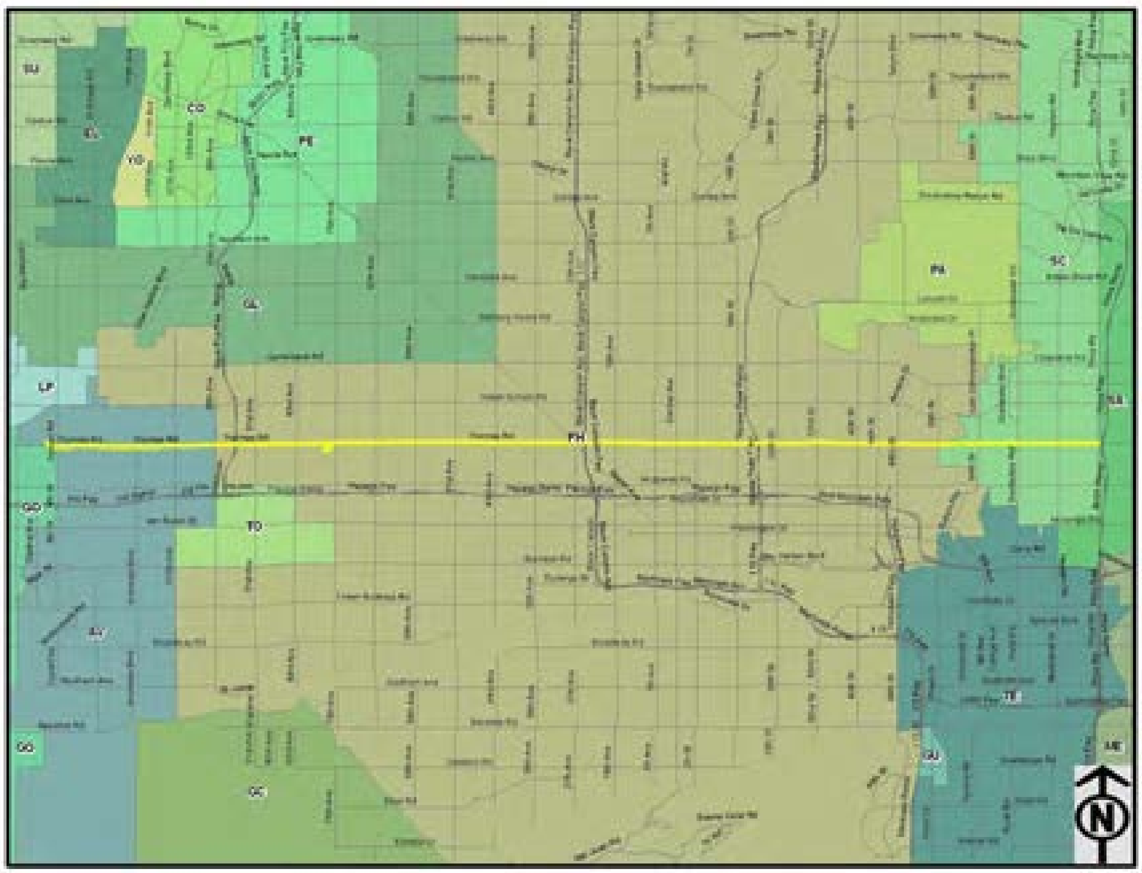
Supergrid Indian School Rd – FY 2020

Year PTF Funding Begins (CY)		2019
Year PTF Funding Discontinues (CY)		PTF Expiration
Replaces Existing Route		No
Service Days		7 Days
	Weekdays	Weekends
Peak Headways (minutes)	15	NA
Off-Peak Headways (minutes)	30	30
Peak Span of Service (hours)	3	NA
Off-Peak Span of Service (hours)	15	17
Trip Miles	30.4	30.4



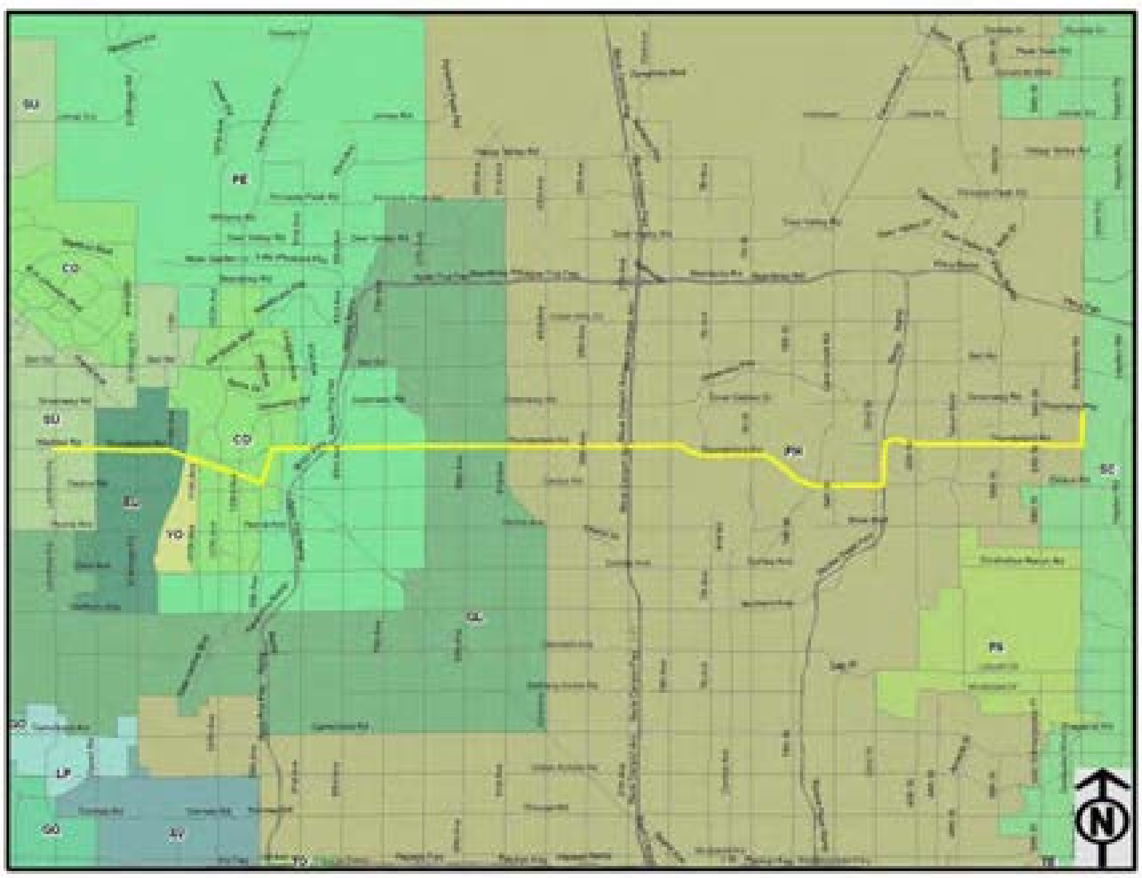
Supergrid Thomas Rd – FY 2020

Year PTF Funding Begins (CY)	2019	
Year PTF Funding Discontinues (CY)	PTF Expiration	
Replaces Existing Route	Yes (Green Line)	
Service Days	7 Days	
	Weekdays	Weekends
Peak Headways (minutes)	15	NA
Off-Peak Headways (minutes)	30	30
Peak Span of Service (hours)	3	NA
Off-Peak Span of Service (hours)	15	17
Trip Miles	26.7	26.7



Supergrid Waddell Rd/Thunderbird Rd – FY 2020

Year PTF Funding Begins (CY)		2019
Year PTF Funding Discontinues (CY)		PTF Expiration
Replaces Existing Route		No
Service Days		7 Days
	Weekdays	Weekends
Peak Headways (minutes)	NA	NA
Off-Peak Headways (minutes)	30	30
Peak Span of Service (hours)	NA	NA
Off-Peak Span of Service (hours)	17	17
Trip Miles	28.0	28.0



Transportation Master Plan
Bicycle Element

Appendix 6-A
2007 League of American Bicyclists Application

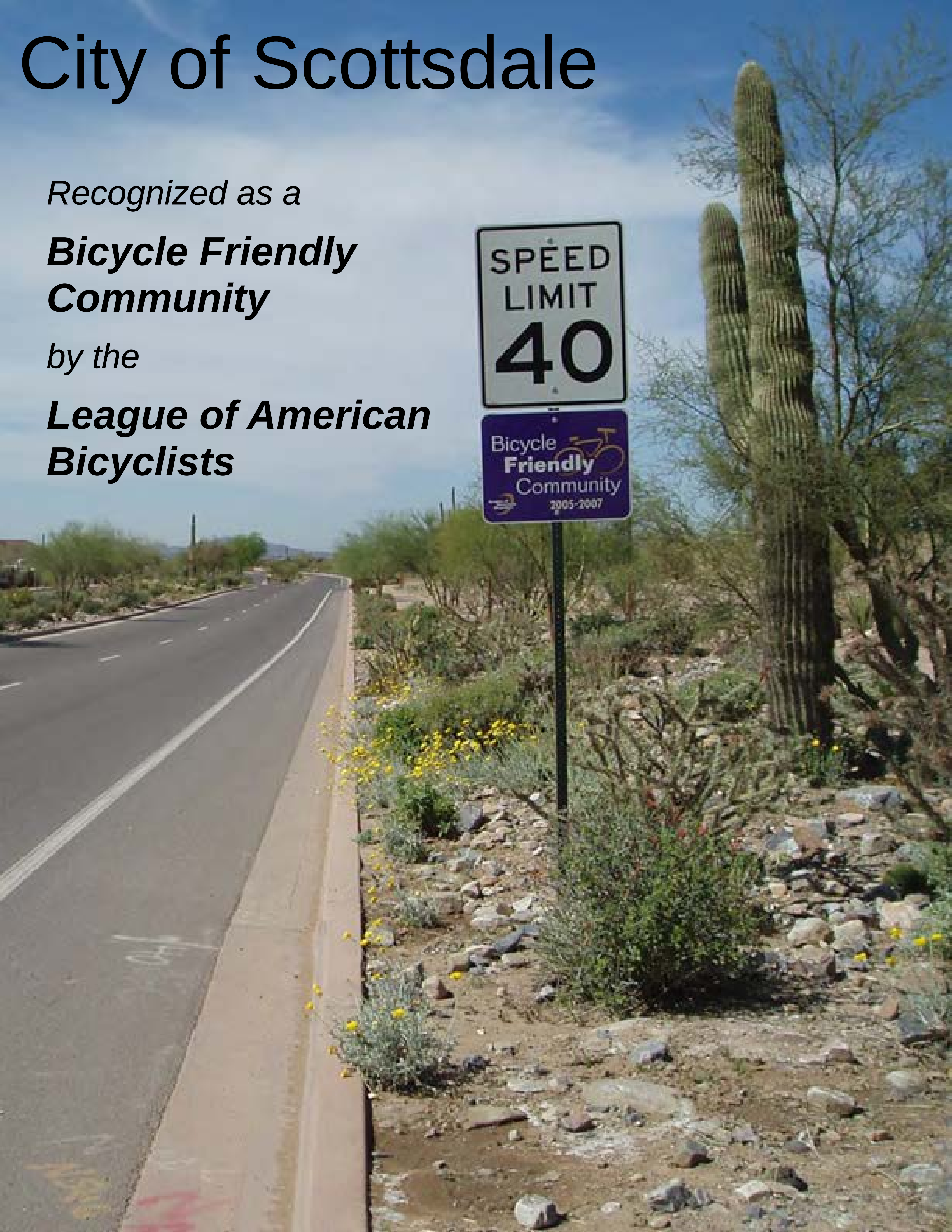
City of Scottsdale

Recognized as a

Bicycle Friendly Community

by the

League of American Bicyclists



The League of American Bicyclists
Bicycle Friendly Communities Campaign
APPLICATION PART I

Name of Community:

City of Scottsdale

Mayor or top elected official in municipality:

Mary Manross, Mayor

Contact First Name:

Reed

Contact Last Name:

Kempton

Position:

Transportation Planner

Employer:

City of Scottsdale

Address:

7447 E. Indian School Rd., Suite 205

City:

Scottsdale

State:

AZ

Zip:

85251

Phone:

480-312-7630

Fax:

480-312-4000

Email:

rkempton@ScottsdaleAZ.gov

Website:

www.ScottsdaleAZ.gov

Population:

232,929

Square mileage of municipality, Total Area:

184.2 square miles

Square mileage of municipality, Water Area:

0.3 square miles

Square mileage of municipality, Land Area:

183.9 square miles

Population Density:

1266/mi

Average temperature for January:

53.7 °F

Average temperature for April:

68.9 °F

Average temperature for July:

91.00

Average temperature for October:

73.7 °F

Average precipitation for January:

1.10 inches

Average precipitation for April:

0.30 inches

Average precipitation for July:

1.00 inches

Average precipitation for October:

0.90 inches

Median Income:

$68,053

Age distribution, % under 20:

22.50 %

Age distribution, % 20 - 64:

60.90 %

Age distribution, % 65 - 84:

14.90 %

Age distribution, % 85+:

1.70 %

Race, % Hispanic or Latino :

13.00 %

Race, % Not Hispanic or Latino:

87.00 %

Race, % One race:

98.30 %

Race, % White:

91.40 %

Race, % Black or African American:

1.40 %

Race, % American Indian and Alaska Native: 0.70 %

Race, % Asian:

2.60 %

Race, % Native Hawaiian and Other Pacific Islander:

0.10 %

Race, % Some other race:

2.10 %

Race, % Two or more races:

1.80 %

If you have Journey-to-Work census data on bicycling to work, what percentage of people in your community bike to work?

1.74 %

How many households are within 1/4 mile of a retail or business area?

Most

How many neighborhoods have significant grass, flowers, and trees?

All neighborhoods in Scottsdale contain landscaping. The City prides itself on the quality of its landscape design, especially with the use of drought tolerant and native plant species. Grass and flowers are used sparingly due to water demand.

How many neighborhoods have significant amenities such as parks, water fountains, benches, and public art?

Most

How many neighborhoods in your community would you consider a good place to raise children?

All

Do you have a Bicycle Master Plan?

Yes

Do you have a written bicycle accommodation policy?

Yes

What was your community's most significant investment for bicycling in the past year?

Even though we completed several major on- and off-street bicycle/pedestrian projects, started a Safe Routes to School Program, and held our first community bike ride, our most significant investment in the past year was in our Capital Improvement Plan. We have programmed $48.2 million for bicycle and pedestrian projects for Fiscal Years 2008-2012. This is 19.2 percent of the $251 million funded by the Transportation Department.

List current community activities that encourage/promote bicycling.

Our B.I.K.E.S. program provides free bikes to City employees who agree to ride them to work. Handlebar Helpers, a community “Earn a Bike” and apprentice program recycles bikes and trains young people in bike repair. Cycle the Arts, an annual family bike ride with guides from the Public Art Program tours part of the City’s extensive public art collection. Several large, annual bike rides bring thousands of cyclists to our community. Programs promoting cycling appear on the City’s cable TV channel. Free bike maps are available at all libraries, community centers, and local bike shops. The City’s web site has a bikeways page with local information and a link to request a bike map by mail. The bike map can also be viewed on-line. Residents can register their bicycles with a special program operated by the Police Department. The City sponsors booths at local arts fairs, environmental festivals, and other events to distribute bicycle safety and promotional information. The City routinely holds “Bring Government to the People” events where staff goes door-to-door to talk with residents about their neighborhoods, find out what their concerns are, and raise awareness of City services. Volunteers from the Transportation Department are always at these events with bike maps and flyers promoting upcoming activities. There is an annual Bike to Work event. Schools are getting involved with the Safe Routes to Schools program. Bicycling is promoted at all public meetings sponsored by the Transportation Department. Bicycle Friendly Community signs have been installed along bicycle facilities throughout the City.

List your official bicycle/pedestrian coordinator or bicycle issues contact person on government staff.
Reed Kempton

What department is the bicycle coordinator located in?
Transportation

How many hours are spent per year in this capacity?
2000

List all other government staff or contractors whose primary duties are devoted to bicycling issues.
Scott Hamilton - Trails

Do you have a Bicycle Advisory Committee, Ped/Bike Council or other venue for citizen input?
Yes

List the name of the Chair and their contact information.
Transportation Commission: Brian Davis, Chair - Staff contact is Rose Arballo 480-312-7650.

The League of American Bicyclists

Bicycle Friendly Communities Campaign

APPLICATION PART II

ENGINEERING

Do you have a policy that requires the accommodation of cyclists in all new road construction and reconstruction and resurfacing? Please include a copy of this legislation or policy.

Yes.

The 1994 *City of Scottsdale Bicycle/Pedestrian Transportation Plan* established policies that integrated bicycle accommodations with road construction and reconstruction projects. The plan was submitted with our 2005 Bicycle Friendly Community (BFC) application.

The *City of Scottsdale Design Standards and Policies Manual* (DSPM) specifically includes bikeways as a component of all public and private project proposals. The DSPM, updated annually, identifies bike lanes as a standard in roadway cross-sections and includes a bikeways chapter that provides details on bicycle facilities. The relevant pages are in the process of being updated. The most recent versions were submitted with our 2005 BFC application.

The *City of Scottsdale Streets Master Plan*, adopted by City Council in October 2003, recognizes that streets are important for pedestrians, bicyclists, equestrians, and transit riders (Goal C). Bicycle lanes are a standard element in all street classifications larger than a local street when new streets are built or existing streets are improved. The document includes design standards and cross sections that provide for bicycle lanes. A copy of the document was submitted with our 2005 BFC Application.

Currently, staff evaluates the potential for including bike lanes on all slurry and restriping projects. The City is in the process of developing a comprehensive Transportation Master Plan that will include a bicycle element that will provide an update to the 1994 bike plan. This element features bicycle latent demand analysis, bicycle level of service calculations, facility gap identification, collision studies, pavement restriping guidelines, and a methodology for ranking projects.

2. Have you provided training for your engineers and planners on how to accommodate cyclists? Please describe.

Yes.

Many of the engineers and planners have extensive bicycle accommodation experience. Three members of the transportation planning staff, including the general manager, worked for other agencies as bicycle coordinators. They attend and are frequently presenters at a variety of national and local conferences and training courses. Informal training takes place on a routine basis as a component of the project design and review process. Relevant journal articles, surveys, opinion pieces, and other documents are circulated throughout the department. Cost effective training opportunities are explored as they become available. Staff is routinely given the opportunity to attend live web conferences such as those presented by the American Society of Civil Engineers (ASCE) and the Institute of Transportation Engineers (ITE). Many participated in a recent national web seminar on complete streets held by the American Planning Association.

Is there a mechanism to provide training on an on-going basis?

Yes.

3. How many bridges are in your community?

63.

How many are closed or inaccessible to cyclists?

None.

Of those accessible by bike, how many have shoulders, bike lanes, wide curb lanes, or sidewalks/walkways?

All.

4. Do you have a bike parking ordinance? If yes, please include a copy of your ordinance.

Yes. A copy of the document was submitted with our 2005 BFC Application.

5. Are there bike racks or storage units at:

Schools:	All
Libraries:	All
Transit stations:	All
Recreation centers:	All
Government buildings:	All
Office buildings:	Most
Retail centers:	Most
Public spaces and parks:	All

6. If your community has transit service:

a. Are buses equipped with bike racks?

Yes. All are equipped with bike racks.

b. Can bikes be brought inside transit vehicles?

Yes, at the discretion of the bus driver.

7. How many miles of bike lanes do you have?

95 miles.

How many miles of bike lanes are in your bicycle master plan?

The 1994 City of Scottsdale Bicycle/Pedestrian Transportation Plan identifies 244 miles of on-street bicycle facilities. The plan does not specify the type. The Bicycle Element of the Transportation Master Plan will be more specific.

What is the mileage of your total road network?

900 miles

8. What percent of arterial streets have bike lanes or paved shoulders?

29 percent

9. How many miles of designated bike routes do you have?

50 miles

How many miles of signed bike routes are in your bicycle master plan?

The 1994 City of Scottsdale Bicycle/Pedestrian Transportation Plan identifies 244 miles of on-street bicycle facilities. The plan does not specify the type. The Bicycle Element of the Transportation Master Plan will be more specific.

10. Please describe any maintenance programs or policies that ensure bike lanes and shoulders remain usable.

a. Routine maintenance

All major streets are swept weekly. Downtown streets are swept three-times weekly. The street resurfacing schedule is posted on the City web site. The City web site also features a comprehensive “Report a Problem” page with links to 11 major areas that include “Streets and alleys, Streetlight and Traffic Signal Maintenance” and “Traffic Engineering, Sight Obstructions and Parking Issues.” The City also sponsors an EYES On-line Program (Employees Yielding Effective Savings) encouraging City employees to report any problems they see. All participants are entered in monthly prize drawings.

b. Capital improvements

The pavement condition of all streets is monitored through the use of a GIS-based pavement management system. Streets are maintained in excellent condition and rebuilt when necessary. Details for all capital improvement projects are available on the City web site.

11. Please describe initiatives your community has taken to ensure or improve bicycle access, safety and convenience at intersections, including bicycle detection, signing and marking.

Whenever possible, grade-separated bicycle/pedestrian facilities are constructed to help people cross major streets. Our system provides 72 crossings under streets, 5 crossings over streets, and one crossing over a freeway. There are eight bike/ped crossings over canals. The City has installed 11 pedestrian refuges and two raised pedestrian crossings on collector streets and have more in design. All signing and marking is done in compliance with the Manual on Uniform Traffic Control Devices (MUTCD). Four new grade-separated crossings are included in our current Capital Improvement Plan. Bicycle detection is being addressed in the Bicycle Element of the Transportation Master Plan.

12. How many miles of paved or hard surface trails (e.g. asphalt, concrete, crushed rock) do you have?

61 miles of paved paths

How many miles of paved or hard surface trails are in your bicycle master plan?

91 miles

13. How many miles of natural surface (singletrack) do you have?

238 miles

What is the total mileage of natural surface trails that are open to mountain bikes?

236 miles. One section of trail features a very steep climb to the top of a peak. Bike racks are available at the base of the ascent.

14. What is the estimated acreage of open space and public lands within the community (city, county, state, and federal public lands)?

Scottsdale City parks = 999 acres
Scottsdale City preserve = 34,324 acres
Immediately adjacent to Scottsdale's borders are:
- Phoenix Papago Park = 1200 acres
- Phoenix Reach 11 Recreation Area = 1,500 acres
- Tempe Canal Park = 40 acres
- Tempe Papago Park = 296 acres
- Tempe Indian Bend Park = 8 acres
- Maricopa County McDowell Mountain Park = 21,099 acres
- Tonto National Forest = 3 million acres

Are these areas open to cyclists?

Yes.

15. Please describe maintenance programs or policies for your Multi-use Paths.

a. Routine maintenance

The City has one full-time employee who inspects and sweeps the paved path system. Paths are inspected weekly and swept monthly with a path-sized sweeper. A second full-time position and an additional sweeper have been approved for the next fiscal year. Path users can notify the City of problem areas through the City web site.

b. Capital improvements

Bicycle and pedestrian projects account for 19 percent of the Transportation Department's Five-year Capital Improvement Plan (CIP), a $48.2 million investment in these modes for Fiscal Years 2008-2012. This includes 16 miles of new/improved path construction and four new grade-separated structures. In addition, the City has identified a total of $7.5 million for trailhead and connecting trail improvements associated with the McDowell Sonoran Preserve.

Recently completed projects include a 1.5 mile segment of the Pima Path that was widened from 8 to 10 feet with a new bridge over Via de Ventura. This closed the final gap in a 9-mile corridor. 3.5 miles of new paths were constructed in Northsight, CAP Basin, and Indian School Parks. A new bike/pedestrian bridge was built over the Arizona Canal at the 82nd St. alignment. A new path and bike lanes were included with the 96th St. reconstruction. Several large box culverts were installed with roadway projects to provide future grade-separated crossings when the path system is extended into those areas. The Lost Dog Wash Access Area with 100 passenger vehicle spaces, 20 horse trailer spaces, bike racks, restrooms, ramadas, hitching rails, and water troughs was recently finished. Other Preserve improvements include the Windgate Pass, Bell Pass, Paradise, Prospector, Windmill, and Gateway loop trails.

Another recent project is along 96th St. from Shea Blvd to Sweetwater Rd. 96th St. One-third of this corridor was a typical street with four travel lanes and a center two-way left turn lane. One-third was three lanes and one-third was two lanes. Traffic volumes were much less than designed capacity. Two miles of the street were fully reconstructed with two travel lanes, bike lanes, landscaped medians, and center lane street print where left turns are permitted. The edges feature sidewalks or a paved shared-use path on one side and an unpaved, stabilized decomposed granite trail on the other. Two modern roundabouts accommodating bicycle facilities were installed at collector street intersections.

Transportation projects completed in the past two years include:

- 96th Street: Shea to Sweetwater – bike lanes, multi-use path and trail (2 miles)
- 82nd Street and Arizona Canal – bicycle/pedestrian bridge over Arizona Canal
- Hayden Road: Cactus to Redfield – bike lanes (1 mile)
- Hayden Road: Pima Freeway to Thompson Peak Pkwy – bike lanes, grade-separated crossing (1.25 miles)
- Hayden/Miller Road: Deer Valley to Pinnacle Peak – bike lanes (1 mile)
- Hayden and McDonald intersection grade-separated crossing
- Pima Path at Via Linda – bicycle/pedestrian bridge and new path (1.5 miles and completed final gap in 9-mile corridor)
- Scottsdale Road: Indian Bend to Gold Dust – bike lanes (2.75 miles)

16. Does your community have an ordinance or local code requirement for employers to provide bicycle parking, shower facilities, etc.? If yes, please describe or include a copy.

Yes. The City of Scottsdale enforces a bicycle parking ordinance, adopted in March 1995, that encourages the use of bicycles (Sec. 9.101.4). The code states that every land use where 40 or more auto parking spaces are required must provide bicycle parking at the rate of one space for every ten auto spaces. Outside the downtown area, a minimum of four bicycle parking spaces are required regardless of the number of auto spaces required. Inside the downtown area, the City may provide bicycle parking in the public rights-of-way (Sec. 9.103.B). The number of required auto parking spaces may be reduced by providing additional bicycle parking, high security bicycle parking spaces, lockers, showers, and changing facilities (Sec. 9.104.C.) Standards for locating the bicycle parking are also provided (Sec. 9.106.A.2 and Sec. 9.106.B.2). A copy of the document was submitted with our 2005 BFC Application.

17. Please describe recreational facilities for cyclists such as low traffic rural roads and signed touring routes.

Pima Path/Route Corridor

The Pima Path is a unique combination of bike routes and paths that provides nearly nine miles of bicycle facilities along a north/south corridor. About eight miles of Pima Road lies on the border between the City of Scottsdale and the Salt River Pima-Maricopa Indian Community. Scottsdale developed in this corridor as primarily residential with only arterial street access to Pima Road. Tribal land along Pima Road is currently being developed as primarily commercial. By providing short sections of pathways near the arterial intersections, Scottsdale was able to connect the residential access roads parallel with Pima Road for use by bicyclists and pedestrians. This facility crosses and connects with the Indian Bend Wash Path and the Sun Circle Trail. A major section of this corridor has just been rebuilt with a widened path and a new bridge over Via Linda.

Hidden Hills

Hidden Hills is a gated community with a public trails easement over the primary street to provide bicycle/pedestrian access between Scottsdale and the Town of Fountain Hills. The gates on both ends of the street are offset to allow bicycles to move through them without dismounting.

18. Are there other facilities that have been created to promote bicycling in your community? If yes, please describe.

Yes.

Indian Bend Wash

Scottsdale's Indian Bend Wash is much more than just a few miles of path. This greenbelt is one of the nation's most well-known flood-control projects. Seven and a half miles of parkland provide lakes, golf courses, many recreational facilities, and an extensive multi-use path system for skating, biking, walking, and jogging. The wash was once an eroded eyesore running through the center of the community. The details of how this project was developed can be found on-line at http://www.ci.scottsdale.az.us/Parks/_docs/IndianBendWashBook.pdf

Residential properties, attractive shopping centers, resorts, and schools now line the slopes of the wash. Scottsdale has made the Indian Bend Wash greenbelt an integral part of its outdoor lifestyle. Due to the City's linear shape, about 80 percent of Scottsdale's citizens are within walking distance of the Wash. Estimates are that one million people make use of the greenbelt annually. The Wash has attracted residential and commercial activity that thrive on the traffic generated around and through the area.

Thomas Road Bike Stop

There are many places to stop and rest along the City's pathway system. The Thomas Bike Stop, however, is large enough to be classified as one of Scottsdale's city parks. Located on Thomas Road at the northern end of Eldorado Park along the Indian Bend Wash Multi-use Path, this one-acre "rest stop" has picnic areas, one large ramada, two small ramadas, and a restroom.

Portals and Loops

A nonprofit organization with membership from the cities of Scottsdale, Phoenix, and Tempe, the Papago Salado Association promotes and facilitates the implementation of paths and facilities along the "Papago Salado Trail." This series of facilities passes through the cities of Scottsdale, Tempe, and Phoenix along the Salt River Project (SRP) canals. The Papago Salado Association acknowledges and preserves the unique and vital presence of SRP's infrastructure of canals and paths within the fabric of the three cities. SRP has provided three interpretive sites, one in each city, along their canal banks. In 2004, the mayors of Scottsdale, Tempe, and Phoenix, council members of each community, the president of SRP, and members of SRP's Board of Directors, dedicated the first of the three interpretive sites. The City of Scottsdale has two major projects in this corridor. Work has just begun to rebuild and upgrade a tunnel under McDowell Road and widen a one-mile section of path from 8 to 10 feet. A design project has begun that will continue the path along the Crosscut Canal north to connect with the Arizona Canal.

EDUCATION

1. How do you educate motorists to share the road with cyclists? Please describe.

Community motorists are reached through a variety of educational formats. Bike Lane, Bike Route, Share the Road, and Bicycle Friendly Community signs are used throughout Scottsdale to remind motorists to expect bicyclists on our streets.

Bicycling is a regular topic on the Chief of Police's weekly television show on the city's cable television channel. Members of the Coalition of Arizona Bicyclists (CAzB) have been Chief Rodbell's guests and officers from the Scottsdale Bike Unit have appeared to demonstrate bicycle safety.

In cooperation with the City of Scottsdale, CAzB developed a Public Service Announcement on Arizona's three-foot passing law. The PSA gets regular airing on Scottsdale's Channel 11 and was distributed to other agencies around Arizona for their use. CAzB representatives have also appeared on the Transportation Department's Let's Get Moving program to talk about bicycle safety and new legislation.

The Transportation Department holds many public meetings each year on a wide range of transportation related projects and programs. An Arizona version of "Street Smarts" and the Scottsdale Bike map are made available at these meetings.

How many community motorists do you reach with these efforts?

Most

2. Are there other bicycle education opportunities for adults? Please describe.

Local bicycle clubs, organizations, and shops offer educational opportunities for adults. CAzB arranges for facilities and provides instruction by LAB certified instructors on a regular basis.

Scottsdale Community College offers a course titled Mountain Biking the Southwest. The course covers basic skills and techniques for mountain biking and the application of these to mountain biking as a recreational and lifetime activity in the southwest. The course includes bicycle maintenance techniques, trail etiquette and safety considerations.

Do you have a bicycle safety program for children in schools?

Most.

How many schools participate?

10 of 27 each year

Bike Rodeos

The City of Scottsdale Police Bike Unit, working with the Scottsdale Unified School District, organizes several bike rodeos and safety presentations each year for school age children. An average of ten schools participate each year. The rodeos include a safety presentation and a bike obstacle course for the students. CycloCat's Guide to Bike Safety is given to all participants. A copy of the guide was included with our original application.

Parent/Student Handbook

Each Scottsdale Unified School District school provides a Parent/Student handbook that requires a signature from the parents for each student. The handbooks contain the following information on bicycles:

BICYCLES/ROLLER BLADES/SKATEBOARDS/SCOOTERS

1. In the interest of safety, children must be in fourth grade in order to ride the above mentioned items to school. Children in K-3 grades will not be permitted to bring these items on campus. Parents who wish to take exception to this rule need to contact the school office and set up an appointment to discuss this with the administration. It is strongly recommended that helmets be worn as students ride to and from school.

2. Bicycles must be parked in designated areas. A bicycle may only utilize one space in the bike rack. The bike racks will be locked while school is in session.

3. Bikes are to remain in the bike area during the school day. Bikes are not allowed in the main section of the campus for any reason.

4. Students must lock their bicycles while they are in the designated areas. Neither the district nor its employees are responsible for damage to or theft of any bicycles.

5. Students must observe the following safe riding habits:

    One rider per bicycle.
    Use bike lanes coming to and from school.
    Ride on the right side of the street.
    Use crosswalks when crossing the street and walk all items listed above while in crosswalks.
    Obey crossing guards.
    Students must walk all items listed above while on campus.

6. District policy states that bicycles, roller blades, scooters, and skateboards are not to be ridden on campus at anytime. This includes the parking lot as well.

4. What other types of bicycle safety and education opportunities are available for children? Please describe. How many children participate?

CycloCat’s Guide to Bike Safety

This children’s guide to bike safety is given out at bike rodeos, safety presentations, Public Safety Day events, and other community functions.

Bicycle Safety Education Campaign

Valley Metro developed a strategic marketing, community outreach, education and communications plan for a bicycle safety education campaign for Maricopa County. This included advertising elements, public relations strategies, community outreach programs, and education initiatives. The primary objectives of this plan are to motivate people to wear safety helmets and ride on the right side of the road, communicate the risks involved when people do not wear helmets, and reduce the number of bicycle-related injuries. A Bicycle Safety Education Stakeholders Group was organized to bring MAG agencies, health care professionals, and bicycle safety experts together to implement the plan.

The plan includes:

Bicycle Safety Education Curriculum for School Outreach
Activity materials for use in presentations for school children
“Put a Lid on your Kid” guide for parents
Presentation tools such as “brains” that show the potential injury to the head and brain
Giveaway items
Train-the-trainer workshops (Agencies can get free bike helmets for participating in the workshops. Scottsdale is giving away 100 children’s helmets from this program at the next Cycle the Arts bike ride.)
Event booths
Marketing programs

Helmet Contest

Maricopa County area public and private schools, along with Phoenix Children's Hospital and the SAFE KIDS Coalition of Maricopa County, have developed a partnership with the professional baseball team in Phoenix, the Arizona Diamondbacks, to promote helmet use through a school-based contest. The program takes place every spring. In March, more than 1,800 packets are mailed to school principals and art teachers in the county who receive a letter on Arizona Diamondbacks letterhead announcing the contest. They are asked to distribute the materials including a blank drawing of a helmet to the students in 4th-6th grades. Students are instructed to create a helmet design using the official Diamondbacks colors. A panel of judges selects the five finalists and then during a home game, the fans at a Diamondbacks game pick their favorite helmet design to select the winner. More than 3,400 students entered the contest in 2000 and each year the number increases. The winner and his/her classmates are given free tickets to a Diamondbacks game, and during an on-field ceremony prior to the game, one of the Diamondback ballplayers presents the winning student with the Helmet Coloring Contest trophy.

"Helmet Your Brain - Avoid the Pain"

This is a free educational kit designed for teachers, youth leaders, health professionals, and parents to teach children, especially those between 8 - 12 years old, the importance of wearing a helmet. The "Helmet Your Brain Avoid the Pain" program is sponsored by the Maricopa County SAFE KIDS Coalition. Barrow Neurological Institute® of St. Joseph's Hospital and Medical Center, a partner member of the SAFE KIDS Coalition, helped develop the kit in conjunction with the Coalition.

The "Helmet Your Brain Avoid the Pain" kit includes:

Easy-to-follow lesson plans with interactive activities
Models of the skull and brain
Brain JELLO mold

Video tapes from SAFE KIDS and Bill Nye "The Science Guy"
Reproducible parent and student handouts

5. Do you make bicycle safety materials available to the public? Please describe.

Yes. The City of Scottsdale Bike Map and the regional bike map from the metropolitan planning agency, Maricopa Association of Governments (MAG), include safety information. Both are distributed free of charge and are regularly updated and reprinted.

Bicycle safety information is available on the Scottsdale web site and links are provided to the ADOT Bicycle/Pedestrian program and other related sites. Also available from ADOT and distributed free through a variety of sources in Scottsdale are Arizona Bicycle Street Smarts and Share the Road: A Guide for Bicyclists and Motorists. Copies were included with our original application. The local newspaper publishes a monthly bike safety article furnished by CAzB. The CycloCat activity booklets are handed out at rodeos and presentations.

Time to Recreate, a show on the City's cable network, recently presented a segment featuring the City's shared-use path system and how to use it safely.

6. Do you have a bicycle ambassador program that educates community members on local opportunities for bicycling and answers their questions?

The City works closely with the Coalition of Arizona Bicyclists (CAzB) to promote bicycling in our community. CAzB members attend public meetings to discuss bicycle issues with residents, teach LAB cycling courses, and encourage our political leaders to support bicycling programs.

7. Do you have League Cycling Instructors in your area? Please list active instructors.

Donald Randolph, LCI #: 191, Scottsdale, AZ
Richard Lorance, LCI #: 687 C K, Tempe, AZ
Douglas Hawley, LCI #: 361 K C, Mesa, AZ
Gene Holmerud, LCI #: 1193, Phoenix, AZ
Radar Matt, LCI #: 633, Phoenix, AZ
Sharon Newman-Matt, LCI #: 1427, Phoenix, AZ
Kathryn L. Mills, LCI #: 1194, Phoenix, AZ
Richard Moeur, LCI #: 266 C, Phoenix, AZ
Brian H. Nelson, LCI #: 1195, Phoenix, AZ
Michael Sanders, LCI #: 1428, Phoenix, AZ
Gerald Stanley, LCI #: 1525, Phoenix, AZ
Jay Stewart, LCI #: 1196, Phoenix, AZ
Robert Ward, LCI #: 1430, Phoenix, AZ
Heather Fowler, LCI #: 812 K C, New River, AZ
Edwin Cure, LCI #: 1192, Glendale, AZ

8. Is bicycle safety education included in routine local activities (e.g. tax renewal, drivers licensing and testing, or inserts with utility bills each month)? If so, please describe.

The Scottsdale Police Department bicycle registration program is advertised in utility bills and on the City's web site.

The following information is included in the Arizona Drivers License manual, available in print and on-line versions.

Sharing the Road With a Bike

Bicyclists must obey the same traffic laws as drivers of motor vehicles, and they have the right-of-way under the same conditions as motorists.

Motorists should be alert for bicyclists along the roadway, because cyclists are often difficult to see. Extra caution is necessary. Motorists are required to allow a minimum safe distance of 3 feet when passing a bicycle traveling in the same direction.

At night, you should dim your headlights for bicyclists.

Drivers should be prepared for a bicyclist swerving.

Although bicyclists must ride with the flow of traffic and stay near the right side of the road, they can legally move left for several reasons, such as:

Turning left
Avoiding hazards
Passing pedestrians or vehicles
If the lane in which the person is operating a bicycle is too narrow for bicycle and motor vehicle to travel safely side by side

Important rules for bicyclists:

Do not carry more persons than the design of the bicycle permits

Do not ride more than two side-by-side

Ride as near to the right side of the road as possible

Use proper hand signals (See Signaling on Page 34)

Do not bicycle under the influence of drugs or alcohol — it is illegal

When riding at night, have a white headlamp visible from 500 feet, and a rear reflector

ENCOURAGEMENT

How do you promote National Bike Month in May (or another month)? Please describe.

Every month is Bicycle Month in Scottsdale! With no snow, 7.74 inches of rainfall, and 314 days of sunshine each year, bicycling is an activity enjoyed regardless of the season. Even summer days provide cool, comfortable temperatures for that morning ride.

In April each year, Scottsdale participates with Valley Metro, the regional Clean Air Campaign, and other Valley communities to promote Valley Bike Month and Week. In 2004, 73,200 commuters in the region chose to ride their bicycles to work one day a week or more instead of drive. Every year, thousands of riders participate in region-wide bicycle events during April and May. A major partner in the Bike Month program is the Arizona Diamondback baseball team. Each year they arrange for a player to participate in a safety campaign that features helmets, bike safety, riding on the right, or something similar. A special ride, *The Great Bike Chase*, to a major league ballgame at Chase Field, will have nearly 2000 riders.

In 2006, the City of Scottsdale sponsored the first annual Cycle the Arts ride, a family-fun bike ride demonstrating public art in our community. About 50 riders joined neighbors, city staff, and local art experts for a short, 8-mile bicycle ride and an up close look at local public art installations. The event began at the Paiute Neighborhood Center and included downtown Scottsdale, the Civic Center, and the Indian Bend Wash. Before and after the ride there were fun activities for kids of all ages that combined bicycles and art. In addition, cyclists brought non-perishable food items for donation for the Vista del Camino food bank. The 2007 event will take place May 6 and free bike helmets will be given to the first 75 children to sign up.

How many people do you reach with events and activities during this celebration?

Valley-wide, thousands of people will participate in regional and local events promoting the fun, healthy benefits of cycling. Estimations are that more than 100,000 people will be directly exposed to some form of print media and millions will be exposed to an assortment of television, radio, newspaper, and web based promotional items.

3. Do you actively promote Bike to Work Day or other bicycle commuting incentive programs? Please describe.

Yes. We actively promote Bike to Work Day and other bicycle commuting incentive programs. Through the regional marketing efforts of Valley Metro, the Maricopa County mandatory employee trip reduction program, and other promotional opportunities, nearly all of the community's workforce gets information about bicycling as a viable alternative for trips to work.

The City sponsors a Bike to Work Day ride to City Hall. Each year, participants ride 4.5 miles with elected officials, Police Bike Unit members, and other City staff. Riders are provided incentives and are eligible for prizes.

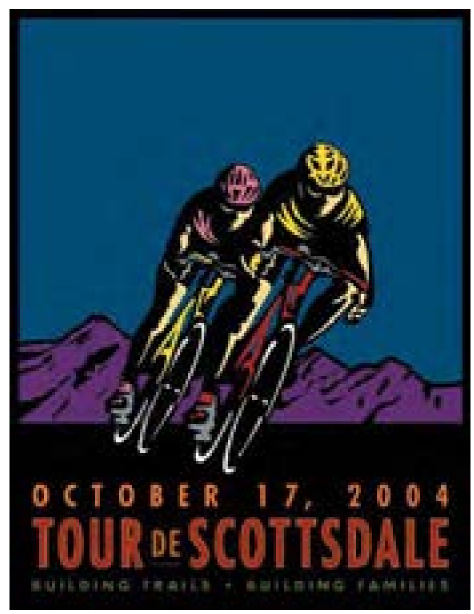
The City of Scottsdale has its own incentive program where employees can earn bicycles just by riding them to work. B.I.K.E.S. (Bicycle Incentive and Keen Efforts for Scottsdale) uses bicycles from the Handlebar Helper program. Employees enter into an agreement with the City to use, at no cost, a reconditioned bicycle for commuting to and from work. The participant agrees to ride at least 20 days in six months, wear a helmet, and ride safely.

What portion of the community workforce do you reach?

Most

4. Is there an annual bike tour or ride promoted to the general public in your community? Please describe.

The following events are annually promoted and take place in Scottsdale:



Cycle the Arts: Guided Tour of Public Art installations. Free.

Scottsdale Police Bike Unit Ride: Tour; Admission is a can of food for the Vista del Camino Community Center. Route utilizes the Indian Bend Wash Path.

Tour de Scottsdale: Timed Event; DCB Adventures; Begins and ends in Scottsdale. Proceeds benefit the City's trail program. Distance of 67 miles.

El Tour de Phoenix: Timed Event; Perimeter Bicycling Association of America; Begins and ends in Mesa. Route includes Scottsdale, Maricopa County, Fountain Hills, and Tonto National Forest. Despite the name, the ride does not pass through Phoenix. Distance options of 70 and 25 miles.

Answer to the Challenge: Tour; GABA; Begins and ends in Scottsdale. Three-day event covering 325 miles with 22,000 feet of vertical climbing.

Memorial Ride for Safety: Tour; Coalition of Arizona Bicyclists; Begins and ends in Scottsdale. Route goes through Carefree and the Tonto National Forest. Distance options of 60 and 35 miles.

Tandem "Rally in the Valley": Tour; Arizona Bicycle Club; Various routes traveling through Scottsdale, Paradise Valley, and Phoenix. Distance options vary.

Sun Festival Southwest: Tour; Sun Festival and Arizona Bicycle Club. Sun and fun filled educational weekend celebrates, generates, and demonstrates renewable energy and healthy living for the entire community. Distance options vary.

McDowell Century: Tour; Arizona Bicycle Club; Begins and ends in Scottsdale. Distance options of 100, 65, and 30 miles.

The following events are annually promoted in Scottsdale but may take place in neighboring communities:

MS150 Best Dam Bike Ride: MS Society.
Tortilla Flats Ride: Arizona Bicycle Club
Casa Grande Century: GABA Phoenix
Laveen Country Challenge: Laveen Lions Foundation
Arizona Senior Olympics
Le Grande Tour: Arizona Parks and Recreation Association
Gila Valley Tour: ABC
Around the White Tanks: GABA West Valley
Tour de Cure: American Diabetes Association
Desert Classic: ABC
Palo Verde Nuclear Century: GABA West Valley
Tour de Farm: H304 Charities
The Great Bike Chase: Valley Metro

This year Scottsdale will again host the Arizona State Criterium Championships during April. This is a USCF event featuring Arizona's best bicycle racers.

In March 2007, NORBA will host a national mountain bike race in Maricopa County McDowell Mountain Park adjacent to Scottsdale.

5. Are there community road or mountain bike clubs, bicycle advocacy organizations or racing clubs? Please describe.

Many bicycle organizations are located in Scottsdale or frequently stage rides in the City. They include:

Coalition of Arizona Bicyclists, advocate organization
ABC – Arizona Bicycle Club
Pinnacle Peak Chapter
Scottsdale – Frank Lloyd Wright Chapter
Scottsdale – Via Linda Chapter
Bull Shifters Bicycling Club
GABA – Greater Arizona Bicycling Association
Phoenix Metro Bicycle Club
MBAA – Mountain Bike Association of Arizona
BRAG – Bent Riders of Arizona Group
Arizona Bicycle Bunch
RideAZ – Arizona Mountain Bike Riders
Red Mountain Cycling Club
Arizona Outdoor Travel Club

Racing clubs located in Scottsdale include:

Bicycle Ranch
Camelback Cycling Club
Notre Dame Preparatory HS Cycling
Racelab U-23 Cycling Team
San Tan Racing
Strada Racing Club
Team One Racing

Racing clubs training in Scottsdale include:

Team Ace Asphalt/Corsa Bicycle
White Mountain Road Club
Nova Youth Cycling League
HLHAP

Sonoran Cycling
Tribe Racing
Patent It! Cycling Club
Swiss American Bicycle Club
Azphalt Cycling
Construction Zone, The
ECFA/Honeywell
G.S. Tifosi
Mountain Velo Cycling Team
Phoenix Consumers Cycling Club
Team Vitesse
Arizona State University

6. How many specialty bicycle retailers (i.e. bike shops, not big box retailers like K-Mart or Wal Mart) are there in your community?

There are 20 bicycle shops located in Scottsdale.

7. Are there other bicycling areas or facilities such as BMX tracks, velodromes or mountain biking centers in your community?

There are BMX tracks located nearby in Phoenix, Chandler, and Queen Creek. Competitive mountain bike singletrack courses are located in several of Maricopa County's regional parks. McDowell Mountain Regional Park, adjacent to Scottsdale, annually hosts a national NORBA event.

8. Does your trails system have a unit of the National Mountain Bike Patrol? Patrollers inform, assist and educates mountain bikers and other trail users.

The Preserve has a local mountain bike patrol unit that is not currently affiliated with the National Mountain Bike Patrol.

9. Are there opportunities to rent bicycles in your community or other recreational opportunities involving bicycling? Please describe.

Yes. There are 11 locations advertising bicycle rentals. In addition, many of the local resorts make bicycles available to their guests.

10. Do you have Safe Routes to School program that includes bicycling?

Yes.

Scottsdale's school transportation safety program involves proactive school site transportation audits to identify potential transportation improvements that would help provide safe access to and from schools in Scottsdale. In October 2006, the community held its first formal Safe Walk/Bike/ Bus to school event. The City is finalizing a comprehensive Safe Routes to School Program that will be housed in the Transportation Department. Several schools are expected to participate in future events.

School Safety Audits
In September 2005, the city of Scottsdale's Transportation Department initiated proactive school site transportation audits to identify potential transportation improvements that would help provide safe access to and from schools in Scottsdale. An initial goal was set to audit every public school in the city by the end of the school year, May 2006. The intention of the transportation audit was to identify major issues at many schools and to focus on areas adjacent to school and existing school crossings for safety improvements. Since that time, Transportation Department staff have performed on-site visits of Scottsdale schools during morning drop-off and afternoon pick-up hours. Following each site visit, a report was prepared which indicated general observations by staff from Traffic Engineering and Transportation Planning who attended the review. Each report also lists recommended changes and other issues that could be addressed as part of a longer-range program. In doing the safety audits, the city has taken a critical step in identifying engineering solutions necessary to ensure school safety. By focusing on low cost, easy to implement solutions, such as signage, paint/striping and curb ramps, it was hoped that support for other elements of a

comprehensive program such as more thorough engineering treatments, enforcement, education and encouragement would be generated.

Safe Walk/Bike/Bus to School

In October of 2006, Grayhawk Elementary School became the first Scottsdale school to hold a formal Safe Walk/Bike/Bus to school event. The event was preceded by other activities initiated by the Parent Teacher Organization Health, Safety and Environment Committee at Grayhawk Elementary with the full support of school administration and staff, and the City of Scottsdale. The October 20 event was held to celebrate International Walk To School Month. The 773 students were encouraged to walk with parents, teachers, city staff and others. Because more than 200 of these students do not live in the community but are open enrolled at the school, they were encouraged to join the event by parking at a nearby supermarket that offered the commuting families parking space in their lot. It is estimated that between 650 and 700 children participated in the event far exceeding expectations of parents, teachers, staff and the City of Scottsdale.

How many schools are involved?

All public schools are involved in the Safety Audits. Several are involved with the Safe Routes to School Program.

11. Does your community have youth recreation and intervention programs that are centered around bicycling?

Yes

Handlebar Helpers

Handlebar Helpers is a community "earn-a-bike program" staffed by the City of Scottsdale. This volunteer-supported program began in Scottsdale in the fall of 1994 through a group effort of citizen volunteers and City of Scottsdale staff. The initial purpose of the program was to provide a way for kids who could not otherwise afford bicycles to earn them, through volunteering time in their community. In response to community need, the program has grown to include adults, and the purpose has been expanded to promote bicycle safety, increase individual responsibility and self-esteem, encourage bicycle riding for individual health and environmental benefit, and demonstrate additional environmental responsibility through reuse and recycling. In addition, the apprentice program teaches bicycle repair and other job and life skills. The program is offered to Scottsdale residents only.

The City of Scottsdale provides facilities for the program in the Paiute Neighborhood Center, administrative support, and two part-time bicycle maintenance and repair experts. All other operating expenses and materials are funded by the city budget as well. The program receives donated bikes. Bike technicians establish a “price” that the program participant must pay in hours of volunteer work to own the bike. Once the participant has completed approximately half of the volunteer hours, an appropriate bike is selected with the help of a volunteer bike tech who then either reconditions or supervises the reconditioning of the selection. When the participant has satisfied the volunteer commitment, the bike, a helmet, and a lock are awarded at a special ceremony. Each recipient receives a folder that contains a written description and picture of their bike, and a safety brochure, available in English and Spanish. The Scottsdale Police Department Bike Patrol supports the program and participates in this presentation. They emphasize the safety information and are good role models, as they always wear helmets and ride safely. Kids receiving bicycles are encouraged to bring their parents. Another neighborhood supporting feature is that the program coordinator awards movie tickets to those “caught” wearing their helmets while riding their bicycles.

12. Do you publish a bike map and keep it up to date?

Yes. We publish a 4-color, 24x36 folding street map that shows bike lanes, bike routes, shared-use paths, unpaved trails, bus stops, parks, and other useful information. We print 15,000 at a time and update before each reprinting. They are available free of charge at all libraries, community centers, and local bike shops. There is also an on-line version. Also available on-line is a request form to receive a Scottsdale Bike Map by mail. Since October 2005, 1,230 maps have been requested from the web site. A regional bike map, updated about every two years, is published by MAG and distributed upon request.

13. Do you publish a map of mountain bike trails?

Yes. The Scottsdale Bike map also shows the unpaved trails. More detailed maps have been developed that show specific areas around popular trail heads. They are available on-line at http://www.scottsdaleaz.gov/preserve/pdf/TrailMaps.pdf.

14. Please describe any other efforts in your community to encourage cycling.

Scottsdale Waterfront/Downtown

The Scottsdale Waterfront is situated alongside 1,800 linear feet of the Arizona Canal. Twelve and a half acres of ground have already been broken on this 600,000-sq.ft. project. The Scottsdale Waterfront will feature pedestrian-friendly waterfront walkways, a shared-use path, outdoor plazas, and water-themed paseos. Key project considerations were to activate the Arizona Canal, connect downtown districts through land use and pedestrian retail experiences, and enhance mobility by supporting alternate modes of transportation. The Scottsdale Economic Vitality staff estimates that total investment in the downtown and other southern parts of the City since 2003 now totals nearly $3.13 billion. People are already starting to move into downtown and are walking and riding their bikes to work.

Public Art

Scottsdale has a history of commitment to the arts. Some of the City's first settlers were artists, craftsmen, architects, art collectors, educators, and others who believed that art should be part of the fabric of the community. The municipal art collection was formally established in 1967 and now includes more than 1,950 total objects (704 municipal and 1250 museum pieces). As a defining characteristic of our community, public art enhances Scottsdale's unique character, image and identity. The City has a Percent for Art component in its Capital Improvement Program (CIP) budget as well as an Art in Private Development ordinance. Our parks and paths have benefited tremendously from this effort. Transportation projects regularly include artists as members of design teams, most recently on the Crosscut Canal path project from McDowell to Thomas roads. Each year, the Public Art Program teams with City staff to host a bicycle tour of public art installations. This Cycle the Arts event is truly unique to Scottsdale.

Spinning Our Wheels by artist Aris Georgiades was a temporary installation presented by the Scottsdale Public Art Program, which ran during the course of the Scottsdale Arts Festival (March 11th-13th, 2005). Through participation on a component bike sculpture, the work becomes an interactive piece that explores the frustration of going in circles in our daily lives. The artist was available to assist people at the festival to get on the sculpture and to work as a team to gain momentum. Humor and deeper meaning become evident through the process of participation. After the festival, the City Transportation Department purchased the piece for use at upcoming bicycle events.

Rippling Waters Bridge, by Carolyn Law, located over the Crosscut Canal on the west side of Tonalea Elementary School, dramatizes a sense of flow through the neighborhood. The canal crossing is an important access point for school children and for recreational users along the path. Law's prismatic pickets create an optical effect of shimmering water and shift color as one walks across, causing a sensory connection to the contents of the channel. Like most water infrastructure in Arizona, canals are slowly outgrowing their identity as unnoticed fixtures in our built environment. Law's bridge promotes these waterways as community assets that string together all corners of the Valley.

Artist Erik Gonzales conceived of *Visual Puzzles* as a series of artworks on the Osborn pedestrian/bicycle bridge that recognize the significance of the Crosscut Canal to Scottsdale and illuminate an artist's perspective on the canal's history. The antiqued images within the art panels are comprised of several layers of shapes, textures and earthen-tone colors and are a combination of historic aerial photographs of the location and original abstract forms. In the black-and-white imagery of the artworks, large rectangular and round shapes are from aerial views of the Crosscut Hydro Plant. The blueprints are reproductions that were used by engineers and contractors during construction of the canal.

Parada del Sol Parade

The Scottsdale Jaycees Parada del Sol is a month-long celebration culminating in nearly a week of professional rodeo performances and a magnificent parade. The Parada del Sol Parade is one of the community highlights each year in Scottsdale. Over 150 entries and nearly 1,000 horses travel north two miles up Scottsdale Road, making the event the "World's Largest Horse Drawn Parade." It is followed by an all day Trails End Party in Scottsdale's Old Town. To promote their love of cycling and their laid-back life style, one of the local clubs, Bent Riders of Arizona Group (BRAG) regularly joins the horses and glides up the street on their unique recumbent bicycles.

Bicycle Delivered Coffee Bar

A coffee bar in the main City office building is provided by a popular restaurant located nearby on the Scottsdale Civic Center Mall. All products are delivered by bicycle and their logo is a bike. Lunch orders are taken in the morning and delivered promptly at noon by bicycle.

ENFORCEMENT

1. Is your local police department addressing the concerns of cyclists in your community? Is there a liaison that communicates with the bicycling community?

Yes. Chief of Police Alan Rodbell has personally met with local bicycle advocates to discuss their concerns. Members of the Coalition of Arizona Bicyclists have been guests on his weekly cable television show, *Behind the Badge*, to discuss bicycle safety. Chief Rodbell is available to the bicycling community without the need for a designated liaison.

2. Do you offer specific training to police officers regarding traffic law as it applies to bicyclists?

Police Officers get traffic law training in the Police Academy and bicycle laws are covered at that time. The City has three certified bike instructors through the International Police Mountain Bike Association (IPMBA) and they have certified several officers throughout the state to become police cyclists. The IPMBA outline specifically includes traffic laws pertaining to cyclists.

The Scottsdale Police Bike Unit hosted the 2005 IPMBA conference in Scottsdale during our annual Bike Week. This event provided officers from around the country with skill enhancing training and certification courses; essential, dynamic, and innovative on-bike sessions; insightful and information-filled in-class workshops; and the nation's largest and best bicycle patrol product exhibition.

The Coalition of Arizona Bicyclists developed a training program with the Scottsdale Police Department based on the Bicycle Enforcement Program offered by Massbike and the National Highway Safety Administration. It includes an overview of vehicular cycling theory (Road One Class), crash statistics, Arizona bicycle laws, Arizona vehicle laws as they apply to cyclists, and the reasons for enforcing bicycle and vehicle laws.

3. Do you use targeted enforcement to encourage cyclists and motorists to share the road safely?

No. To date, the City has not used any type of targeted enforcement to encourage cyclists and motorists to share the road safely.

4. Do you have public safety employees on bikes? Indicate the number of employees on bike as well as the size of the entire staff.

Yes. We currently have nine officers and two sergeants assigned to the Scottsdale Police Bike Unit and the downtown squads. There are 14 School Resource Officers and two sergeants that are certified bike officers. There are approximately 64 other officers that have been certified as bike officers in Scottsdale Police Department on a reserve list. An impressive 21% of Scottsdale's 371 officers are ready to serve as bicycle officers.

5. Do you have a mandatory helmet law? To what ages does it apply?

No. Neither the City of Scottsdale, Maricopa County, nor the State of Arizona have mandatory bicycle helmet laws. There are no communities in the region with mandatory bicycle helmet laws. The State of Arizona also does not have a mandatory helmet law for adults on motorcycles. Children under 18 are required to wear helmets when riding or operating a motorcycle.

6. Do you have mandatory sidepath laws? If so, what is the status of these laws? Are they enforced?

No.

EVALUATION AND PLANNING

1. Do you have any information on the number of trips by bike in your community including census data? Please describe.

Surveys from the Maricopa County Trip Reduction Program (TRP) show that Scottsdale's bicycle mode percentage for commute to work trips has increased to 1.74 percent in 2006 from 1.15 percent in 2001. The trend continues to show that as we add facilities and close the gaps in existing corridors, more people are bicycling to work. The bicycle mode percentage for the County as a whole is 1.0 percent. All businesses in Maricopa County with 50 or more employees at a site are required to participate in the TRP. Each employee fills out a survey once each year documenting their commute to work choices. The average adult bicycle commute in the County is 6.5 miles.

The 2000 Census data journey to work table indicates that the bicycle mode for Scottsdale provides 0.8 percent of work commute trips. These numbers underestimate actual bicycle trips. Scottsdale is undergoing major changes in housing density downtown that will have significant impact as the area becomes a vibrant residential/work area.

2. How many cyclist/motor vehicle fatalities have occurred in your community in the past five years?

Three.

3. How many cyclist/motor vehicle crashes have occurred in your community in the past five years?

232. Reported bicycle/vehicle collisions from 1994 through 2004 have been divided into total collisions, injury collisions, and fatal collisions. The lowest number of bicycle/vehicle collisions occurred in 2003 with 40 total collisions, 35 of which resulted in injury and one resulted in a fatality. The highest number of bicycle-vehicle collisions occurred in 1995 with a total of 88 crashes, 77 of which resulted in injury and one resulted in a fatality. The majority of bicycle-vehicle collisions resulted in injury. An additional 84 bicycle crashes were reported during January 2005 – October 2006. Scottsdale's bicycle crash rate in 2005 (23.89 crashes per 100,000 population) and bicyclist fatality rate (0.44 fatalities per 100,000 population) are considerably lower than Maricopa County as a whole (38.23 crashes per 100,000 population and 0.64 fatalities per 100,000)

4. Do you have a specific plan or program to reduce these numbers?

Yes. The Bicycle Element of the Transportation Master Plan will include specific engineering, educational, and enforcement countermeasures to address collision rates. After determining that the shared-use path crossing at Hayden and Chaparral roads had one of the highest number of bicycle/vehicle collisions, a CIP project was started that will grade-separate the crossing of Chaparral and eliminate the need for through pathway users to cross Hayden twice. This project is in final environmental review and is expected to go to construction next year.

5. Do you have a system in place that allows bicyclists to submit ideas and concerns to public officials? Please describe.

Yes. In Scottsdale, bicyclists serve on the City Council, the Transportation Commission, and populate the staff. For those cyclists not quite so plugged in, the City's web site allows for several methods of submitting ideas and concerns. The *Report a Problem* page provides a form that addresses many routine issues as well as space to describe any other problem. Staff in each department are identified and their phone numbers and e-mail addresses are provided. Citizens can send e-mails directly to Council Members. Cyclists routinely contact the staff in person at public meetings, in their offices, and on the telephone. Citizens may also address the Transportation Commission meetings, generally held on the 3rd Thursday of each month at 6 p.m.

6. Do you have a comprehensive bicycle plan? Please include a copy.

Yes. A copy was included with our original application.

When was it passed or updated?

The City of Scottsdale Bicycle/Pedestrian Transportation Plan was adopted in January 1995. It is currently being updated as an element of the City's first overall comprehensive Transportation Master Plan.

Is it funded?

Funding is provided through the Transportation Capital Improvement Plan (CIP). Approved funding for bicycle and pedestrian projects from 2008-2012 is $37.65 million, 15 percent of the total. An additional $10.5 million is included for bike lanes and sidewalks in roadway improvement projects bringing the total expenditure on bicycle and pedestrian facilities to $48.2 million, 19 percent of the CIP. Funding comes from a dedicated transportation sales tax, transportation bond elections, and Federal grants.

What percentage has been implemented?

About 85% has been implemented. The plan is guided by four action level options. Nearly all recommended actions in Levels I, II, and III have been implemented. Several action items in Level IV have been implemented or are in the planning stage of development.

When the 1994 bike plan was adopted, Scottsdale had eight miles of bike lanes, 37 miles of paved multi-use paths, and 35 miles of unpaved multi-use trails. Today Scottsdale has 95 miles of bike lanes, 61 miles of paved multi-use paths, and 238 miles of unpaved multi-use trails.

7. Do you have a trails master plan that addresses mountain bike access, and are there ongoing relations between the mountain biking community and the community recreation and planning staff?

Yes.

The Scottsdale Trails Master Plan: On the Right Trail, approved in February 2004, identifies nearly 300 miles of trails. The plan provides guidance for the future, defines trail classifications, trail standards, provides an action plan, and explains funding processes.

The Trails Program is currently located within the City's Preservation Department with two full-time staff. In 2000, Scottsdale voters approved a $2.5 million capital improvement program specifically for trail development and improvements and additional general fund monies have been allocated.

A total of $7.5 million has been identified for trailhead and connecting trail improvements associated with the McDowell Sonoran Preserve. Scottsdale citizens have voted seven times to support the preservation of mountain and desert lands in the City. Sales tax collections dedicated to the preservation program total over $215 million as March 2007. Approximately $300 million in bonds have been issued for land acquisition. The City owns 11,660 acres in the Preserve boundary. Another 1,713 are privately preserved.

The Scottsdale Transportation Department has played a significant role in the implementation of the City's trails infrastructure. Trails have been built or improved in conjunction with a variety of street improvement projects. Trails have been constructed within rights-of-way along arterial streets and trails have been included within grade-separated crossings, usually associated with drainage improvements, across major arterials. Other transportation related improvements include trail-crossing signs, fence installation between trails and roadways, improved crosswalks, and the installation of pedestrian/equestrian/bicyclist-activated signals at certain intersections.

Maricopa County Regional Trail System

Scottsdale is situated adjacent to several other municipalities with trails, as well as large areas of open space, such as Maricopa County's 21,099-acre McDowell Mountain Regional Park to the east, and the Tonto National Forest to the north/northeast. Because of this connectivity, several regionally significant trails cross through the City of Scottsdale. Most of these trails run along canal and power line corridors. The Sun Circle Trail is a 110-mile regional trail that was established in the 1960s by Maricopa County in partnership with the Salt River Project (SRP). It runs along the Arizona Canal and connects with Phoenix to the west, and the Salt River Pima-Maricopa Indian Community to the east. The Central Arizona Project (CAP) canal, controlled by the Bureau of Reclamation (BOR), runs through central Scottsdale and also acts as a regionally significant trail corridor. The 242-mile Maricopa Trail, identified by the Maricopa County Board of Supervisors in August 2004, crosses Scottsdale using the CAP, the McDowell Sonoran Preserve, and several trails at the northern edge of Scottsdale. In 2006, the Lost Dog Wash Trailhead opened for public use providing access to ten miles of new trails that connect to other trails in and out of the Preserve. Trail connections to McDowell Mountain Regional Park and the regional trail system were completed with the construction of Windmill and Prospector Trails.

8. Is your bicycle network part of broader development plans, land use plans and ongoing development projects?

Yes. Staff from Transportation, Fire, Preservation, and Municipal Services meet with Planning and Development Services to review projects. Each project is reviewed for impacts to transportation and other City facilities and services. New facilities and access to existing facilities are frequently stipulated as requirements for permit approval.

With development taking place along the Arizona Canal in downtown Scottsdale, the Transportation Department moved forward with the Arizona/Crosscut Canal Study that provides an overall design and concept report to facilitate the completion of the path system along the SRP canal banks. This study identifies which side of the canals the paved path should be on, where bicycle/pedestrian bridges should be built over the canals, and where parks, public art, and other amenities should be located. Combined with projects already under construction in Tempe, this project will ultimately complete a 17-mile loop that passes through downtown Scottsdale, Papago Park in Phoenix, downtown Tempe, the Tempe Town Lake, and the Indian Bend Wash.

How many trails, bike lanes, paved shoulders, and bike routes connect with each other to provide seamless transportation options?

Most.

9. Have you evaluated your transportation network and prioritized bicycle improvements based on hazards and needs?

Yes. The Transportation Master Plan will include a comprehensive evaluation of our entire transportation network. The Bicycle Element includes a bicycle/pedestrian latent demand analysis that shows where the greatest potential is for people to ride and walk. A Bicycle Level of Service evaluation has been completed for our street system. All arterial and collector streets without bike lanes have been evaluated for potential bike lane striping and restriping policy guidelines are being proposed. Bicycle/vehicle collisions have been mapped and analyzed. A gap analysis has been performed to identify missing connections. All the processes described above are in GIS format to allow us to evaluate the needs, hazards, and potential usage as priorities are set and projects are ranked for funding.

Using GIS data, we determined that 59 percent of all address locations (office, residential, retail, etc.) are located within 0.5 miles of one of our shared-use paths. Thirty-five (35) percent are located within 0.25 miles of a path. We will be using this information to help set goals for future service. For example, one goal might be to have 75 percent of all address locations within 0.5 miles of a path by 2012.

10. What specific improvements do you have planned for bicycling in the following year?

We have 26 projects with bicycle facilities in various stages of progress. It is anticipated that projects planned or currently in design and construction phases will add in the next five years:

23 miles of bike lanes

16 miles of new or improved paved multi-use path

4 grade-separated crossings

37 miles of new/improved sidewalks

9 miles of streetscape enhancements, which generally include wider sidewalks, bicycle lanes, landscaping, and amenities

Current projects include:

Arizona Canal Path: Chaparral to McDonald – new path (1 mile)
Bell Road: 94th St. to 98th St. – improved sidewalks (0.5 miles)
Cactus Road: Pima Freeway to Frank Lloyd Wright – bike lanes, new path (2.8 miles)
Camelback Road: 64th St. to 68th St. – improved sidewalks (0.5 miles)
Crosscut Canal: McDowell to Thomas – pathway improvements (1.1 miles)
Crosscut Canal: Thomas to Indian School – new path (0.7 miles)
Indian Bend Road: Scottsdale to Hayden – bike lanes and new path (1 mile)
Indian Bend Wash: Chaparral to Jackrabbit – new path (0.5 miles)
Indian Bend Wash: Path widening and renovation (2.5 miles)
Indian School Road: Drinkwater to Pima – bike lanes and path connections (1.75 miles)
McDonald Road: Scottsdale to 78th St. – bike lanes (0.75 miles)
McKellips Service Center – new path connecting Miller with Rio Salado path (0.2 miles)
North Frontage Road: Hayden to Pima – bike lanes (1.2 miles)
Pima Road: Deer Valley to Pinnacle Peak – bike lanes, improved sidewalks (1 mile)
Pinnacle Peak Road: Scottsdale to Pima – bike lanes (2 miles)
Scottsdale Road: Frank Lloyd Wright to Thompson Peak Pkwy – bike lanes (2.2 miles)
Scottsdale Road: Thompson Peak Pkwy to Pinnacle Peak – bike lanes (2 miles)
Scottsdale Road Ped & Bike improvements Phase 1 – bike lanes, improved sidewalks (1.8 miles)
Scottsdale Road Ped & Bike improvements Phase 2 – bike lanes, improved sidewalks (1.8 miles)
South Frontage Road: Hayden to Pima – bike lanes (1 mile)
Stacked 40: Center to Hayden – bike lanes (0.75 miles)
Stacked 40: North Frontage (74th to Hayden) – bike lanes (0.5 miles)
Thomas Road: 64th St to Granite Reef – bike lanes, improved sidewalks (2 miles)
Thompson Peak Bridge @ Reata Pass Wash – bike lanes
Thunderbird/Redfield: Scottsdale to Hayden – bike lanes (1.1 miles)
Upper Camelback Wash Multi-use Path: 92nd to Cactus (1.1 miles)

11. What are the three primary reasons your city deserves to be designated as a Bicycle Friendly Community?

Everyone comes to Scottsdale to bicycle. With year-around cycling weather and high quality facilities that connect origins and destinations, Scottsdale is a great cycling community. The Indian Bend Wash Path is the most popular and well-known bicycling facility in Arizona. Our trail system is extensive. We have our own Preserve and direct connections to McDowell Mountain Regional Park and the Tonto National Forest.

Lance Armstrong and company in Scottsdale with local Bicycle Ranch riders. January 2002

We are aggressively expanding and improving our bicycle network. In the past two years, we have increased our annual investment in new facilities from $3 million to nearly $10 million. Our 5-year CIP features $48.2 million in bicycle and pedestrian projects. All projects, whether public or private, are evaluated with the intention of including bicycle and pedestrian amenities. We have a planner dedicated to bicycle issues and a dedicated trails coordinator.

Active bicyclists are involved at all levels of government. We are on the City Council, the Transportation Commission, and the staff. We really do bicycle here. Bicycling is one of the environmental values demonstrated and supported in the community, which include nationally recognized Green Building and Desert Preservation programs.

"*As we address our transportation needs, we are not just talking about roadways and public transit, either. We haven't forgotten our non-motorized travelers in Scottsdale, and there are more every year. Energy saving and environmentally friendly means of getting around need to be highlighted and encouraged. We are expanding our extensive network of more than 95 miles of bike lanes and 65 miles of paved pathways. New bicycle, pedestrian and equestrian path improvements are under way, with more on the drawing board. Our commitment to creating healthy and environmentally responsible options for transportation is just one way we demonstrate our awareness of the importance of protecting our land, water and air."*

Mayor Mary Manross, State of the City Address, March 1, 2007

12. What are the three aspects of your community most in need of improvement in order to accommodate bicyclists?

We still have some gaps in both the street and path networks. Projects completed in the past two years have closed some of those gaps and several more connections will be completed within the next two years.

We still need to demonstrate to more people that bicycling to work is easy, safe, and fun. Many weekend cyclists have never commuted on their bicycle because they believe it is too far, too dangerous, too hot, too cold, too… Scottsdale's primary focus continues to be on improving all types of facilities and providing connections to them. As the community matures, we are developing programs that will devote resources towards education and encouragement.

We need to improve driver behavior around cyclists. Scottsdale has been very aggressive about citing red light runners and has permanent photo enforcement sites at certain major intersections as well as the first fixed photo enforcement demonstration program on a freeway in the US. The City has one mid-block photo enforcement installation and several photo enforcement vans that set up at random locations. Getting more people on bikes will also help modify motorists' behavior. Drivers tend to show people they know more respect. If every driver had a family member or a friend who bicycled, every bicyclist would get a little more consideration, and sharing the road would become more than just a roadway sign.

Transportation Master Plan
Bicycle Element

Appendix 6-B
Bicycle Crash Data

Historic Crash Data

The City of Scottsdale provided complete crash data files in electronic format for this analysis. These files contained data on report number, date and time of the crash, crash location (street names and distance and direction from intersection), injury severity, date of birth, physical condition, violations, action, travel direction, and manner of collision (head-on, rear-end, bicycle, etc.). Bicycle crashes were extracted from the overall database for review.

Figure 1 illustrates the number of reported bicycle-vehicle collisions from 1994 through 2004 divided into total collisions, injury collisions, and fatal collisions. The lowest number of bicycle-vehicle collisions occurred in 2003 with 40 total collisions, 35 of which resulted in injury and one resulted in a fatality. The highest number of bicycle-vehicle collisions occurred in 1995 with a total of 88 crashes, 77 of which resulted in injury and one resulted in a fatality. The majority of bicycle-vehicle collisions resulted in injury.

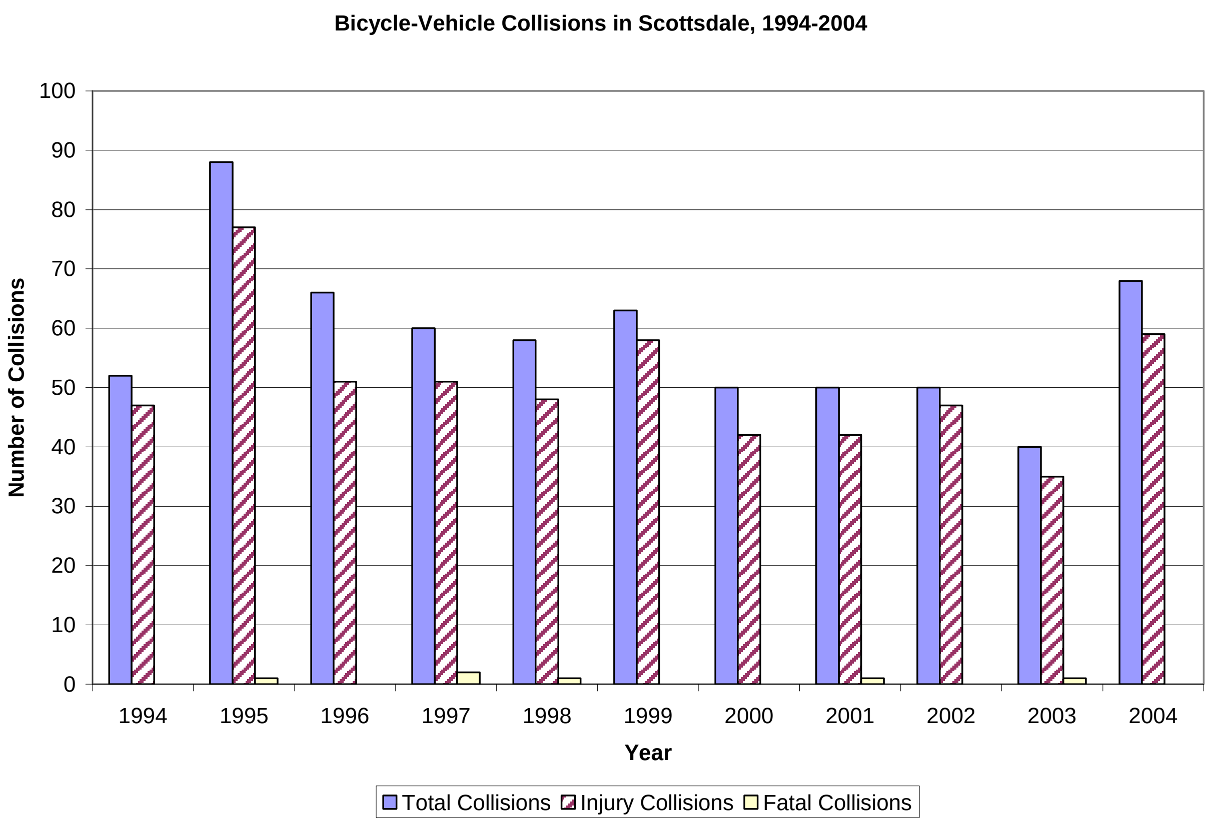


Figure 1   Bicycle-vehicle collisions in Scottsdale, 1994-2004

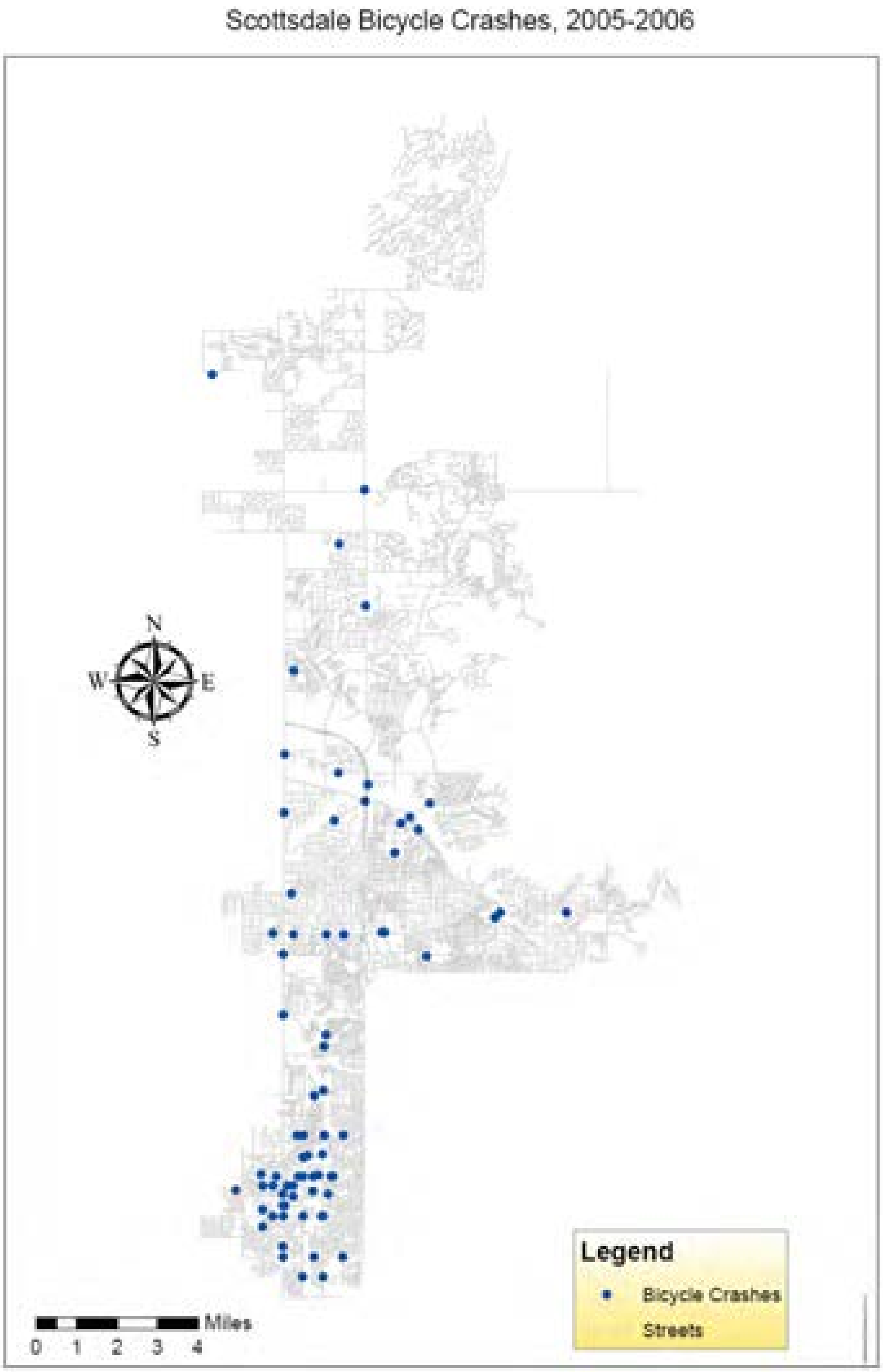


Figure 2 Geographical distribution of bicycle crashes in Scottsdale, January 2005-October 2006

An additional 84 bicycle crashes were reported during January 2005 – October 2006. The geographical distribution of these crashes is depicted in Figure 2. Many of the crashes occurred in southern Scottsdale, where bicyclist exposure levels are likely higher than in the rest of the City. Few crashes occurred north of Frank Lloyd Wright Boulevard, probably reflecting the less dense nature of development in that part of the City, and therefore lower numbers of bicyclists.

The 84 bicycle crashes were analyzed to gain an understanding of crash characteristics. Most crashes resulted in an injury to the bicyclist (Figure 3). Only three crashes did not result in an injury. There was one bicyclist fatality.

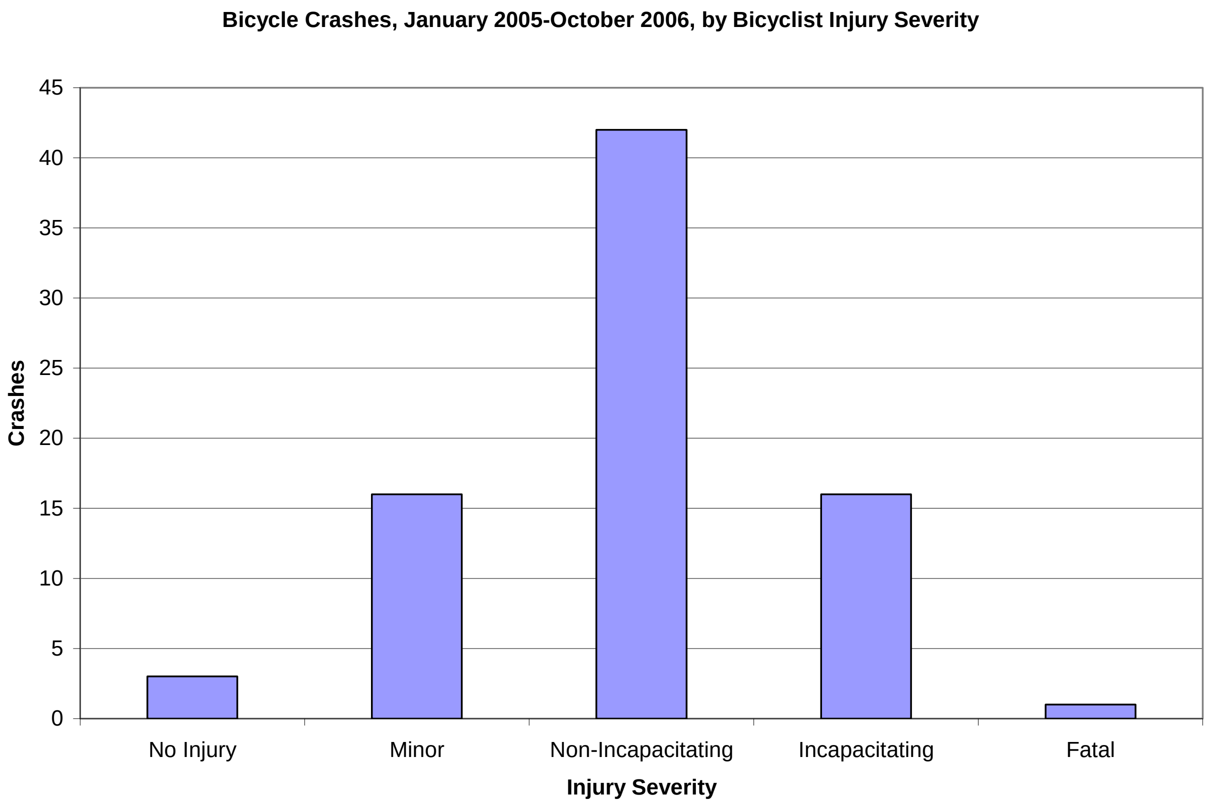


Figure 3 Injury severity

By time of day, 68 bicycle crashes occurred between 6:00 AM and 5:59 PM (Figure 4). Another 15 crashes occurred during the evening hours of 6:00 PM to 11:59 PM. Only one crash occurred during the overnight hours of 12:00 AM to 5:59 AM.

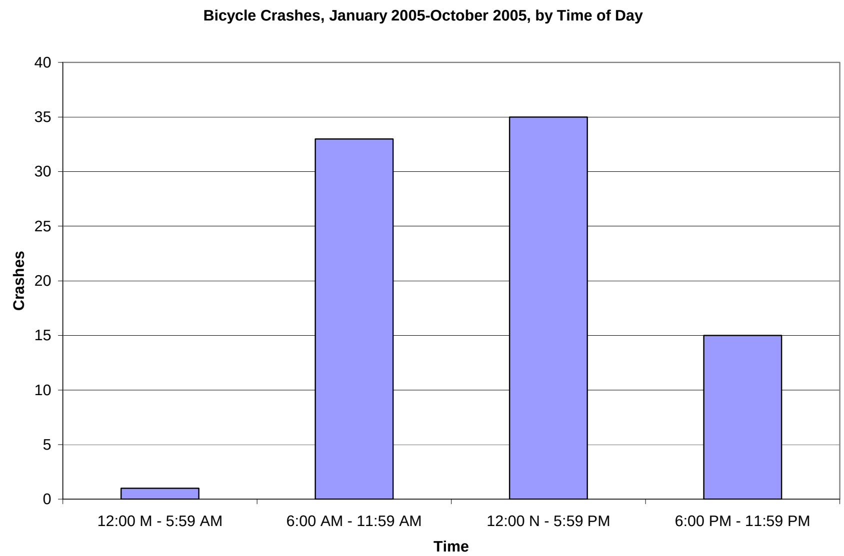


Figure 4 Time of day

Excluding crashes occurring on private property (for example, parking lots), bicycle crashes were nearly evenly distributed between intersection and midblock locations (Figure 5).

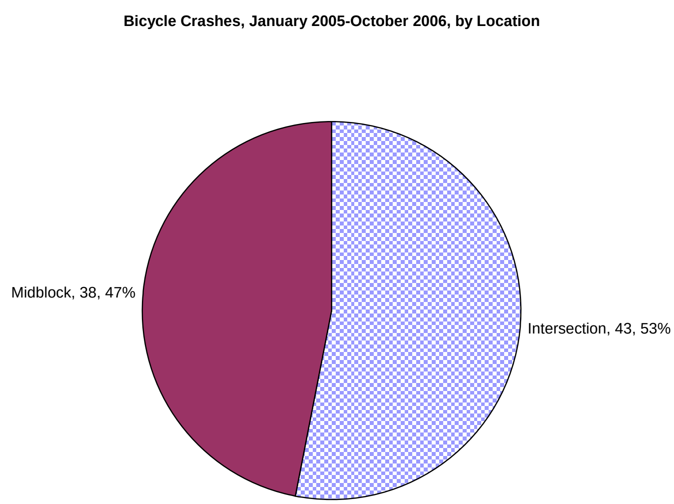


Figure 5 Intersection and midblock bicycle crashes

Bicyclists were most commonly between 18 and 44 years of age (Figure 6).

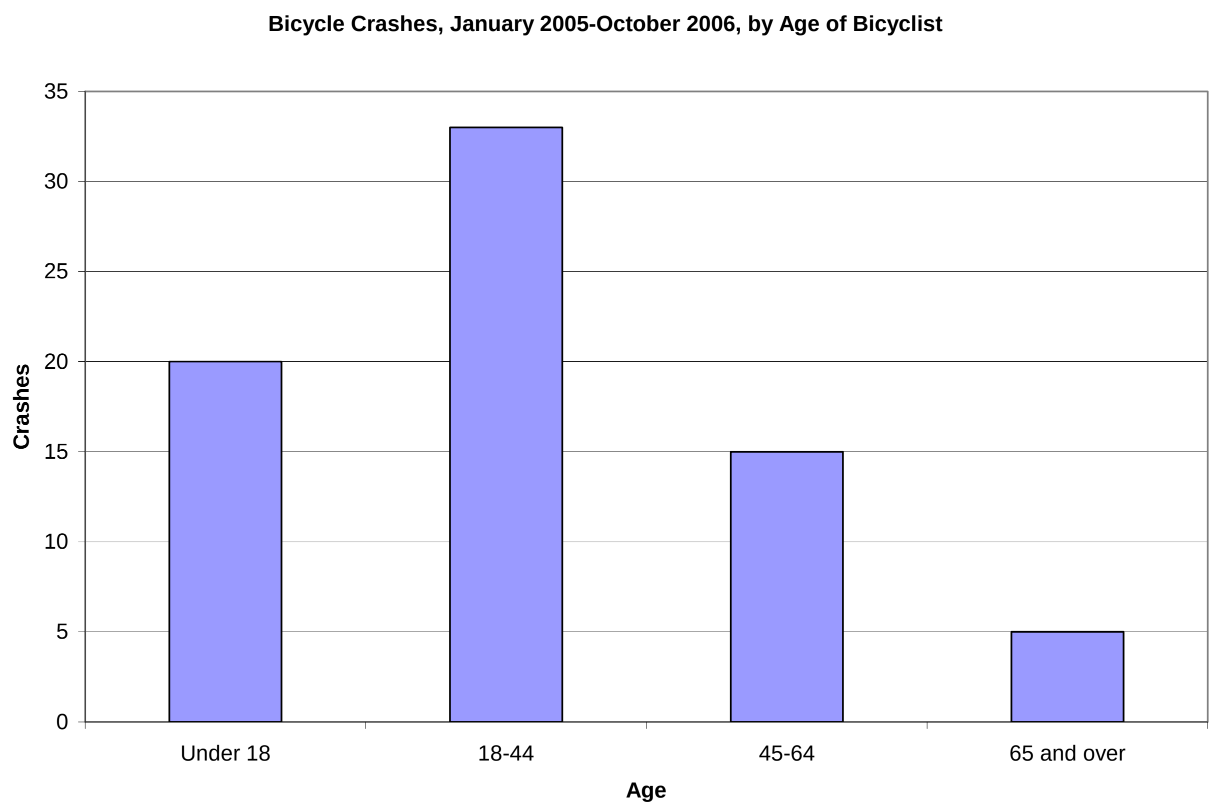


Figure 6 Age

The majority of bicyclists had no apparent defects in their physical condition (Figure 7).

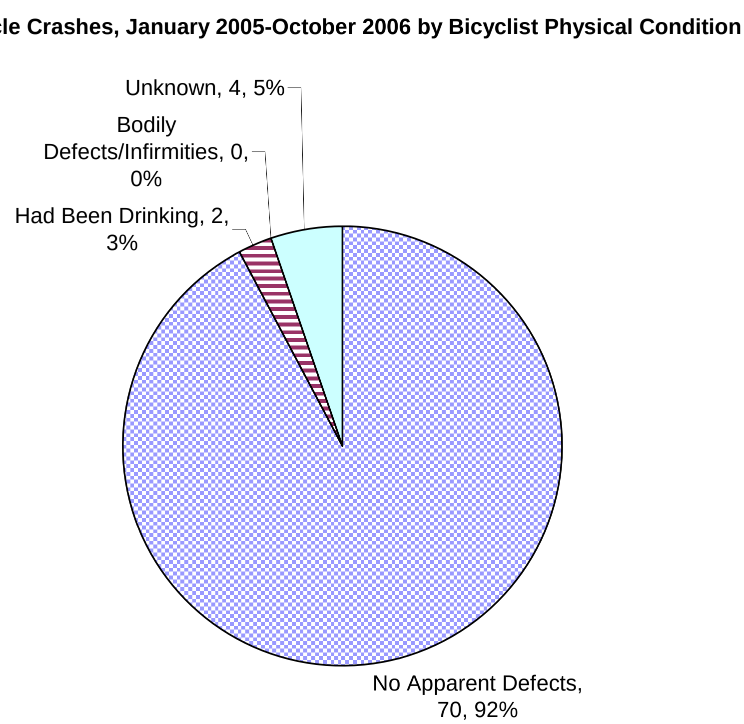


Figure 7 Physical condition

Compared to Maricopa County as a whole, Scottsdale's bicycle crash rate in 2005 (crashes per 100,000 population) and bicyclist fatality rate (fatalities per 100,000 population) are considerably lower (Figure 8).[1]

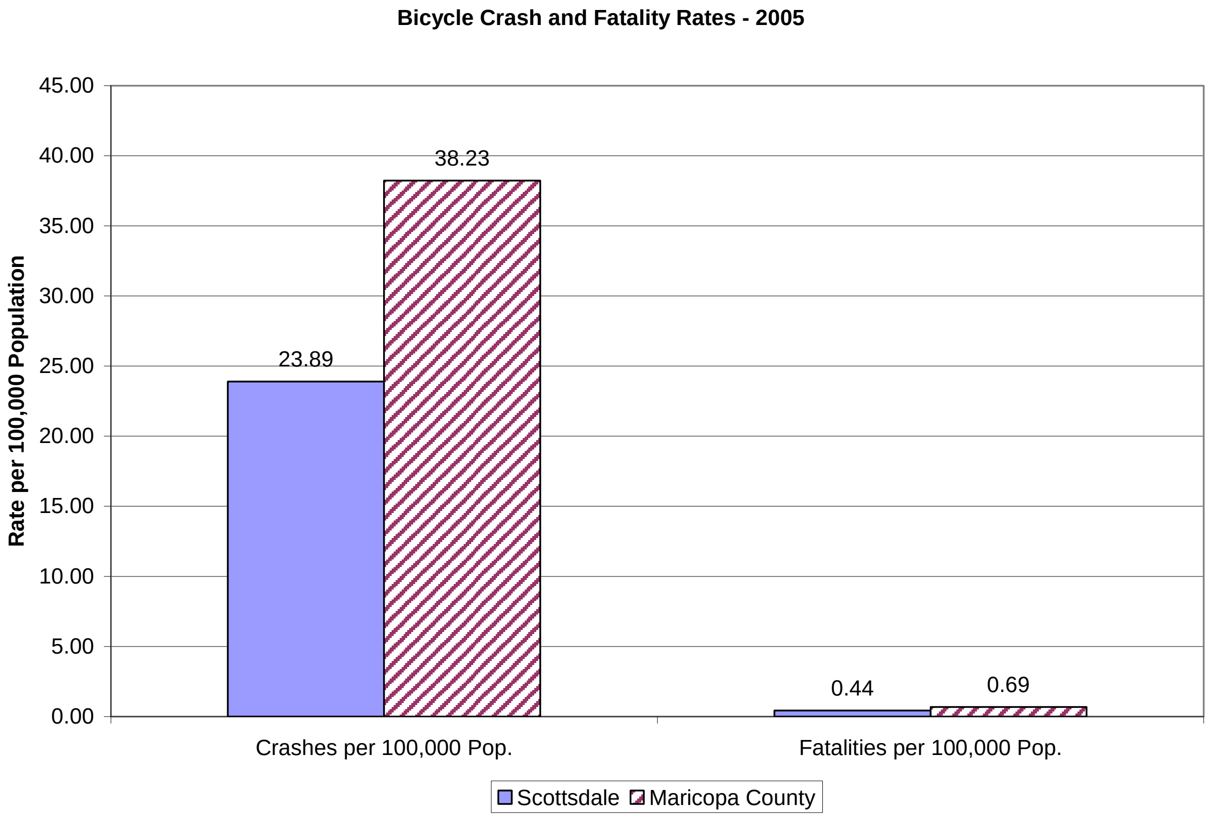


Figure 8 Bicycle crash and fatality rates in Scottsdale and Maricopa County

Discussion of the General Crash Data Analysis

First, while the general analysis by time of day (Figure 4) provides a temporal context, it is recommended that an analysis of crashes by light condition (daylight, dawn, dusk, dark with street lights, dark without streetlights) be performed. The results could suggest engineering countermeasures (such as installing streetlights), educational countermeasures (such as conveying the importance of being seen at night to bicyclists), and enforcement countermeasures.

Second, crashes were nearly evenly distributed between intersections and midblock locations (Figure 5). A more thorough analysis of bicyclist and motorist behaviors could indicate, for example, the need for educating bicyclists on the importance of riding with traffic, the need for educating motorists on the importance of scanning for bicyclists before making a turn, or the need for installing bicyclist-activated traffic signals.

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[1] Maricopa County pedestrian crash data are available online at http://www.mag.maricopa.gov/archive/safetywebcrashdata/bikecrashtrend99_05.htm

Third, many bicyclists involved in crashes were under age 18 (Figure 6). A more detailed examination of the crash circumstances is recommended. Based on the results, bicyclist safety education in schools or more aggressive enforcement of motor vehicle traffic laws around schools might be in order.

Hard Copy Crash Report Reviews

In addition to the review of the computerized crash dataset, thirty-three hard copy crash reports were reviewed. These crashes were selected because they occurred on the following streets that City staff identified as being of interest: Indian School Road, Thomas Road, McDowell Road, and Scottsdale Road between Indian School Road and Thomas. All of the crash reports were read to determine root causes for the crashes, similar characteristics among the crashes, and potential countermeasures to prevent like crashes in the future. The findings of these reviews are discussed below.

The review of the crashes yielded a clear trend in the bicycle crashes occurring within the study area (Figure 9). Sixty-four percent of the crashes (21 of 33) involved motorists colliding with bicyclists riding against traffic on the sidewalk. An additional 15 percent (5 of 33) involved motorists colliding with cyclists riding against traffic on the roadway. In these crashes, motorists were most often exiting a side street or driveway onto the main road and failed to scan to the left for any approaching bicyclists or pedestrians coming from that direction. In one of these crashes, the cyclist crossed a side street against a don’t walk signal. This preponderance of “cyclists riding against traffic” crashes illustrates the potential hazards associated with riding where motorists are not scanning for conflicting traffic.

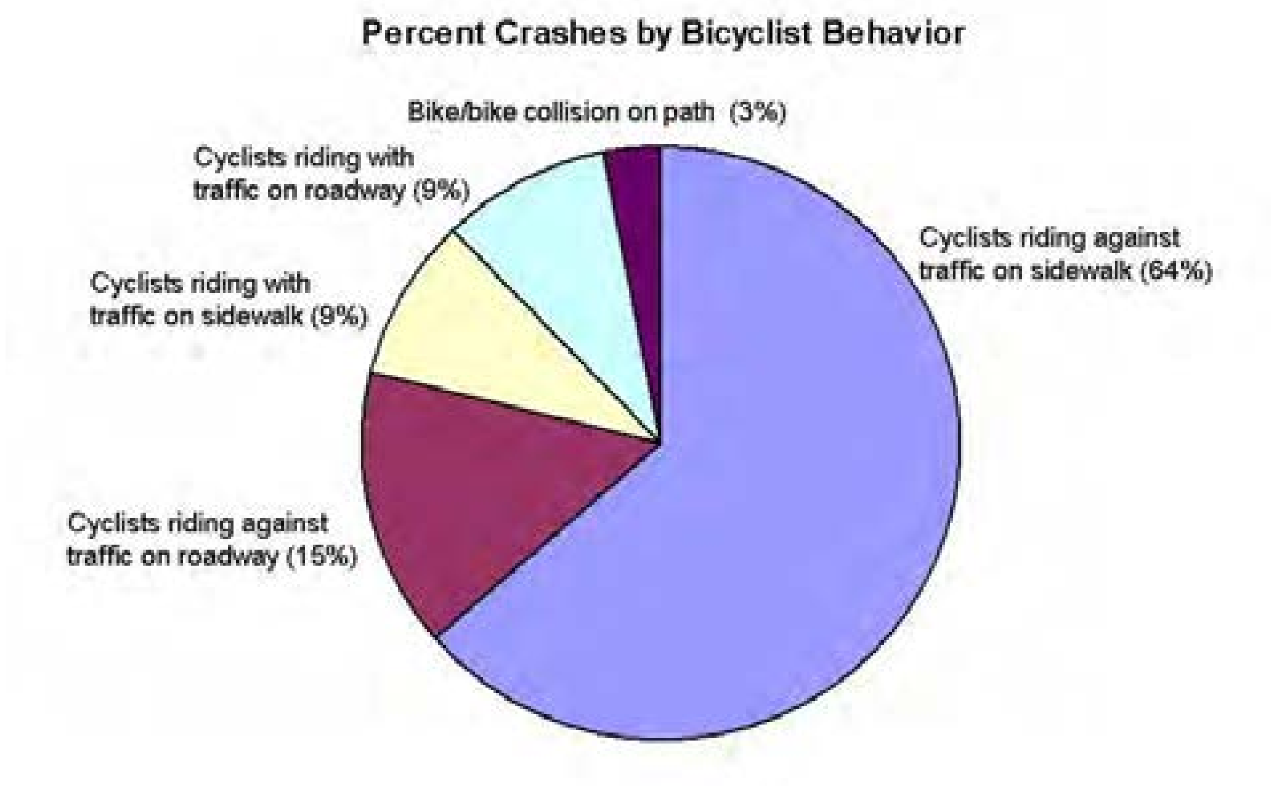


Figure 9 Crashes by bicyclist behavior

The potential for crashes resulting from incomplete/insufficient scanning on the part of motorists is further illustrated by the next most frequent crash type – cyclists riding with traffic on the sidewalk. In these crashes the motorists failed to yield to bicyclists approaching on the sidewalk or in the crosswalk. One of these crashes involved a permitted left turn at a signalized intersection. Another occurred when a motorist turned left into a driveway. The third was a cyclist-only crash; however, it involved a cyclist who fell when he hit a curb while avoiding a car pulled across the crosswalk.

Three crashes involved cyclists riding on the roadway, with traffic. In one crash, the cyclist swerved off a sidewalk, out from behind a parked car and into the path of an overtaking motor vehicle. In another, the cyclist swerved off the sidewalk directly into the path of an overtaking motor vehicle. Both of these crash reports mentioned witnesses who confirmed the actions of the cyclists. The final crash involving a cyclist who was riding in the roadway with traffic was a hit-and-run crash. It occurred at 1:30 in the morning and involved an intoxicated left-turning motorist hitting a cyclist. The roadway (Thomas Road) is reported to be lit with functioning street lamps; the crash report does not note whether or not the bicycle was fitted with a headlamp.

The final crash involved two cyclists riding on a pathway. The crash occurred on a pathway when one cyclist moved left of center and had a head on collision with an oncoming cyclist.

Five of the crashes (15 percent) occurred under "dark with street lights" conditions. In none of these crashes do the police officers note defective lighting for the bicyclists on the crash report. This could be taken to mean that all the bicyclists were using headlamps when involved in their respective crashes. This, however, is unlikely, because it is rare for a crash report to indicate whether or not a cyclist was using a light unless the cyclist is using a light. Consequently, it is believed that the lack of headlamps on the bicycles may have contributed to the crashes.

Recommended Countermeasures

Countermeasures are more effective if they are implemented citywide, rather than only on specific streets or at specific intersections. The following two sections describe educational and enforcement countermeasures that target bicyclist behaviors such as riding against traffic and riding at night without lights.

Figure 10 The dangers of riding on the sidewalk

Educational Countermeasures

Educational countermeasures will have a greater effect if they are implemented across the city. Consequently, we recommend a broad application of these campaigns with greater saturation within the high crash areas.

THE DANGERS OF RIDING AGAINST TRAFFIC & MOTORIST YIELD TO SIDEWALK TRAFFIC

Riding against traffic, either on the sidewalk or on the roadway is fairly common practice in Scottsdale. Despite the dangers of riding on the sidewalk (Figure 10), especially against traffic, it is recognized that sidewalk riding will continue because many people simply are not comfortable riding bikes on the roadway with motor vehicles. Additionally, cyclists cannot be expected to cross a multi-lane roadway to get to a sidewalk so they can ride in the same direction as cars in the adjacent travel lane. Thus, it is imperative that cyclists who chose to ride on the sidewalk be aware of the hazards associated with this practice. Driver- and cyclist-targeted campaigns with graphics representing Scottsdale are recommended; this representation would include location, demographics, and language. It is also important to target motorists with these campaigns to make the drivers aware that they need to scan for traffic on the sidewalk. To maximize the potential for reducing crashes, these campaigns must be run concurrently.

RIDING AT NIGHT WITHOUT LIGHTS

Bicyclists operating at night without lights are nearly invisible to motorists – until it is too late. Even if a bicycle is properly fitted with reflectors, motorists coming from a side street will not see the cyclists until it is too late for the driver to react. Yet some bicyclists will choose to ride at night without lights, and they must be made aware of the dangers they face in the dark. Reviews of as yet unpublished research papers show that a minimal (time) amount of exposure to conspicuity issues results in a much increased appreciation of how well motorists can see bicyclists at night. Applying this potential increase in awareness to the Scottsdale bicycle crash problem is recommended. Informational posters (Figure 11) showing sight distances for various colors of clothing and illustrating the limitations of reflectors may provide cyclists (and pedestrians) the information they need to make better choices when choosing gaps to cross the road or when anticipating driver behaviors at driveways and intersections.

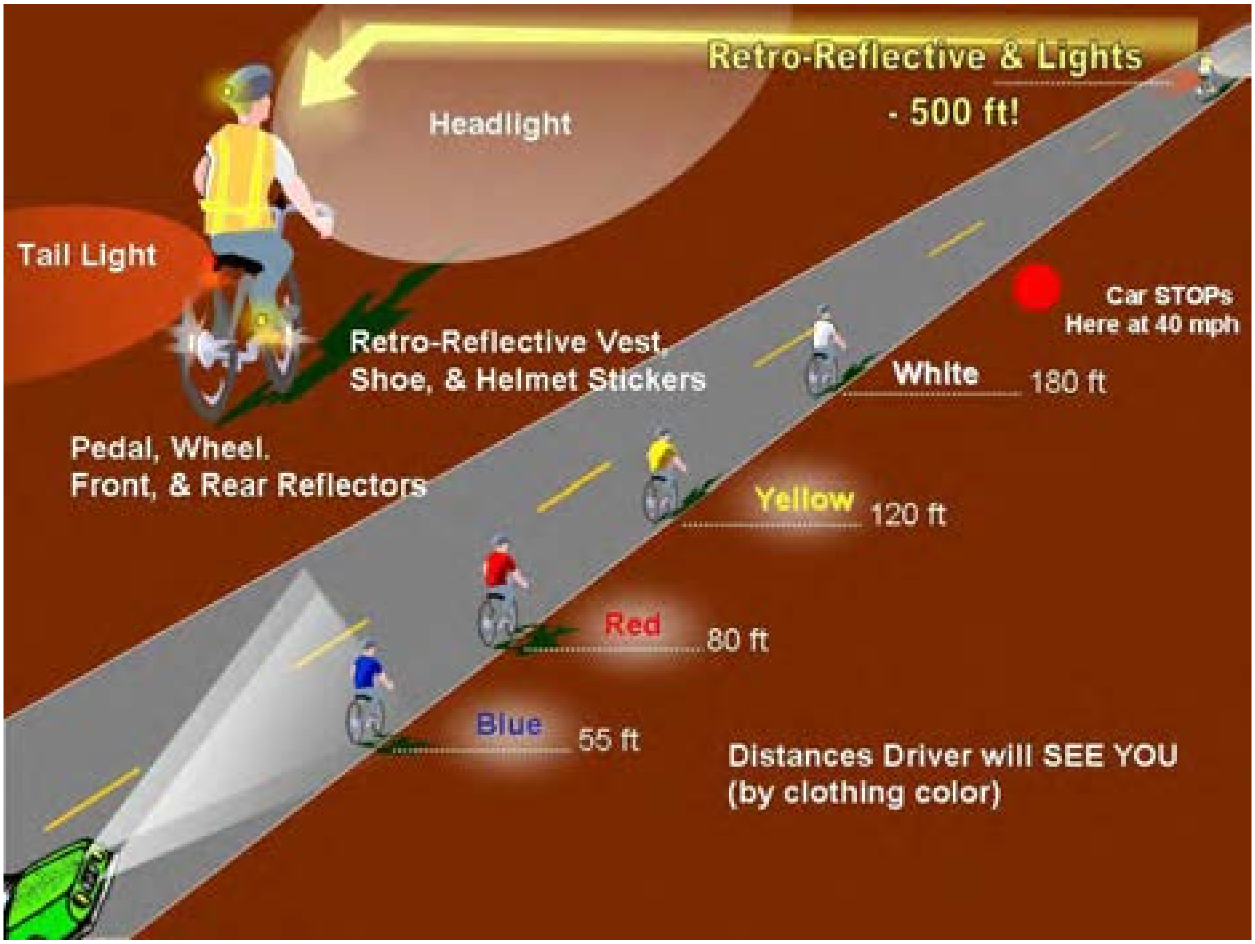


Figure 11 Informational poster illustrating bicyclist visibility at night

Enforcement Countermeasures

The effort to enforce the traffic laws as they relate to bicycle safety should be addressed in an overall, coordinated, countywide bicycle enforcement campaign. Sporadic enforcement will not result in significant improvements to cyclist behavior and will likely result in resentment of law enforcement personnel. Those behaviors to be targeted should be determined at the outset of the law enforcement campaign.

The following behaviors should be targeted:

- riding against traffic on the roadway,
- failure to yield to pedestrians and cyclists riding on the sidewalk,
- riding at night without lights, and
- violating traffic signals.

These four behaviors were chosen for two reasons. First, they represent particularly hazardous behaviors which result in many crashes. Secondly, and very importantly, the enforcement of these behaviors is easy to justify to the public. When coupled with (and in fact preceded by) a large scale education campaign, the public will understand the importance of the campaign and consequently will accept the enforcement activity.

Transportation Master Plan
Bicycle Element

Appendix 6-C
Bicycle Level of Service and Prioritization Results

Appendix C: City of Scottsdale Bicycle LOS and Prioritization Results

Seg ID	Road Name	From	To	Length (mi)	Dir.	Lanes (L) Th #	Lanes (L) Con	YR 2004 Roadway ADT	Tks. (HV) (%)	Post. Spd. (SP_p) mph	Width Of Pavement W_t (ft)	Width Of Pavement W_l (ft)	Occ. Park. (OSPA) (%)	Pavecon PC_t (1..5)	Pavecon PC_l (1..5)	Cross Sec. (C/S)	Bicycle LOS Score (0..7)	Bicycle LOS Grade (A..F)	Latent Demand	Improved LOS	Delta LOS	100% Delta LOS	Recommended Facility Improvement	Improvement Cost (per mile)	Benefit-Cost Index
5	Hayden	Chaparral	McDonald	1.0	N	6	D	33,450	4	45	10.0	0.0	0	4.5	0.0	C	**4.89**	**E**	100	3.86	1.03	29	Restripe	$8,500	1520
33	Scottsdale	Drinkwater	Chaparral	0.6	N	6	D	39,200	4	40	11.0	0.0	0	3.5	0.0	C	**5.02**	**E**	100	4.10	0.92	26	Restripe	$8,500	1483
57	94th / Thompson	Thunderbird	100th	1.0	S	6	D	15,850	4	40	12.0	0.0	0	4.0	0.0	C	**4.29**	**D**	100	3.39	0.90	25	Restripe	$8,500	1476
39	Camelback	64th	Scottsdale	1.0	E	6	D	27,600	4	35	14.0	0.0	0	3.5	0.0	C	**4.34**	**D**	100	3.51	0.83	24	Restripe	$8,500	1453
20	Thomas	Civic Center Plaza	84th	1.2	E	4	S	32,700	4	40	15.0	0.0	0	4.0	0.0	C	**4.46**	**D**	100	3.78	0.68	19	Restripe	$8,500	1403
29	Scottsdale	McKellips	McDowell	1.0	N	6	D	38,750	4	40	15.0	0.0	0	3.5	0.0	C	**4.50**	**D**	100	3.82	0.68	19	Restripe	$8,500	1403
3	Hayden	Thomas	Indian School	1.0	S	6	D	34,950	4	45	11.0	0.0	0	4.0	0.0	C	**4.91**	**E**	100	4.23	0.68	19	Restripe	$8,500	1403
22	64th	Osborn	Indian School	0.2	N	4	S	7,700	2	35	11.0	0.0	0	4.5	0.0	C	**3.60**	**D**	100	2.93	0.67	19	Restripe	$8,500	1400
30	Scottsdale	McDowell	Thomas	1.0	N	6	S	42,300	5	40	11.0	0.0	0	3.5	0.0	C	**5.31**	**E**	100	4.64	0.67	19	Restripe	$8,500	1400
41	Chaparral	82nd	Pima	0.7	W	4	S	25,850	4	40	11.0	0.0	0	4.5	0.0	C	**4.76**	**E**	100	4.09	0.67	19	Restripe	$8,500	1400
23	Indian School	60th	64th	0.5	E	4	S	21,200	4	40	12.0	0.0	0	4.5	0.0	C	**4.54**	**E**	100	3.98	0.56	16	Restripe	$8,500	1363
40	Camelback	Scottsdale	82nd	1.2	E	4	D	14,650	3	35	13.0	0.0	0	4.0	0.0	C	**3.98**	**D**	100	3.47	0.51	14	Restripe	$8,500	1346
24	Indian School	Drinkwater	Pima	1.7	W	4	S	35,750	4	40	15.0	0.0	0	3.0	0.0	C	**4.83**	**E**	100	4.34	0.49	14	Restripe	$8,500	1340
6	Hayden	McDonald	Indian Bend	1.0	N	6	D	30,900	4	45	10.0	0.0	0	4.5	0.0	C	**4.85**	**E**	80	3.82	1.03	29	Restripe	$8,500	1284
43	McDonald	W of Scottsdale	Granite Reef	1.6	E	4	S	20,900	4	40	12.0	0.0	0	4.0	0.0	C	**4.64**	**E**	90	4.00	0.64	18	Restripe	$8,500	1272
34	Scottsdale	McDonald	Indian Bend	2.0	N	6	D	54,400	5	45	9.0	0.0	0	4.0	0.0	C	**5.60**	**F**	70	4.38	1.22	35	Restripe	$8,500	1230
56	92nd / 94th	Shea	Thunderbird	2.1	N	4	D	14,025	4	40	12.5	0.0	0	4.0	0.0	C	**4.37**	**D**	80	3.71	0.66	19	Restripe	$8,500	1161
11	Pima	McDowell	Thomas	1.0	S	2	U	4,600	3	45	12.0	0.0	0	4.5	0.0	C	**3.97**	**D**	80	3.33	0.64	18	Restripe	$8,500	1154
79	FLW	Thunderbirird	Via Linda	2.6	NW	4	D	27,400	4	45	12.5	0.0	0	3.5	0.0	C	**4.97**	**E**	80	4.47	0.50	14	Restripe	$8,500	1108
7	Hayden	Indian Bend	Shea	3.3	N	6	D	35,820	4	45	12.0	0.0	0	4.5	0.0	C	**4.71**	**E**	70	3.90	0.81	23	Restripe	$8,500	1093
70	96th	Via Linda	Shea	0.7	S	4	D	7,950	3	45	11.5	0.0	0	4.5	0.0	C	**3.94**	**D**	70	3.15	0.79	22	Restripe	$8,500	1087
52	Via Linda	90th	Shea	2.5	E	4	D	22,300	4	40	11.5	0.0	0	4.5	0.0	C	**4.63**	**E**	70	3.85	0.78	22	Restripe	$8,500	1083
82	Thunderbird/ Redfield	Scottsdale	Hayden	1.1	E	2	S	19,800	3	35	16.5	0.0	0	3.5	0.0	C	**4.13**	**D**	60	3.18	0.95	27	Restripe	$8,500	1022
35	Scottsdale	Shea	FLW	3.9	S	6	D	43,900	5	45	11.0	0.0	0	3.0	0.0	C	**5.62**	**F**	60	4.69	0.93	26	Restripe	$8,500	1016
48	Via de Ventura	Hayden	Pima	0.4	W	4	D	25,100	4	40	12.0	0.0	0	4.5	0.0	C	**4.63**	**E**	70	4.07	0.56	16	Restripe	$8,500	1010
66	Shea	96th	City Limit	6.1	W	6	D	39,600	4	45	11.0	0.0	0	4.0	0.0	S	**4.97**	**E**	60	4.13	0.84	24	Restripe	$8,500	986
100	Dixileta	66th	Scottsdale	0.8	W	2	U	1,800	3	45	14.0	2.0	0	4.0	4.0	S	**2.60**	**C**	10	0.00	2.60	74	Restripe	$8,500	984
69	124th	Via Linda	Columbine	0.5	S	4	D	5,700	2	30	14.0	0.0	0	4.0	0.0	C	**2.41**	**B**	50	1.27	1.14	32	Restripe	$8,500	968
72	Cholla	92nd	96th	0.5	W	2	S	2,000	2	30	13.0	0.0	0	4.0	0.0	C	**2.99**	**C**	70	2.56	0.43	12	Restripe	$8,500	967
10	Hayden	Redfield	FLW	1.5	N	4	D	26,000	4	45	12.5	0.0	0	4.0	0.0	C	**4.79**	**E**	60	4.04	0.75	21	Restripe	$8,500	956
73	Cholla	96th	100th	0.5	W	2	S	600	2	30	23.5	0.0	0	4.5	0.0	S	**0.38**	**A**	70	0.00	0.38	11	Restripe	$8,500	950
55	Mountain View / 92nd	Scottsdale	Shea	3.3	E	4	D	13,450	4	40	12.0	0.0	0	4.0	0.0	C	**4.42**	**D**	60	3.69	0.73	21	Restripe	$8,500	949
16	Pima	Via de Ventura	101	0.8	S	4	U	11,400	4	45	12.0	0.0	0	4.0	0.0	C	**4.43**	**D**	60	3.71	0.72	20	Restripe	$8,500	946
81	Raintree	78th	Redfield	1.3	W	4	D	21,150	4	40	12.5	0.0	0	3.5	0.0	C	**4.73**	**E**	60	4.07	0.66	19	Restripe	$8,500	926
45	Indian Bend	Hayden	Pima	1.0	E	4	D	21,800	4	45	12.0	0.0	0	4.5	0.0	C	**4.66**	**E**	60	4.02	0.64	18	Restripe	$8,500	919
53	Via Linda	Shea	132nd	3.5	E	4	D	12,425	4	40	12.0	0.0	0	4.0	0.0	C	**4.38**	**D**	60	3.74	0.64	18	Restripe	$8,500	919
68	136th	Coyote	Cactus	0.2	N	2	S	5,400	2	30	16.0	0.0	0	4.0	0.0	S	**3.06**	**C**	50	2.14	0.92	26	Restripe	$8,500	895
15	Pima	Inner Circle	Via de Ventura	0.6	N	3	U	11,400	4	45	14.0	2.0	0	4.0	4.0	C	**4.17**	**D**	60	3.71	0.46	13	Restripe	$8,500	859

Appendix C: City of Scottsdale Bicycle LOS and Prioritization Results

Seg ID	Road Name	From	To	Length (mi)	Dir.	Lanes (L) Th #	Lanes (L) Con	YR 2004 Roadway ADT	Tks. (HV) (%)	Post. Spd. (SP_p) mph	Width Of Pavement W_t (ft)	Width Of Pavement W_l (ft)	Occ. Park. (OSPA) (%)	Pavecon PC_t (1..5)	Pavecon PC_l (1..5)	Cross Sec. (C/S)	Bicycle LOS Score (0..7)	Bicycle LOS Grade (A..F)	Latent Demand	Improved LOS	Delta LOS	100% Delta LOS	Recommended Facility Improvement	Improvement Cost (per mile)	Benefit-Cost Index
46	McCormick	Scottsdale	Hayden	1.3	E	4	D	6,300	3	40	11.0	0.0	0	5.0	0.0	C	**3.48**	**C**	50	2.73	0.75	21	Restripe	$8,500	838
78	FLW	Scottsdale	Thunderbird	3.9	NW	6	D	32,700	4	45	11.0	0.0	0	3.5	0.0	C	**5.03**	**E**	50	4.35	0.68	19	Restripe	$8,500	815
80	FLW	Via Linda	Shea	0.5	NW	4	D	22,700	4	40	12.0	0.0	0	3.5	0.0	C	**4.83**	**E**	50	4.19	0.64	18	Restripe	$8,500	802
49	Doubletree Ranch	Scottsdale	Hayden	2.0	W	4	D	18,450	4	40	12.0	0.0	0	4.5	0.0	C	**4.48**	**D**	50	3.92	0.56	16	Restripe	$8,500	775
121	Pinnacle Peak	Scottsdale	Country Club	1.6	W	2	S	16,250	4	45	13.0	2.0	0	4.0	4.0	S	**4.84**	**E**	30	3.88	0.96	27	Restripe	$8,500	673
108	Jomax	56th	Scottsdale	2.0	E	2	U	1,500	2	35	12.5	2.5	0	4.0	4.0	S	**1.57**	**B**	10	0.48	1.09	31	Restripe	$8,500	481
96	Carefree	56th	Scottsdale	1.9	E	2	U	14,600	4	45	15.0	2.5	0	4.5	4.5	S	**4.00**	**D**	30	3.72	0.28	8	Restripe	$8,500	446
88	Cave Creek	Desert Hills	Deer Trail	2.5	W	4	D	5,600	6	40	12.0	0.0	0	4.5	0.0	C	**3.90**	**D**	10	3.12	0.78	22	Restripe	$8,500	378
101	Dixileta	Scottsdale	Pima	2.0	W	2	U	1,800	3	40	13.0	0.0	0	4.5	0.0	S	**2.10**	**B**	10	1.36	0.74	21	Restripe	$8,500	364
112	Alma School	Happy Valley	Rio Verde	2.4	N	4	D	5,900	3	40	11.5	0.0	0	4.5	0.0	C	**3.33**	**C**	10	2.65	0.68	19	Restripe	$8,500	344
33A	Scottsdale	Chaparral	McDonald	1.0	N	6	D	45,500	5	40	15.0	0.0	0	4.0	0.0	C	**4.67**	**E**	10	3.99	0.68	19	Restripe	$8,500	344
12	Pima	Thomas	Chaparral	2.0	S	2	U	8,600	3	45	12.0	0.0	0	4.0	0.0	C	**4.39**	**D**	90	3.11	1.28	36	Add PS	$200,000	63
74	Cholla	104th	106th	0.3	W	2	U	600	2	30	9.5	0.0	0	4.0	0.0	C/S	**1.69**	**B**	70	0.00	1.69	48	Add PS	$200,000	59
13	Pima	Chaparral	Indian Bend	2.0	S	2	U	11,850	4	45	12.0	0.0	0	3.5	0.0	C	**4.96**	**E**	80	3.68	1.28	36	Add PS	$200,000	58
14	Pima	Indian Bend	Inner Circle	0.4	N	2	U	11,400	4	45	12.0	0.0	0	4.0	0.0	S	**4.78**	**E**	60	3.50	1.28	36	Add PS	$200,000	48
63	64th	Shea	Cholla	0.5	S	2	U	8,700	2	35	12.0	0.0	0	3.5	0.0	C/S	**4.15**	**D**	60	2.87	1.28	36	Add PS	$200,000	48
36	Scottsdale	FLW	Pinnacle Peak	4.2	W	4	S	46,520	4	50	11.5	0.0	0	3.5	0.0	S	**5.43**	**E**	40	4.19	1.24	35	Add PS	$200,000	38
44	Indian Bend	W of Scottsdale	Hayden	1.1	E	2	U	19,600	4	40	13.0	1.0	0	3.5	0.0	S	**4.98**	**E**	60	4.55	0.43	12	Add PS	$200,000	36
92	Stagecoach Pass	82nd	Pima	1.0	E	2	U	1,700	3	35	11.0	0.0	0	4.5	0.0	S	**2.49**	**B**	10	0.78	1.71	48	Add PS	$200,000	29
94	Stagecoach Pass	E of 97th	dead end	1.6	E	2	U	1,700	3	30	11.0	0.0	0	5.0	0.0	C/S	**2.27**	**B**	10	0.57	1.70	48	Add PS	$200,000	29
93	Stagecoach Pass	Pima	W of 97th	1.0	E	2	U	1,700	3	30	11.0	1.0	0	4.5	4.5	S	**2.58**	**C**	10	1.00	1.58	45	Add PS	$200,000	27
117	Happy Valley	Scottsdale	Hayden	1.0	W	2	U	2,600	3	40	11.0	0.0	0	4.0	0.0	S	**3.31**	**C**	10	1.80	1.51	43	Add PS	$200,000	26
21	Thomas	84th	Pima	0.5	E	4	S	28,550	4	40	11.0	0.0	0	4.0	0.0	C	**4.91**	**E**	100	2.00	2.91	82	DCS	FALSE	#DIV/0!
37	Scottsdale	Dove Valley	Carefree Hwy	1.0	N	4	D	21,500	5	50	13.0	0.0	0	4.5	0.0	S	**4.89**	**E**	10	3.53	1.36	39	Add PS	$200,000	24
4	Hayden	Indian School	Chaparral	1.0	S	6	D	36,000	4	45	11.0	0.0	0	4.5	0.0	C	**4.82**	**E**	100	2.00	2.82	80	DCS	FALSE	#DIV/0!
89	Lone Mountain	68th	Scottsdale	0.5	W	2	U	4,300	3	45	12.0	0.0	0	4.0	0.0	S	**4.04**	**D**	10	2.76	1.28	36	Add PS	$200,000	23
103	Rio Verde	Pima	W. of 118th	3.7	E	4	D	12,600	10	50	12.0	0.0	0	4.0	0.0	S	**6.54**	**F**	10	5.26	1.28	36	Add PS	$200,000	23
65	Shea	64th	96th	4.0	W	6	D	51,500	6	50	13.0	0.0	0	4.0	0.0	C	**5.53**	**F**	60	2.00	3.53	100	DCS	FALSE	#DIV/0!
8	Hayden	Shea	Cactus	1.0	N	4	S	22,500	4	45	11.5	0.0	0	4.0	0.0	C	**4.84**	**E**	70	2.00	2.84	80	DCS	FALSE	#DIV/0!
125	Pima	Country Club	Pinnacle Peak	0.5	S	4	D/U	36,000	5	50	14.0	2.0	0	4.0	4.0	S	**5.12**	**E**	10	4.10	1.02	29	Add PS	$200,000	19
104	Rio Verde	W. of 118th	E of 136th	3.2	E	2	U	9,100	7	50	14.0	2.5	0	4.0	4.0	S	**5.01**	**E**	10	4.17	0.84	24	Add PS	$200,000	17
64	64th	Cholla	Cactus	0.5	S	2	S	8,000	2	35	12.0	0.0	0	4.0	0.0	C	**3.95**	**D**	60	2.00	1.95	55	DCS	FALSE	#DIV/0!
83	Northsight / Thunderbird	Hayden	FLW	2.8	E	4	S	6,400	2	35	11.5	0.0	0	3.0	0.0	C	**3.88**	**D**	60	2.00	1.88	53	DCS	FALSE	#DIV/0!
38	Scottsdale	Carefree Hwy	Boulder Pass	0.5	N	4	D	21,500	4	35	11.5	0.0	0	4.5	0.0	C/S	**4.48**	**D**	10	3.86	0.62	18	Add PS	$200,000	14
122	Pinnacle Peak	Country Club	Pima	0.4	W	4	D	16,800	4	45	11.0	0.0	0	4.5	0.0	C	**4.65**	**E**	20	2.00	2.65	75	DCS	FALSE	#DIV/0!
67	136th	Via Linda	Coyote	0.2	S	4	D	5,400	2	30	11.0	0.0	0	4.0	0.0	C	**2.93**	**C**	50	2.00	0.93	26	DCS	FALSE	#DIV/0!
31	Scottsdale	Thomas	Goldwater	0.5	N	6	D/S	40,400	5	35	10.0	0.0	0	3.5	0.0	C	**5.24**	**E**	100	2.00	3.24	92	DCS	FALSE	#DIV/0!
28	Goldwater	Fashion Square	Scottsdale	1.3	S	3	OW	22,500	4	35	10.0	0.0	0	4.5	0.0	C	**4.75**	**E**	100	2.00	2.75	78	DCS	FALSE	#DIV/0!

Appendix C: City of Scottsdale Bicycle LOS and Prioritization Results

Seg ID	Road Name	From	To	Length (mi)	Dir.	Lanes (L) Th #	Con	YR 2004 Roadway ADT	Tks. (HV) (%)	Post. Spd. (SP_p) mph	Width Of Pavement W_t (ft)	W_l (ft)	Occ. Park. (OSPA) (%)	Pavecon PC_t (1..5)	PC_l (1..5)	Cross Sec. (C/S)	Bicycle LOS Score (0..7)	Grade (A..F)	Latent Demand	Improved LOS	Delta LOS	100% Delta LOS	Recommended Facility Improvement	Improvement Cost (per mile)	Benefit-Cost Index
19	Thomas	56	Civic Center Plaza	2.3	E	5	S	29,250	4	40	11.0	0.0	0	4.0	0.0	C	**4.72**	**E**	100	2.00	2.72	77	DCS	FALSE	#DIV/0!
2	Hayden	McKellips	Thomas	2.0	S	6	D	30,150	4	45	11.0	0.0	0	4.0	0.0	C	**4.83**	**E**	90	2.00	2.83	80	DCS	FALSE	#DIV/0!
27	Goldwater	Scottsdale	Fashion Square	0.4	S	5	D	22,500	4	35	10.0	0.0	0	4.5	0.0	C	**4.46**	**D**	100	2.00	2.46	70	DCS	FALSE	#DIV/0!
42	Chaparral	Scottsdale	Miller	0.5	W	4	S	19,200	3	35	11.0	0.0	0	4.0	0.0	C	**4.36**	**D**	100	2.00	2.36	67	DCS	FALSE	#DIV/0!
1	McKellips	Scottsdale	Pima Fwy	2.0	E	4	D/S	14,000	4	40	11.0	0.0	0	3.5	0.0	C	**4.70**	**E**	90	2.00	2.70	76	DCS	FALSE	#DIV/0!
32	Scottsdale	Goldwater	Drinkwater	0.8	N	4	U	27,650	4	25	12.0	0.0	0	3.5	0.0	C	**4.31**	**D**	100	2.00	2.31	65	DCS	FALSE	#DIV/0!
26	Drinkwater	Scottsdale	Scottsdale	1.4	N	5	D	14,000	3	35	10.0	0.0	0	4.5	0.0	C	**4.00**	**D**	100	2.00	2.00	57	DCS	FALSE	#DIV/0!
18	McDowell	64	84	2.5	W	6	D	34,800	4	45	11.0	0.0	0	4.0	0.0	C	**4.90**	**E**	70	2.00	2.90	82	DCS	FALSE	#DIV/0!
17	90th	101	Shea	1.3	N	4	S	22,150	4	40	10.0	0.0	0	4.0	0.0	C	**4.89**	**E**	70	2.00	2.89	82	DCS	FALSE	#DIV/0!
75	Cholla	106th	Via Linda	0.8	W	2	S	800	2	30	12.5	0.0	0	4.5	0.0	C	**2.52**	**C**	70	2.00	0.52	15	DCS	FALSE	#DIV/0!
25	Civic Center Plaza	Thomas	Civic Center Blvd	0.4	N	2	S	ND	ND	35	25.0	0.0	75	4.0	0.0	C	**N/A**	**N/A**	100	N/A	N/A	N/A	Restripe	$8,500	N/A
50	Via Linda	Hayden	87th	1.4	W	2	U	ND	5	25	18.0	0.0	0	4.5	0.0	C	**N/A**	**N/A**	70	N/A	N/A	N/A	Restripe	$8,500	N/A
51	Via Linda	87th	90th	0.3	W	2	S	ND	ND	25	14.5	1.5	0	4.5	0.0	C	**N/A**	**N/A**	70	N/A	N/A	N/A	Restripe	$8,500	N/A
58	Lakeview	Via Linda	Shea	0.7	N	2	S	ND	ND	35	13.5	0.0	0	3.5	0.0	C	**N/A**	**N/A**	70	N/A	N/A	N/A	Restripe	$8,500	N/A
59	Mescal / 74th	Scottsdale	Scottsdale	0.9	S/E	4	D	ND	ND	35	13.5	0.0	0	3.5	0.0	C	**N/A**	**N/A**	60	N/A	N/A	N/A	Restripe	$8,500	N/A
60	70th / Mescal	Scottsdale	Scottsdale	1.2	N/E	2	U	ND	ND	25	18.5	0.0	0	4.0	0.0	C	**N/A**	**N/A**	60	N/A	N/A	N/A	Restripe	$8,500	N/A
71	110th / Altadena	Shea	FLW	0.9	S	2	S	ND	ND	30	13.0	0.0	0	4.0	0.0	C	**N/A**	**N/A**	60	N/A	N/A	N/A	Restripe	$8,500	N/A
84	Greenway/ Hayden Loop	Scottsdale	FLW	1.3	SW	4	D	ND	ND	40	12.0	0.0	0	4.5	0.0	C	**N/A**	**N/A**	60	N/A	N/A	N/A	Restripe	$8,500	N/A
85	90th	Raintree	FLW	0.8	S	4	S	ND	ND	35	12.5	0.0	0	3.5	0.0	C	**N/A**	**N/A**	60	N/A	N/A	N/A	Restripe	$8,500	N/A
95	Westland	83rd	Pima	0.7	E	2	U	ND	ND	35	14.0	0.0	0	4.5	0.0	C	**N/A**	**N/A**	10	N/A	N/A	N/A	Restripe	$8,500	N/A
97	60th	Dove Valley	Carefree Hwy	1.0	N	4	U	ND	ND	35	12.0	0.0	0	4.5	0.0	C/S	**N/A**	**N/A**	20	N/A	N/A	N/A	Restripe	$8,500	N/A
115	Jomax	113th	116th	0.4	E	4	D	ND	ND	40	12.0	0.0	0	5.0	0.0	C	**N/A**	**N/A**	10	N/A	N/A	N/A	Restripe	$8,500	N/A
116	Jomax	116th	118th	0.2	E	2	U	ND	ND	30	11.0	0.0	0	4.5	0.0	S	**N/A**	**N/A**	10	N/A	N/A	N/A	Restripe	$8,500	N/A
120	Happy Valley	Alma School	118th	2.4	W	4	D	ND	ND	40	11.5	0.0	0	4.5	0.0	C	**N/A**	**N/A**	10	N/A	N/A	N/A	Restripe	$8,500	N/A
130	Paradise	98th	E of 100th	0.3	W	2	U	ND	ND	35	14.0	0.0	0	5.0	0.0	C	**N/A**	**N/A**	90	N/A	N/A	N/A	Restripe	$8,500	N/A
131	Paradise	E of 100th	Thompson Peak	0.4	W	2	S	ND	ND	30	16.5	0.0	0	4.5	0.0	C	**N/A**	**N/A**	90	N/A	N/A	N/A	Restripe	$8,500	N/A
132	78th	Greenway	FLW	0.7	S	2	S	ND	ND	30	13.5	0.0	0	4.0	0.0	C	**N/A**	**N/A**	60	N/A	N/A	N/A	Restripe	$8,500	N/A
133	Paradise	Scottsdale	Greenway Hayden Loop	1.0	E	2	S	3,500	ND	30	13.5	0.0	0	4.0	0.0	C	**N/A**	**N/A**	60	N/A	N/A	N/A	Restripe	$8,500	N/A
134	Greenway Road	73rd	79th	0.7	W	2	U	ND	ND	30	20.0	0.0	25	3.5	0.0	C	**N/A**	**N/A**	60	N/A	N/A	N/A	Restripe	$8,500	N/A
135	73rd / Dial	Paradise	Redfield	1.6	S	2	U	ND	ND	30	19.0	0.0	0	3.5	0.0	C	**N/A**	**N/A**	60	N/A	N/A	N/A	Restripe	$8,500	N/A
136	Butherus	Scottsdale	Airport	0.5	E	4	D	ND	ND	30	13.5	0.0	0	4.0	0.0	C	**N/A**	**N/A**	60	N/A	N/A	N/A	Restripe	$8,500	N/A
91	Lone Mountain	Via Cortana	Standing Stones	0.3	N	2	U	ND	ND	35	10.5	0.0	0	4.5	0.0	C/S	**N/A**	**N/A**	10	N/A	N/A	N/A	Add PS	$200,000	N/A
98	Dove Valley	56th	60th	0.5	E	2	S	ND	ND	30	12.0	0.0	0	4.0	0.0	S	**N/A**	**N/A**	20	N/A	N/A	N/A	Add PS	$200,000	N/A
99	Dove Valley	60th	62nd	0.3	E	2	U	ND	ND	30	11.5	2.0	0	4.5	0.0	C/S	**N/A**	**N/A**	20	N/A	N/A	N/A	Add PS	$200,000	N/A
107	64th	Jomax	Pinnacle Vista	0.5	S	2	U	ND	ND	25	11.5	0.0	0	4.0	0.0	S	**N/A**	**N/A**	10	N/A	N/A	N/A	Add PS	$200,000	N/A
110	Jomax	Pima	dead end	1.0	E	2	U	ND	ND	25	9.0	0.0	0	3.0	0.0	S	**N/A**	**N/A**	10	N/A	N/A	N/A	Add PS	$200,000	N/A
111	Alma School	dead end	Happy Valley	0.5	S	2	U	ND	ND	25	11.5	0.0	0	4.0	0.0	S	**N/A**	**N/A**	10	N/A	N/A	N/A	Add PS	$200,000	N/A
114	Jomax	Alma School	113th	0.8	W	2	U	ND	ND	40	12.0	0.0	0	4.5	0.0	S	**N/A**	**N/A**	10	N/A	N/A	N/A	Add PS	$200,000	N/A

Appendix C: City of Scottsdale Bicycle LOS and Prioritization Results

Seg ID	Road Name	From	To	Length (mi)	Dir.	Lanes (L) Th #	Lanes (L) Con	YR 2004 Roadway ADT	Tks. (HV) (%)	Post. Spd. (SP_p) mph	Width Of Pavement W_t (ft)	Width Of Pavement W_l (ft)	Occ. Park. (OSPA) (%)	Pavecon PC_t (1..5)	Pavecon PC_l (1..5)	Cross Sec. (C/S)	Bicycle LOS Score (0..7)	Bicycle LOS Grade (A..F)	Latent Demand	Improved LOS	Delta LOS	100% Delta LOS	Recommended Facility Improvement	Improvement Cost (per mile)	Benefit-Cost Index
123	Hayden	Deer Valley	Happy Valley	1.0	N	2	U	ND	ND	30	10.5	0.0	0	4.0	0.0	S	**N/A**	**N/A**	20	N/A	N/A	N/A	Add PS	$200,000	N/A
124	Miller	Pinnacle Peak	Parkview	0.6	S	2	U	ND	ND	25	10.5	0.0	0	3.0	0.0	S	**N/A**	**N/A**	10	N/A	N/A	N/A	Add PS	$200,000	N/A
126	Deer Valley	Scottsdale	Miller	0.5	E	2	U	ND	ND	30	10.0	0.0	0	4.0	0.0	C/S	**N/A**	**N/A**	30	N/A	N/A	N/A	Add PS	$200,000	N/A
129	94th	dead end	Bahia	0.3	S	2	S	ND	ND	25	12.0	0.0	0	4.0	0.0	C	**N/A**	**N/A**	70	N/A	N/A	N/A	Add PS	$200,000	N/A
47	Eastwood	Scottsdale	Doubletree Ranch	1.0	W	2	U	ND	ND	35	12.0	0.0	0	4.5	0.0	C	**N/A**	**N/A**	50	N/A	N/A	N/A	DCS	FALSE	N/A
76	84th	Desert Cove	Cholla	0.3	N	2	U	ND	ND	25	10.0	0.0	0	4.5	0.0	S	**N/A**	**N/A**	60	N/A	N/A	N/A	DCS	FALSE	N/A
105	56th	Pinnacle Vista	Dynamite	0.5	N	2	U	ND	ND	35	10.0	0.0	0	4.0	0.0	C	**N/A**	**N/A**	10	N/A	N/A	N/A	DCS	FALSE	N/A
128	Williams	Scottsdale	Pinnacle Peak	1.2	E/N	2	S	ND	ND	30	11.5	0.0	0	4.5	0.0	C	**N/A**	**N/A**	40	N/A	N/A	N/A	DCS	FALSE	N/A
86	Redfield	Raintree	FLW	1.1	E	4	S	ND	ND	30	10.5	0.0	0	3.5	0.0	C	**N/A**	**N/A**	60	N/A	N/A	N/A	DCS	FALSE	N/A
113	Alma School	Rio Verde	dead end	1.0	N	2	S	ND	ND	35	12.0	0.0	0	4.0	0.0	C	**N/A**	**N/A**	10	N/A	N/A	N/A	DCS	FALSE	N/A
127	79th	Miller	Williams	1.0	N	2	U	ND	ND	30	12.0	0.0	0	4.5	0.0	C	**N/A**	**N/A**	40	N/A	N/A	N/A	DCS	FALSE	N/A

Notes:

W_t = width of outside general tarvel lane plus any bike lane or paved shoulder

W_l = width of paving between the outside lane stripe and the edge of pavement, if any

OSPA = percentage of segment with occupied on-street parking

PCt = FHWA's five point pavement surface condition rating of the travel lane ("5" is new, "1" is poor)

PCl = FHWA's five point pavement surface condition rating of the shoulder ("5" is new, "1" is poor)

Cross Section: C=curbed, S=open shoulder

Transportation Master Plan
Bicycle Element

Appendix 6-D
Path Prioritization by Path ID Number

Appendix D: City of Scottsdale Path Prioritization Calculations by Path ID

Path ID	Name	From	To	Length (ft)	Length (mi)	Latent Demand	LOS	Connection SUPs	Connection Bike Lanes or Paved Shoulders	Connection Bike Routes	Connection Streets	Connection Future Paths	Connection Total	Connection Score (max 10)	Prioritization Score	Tier
1	South Corp Yard Path	Miller Rd	Indian Bend Wash	671	0.1	8	8	1	1	0	0	0	7.0	7.0	7.8	I
2	Granite Reef Path	McKellips Rd	Granite Reef Rd	1531	0.3	6	8	0	0	0	2	1	2.5	2.5	5.9	II
3	Papago Path	Granite Reef Rd	Pima Path	2732	0.5	6	8	1	0	0	0	1	4.5	4.5	6.3	II
4	Yavapai Path	Yavapai Elementary School	Indian Bend Wash	316	0.1	7	8	1	0	0	0	0	4.0	4.0	6.7	II
5	Crosscut Connection	Belleview St	Crosscut Canal	798	0.2	8	8	1	0	0	1	0	5.0	5.0	7.4	I
6	Indian Bend Path	McDowell Rd	Eldorado Aquatic Center	2726	0.5	9	8	1	1	0	0	1	7.5	7.5	8.4	I
7	Indian Bend Path	Eldorado Aquatic Center	Indian Bend Wash	851	0.2	9	8	2	1	1	1	1	14.0	10.0	8.9	I
8	Elm Dr Connector	Elm Dr	Granite Reef Senior Center	146	0.0	5	8	0	0	0	1	0	1.0	1.0	5.1	III
9	70th St Connection	Virginia Ave	Thomas Rd	1450	0.3	10	8	0	0	0	3	0	3.0	3.0	8.0	I
10	Thomas Rd Path	61st St	62nd St	342	0.1	9	8	0	0	0	2	0	2.0	2.0	7.3	I
11	Crosscut Connector	64th St	Crosscut Canal	426	0.1	10	8	1	1	0	1	0	8.0	8.0	9.0	I
12	Thomas Bike Stop	Thomas Rd	Indian Bend Wash	832	0.2	10	6	1	0	0	1	0	5.0	5.0	7.8	I
13	Thomas Rd Gap	Indian Bend Wash	Thomas Rd	304	0.1	10	6	1	0	0	1	0	5.0	5.0	7.8	I
14	Thomas Rd Path	Pima Park	Pima Path	623	0.1	10	8	1	0	0	0	0	4.0	4.0	8.2	I
15	Paiute Path	Avalon Dr	Osborn Rd	1423	0.3	9	8	0	0	1	1	0	2.5	2.5	7.4	I
16	Earll Path	81st Pl	82nd Pl	111	0.0	9	6	0	0	0	2	0	2.0	2.0	6.7	II
17	Osborn Path	Osborn Rd	Pima Rd	131	0.0	9	6	0	0	1	1	0	2.5	2.5	6.8	II
18	Columbus Path	Columbus Ave	Granite Reef Rd	48	0.0	9	8	0	0	0	2	0	2.0	2.0	7.3	I
19	Civic Center Path	Drinkwater Bl	75th St	666	0.1	9	6	0	0	1	2	0	3.5	3.5	7.0	I
20	2nd St Path	75th St	Indian Bend Wash	1392	0.3	10	6	1	1	0	1	1	8.5	8.5	8.5	I
21	Main Street Path	78th St	Indian Bend Wash	246	0.0	9	8	1	0	0	1	0	5.0	5.0	7.9	I
22	Indian School Path	Bashas Market	81st St	135	0.0	10	2	0	1	0	1	0	4.0	4.0	6.4	II
23	Crosscut Path	Catalina Dr	Thomas Rd	508	0.1	10	8	1	1	0	1	1	8.5	8.5	9.1	I
24	Crosscut Canal Path	Thomas Rd	Indian School Rd	3683	0.7	10	8	0	2	0	0	3	7.5	7.5	8.9	I
25	Arizona Canal Path	60th St	64th St	2765	0.5	10	8	0	1	0	1	3	5.5	5.5	8.5	I
26	Arizona Canal Path	64th St	Goldwater Bl	4694	0.9	10	8	0	0	1	0	4	3.5	3.5	8.1	I
27	68th Street Bridge	Lafayette Bl	Indian School Rd	367	0.1	9	8	0	2	1	0	1	8.0	8.0	8.5	I
28	Arizona Canal Path	Goldwater Bl	Scottsdale Rd	2078	0.4	10	8	0	0	0	4	2	5.0	5.0	8.4	I
29	Arizona Canal Path	Scottsdale Rd	Chaparral Rd	3400	0.6	10	8	0	0	0	3	2	4.0	4.0	8.2	I
30	Arizona Canal Path	Chaparral Rd	McDonald Dr	5444	1.0	10	8	0	1	0	2	5	7.5	7.5	8.9	I
31	Miller Connection	Arizona Canal	Miller Rd	68	0.0	9	8	0	1	0	0	1	3.5	3.5	7.6	I
32	Jackrabbit Path	Arizona Canal	Miller Rd	170	0.0	9	8	0	1	0	0	1	3.5	3.5	7.6	I
33	Jackrabbit Bridge	Arizona Canal at Jackrabbit Rd		181	0.0	9	8	1	1	1	0	2	9.5	9.5	8.8	I
34	San Miguel Path	Arizona Canal	76th Pl	132	0.0	9	8	0	0	0	1	1	1.5	1.5	7.2	I
35	Arizona Canal Path	McDonald Rd	Indian Bend Wash	4148	0.8	8	8	2	0	0	0	3	9.5	9.5	8.3	I
36	Lincoln Path	Arizona Canal	78th St	501	0.1	6	8	1	0	1	0	1	6.0	6.0	6.6	II
37	Lincoln Path	Indian Bend Wash	79th St	822	0.2	7	8	2	0	0	1	0	9.0	9.0	7.7	I
38	Indian Bend Path	Silverado Golf Course	Indian Bend Rd	1661	0.3	6	8	2	0	0	1	1	9.5	9.5	7.3	I
39	Hayden Tunnel 2	Hayden Rd at Coolidge		141	0.0	10	8	1	0	0	0	1	4.5	4.5	8.3	I
40	Hayden Tunnel	Hayden Rd at Chaparral		174	0.0	10	8	1	0	0	0	1	4.5	4.5	8.3	I
41	Indian Bend Path	Chaparral Rd	Jackrabbit Rd	2932	0.6	10	8	2	2	0	0	0	14.0	10.0	9.4	I
42	Vista Path	Chaparral Park	Vista Dr	52	0.0	9	8	1	0	0	1	0	5.0	5.0	7.9	I
43	Jackrabbit Path	Indian Bend Path	Jackrabbit Rd	113	0.0	9	8	0	0	1	1	0	2.5	2.5	7.4	I
44	Chaparral Path	Chaparral Park Path	McDonald	2224	0.4	10	8	1	0	0	1	1	5.5	5.5	8.5	I
45	Chaparral Path	McDonald Dr	Valley Vista Dr	632	0.1	8	8	0	0	0	2	2	3.0	3.0	7.0	I
46	Valley Vista Path	Hayden Rd	82nd St	1223	0.2	8	8	0	0	0	3	2	4.0	4.0	7.2	I
47	82nd St Path	Valley Vista Dr	Redwing Rd	2544	0.5	8	8	1	0	1	4	1	10.0	10.0	8.4	I
48	Agua Linda Path	Agua Linda Park	Pima Path	217	0.0	7	8	1	0	0	0	0	4.0	4.0	6.7	II
49	La Luna Connector	Via de La Luna	Pima Path	29	0.0	6	6	1	0	0	1	0	5.0	5.0	5.8	II
50	Joshua Tree Cnctr	Joshua Tree Ln	Pima Path	21	0.0	6	8	1	0	0	1	0	5.0	5.0	6.4	II
51	Sereno Connector	Via de Sereno	Pima Path	26	0.0	6	4	1	0	0	1	0	5.0	5.0	5.2	III
52	Dorado Connector	Via de Dorado	Pima Path	49	0.0	6	8	1	0	0	1	0	5.0	5.0	6.4	II
53	Inner Circle Cnctr	Inner Circle	Pima Path	12	0.0	6	6	1	0	0	0	0	4.0	4.0	5.6	III
54	Del Arbor Connector	Via del Arbor	Pima Path	54	0.0	6	6	1	0	0	1	0	5.0	5.0	5.8	II

Appendix D: City of Scottsdale Path Prioritization Calculations by Path ID

Path ID	Name	From	To	Length (ft)	Length (mi)	Latent Demand	LOS	Connection SUPs	Connection Bike Lanes or Paved Shoulders	Connection Bike Routes	Connection Streets	Connection Future Paths	Connection Total	Connection Score (max 10)	Prioritization Score	Tier
55	Taz Norte Connector	Via Taz Norte	Pima Path	14	0.0	6	4	1	0	0	1	0	5.0	5.0	5.2	III
56	McCormick Connector	Via de McCormick	Pima Path	19	0.0	6	6	1	0	0	1	0	5.0	5.0	5.8	II
57	Commercio Connector	Ranch Office	Pima Path	30	0.0	6	6	1	0	0	1	0	5.0	5.0	5.8	II
58	Ranch Connector	Ranch Office Park	Pima Path	34	0.0	6	6	1	0	0	0	0	4.0	4.0	5.6	III
59	Ranch Connector	Ranch Office Park	Pima Path	45	0.0	6	6	1	0	0	1	0	5.0	5.0	5.8	II
60	Ranch Connector	Ranch Office Park	Pima Path	19	0.0	6	6	1	0	0	1	0	5.0	5.0	5.8	II
61	Villa Vallarta Path	Villa de Vallarta	Pima Path	37	0.0	6	4	1	0	0	0	0	4.0	4.0	5.0	III
62	Villa Royale Path	Villa Royale	Pima Path	32	0.0	6	4	1	0	0	0	0	4.0	4.0	5.0	III
63	San Esteban Path	San Esteban Dr	Pima Path	78	0.0	6	6	1	0	0	1	0	5.0	5.0	5.8	II
64	87th Wy Connector	87th Wy	Pima Path	219	0.0	6	8	1	0	0	1	0	5.0	5.0	6.4	II
65	San Rafael Connector	San Rafael Dr	Pima Path	23	0.0	6	8	1	0	0	1	0	5.0	5.0	6.4	II
66	Rancho Antiqua Path2	Rancho Antigua	Pima Path	27	0.0	6	8	1	0	0	0	0	4.0	4.0	6.2	II
67	Rancho Antigua Path	Rancho Antigua	Pima Path	57	0.0	6	8	1	0	0	0	0	4.0	4.0	6.2	II
68	Pima Path	Mountain View Rd Crossing		84	0.0	6	6	2	0	0	0	0	8.0	8.0	6.4	II
69	Sun Canyon Connector	Sun Canyon	Pima Path	43	0.0	6	8	1	0	0	1	0	5.0	5.0	6.4	II
70	Casabella Connector	Casabella Condominiums	Pima Path	47	0.0	6	8	1	0	0	0	0	4.0	4.0	6.2	II
71	Mustang Connector	Mustang Tr	Pima Path	49	0.0	6	8	1	0	0	1	0	5.0	5.0	6.4	II
72	Arizona Canal Path	Hayden Rd	82nd St	1282	0.2	7	8	1	0	0	1	0	5.0	5.0	6.9	I
73	Arizona Canal Path	Hayden Rest Stop	Arizona Canal Path	70	0.0	7	8	1	0	0	0	0	4.0	4.0	6.7	II
74	Indian Bend Rd Path	Scottsdale Rd	Hayden Rd	5107	1.0	6	8	1	0	0	2	3	7.5	7.5	6.9	I
75	IBW West Path	Indian Bend Rd	Scottsdale Rd	3752	0.7	5	8	0	1	0	1	2	5.0	5.0	5.9	II
76	Scottsdale Rd Path	Indian Bend Wash	McCormick Py	1692	0.3	4	2	1	1	0	3	3	11.5	10.0	4.6	III
78	Indian Bend Path	Hayden Rd	Indian Bend Path	1178	0.2	5	4	2	0	0	2	1	10.5	10.0	5.7	II
79	McCormick Py Path	Scottsdale Rd	Indian Bend Path	6023	1.1	5	4	1	1	0	3	4	12.0	10.0	5.7	II
81	McCormick Path	Via Bonita	Doubletree Ranch Rd	922	0.2	5	6	1	0	0	4	0	8.0	8.0	5.9	II
82	Via de Ventura Path	Indian Bend Path	Doubletree Ranch Rd	2387	0.5	5	6	2	0	0	1	0	9.0	9.0	6.1	II
83	Paseo Path	Via Paseo Del Norte	Scottsdale McCormick Office Park	349	0.1	5	8	0	0	0	1	1	1.5	1.5	5.2	III
84	Paseo Path	Paseo Path	Via de Negocio	483	0.1	5	8	0	0	0	1	1	1.5	1.5	5.2	III
85	Ventura Path B	85th Wy	86th Pl	329	0.1	6	8	0	0	0	2	0	2.0	2.0	5.8	II
86	Ventura Path	85th Wy	86th Pl	423	0.1	6	8	0	0	0	2	0	2.0	2.0	5.8	II
87	Mountain View Path	68th Pl	Scottsdale Rd	2521	0.5	5	6	0	0	0	2	1	2.5	2.5	4.8	III
88	Mountain View Path	Scottsdale Rd	78th St	4148	0.8	5	6	0	0	1	3	1	5.0	5.0	5.3	III
89	Gainey Ranch Path	Mountain View Rd	Gold Dust Rd	2527	0.5	7	6	2	0	0	2	1	10.5	10.0	7.3	I
90	Gainey Ranch Path2	Mountain View Rd	Gold Dust Rd	2330	0.4	7	8	1	0	0	2	2	7.0	7.0	7.3	I
91	Gold Dust Path	West of Hayden Rd	Arabian Tr	1147	0.2	7	6	1	0	1	1	1	7.0	7.0	6.7	II
92	70th St Path	Mountain View Rd	Gold Dust Ave	1318	0.2	5	6	0	0	0	1	1	1.5	1.5	4.6	III
93	Gold Dust Path	68th Wy	70th St	1253	0.2	5	4	0	0	0	2	2	3.0	3.0	4.3	III
94	68th Pl Path	Gold Dust Ave	Shea Bl	1452	0.3	5	2	0	0	0	4	2	5.0	5.0	4.1	III
95	68th Pl Path	Shea Bl	Cholla St	2875	0.5	6	2	0	0	1	4	4	7.5	7.5	5.1	III
96	Mescal Path	68th Pl	68th Pl	1577	0.3	6	1	0	0	0	2	2	3.0	3.0	3.9	III
97	Cholla Path	66th St	68th Pl	1560	0.3	6	4	0	0	1	3	1	5.0	5.0	5.2	III
98	Gold Dust Gap	Gold Dust Ave	Gold Dust Ave	201	0.0	5	4	0	0	0	2	0	2.0	2.0	4.1	III
99	Mountain View Path	Mountain View Rd	Arabian Tr	2925	0.6	7	8	2	0	1	1	1	11.0	10.0	7.9	I
100	Irish Hunter Path	Mountain View Path	Arabian Tr	1371	0.3	6	6	1	0	1	3	1	9.0	9.0	6.6	II
101	Arabian Path	Irish Hunter Path	Arabian Tr	710	0.1	6	8	0	0	1	0	2	2.5	2.5	5.9	II
102	Arabian Path	Arabian Tr	Shea Bl	519	0.1	7	8	1	0	1	1	1	7.0	7.0	7.3	I
103	90th St Path	Bella Vista Path	Indian Bend Path	2707	0.5	7	8	1	0	0	3	1	7.5	7.5	7.4	I
104	Bella Vista Path	90th St	104th St	8690	1.6	7	8	0	0	0	0	4	2.0	2.0	6.3	II
105	100 Pl Connector	Bella Vista Path	100th Pl	52	0.0	5	4	0	0	0	1	1	1.5	1.5	4.0	III
106	Bella Vista Path	104th St	112th St	5309	1.0	6	8	0	0	0	0	4	2.0	2.0	5.8	II
107	Bella Vista Path	112th St	122nd St	6447	1.2	6	8	0	0	0	0	3	1.5	1.5	5.7	II
108	Bella Vista Path	122nd St	CAP Aqueduct	4625	0.9	6	8	0	0	0	0	3	1.5	1.5	5.7	II
109	Bella Vista Path	CAP Aqueduct	Shea Bl	10230	1.9	5	8	1	0	1	2	2	8.5	8.5	6.6	II
110	96th St Path	Bella Vista Path	Mission Ln	777	0.1	5	6	0	0	0	1	1	1.5	1.5	4.6	III

Appendix D: City of Scottsdale Path Prioritization Calculations by Path ID

Path ID	Name	From	To	Length (ft)	Length (mi)	Latent Demand	LOS	Connection SUPs	Connection Bike Lanes or Paved Shoulders	Connection Bike Routes	Connection Streets	Connection Future Paths	Connection Total	Connection Score (max 10)	Prioritization Score	Tier
111	104th St Path	Bella Vista Path	Mission Ln	581	0.1	5	8	0	0	0	1	2	2.0	2.0	5.3	III
112	104th St Path	Mission Ln	Via Linda	1748	0.3	6	8	0	1	0	2	2	6.0	6.0	6.6	II
113	104th St Path	Via Linda	Scottsdale Ranch Park	180	0.0	6	8	0	0	0	1	2	2.0	2.0	5.8	II
114	Sctsdl Ranch Path	104th St Path	Scottsdale Ranch Path	79	0.0	6	8	1	0	0	0	1	4.5	4.5	6.3	II
115	Via Linda Path	Mountain View Rd	Lakeview Dr	3920	0.7	7	8	1	1	0	2	2	10.0	10.0	7.9	I
116	ScRanchPk 2	Tennis Courts	Path	237	0.0	6	8	2	0	0	0	0	8.0	8.0	7.0	I
117	ScRanchPk 1	Path	Lakeview Dr	349	0.1	5	8	1	0	0	1	0	5.0	5.0	5.9	II
118	Lakeview Path	Via Linda	Laguna Elementary School	1734	0.3	7	8	1	0	0	1	3	6.5	6.5	7.2	I
119	Lakeview Path	Laguna Elementary School	Shea Bl	1709	0.3	6	8	1	0	0	4	1	8.5	8.5	7.1	I
120	Bella Vista Cnctr	Bella Vista Path	Bella Vista	435	0.1	5	8	0	0	0	1	1	1.5	1.5	5.2	III
121	Palomino Path	Bella Vista Path	117th Wy	5521	1.0	5	8	0	2	0	2	2	9.0	9.0	6.7	II
122	Doubletree Path	Power Line Path	Doubletree Ranch Rd	130	0.0	5	8	0	0	0	1	1	1.5	1.5	5.2	III
123	Power Line Path	Bella Vista Path	Shea Bl	6336	1.2	6	8	0	1	0	4	3	8.5	8.5	7.1	I
124	Powerline Path	Shea Bl	Cactus Rd	7064	1.3	5	8	1	0	0	11	3	16.5	10.0	6.9	I
125	CAP Path	Bella Vista Path	Shea	7953	1.5	6	8	0	0	1	3	4	6.5	6.5	6.7	II
126	CAP Path	Shea Bl	Via Linda	4327	0.8	6	8	1	0	0	2	2	7.0	7.0	6.8	II
127	CAP Path	Via Linda	Sweetwater Ave	9245	1.8	6	8	0	0	1	2	3	5.0	5.0	6.4	II
128	CAP Path	Sweetwater Ave	Thompson Peak Py	8784	1.7	8	8	0	1	1	1	3	7.0	7.0	7.8	I
129	CAP Path	Thompson Peak Py	Loop 101	7011	1.3	9	8	1	1	0	1	3	9.5	9.5	8.8	I
130	CAP Path	Loop 101	Hayden Rd	5177	1.0	5	8	0	2	0	0	2	7.0	7.0	6.3	II
131	CAP Path	Hayden Rd	Scottsdale Rd	5417	1.0	5	8	0	2	0	0	2	7.0	7.0	6.3	II
132	124th St Path	CAP Aqueduct	Cochise Dr	1681	0.3	6	8	0	0	1	2	2	4.5	4.5	6.3	II
133	124th St Path	Cochise Dr	Lost Dog Trailhead	6616	1.3	6	2	0	0	1	10	3	13.0	10.0	5.6	III
134	Mt View Connector	Camelback Walk	Mountain View Rd	401	0.1	6	6	1	0	0	1	0	5.0	5.0	5.8	II
135	Shea Path	64th St	Scottsdale Rd	5293	1.0	6	10	0	0	0	8	1	8.5	8.5	7.7	I
136	Shea Path	Scottsdale Rd	Hayden Rd	5263	1.0	5	10	1	0	0	5	2	10.0	10.0	7.5	I
137	Shea Path	Hayden Rd	Loop 101	4155	0.8	6	10	1	1	0	3	3	11.5	10.0	8.0	I
138	Shea Path	Loop 101	96th St	5356	1.0	6	10	2	1	1	4	0	16.5	10.0	8.0	I
139	Shea Path	96th St	104th St	5313	1.0	7	8	1	2	1	1	2	13.5	10.0	7.9	I
140	Shea Path	104th St	Frank Lloyd Wright Blvd	6569	1.2	6	8	0	2	1	3	2	11.5	10.0	7.4	I
141	Shea Path	Frank Lloyd Wright Bl	124th St	6614	1.3	6	8	1	1	1	3	3	13.0	10.0	7.4	I
142	Shea Path	124th St	136th St	8533	1.6	6	8	1	0	3	0	3	10.0	10.0	7.4	I
143	Arabian_Shea Path	Arabian Tr	Shea Bl	522	0.1	6	10	1	0	1	1	1	7.0	7.0	7.4	I
144	Shea Path	120th St	124th St	2634	0.5	6	8	1	0	1	2	2	8.5	8.5	7.1	I
145	Shea Path	124th St	132nd St	3623	0.7	6	8	0	0	1	2	3	5.0	5.0	6.4	II
146	Shea Path	132nd St	140th St	6590	1.2	6	8	0	0	1	2	2	4.5	4.5	6.3	II
147	Hayden Path	Shea Bl	Cactus Rd	5719	1.1	7	8	0	1	0	4	2	8.0	8.0	7.5	I
148	Hayden Path	Cactus Rd	Thunderbird Rd	5324	1.0	7	8	0	2	1	3	2	11.5	10.0	7.9	I
149	Hayden Path	Thunderbird Rd	Frank Lloyd Wright Bl	9941	1.9	5	8	0	1	0	9	4	14.0	10.0	6.9	I
150	Professional Gap	85th Pl	Scottsdale Professional	82	0.0	6	4	0	0	0	1	0	1.0	1.0	4.4	III
151	Pima Path	Shea Bl	Cactus Rd	5462	1.0	7	8	1	0	0	7	2	12.0	10.0	7.9	I
152	Pima Path	Cactus Rd	Thunderbird Rd	5614	1.1	7	6	1	1	1	2	2	11.5	10.0	7.3	I
153	Pima Path	Thunderbird Rd	Frank Lloyd Wright Bl	6728	1.3	7	6	0	1	0	4	3	8.5	8.5	7.0	I
154	Pima Path	Frank Lloyd Wright Bl	Bell Rd	6053	1.1	6	8	0	1	0	0	4	5.0	5.0	6.4	II
155	Pima Path	Loop 101	Power Line Path	3796	0.7	4	4	0	1	0	1	3	5.5	5.5	4.3	III
156	Pima Path	Overlook Dr	Los Gatos Dr	1649	0.3	3	2	1	0	0	1	2	6.0	6.0	3.3	III
157	Pima Path	Los Gatos Dr	Happy Valley Rd	9027	1.7	1	8	0	2	0	2	2	9.0	9.0	4.7	III
158	Pima Path	Happy Valley Rd	Jomax Rd	5190	1.0	1	6	0	1	0	0	2	4.0	4.0	3.1	III
159	Pima Path	Jomax Rd	Dynamite Bl	5192	1.0	1	6	0	2	0	0	2	7.0	7.0	3.7	III
160	Pima Path	Dynamite Bl	Dixileta Dr	5354	1.0	1	6	0	1	0	0	2	4.0	4.0	3.1	III
161	Pima Path	Dixileta Dr	Lone Mountain Rd	5433	1.0	1	4	0	1	0	1	2	5.0	5.0	2.7	III
162	Pima Path	Lone Mountain Rd	Westland Rd	8400	1.6	1	4	0	1	0	1	2	5.0	5.0	2.7	III
163	Pima Path	Westland Rd	Stagecoach Rd	7880	1.5	1	4	0	2	0	0	2	7.0	7.0	3.1	III
164	Indian Bend Path	92nd St	Cactus Rd	6329	1.2	7	6	2	1	1	4	1	17.0	10.0	7.3	I

Appendix D: City of Scottsdale Path Prioritization Calculations by Path ID

Path ID	Name	From	To	Length (ft)	Length (mi)	Latent Demand	LOS	Connection SUPs	Connection Bike Lanes or Paved Shoulders	Connection Bike Routes	Connection Streets	Connection Future Paths	Connection Total	Connection Score (max 10)	Prioritization Score	Tier
165	Cholla Path	94th St	108th St	9034	1.7	7	2	1	2	1	5	2	17.5	10.0	6.1	II
166	Cholla Path	108th St	Cholla Park	3396	0.6	5	6	2	0	1	3	0	12.5	10.0	6.3	II
167	Cactus Path	96th St	104th St	5304	1.0	7	6	1	2	1	3	2	15.5	10.0	7.3	I
168	Cactus Path	104th St	Frank Lloyd Wright Bl	4019	0.8	5	6	0	1	1	2	2	7.5	7.5	5.8	II
169	Bent Tree Path	110th St	Frank Lloyd Wright Bl	1036	0.2	5	6	1	0	0	1	1	5.5	5.5	5.4	III
170	132nd St Path	Shea Bl	Via Linda	3054	0.6	6	2	1	0	1	4	2	10.5	10.0	5.6	III
171	Mayo Path	Shea Bl	Cactus Rd	6224	1.2	6	2	0	1	0	5	2	9.0	9.0	5.4	III
172	Via Linda Path	124th St	136th St	7896	1.5	5	4	0	0	2	4	2	8.0	8.0	5.3	III
173	Via Linda Path	Hidden Hills		6884	1.3	5	4	0	0	1	0	1	2.0	2.0	4.1	III
174	128th St Path	Shea Bl	Cactus Rd	5618	1.1	6	2	0	0	0	5	3	6.5	6.5	4.9	III
175	Cactus Path	124th St	128th St	2542	0.5	6	2	0	0	0	3	2	4.0	4.0	4.4	III
176	Scottsdale Rd Path	Cactus Park	Sweetwater Ave	1478	0.3	8	10	1	0	0	1	0	5.0	5.0	8.0	I
177	Sweetwater Path	Scottsdale Rd	76th St	2568	0.5	8	2	0	0	0	3	2	4.0	4.0	5.4	III
178	76th St Path	Sweetwater Ave	Cotton Dr	1376	0.3	8	1	0	1	0	1	3	5.5	5.5	5.4	III
179	76th St Path	Sutton Dr	Thunderbird Rd	3906	0.7	7	6	0	0	0	4	2	5.0	5.0	6.3	II
180	73rd St Path	Sutton Dr	Thunderbird Rd	1449	0.3	7	8	0	0	0	2	2	3.0	3.0	6.5	II
181	Thunderbird Path	Thunderbird Rd	Redfield Rd	556	0.1	7	6	0	0	0	1	3	2.5	2.5	5.8	II
182	Thunderbird Path	Redfield Rd	Thunderbird Rd	1466	0.3	7	6	0	0	0	2	2	3.0	3.0	5.9	II
183	73rd St Path	Thunderbird Rd	Redfield Rd	1253	0.2	6	8	0	0	0	3	1	3.5	3.5	6.1	II
184	Thunderbird Path	76th St	Hayden Rd	2703	0.5	7	6	0	1	0	0	3	4.5	4.5	6.2	II
185	Thunderbird Path	Hayden Rd	Loop 101	4987	0.9	6	2	0	3	1	2	3	14.0	10.0	5.6	III
186	Northsight Path	Thunderbird Rd	Northsight Path	559	0.1	6	6	1	2	1	0	1	12.0	10.0	6.8	II
187	Redfield Path	Hayden Rd	Northsight Park	2602	0.5	5	6	0	0	0	1	2	2.0	2.0	4.7	III
188	82nd St Connector	82nd St	Redfield Path	309	0.1	5	6	0	0	0	1	1	1.5	1.5	4.6	III
189	Redfield Path	Northsight Park	Gelding Dr	590	0.1	6	6	0	0	0	2	2	3.0	3.0	5.4	III
190	Northsight Path	Northsight Path	Redfield Path	241	0.0	6	6	1	0	0	0	1	4.5	4.5	5.7	II
191	76th St Path	Greenway Rd	CAP Aqueduct	3916	0.7	7	10	0	0	0	6	1	6.5	6.5	7.8	I
192	Northsight Path	Hayden Rd	CAP Aqueduct	2206	0.4	10	8	0	0	0	2	3	3.5	3.5	8.1	I
193	FLW Path	82nd St	Northsight Path	1971	0.4	5	8	0	0	0	2	1	2.5	2.5	5.4	III
194	92nd St Path	Cactus Rd	Larkspur Dr	1311	0.2	7	6	0	0	0	1	1	1.5	1.5	5.6	III
195	Larkspur Path	Larkspur Dr	93rd St	986	0.2	7	6	0	0	0	2	1	2.5	2.5	5.8	II
196	92nd St Path	Larkspur Dr	Sweetwater Ave	1270	0.2	7	6	0	0	1	2	3	5.0	5.0	6.3	II
197	92nd St Path	Sweetwater Ave	Raintree Dr	5251	1.0	9	8	0	1	2	6	2	13.0	10.0	8.9	I
198	92nd St Path	Raintree Dr	Frank Lloyd Wright Bl	3149	0.6	9	8	0	1	1	3	2	8.5	8.5	8.6	I
199	100th St Path	Frank Lloyd Wright Bl	Thompson Peak Py	2499	0.5	9	8	1	2	0	0	0	10.0	10.0	8.9	I
200	FLW Path	Thunderbird Rd	Redfield Path	485	0.1	9	8	0	0	0	1	2	2.0	2.0	7.3	I
201	Sweetwater Path	89th St	96th St	4514	0.9	7	4	2	1	1	6	2	19.5	10.0	6.7	II
202	Sweetwater Path	96th St	Frank Lloyd Wright	5944	1.1	7	4	1	2	1	6	2	18.5	10.0	6.7	II
203	Presidio Path	96th St	97th St Path	1053	0.2	6	6	1	1	0	0	1	7.5	7.5	6.3	II
204	97th St Path	Sutton Dr	Presidio Rd	435	0.1	7	6	0	0	0	2	2	3.0	3.0	5.9	II
205	Presidio Path	Sutton Dr	100th St	2018	0.4	7	6	0	1	0	2	2	6.0	6.0	6.5	II
206	100th St Path	Aztec Elementary School	Frank Lloyd Wright	1559	0.3	7	8	0	1	0	1	2	5.0	5.0	6.9	I
207	100th St Path	Thompson Peak Py	Frank Lloyd Wright Bl	5097	1.0	8	8	0	3	0	0	3	10.5	10.0	8.4	I
208	97th St Path	Presidio Path	Thunderbird Rd	1711	0.3	7	6	0	0	0	1	2	2.0	2.0	5.7	II
209	Thunderbird Path	97th St Path	Frank Lloyd Wright Bl	510	0.1	8	6	0	0	0	2	2	3.0	3.0	6.4	II
210	Redfield Path	Frank Lloyd Wright Bl	100th St	1328	0.3	8	8	0	1	0	2	2	6.0	6.0	7.6	I
211	FLW Path	100th St	CAP Aqueduct	1520	0.3	7	8	0	1	0	0	2	4.0	4.0	6.7	II
212	Desert Canyon Path	WestWorld	Desert Canyon Path	1578	0.3	9	2	1	1	0	0	1	7.5	7.5	6.6	II
213	Desert Canyon Path	Thompson Peak Py	Desert Canyon Middle School	689	0.1	9	4	0	1	1	0	3	6.0	6.0	6.9	I
214	Desert Canyon Path	Desert Canyon Path	102nd St	762	0.1	9	4	1	0	1	0	1	6.0	6.0	6.9	I
215	Ranch Park Path	102nd St	Desert Canyon Path	2060	0.4	9	4	1	0	1	0	1	6.0	6.0	6.9	I
216	Scottsdale Rd Path	CAP Aqueduct	Loop 101	7627	1.4	4	8	0	0	0	4	4	6.0	6.0	5.6	III
217	Scottsdale Rd Path	Loop 101	Thompson Peak Py	3801	0.7	4	8	1	1	0	1	2	9.0	9.0	6.2	II
218	Scottsdale Rd Path	Deer Valley Rd	Pinnacle Peak Rd	5364	1.0	3	8	0	2	0	4	2	11.0	10.0	5.9	II

Appendix D: City of Scottsdale Path Prioritization Calculations by Path ID

Path ID	Name	From	To	Length (ft)	Length (mi)	Latent Demand	LOS	Connection SUPs	Connection Bike Lanes or Paved Shoulders	Connection Bike Routes	Connection Streets	Connection Future Paths	Connection Total	Connection Score (max 10)	Prioritization Score	Tier
219	Scottsdale Rd Path	Pinnacle Peak Rd	Happy Valley Rd	5257	1.0	2	8	0	0	0	4	2	5.0	5.0	4.4	III
220	Scottsdale Rd Path	Happy Valley Rd	Jomax Rd	4939	0.9	1	8	0	2	0	0	2	7.0	7.0	4.3	III
221	Scottsdale Rd Path	Jomax Rd	Dynamite Bl	5283	1.0	1	8	0	2	0	2	3	9.5	9.5	4.8	III
222	Scottsdale Rd Path	Dynamite BL	Dixileta Rd	5271	1.0	1	8	0	0	0	5	2	6.0	6.0	4.1	III
223	Scottsdale Rd Path	Dixileta Rd	Lone Mountain Rd	5205	1.0	1	8	0	0	0	1	2	2.0	2.0	3.3	III
224	Scottsdale Rd Path	Lone Mountain Rd	Carefree Hwy	10692	2.0	1	8	0	3	0	1	2	11.0	10.0	4.9	III
225	Hayden Path	CAP Aqueduct	Copper Basin Park	4008	0.8	5	4	2	2	0	1	3	16.5	10.0	5.7	II
226	Hayden Path	Copper Basin Park	Power Line Path	7693	1.5	5	4	1	1	0	3	4	12.0	10.0	5.7	II
227	Bell Path	Hayden Rd	Copper Basin Park	602	0.1	5	4	1	1	0	0	1	7.5	7.5	5.2	III
228	Bell Path	Copper Basin Park	Loop 101	3479	0.7	5	4	1	0	0	3	1	7.5	7.5	5.2	III
229	Bell Path	Loop 101	Power Line Path	2724	0.5	5	6	0	0	0	4	2	5.0	5.0	5.3	III
230	Bell Path	Power Line Path	Thompson Peak Py	6203	1.2	5	6	0	2	0	0	3	7.5	7.5	5.8	II
231	82nd St Path	Princess Dr	Union Hills Dr	1885	0.4	5	4	2	1	0	4	1	15.5	10.0	5.7	II
232	82nd St Path	Union Hills Dr	Loop 101	1371	0.3	5	4	0	0	0	2	3	3.5	3.5	4.4	III
233	Union Hills Path	Scottsdale Rd	Hayden Rd	5356	1.0	4	4	0	1	0	1	2	5.0	5.0	4.2	III
234	Union Hills Path	Hayden Rd	Loop 101	2855	0.5	5	4	0	1	0	2	4	7.0	7.0	5.1	III
235	Union Hills Tunnel	Loop 101		595	0.1	4	4	0	0	0	2	2	3.0	3.0	3.8	III
236	Union Hills Path	Loop 101	Power Line Path	1387	0.3	4	4	0	0	0	1	2	2.0	2.0	3.6	III
237	Loop 101 Path	Hayden Rd	Bell Rd	5399	1.0	5	8	0	3	0	1	4	12.0	10.0	6.9	I
238	Loop 101 Path	Scottsdale Rd	Hayden Rd	5374	1.0	5	8	0	1	0	1	1	4.5	4.5	5.8	II
239	Loop 101 Path	Hayden Rd	Princess Dr	5798	1.1	5	8	0	2	0	0	3	7.5	7.5	6.4	II
240	Loop 101 Path	Scottsdale Rd	Hayden Rd	5503	1.0	4	8	0	1	0	0	4	5.0	5.0	5.4	III
241	Pima Path	CAP Aqueduct	Bell Rd	3272	0.6	5	8	0	2	0	2	3	9.5	9.5	6.8	II
242	WestWorld Path	Loop 101	Power Line Path	4811	0.9	5	6	0	0	0	3	2	4.0	4.0	5.1	III
243	Power Line Path	WestWorld	Pima Rd	7881	1.5	5	4	1	3	0	0	6	16.0	10.0	5.7	II
244	Power Line Path	Pima Rd	Hayden Rd	7804	1.5	5	4	0	2	0	0	3	7.5	7.5	5.2	III
245	Power Line Path	Hayden Rd	Thompson Peak Py	3018	0.6	5	4	1	2	0	0	0	10.0	10.0	5.7	II
246	Powerline Path	74th St	Scottsdale Rd	4077	0.8	4	4	1	1	1	3	2	12.5	10.0	5.2	III
247	Thompson Peak Path	Hayden Rd	Pima Rd	5893	1.1	5	4	2	2	0	1	1	15.5	10.0	5.7	II
248	76th St Path	Loop 101	Thompson Peak Py	6247	1.2	4	6	1	1	1	1	2	10.5	10.0	5.8	II
249	Center Path	Scottsdale Rd	76th St Path	1192	0.2	4	6	0	0	0	1	2	2.0	2.0	4.2	III
250	94th St Path	Power Line Path	Bell Rd	854	0.2	5	6	0	1	0	0	2	4.0	4.0	5.1	III
251	Thompson Peak Path	Bell Path	Desert Activity Center	1586	0.3	5	4	0	0	0	1	1	1.5	1.5	4.0	III
252	Old Pima Path	Power Line Path	Hualapai Dr	4005	0.8	4	4	1	1	0	0	1	7.5	7.5	4.7	III
253	Horizon Crossing	Indian Bend Path	Horizon Park	193	0.0	9	8	1	1	0	0	0	7.0	7.0	8.3	I
254	Reata Path	Power Line Path	Union Hills Dr	7924	1.5	4	6	0	2	0	0	3	7.5	7.5	5.3	III
255	Reata Path	Union Hills Dr	Thompson Peak Py	7292	1.4	5	6	1	1	0	0	3	8.5	8.5	6.0	II
256	Reata Path	Thompson Peak Py	Adobe Dr	5360	1.0	4	6	0	1	0	0	2	4.0	4.0	4.6	III
257	Reata Path	Adobe Dr	Pinnacle Peak Rd	5257	1.0	3	6	0	1	0	0	2	4.0	4.0	4.1	III
258	Reata Path	Pinnacle Peak Rd	Happy Valley Rd	5909	1.1	1	6	0	1	0	2	2	6.0	6.0	3.5	III
259	Reata Path	Happy Valley Rd	Jomax Rd	6116	1.2	1	6	0	0	0	4	2	5.0	5.0	3.3	III
260	Reata Path	Jomax Rd	Rio Verde Dr	6279	1.2	1	6	0	1	0	2	2	6.0	6.0	3.5	III
261	Hualapai Path	Ironwood Path	Pima Acres Path	2487	0.5	3	1	1	0	0	0	1	4.5	4.5	2.7	III
262	Pima Acres Path	S of Hualapai Dr	Diamond Rim Dr	1810	0.3	4	4	0	0	0	1	1	1.5	1.5	3.5	III
263	Pima Acres Path	Diamond Rim Dr	Desert Camp Dr	1597	0.3	5	6	0	0	0	2	2	3.0	3.0	4.9	III
264	Desert Camp Path	Pima Acres Path	Thompson Peak Py	2195	0.4	5	6	2	1	0	1	1	12.5	10.0	6.3	II
265	94th St Connector	Sierra Pinta Dr	Desert Camp Dr	107	0.0	4	4	0	0	0	2	0	2.0	2.0	3.6	III
266	DC Ranch Path	Alma School Path	Copper Ridge Middle School	377	0.1	4	4	1	0	0	0	1	4.5	4.5	4.1	III
267	DC Ranch Path	DC Ranch Path	Thompson Peak Py	768	0.1	5	4	2	0	0	0	0	8.0	8.0	5.3	III
268	Thompson Peak Path	Thompson Peak Path	Wash Crossing	2772	0.5	5	4	1	1	0	0	1	7.5	7.5	5.2	III
269	Deer Valley Path	Existing sidewalk	Miller Rd	1069	0.2	3	4	2	2	0	0	1	14.5	10.0	4.7	III
270	Milller Path	Deer Valley Rd	Pinnacle Peak Rd	6322	1.2	3	2	2	1	0	5	1	16.5	10.0	4.1	III
271	Miller Path	Williams Dr	Pinnacle Peak Rd	2731	0.5	3	4	0	0	0	2	3	3.5	3.5	3.4	III
272	Miller Path	Pinnacle Peak Rd	Happy Valley Rd	5209	1.0	1	4	0	0	0	2	3	3.5	3.5	2.4	III

Appendix D: City of Scottsdale Path Prioritization Calculations by Path ID

Path ID	Name	From	To	Length (ft)	Length (mi)	Latent Demand	LOS	Connection SUPs	Connection Bike Lanes or Paved Shoulders	Connection Bike Routes	Connection Streets	Connection Future Paths	Connection Total	Connection Score (max 10)	Prioritization Score	Tier
273	Rawhide Path	Scottsdale Rd	Happy Valley Rd	7539	1.4	2	6	0	0	0	4	3	5.5	5.5	3.9	III
274	Happy Valley Path	Scottsdale Rd	Alma School Rd	20704	3.9	1	6	0	3	0	5	6	17.0	10.0	4.3	III
275	Rawhide Path	Happy Valley Rd	Jomax Rd	5222	1.0	1	2	0	1	0	1	1	4.5	4.5	2.0	III
276	Jomax Path	Jomax Rd	Alma School Rd	1421	0.3	1	2	0	0	0	2	2	3.0	3.0	1.7	III
277	Jomax Path	Pinnacle Peak Py	Alma School Rd	1317	0.2	1	2	0	1	0	1	2	5.0	5.0	2.1	III
278	56th St Path	Jomax Rd	Dynamite Bl	5320	1.0	1	1	0	0	0	4	2	5.0	5.0	1.8	III
279	Pinnacle Vista Path	56th St	64th St	5254	1.0	1	1	0	1	0	2	2	6.0	6.0	2.0	III
280	64th St Path	Pinnacle Vista Dr	Dynamite Bl	2580	0.5	1	4	0	0	0	2	2	3.0	3.0	2.3	III
281	Dynamite Path	56th St	Scottsdale Rd	10647	2.0	1	6	0	2	0	4	1	10.5	10.0	4.3	III
282	Dynamite Path	Scottsdale Rd	80th St	5172	1.0	1	2	0	1	0	1	3	5.5	5.5	2.2	III
283	Dynamite Path	80th St	Pima Rd	5389	1.0	1	2	0	1	0	1	3	5.5	5.5	2.2	III
284	Dynamite Path	Pima Rd	97th Pl	6190	1.2	1	10	0	2	0	2	2	9.0	9.0	5.3	III
285	Dynamite Path	97th Pl	Alma School Py	8978	1.7	1	10	0	0	0	4	2	5.0	5.0	4.5	III
286	Lone Mountain Path	Scottsdale Rd	Pima Rd	10360	2.0	1	4	0	2	0	1	2	8.0	8.0	3.3	III
287	Dove Valley Path	56th St	60th St	2798	0.5	3	6	0	0	0	2	2	3.0	3.0	3.9	III
288	60th St Path	Dove Valley Rd	Carefree Hwy	5178	1.0	3	6	0	0	0	6	3	7.5	7.5	4.8	III
289	Border Path	60th St	Scottsdale Rd	12678	2.4	1	8	0	1	0	2	2	6.0	6.0	4.1	III
290	Carefree Path	56th St	Scottsdale Rd	10068	1.9	3	8	0	0	0	4	2	5.0	5.0	4.9	III
291	Westland Path	Scottsdale Rd	Hayden Rd	5378	1.0	1	2	0	1	0	3	2	7.0	7.0	2.5	III
292	Westland Path	Hayden Rd	Pima Rd	5317	1.0	1	2	0	2	0	4	2	11.0	10.0	3.1	III
293	Westland Path	Pima Rd	92nd Pl	4830	0.9	1	2	0	2	0	2	3	9.5	9.5	3.0	III
294	Westland Path	92nd Pl	Stagecoach Rd	9050	1.7	1	2	0	1	0	6	1	9.5	9.5	3.0	III
295	Stagecoach Path	Pima Rd	Lone Mountain Py	13116	2.5	1	4	0	1	0	7	3	11.5	10.0	3.7	III
296	Lone Mountain Path	Stagecoach Rd	Cave Creek Rd	11089	2.1	1	4	0	1	0	6	2	10.0	10.0	3.7	III
297	Cave Creek Path	City Limits	Lone Mountain Py	8631	1.6	1	4	0	3	0	2	2	12.0	10.0	3.7	III
298	Cave Creek Path	Lone Mountain Py	112th Pl	7015	1.3	1	6	0	1	0	3	2	7.0	7.0	3.7	III
299	Cave Creek Path	112th Pl	City Limits	6172	1.2	1	6	0	0	0	1	1	1.5	1.5	2.6	III
300	Camelback Path	Camelback Rd	Chaparral Rd	2651	0.5	10	8	2	0	0	2	0	10.0	10.0	9.4	I
301	Shea Path	142nd St	City Limits	1342	0.3	6	8	1	0	0	1	0	5.0	5.0	6.4	II
302	IBW Osborn Bridge			213	0.0	10	6	2	0	0	1	0	9.0	9.0	8.6	I

Transportation Master Plan
Bicycle Element

Appendix 6-E
Path Prioritization by Tier/Priority

Appendix E: City of Scottsdale Path Prioritization Calculations by Tier

Path ID	Name	From	To	Length (ft)	Length (mi)	Latent Demand	LOS	Connection SUPs	Connection Bike Lanes or Paved Shoulders	Connection Bike Routes	Connection Streets	Connection Future Paths	Connection Total	Connection Score (max 10)	Prioritization Score	Tier
41	Indian Bend Path	Chaparral Rd	Jackrabbit Rd	2932	0.6	10	8	2	2	0	0	0	14.0	10.0	9.4	I
300	Camelback Path	Camelback Rd	Chaparral Rd	2651	0.5	10	8	2	0	0	2	0	10.0	10.0	9.4	I
23	Crosscut Path	Catalina Dr	Thomas Rd	508	0.1	10	8	1	1	0	1	1	8.5	8.5	9.1	I
11	Crosscut Connector	64th St	Crosscut Canal	426	0.1	10	8	1	1	0	1	0	8.0	8.0	9.0	I
7	Indian Bend Path	Eldorado Aquatic Center	Indian Bend Wash	851	0.2	9	8	2	1	1	1	1	14.0	10.0	8.9	I
24	Crosscut Canal Path	Thomas Rd	Indian School Rd	3683	0.7	10	8	0	2	0	0	3	7.5	7.5	8.9	I
30	Arizona Canal Path	Chaparral Rd	McDonald Dr	5444	1.0	10	8	0	1	0	2	5	7.5	7.5	8.9	I
197	92nd St Path	Sweetwater Ave	Raintree Dr	5251	1.0	9	8	0	1	2	6	2	13.0	10.0	8.9	I
199	100th St Path	Frank Lloyd Wright Bl	Thompson Peak Py	2499	0.5	9	8	1	2	0	0	0	10.0	10.0	8.9	I
33	Jackrabbit Bridge	Arizona Canal at Jackrabbit Rd		181	0.0	9	8	1	1	1	0	2	9.5	9.5	8.8	I
129	CAP Path	Thompson Peak Py	Loop 101	7011	1.3	9	8	1	1	0	1	3	9.5	9.5	8.8	I
198	92nd St Path	Raintree Dr	Frank Lloyd Wright Bl	3149	0.6	9	8	0	1	1	3	2	8.5	8.5	8.6	I
302	IBW Osborn Bridge			213	0.0	10	6	2	0	0	1	0	9.0	9.0	8.6	I
20	2nd St Path	75th St	Indian Bend Wash	1392	0.3	10	6	1	1	0	1	1	8.5	8.5	8.5	I
25	Arizona Canal Path	60th St	64th St	2765	0.5	10	8	0	1	0	1	3	5.5	5.5	8.5	I
27	68th Street Bridge	Lafayette Bl	Indian School Rd	367	0.1	9	8	0	2	1	0	1	8.0	8.0	8.5	I
44	Chaparral Path	Chaparral Park Path	McDonald	2224	0.4	10	8	1	0	0	1	1	5.5	5.5	8.5	I
6	Indian Bend Path	McDowell Rd	Eldorado Aquatic Center	2726	0.5	9	8	1	1	0	0	1	7.5	7.5	8.4	I
28	Arizona Canal Path	Goldwater Bl	Scottsdale Rd	2078	0.4	10	8	0	0	0	4	2	5.0	5.0	8.4	I
47	82nd St Path	Valley Vista Dr	Redwing Rd	2544	0.5	8	8	1	0	1	4	1	10.0	10.0	8.4	I
207	100th St Path	Thompson Peak Py	Frank Lloyd Wright Bl	5097	1.0	8	8	0	3	0	0	3	10.5	10.0	8.4	I
35	Arizona Canal Path	McDonald Rd	Indian Bend Wash	4148	0.8	8	8	2	0	0	0	3	9.5	9.5	8.3	I
39	Hayden Tunnel 2	Hayden Rd at Coolidge		141	0.0	10	8	1	0	0	0	1	4.5	4.5	8.3	I
40	Hayden Tunnel	Hayden Rd at Chaparral		174	0.0	10	8	1	0	0	0	1	4.5	4.5	8.3	I
253	Horizon Crossing	Indian Bend Path	Horizon Park	193	0.0	9	8	1	1	0	0	0	7.0	7.0	8.3	I
14	Thomas Rd Path	Pima Park	Pima Path	623	0.1	10	8	1	0	0	0	0	4.0	4.0	8.2	I
29	Arizona Canal Path	Scottsdale Rd	Chaparral Rd	3400	0.6	10	8	0	0	0	3	2	4.0	4.0	8.2	I
26	Arizona Canal Path	64th St	Goldwater Bl	4694	0.9	10	8	0	0	1	0	4	3.5	3.5	8.1	I
192	Northsight Path	Hayden Rd	CAP Aqueduct	2206	0.4	10	8	0	0	0	2	3	3.5	3.5	8.1	I
9	70th St Connection	Virginia Ave	Thomas Rd	1450	0.3	10	8	0	0	0	3	0	3.0	3.0	8.0	I
137	Shea Path	Hayden Rd	Loop 101	4155	0.8	6	10	1	1	0	3	3	11.5	10.0	8.0	I
138	Shea Path	Loop 101	96th St	5356	1.0	6	10	2	1	1	4	0	16.5	10.0	8.0	I
176	Scottsdale Rd Path	Cactus Park	Sweetwater Ave	1478	0.3	8	10	1	0	0	1	0	5.0	5.0	8.0	I
21	Main Street Path	78th St	Indian Bend Wash	246	0.0	9	8	1	0	0	1	0	5.0	5.0	7.9	I
42	Vista Path	Chaparral Park	Vista Dr	52	0.0	9	8	1	0	0	1	0	5.0	5.0	7.9	I
99	Mountain View Path	Mountain View Rd	Arabian Tr	2925	0.6	7	8	2	0	1	1	1	11.0	10.0	7.9	I
115	Via Linda Path	Mountain View Rd	Lakeview Dr	3920	0.7	7	8	1	1	0	2	2	10.0	10.0	7.9	I
139	Shea Path	96th St	104th St	5313	1.0	7	8	1	2	1	1	2	13.5	10.0	7.9	I
148	Hayden Path	Cactus Rd	Thunderbird Rd	5324	1.0	7	8	0	2	1	3	2	11.5	10.0	7.9	I
151	Pima Path	Shea Bl	Cactus Rd	5462	1.0	7	8	1	0	0	7	2	12.0	10.0	7.9	I
1	South Corp Yard Path	Miller Rd	Indian Bend Wash	671	0.1	8	8	1	1	0	0	0	7.0	7.0	7.8	I
12	Thomas Bike Stop	Thomas Rd	Indian Bend Wash	832	0.2	10	6	1	0	0	1	0	5.0	5.0	7.8	I
13	Thomas Rd Gap	Indian Bend Wash	Thomas Rd	304	0.1	10	6	1	0	0	1	0	5.0	5.0	7.8	I
128	CAP Path	Sweetwater Ave	Thompson Peak Py	8784	1.7	8	8	0	1	1	1	3	7.0	7.0	7.8	I
191	76th St Path	Greenway Rd	CAP Aqueduct	3916	0.7	7	10	0	0	0	6	1	6.5	6.5	7.8	I
37	Lincoln Path	Indian Bend Wash	79th St	822	0.2	7	8	2	0	0	1	0	9.0	9.0	7.7	I
135	Shea Path	64th St	Scottsdale Rd	5293	1.0	6	10	0	0	0	8	1	8.5	8.5	7.7	I
31	Miller Connection	Arizona Canal	Miller Rd	68	0.0	9	8	0	1	0	0	1	3.5	3.5	7.6	I
32	Jackrabbit Path	Arizona Canal	Miller Rd	170	0.0	9	8	0	1	0	0	1	3.5	3.5	7.6	I
210	Redfield Path	Frank Lloyd Wright Bl	100th St	1328	0.3	8	8	0	1	0	2	2	6.0	6.0	7.6	I
136	Shea Path	Scottsdale Rd	Hayden Rd	5263	1.0	5	10	1	0	0	5	2	10.0	10.0	7.5	I
147	Hayden Path	Shea Bl	Cactus Rd	5719	1.1	7	8	0	1	0	4	2	8.0	8.0	7.5	I
5	Crosscut Connection	Belleview St	Crosscut Canal	798	0.2	8	8	1	0	0	1	0	5.0	5.0	7.4	I
15	Paiute Path	Avalon Dr	Osborn Rd	1423	0.3	9	8	0	0	1	1	0	2.5	2.5	7.4	I

Appendix E: City of Scottsdale Path Prioritization Calculations by Tier

Path ID	Name	From	To	Length (ft)	Length (mi)	Latent Demand	LOS	Connection SUPs	Connection Bike Lanes or Paved Shoulders	Connection Bike Routes	Connection Streets	Connection Future Paths	Connection Total	Connection Score (max 10)	Prioritization Score	Tier
43	Jackrabbit Path	Indian Bend Path	Jackrabbit Rd	113	0.0	9	8	0	0	1	1	0	2.5	2.5	7.4	I
103	90th St Path	Bella Vista Path	Indian Bend Path	2707	0.5	7	8	1	0	0	3	1	7.5	7.5	7.4	I
140	Shea Path	104th St	Frank Lloyd Wright Blvd	6569	1.2	6	8	0	2	1	3	2	11.5	10.0	7.4	I
141	Shea Path	Frank Lloyd Wright Bl	124th St	6614	1.3	6	8	1	1	1	3	3	13.0	10.0	7.4	I
142	Shea Path	124th St	136th St	8533	1.6	6	8	1	0	3	0	3	10.0	10.0	7.4	I
143	Arabian_Shea Path	Arabian Tr	Shea Bl	522	0.1	6	10	1	0	1	1	1	7.0	7.0	7.4	I
10	Thomas Rd Path	61st St	62nd St	342	0.1	9	8	0	0	0	2	0	2.0	2.0	7.3	I
18	Columbus Path	Columbus Ave	Granite Reef Rd	48	0.0	9	8	0	0	0	2	0	2.0	2.0	7.3	I
38	Indian Bend Path	Silverado Golf Course	Indian Bend Rd	1661	0.3	6	8	2	0	0	1	1	9.5	9.5	7.3	I
89	Gainey Ranch Path	Mountain View Rd	Gold Dust Rd	2527	0.5	7	6	2	0	0	2	1	10.5	10.0	7.3	I
90	Gainey Ranch Path2	Mountain View Rd	Gold Dust Rd	2330	0.4	7	8	1	0	0	2	2	7.0	7.0	7.3	I
102	Arabian Path	Arabian Tr	Shea Bl	519	0.1	7	8	1	0	1	1	1	7.0	7.0	7.3	I
152	Pima Path	Cactus Rd	Thunderbird Rd	5614	1.1	7	6	1	1	1	2	2	11.5	10.0	7.3	I
164	Indian Bend Path	92nd St	Cactus Rd	6329	1.2	7	6	2	1	1	4	1	17.0	10.0	7.3	I
167	Cactus Path	96th St	104th St	5304	1.0	7	6	1	2	1	3	2	15.5	10.0	7.3	I
200	FLW Path	Thunderbird Rd	Redfield Path	485	0.1	9	8	0	0	0	1	2	2.0	2.0	7.3	I
34	San Miguel Path	Arizona Canal	76th Pl	132	0.0	9	8	0	0	0	1	1	1.5	1.5	7.2	I
46	Valley Vista Path	Hayden Rd	82nd St	1223	0.2	8	8	0	0	0	3	2	4.0	4.0	7.2	I
118	Lakeview Path	Via Linda	Laguna Elementary School	1734	0.3	7	8	1	0	0	1	3	6.5	6.5	7.2	I
119	Lakeview Path	Laguna Elementary School	Shea Bl	1709	0.3	6	8	1	0	0	4	1	8.5	8.5	7.1	I
123	Power Line Path	Bella Vista Path	Shea Bl	6336	1.2	6	8	0	1	0	4	3	8.5	8.5	7.1	I
144	Shea Path	120th St	124th St	2634	0.5	6	8	1	0	1	2	2	8.5	8.5	7.1	I
19	Civic Center Path	Drinkwater Bl	75th St	666	0.1	9	6	0	0	1	2	0	3.5	3.5	7.0	I
45	Chaparral Path	McDonald Dr	Valley Vista Dr	632	0.1	8	8	0	0	0	2	2	3.0	3.0	7.0	I
116	ScRanchPk 2	Tennis Courts	Path	237	0.0	6	8	2	0	0	0	0	8.0	8.0	7.0	I
153	Pima Path	Thunderbird Rd	Frank Lloyd Wright Bl	6728	1.3	7	6	0	1	0	4	3	8.5	8.5	7.0	I
72	Arizona Canal Path	Hayden Rd	82nd St	1282	0.2	7	8	1	0	0	1	0	5.0	5.0	6.9	I
74	Indian Bend Rd Path	Scottsdale Rd	Hayden Rd	5107	1.0	6	8	1	0	0	2	3	7.5	7.5	6.9	I
124	Powerline Path	Shea Bl	Cactus Rd	7064	1.3	5	8	1	0	0	11	3	16.5	10.0	6.9	I
149	Hayden Path	Thunderbird Rd	Frank Lloyd Wright Bl	9941	1.9	5	8	0	1	0	9	4	14.0	10.0	6.9	I
206	100th St Path	Aztec Elementary School	Frank Lloyd Wright	1559	0.3	7	8	0	1	0	1	2	5.0	5.0	6.9	I
213	Desert Canyon Path	Thompson Peak Py	Desert Canyon Middle School	689	0.1	9	4	0	1	1	0	3	6.0	6.0	6.9	I
214	Desert Canyon Path	Desert Canyon Path	102nd St	762	0.1	9	4	1	0	1	0	1	6.0	6.0	6.9	I
215	Ranch Park Path	102nd St	Desert Canyon Path	2060	0.4	9	4	1	0	1	0	1	6.0	6.0	6.9	I
237	Loop 101 Path	Hayden Rd	Bell Rd	5399	1.0	5	8	0	3	0	1	4	12.0	10.0	6.9	I
17	Osborn Path	Osborn Rd	Pima Rd	131	0.0	9	6	0	0	1	1	0	2.5	2.5	6.8	II
126	CAP Path	Shea Bl	Via Linda	4327	0.8	6	8	1	0	0	2	2	7.0	7.0	6.8	II
186	Northsight Path	Thunderbird Rd	Northsight Path	559	0.1	6	6	1	2	1	0	1	12.0	10.0	6.8	II
241	Pima Path	CAP Aqueduct	Bell Rd	3272	0.6	5	8	0	2	0	2	3	9.5	9.5	6.8	II
4	Yavapai Path	Yavapai Elementary School	Indian Bend Wash	316	0.1	7	8	1	0	0	0	0	4.0	4.0	6.7	II
16	Earll Path	81st Pl	82nd Pl	111	0.0	9	6	0	0	0	2	0	2.0	2.0	6.7	II
48	Agua Linda Path	Agua Linda Park	Pima Path	217	0.0	7	8	1	0	0	0	0	4.0	4.0	6.7	II
73	Arizona Canal Path	Hayden Rest Stop	Arizona Canal Path	70	0.0	7	8	1	0	0	0	0	4.0	4.0	6.7	II
91	Gold Dust Path	West of Hayden Rd	Arabian Tr	1147	0.2	7	6	1	0	1	1	1	7.0	7.0	6.7	II
121	Palomino Path	Bella Vista Path	117th Wy	5521	1.0	5	8	0	2	0	2	2	9.0	9.0	6.7	II
125	CAP Path	Bella Vista Path	Shea	7953	1.5	6	8	0	0	1	3	4	6.5	6.5	6.7	II
201	Sweetwater Path	89th St	96th St	4514	0.9	7	4	2	1	1	6	2	19.5	10.0	6.7	II
202	Sweetwater Path	96th St	Frank Lloyd Wright	5944	1.1	7	4	1	2	1	6	2	18.5	10.0	6.7	II
211	FLW Path	100th St	CAP Aqueduct	1520	0.3	7	8	0	1	0	0	2	4.0	4.0	6.7	II
36	Lincoln Path	Arizona Canal	78th St	501	0.1	6	8	1	0	1	0	1	6.0	6.0	6.6	II
100	Irish Hunter Path	Mountain View Path	Arabian Tr	1371	0.3	6	6	1	0	1	3	1	9.0	9.0	6.6	II
109	Bella Vista Path	CAP Aqueduct	Shea Bl	10230	1.9	5	8	1	0	1	2	2	8.5	8.5	6.6	II
112	104th St Path	Mission Ln	Via Linda	1748	0.3	6	8	0	1	0	2	2	6.0	6.0	6.6	II
212	Desert Canyon Path	WestWorld	Desert Canyon Path	1578	0.3	9	2	1	1	0	0	1	7.5	7.5	6.6	II

Appendix E: City of Scottsdale Path Prioritization Calculations by Tier

Path ID	Name	From	To	Length (ft)	Length (mi)	Latent Demand	LOS	Connection SUPs	Connection Bike Lanes or Paved Shoulders	Connection Bike Routes	Connection Streets	Connection Future Paths	Connection Total	Connection Score (max 10)	Prioritization Score	Tier
180	73rd St Path	Sutton Dr	Thunderbird Rd	1449	0.3	7	8	0	0	0	2	2	3.0	3.0	6.5	II
205	Presidio Path	Sutton Dr	100th St	2018	0.4	7	6	0	1	0	2	2	6.0	6.0	6.5	II
22	Indian School Path	Bashas Market	81st St	135	0.0	10	2	0	1	0	1	0	4.0	4.0	6.4	II
50	Joshua Tree Cnctr	Joshua Tree Ln	Pima Path	21	0.0	6	8	1	0	0	1	0	5.0	5.0	6.4	II
52	Dorado Connector	Via de Dorado	Pima Path	49	0.0	6	8	1	0	0	1	0	5.0	5.0	6.4	II
64	87th Wy Connector	87th Wy	Pima Path	219	0.0	6	8	1	0	0	1	0	5.0	5.0	6.4	II
65	San Rafael Connector	San Rafael Dr	Pima Path	23	0.0	6	8	1	0	0	1	0	5.0	5.0	6.4	II
68	Pima Path	Mountain View Rd Crossing		84	0.0	6	6	2	0	0	0	0	8.0	8.0	6.4	II
69	Sun Canyon Connector	Sun Canyon	Pima Path	43	0.0	6	8	1	0	0	1	0	5.0	5.0	6.4	II
71	Mustang Connector	Mustang Tr	Pima Path	49	0.0	6	8	1	0	0	1	0	5.0	5.0	6.4	II
127	CAP Path	Via Linda	Sweetwater Ave	9245	1.8	6	8	0	0	1	2	3	5.0	5.0	6.4	II
145	Shea Path	124th St	132nd St	3623	0.7	6	8	0	0	1	2	3	5.0	5.0	6.4	II
154	Pima Path	Frank Lloyd Wright Bl	Bell Rd	6053	1.1	6	8	0	1	0	0	4	5.0	5.0	6.4	II
209	Thunderbird Path	97th St Path	Frank Lloyd Wright Bl	510	0.1	8	6	0	0	0	2	2	3.0	3.0	6.4	II
239	Loop 101 Path	Hayden Rd	Princess Dr	5798	1.1	5	8	0	2	0	0	3	7.5	7.5	6.4	II
301	Shea Path	142nd St	City Limits	1342	0.3	6	8	1	0	0	1	0	5.0	5.0	6.4	II
3	Papago Path	Granite Reef Rd	Pima Path	2732	0.5	6	8	1	0	0	0	1	4.5	4.5	6.3	II
104	Bella Vista Path	90th St	104th St	8690	1.6	7	8	0	0	0	0	4	2.0	2.0	6.3	II
114	Sctsdl Ranch Path	104th St Path	Scottsdale Ranch Path	79	0.0	6	8	1	0	0	0	1	4.5	4.5	6.3	II
130	CAP Path	Loop 101	Hayden Rd	5177	1.0	5	8	0	2	0	0	2	7.0	7.0	6.3	II
131	CAP Path	Hayden Rd	Scottsdale Rd	5417	1.0	5	8	0	2	0	0	2	7.0	7.0	6.3	II
132	124th St Path	CAP Aqueduct	Cochise Dr	1681	0.3	6	8	0	0	1	2	2	4.5	4.5	6.3	II
146	Shea Path	132nd St	140th St	6590	1.2	6	8	0	0	1	2	2	4.5	4.5	6.3	II
166	Cholla Path	108th St	Cholla Park	3396	0.6	5	6	2	0	1	3	0	12.5	10.0	6.3	II
179	76th St Path	Sutton Dr	Thunderbird Rd	3906	0.7	7	6	0	0	0	4	2	5.0	5.0	6.3	II
196	92nd St Path	Larkspur Dr	Sweetwater Ave	1270	0.2	7	6	0	0	1	2	3	5.0	5.0	6.3	II
203	Presidio Path	96th St	97th St Path	1053	0.2	6	6	1	1	0	0	1	7.5	7.5	6.3	II
264	Desert Camp Path	Pima Acres Path	Thompson Peak Py	2195	0.4	5	6	2	1	0	1	1	12.5	10.0	6.3	II
66	Rancho Antiqua Path2	Rancho Antigua	Pima Path	27	0.0	6	8	1	0	0	0	0	4.0	4.0	6.2	II
67	Rancho Antigua Path	Rancho Antigua	Pima Path	57	0.0	6	8	1	0	0	0	0	4.0	4.0	6.2	II
70	Casabella Connector	Casabella Condominiums	Pima Path	47	0.0	6	8	1	0	0	0	0	4.0	4.0	6.2	II
184	Thunderbird Path	76th St	Hayden Rd	2703	0.5	7	6	0	1	0	0	3	4.5	4.5	6.2	II
217	Scottsdale Rd Path	Loop 101	Thompson Peak Py	3801	0.7	4	8	1	1	0	1	2	9.0	9.0	6.2	II
82	Via de Ventura Path	Indian Bend Path	Doubletree Ranch Rd	2387	0.5	5	6	2	0	0	1	0	9.0	9.0	6.1	II
165	Cholla Path	94th St	108th St	9034	1.7	7	2	1	2	1	5	2	17.5	10.0	6.1	II
183	73rd St Path	Thunderbird Rd	Redfield Rd	1253	0.2	6	8	0	0	0	3	1	3.5	3.5	6.1	II
255	Reata Path	Union Hills Dr	Thompson Peak Py	7292	1.4	5	6	1	1	0	0	3	8.5	8.5	6.0	II
2	Granite Reef Path	McKellips Rd	Granite Reef Rd	1531	0.3	6	8	0	0	0	2	1	2.5	2.5	5.9	II
75	IBW West Path	Indian Bend Rd	Scottsdale Rd	3752	0.7	5	8	0	1	0	1	2	5.0	5.0	5.9	II
81	McCormick Path	Via Bonita	Doubletree Ranch Rd	922	0.2	5	6	1	0	0	4	0	8.0	8.0	5.9	II
101	Arabian Path	Irish Hunter Path	Arabian Tr	710	0.1	6	8	0	0	1	0	2	2.5	2.5	5.9	II
117	ScRanchPk 1	Path	Lakeview Dr	349	0.1	5	8	1	0	0	1	0	5.0	5.0	5.9	II
182	Thunderbird Path	Redfield Rd	Thunderbird Rd	1466	0.3	7	6	0	0	0	2	2	3.0	3.0	5.9	II
204	97th St Path	Sutton Dr	Presidio Rd	435	0.1	7	6	0	0	0	2	2	3.0	3.0	5.9	II
218	Scottsdale Rd Path	Deer Valley Rd	Pinnacle Peak Rd	5364	1.0	3	8	0	2	0	4	2	11.0	10.0	5.9	II
49	La Luna Connector	Via de La Luna	Pima Path	29	0.0	6	6	1	0	0	1	0	5.0	5.0	5.8	II
54	Del Arbor Connector	Via del Arbor	Pima Path	54	0.0	6	6	1	0	0	1	0	5.0	5.0	5.8	II
56	McCormick Connector	Via de McCormick	Pima Path	19	0.0	6	6	1	0	0	1	0	5.0	5.0	5.8	II
57	Commercio Connector	Ranch Office	Pima Path	30	0.0	6	6	1	0	0	1	0	5.0	5.0	5.8	II
59	Ranch Connector	Ranch Office Park	Pima Path	45	0.0	6	6	1	0	0	1	0	5.0	5.0	5.8	II
60	Ranch Connector	Ranch Office Park	Pima Path	19	0.0	6	6	1	0	0	1	0	5.0	5.0	5.8	II
63	San Esteban Path	San Esteban Dr	Pima Path	78	0.0	6	6	1	0	0	1	0	5.0	5.0	5.8	II
85	Ventura Path B	85th Wy	86th Pl	329	0.1	6	8	0	0	0	2	0	2.0	2.0	5.8	II
86	Ventura Path	85th Wy	86th Pl	423	0.1	6	8	0	0	0	2	0	2.0	2.0	5.8	II

Appendix E: City of Scottsdale Path Prioritization Calculations by Tier

Path ID	Name	From	To	Length (ft)	Length (mi)	Latent Demand	LOS	Connection SUPs	Connection Bike Lanes or Paved Shoulders	Connection Bike Routes	Connection Streets	Connection Future Paths	Connection Total	Connection Score (max 10)	Prioritization Score	Tier
106	Bella Vista Path	104th St	112th St	5309	1.0	6	8	0	0	0	0	4	2.0	2.0	5.8	II
113	104th St Path	Via Linda	Scottsdale Ranch Park	180	0.0	6	8	0	0	0	1	2	2.0	2.0	5.8	II
134	Mt View Connector	Camelback Walk	Mountain View Rd	401	0.1	6	6	1	0	0	1	0	5.0	5.0	5.8	II
168	Cactus Path	104th St	Frank Lloyd Wright Bl	4019	0.8	5	6	0	1	1	2	2	7.5	7.5	5.8	II
181	Thunderbird Path	Thunderbird Rd	Redfield Rd	556	0.1	7	6	0	0	0	1	3	2.5	2.5	5.8	II
195	Larkspur Path	Larkspur Dr	93rd St	986	0.2	7	6	0	0	0	2	1	2.5	2.5	5.8	II
230	Bell Path	Power Line Path	Thompson Peak Py	6203	1.2	5	6	0	2	0	0	3	7.5	7.5	5.8	II
238	Loop 101 Path	Scottsdale Rd	Hayden Rd	5374	1.0	5	8	0	1	0	1	1	4.5	4.5	5.8	II
248	76th St Path	Loop 101	Thompson Peak Py	6247	1.2	4	6	1	1	1	1	2	10.5	10.0	5.8	II
78	Indian Bend Path	Hayden Rd	Indian Bend Path	1178	0.2	5	4	2	0	0	2	1	10.5	10.0	5.7	II
79	McCormick Py Path	Scottsdale Rd	Indian Bend Path	6023	1.1	5	4	1	1	0	3	4	12.0	10.0	5.7	II
107	Bella Vista Path	112th St	122nd St	6447	1.2	6	8	0	0	0	0	3	1.5	1.5	5.7	II
108	Bella Vista Path	122nd St	CAP Aqueduct	4625	0.9	6	8	0	0	0	0	3	1.5	1.5	5.7	II
190	Northsight Path	Northsight Path	Redfield Path	241	0.0	6	6	1	0	0	0	1	4.5	4.5	5.7	II
208	97th St Path	Presidio Path	Thunderbird Rd	1711	0.3	7	6	0	0	0	1	2	2.0	2.0	5.7	II
225	Hayden Path	CAP Aqueduct	Copper Basin Park	4008	0.8	5	4	2	2	0	1	3	16.5	10.0	5.7	II
226	Hayden Path	Copper Basin Park	Power Line Path	7693	1.5	5	4	1	1	0	3	4	12.0	10.0	5.7	II
231	82nd St Path	Princess Dr	Union Hills Dr	1885	0.4	5	4	2	1	0	4	1	15.5	10.0	5.7	II
243	Power Line Path	WestWorld	Pima Rd	7881	1.5	5	4	1	3	0	0	6	16.0	10.0	5.7	II
245	Power Line Path	Hayden Rd	Thompson Peak Py	3018	0.6	5	4	1	2	0	0	0	10.0	10.0	5.7	II
247	Thompson Peak Path	Hayden Rd	Pima Rd	5893	1.1	5	4	2	2	0	1	1	15.5	10.0	5.7	II
53	Inner Circle Cnctr	Inner Circle	Pima Path	12	0.0	6	6	1	0	0	0	0	4.0	4.0	5.6	III
58	Ranch Connector	Ranch Office Park	Pima Path	34	0.0	6	6	1	0	0	0	0	4.0	4.0	5.6	III
133	124th St Path	Cochise Dr	Lost Dog Trailhead	6616	1.3	6	2	0	0	1	10	3	13.0	10.0	5.6	III
170	132nd St Path	Shea Bl	Via Linda	3054	0.6	6	2	1	0	1	4	2	10.5	10.0	5.6	III
185	Thunderbird Path	Hayden Rd	Loop 101	4987	0.9	6	2	0	3	1	2	3	14.0	10.0	5.6	III
194	92nd St Path	Cactus Rd	Larkspur Dr	1311	0.2	7	6	0	0	0	1	1	1.5	1.5	5.6	III
216	Scottsdale Rd Path	CAP Aqueduct	Loop 101	7627	1.4	4	8	0	0	0	4	4	6.0	6.0	5.6	III
169	Bent Tree Path	110th St	Frank Lloyd Wright Bl	1036	0.2	5	6	1	0	0	1	1	5.5	5.5	5.4	III
171	Mayo Path	Shea Bl	Cactus Rd	6224	1.2	6	2	0	1	0	5	2	9.0	9.0	5.4	III
177	Sweetwater Path	Scottsdale Rd	76th St	2568	0.5	8	2	0	0	0	3	2	4.0	4.0	5.4	III
178	76th St Path	Sweetwater Ave	Cotton Dr	1376	0.3	8	1	0	1	0	1	3	5.5	5.5	5.4	III
189	Redfield Path	Northsight Park	Gelding Dr	590	0.1	6	6	0	0	0	2	2	3.0	3.0	5.4	III
193	FLW Path	82nd St	Northsight Path	1971	0.4	5	8	0	0	0	2	1	2.5	2.5	5.4	III
240	Loop 101 Path	Scottsdale Rd	Hayden Rd	5503	1.0	4	8	0	1	0	0	4	5.0	5.0	5.4	III
88	Mountain View Path	Scottsdale Rd	78th St	4148	0.8	5	6	0	0	1	3	1	5.0	5.0	5.3	III
111	104th St Path	Bella Vista Path	Mission Ln	581	0.1	5	8	0	0	0	1	2	2.0	2.0	5.3	III
172	Via Linda Path	124th St	136th St	7896	1.5	5	4	0	0	2	4	2	8.0	8.0	5.3	III
229	Bell Path	Loop 101	Power Line Path	2724	0.5	5	6	0	0	0	4	2	5.0	5.0	5.3	III
254	Reata Path	Power Line Path	Union Hills Dr	7924	1.5	4	6	0	2	0	0	3	7.5	7.5	5.3	III
267	DC Ranch Path	DC Ranch Path	Thompson Peak Py	768	0.1	5	4	2	0	0	0	0	8.0	8.0	5.3	III
284	Dynamite Path	Pima Rd	97th Pl	6190	1.2	1	10	0	2	0	2	2	9.0	9.0	5.3	III
51	Sereno Connector	Via de Sereno	Pima Path	26	0.0	6	4	1	0	0	1	0	5.0	5.0	5.2	III
55	Taz Norte Connector	Via Taz Norte	Pima Path	14	0.0	6	4	1	0	0	1	0	5.0	5.0	5.2	III
83	Paseo Path	Via Paseo Del Norte	Scottsdale McCormick Office Park	349	0.1	5	8	0	0	0	1	1	1.5	1.5	5.2	III
84	Paseo Path	Paseo Path	Via de Negocio	483	0.1	5	8	0	0	0	1	1	1.5	1.5	5.2	III
97	Cholla Path	66th St	68th Pl	1560	0.3	6	4	0	0	1	3	1	5.0	5.0	5.2	III
120	Bella Vista Cnctr	Bella Vista Path	Bella Vista	435	0.1	5	8	0	0	0	1	1	1.5	1.5	5.2	III
122	Doubletree Path	Power Line Path	Doubletree Ranch Rd	130	0.0	5	8	0	0	0	1	1	1.5	1.5	5.2	III
227	Bell Path	Hayden Rd	Copper Basin Park	602	0.1	5	4	1	1	0	0	1	7.5	7.5	5.2	III
228	Bell Path	Copper Basin Park	Loop 101	3479	0.7	5	4	1	0	0	3	1	7.5	7.5	5.2	III
244	Power Line Path	Pima Rd	Hayden Rd	7804	1.5	5	4	0	2	0	0	3	7.5	7.5	5.2	III
246	Powerline Path	74th St	Scottsdale Rd	4077	0.8	4	4	1	1	1	3	2	12.5	10.0	5.2	III
268	Thompson Peak Path	Thompson Peak Path	Wash Crossing	2772	0.5	5	4	1	1	0	0	1	7.5	7.5	5.2	III

Appendix E: City of Scottsdale Path Prioritization Calculations by Tier

Path ID	Name	From	To	Length (ft)	Length (mi)	Latent Demand	LOS	Connection SUPs	Connection Bike Lanes or Paved Shoulders	Connection Bike Routes	Connection Streets	Connection Future Paths	Connection Total	Connection Score (max 10)	Prioritization Score	Tier
8	Elm Dr Connector	Elm Dr	Granite Reef Senior Center	146	0.0	5	8	0	0	0	1	0	1.0	1.0	5.1	III
95	68th Pl Path	Shea Bl	Cholla St	2875	0.5	6	2	0	0	1	4	4	7.5	7.5	5.1	III
234	Union Hills Path	Hayden Rd	Loop 101	2855	0.5	5	4	0	1	0	2	4	7.0	7.0	5.1	III
242	WestWorld Path	Loop 101	Power Line Path	4811	0.9	5	6	0	0	0	3	2	4.0	4.0	5.1	III
250	94th St Path	Power Line Path	Bell Rd	854	0.2	5	6	0	1	0	0	2	4.0	4.0	5.1	III
61	Villa Vallarta Path	Villa de Vallarta	Pima Path	37	0.0	6	4	1	0	0	0	0	4.0	4.0	5.0	III
62	Villa Royale Path	Villa Royale	Pima Path	32	0.0	6	4	1	0	0	0	0	4.0	4.0	5.0	III
174	128th St Path	Shea Bl	Cactus Rd	5618	1.1	6	2	0	0	0	5	3	6.5	6.5	4.9	III
224	Scottsdale Rd Path	Lone Mountain Rd	Carefree Hwy	10692	2.0	1	8	0	3	0	1	2	11.0	10.0	4.9	III
263	Pima Acres Path	Diamond Rim Dr	Desert Camp Dr	1597	0.3	5	6	0	0	0	2	2	3.0	3.0	4.9	III
290	Carefree Path	56th St	Scottsdale Rd	10068	1.9	3	8	0	0	0	4	2	5.0	5.0	4.9	III
87	Mountain View Path	68th Pl	Scottsdale Rd	2521	0.5	5	6	0	0	0	2	1	2.5	2.5	4.8	III
221	Scottsdale Rd Path	Jomax Rd	Dynamite Bl	5283	1.0	1	8	0	2	0	2	3	9.5	9.5	4.8	III
288	60th St Path	Dove Valley Rd	Carefree Hwy	5178	1.0	3	6	0	0	0	6	3	7.5	7.5	4.8	III
157	Pima Path	Los Gatos Dr	Happy Valley Rd	9027	1.7	1	8	0	2	0	2	2	9.0	9.0	4.7	III
187	Redfield Path	Hayden Rd	Northsight Park	2602	0.5	5	6	0	0	0	1	2	2.0	2.0	4.7	III
252	Old Pima Path	Power Line Path	Hualapai Dr	4005	0.8	4	4	1	1	0	0	1	7.5	7.5	4.7	III
269	Deer Valley Path	Existing sidewalk	Miller Rd	1069	0.2	3	4	2	2	0	0	1	14.5	10.0	4.7	III
76	Scottsdale Rd Path	Indian Bend Wash	McCormick Py	1692	0.3	4	2	1	1	0	3	3	11.5	10.0	4.6	III
92	70th St Path	Mountain View Rd	Gold Dust Ave	1318	0.2	5	6	0	0	0	1	1	1.5	1.5	4.6	III
110	96th St Path	Bella Vista Path	Mission Ln	777	0.1	5	6	0	0	0	1	1	1.5	1.5	4.6	III
188	82nd St Connector	82nd St	Redfield Path	309	0.1	5	6	0	0	0	1	1	1.5	1.5	4.6	III
256	Reata Path	Thompson Peak Py	Adobe Dr	5360	1.0	4	6	0	1	0	0	2	4.0	4.0	4.6	III
285	Dynamite Path	97th Pl	Alma School Py	8978	1.7	1	10	0	0	0	4	2	5.0	5.0	4.5	III
150	Professional Gap	85th Pl	Scottsdale Professional	82	0.0	6	4	0	0	0	1	0	1.0	1.0	4.4	III
175	Cactus Path	124th St	128th St	2542	0.5	6	2	0	0	0	3	2	4.0	4.0	4.4	III
219	Scottsdale Rd Path	Pinnacle Peak Rd	Happy Valley Rd	5257	1.0	2	8	0	0	0	4	2	5.0	5.0	4.4	III
232	82nd St Path	Union Hills Dr	Loop 101	1371	0.3	5	4	0	0	0	2	3	3.5	3.5	4.4	III
93	Gold Dust Path	68th Wy	70th St	1253	0.2	5	4	0	0	0	2	2	3.0	3.0	4.3	III
155	Pima Path	Loop 101	Power Line Path	3796	0.7	4	4	0	1	0	1	3	5.5	5.5	4.3	III
220	Scottsdale Rd Path	Happy Valley Rd	Jomax Rd	4939	0.9	1	8	0	2	0	0	2	7.0	7.0	4.3	III
274	Happy Valley Path	Scottsdale Rd	Alma School Rd	20704	3.9	1	6	0	3	0	5	6	17.0	10.0	4.3	III
281	Dynamite Path	56th St	Scottsdale Rd	10647	2.0	1	6	0	2	0	4	1	10.5	10.0	4.3	III
233	Union Hills Path	Scottsdale Rd	Hayden Rd	5356	1.0	4	4	0	1	0	1	2	5.0	5.0	4.2	III
249	Center Path	Scottsdale Rd	76th St Path	1192	0.2	4	6	0	0	0	1	2	2.0	2.0	4.2	III
94	68th Pl Path	Gold Dust Ave	Shea Bl	1452	0.3	5	2	0	0	0	4	2	5.0	5.0	4.1	III
98	Gold Dust Gap	Gold Dust Ave	Gold Dust Ave	201	0.0	5	4	0	0	0	2	0	2.0	2.0	4.1	III
173	Via Linda Path	Hidden Hills		6884	1.3	5	4	0	0	1	0	1	2.0	2.0	4.1	III
222	Scottsdale Rd Path	Dynamite BL	Dixileta Rd	5271	1.0	1	8	0	0	0	5	2	6.0	6.0	4.1	III
257	Reata Path	Adobe Dr	Pinnacle Peak Rd	5257	1.0	3	6	0	1	0	0	2	4.0	4.0	4.1	III
266	DC Ranch Path	Alma School Path	Copper Ridge Middle School	377	0.1	4	4	1	0	0	0	1	4.5	4.5	4.1	III
270	Milller Path	Deer Valley Rd	Pinnacle Peak Rd	6322	1.2	3	2	2	1	0	5	1	16.5	10.0	4.1	III
289	Border Path	60th St	Scottsdale Rd	12678	2.4	1	8	0	1	0	2	2	6.0	6.0	4.1	III
105	100 Pl Connector	Bella Vista Path	100th Pl	52	0.0	5	4	0	0	0	1	1	1.5	1.5	4.0	III
251	Thompson Peak Path	Bell Path	Desert Activity Center	1586	0.3	5	4	0	0	0	1	1	1.5	1.5	4.0	III
96	Mescal Path	68th Pl	68th Pl	1577	0.3	6	1	0	0	0	2	2	3.0	3.0	3.9	III
273	Rawhide Path	Scottsdale Rd	Happy Valley Rd	7539	1.4	2	6	0	0	0	4	3	5.5	5.5	3.9	III
287	Dove Valley Path	56th St	60th St	2798	0.5	3	6	0	0	0	2	2	3.0	3.0	3.9	III
235	Union Hills Tunnel	Loop 101		595	0.1	4	4	0	0	0	2	2	3.0	3.0	3.8	III
159	Pima Path	Jomax Rd	Dynamite Bl	5192	1.0	1	6	0	2	0	0	2	7.0	7.0	3.7	III
295	Stagecoach Path	Pima Rd	Lone Mountain Py	13116	2.5	1	4	0	1	0	7	3	11.5	10.0	3.7	III
296	Lone Mountain Path	Stagecoach Rd	Cave Creek Rd	11089	2.1	1	4	0	1	0	6	2	10.0	10.0	3.7	III
297	Cave Creek Path	City Limits	Lone Mountain Py	8631	1.6	1	4	0	3	0	2	2	12.0	10.0	3.7	III
298	Cave Creek Path	Lone Mountain Py	112th Pl	7015	1.3	1	6	0	1	0	3	2	7.0	7.0	3.7	III

Appendix E: City of Scottsdale Path Prioritization Calculations by Tier

Path ID	Name	From	To	Length (ft)	Length (mi)	Latent Demand	LOS	Connection SUPs	Connection Bike Lanes or Paved Shoulders	Connection Bike Routes	Connection Streets	Connection Future Paths	Connection Total	Connection Score (max 10)	Prioritization Score	Tier
236	Union Hills Path	Loop 101	Power Line Path	1387	0.3	4	4	0	0	0	1	2	2.0	2.0	3.6	III
265	94th St Connector	Sierra Pinta Dr	Desert Camp Dr	107	0.0	4	4	0	0	0	2	0	2.0	2.0	3.6	III
258	Reata Path	Pinnacle Peak Rd	Happy Valley Rd	5909	1.1	1	6	0	1	0	2	2	6.0	6.0	3.5	III
260	Reata Path	Jomax Rd	Rio Verde Dr	6279	1.2	1	6	0	1	0	2	2	6.0	6.0	3.5	III
262	Pima Acres Path	S of Hualapai Dr	Diamond Rim Dr	1810	0.3	4	4	0	0	0	1	1	1.5	1.5	3.5	III
271	Miller Path	Williams Dr	Pinnacle Peak Rd	2731	0.5	3	4	0	0	0	2	3	3.5	3.5	3.4	III
156	Pima Path	Overlook Dr	Los Gatos Dr	1649	0.3	3	2	1	0	0	1	2	6.0	6.0	3.3	III
223	Scottsdale Rd Path	Dixileta Rd	Lone Mountain Rd	5205	1.0	1	8	0	0	0	1	2	2.0	2.0	3.3	III
259	Reata Path	Happy Valley Rd	Jomax Rd	6116	1.2	1	6	0	0	0	4	2	5.0	5.0	3.3	III
286	Lone Mountain Path	Scottsdale Rd	Pima Rd	10360	2.0	1	4	0	2	0	1	2	8.0	8.0	3.3	III
158	Pima Path	Happy Valley Rd	Jomax Rd	5190	1.0	1	6	0	1	0	0	2	4.0	4.0	3.1	III
160	Pima Path	Dynamite Bl	Dixileta Dr	5354	1.0	1	6	0	1	0	0	2	4.0	4.0	3.1	III
163	Pima Path	Westland Rd	Stagecoach Rd	7880	1.5	1	4	0	2	0	0	2	7.0	7.0	3.1	III
292	Westland Path	Hayden Rd	Pima Rd	5317	1.0	1	2	0	2	0	4	2	11.0	10.0	3.1	III
293	Westland Path	Pima Rd	92nd Pl	4830	0.9	1	2	0	2	0	2	3	9.5	9.5	3.0	III
294	Westland Path	92nd Pl	Stagecoach Rd	9050	1.7	1	2	0	1	0	6	1	9.5	9.5	3.0	III
161	Pima Path	Dixileta Dr	Lone Mountain Rd	5433	1.0	1	4	0	1	0	1	2	5.0	5.0	2.7	III
162	Pima Path	Lone Mountain Rd	Westland Rd	8400	1.6	1	4	0	1	0	1	2	5.0	5.0	2.7	III
261	Hualapai Path	Ironwood Path	Pima Acres Path	2487	0.5	3	1	1	0	0	0	1	4.5	4.5	2.7	III
299	Cave Creek Path	112th Pl	City Limits	6172	1.2	1	6	0	0	0	1	1	1.5	1.5	2.6	III
291	Westland Path	Scottsdale Rd	Hayden Rd	5378	1.0	1	2	0	1	0	3	2	7.0	7.0	2.5	III
272	Miller Path	Pinnacle Peak Rd	Happy Valley Rd	5209	1.0	1	4	0	0	0	2	3	3.5	3.5	2.4	III
280	64th St Path	Pinnacle Vista Dr	Dynamite Bl	2580	0.5	1	4	0	0	0	2	2	3.0	3.0	2.3	III
282	Dynamite Path	Scottsdale Rd	80th St	5172	1.0	1	2	0	1	0	1	3	5.5	5.5	2.2	III
283	Dynamite Path	80th St	Pima Rd	5389	1.0	1	2	0	1	0	1	3	5.5	5.5	2.2	III
277	Jomax Path	Pinnacle Peak Py	Alma School Rd	1317	0.2	1	2	0	1	0	1	2	5.0	5.0	2.1	III
275	Rawhide Path	Happy Valley Rd	Jomax Rd	5222	1.0	1	2	0	1	0	1	1	4.5	4.5	2.0	III
279	Pinnacle Vista Path	56th St	64th St	5254	1.0	1	1	0	1	0	2	2	6.0	6.0	2.0	III
278	56th St Path	Jomax Rd	Dynamite Bl	5320	1.0	1	1	0	0	0	4	2	5.0	5.0	1.8	III
276	Jomax Path	Jomax Rd	Alma School Rd	1421	0.3	1	2	0	0	0	2	2	3.0	3.0	1.7	III

Transportation Master Plan
Bicycle Element

Appendix 6-F
Signal Timing Adjustments

Minimum clearance interval

The clearance interval at a traffic signal (the yellow time plus the time when all approaches have a red signal) is intended to allow those drivers who cannot reasonably stop when the signal turns yellow to make it to and through the intersection prior to conflicting traffic receiving a green signal. The AASHTO Bike Guide[1] provides the following equation for calculating the minimum clearance interval[2]:

$$y + r_{clear} \geq t_r + \frac{v}{2b} + \frac{w + l}{v}$$

y	= yellow interval(s)
r_{clear}	= red clearance interval(s)
t_r	= reaction time (1.0 s)
v	= bicyclist speed ~~(mph)~~ (fps)
b	= bicyclist braking deceleration (4 to 8 ft/s^2)
w	= width of crossing (ft)
l	= bicycle length (6 ft)

This equation essentially calculates the time it takes a bicycle to pass from the "point of no return" on the intersection approach to the far side of the intersection, taking into account the bicycle's length and speed and the cyclist's reaction time. This is shown graphically in Figure 1.

[1] *Guide for the Development of Bicycle Facilities*, pg. 65, AASHTO, Washington, D.C., 1999.

[2] The AASHTO Guide erroneously shows the equation as measuring bicyclist speed in miles per hour, rather than in feet per second. The equation shown corrects this error.

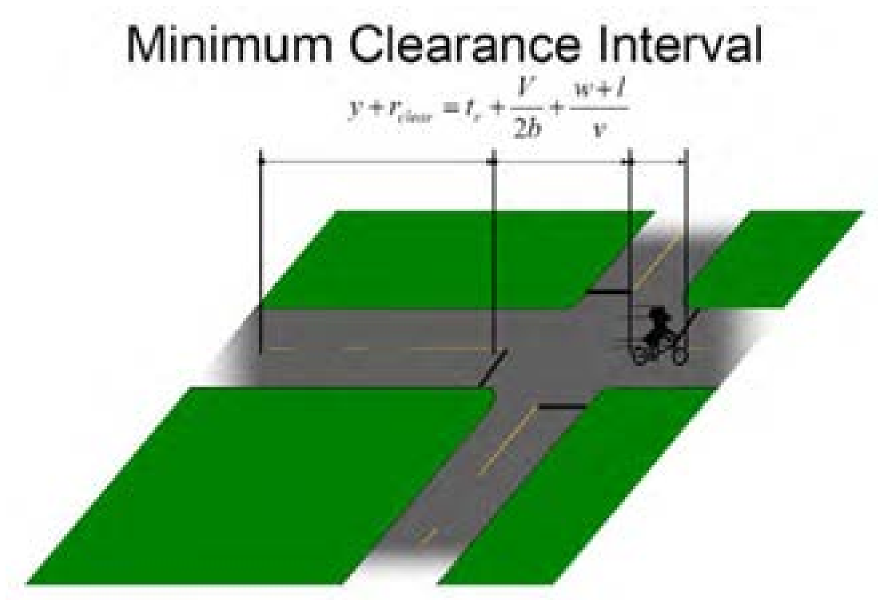


Figure 1 Calculation of Minimum Clearance Interval

Direct application of this equation is problematic. If one assumes the deceleration rate of a bicyclist to be 4 feet per second per second (fpsps), then to cross a relatively small intersection of 72 feet (five 12-foot travel lanes, two 4-foot bike lanes and a 4-foot traffic separator) would require a clearance interval of 6.3 seconds. This is much longer than typical for a clearance interval, and it is not advisable to lengthen the clearance interval because long clearance intervals have been shown to increase crashes. If, however, one assumes a deceleration rate of 8 fpsps, then the clearance interval can be reduced to 5.5 seconds, a time that is not unreasonably long. The problem is that most bicyclists will not actually clear the intersection in 5.5 seconds.

The 2004 report *Characteristics of Emerging Road and Trail Users and Their Safety*[3] revealed that the AASHTO assumptions of a 20 mph design speed results is an underestimation of the needed clearance interval for cyclists. Figure 2 shows the needed clearance intervals for a variety of users based upon the crossing width of the intersecting roadway. The AASHTO clearance interval calculated using 8 fpsps is shown for reference. As can be seen, once a crossing width exceeds about 55 feet, the AASHTO equation underestimates the needed time for a bicyclist to clear the intersection.

One potential solution for clearing cyclists from an intersection without lengthening the clearance interval (yellow phase plus all-red phase) is through the use of loops in bike lanes on approaches to the intersection, placed in advance of the "point of no return." These loops would detect bicyclists in the bike lanes who are too close to clear the intersection during the normal clearance interval and, rather than lengthening the clearance interval, would cause the green time to be extended by a couple of seconds.

[3] *Characteristics of Emerging Road and Trail Users and Their Safety*, FHWA-HRT-04-103, Washington, D.C., 2004.

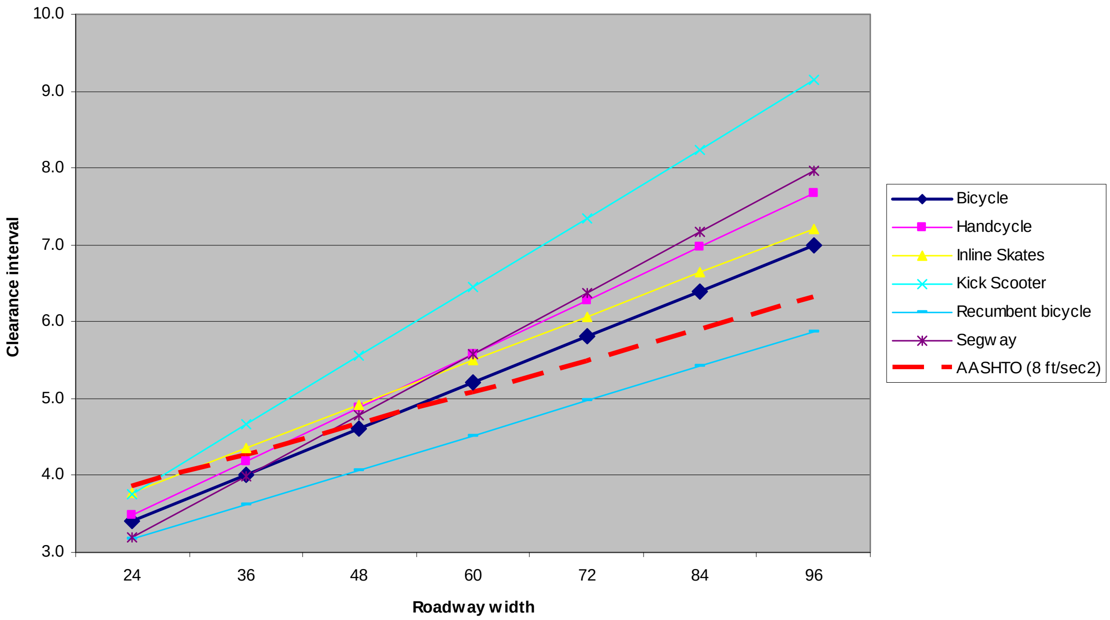


Figure 2: Clearance Intervals For Various User Types

Minimum Green Time

The minimum green time for a traffic signal is actually the minimum time provided by the green, yellow, and all-red for a vehicle to react, start moving, and clear an intersection. AASHTO[4] provides the following equation for the calculation of minimum green time for bicycles:

For English Units:

$$g + y + r_{clear} \geq t_{cross} = t_r + \frac{v}{2a} + \frac{w + l}{v}$$

g	= minimum green
y, r_{clear}	= yellow and red clearance intervals actually used
t_{cross}	= Time to cross the intersection
t_r	= Reaction time (2.5 s)
v	= Bicycle speed (ft/s)
a	= Bicycle acceleration (1.5 - 3 ft/s^2)
w	= Width of crossing (ft)
l	= Bicycle length (6 ft)

[4] *Guide for the Development of Bicycle Facilities*, pg. 65, AASHTO, Washington, D.C., 1999.

This equation is very conservative; it actually provides time for cyclists to accelerate to speed before calculating the time to cross the intersection. The Characteristics of Emerging Trail Users report can be used to determine the actual required minimum crossing times (see Figure 3).

If the minimum green time provided at a signal does not normally meet the needs of cyclists, a signal loop within a bike lane can be used to call a longer minimum green when bicycles are present.

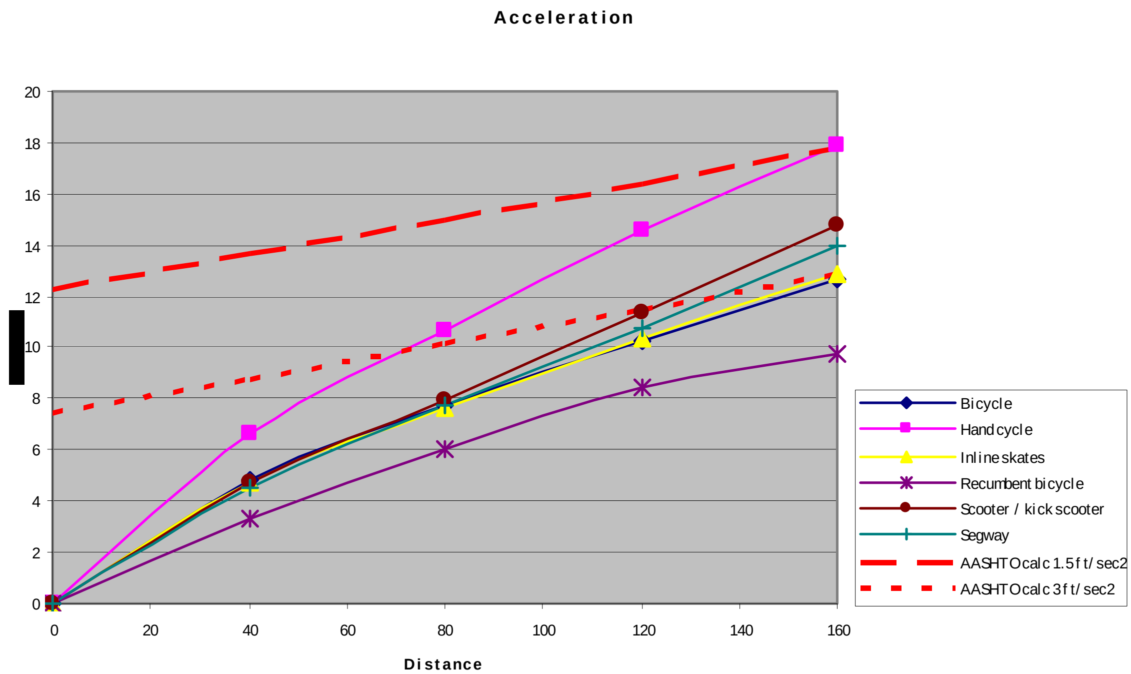


Figure 3: Crossing Times For Various User Types

Transportation Master Plan
Bicycle Element

Appendix 6-G
Signage and Wayfinding Recommendations for Bicycles

BICYCLE NO. 2

TECHNICAL COMMITTEE RECOMMENDATION

TECHNICAL COMMITTEE: Bicycle Technical Committee

DATE OF ACTION: June 23rd, 2005 (*modified January 20th, 2006*)

TOPIC: Proposed D1 & D11 Series Bicycle Guide Signs
Part 9 of the MUTCD

ORIGIN OF REQUEST: NCUTCD Bicycle Technical Committee

DISCUSSION:

The system of bicycle route guide signs currently in the MUTCD works reasonably well in areas where only one bicycle route exists. Urban areas, however, frequently have locations where multiple routes intersect or overlap. In these locations, the signage system currently established in the MUTCD has limited flexibility in addressing these issues, and can result in sign clutter and higher costs.

To address this concern, the following changes to the MUTCD signage for bicyclist guidance are proposed:

1. Add new Bicycle Destination Signs (D1-1b, D1-1c, D1-2b, D1-2c, D1-3b, D1-3c) for specific use as guide and wayfinding signs for bicycle travel. These revised D1 series signs include a bicycle symbol added to the principal legend. The proposal allows the use of these new Destination Signs in place of the D11-1 / D1-1 / M7-1 sign assembly currently shown in the MUTCD. Using these new bicycle-specific signs will decrease costs and reduce sign clutter because all pertinent user information can be located on one panel. This allows travelers to quickly comprehend sign information with minimal distraction.

2. Add a new optional Bicycle Route Guide Sign (D11-1c). The new optional D11-1c sign substitutes additional route name, direction, or destination information in lieu of a generic "BIKE ROUTE" message to provide improved guidance and destination information to bicyclists. By replacing the "BIKE ROUTE" text with more specific information, the D11-1c can be used to replace D11-1 / D1-1 sign assemblies, reducing sign clutter and cost. It can also increase user comprehension of the sign by reducing the amount of text and incorporating all messages into one sign panel.

The proposed signs are modeled after successful bikeway sign systems that are in place in other countries that incorporate a bike symbol, destination, direction and distance (if appropriate) into a single panel. The design has been adjusted to be consistent with US and MUTCD guidelines for guide signing.

Example of bicycle-specific guide signing outside US (Netherlands)

The proposed Standard, Guidance, and Option statements are modeled after similar wording in Chapter 2D for directional signing for conventional roads.

These proposed changes were also reviewed and approved by the NCUTCD Guide and Motorist Information (G/MI) Technical Committee at their meeting in June 2005.

COMMITTEE ACTION:

The Bicycle Technical Committee recommends that the National Committee submit this proposal as developed by the NCUTCD BTC to sponsors for comment and approval.

Approved unanimously by NCUTCD Council January 20th, 2006.

Note: Deleted items are shown in ~~strikethrough red~~, and added text is shown in underline green.

Insert the following entries into existing Table 9B-1:

Destination	D1-1, D1-1a	Varies x 150 (Varies x 6)	Varies x 450 (Varies x 18)
Bicycle Destination	D1-1b, D1-1c, D1-2b, D1-2c, D1-3b, D1-3c	Varies x 150, 300, 450 (Varies x 6, 12, 18)	Varies x 150, 300, 450 (Varies x 6, 12, 18)
Street Name	D3	Varies x 150 (Varies x 6)	Varies x 450 (Varies x 18)
Bicycle Route Guide	D11-1, D11-1c	600 x 450 (24 x 18)	600 x 450 (24 x 18)

Revise Sections 9B.19 and 9B.21 :

Section 9B.19 Bicycle ~~Route~~ Guide Signs (D11-1, D11-1c, D1-1b, D1-1c, D1-2b, D1-2c, D1-3b, D1-3c)

~~Guidance:~~ Option:
~~If used,~~ Bicycle Route Guide (D11-1) signs (see Figure 9B-4) ~~should~~ may be provided ~~at decision points~~ along designated bicycle routes~~, including signs~~ to inform bicyclists of bicycle route direction changes and to confirm ~~confirmation signs for~~ route direction, distance, and destination.

If used, Bicycle Route Guide signs ~~should~~ may be repeated at regular intervals so that bicyclists entering from side streets will have an opportunity to know that they are on a bicycle route. Similar guide signing ~~should~~ may be used for shared roadways with intermediate signs placed for bicyclist guidance.

Alternative Bicycle Route Guide Signs (D11-1c) may be used to provide information on route direction, destination, and/or route name in place of the "BIKE ROUTE" wording on the D11-1 sign (see Figure 9B-4 and 9B-6).

Destination (D1-1, D1-1a) signs, Street Name (D3) signs or Bicycle Destination (D1-1b, D1-1c, D1-2b, D1-2c, D1-3b, D1-3c) signs (see Figure 9B-4) may be installed to provide direction, destination, and distance information as needed for bicycle travel. If several destinations are to be shown at a single location, they may be placed on a single panel with an arrow (and the distance, if desired) for each name. If more than one destination lies in the same direction, a single arrow may be used for the destinations.

Guidance:
Adequate separation should be made between any destination or group of destinations in one direction and those in other directions by suitable design of the arrow, spacing of lines of legend, heavy lines entirely across the panel, or separate panels.

Standard:

An arrow pointing to the right, if used, shall be at the extreme right of the sign. An arrow pointing left or up, if used, shall be at the extreme left. The distance figures, if used, shall be placed to the right of the destination names.

On Bicycle Destination signs, a bicycle symbol shall be placed next to each destination or group of destinations. If an arrow is at the extreme left, the bicycle symbol shall be placed to the right of the respective arrow.

Guidance:

Unless a sloping arrow will convey a clearer indication of the direction to be followed, the directional arrows should be horizontal or vertical.

The bicycle symbol should be to the left of the destination legend.

If several individual name panels are assembled into a group, all panels in the assembly should be of the same length.

Support:

Figure 9B-5 shows an example of the signing for the beginning and end of a designated bicycle route on a shared-use path. Figure 9B-6 shows an example of signing for an on-roadway bicycle route. Figure 9B-7 shows examples of signing and markings for shared-use paths.

Section 9B.21 ~~Destination~~ Arrow and Supplemental Plaque Signs for Bicycle Route Signs

Option:

~~Destination (D1-1b and D1-1c) signs (see Figure 9B-4) may be mounted below Bicycle Route Guide signs, Bicycle Route signs, or Interstate Bicycle Route signs to furnish additional information, such as directional changes in the route, or intermittent distance and destination information.~~

The M4-11 through M4-13 supplemental plaques (see Figure 9B-4) may be mounted above the appropriate Bicycle Route Guide signs, Bicycle Route signs, or Interstate Bicycle Route signs.

Guidance:

If used, the appropriate arrow (M7-1 through M7-7) sign (see Figure 9B-4) should be placed below the Bicycle Route Guide sign, Bicycle Route sign, or Interstate Bicycle Route sign.

Arrow signs and supplemental plaques should not be used in conjunction with Bicycle Destination Signs.

Standard:

The arrow signs and supplemental plaques used with the D11-1 or M1-8 signs shall have a white legend and border on a green background.

The arrow signs and supplemental plaques used with the M1-9 sign shall have a white legend and border on a black background.

Insert the following signs into existing Figure 9B-4:

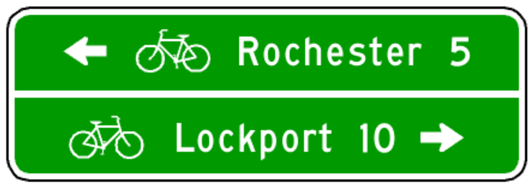
D1-1

D1-1a

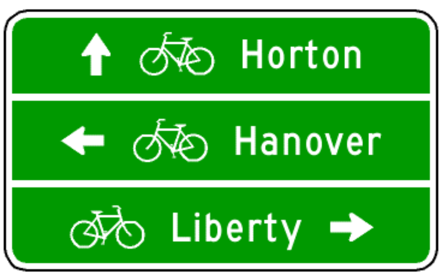
D1-1b

D1-1c

D1-2b



D1-2c



D1-3b

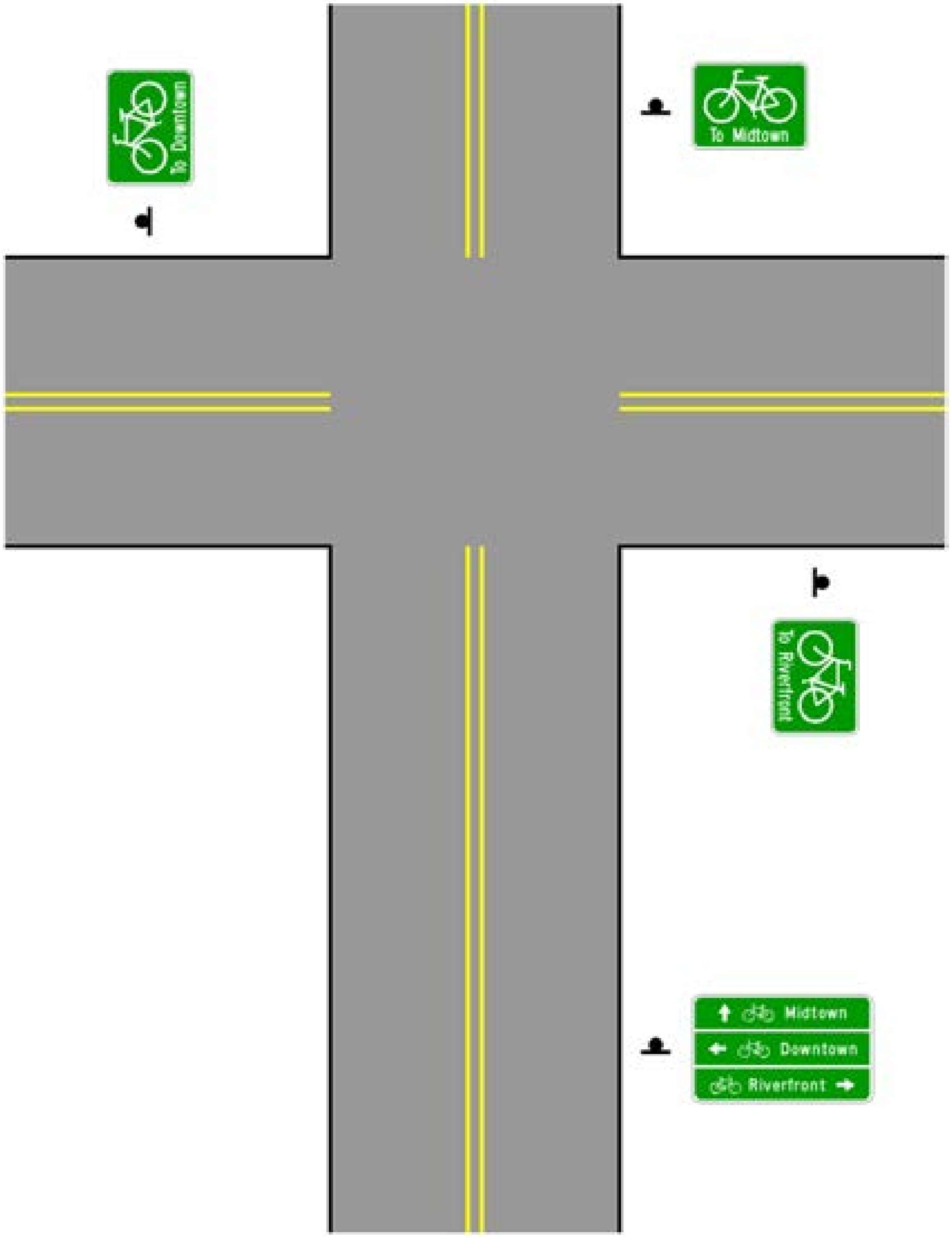
D1-3c

D3

D11-1c

Replace existing Figure 9B-6 with the following:

Figure 9B-6. Example of Bicycle Guide Signing



SHS figures

D1-1b

D1-1c

SHS figures

D1-2b

D1-2c

SHS figures

D1-3b

D1-3c

Transportation Master Plan
Bicycle Element

Appendix 6-H
Mile Marker Recommendations for Paths and Trails

BICYCLE No. 5

TECHNICAL COMMITTEE RECOMMENDATION

TECHNICAL COMMITTEE: Bicycle Technical Committee

DATE OF ACTION: June 23rd, 2005 (*modified January 18th, 2006*)

TOPIC: Proposed Reference Location Signs
Part 9 of the MUTCD

ORIGIN OF REQUEST: NCUTCD Bicycle Technical Committee

DISCUSSION:

Reference Location signs (mileposts) have been defined in Chapter 2D of the MUTCD since 1971, and have proven extraordinarily valuable for traveler information, maintenance and operations, emergency response, and numerous other applications.

The linear nature of many shared-use paths would seem to also naturally lend itself to the application of Reference Location signs. However, the use and design of such signs has not yet been explicitly addressed in Part 9 of the MUTCD. Defining a standard and uniform design could provide more uniform traveler guidance, reduce the proliferation of non-standard reference location signs, and encourage the use of these signs where desirable and appropriate.

The Bicycle Technical Committee proposes to add a section to Chapter 9B of the MUTCD defining the optional use of Reference Location signs for shared-use paths. The proposed signs would be proportionately sized for the lower operating speeds of shared-use paths, using a 6” wide panel with 3” numerals. The proposed text is adapted directly from Section 2D.46 defining the use of these signs for conventional roadways.

These proposed changes were also reviewed and approved by the NCUTCD Guide and Motorist Information (G/MI) Technical Committee at their meeting in June 2005.

COMMITTEE ACTION:

The Bicycle Technical Committee recommends that the National Committee submit this proposal as developed by the NCUTCD BTC to sponsors for comment and approval.

Approved unanimously by NCUTCD Council January 20th, 2006.

Add the following entries to Table 9B-1 of the MUTCD:

Sign	MUTCD Code	Minimum Sign Size – mm (in)	
		Shared-Use Path	Roadway
Reference Location	D10-1, D10-2, D10-3	150 x 300, 450, 600 (6 x 12, 18, 24)	250 x 600, 900, 1200 (10 x 24, 36, 48)
Intermediate Reference Location	D10-1a, D10-2a, D10-3a	150 x 450, 600, 750 (6 x 18, 24, 30)	250 x 675, 900, 1200 (10 x 27, 36, 48)

Add the following section to Chapter 9B of the MUTCD:

Section 9B.XX Reference Location Signs (D10-1 through D10-3) and Intermediate Reference Location Signs (D10-1a through D10-3a)

Support:

There are two types of reference location signs:

A. Reference Location signs (D10-1, 2, and 3) show an integer distance point along a shared-use path; and

B. Intermediate Reference Location signs (D10-1a, 2a, and 3a) also show a decimal between integer distance points along a shared-use path.

Option:

Reference Location (D10-1 to D10-3) signs (see Figure 9B-X) may be installed along any section of a shared-use path to assist users in estimating their progress, to provide a means for identifying the location of emergency incidents and crashes, and to aid in maintenance and servicing.

To augment the reference location sign system, Intermediate Reference Location (D10-1a to D10-3a) signs (see Figure 9B-X), which show the tenth of a kilometer (mile) with a decimal point, may be installed at one tenth of a kilometer (mile) intervals, or at some other regular spacing.

Standard:

When Intermediate Reference Location (D10-1a to D10-3a) signs are used to augment the reference location sign system, the reference location sign at the integer kilometer (mile) point shall display a decimal point and a zero numeral.

Reference location signs shall have a minimum mounting height of 600 mm (2 ft) to the bottom of the sign, and shall not be governed by the mounting height requirements prescribed in Section 9B.01.

Option:

Reference location signs may be installed on one side of the shared-use path only and may be installed back-to-back.

If a reference location sign cannot be installed in the correct location, it may be moved in either direction as much as 15 m (50 ft).

Guidance:

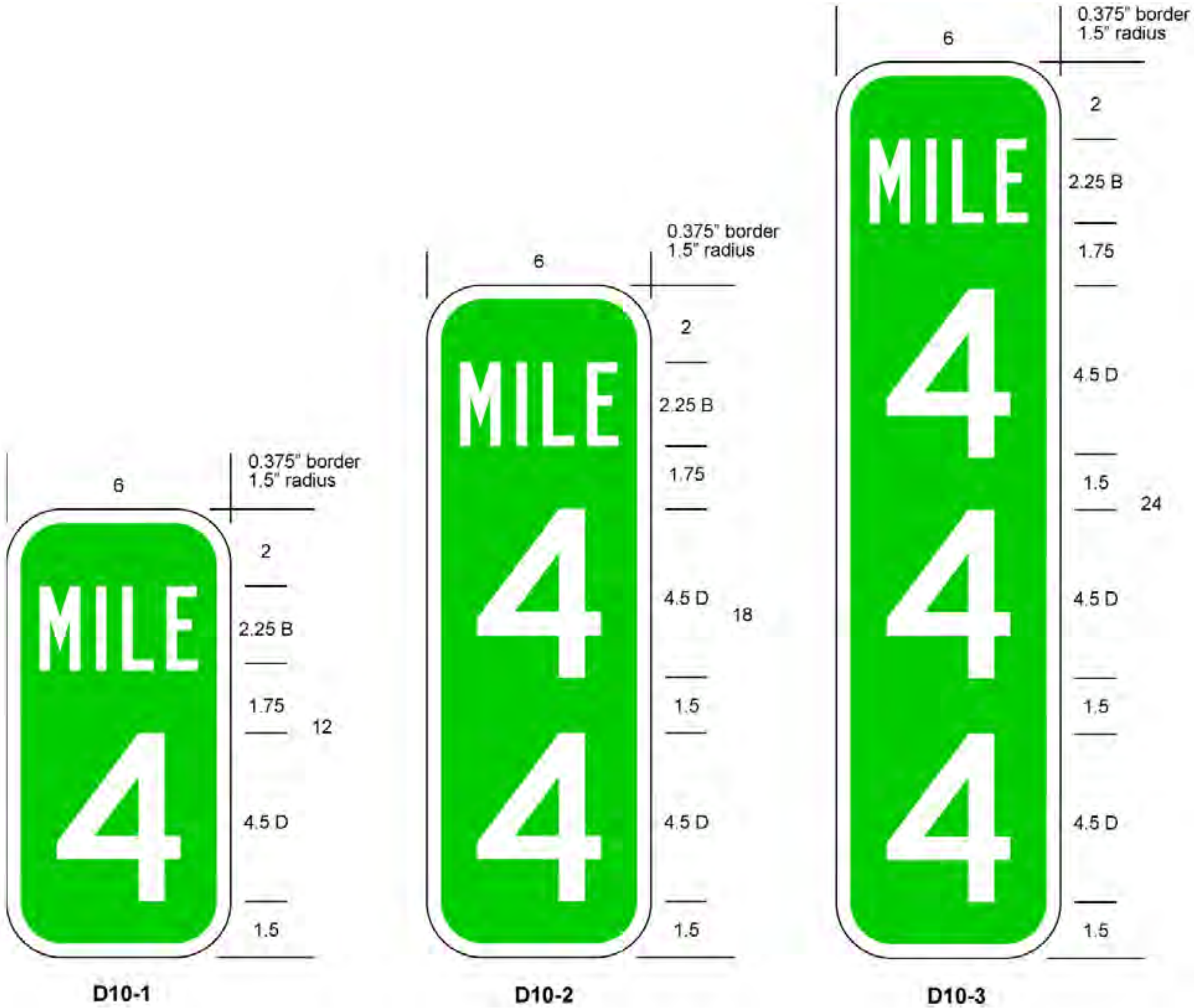
If a reference location sign cannot be placed within 15 m (50 ft) of the correct location, it should be omitted.

Support:

See Section 2D.46 for additional information on the application of reference location signs.

Add the following signs to Chapter 9B of the MUTCD (either as part of Figure 9B-4 or as a separate figure):

SHS Figures


6
0.375" border
1.5" radius
2
MILE
2.25 B
1.75
12
4
4.5 D
1.5
D10-1
6
0.375" border
1.5" radius
2
MILE
2.25 B
1.75
4
4.5 D
18
1.5
4
4.5 D
1.5
D10-2
6
0.375" border
1.5" radius
2
MILE
2.25 B
1.75
4
4.5 D
1.5
24
4
4.5 D
1.5
4
4.5 D
1.5
D10-3

Transportation Master Plan
Bicycle Element

Appendix 6-I
Detection of Bicycles

Detection of Bicycles

For traffic signals to operate efficiently they must be able to detect when vehicles are present on approaches to the intersection. In response to detecting the presence (and consequently the absence) of vehicles, traffic signal hardware can adjust signal phasing and timing plans to accommodate fluctuating traffic conditions throughout the day and week. Inefficient signal operations can arise when vehicle detection hardware is not operating optimally, such as when a loop fails. When this happens, the detector hardware will usually compensate by providing an automatic recall to the movement formerly monitored by the failed detector; this means that the lane over the failed loop will receive a green light during every cycle, whether a vehicle is there or not. Alternatively, there are some signal loop installations which may detect cars, but do not detect some trucks, motorcycles or bicycles. If they are not detected, these vehicles may not receive a green light.

This section describes common detector types and how their detection of bicycles can be optimized. This section also recommends an approach to bicycle detection that optimizes existing technology (i.e., inductive loop detectors) before pursuing new technologies for bicycle detection only.

Inductive Loops. The most common type of vehicle detection hardware is the inductive loop. The loop consists of a wire (or several wires) embedded into the roadway. A very low voltage current runs continuously through the loop; whenever a conductive object enters the electrical field around the loop, the loop's inductance is altered. The detector hardware senses this change in inductance and interprets it as a vehicle over the loop.[1]

Loop sensitivity is also an important aspect to consider with regard to bicycle detection. Sensitivity is affected by several factors, the three most important of which are: the amount of metal in the vehicle; the proportion of the loop covered by the vehicle; and the distance between the roadway surface and the metal in the vehicle. Ideally, a loop would be able to detect any vehicle placed over the loop but not detect vehicles in any adjacent lanes. Calibrating loops sensitively to do so is a principal challenge of signal hardware design, which has led to the development of numerous loop configuration solutions. Some of the more common configurations are shown in Figure 1. Each of these of these configurations is widely used across the country and each is capable of detecting bicycles in their fields.

[1] It is important to note that induction loops do <u>not</u> detect changes in the magnetic field and therefore a bicycle need not be made of steel to be detected. Because aluminum is a better conductor than steel, aluminum bikes are actually are more easily detected by inductive loops than steel bikes.

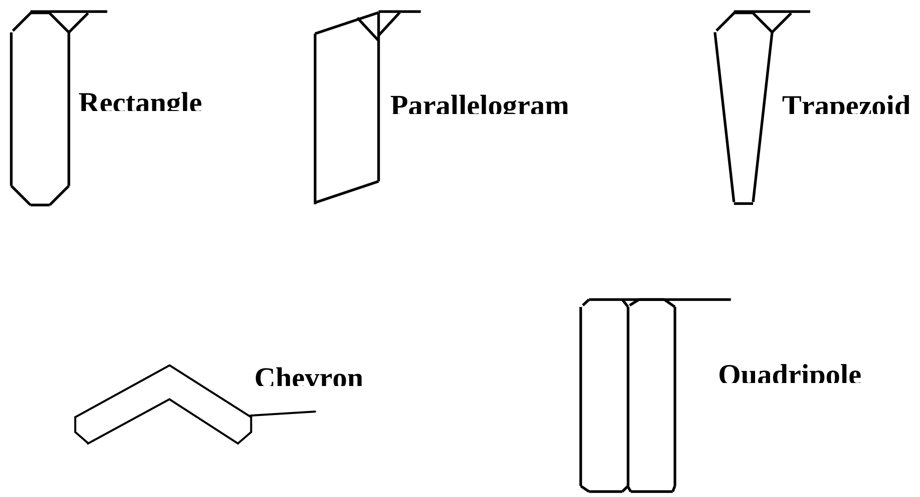


Figure 1   Common Configurations of Inductive Loop Detectors

There is a perception among many cyclists and roadway engineers that inductive loops do not detect the presence of bicycles; this perception is often based on cyclists not waiting in an optimal spot for detection. Research has shown that inductive loops are highly reliable at detecting steel and aluminum bicycles when bicycles are in the proper position.[2] There are two basic strategies to improve detection of bicycles: to direct bicyclists to the area of optimal loop sensitivity ("marking the sweet spot") or to place new loops in spots where cyclists are likely to be waiting, such as in the bike lane or at the right edge of the pavement. It is recommended that these strategies for optimizing loop detection of bicyclists be employed before investigating a substantial investment of new technology; the technology already in place around many Scottsdale intersections is likely quite capable of detecting bicyclists. The following sections describe these two strategies.

Marking the Sweet Spot. One of the simplest ways to facilitate the detection of bicyclists at traffic signals is to mark that spot on the roadway where a given loop will detect a bicycle. The MUTCD provides for a symbol that may be placed on the pavement to indicate the optimum position for a bicyclist to actuate the signal (Figure 2).[3] Used in conjunction with the BICYCLE SIGNAL ACTUATION sign (R10-22, Figure 3)[4], this symbol can eliminate the problem of bicycle detection for any intersection movement where the loops can detect bicyclists.

[2] See for example the FHWA report "*Bicycle and Pedestrian Transportation*," prepared by SRF consulting in 2003, available on line at http://ntl.bts.gov/lib/23000/23300/23330/BikePedDetFinalReport.pdf
[3] *MUTCD*, Section 9C.05 Bicycle Detector Symbol, FHWA, Washington, D.C., 2003.
[4] *MUTCD*, Section 9B.12, Bicycle Signal Actuation Sign, FHWA, Washington, D.C., 2003.

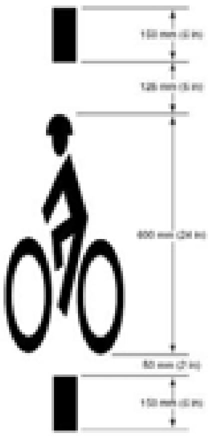


Figure 2   Signal Actuation Stencil

R10-22

Figure 3   Signal Actuation Sign

This sweet spot can be located by two people in the field using the following process. First, have one person open the controller cabinet and note the light indicating detection for the lane of interest. Next, place a bicycle at the right edge of the lane with the front tire overhanging the stop line. Then move the bicycle slowly to the left in the lane until the controller indicates the bike is detected by the signal loop (see Figure 4). Continue moving the bike until the bicycle can no longer be detected. Finally, mark the pavement at middle of this range of detection. In many cases an entire bicycle is not needed to locate the sweet spot, just a bicycle wheel may do. However, until it can be determined if a single wheel will be detected by Scottsdale loops, an entire bike – and initially both a mountain bike and a road bike – may be appropriate for experimentation.

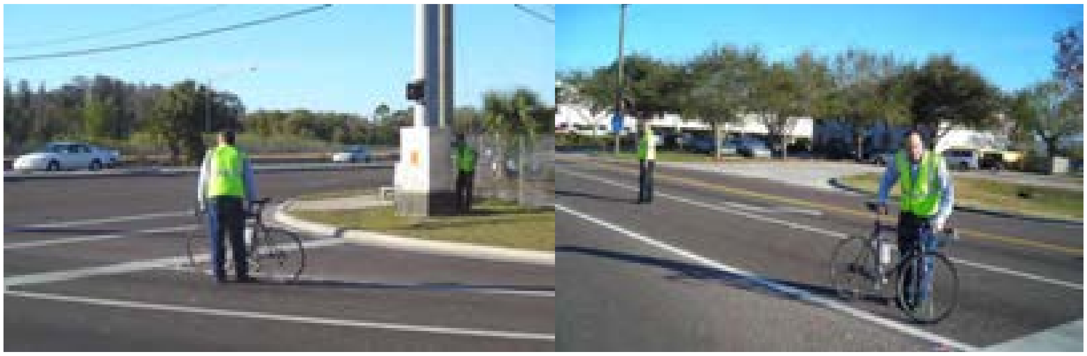


Figure 4   Finding the "Sweet Spot"

Loops for Bike Lanes. Placement of signal loops within bike lanes is not always necessary. As stated above, frequently bicycles only need to be detected in situations where no motor vehicle is present; in those situations, bicyclists could exit the bike lane and wait to be detected over the standard signal loop. Even so, changing lanes at an intersection to call for a signal change is not a normal vehicular behavior. Consequently, in the interest of providing consistent treatments and promoting consistent vehicular behavior, bike lane detection should still be considered at locations where signal change is unlikely without detection.

The most commonly recommended loop type for bike lanes is a quadripole loop of reduced size. These loops are highly sensitive to objects in the area immediately above them, but detection falls off rapidly outside of this sensitivity field; this means that cars in adjacent lanes will not be detected. Quadripole loops, when placed in a bike lane, typically detect within an area two feet wide by ten feet long.

Other Detection Technologies

In addition to inductive loops there are numerous other technologies being used to detect bicyclists at signalized intersections. These include video, microwave, infrared, and ultrasonic detectors. Of these methodologies, video detection is the most commonly used at this time. New technologies can be effective and should be explored for future use especially when a platform conversion is underway for general vehicle detection needs as well.

Wireless sensors. Wireless sensors can be used as a direct replacement for conventional inductive loops at intersections, but without pavement cuts or lead-in cabling. With new sensitivity modes for stop bar applications, the wireless vehicle detection systems can be tuned to accurately detect the presence of automobiles, motorcycles, scooters, and bicycles at intersections. Using pulse or presence modes and mapped as required to different detector groups and signal phases, the wireless vehicle detection system can be easily configured in the same way that inductive loops would interface to a traffic controller. Unlike loops, however, each wireless sensor can be installed in less than ten minutes, making their installation a much faster and less expensive option.

Video Detection. Video detection has been used very successfully to detect bicyclists. In this methodology, a specific field of interest is outlined on a video display and any change within the field area is detected by the video detection hardware and software. Video detection of bicyclists has several advantages over inductive loop detectors. Inductive loops can fail, and, since they are hard wired into the roadway, they can take a long time to replace – typically coincident with resurfacing of a roadway. Inductive loops also limit a traffic engineer’s ability to shift roadway lanes, crosswalks, or stop bars. Video detection hardware does not include any in-pavement components, thus the area of detection can be easily adjusted.

Video detection is not perfect, however. Some users have reported that such factors as glare, rain, or dirty lenses significantly reduce the detection capability of the video hardware. Proper alignment of the cameras, lens hoods and maintenance may be able to minimize the impact of these limitations. Another limitation of the video system that has been identified is that it may not detect cyclists at night if the cyclists are not using lamps; increased street lighting can help avoid this problem.

Microwave Detection. Microwave detectors transmit electromagnetic radiation at a detection zone on the pavement or sidewalk and use the Doppler principle to determine if a person, bike or car is present. Some types of microwave detectors cannot detect stationary objects, while others are able to detect both detect passage (moving objects) and presence (stationary objects). Microwave detectors can detect pedestrians and bicyclists. Currently, they are not typically used for bicycle detection but are used for pedestrian detection.

Ultrasonic or Acoustic Detectors. Ultrasonic (or acoustic) detection systems work much the same way as microwave detectors. However, bicyclists and pedestrians usually do not cause enough changes in the detected sound energy levels. These systems are also prone to false calls in noisy environments.

Infrared Detection. There are two basic types of infrared detection systems – passive and active. Passive infrared detection systems are not particularly efficient and are subject to adverse weather conditions. Active infrared systems are effective at detecting bicyclists and pedestrians.

Of the above listed alternatives to inductive loops, video is probably the most common in use today. When strategically deployed, however, loop detectors are a very effective means of detecting the presence bicycles at intersections. If they are placed within a marked bike lane, the loops should have no problem detecting bicycles that pass over them, provided that the bicycle is also within the marked lane. If there is not a bike lane, it is advisable to stencil the “sweet spot” on those roadways for which the signal will not cycle to green without being called. Wireless sensors are a new technology that may provide a cost effective and reliable alternative. Other technologies have been have been shown to be effective for bicycles as in ways described above, but it is only advised that video or other technologies be considered for bicycle detection at intersections where such alternatives are being employed for other detection needs as well. The advantages of having a uniform technological platform for all traffic detection outweigh any sensitivity benefits to be gained by any one technology.

Signal Timing Adjustments

Calling the green signal is the primary purpose of detecting bicycles. For this purpose, either detection using the existing loops or loops in the bike lane will suffice. However, because signal timing may also need to be adjusted, there is an additional incentive to place detection loops in bike lanes. The consideration of bicyclists when timing signals involves two calculations – the minimum clearance interval and the minimum green time. Details for how to set signal timing for bicyclists are included in Appendix 6-F.

Transportation Master Plan
Pedestrian Element

Appendix 7-A
Pedestrian Friendly Community Characteristics

Common Characteristics of Pedestrian Friendly Communities	
Characteristic	**Description**
Coordination Between Jurisdictions	Providing pedestrian facilities to meet current and future needs requires close coordination between jurisdictions and other modes of transportation.
Linkages to a Variety of Land Uses/Regional Connectivity	Pedestrian circulation and access is provided to shopping, transit, downtown, schools, parks, offices, mixed-use developments, and other community origins and destinations, as well as adjacent communities.
Continuous Systems/Connectivity	A complete system of interconnected streets, pedestrian walkways, and other pedestrian facilities will increase pedestrian travel.
Shortened-Trips and Convenient Access	Provide connections between popular origins and destinations, between dead-end streets or cul-de-sacs, or as shortcuts through open spaces.
Continuous Separation from Traffic	Street and driveway crossings locations are well defined or minimized as appropriate. Buffers from motor vehicles and separation of uses are provided.
Pedestrian Supportive Land Use Patterns	Land use patterns, such as a grid layout or short blocks in business districts and Downtown, enhance pedestrian mobility.
Well-Functioning Facilities	Provide adequate width and sight distance, accessible grades, and alignment to avoid blind corners. Common problems, such as poor drainage, are avoided.
Designated Space	Pedestrian facilities should be well delineated, signed, and marked. Designing a secure environment for pedestrians is important.
Security and Visibility	Lighting, increased visibility, open sight-lines, and access to police and emergency vehicles enhances security.
Automobile is not the Only Consideration	Streets are designed for all modes of transportation. Parking supply is reduced or managed using methods that encourage walking.
Neighborhood Traffic Calming	Narrowed streets lined with trees, traffic circles, curb bulbs, neckdowns, and other techniques can lower vehicle speeds and create safer conditions for pedestrians.
Accessible and Appropriately Located Transit	Siting of transit facilities adjacent to work, residential areas, shopping, and recreational facilities encourages pedestrian trips. Transit stops and centers should typically be located in areas of supporting densities (4 to 7 units per acre minimum). Development of adequate pedestrian facilities to access transit is essential to their success as an alternative mode of travel.
Lively Public Spaces	Secure, attractive, and active spaces – such as pedestrian plazas - provide focal points in the community where people can gather and interact.
Character	Preservation of important cultural, historic, and architectural resources strengthens community heritage and character.
Scenic Opportunities	Attractive environments and scenic views encourage pedestrian use, particularly when facilities are oriented toward them.
Pedestrian Furnishings	Furnishings, such as benches, restrooms, drinking fountains, artwork and other elements, create a more attractive and functional environment for pedestrians.
Street Trees and Landscaping	Street trees bring human scale to the street environment. Landscaping in planting strips between the sidewalk and curb, in containers, and in other areas soften surrounding hard edges of buildings and parking lots and add life, color, and texture to the pedestrian's field of vision.
Design Requirements	Guidelines and adopted standards are followed and, if deviated from, justified

Common Characteristics of Pedestrian Friendly Communities	
Characteristic	**Description**
	and documented.
Proper Maintenance	Frequent cleanup and repair on a regular basis ensures ongoing, consistent use.
Source: *Pedestrian Facilities Guidebook*, Washington State Department of Transportation, September 1997, available at www.wsdot.wa.gov/walk/designinfo.htm	

Transportation Master Plan
Pedestrian Element

Appendix 7-B
Current Pedestrian Policies and Documents

1.0 City of Scottsdale Bicycle/Pedestrian Transportation Plan (January 1995)

The City of Scottsdale *Bicycle/Pedestrian Transportation Plan* was adopted in January 1995. The Plan provides guidance for integrating non-motorized modes of transportation into City plans and policies, ensuring that Scottsdale continues to grow as a pedestrian/bicycle friendly community. The *Bicycle/Pedestrian Transportation Plan* looks at pedestrian movement as a transportation mode and reviews travel demand, safety, convenience, cost, intermodal connections, and similar factors. The goals of the plan are listed below.

PLANNING AND IMPLEMENTATION GOAL: The City of Scottsdale will incorporate the needs of human-powered transportation into the policy-making, planning, design, construction and maintenance phase of all existing and new City policies, plans, programs, projects, facilities and operations.

DESIGN AND STANDARDS GOAL: The City of Scottsdale will devise and adopt design guidelines and standards needed to implement a safe, functional, convenient, accessible and pleasurable walking and cycling environment for recreation and transportation.

SAFETY, EDUCATION AND ENFORCEMENT GOAL: The City of Scottsdale will develop and implement comprehensive and proactive safety, education and enforcement programs for all bicyclists, pedestrians and motorists.

PROMOTION AND ECONOMICS GOAL: The City of Scottsdale will employ comprehensive and proactive programs to promote cycling and walking as viable, economically desirable forms of transportation and recreation for both residents and visitors.

2.0 City of Scottsdale General Plan Community Mobility Element

The *Transportation Master Plan's* Pedestrian Element has been developed consistent with the pedestrian mobility goals contained in the Community Mobility element of the Scottsdale General Plan. The Community Mobility element recognizes, among other things, that "Land use and transportation plans need to incorporate multimodal opportunities now and in the future." As a result, the Community Mobility element focuses on three levels of mobility: regional; citywide; and neighborhood. At the regional level, mobility takes precedence over access; at the city level mobility and access are balanced. It is at the local/neighborhood level where access takes precedence over mobility, and non-motorized mobility types (for example: walking, biking, and in some neighborhoods horseback riding) are a priority. To this end, the following *General Plan* goals and approaches were selected as most applicable to guide the specific recommendations of this Pedestrian Element, found in Section 9.0 Recommendations:

GOAL 9: Protect neighborhoods from negative impacts of regional and citywide networks.

- Explore neighborhood street layouts and design that are not necessarily aligned with the citywide and regional network to prevent cut-through automobile traffic, reduce speeding and noise, provide greater and safer opportunities for non-motorized modes, and to create an environment where the neighborhood can flourish.
- Look for opportunities to provide grade-separated crossings for various travel modes (e.g. bicycle, pedestrian, equestrian) that connect neighborhoods to high demand locations and other neighborhoods, especially when separated by city or regional corridors.

GOAL 10: Encourage a diversity of links between neighborhood systems and with citywide and regional systems.

- Explore alternative layouts that use existing connections such as alleys, drainage corridors, dead-end streets, vista corridors, grade-separated crossings, and open space to create additional non-motorized connections between neighborhoods.
- Provide accessibility to mass transit by enhancing the pedestrian experience, providing non-motorized routes and transit options that are not on fixed routes (such as shuttles, or Dial-a-ride type services).
- Ensure that intermodal connections are functional so that movement between types of transportation is convenient and uninterrupted.

GOAL 11: Provide opportunities for building "community" through neighborhood mobility.

- Provide non-motorized modes of transportation as an alternative to the automobile and develop opportunities to foster a sense of community by linking civic spaces.
- Strive for the highest standards of safety and security for all motorized and non-motorized modes.
- Promote non-motorized travel for short neighborhood trips such as homes to schools, parks, libraries, retail centers, and civic spaces.
- Promote school site design that encourages non-motorized travel for students and personnel by accommodating direct links between schools and neighborhoods in a manner that minimizes exposure to vehicles.
- Provide a high level of service for pedestrians through facilities that are separated and protected from vehicle travel (e.g., placing landscaping between curbs and sidewalks).
- Emphasize strong pedestrian orientation (e.g. shaded safe paths, links to civic spaces) to foster a strong sense of community.

GOAL 12: Recognize the diversity of neighborhoods throughout the City and their different mobility needs.

- Continuously communicate with the community that the strength of live, work and play land use relationships will have a direct impact on the service levels and number of mobility choices that a neighborhood may experience. Mixed-use development will have a stronger emphasis on pedestrian-oriented design and contain more dynamic non-motorized connections. On the other hand, more singular land uses such as low-density equestrian areas may place more emphasis on local trail systems to maintain connectivity.

- In maturing neighborhoods explore retrofitting of aging infrastructure, re-design of streets, and connections for non-motorized traffic to augment a neighborhood's livability and safety.
- Consider the use of grade separations to enhance safety and provide choices for mobility of different modes.

3.0 City of Scottsdale Downtown Plan’s Downtown Urban Design and Architectural Guidelines (1986; updated in 2004)

The Guidelines list recommendations for site development, building form, architectural and landscape character to assure that new development contributes to Downtown urban design goals and is compatible with the character of existing Downtown districts. Many of the goals address pedestrian needs, such as:

- Urban Design Goal 2: Strengthen pedestrian character and create new pedestrian linkages. Downtown's pedestrian character distinguishes it from other places in the Valley. It serves as an attraction to visitors and an important part of the City's heritage valued by residents. All new Downtown projects should emphasize and extend this pedestrian character. An attractive network of clear pedestrian linkages between the separate Downtown districts should be developed, making it possible for enjoyable walks through a wider area of Downtown.
- Urban Design Goal 3: Create a compact downtown with an intensified and diverse mix of activities. Downtown Scottsdale can accept growth and prosper if it keeps its pedestrian character and presents an attractive alternative to the automobile-oriented nature of other places in the metropolitan area. Downtown should attract housing, hotels, offices and other activities to complement its present specialty shopping reputation. The Development area should be compact and intense while maintaining present pedestrian scale.
- Urban Design Goal 6: Continue and expand the tradition of downtown's covered walkways. The covered walkways are a key part of Downtown's architectural heritage. The walkways unify diverse fronts, provide people with shaded protection from the sun, and further serve as a consistent architectural element of pedestrian scale. Covered walkways are required in the Pedestrian Overlay District and are strongly encouraged in all areas as a unifying urban design element, signaling Scottsdale's special pedestrian character.
- Urban Design Goal 7: Create coherent and consistent street spaces. Downtown's streets, building setback areas and building frontages should work together to create a unified image. Site planning of individual projects should give priority to establishing complementary and supportive relationships with neighboring properties and the urban design goals of their districts.
- Urban Design Goal 9: Expand the downtown trolley system. The trolleys are a promising method of moving Downtown visitors. They provide linkages between Districts, strengthen pedestrian choices, and reduce traffic congestion. The Trolleys should be emphasized as a key to solving Downtown's traffic circulation problems. Individual projects should be planned to accommodate its expansion.

The Guidelines divided Downtown into two different development area types: Type 1 (compact development area) and Type 2 (intermediate development area). The Type 1 Development areas contain most of the Old Town, West Main and Fifth Avenue and Marshall Way - Craftsman's Court districts. Urban design goals for these districts are:

- Preservation of existing pedestrian-scale and strengthening of fine-grain building character.
- Development of strong pedestrian linkages between districts.
- Improvement of the quality and continuity of "street spaces".
- Compatibility of architectural character.

The Type Development Areas comprise the major portion of Downtown. The size of development sites in Type 2 Areas varies widely, ranging from small infill projects to large assemblages of land for multi-building developments. Urban Design goals for these districts are:

- Development of unified street spaces with consistent design principles for the building setback zone.
- Development of pedestrian and vehicular linkages between adjacent large projects.
- Consistent planting design principles to achieve visual structure on important arterial streets.
- Careful handling or architectural form to reduce the apparent size and bulk of larger buildings.

The Planning and Development Services Department is undertaking an update of the Downtown Plan which is anticipated to be completed in 2008.

4.0 City of Scottsdale Safe Routes to School Implementation Plan (2006)

This document identifies the purpose of the City's Safe Routes to School (SRTS) program, specific program elements, and required resources to implement the program. There are two primary goals with the SRTS program:

- Wherever it's safe, encourage children to walk and bicycle to school.
- Where safety deficiencies exist, correct them so that children are able to safely walk and bicycle to school.

Program elements would include creating a Transportation Safety Committee at each school, conducting a committee kick-off meeting, creating partnership agreements, collecting information, creating a map of routes used to get to school and evaluating the travel environment, identifying issues and finding solutions, developing a Safe Routes to School Improvement and Implementation Plan, funding the plan, and acting, evaluating and making changes if needed.

5.0 Maricopa Association of Governments (MAG) Pedestrian Polices and Design Guidelines (2005)

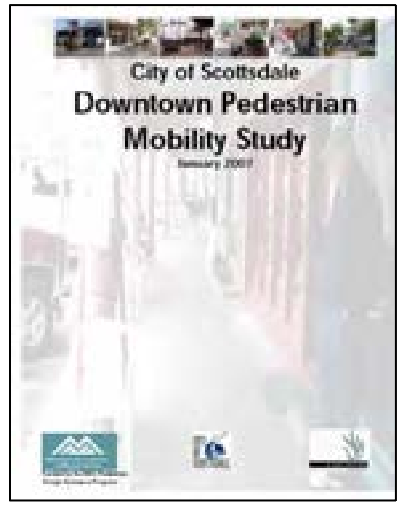
The *Pedestrian Policies and Design Guidelines* identifies policies and design guidance to help make pedestrian areas safe and comfortable. The document provides an overview of pedestrians and their abilities, recommendations for jurisdictions, design principles, a methodology to identify the appropriate type of pedestrian facility, and specific design guidelines on aspects such as sidewalk width and texture, appropriate clearances, landscaping, and provision of pedestrian amenities. This document is referred to extensively in the design guidelines created for the Pedestrian Element of the *Transportation Master Plan*.

6.0 MAG Pedestrian Plan 2000 (December 1999)

The MAG *Pedestrian Plan 2000* includes programs and actions to promote better pedestrian accommodation in the regional transportation system. The Plan provides flexible design tools, and goals and objectives. Major goals of the Plan address land use, public awareness, funding, designing for people, and linkage.

7.0 Downtown Pedestrian Mobility Study (January 2007)

This *Downtown Scottsdale Pedestrian Mobility Study* was done with a MAG grant to the City of Scottsdale. The City requested the funds to measure pedestrian mobility in Downtown Scottsdale, and to determine how and where to make improvements to that mobility. The Study assessed Downtown Scottsdale within its four established districts - Old Town, Main Street, 5th Avenue, and Marshall Way Arts. Concurrently, the City's Downtown Group sponsored a similar effort to assess mobility issues within the Northeast Quadrant area, an emerging district east of Scottsdale Road, south of Camelback, north of Goldwater Boulevard, and west of 75th Street. While each established district has its distinct character, the districts have begun to grow together and are within a comfortable walking distance of one another, pointing to a need for a degree of connectivity and cohesion for pedestrians.

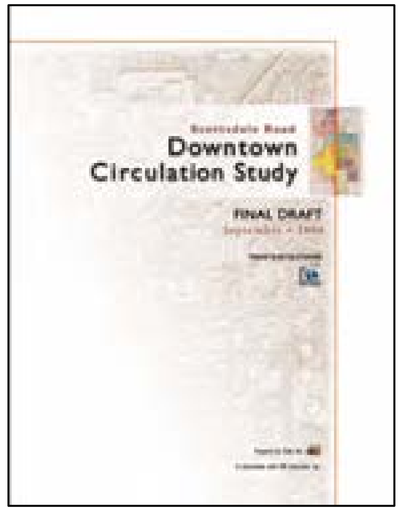


The study combines the MAG *Pedestrian Policies and Design Guidelines* with the City's Downtown *Urban Design and Architectural Guidelines* to establish measurable criteria and a substantial database for the evaluation of mobility. With this database, the City will pinpoint where and what types of impediments or problem areas exist that impede pedestrians' ability to move around Downtown. This information will be the basis for future capital improvement projects.

Major issues of concern throughout Downtown identified in the Study include:

- Discontinuous or blocked sidewalks; lack of a clearly defined and intuitively continuous pedestrian walkway of sufficient width.
- Wide intersections that create disconnections between Districts and across major streets.
- Uneven, narrow or disjointed walkways.
- Ramps which do not provide direction to the crosswalk or to the ramp across the street.
- No line of sight or ADA access to the Civic Center Mall from Brown Avenue or First Avenue (Note that a temporary ramp has since been installed in this location).
- Sidewalk boundaries that are not discernible to pedestrians with low vision.
- Unclear walkway access to buildings and/or around streetside uses, such as sidewalk cafes and retail displays.
- Unclear street signage and conflicts with vehicles, parked or moving, especially during periods of high activity such as special events.
- Jaywalking at night across major roadways, such as Scottsdale Road, during evening hours and special events.

8.0 City of Scottsdale Downtown Circulation Study (September 2006)



The *Downtown Circulation Study* examined existing conditions related to motor vehicle traffic, pedestrian and bicycle travel, transit, and parking in Downtown Scottsdale. This study also analyzed the various modes of travel and made recommendations for improving circulation throughout Downtown. The study was completed as part of the Scottsdale Road Streetscape project, which includes design guidelines and streetscape designs for Scottsdale Road from McKellips Road (now Roosevelt Road) to Chaparral Road. The pedestrian circulation section describes general conditions related to pedestrian travel in Downtown, specific opportunities and challenges including Scottsdale Road as both a connecting and dividing force, and variations in sidewalk capacity and pedestrian flow.

The Study identifies several opportunities and challenges to pedestrian mobility in Downtown as discussed below.

- Scottsdale Road/Downtown intersections.
- Sidewalk capacity and pedestrian flow.
- Accessibility and barriers to pedestrian travel.
- Pedestrian access to Downtown.
- Pedestrian lighting.

As Downtown continues to add more residential and mixed-use projects and improvements are made between districts, pedestrian travel between destinations and districts will intensify. Improvements to various walking routes, crossings, and intersections will need to keep pace with the changes in Downtown and new travel patterns that develop. New features that help pedestrians cross roadways, improved pedestrian lighting, removal of obstructions (columns, furnishings, street lights, etc.) in the pedestrian path of travel, and accessible curb ramps will be needed. There are several places in Downtown Scottsdale where sidewalk widths are too narrow for pedestrian traffic and where there are barriers for people with physical challenges and disabilities.

Angled and front-in perpendicular parking along Scottsdale Road can create safety concerns for pedestrians and motorists. When maneuvering into or out of these spaces, visibility and safety of pedestrians walking along the sidewalk becomes compromised.

At many intersections in Downtown along Scottsdale Road, pedestrians are required to push the walk signal activation button in order to obtain sufficient time to cross the street. In some cases, even when the pedestrian cycle is activated by the push button, the amount of time available for crossing may be insufficient for some pedestrians, especially those who have slower walking speeds or mobility impairments.

Intersections along Scottsdale Road that require particular attention to improve mobility for pedestrians include Indian School Road, Camelback Road, Arizona Canal, Chaparral Road, Highland Avenue, and Osborn Road. Enhancements are also suggested at Indian School Road/Goldwater Boulevard and Indian School Road/Marshall Way. Intersection improvements are also needed at 2nd

Street, 3rd Avenue, and 5th Avenue along Scottsdale Road since these are the primary east-west streets that tie into the couplet system.

The intersection of Indian School and 68th Street also should be improved for pedestrians given the redevelopment of the Valley Ho and new residential units on the south side that create the need to enhance pedestrian mobility and safety north to the Arizona Canal. Other intersections of concern that create challenges for pedestrians include the crossing of Goldwater Blvd. at Main Street, the crossing of Drinkwater Blvd. at Brown, near Stetson/Goldwater (south of Camelback Road), the crossing of Camelback Road at 73rd Street, and the crossing of Goldwater Blvd. at 5th Avenue.

Currently north-south pedestrian access into and out of Downtown is difficult. Major pedestrian barriers exist where the couplet streets merge with Scottsdale Road. At the intersections of Scottsdale and Goldwater in north Downtown, and the intersection of Scottsdale and Drinkwater in south Downtown, pedestrian crossing and sidewalk improvements are needed. The configurations of these merge areas are not conducive for pedestrians. Lack of crosswalks and sidewalks make crossings impossible and prohibited. These conditions create major barriers for pedestrians seeking access to Downtown from the surrounding neighborhoods. It is also a challenge for pedestrians to cross at the intersection of Scottsdale Road and Camelback since no sidewalk exists on the west side of Scottsdale Road.

9.0 Design Standards and Policy Manual (DS&PM)

The DS&PM encourages multiple pedestrian connections, short direct access, and separation between the back of curb and sidewalks. The only mandatory pedestrian requirements are related to sidewalks and curb ramps and are as follows:

> Sidewalks are typically provided on all arterial, collector, and local streets. Some streets within the northern area of the City do not provide sidewalks or other pedestrian facilities. Scottsdale requires a minimum six-foot sidewalk on all minor streets; eight-foot or wider sidewalks are required along all major streets (major collector classification or greater). The City requires sidewalks to be a minimum of four feet from the back of curb (eight feet being typical). The exception to this setback rule is when a sidewalk is adjacent to a bus stop, or in areas with a more urban design character, such as Downtown.

These guidelines should be updated to also reflect latent demand when determining locations and widths.

The DS&PM encourages the following measures to enhance the connectivity and safety of the pedestrian environment:

- Reduced curb cuts.
- Provision of through pedestrian access from cul-de-sacs and dead ends, across drainage easements, and between commercial developments to destinations.

Recently, the City has taken substantial steps to improve curb ramp facilities. The DS&PM requires curb ramps to be placed wherever a pedestrian access route crosses a sidewalk/street transition, at intersections, medians, alleys, and where pedestrian travel continues on the roadway once a public sidewalk ends.

Additionally, the City requires alterations in retrofit development areas to follow guidelines for new construction unless technically infeasible as determined by the Scottsdale Transportation Department.

Finally, the City is working to improve pedestrian access and safety by requiring the use of directional ramps at all intersections. The City of Scottsdale *Standard Details* require that where physically feasible, directional ramps should be installed at all intersections. In locations without sufficient space to accommodate full directional ramp treatment, a diagonal ramp with a minimum eight-foot wide and four-foot deep landing at the back of the ramp is preferred. In all cases, ramps shall be provided with truncated domes, a detectable warning device.

Transportation Master Plan
Pedestrian Element

Appendix 7-C
Pedestrian Collision Information from 2000 to 2006

Maps of pedestrian collisions by Planning Zone from 2000 to 2006 are shown in Figure 1 through Figure 5.

Figure 1 Pedestrian Collisions in Scottsdale, Planning Zone A, 2000—2006

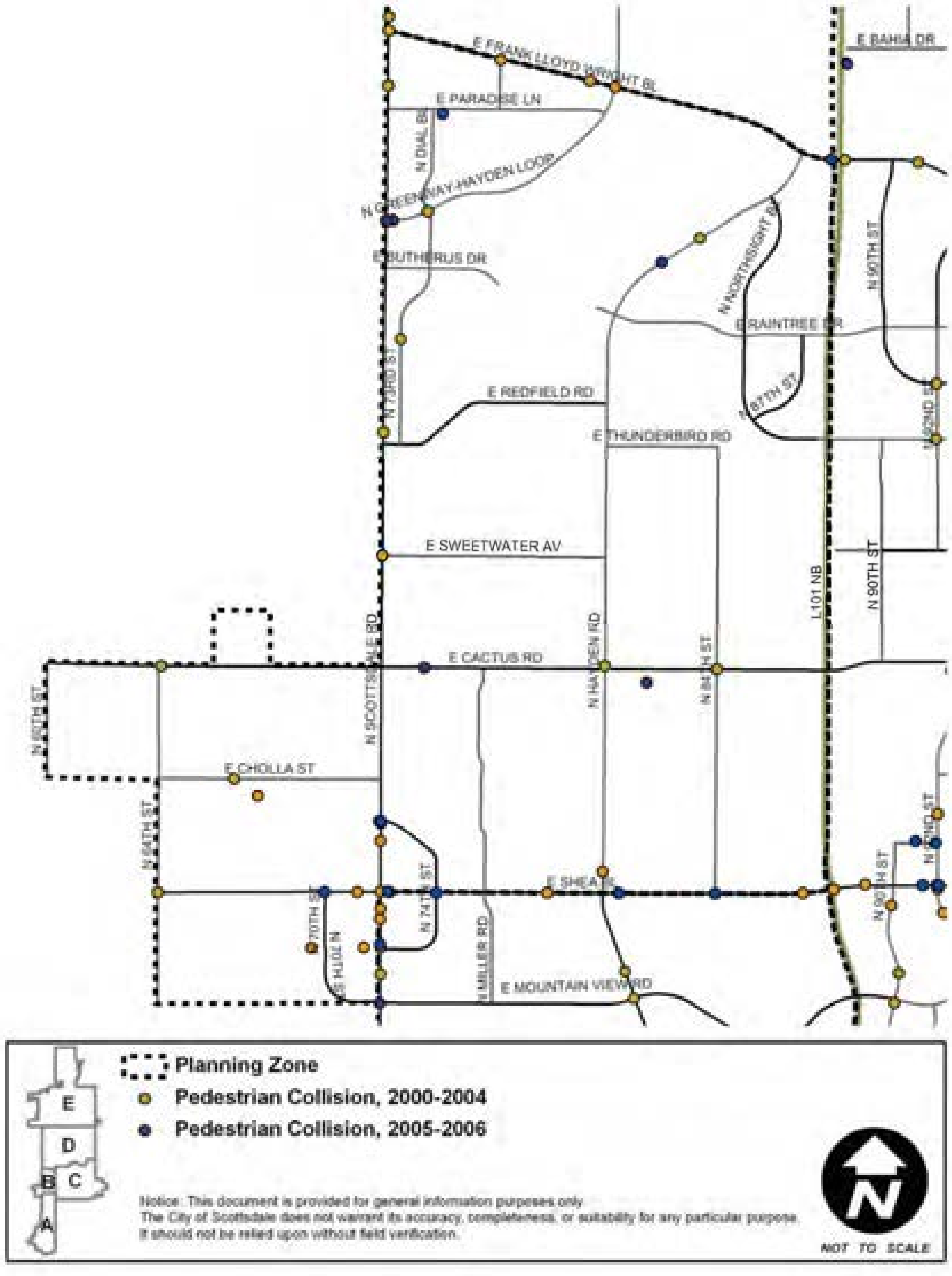


Figure 2 Pedestrian Collisions in Scottsdale, Planning Zone B, 2000—2006

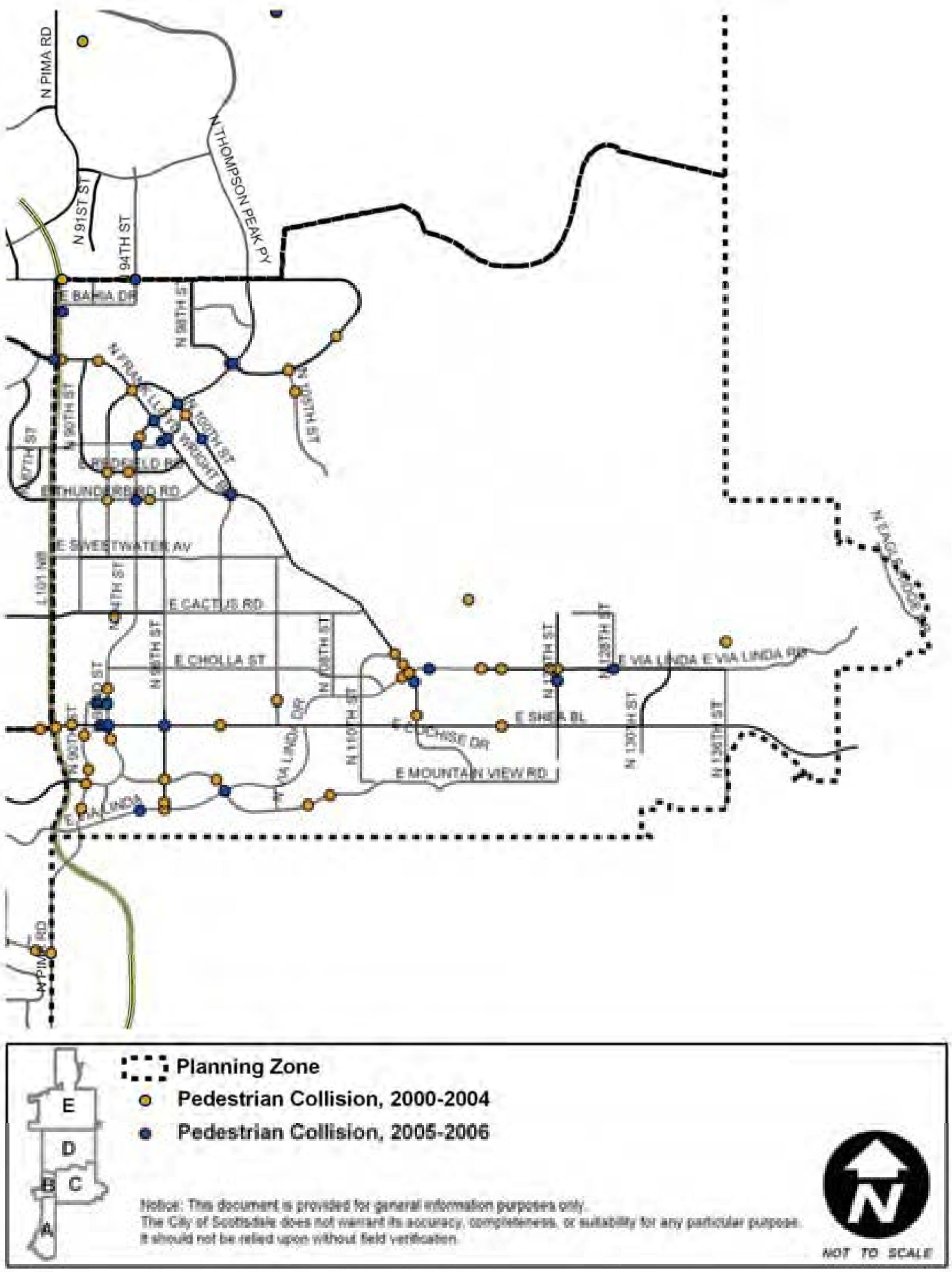


Figure 3 Pedestrian Collisions in Scottsdale, Planning Zone C, 2000—2006

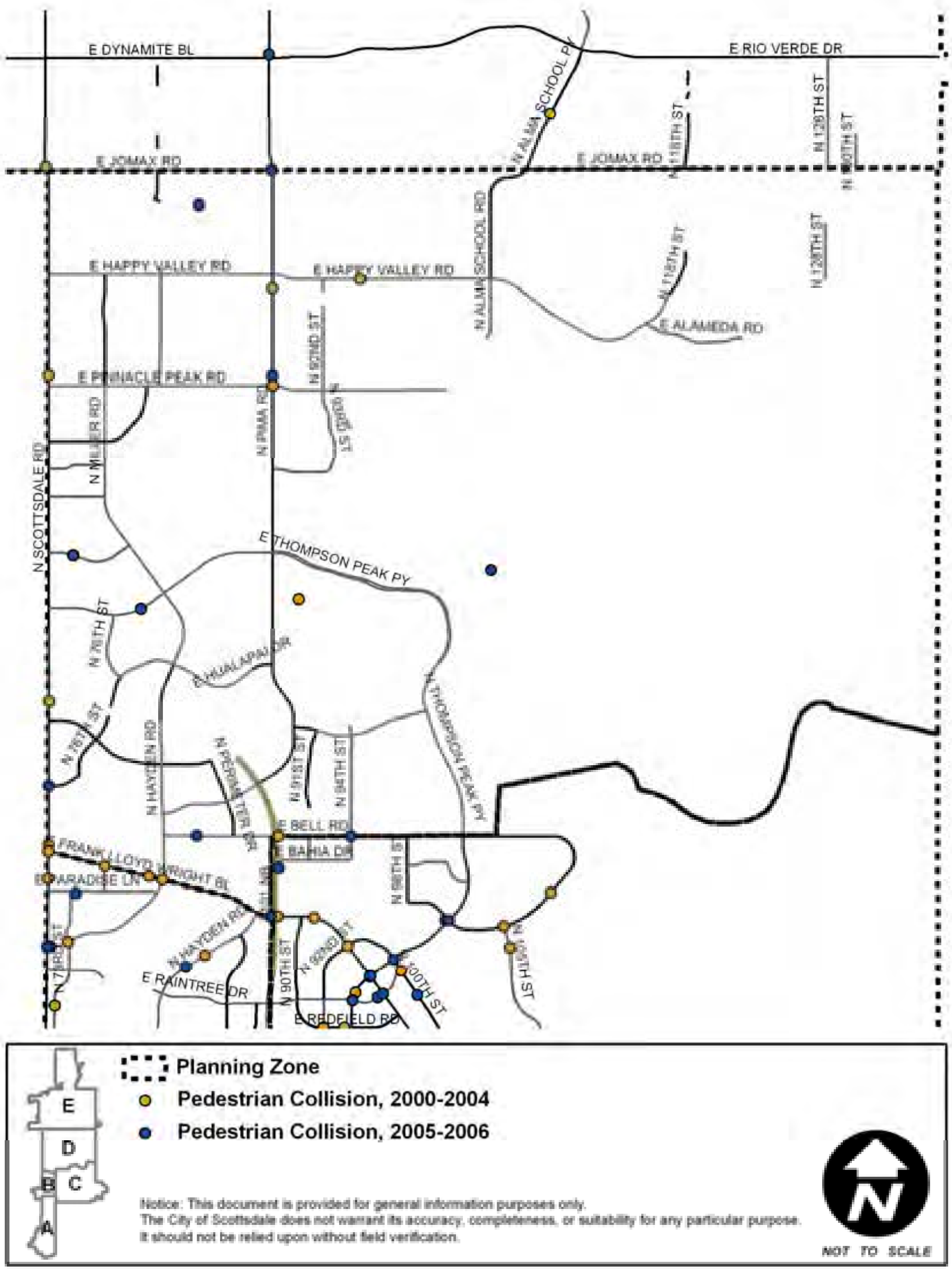


Figure 4 Pedestrian Collisions in Scottsdale, Planning Zone D, 2000—2006

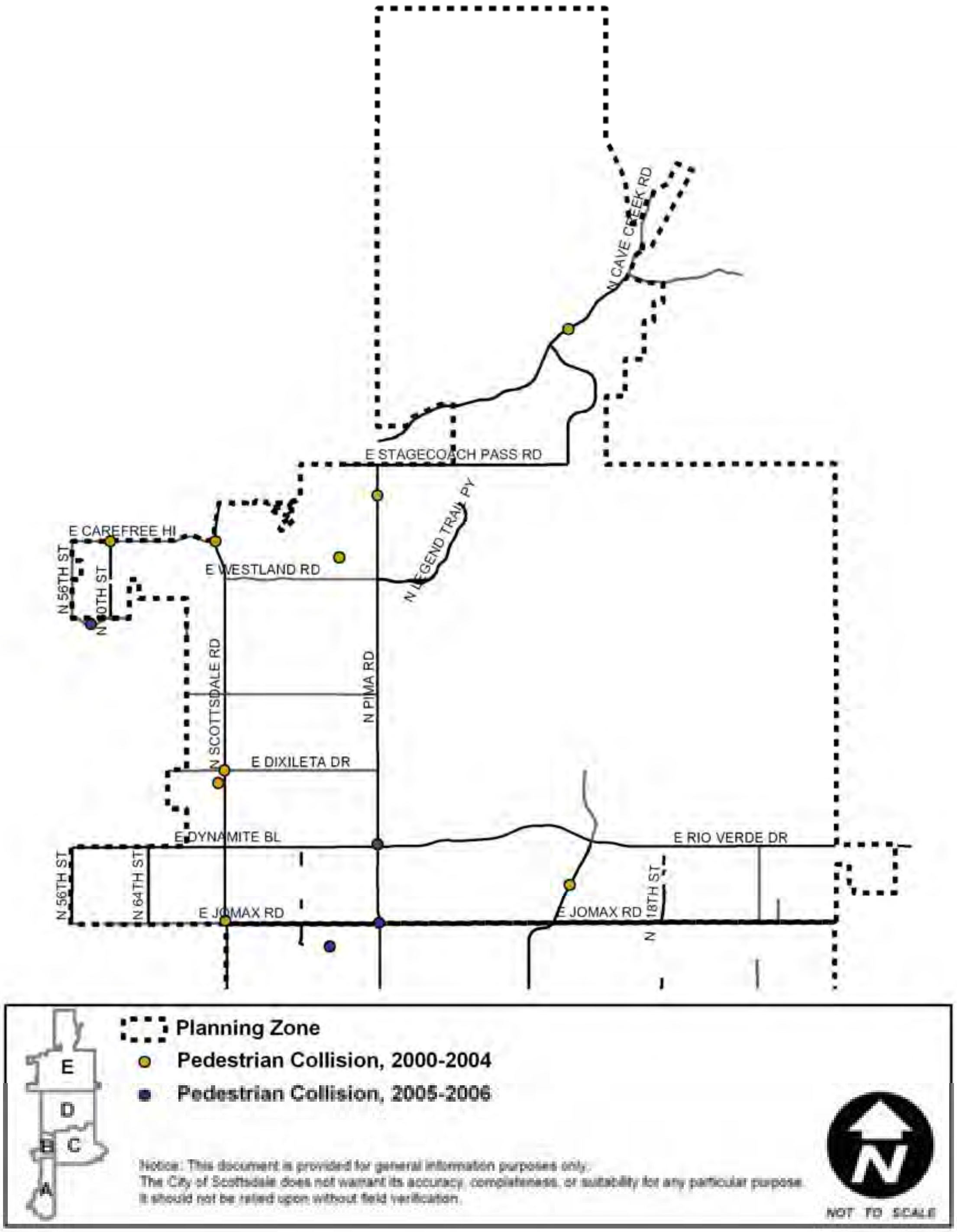


Figure 5 Pedestrian Collisions in Scottsdale, Planning Zone E, 2000—2006

Figure 6 illustrates the number of reported pedestrian-vehicle collisions in the City of Scottsdale from 1994 through 2004, separated into total collisions, injury collisions, and fatal collisions. The lowest number of pedestrian-vehicle collisions occurred in 1994 with a total of 23 crashes, 19 of which resulted in injury and four resulted in fatalities. The highest number of pedestrian collisions occurred two years later with 58 total collisions, 47 of which were injury related and five fatalities. The majority of pedestrian-vehicle collisions resulted in injury.

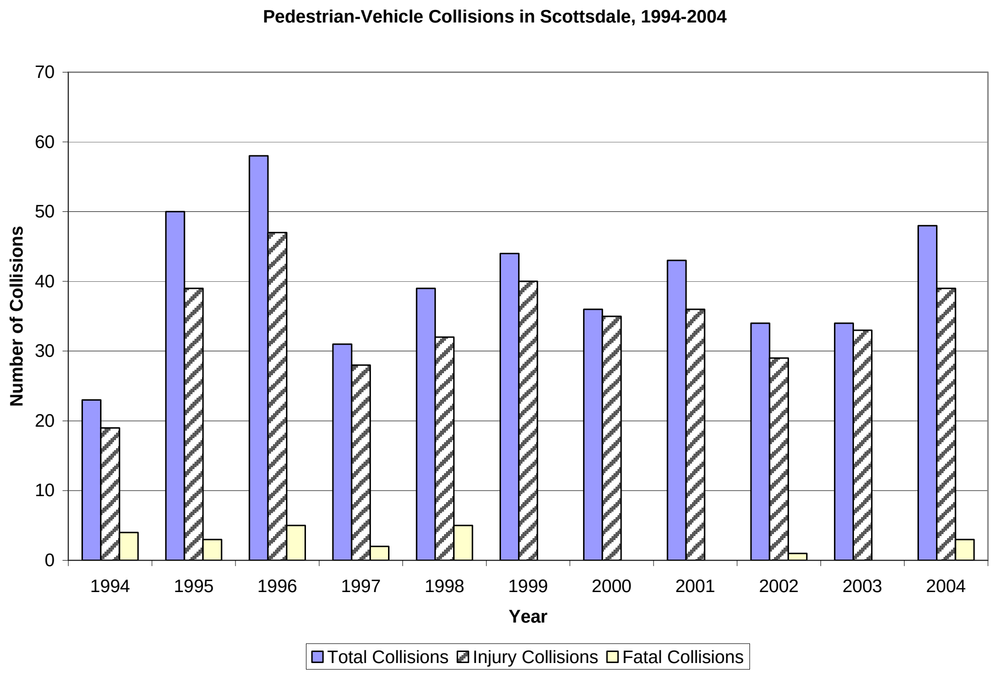


Figure 6   Pedestrian-vehicle Collisions in Scottsdale, 1994—2004

An additional 85 pedestrian crashes were reported during January 2005—October 2006. These 85 pedestrian crashes were analyzed to gain an understanding of crash characteristics. Most crashes resulted in an injury to the pedestrian (see Figure 7 on the next page). Only one crash did not result in an injury. There was one pedestrian fatality.

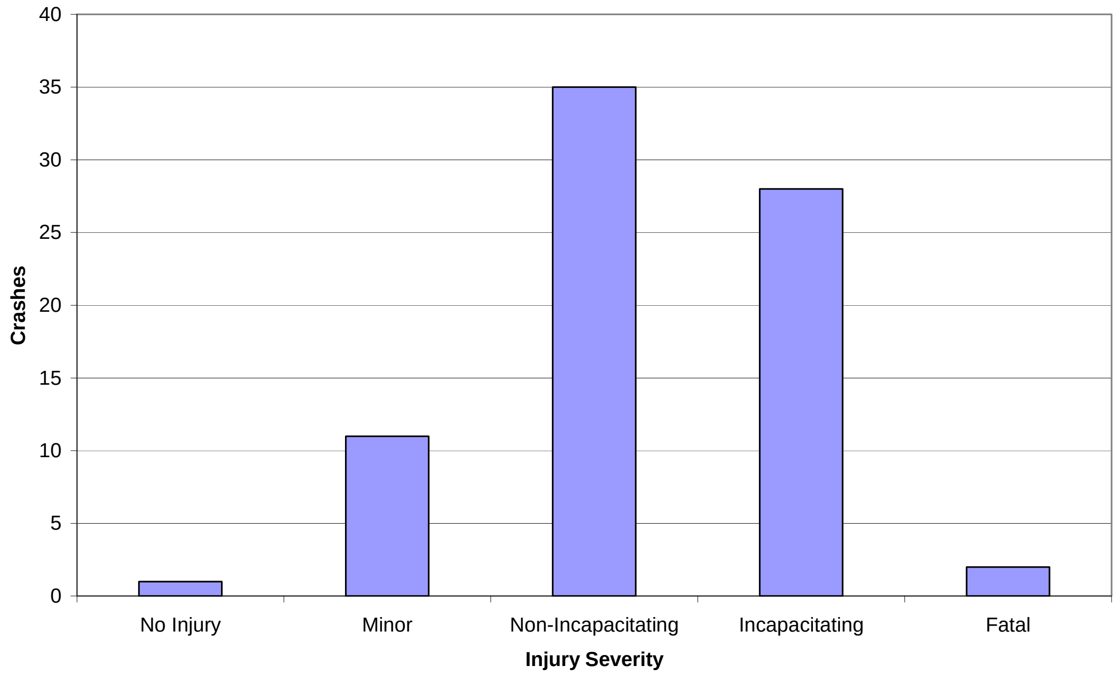


Figure 7 Pedestrian Crashes, Injury Severity, January 2005—October 2006

By time of day, pedestrian crashes were fairly evenly distributed among three time periods: 6:00 AM to 11:59 AM; 12:00 Noon to 5:59 PM; and 6:00 PM to 11:59 PM (see Figure 8). The fewest crashes occurred during the overnight hours of 12:00 AM to 5:59 AM.

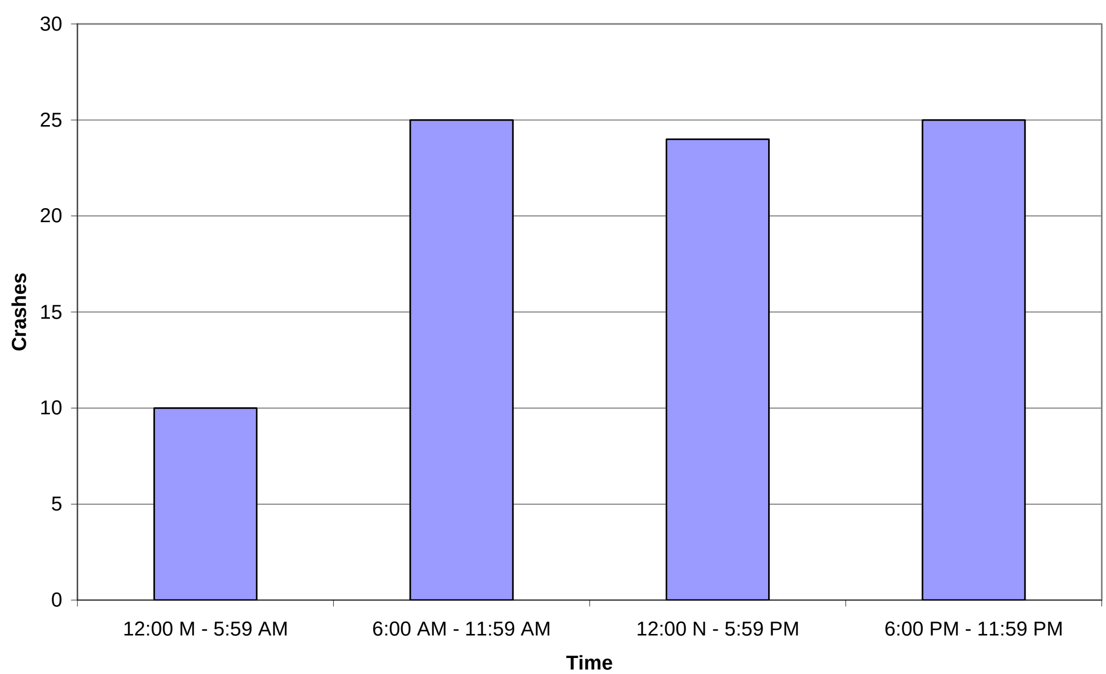


Figure 8 Pedestrian Crashes By Time of Day, January 2005—October 2006

Excluding crashes occurring on private property (for example, parking lots), 40 percent of pedestrian crashes occurred at intersections (see Figure 9) and the majority of the collisions occurred between intersections or midblock of the intersection.

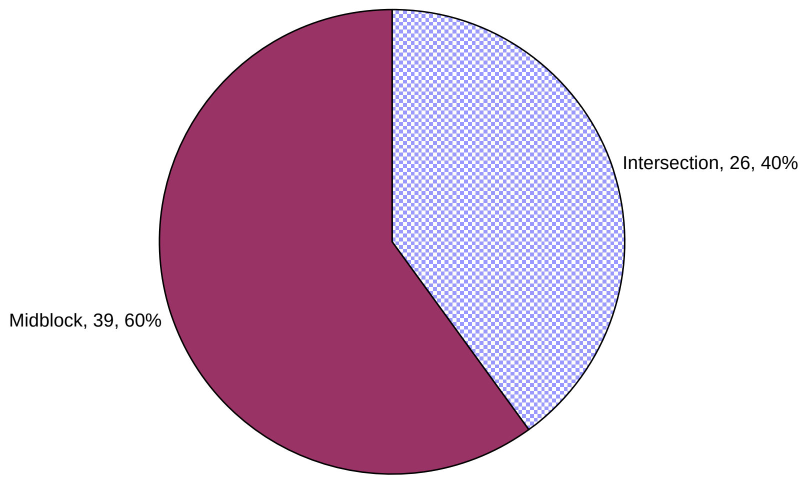


Figure 9 Pedestrian Crashes by Location, January 2005—October 2006

Pedestrians involved in the crashes were most commonly between 18 and 44 years of age (see Figure 10).

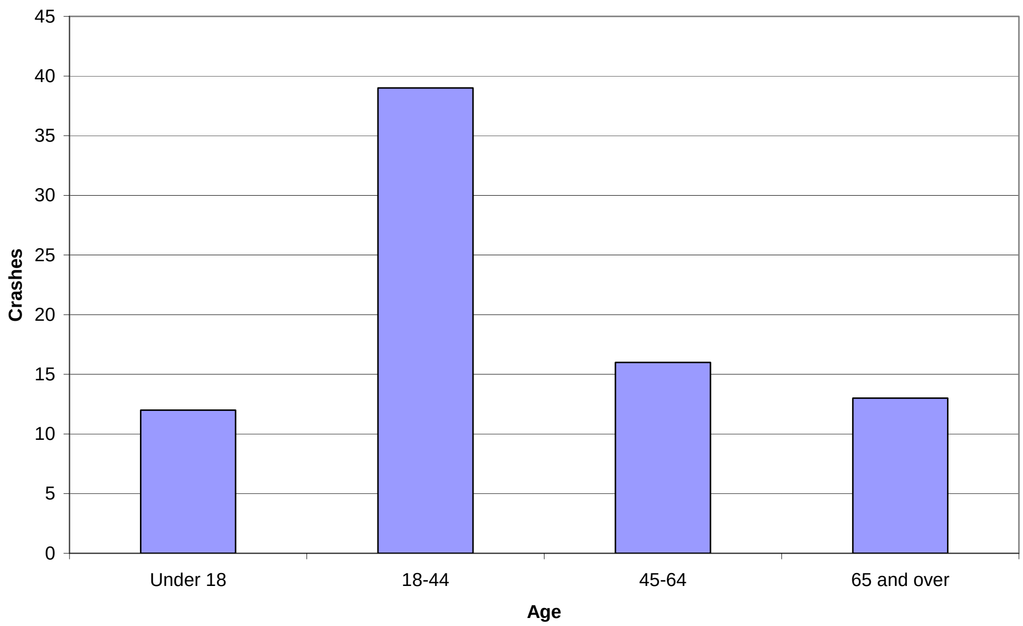


Figure 10 Pedestrian Crashes By Age of Pedestrian, January 2005—October 2006

The majority of pedestrians had no apparent defects in their physical condition (see Figure 11). However, 13 percent of the pedestrians had been drinking.

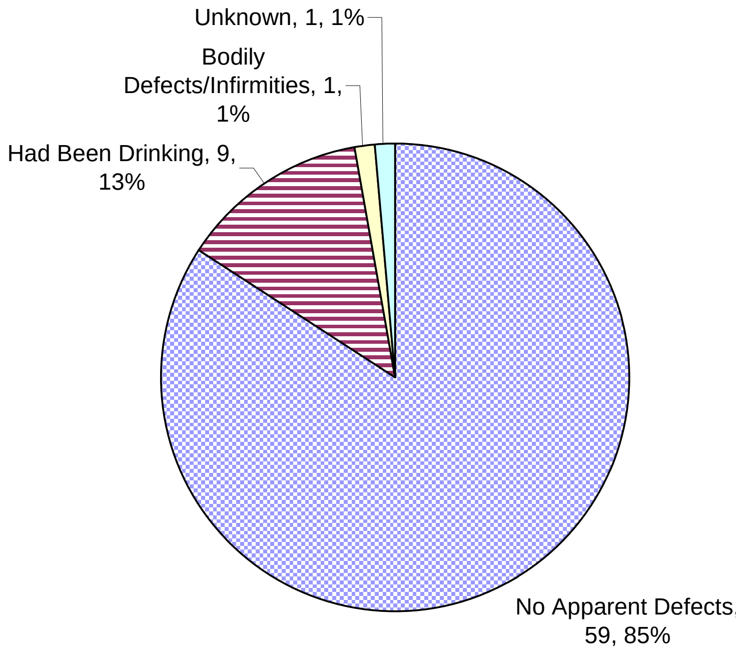


Figure 11   Physical Condition of the Pedestrian, January 2005—October 2006

Transportation Master Plan
Pedestrian Element

Appendix 7-D
Planned Capital Improvement Projects

Figure 1 FY 2008 – 2012 Capital Improvement Projects, Planning Zone A

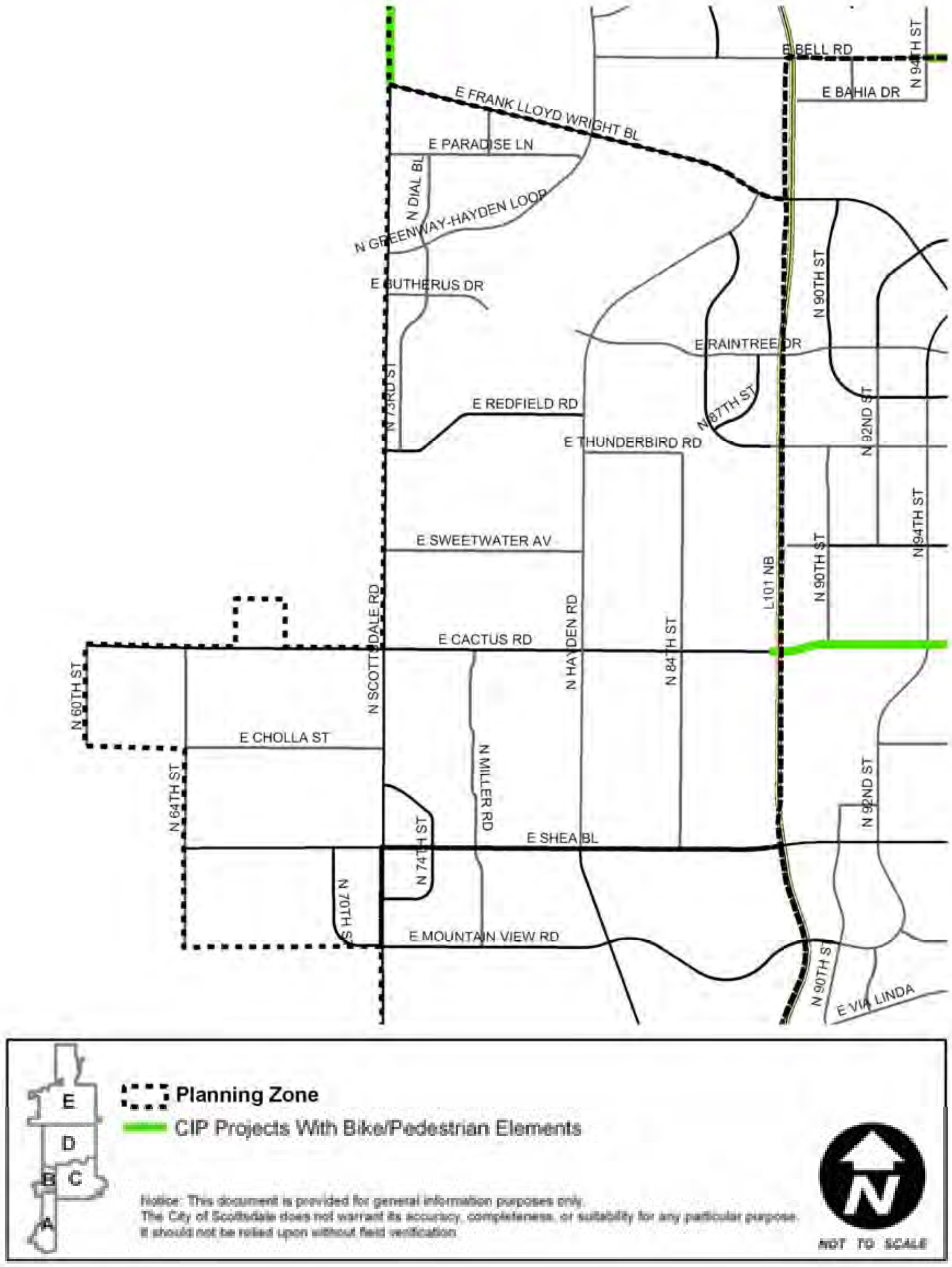


Figure 2 FY 2008 – 2012 Capital Improvement Projects, Planning Zone B

Figure 3 FY 2008 –2012 Capital Improvement Projects, Planning Zone C

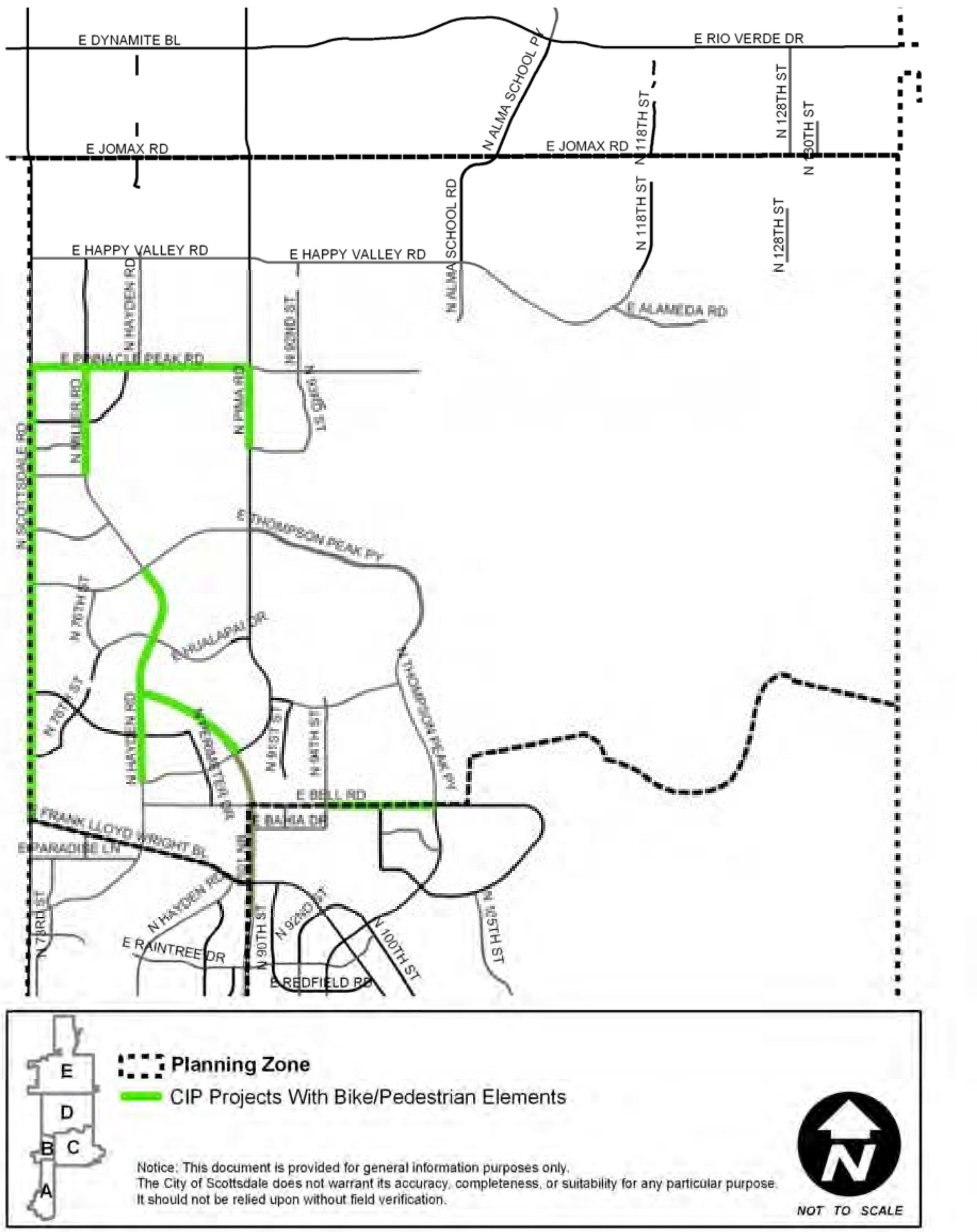


Figure 4   FY 2008 – 2012 Capital Improvement Projects, Planning Zone D

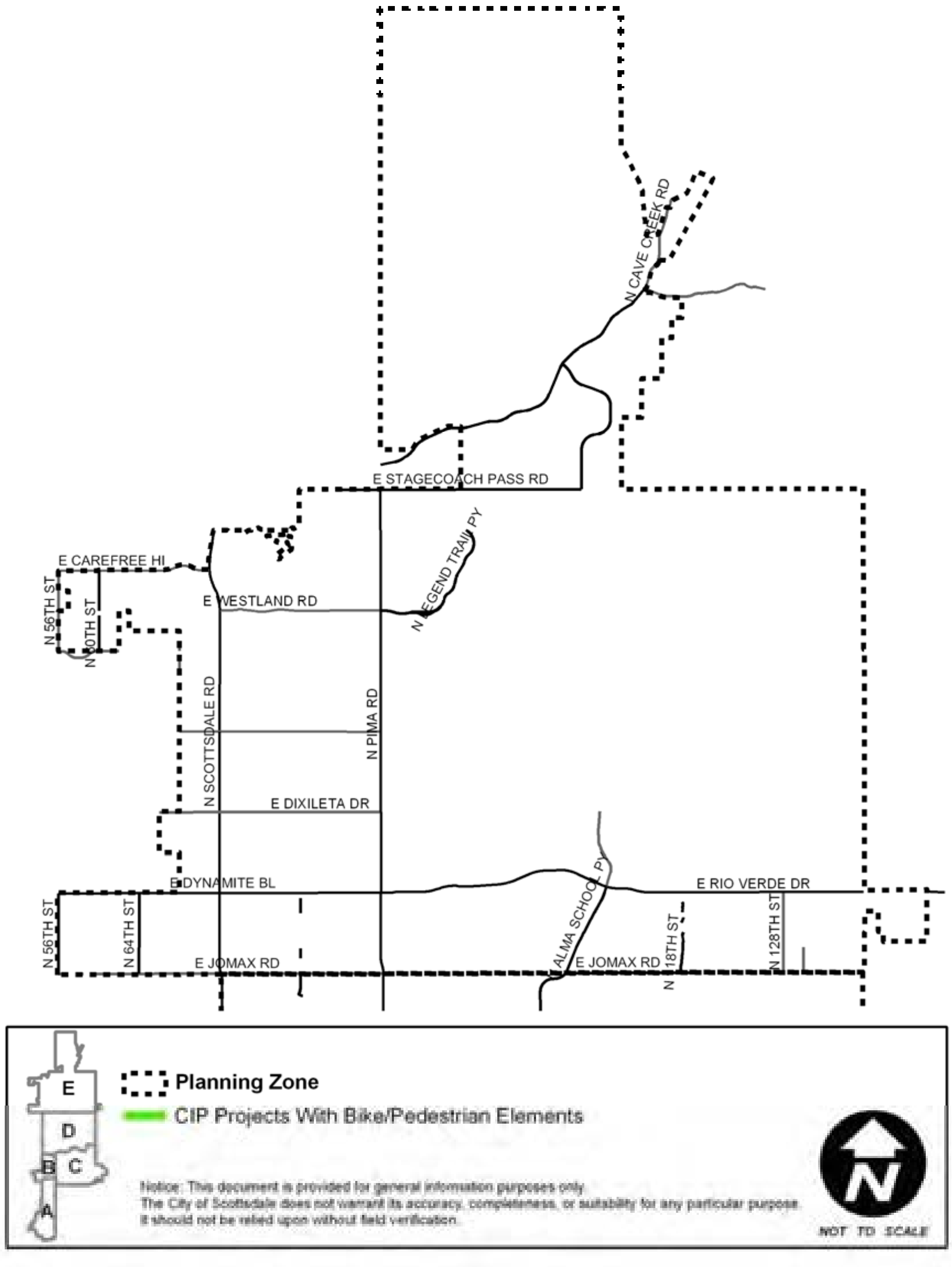


Figure 5 FY 2008 –2012 Capital Improvement Projects, Planning Zone E

Transportation Master Plan
Pedestrian Element

Appendix 7-E
Pedestrian Latent Demand

The following maps detail the results of the latent demand analysis by Planning Area. While the results shown in Figures 1 through 5 are tied to particular study roadway segments, latent demand for areas between the segments can generally be estimated.

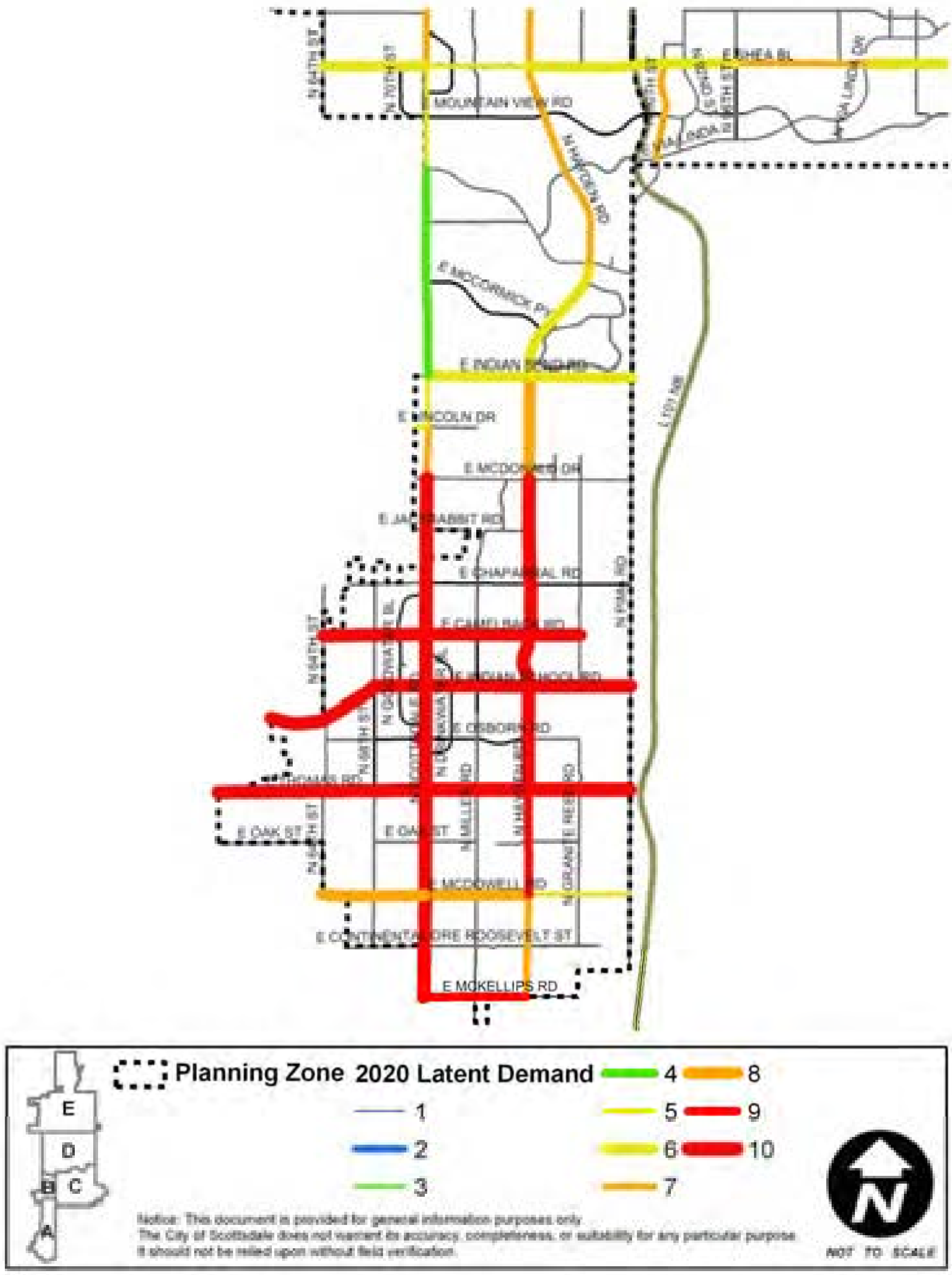


Figure 1 2020 Pedestrian Latent Demand, Planning Zone A

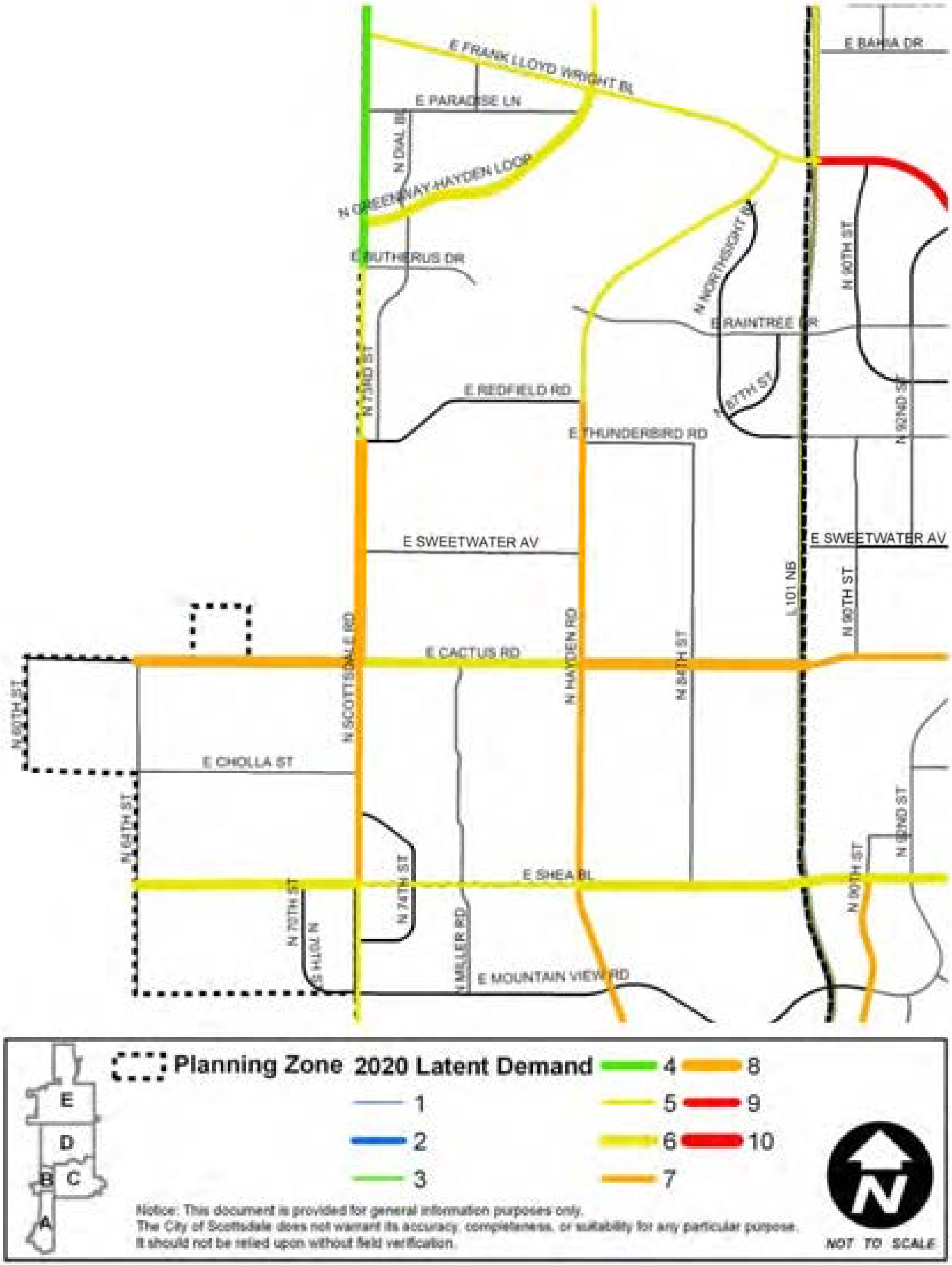


Figure 2 2020 Pedestrian Latent Demand, Planning Zone B

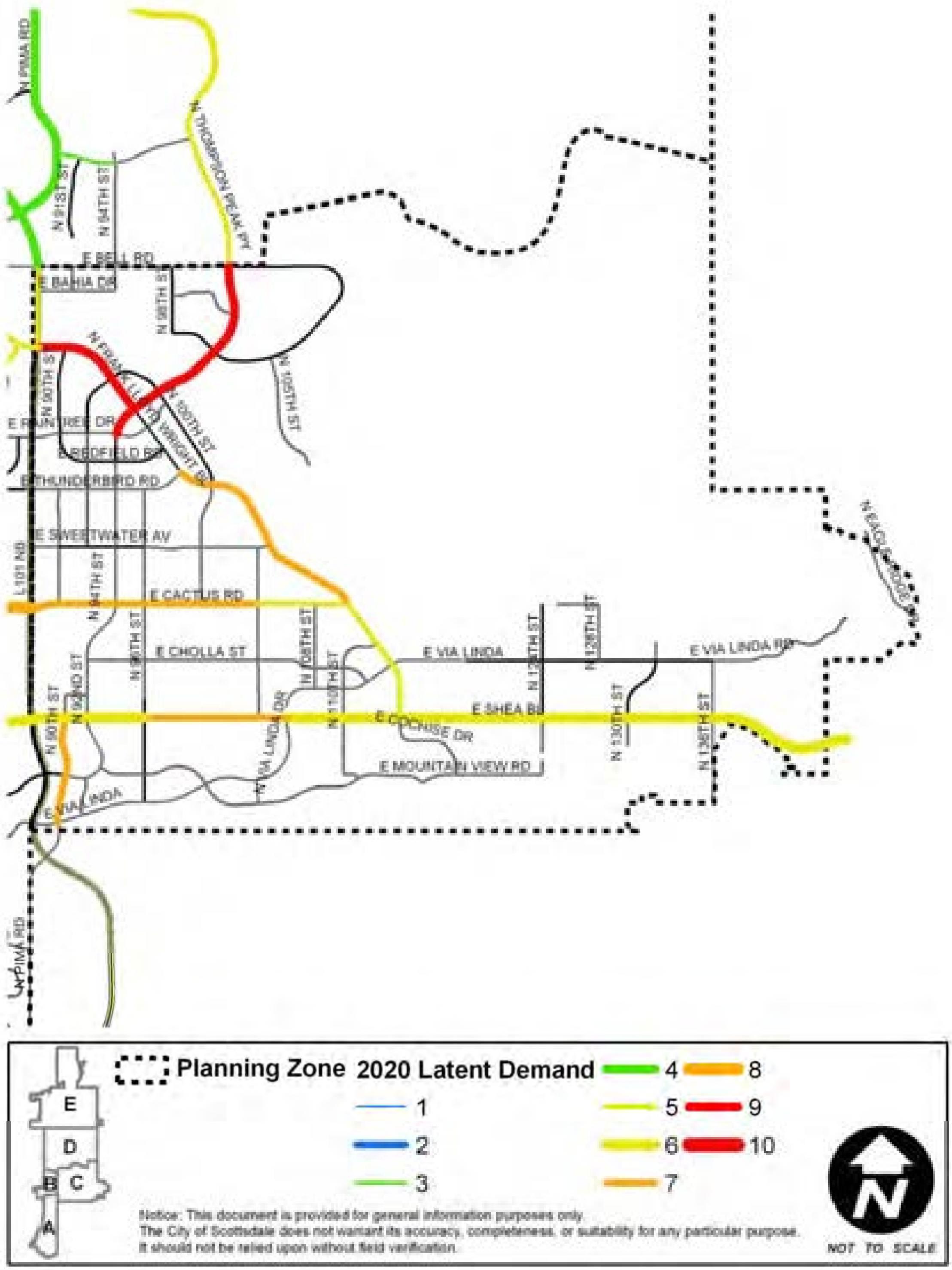


Figure 3 2020 Pedestrian Latent Demand, Planning Zone C

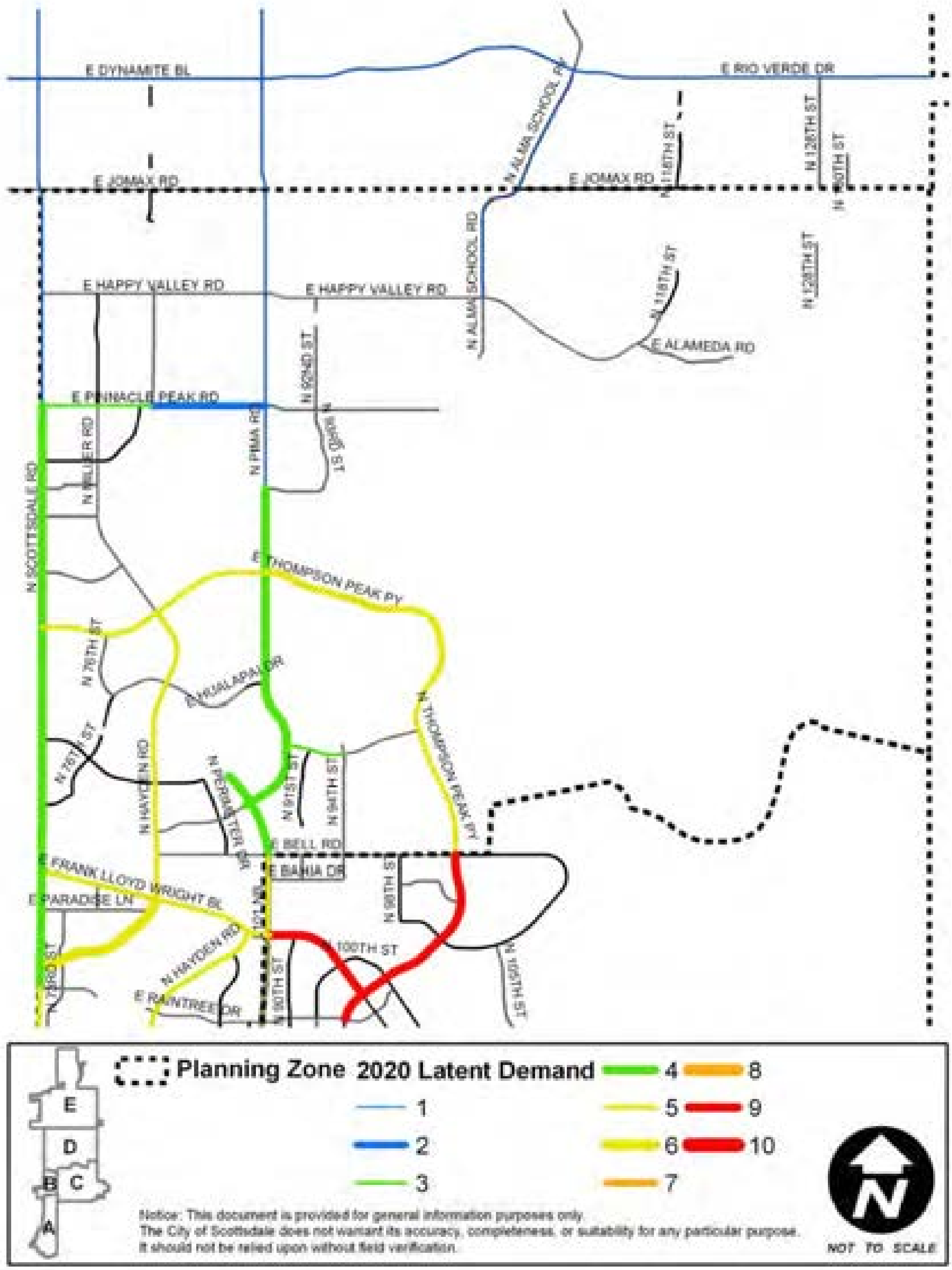


Figure 4 2020 Pedestrian Latent Demand, Planning Zone D

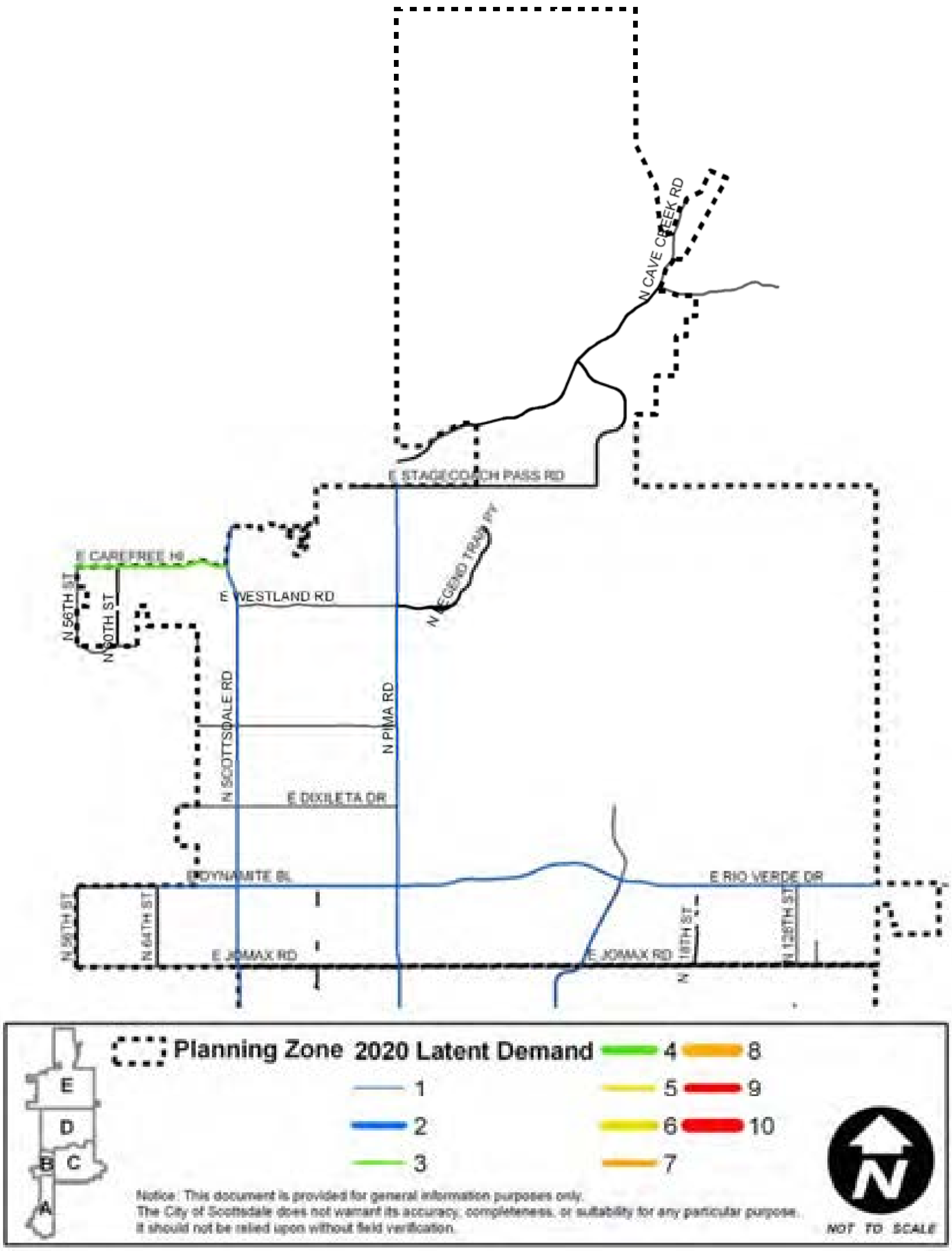
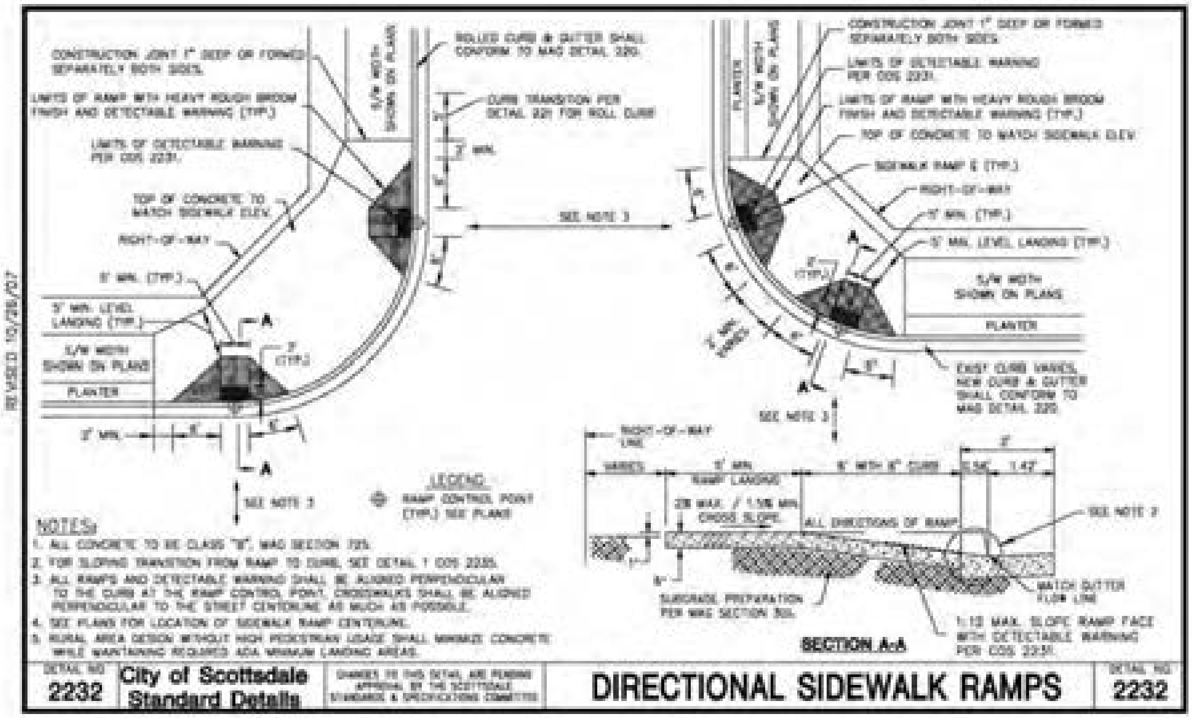
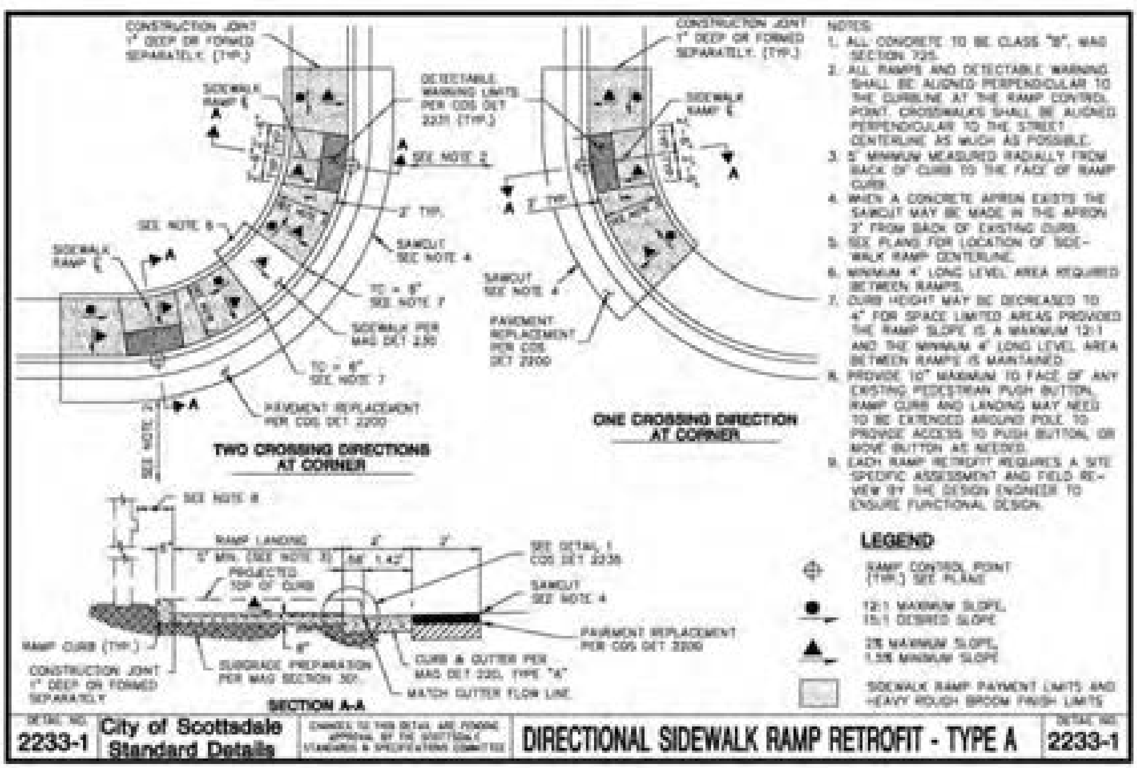


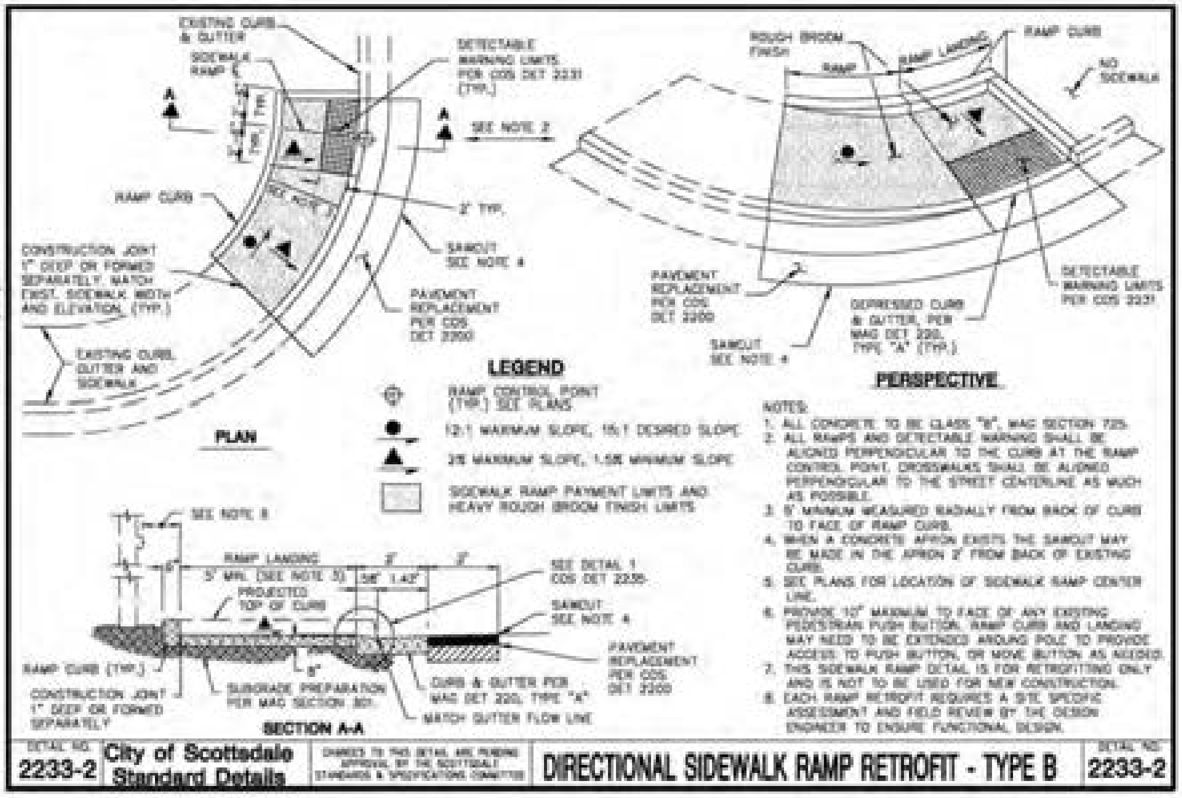
Figure 5 2020 Pedestrian Latent Demand, Planning Zone E

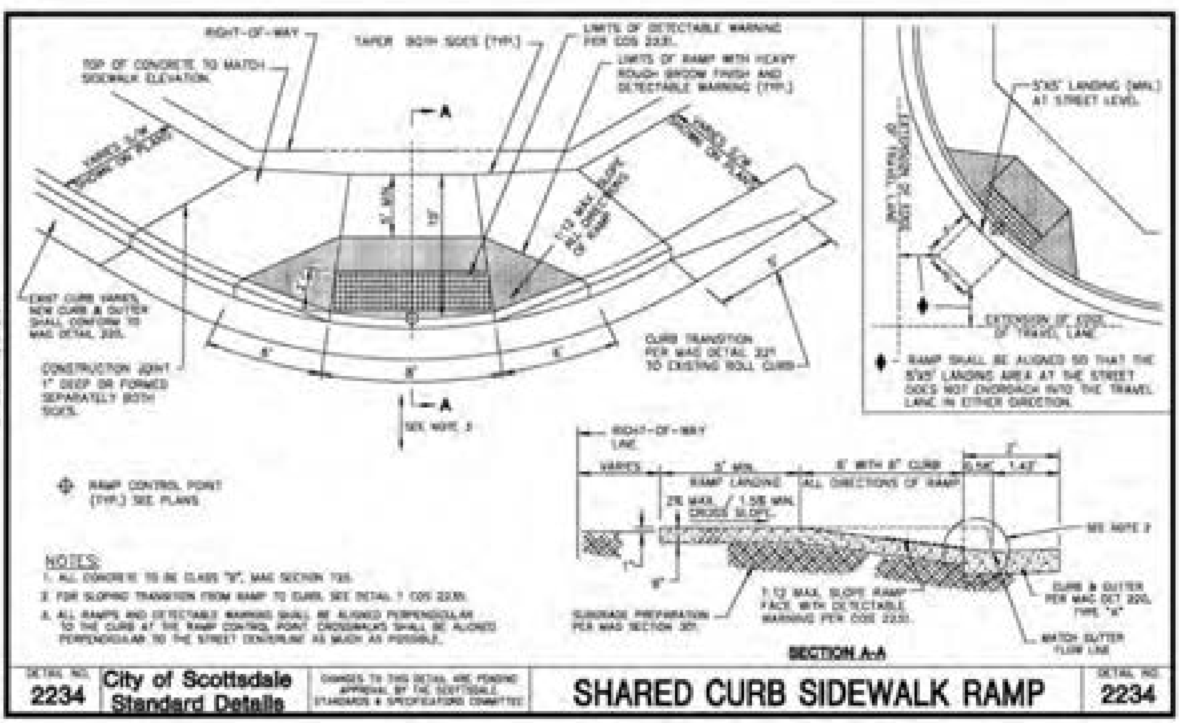
Transportation Master Plan
Pedestrian Element

Appendix 7-F
Curb Ramp Diagrams


SEE NOTE 3
LEGEND
NOTES:
SECTION A-A
2232
City of Scottsdale
Standard Details
DIRECTIONAL SIDEWALK RAMPS
2232


TWO CROSSING DIRECTIONS AT CORNER
ONE CROSSING DIRECTION AT CORNER
SECTION A-A
LEGEND
2233-1
City of Scottsdale
Standard Details
DIRECTIONAL SIDEWALK RAMP RETROFIT - TYPE A
2233-1


LEGEND
RAMP CONTROL POINT (TYP.) SEE PLANS
12:1 MAXIMUM SLOPE, 15:1 DESIRED SLOPE
2% MAXIMUM SLOPE, 1.5% MINIMUM SLOPE
SIDEWALK RAMP PAYMENT LIMITS AND HEAVY ROUGH BROOM FINISH LIMITS
PLAN
PERSPECTIVE
SECTION A-A
NOTES:
1. ALL CONCRETE TO BE CLASS "B", MAG SECTION 725.
2. ALL RAMPS AND DETECTABLE WARNING SHALL BE ALIGNED PERPENDICULAR TO THE CURB AT THE RAMP CONTROL POINT. CROSSWALKS SHALL BE ALIGNED PERPENDICULAR TO THE STREET CENTERLINE AS MUCH AS POSSIBLE.
3. 5' MINIMUM MEASURED RADIALLY FROM BACK OF CURB TO FACE OF RAMP CURB.
4. WHEN A CONCRETE APRON EXISTS THE SAWCUT MAY BE MADE IN THE APRON 2' FROM BACK OF EXISTING CURB.
5. SEE PLANS FOR LOCATION OF SIDEWALK RAMP CENTER LINE.
6. PROVIDE 10" MAXIMUM TO FACE OF ANY EXISTING PEDESTRIAN PUSH BUTTON. RAMP CURB AND LANDING MAY NEED TO BE EXTENDED AROUND POLE TO PROVIDE ACCESS TO PUSH BUTTON, OR MOVE BUTTON AS NEEDED.
7. THIS SIDEWALK RAMP DETAIL IS FOR RETROFITTING ONLY AND IS NOT TO BE USED FOR NEW CONSTRUCTION.
8. EACH RAMP RETROFIT REQUIRES A SITE SPECIFIC ASSESSMENT AND FIELD REVIEW BY THE DESIGN ENGINEER TO ENSURE FUNCTIONAL DESIGN.
DETAIL NO. 2233-2
City of Scottsdale Standard Details
DIRECTIONAL SIDEWALK RAMP RETROFIT - TYPE B
DETAIL NO. 2233-2


RAMP CONTROL POINT (TYP.) SEE PLANS
SECTION A-A
NOTES:
1. ALL CONCRETE TO BE CLASS "B", MAG SECTION 725.
DETAIL NO. 2234
City of Scottsdale Standard Details
SHARED CURB SIDEWALK RAMP
DETAIL NO. 2234

Transportation Master Plan
Pedestrian Element

Appendix 7-G
Principles of Universal Design

Principle One - Equitable Use – the design is useful and marketable to people with diverse abilities.

- Guideline 1a. Provide the same means of use for all users: identical whenever possible; equivalent when not.
- Guideline 1b. Avoid segregating or stigmatizing any users.
- Guideline 1c. Provisions for privacy, security, and safety should be equally available to all users.

Principle Two - Flexibility in Use – the design accommodates a wide range of individual preferences and abilities.

- Guideline 2a. Provide choice in methods of use.
- Guideline 2b. Accommodate right- or left-handed access and use.
- Guideline 2c. Facilitate the user's accuracy and precision.
- Guideline 2d. Provide adaptability to the user's pace.

Principle Three - Simple and Intuitive Use – use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration levels.

- Guideline 3a. Eliminate unnecessary complexity.
- Guideline 3b. Be consistent with user expectations and intuition.
- Guideline 3c. Accommodate a wide range of literacy and language skills.
- Guideline 3d. Arrange information consistent with its importance.
- Guideline 3e. Provide effective prompting and feedback during and after task completion.

Principle Four - Perceptible Information – the design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.

- Guideline 4a. Use different modes (pictorial, verbal, tactile) for redundant presentation of essential information.
- Guideline 4b. Provide adequate contrast between essential information and its surroundings.
- Guideline 4c. Maximize "legibility" of essential information.
- Guideline 4d. Differentiate elements in ways that can be described (i.e., make it easy to give instructions or directions).
- Guideline 4e. Provide compatibility with a variety of techniques or devices used by people with sensory limitations.

Principle Five - Tolerance for Error – the design minimizes hazards and the adverse consequences of accidental or unintended actions.

- Guideline 5a. Arrange elements to minimize hazards and errors: most used elements, most accessible; hazardous elements eliminated, isolated, or shielded.
- Guideline 5b. Provide warnings of hazards and errors.
- Guideline 5c. Provide fail safe features.
- Guideline 5d. Discourage unconscious action in tasks that require vigilance.

Principle Six - Low Physical Effort – the design can be used efficiently and comfortably and with a minimum of fatigue.

- Guideline 6a. Allow user to maintain a neutral body position.
- Guideline 6b. Use reasonable operating force.
- Guideline 6c. Minimize repetitive actions.
- Guideline 6d. Minimize sustained physical effort.

Principle Seven - Size and Space for Approach and Use – appropriate size and space is provided for approach, reach, manipulation, and use regardless of user's body size, posture, or mobility.

- Guideline 7a. Provide a clear line of sight to important elements for any seated or standing user.
- Guideline 7b. Make reach to all components comfortable for any seated or standing user.
- Guideline 7c. Accommodate variations in hand and grip size.
- Guideline 7d. Provide adequate space for the use of assistive devices or personal assistance.

Transportation Master Plan
Pedestrian Element

Appendix 7-H
Pedestrian Facility Maintenance Requirements

Pedestrian Facility Maintenance Requirements		
Pedestrian Facility	**Concern**	**Maintenance Activity**
Sidewalks and Walkways	Tree roots have caused cracking and heaving of the sidewalk.	Remove damaged sidewalks, cut roots and install new sidewalk. Consult arborist before removing large tree roots.
	Section of sidewalk has popped up, creating a vertical height difference greater than 1/4 inch.	Replace defective section of sidewalk or provide temporary asphalt shim.
	Cracked surface and poorly placed temporary patches.	Replace defective sections of sidewalk.
	Separation of expansion and construction joints so that space between adjoining sections are greater than 1/4 inch.	Fill joint with hardening expansion compound.
	Trash, loose sand, oil or grease is present on walkway or sidewalk.	Serve notice to abutting land owners to clean and maintain sidewalks.
	Materials, signs, vending machines, etc. restricting the effective sidewalk width.	Require responsible parties to remove obstructions.
	Low hanging tree limbs, bushes, weeds and other foliage growing into sidewalk and/or posing obstructions and sight restrictions.	Enforce local regulations requiring abutting property owners to perform timely clearance activity. Alternatively, hire private contractor to clear sidewalk and assess cost to abutting property owner. Or, city staff clears the sidewalk.
Crosswalks and Curb Ramps	Curb ramp surface is worn into a glazed and slippery surface.	Replace curb ramp.
	Poor drainage is causing water retention in the gutter area.	Clean gutter and catch basin area.
	Street rutting is causing water ponding in the crosswalk.	Resurface street or crosswalk area.
	Street repaving has resulted in a step or transition problem at bottom of curb ramp.	Repaving contract specification should specify a maximum of ¼ inch vertical edge between new pavement and gutter or curb ramp.
	Slippery manhole covers in crosswalk.	When manholes must be located in crosswalk, they should have slip resistant cover design, be flush with the surface, and visible.
	Deterioration of crosswalk markings.	Identify high volume locations that require additional refurbishing activities, and program funding for improvements.
	Expansion and construction joints have separated so that space between adjoining sections are greater than 1/4 inch.	Fill joint with hardening expansion compound.
Overpasses and Underpasses	Objects are falling from the overpass.	Enclose overpass with fencing.
	Sparse pedestrian use of underpass.	Underpass should be well lit and as wide as possible to provide a feeling of personal safety.
	Worn step or ramp surfaces.	Overlay, replace or texturize to provide a slip-free and unbroken surface.
	Section of walking surface has popped up, creating a vertical height difference greater than ½ inch.	Replace defective section of walking surface or provide temporary asphalt shim.
Work Zones	Temporary pathways at work zones are typically constructed of relatively inexpensive,	Frequently inspect the pathway surface. Wooden surface materials should be treated

Pedestrian Facility Maintenance Requirements		
Pedestrian Facility	**Concern**	**Maintenance Activity**
	short life materials.	with no slip strips or surface treatment. Surface materials with holes, cracks or abrupt changes in elevation should be replaced.
	The roadway to which traffic has been detoured experiences greater traffic volumes; placement of pedestrian path on detour roadway may create difficulties for pedestrians.	Periodically check detour pathway for adequacy of pedestrian and vehicular signal timing, proper pedestrian detour signing, pedestrian traffic hazards, and proper motorist information.
	Construction materials debris in pathway.	Require contractor to maintain a clear pathway.
	Pedestrian accommodation needs have changed due to dynamic construction activities.	Perform periodic inspection to ensure pedestrian information needs keep pace with construction activities.
	Traffic barricades are damaged.	Replace barricade and re-evaluate their adequacy to ensure pedestrian safety.
Traffic Control Devices	Sign is not readily visible to pedestrian.	Inspect sign from vantage point of pedestrian (consider pedestrian in wheelchair, as well). Ensure sign is not obscured by other signs, landscaping or street furnishings.
	Pedestrian sign is not at height that can be viewed by all pedestrians.	Mount signs in accordance with Section **Error! Reference source not found.**.
	Pedestrian signal must be maintained.	Inspect pedestrian signal periodically for damage due to turning vehicles. If damaged, consider back bracketing the pedestrian assembly. Refurbish signal as needed, including lens cleaning and bulb replacement.
Source: *Planning, Design and Maintenance of Pedestrian Facilities*. Federal Highway Administration. 1989 as cited in Pedestrian Compatible Planning and Design Guidelines. Chapter 4: Operations and Maintenance of Pedestrian Facilities, Table 8, New Jersey Department of Transportation., available at http://www.state.nj.us/transportation/publicat/pdf/PedComp/pedoperations.pdf		

Transportation Master Plan
Pedestrian Element

Appendix 7-I
Pedestrian Accommodation in Work Zones

Guidelines for Pedestrian Accommodation in Work Zones

PLANNING CONSIDERATIONS

- Consider origins, destinations and walking paths to determine (1) where pedestrian access should be maintained and (2) where it may be blocked and provided with an alternate path.
- Because most pedestrians take the shortest path of travel, make it very difficult for pedestrians to walk where it is unsafe by using barricades, barriers, signals, etc. In addition, provide an alternative that is safe and accessible that appears to be convenient and is as direct as possible. Pedestrians must feel that their needs have been adequately addressed by the detour route, or they will choose their own route that they feel is convenient and safe. Pedestrians should feel secure and not be subjected to undue risk. Adequate accommodations must be provided to meet the needs of all types of pedestrians, including children, pedestrians who are visually impaired, and older pedestrians.
- Check for pedestrian-generating land uses, such as schools, senior centers, facilities used by pedestrians with mobility or cognitive impairments, shopping centers, restaurants, parks, transit stops, etc. to determine if additional pedestrian detour routes or facilities are necessary.
- Consider needs for nighttime accommodation, especially the potential masking effect of barricade lights and high visibility work site markings.
- To avoid blockage of the pedestrian path by construction material, equipment and debris, establish a designated location for these items as a part of the construction contract and require in the contract that identified pedestrian routes will be kept accessible and clear.
- Consider staging construction when there is no acceptable alternative routing for pedestrians.

Guidelines for Pedestrian Accommodation in Work Zones

INFORMATION NEEDS

Four (4) types of information are required for pedestrians in work zones: advance information, transition information, information to guide the pedestrian through the work zone, and information on how to exit the work zone.

Advance Information

- Advance information is required only for detours and bypasses.
- Pedestrians need advance warning of any sidewalk/path blockages. Information should advise of the blockage and identify the alternate path.
- In general, no advance information is needed for the following situations: (1) an accessible pedestrian walkway is provided through the work zone and there is no need for sidewalk blockage, closure or pedestrian diversion; and/or (2) the continuity of the accessible pedestrian pathway is maintained and the pathway itself is obvious to all pedestrians (including pedestrians with visual impairments).
- Tailor sign messages to specific needs. Typical messages include: Sidewalk Closed Ahead, Sidewalk Closed — Use Other Side, and Pedestrian Detour — Follow Arrow. Signs should be located on barricades detectable to the blind.
- If groups with special needs are known to use the facility, hold public meetings to describe the project, its duration, and its impact on users. In addition, a guide may be posted to alert these users during the initial period following the start of construction.

Transition Information

- Provide proper transition and channelization into the work zone path with a bypass or detour.
- Select appropriate channelization devices based on project duration.
- Devices suitable for channelization purposes include: closely spaced cones; temporary marking tape; barricades, ropes or chains; wood railings; portable concrete barriers; etc. Use of tape, rope, chains or railings must take into account the needs and limitations of pedestrians who are visually impaired.

Guidance Through Work Zones

- Clearly define boundaries of the pathway through the work zone.
- Select guidance and pathway delineation devices consistent with the duration of the project and the level of hazard.
- Devices suitable for pathway delineation and protection include closely spaced cones, wooden railings, barricades, and portable concrete type barriers.

Exit Information

- No exit information is required if the existing pathway is used, or if the continuity of the accessible pathway is obvious to all pedestrians (including pedestrians who are visually impaired).
- In case of a bypass or detour, pedestrians need positive direction to return to the original path. Appropriate signing and other devices must be provided for this purpose.

Guidelines for Pedestrian Accommodation in Work Zones

PEDESTRIAN PATHWAY CONSIDERATIONS

- Provide walkway widths consistent with original sidewalk width or sufficient to satisfy current pedestrian volumes (See Section **Error! Reference source not found.**).
- Clearly define the boundaries of the pathway for all pedestrians, including pedestrians who are visually impaired.
- Keep the walkway surface even and free of holes, wide cracks, fixed obstructions, and steep grades. Pedestrian walkway surface should be made of stabilized material (See Section **Error! Reference source not found.**).
- Provide a non-slip surface for temporary pathways.
- The transition into and out of redefined or relocated walkways should be clearly defined by markings, signs, or barricades to provide positive direction to pedestrians (including pedestrians who are visually impaired).
- A physical barrier may be necessary to keep pedestrians from wandering into a traffic lane or the construction area.
- Provide ramping where grade differential along the pathway is more than ½ inch between existing and temporary designated sidewalk. All ramping should be rigid and firmly secured to ensure safety of pedestrians.
- Do not allow changes in construction to block the pedestrian pathway. A periodic inspection and maintenance of the work zone area may be necessary.
- Physical separators between pedestrians and traffic should be selected based on duration of the project and space availability. In all cases, a separator should be used to confine pedestrians to a safe walkway space.
- The interior of overhead protected (canopy type) pedestrian walkways should be properly illuminated for nighttime visibility.
- All pathways must be kept clear of projecting items or other obstacles. See Section **Error! Reference source not found.**.
- Evaluate potential impacts of drainage along all identified pedestrian routes and assure that water is effectively removed and that no ponding will occur.

INTERSECTION CROSSINGS

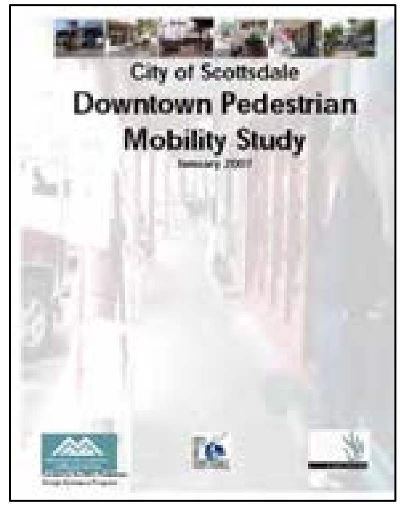
- If the original crosswalk is altered or removed, provide a clearly defined new crosswalk path using temporary marking tape. Make sure that the original crosswalk markings are not visible.
- Keep the crosswalk clear of debris, mud, construction materials, construction equipment, and other devices.
- Appropriately warn motorists if the pedestrian crossing is unexpected. Evaluate any possible need for pedestrian crossing signs. Special warning signing may be needed if the problem is severe.
- Provide signing and/or markings to define the entrance to the crosswalk. Channelize pedestrians into the new crosswalk area.
- Modify traffic signal timing/phasing and location if changed pedestrian needs require it. (See Section **Error! Reference source not found.**).
- Consider deactivating pedestrian signals or covering signal heads and pushbutton signs when an existing crossing is not to be used.
- Provide covers, or metal plates, over any cuts or ditches in the area for the entire width of the existing or modified crosswalk.
- Consider lighting the area, including curb ramps, for nighttime visibility if the cut in pavement is deep or hazardous.

Guidelines for Pedestrian Accommodation in Work Zones
SIDEWALK CLOSURE AND BLOCKAGE • If an existing sidewalk through a work zone is to be closed, detour pedestrian traffic to the other side of the roadway where a sidewalk or a pedestrian path is available. Provide adequate signs and barriers for diverting pedestrian traffic to designated crosswalks. Signs should be placed logically and conspicuously for proper visibility from all approaches. Possible sign messages are: Sidewalk Closed Ahead and Sidewalk Closed, Pedestrians Use Other Side, with an arrow. Warnings/signage should be detectible to all pedestrians, including pedestrians with visual impairments. • Sidewalk closure should be accomplished with a substantial barrier. Use signs indicating there is a sidewalk closure and pedestrian diversion. • If pedestrians have to cross the roadway due to a sidewalk closure, ensure that an adequate crossing is provided using signing, crosswalk markings, traffic signal modification, and pedestrian signs, if warranted. Curb ramps must be available. • For short-term utility operations, use less permanent devices, such as barricades, or even closely spaced cones. Use signs and cones for delineation and channelization for safe walking around work zones.
PEDESTRIAN PROTECTION • Separators provided on both traffic and construction sides should be compatible with the level of hazard. • The type of separator used should not create an additional hazard. • A physical separator may be needed if the sidewalk on the side of the roadway where construction is located will be closed and pedestrian traffic will be diverted close to moving traffic. • If there is construction overhead, and the possibility of falling debris or wet concrete, overhead protection should be provided for pedestrians walking below.
INSPECTION AND MAINTENANCE • Check for compliance with the traffic control plan for pedestrian accommodations. • Periodically check for missing signs or other traffic control devices installed for pedestrian accommodations in work zones. • Check for changes in construction activity that would require a change in pedestrian accommodations. • Check for any material in pedestrian pathways, such as spilled concrete, sedimentation, debris, construction materials, and equipment. • Maintain signal equipment in operational condition. Check bulbs periodically. • Following rain, check to ensure the pedestrian route is clear and accessible.
Source: from *The Planning, Design and Maintenance of Pedestrian Facilities*, Federal Highway Administration, 1989, as cited in the Pedestrian Compatible Planning and Design Guidelines. Chapter 4: Operations and Maintenance of Pedestrian Facilities, Table 7, New Jersey Department of Transportation, available at http://www.state.nj.us/transportation/publicat/pdf/PedComp/pedoperations.pdf

Transportation Master Plan
Pedestrian Element

Appendix 7-J
Downtown Pedestrian Mobility Study Summary
(January 2007)

The *Downtown Scottsdale Pedestrian Mobility Study* was done with a MAG grant to the City of Scottsdale. The City requested the funds to measure pedestrian mobility in Downtown Scottsdale, and to determine how and where to make improvements to that mobility. The Study assessed Downtown Scottsdale within its four established districts - Old Town, Main Street, 5th Avenue, and Marshall Way Arts. Concurrently, the City's Downtown Group sponsored a similar effort to assess mobility issues within the Northeast Quadrant area, an emerging district east of Scottsdale Road, south of Camelback, north of Goldwater Boulevard, and west of 75th Street. While each established district has its distinct character, the districts have begun to grow together and are within a comfortable walking distance of one another, pointing to a need for a degree of connectivity and cohesion for pedestrians.



The study combines the MAG *Pedestrian Policies and Design Guidelines* with the City's *Downtown Urban Design and Architectural Guidelines* to establish measurable criteria and a substantial database for the evaluation of mobility. With this database, the City will pinpoint where and what types of impediments or problem areas exist that impede pedestrians' ability to move around Downtown. This information will be the basis for future capital improvement projects.

Major issues of concern throughout Downtown identified in the Study include:

- Discontinuous or blocked sidewalks; lack of a clearly defined and intuitively continuous pedestrian walkway of sufficient width.
- Wide intersections that create disconnections between Districts and across major streets.
- Uneven, narrow or disjointed walkways.
- Ramps which do not provide direction to the crosswalk or to the ramp across the street.
- No line of sight or ADA access to the Civic Center Mall from Brown Avenue or First Avenue (Note that a temporary ramp has since been installed in this location).
- Sidewalk boundaries that are not discernible to pedestrians with low vision.
- Unclear walkway access to buildings and/or around streetside uses, such as sidewalk cafes and retail displays.
- Unclear street signage and conflicts with vehicles, parked or moving, especially during periods of high activity such as special events.
- Jaywalking at night across major roadways, such as Scottsdale Road, during evening hours and special events.

CITY OF SCOTTSDALE
PEDESTRIAN MOBILITY STUDY - STUDY AREA FIGURE 1

A DYE DESIGN
Downtown Scottsdale Pedestrian Mobility Study

January 2007
page 2

Figure 1 Downtown Pedestrian Mobility Study Project Area

Major Pedestrian Deficiencies in Downtown Districts

OLD TOWN

- Sidewalk Clearance and Obstructions. Most segments have light posts and canopy supports that do not allow for the minimum 3 foot horizontal clearance; many areas have wall-mounted objects protruding more than 4 inches from a wall.
- Curbs. Three (3) segments had high curbs, or inconsistent curb height varying from 0 to 8 inches high.
- Accessible Ramps. Corners lack tactile strips, color contrast, and dual/directional types of ramps.
- Lighting. There are significant ranges of bright to dark exist from existing light fixtures.
- 2nd Street & Buckboard Trail. These segments do not have the same level of amenities as the other segments in this District. These streets lack seating, have more frequent driveways making for a discontinuous path of travel, and lack the thematic landscaping/shade and architectural elements common within the District.

MAIN STREET ARTS DISTRICT

- Sidewalk Width. Maximum and minimum widths are variable, ranging from less than 4 feet to over 8 feet in width.
- Sidewalk Surface and Texture. A number of sidewalk surface materials prevail in this District.
- Curbs. Curb height varies.
- Accessible Ramps. Segments lack of tactile strips and portions have double or triple curbs.
- Driveway Crossings. First Avenue has frequent driveway crossings.
- Lighting. Light fixtures have a wide range of bright to dark.
- Shade. Infrequent tree spacing offers little shade.
- Theme. First Avenue and Marshall Way segments lack a cohesive theme and seating.

MARSHALL WAY/5TH AVENUE ARTS DISTRICT

- Sidewalk Width. Sidewalk width varies in these districts from less than 3 feet to more than 14 feet. An isolated section of 3rd Avenue is 22 feet wide.
- Sidewalk Clearances and Obstructions. Some wall-mounted objects and landscaping protrude into the walkway. The frontage zone for opening doors and window shopping is insufficient. Some boulders, benches and planters are obstacles in the pedestrian travel path. Some outdoor dining uses appear to infringe on the pedestrian travel way.
- Sidewalk Surface and Texture. Many areas with sidewalk joints have expanded, and buckled curbs and sidewalks exist.
- Driveways and Crossings. There are a large number of driveways that makes the pedestrian path of travel discontinuous.
- Accessible Ramps. Ramps lack tactile strips and color contrast. Ramps do not provide direction to the crosswalk or to the ramp across the street.
- Theme. An overall theme is lacking in this area, where public art is scarce and seating is infrequent.

NORTHEAST QUADRANT

- Sidewalk Width. Sidewalk width in this area varies from four feet to more than 10 feet in width.
- Sidewalk Surface and Texture. All segments have uneven surfaces with indents greater than one-quarter inch.

Major Pedestrian Deficiencies in Downtown Districts
• Driveway Crossings. Most segments have a large number of driveway crossings. • Accessible Ramps. All segments lack ramps with tactile strips and color contrast. Ramps do not provide direction to the crosswalk or to the ramp across the street. • Lighting. In general, most segments have very low lighting or none at all. • Theme. There is no cohesive theme in this area. Landscaping is lacking, along with seating, shade and architectural elements. No public art or public space exists in this District.
Source: City of Scottsdale *Downtown Pedestrian Mobility Study*, Maricopa Association of Governments and City of Scottsdale, January 2007.

Transportation Master Plan
Pedestrian Element

Appendix 7-K
Review of Sidewalk Cafes

Process

License Agreement Requirements. Requests for sidewalk cafes on public rights of way must have a license agreement with the City of Scottsdale. The issuance of a permit to encroach on the public right-of-way with a sidewalk cafe shall not constitute or be construed to constitute an abandonment of the City of Scottsdale of its interest in the public right-of-way or associated easements. Outdoor dining improvements should be temporary in nature as the City of Scottsdale may require that items be moved from the public right-of-way. At minimum, the Transportation General Manager, or a person designated by the Transportation General Manager, must review all requests to infringe upon the public right-of-way with a sidewalk cafe.

Parking Requirements. If more than 500 square feet of sidewalk cafe is added, additional parking may be required. Parking requirements will vary based on a number of factors, including the type of business and its location. Business owners should ensure that available parking at the business location meets the requirements of the zoning code.

In Downtown Scottsdale certain properties may have parking credits assigned to them or other specific parking conditions affecting parking requirements and availability. This information should be sought from the building owner, leasing agent or the City. For Downtown parking information from the City, call 480-312-7734. For general parking information on requirements in other areas of the City, call the One Stop Shop at 480-312-2500.

Liquor Service Requirements. If liquor will be served in the outdoor patio/sidewalk cafe, requirements of the City of Scottsdale and Arizona Department of Liquor Licenses and Control must be followed. As part of Scottsdale's liquor license process, applicants are required to complete and submit a liquor license questionnaire to the City of Scottsdale Planning and Development Services Department, submit a state liquor license application to be processed concurrently with the Scottsdale conditional use permit request, and complete and submit a City of Scottsdale liquor license application. Additional information is located on the City of Scottsdale Web page at www.scottsdaleaz.gov/bldgresources/counterresources/LiquorLicenses/default.asp.

Evaluation of Sidewalk Cafes

For all sidewalk cafes, the Transportation Department staff will evaluate the width of the sidewalk, presence of potential barriers and obstacles that may infringe on a continuous pedestrian path of travel, and the amount of pedestrian use and the impact of the cafe’s location on pedestrian activity.

The Planning and Development Services Department will evaluate all sidewalk cafes for compliance with liquor license agreements and parking requirements.

Capital Projects Management/Real Estate Group will evaluate whether a license agreement is necessary for use of the City’s right-of-way and work with the property owner to create an appropriate agreement.

The Downtown Group will evaluate sidewalk cafes proposed for Downtown Scottsdale.

General Requirements. Sidewalk cafe operators must:

- Ensure that the sidewalk cafe operations do not interfere with pedestrians or limit their free and unobstructed passage.
- Keep the sidewalk cafe clean.
- Keep the area surrounding the sidewalk cafe clean.
- Provide trash receptacles for use by cafe patrons if throw-away utensils, cups and plates are used.
- Keep site furnishings and landscaping clean and in good condition.
- All operations, including serving of food and beverages, must occur within the defined sidewalk cafe area and/or within any enclosure.

Pedestrian Clearance. Exceptions to the pedestrian clearance requirements may be granted after a site review by the Transportation Department.

A minimum six-foot pedestrian clearance is required along sidewalks and walkways. An eight-foot minimum clearance is desirable in areas with high levels of pedestrian activity, such as Downtown Scottsdale. The minimum clear zone shall be measured from the outermost point of the sidewalk café to the nearest obstruction in the pedestrian travel way. The minimum clear zone shall be a continuous sidewalk that is free of obstructions, including street furniture and landscaping. A landscaped strip is not included in the six-foot minimum.

Recesses in building facades shall not be used to satisfy the minimum clear zone requirement.

The sidewalk/walkway minimum clear zone must be clearly defined and continuous. Linkages to accessible building entrances and parking areas, waiting and drop off zones, sidewalks and walkways, and transit stops must be maintained.

The sidewalk/walkway minimum clear zone must be well maintained at all times and free of litter.

The sidewalk/walkway minimum clear zone must be free of barriers and obstacles, such as traffic signals or signs, bus stops, benches, newspaper stands, trash receptacles, tables and chairs, planters and landscaping, and similar items.

The sidewalk/walkway minimum clear zone shall be free of utility covers, decorative pavers with joints, and other surface features that create a rough or bumpy surface that may pose difficulties to persons using wheelchairs or scooters.

The sidewalk cafe shall be designed to allow for safe passageway for persons with disabilities and persons with visual impairments. Truncated domes or other devices may be required to alert pedestrians with visual impairments of crossings or other changes in use of the sidewalk.

The grade of the sidewalk/walkway minimum clear zone should generally follow that of the adjacent roadway. The cross slope of the minimum clear zone should be two percent or less.

Fencing and Barriers. Fencing should have an open appearance with a defined edge. Barriers required for establishments serving liquor need to meet additional requirements. Fencing/barriers should be removable to allow for other uses of the public right-of-way.

To ensure the access of visually impaired pedestrians, fencing should be a minimum height of 27 inches and be detectible with a cane.

Location. Sidewalk cafe areas should ideally be located in areas where the sidewalk/walkway is at least 10 feet wide. Sidewalk cafes may be considered in areas with sidewalks/walkways less than 10 feet if safety issues of pedestrian clearance, sidewalk surface and pedestrian separation from vehicular traffic are addressed.

Sidewalk cafes shall not extend onto the frontage of adjacent property owners unless written permission is obtained.

Sidewalk cafes are not permitted in areas where, in the opinion of the Transportation General Manager or designee, they obstruct sight lines at intersections or cause operational or safety issues on public rights of way.

Furnishings and Landscaping. Furnishings in the sidewalk cafe shall consist only of moveable tables, moveable chairs and moveable umbrellas. Landscaping may be placed in moveable planters.

Cafe furniture should not be attached, permanently or temporarily, to lampposts, streetlights, trees or any public street furniture.

Sidewalk cafe improvements shall be set up only during hours of operation and may not be stored or stacked outside ton the public right-of-way at any time.

Cafe furniture shall not infringe on the required sidewalk/walkway minimum clear zone.

Existing public site furniture, landscaping and planters may NOT be removed to satisfy the clear zone requirement unless approval is received from the City of Scottsdale Planning and Development Services Department.

Relationship to Crosswalk. If a crosswalk is adjacent to the property with a sidewalk cafe, the crosswalk must intersect perpendicularly with the sidewalk/walkway minimum clear zone. Sidewalk curb ramps must be located at the center of the sidewalk and provide a level landing space of four feet by four feet minimum (five feet by five feet is preferred) with a maximum two percent slope.

Liability and Insurance Requirements. Liability and insurance requirements when using the public right-of-way for a sidewalk cafe are addressed in the license agreement between the property owner and the City of Scottsdale.

Transportation Master Plan
Pedestrian Element

Appendix 7-L
City of Scottsdale Safe Routes to School Program

1.0 Introduction

Safe Routes to School (SRTS) programs began in Denmark in the 1970s to address children pedestrian fatalities.[1] SRTS programs can help:

- to reduce the number of children hit by cars
- reduce congestion around schools by encouraging more students to walk and bicycle to school
- improve children's health by increasing physical activity that can help reduce obesity and related physical ailments caused by obesity
- improve air quality by reducing vehicle emissions
- increase a child's sense of freedom, establish a lifetime of habits and teach safe bicycling and walking skills.[2]

2.0 Current School Safety Efforts

In September 2005, the City of Scottsdale's Traffic Engineering Division initiated proactive school site transportation audits to identify potential transportation improvements that would help provide safe access to and from schools in Scottsdale. An initial goal was set to audit every public school in the city by the end of the school year, May 2006. The intention of the transportation audit was to identify major issues at many schools and to focus on areas adjacent to school and existing school crossings for engineering and safety improvements.

Since that time, Transportation Department staff has performed on-site visits of Scottsdale schools during morning drop-off and afternoon pick-up hours. Following each site visit, a report was prepared which indicated general observations by staff from Traffic Engineering and Transportation Planning who attended the review. Each report also lists recommended changes and other issues that could be addressed as part of a longer-range program.

3.0 Toward a Comprehensive Program

According to the National Highway Traffic Safety Administration[3], the most successful SRTS programs use elements from the following four approaches:

- Engineering. Engineering approaches focus on creating physical improvements to the infrastructure surrounding the school, determine school speed limit zones, and establishing safe crossings. Engineering can help influence and change behavior by creating safer environments for bicycling and walking.
- Enforcement. Enforcement strategies use local law enforcement to help improve driver behavior, help children follow traffic rules, decrease parent perceptions of danger and increase awareness of pedestrians and bicyclists.

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[1] Safe Routes to School Workshop, Roadrunner Elementary School, Phoenix, Arizona, September 21, 2005.
[2] Ibid.
[3] Safe Routes to School Toolkit, National Highway Traffic Safety Administration, September 2002 DOT HS 809 497, http://www.nhtsa.dot.gov/people/injury/pedbimot/bike/Safe-Routes-2002/.

- Education. Education strategies teach students and drivers important safety skills, creates awareness of safety and helps to foster life-long safety habits. Education programs should include children, parents, neighbors and drivers in the school area.
- Encouragement. Encouragement strategies use events and contests to entice students to try walking and bicycling to school.

Many programs also include a fifth “E” – evaluation - to assess the effectiveness of different engineering, enforcement, education and encouragement measures.

In doing the safety audits described previously, the city has already taken a critical step in identifying engineering solutions necessary to ensure school safety. By focusing on low cost, easy to implement solutions, such as signage, paint/striping and curb ramps, it was hoped that support for other elements of a comprehensive program: more thorough engineering treatments, enforcement, education and encouragement would be generated. The overall purpose of a SRTS program, specific elements of the proposed SRTS program, and required resources are outlined below.

4.0 Program Purpose and Goals

There are two primary goals with a SRTS program:

- Wherever it’s safe, encourage children to walk and bicycle to school.
- Where safety deficiencies exist, correct them so that children are able to safely walk and bicycle to school.

5.0 Program Elements

5.1 Create a Transportation Safety Committee at Each School

A transportation safety committee should be created at each school. Some schools may already have transportation safety committees. To be effective, the committee should meet on a monthly or quarterly basis, and may meet more often as activities warrant. The committee should have the ability and means to communicate to the entire school the content and decisions discussed at the meeting through updates to a school newsletter or other appropriate means. The committee should be limited to 10 members to promote efficiency in decision making.

Providing a safe environment for students to travel to and from school requires the attention and cooperation of city officials, the police department, students, parents, school district officials, and school personnel. Therefore, at a minimum, a transportation safety committee should include:

- City staff liaison (s)
- Parent (s) who represent the Parent Teacher Organization
- School staff member (s), such as the School Secretary
- Law enforcement officials/school resource officer
- Crossing guard (s)
- School Principal
- School District Transportation Department Representative

Other participants in the SRTS Committee could also include children/students, nearby businesses, community groups, and neighbors.

For each school, the committee should be formalized with a linkage to the parent teacher organization or as a part of the school's safety committee to ensure credibility and sufficient resources. The Committee can assist in collecting information, organizing events and contests to encourage students to walk or bicycle to school, providing donations and prizes for contests, and promoting and publicizing the program through school newsletters, flyers, press releases or presentations to community organizations.

The Committee will also perform school safety audits to identify potential improvements that may enhance the safety of students traveling to and from school. This process is discussed further in the following pages.

5.2 Committee Kick-Off Meeting

After volunteers are organized to participate in the Committee, a kick-off meeting to discuss the goals and purpose of the SRTS program should be held. A draft presentation that can be used to educate committee members about the SRTS program has been created, using information provided by the Centers for Disease Control and Prevention (http://www.cdc.gov/nccdphp/dnpa/kidswalk/) and other sources. This presentation can be tailored for each school and it can be supplemented with additional talking points available at the US Department of Transportation web site at http://www.nhtsa.dot.gov/people/injury/pedbimot/bike/Safe-Routes-2002/toc.html . At the kick-off meeting, create a list of key tasks or strategies to accomplish the goals (such as creating a SRTS event), assign tasks to Committee members and identify a timeline for their completion. The main focus of the committee should be to create a specific SRTS implementation plan for their school.

5.3 Create Partnership Agreements

Having the cooperation of all agencies responsible for implementing a SRTS program is critical to the program's success. Partnership agreements from the city, the school board and the school principal demonstrate an agency commitment to the SRTS program and commit to participating by providing staff resources. The city of Scottsdale can help provide police enforcement for events, and the transportation department can serve as a resource for data collection. Commitment from the principal and school board will help to assure class time is set aside for the program and to help promote events and contests.

5.4 Collect Information

Collecting information is important to understanding the different dynamics of each school and can also be used to determine the effectiveness of the SRTS program in changing behaviors and addressing program goals. Collecting baseline data through surveys and traffic counts can help identify how students currently arrive at school. Student surveys can be used (a show of hands during homeroom classes) to identify how students arrive at school (being dropped off by a parent or sibling in a car, carpooling with another adult, walking with a parent, walking alone, bicycling, skateboarding or roller blading, or arriving by bus). Surveys can be done by older students as a way to incorporate SRTS into other school curriculum, or by volunteers from the SRTS Committee. Repeating the survey at the end of the school year can help identify changes in student travel behavior.

Traffic counts can supplement survey information by determining how many vehicles enter school grounds to drop off children, how many children bicycle or walk to school, and how many children are bussed to school. A simple traffic count requires volunteers at each school entrance to count cars that arrive during the half-hour before school begins. Counting the number of bicycles parked in the bicycle rack after school begins demonstrates the number of children bicycling to school, and bus drivers can count the number of children on their buses. Traffic counts can be repeated at the end of the school year to determine any changes in traffic patterns, and can also be repeated during SRTS events. Older students also can conduct this traffic count survey as a classroom activity.

Parent surveys can be used to measure attitudes and opportunities for changing behavior. Ask parents who drive their children to school what might get them to allow their children to walk or bicycle to school. This information will aid in the design of a SRTS program that addresses safety concerns of parents. Surveys should also ask parents if they want to volunteer, and provide space on the survey for their name and contact information. Parent surveys can be distributed to parents by mail or sent home with students; discuss the best options with the SRTS Committee and school staff.

Other important data includes traffic and crash data to help identify any potential problem areas, the geographic boundaries of the non-busing area, the number of students within the walk/bike area, and the school population breakdown by grade.

5.5 Create a Map of Routes Used To Get To School and Evaluate the Travel Environment

After collecting data and finalizing partnership agreements, the Transportation Safety Committee should move forward to create a map of routes used by students to get to school. The objective of this map is to identify an environment where children and parents feel comfortable walking or bicycling to school. The Committee should identify safe routes to school for all students within the walking attendance boundary for the school. Ideally the Committee should walk or bicycle the routes in groups to complete the evaluation form. This evaluation may occur over multiple meeting times, and should include some analysis during both school drop-off and pick-up hours since conditions during these times may be different.

Students can also be involved in the evaluation effort. Pedestrians and bicyclists can map their own routes to school and identify problems because those who walk and bike regularly are already familiar with their streets.

City staff can lend assistance in providing aerial base map information. When identifying the safest routes to school, the Committee should aim to minimize street crossings and avoid crossing busy streets where possible. The Committee may identify several concerns in the walking attendance boundary that would prevent an environment where children and parents feel comfortable walking or bicycling to school.

Once the map is completed, the school should distribute the aerial maps documenting the safest routes to school to students and parents and should also have it available in the school office for new students. If the walking boundaries of the school change, additional evaluation will need to occur and the map can be revised.

5.6 Identify Issues and Find Solutions

After identifying a map and completing the evaluation tool, problems will be evident. These problems will likely require a combination of engineering, education, enforcement and encouragement solutions. The Transportation Safety Committee can work with city staff to help identify solutions for safety issues like speeding cars, congested and wide intersections, lack of sidewalks, missing or ineffective crosswalks, overgrown landscaping, lack of bike lanes, etc.

Toolboxes of engineering, enforcement, and education solutions abound, and include:

- The Safe Routes to School web site sponsored by the National Highway Traffic Safety Administration, http://www.nhtsa.dot.gov/people/injury/pedbimot/bike/Safe-Routes-2002/
- The National Center for Safe Routes to School at www.saferoutesinfo.org.
- The Safe Routes to School web site maintained by the Marin County Bicycle Coalition at http://www.saferoutestoschools.org/
- A document titled "Toolbox to Address Safety and Operations on School Grounds and Public Streets Adjacent to Elementary and Middle Schools in Iowa", dated August 2006 and available from the Center for Transportation Research and Education.

It is anticipated that specific educational and encouragement solutions will be selected by the Transportation Safety Committee depending on the issues identified.

5.7 Develop a SRTS Improvement and Implementation Plan

After identifying the issues most important to address, the Transportation Safety Committee should create an improvement plan. The plan should identify major issues and solutions that include engineering, enforcement, education, and encouragement solutions.

It is important to obtain sufficient feedback, review and comment on the draft SRTS Improvement Plan before it is finalized. It may be appropriate to present the school map and draft Plan to the parent teacher organization and other parents. Comments received can then be incorporated into the plan before it is finalized. Presenting the draft plan to a broader audience may also help to generate support for the SRTS program and its implementation.

An important component of the plan is prioritization and timing of specific measures. Prioritization helps to focus limited resources on the most important solutions to implement. It is likely that the some solutions will have to be relatively easy to implement within available resources, while others may not be able to be implemented without additional funding. The plan should include an implementation schedule and assign responsibility for implementation to the appropriate person or organization (school, school district, city, police department, parent organization, teachers, etc.).

Traffic control recommendations will be the responsibility of the City of Scottsdale, and could include items such as "No Parking" signs, "Stop" signs, 15-mph school crossings, or new traffic signals. Most times traffic studies will be needed to determine appropriate changes. These studies may require traffic volume measurement, pedestrian volume measurement, speed measurement, and review of traffic accident history. Traffic control decisions must meet State and Federal criteria. With the exception of a new traffic signal, most traffic control changes can be accomplished within a few months time frame.

Infrastructure recommendations can also be implemented by the City of Scottsdale. Examples of infrastructure recommendations are sidewalk repair or construction and addition of turn lanes at intersections. Because these improvements are subject to the availability of existing funding and the overall budgeting process for the Capital Improvement Program, infrastructure improvements may take several months or years to complete.

The City can also assist with property maintenance recommendations. Public property maintenance, including replacement of damaged signs and trimming of landscaping can be addressed by initiating a work order. These kinds of concerns can usually be addressed fairly quickly, typically within a few weeks. Private property maintenance, including trimming of landscaping, can be referred to the City's

Code Enforcement department to be addressed. Code enforcement issues can usually be resolved within a few months.

Recommendations for improvements on school property would need to be evaluated by the School District and the school. City staff can assist the school and the district on potential changes, such as those to drop off and pick up locations and procedures. The city can also help the school develop parent "parking patrols" to assist with the safe and efficient completion of pickup and dropping off of students. Parking patrols, staffed by parents and other community volunteers, could be one solution organized by the Transportation Safety Committee and included in the SRTS Improvement and Implementation Plan.

The City can also assist the school in identifying the need for education and encouragement measures. Bicycle and safety training can occur through a number of organizations through school assemblies or classroom lessons. It is envisioned that school curricula would need to meet district requirements and would therefore be developed jointly by members of the Transportation Safety Committee with oversight provided by the school and the school district.

The SRTS Improvement and Implementation Plan should be compiled into a document by city staff. The draft document should be reviewed by all Transportation Safety Committee members and their comments should be incorporated into the final document. The document should include the aerial map identifying the safest routes to school, a copy of all evaluation checklists, a copy of recommendations, an action plan with assigned responsibility and timeframe. The final document should be retained by all members of the Transportation Safety Committee for future reference.

5.8 Fund the Plan

Funding sources are available to implement SRTS programs, including federal transportation funding sources such as the Congestion Mitigation and Air Quality Program, the Transportation Enhancement Program, and the Arizona Department of Transportation Safe Routes to School Program. The City can also provide funding for capital improvements subject to the annual budgeting process.

5.9 Act, Evaluate and Make Changes if Needed

The next step is to implement the SRTS Improvement Plan, which could include items such as hosting school events, educating children and parents, enforcement in school zones and sidewalk improvements. After changes are made, evaluating their effectiveness with student and parent surveys will help to determine if changes to the plan are needed.

6.0 Maintain Enthusiasm for the Program

According to the National Highway Traffic Safety Administration, "it takes time to develop new cultural attitudes about transportation. Be sure to reintroduce your program every year at the beginning of the school year." Some ideas from the NHTSA include:

- Holding a kick-off event or assembly to generate excitement about the SRTS program.
- Notify parents by including program information in parent packages sent from the school.
- Hold regular Transportation Safety Committee meetings at times when most people can attend.
- Meet with the principal and teachers at the beginning of the school year to plan in-classroom activities for the year.
- Hold parent gathering events to encourage parents to form "walking school buses", "bike trains" and carpools.

- Keep the school community informed about the program. Each new success can help to build increased support for the program.
- Measure success through surveys. Surveys that show increasing numbers of pedestrians, bicyclists and carpoolers coming to school show that the SRTS program is working!
- Inform the community about the program through press releases and newsletter articles.
- Celebrate every success, large or small. Reward all involved for a job well done.

7.0 Implementation Plan for City of Scottsdale

The table on the following pages lists an implementation plan for a SRTS program in Scottsdale. Because existing resources remain fixed, the program will need to be built slowly. Program expansions will build upon lessons learned during the implementation of the program with a few schools.

Action Item	Tentative Timeline	Responsibility
Initial contact schools with publication describing program.	December 2006	South Area: ??? Central Area: ??? North Area: ???
Apply for ADOT SRTS funding for giveaway items and contract worker support for program.	November and December 2006	
Follow up and determine which schools are willing to participate in the program. The goal is to identify one or two schools willing to implement a program for the 2007/2008 school year (Grayhawk Elementary will likely be one of these schools).	January 2007	
Finalize list of schools willing to participate in program.	January 2007	
Publication #2: parent safety tips, child safety tips, nutrition	February 2007	
Meet with school officials to describe program; create transportation safety committees; committee kick-off meetings	January to March 2007	
Finalize partnership agreements	March 2007	
Publication #3: sun safety at school, creating a SRTS implementation plan, ideas for activities for walk to school month.	April 2007	
Identify potential events to be included in FY 2007-2008 school programs	April and May 2007	Transportation Safety Committee
Collect information and create map of routes used to get to schools	April and May 2007	Transportation Safety Committee
Identify issues and identify solutions	April and May 2007	Transportation Safety Committee
Assemble materials to be included in welcome to school packets; organize kick-off event	June or July 2007 (depends on ability of committee to meet during summer months)	Transportation Safety Committee; Jim McIntyre, COS
Plan in-room classroom activities	August 2007	Transportation Safety Committee; Jim McIntyre, COS

Action Item	Tentative Timeline	Responsibility
Publication #4: benefits of walk to school events; ideas for activities for walk to school month.	August 2007	
Create SRTS Implementation Plans	August and September 2007	Transportation Safety Committee
Implement Plan; Evaluate Programs	Beginning September 2007	Transportation Safety Committee; Others as Identified in Plan
Publication #5.	October 2007	
Walk/Bike to School Events to Coincide with International Walk to School Month	October 2007	
Publication #6	December 2007	

Transportation Master Plan
Pedestrian Element

Appendix 7-M
Accessibility Details and Forms

SEGMENT COVER SHEET

***Trail Name** ______________________

Segment Name ....

Weather Conditions at time of assessment ....

Assessment Team

Date ____________

Coordinator ____________

Certification # ____________

Data Recorder ____________

Stations ____________

Distance ____________

Typical Tread Width ____________

Typical Cross-Slope ____________

Surface ____________

Typical Grade ____________

Direction ____________

Maximum Cross-Slope ____________

Maximum Grade ____________

Minimum Clearance Width ____________

Temp at assessment — Low Temp ____ High Temp ____ ☐ F ☐ C

Most Recent Rainfall — Date ____ Amount ____ ☐ in ☐ cm

Elevation Data — Start ____ End ____

Minimum ____ Maximum ____ ☐ ft ☐ m

Assessment Data Units and Standards ○ Compass bearings ○ GPS coordinates ○ None

Length Units used (ft, in, m, cm)

*Distance ____

*Tread Width ____

*X-Slope Max ____

*Grade Max ____

*MCW ____

Slope Units used (pct, deg)

*Typ X-Slope ____

*Typ Grade ____

*X-Slope Max ____

*Grade Max ____

*X-Slope in/out (+/-) recorded? ☐ Yes

Compass Declination ____________
Format: dd mm.m D
d=degrees, m=minutes to one decimal,
D=Direction (E or W)

Design Tread Width
- ◉ 36 in (0.9 m)
- ○ 60 in (1.5 m)
- ○ 120 in (3 m)

Other ____

Design Height
- ○ 80 in (2.0 m)
- ○ 96 in (2.4 m)
- ○ 120 in (3 m)

Other ____

Rotational Penetrometer Readings

Surface Type ▼	firmness wet	firmness dry	stability wet	stability dry

Minimum Obstruction Height
- ○ 0.5 in (2.5 cm)
- ◉ 2.0 in (5.0 cm)
- ○ 3.0 in (7.5 cm)
- ○ 6.0 in (15 cm)

Other ____

Minimum MCW Height
- ○ 0.5 in (2.5 cm)
- ○ 2.0 in (5.0 cm)
- ○ 3.0 in (7.5 cm)
- ○ 6.0 in (15 cm)

Other ____

▼ Please use only values from Trail Cover Value List

*Data will be exported to Trail Explorer or used in Trail Explorer calculations.

This sheet contains valuable data. If found, please return to:
Beneficial Designs, P.O. Box 69, Minden, NV 89423-0069

TRAIL COVER SHEET

Assessment Date ______________

*Trail Name ______________ Trail Designation ▼ ______________

*Park ______________ Agency ______________

*Destination ______________ Region ______________

*Dest Type ▼ ______________ District ______________

Elevation Max ______ Min ______ u/m ______

*Type ○ Linear ○ Network ○ Loop ○ Stacked Loop

Year Est. ______

Development ○ Fully developed ○ Cleared path ○ Partly developed ○ Undeveloped

Usage ○ High ○ Medium ○ Low

Trail Info

Trail Notes

Trailheads

Activities ▼	Allowed?
	○ Yes ○ No
	○ Yes ○ No
	○ Yes ○ No
	○ Yes ○ No
	○ Yes ○ No
	○ Yes ○ No
	○ Yes ○ No
	○ Yes ○ No
	○ Yes ○ No
	○ Yes ○ No

Environmental Zones ▼

▼ Please use only values from Trail Cover Value List

*Data will be exported to Trail Explorer or used in Trail Explorer calculations.

This sheet contains valuable data. If found, please return to:
Beneficial Designs, P.O. Box 69, Minden, NV 89423-0069

Segment Data Collection

Trail Name ______ Segment Name ______ page __ of __ Assessment Date ______

Station Distance													Feature Distance	[illegible] Zone	Feature Type*	Feature Description	Size / Width	[illegible]	Count [illegible]	[illegible]	[illegible]	Start Feature [illegible]	Action Reqd
	Tread Width	Typ X-Slope	Surface Cat*	Surface Type*	+/- Typ Grade	Compass/GPS Fwd/Lat	Bk/Long	Max X-Slope Magnitude	Length	Max Grade Magnitude	Length	MCW											
Distance																							
	Tread Width	Typ X-Slope	Surface Cat*	Surface Type*	+/- Typ Grade	Compass/GPS Fwd/Lat	Bk/Long	Max X-Slope Magnitude	Length	Max Grade Magnitude	Length	MCW											
Distance																							
	Tread Width	Typ X-Slope	Surface Cat*	Surface Type*	+/- Typ Grade	Compass/GPS Fwd/Lat	Bk/Long	Max X-Slope Magnitude	Length	Max Grade Magnitude	Length	MCW											
Distance																							
	Tread Width	Typ X-Slope	Surface Cat*	Surface Type*	+/- Typ Grade	Compass/GPS Fwd/Lat	Bk/Long	Max X-Slope Magnitude	Length	Max Grade Magnitude	Length	MCW											
Distance																							
	Tread Width	Typ X-Slope	Surface Cat*	Surface Type*	+/- Typ Grade	Compass/GPS Fwd/Lat	Bk/Long	Max X-Slope Magnitude	Length	Max Grade Magnitude	Length	MCW											
Distance																							
	Tread Width	Typ X-Slope	Surface Cat*	Surface Type*	+/- Typ Grade	Compass/GPS Fwd/Lat	Bk/Long	Max X-Slope Magnitude	Length	Max Grade Magnitude	Length	MCW											
Distance																							
	Tread Width	Typ X-Slope	Surface Cat*	Surface Type*	+/- Typ Grade	Compass/GPS Fwd/Lat	Bk/Long	Max X-Slope Magnitude	Length	Max Grade Magnitude	Length	MCW											
Distance																							
	Tread Width	Typ X-Slope	Surface Cat*	Surface Type*	+/- Typ Grade	Compass/GPS Fwd/Lat	Bk/Long	Max X-Slope Magnitude	Length	Max Grade Magnitude	Length	MCW											
Distance																							
	Tread Width	Typ X-Slope	Surface Cat*	Surface Type*	+/- Typ Grade	Compass/GPS Fwd/Lat	Bk/Long	Max X-Slope Magnitude	Length	Max Grade Magnitude	Length	MCW											
Distance																							
	Tread Width	Typ X-Slope	Surface Cat*	Surface Type*	+/- Typ Grade	Compass/GPS Fwd/Lat	Bk/Long	Max X-Slope Magnitude	Length	Max Grade Magnitude	Length	MCW											
Distance																							
	Tread Width	Typ X-Slope	Surface Cat*	Surface Type*	+/- Typ Grade	Compass/GPS Fwd/Lat	Bk/Long	Max X-Slope Magnitude	Length	Max Grade Magnitude	Length	MCW											
Distance																							
	Tread Width	Typ X-Slope	Surface Cat*	Surface Type*	+/- Typ Grade	Compass/GPS Fwd/Lat	Bk/Long	Max X-Slope Magnitude	Length	Max Grade Magnitude	Length	MCW											
Distance																							

* [illegible]

This sheet contains valuable data. If found, please return to: Beneficial Designs, P.O. Box 69, Minden, NV 89423-0069

Beneficial Designs, Inc.

Smart Level with Feet

The Smart Level is a SmartTool™ with precision machine feet… the optimal device to measure any surface, grade, or cross slope.

A Smart Level is a 24-inch (60-cm) SmartTool™ Level with precision machined feet to prevent inaccurate measurements due to teetering on slightly uneven or non-planar surfaces. The precision feet also provide a wider stance to reduce tipping in the lateral direction. It is lightweight, simple to use and requires no assembly. It comes with data forms for the measurement of sidewalk elements. It digitally displays degrees, percent slope and pitch to 1/10-degree accuracy. Extremely durable, it will keep its accuracy for years with push button calibration. Features audio sound at level and plumb. Operates on a standard 9-volt battery.

The traditional SmartTool™ Level can provide inaccurate readings on surfaces that are not flat where there are rocks, ruts and roots which make it difficult to measure. The SmartTool™ with Feet allows the measurement of a grade or cross slope averaged over the length of the SmartTool™. This distance represents the stance that a typical pedestrian with or without the use of adaptive equipment would experience walking or rolling on any surface. The Smart Level is perfect for accessibility surveys! Measure the ADA Built Environment, Sidewalks, Outdoor Recreation Access Routes and Trails with Ease.

Objective measurements aide planners, architects, builders and inspectors in documenting, modifying and creating accessible indoor and outdoor surfaces. These measurements will help determine the relative degree of accessibility of various surfaces, and provide individuals with access information at specific locations. The Smart Level can be used with the UTAP and TrailWare can be used to process measurements taken during a trail assessment.

For the ultimate trail assessment,

use the Smart Level with Feet

For more information, contact:

Beneficial Designs, Inc.
PO Box 69
Minden NV 89423-0069

775.783.8822 v
775.783.8823 f

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SmartTool™ Level

It digitally displays degrees, percent slope and pitch to 1/10-degree accuracy. Extremely durable, it will keep its accuracy for years with push button calibration. Features audio sound at level and plumb. Includes standard 9-volt battery.

What is a Smart Level?

A Smart Level is a 24-inch (60-cm) SmartTool™ Level with precision machined feet to prevent the traditional SmartTool™ Level from teetering on slightly uneven surfaces. The feet also provide a wider stance to reduce tipping in the lateral direction.

What kinds of surfaces can it measure?

Just about any surface!

The Smart Level is perfect for accessibility surveys! Measure the ADA Built Environment, Sidewalks, Outdoor Recreation Access Routes and Trails with Ease.

Why do we need objective measurements?

Objective measurements aide planners, architects, builders and inspectors in documenting, modifying and creating accessible indoor and outdoor surfaces. These measurements will help determine the relative degree of accessibility of various surfaces, and provide individuals with access information at specific locations.

Who can operate it?

Just about anyone!
It is lightweight, and simple to use.

Does the device produce accurate and reliable measurements?

The traditional SmartTool™ Level can provide inaccurate readings on surfaces that are not flat where there are rocks, ruts and roots which make it difficult to measure.

The SmartTool™ Feet allow the measurement of a grade or cross slope averaged over the length of the SmartTool™. This distance represents the stance that a typical hiker with or without the use of adaptive equipment would experience walking or rolling on a trail.

Is assembly required?

No, it comes pre-assembled.

Universal Trail Assessment Process (UTAP) & TrailWare

The Smart Level can be used with the UTAP and TrailWare can be used to process measurements taken during a trail assessment. For more information about UTAP and TrailWare, please call or contact us at <trails@beneficialdesigns.com>.

Beneficial Designs, Inc.

Rotational Penetrometer

Precision measurements of the firmness and stability of indoor and outdoor surfaces

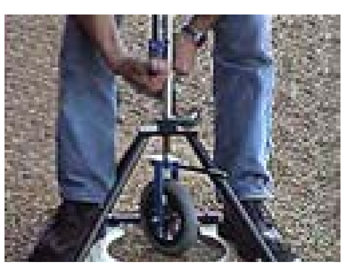
The Rotational Penetrometer (RP) is a precision tool for measuring the firmness and stability of ground and floor surfaces. Measurements of surface firmness and stability are important to all trail users; surfaces that are soft or unstable are much more difficult to negotiate. In addition, the Americans with Disabilities Act Accessibility Guidelines specify that accessible surfaces must be firm and stable. To measure firmness, the Penetrometer wheel has a precision spring that applies a standard force and the penetrometer records how far the wheel penetrates into the surface. Rotating the penetrometer wheel and then repeating the measurement indicates surface stability.

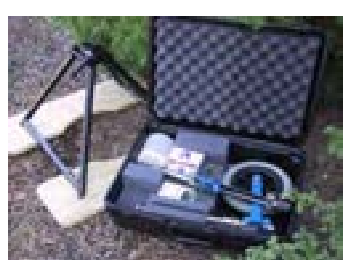
The RP is capable of measuring all types of indoor and outdoor surfaces, from carpet to wood chips to sand. However, its size has been specifically designed for transport to outdoor surfaces, such as trails and playgrounds. The base measures 24” x 24”, and the fully assembled RP stands 28¾” high. Fully assembled, the entire unit weighs 12 pounds. Constructed of stainless steel and aluminum, with surface reference plates of finished plywood make the RP durable for long-term use, indoors or outdoors.

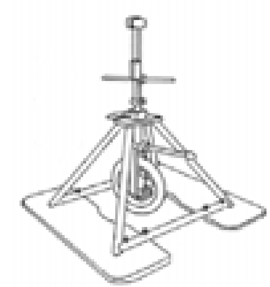
Development of this device was funded by the National Center for Medical Rehabilitation Research in the National Institute of Child Health and Human Development at the National Institutes of Health through Small Business Innovation Research Phase I Grant #1 R43 HD30979-01 and Phase II Grant #2 R44 HD30979-02.

The ultimate accuracy,

from the authors of ASTM 1951







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PO Box 69
Minden NV 89423-0069

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775.783.8823 f

trails@beneficialdesigns.com

What is a Rotational Penetrometer?

The Rotational Penetrometer (RP) is a precision tool for measuring the firmness and stability of ground and floor surfaces.

How does it work?

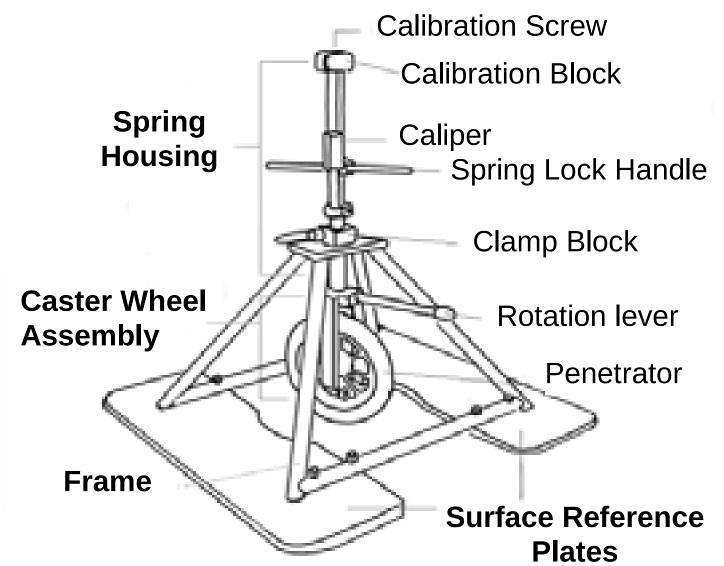
To measure firmness, the precision spring applies force to the penetrator, and the caliper measures the amount of vertical displacement of the penetrator into the surface. The penetrator is then rotated, and the total displacement into the surface is measured, which indicates stability.

What kinds of surfaces can it measure?

It is capable of measuring all types of indoor and outdoor surfaces, from carpet to wood chips to sand. The RP is useful for measuring firmness and stability on trails, playgrounds, and other public surfaces.

How big is it?

The base measures 24 x 24 inches, and the fully assembled RP stands 28¾ inches high. Fully assembled, the entire unit weighs 12 pounds.



Penetrator Assembly = Spring Housing + Caster Wheel Assembly

Rotational Penetrometer

Rotational Penetrometer

Why measure firmness and stability?

The Americans with Disabilities Act Accessibility Guidelines (ADAAG) specify that accessible routes must have ground and floor surfaces that are firm and stable. Surfaces that are not firm and stable limit accessibility for wheelchair, cane, crutch, and walker users, parents with strollers, and other individuals with mobility limitations.

Why do we need objective surface measurements?

Objective surface measurements will provide planners, architects, builders, and inspectors with methods and standards by which they can create accessible indoor and outdoor surfaces. These measurements will determine the relative degree of accessibility of various surfaces, and provide individuals with access information at specific locations. The RP can measure the firmness and stability of any surface from concrete to sand.

Who can operate it?

To use the RP independently, the operator must be able to stand over the 29” device, bend at the waist, and have the strength to release a 44 lb spring. The RP does not require engineering expertise.

How durable is it?

The RP is designed for outdoor use, and its durability reflects that. Constructed of stainless steel and aluminum, with surface reference plates of finished plywood, the RP holds up for long-term use.

Can it be linked to a computer?

Yes. A laptop computer using the RS 232 Optical Interface Cable Assembly and RP Data Collector software can record measurements from the caliper.

Does the device produce accurate and reliable measurements?

The RP’s effectiveness has been proven through research. An interlaboratory study was conducted according to ASTM E691, and the penetrometer was shown to produce repeatable and reproducible measures. These measurements have been shown to correlate with the amount of work required to propel a wheelchair (as measured by ASTM F1951) and the amount of physiological energy required by persons with and without disabilities attempting to negotiate a surface. For copies of the background research, please contact us.

An ASTM standard for field measurement of playground firmness and stability is in the balloting process for ASTM. A technical report is available on the Access Board Website with recommendation for firmness and stability (www.access-board.gov/research/Exterior%20Surfaces/exteriorsarticle.htm.)

Is assembly required?

The RP consists of the Spring Housing and the Caster Wheel Assembly (which can be separated by a quick-release pin) and the frame. The RP is easily assembled without tools, and can be disassembled for storage.

Universal Trail Assessment Process (UTAP) & TrailWare

The RP can be used with the UTAP, and TrailWare can be used to process measurements taken during a trail assessment. For more information about UTAP and TrailWare, please call or contact us at <trails@beneficialdesigns.com>.

PO Box 69, Minden, NV 89423-0069 tel: (775) 783-8822 fax: (775) 783-8823

Beneficial Designs, Inc.

High Efficiency Trail Assessment Process

The High Efficiency Trail Assessment Process (HETAP) Cart quickly and accurately collects objective information for the assessment of trails and sidewalks

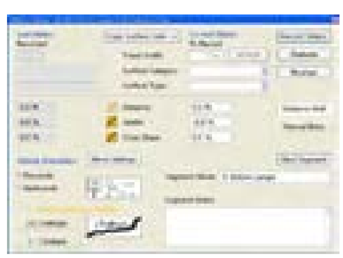
HETAP enables one person to collect accurate information about trail tread conditions at an average speed of one mph. It can be used to measure recreation trails, shared use paths and outdoor recreation access routes. The data collection cart can also be used to measure built environment access routes, sidewalk corridors and sidewalk elements such as curb ramps, driveway crossings and medians. Objective and accurate assessments of on-trail conditions enable land managers to monitor environmental change; identify unique natural features; effectively focus on resource protection activities; create accurate construction and maintenance plans and budgets; and enhance the access, safety and satisfaction of all trail users.

Phase I of this research focused on automating the valid and reliable measurement procedures used in the Universal Trail Assessment Process (UTAP) using a combination of sensors to automate the measurements of trail length, grade and cross slope. Software was created to enable real-time, on-trail data recording. All of the required equipment was integrated into a single cart suitable for one-person operation in a variety of trail environments. A land manager survey obtained valuable feedback on the initial prototype and the potential commercial application.

Phase II research has focused on compatibility with GPS and agency data standards, increasing the speed and durability of the equipment, modifying the system for use on Rola-wheels for use on narrow trails and on ATVs for motorized trails, and on SQL server based software. UTAP and HETAP measurements are being compared for accuracy and reliability. Development of this device is funded by the USDA through Small Business Innovation Research Phase I Grant #2004-33610-14300 and Phase II Grant #2005-33610-16242.

Trail data at your fingertips,

Using the HETAP System



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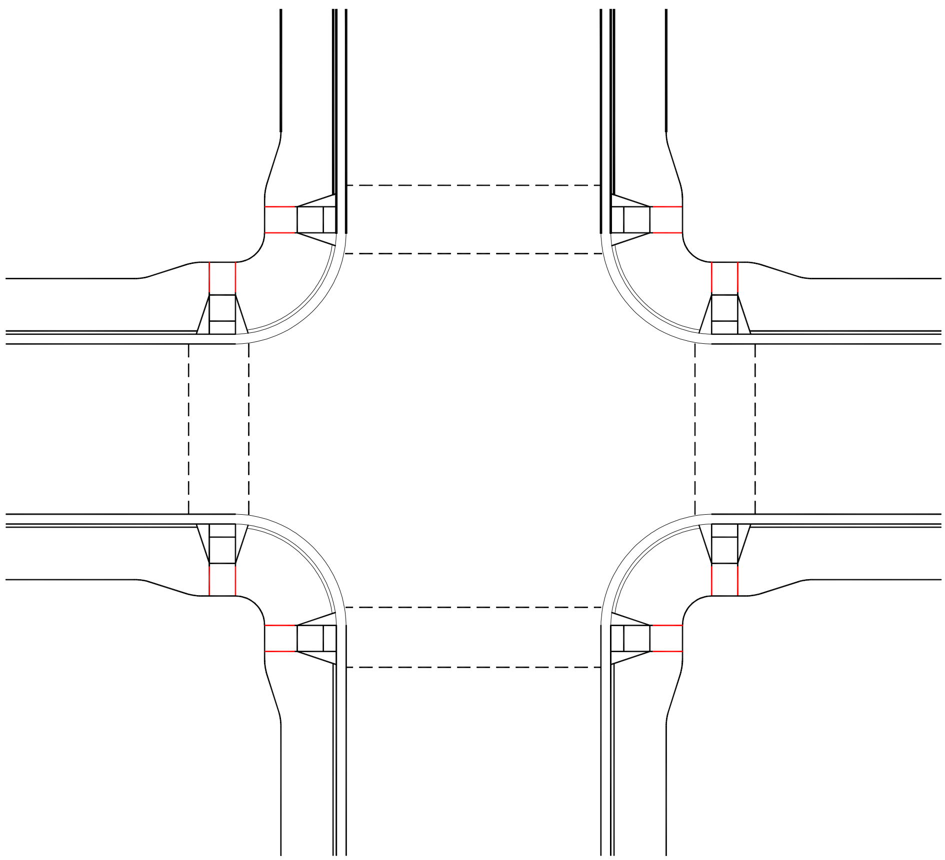
Sample Intersection Data Collection Form

Date ____________ Data Recorder ________________________

INTERSECTION LOCATION

Street Name	________________________	Street Driving Direction	N / S or E / W
Cross Street	________________________	Cross Street Direction	N / S or E / W
GPS Coordinates	N/S ______ E/W ______	Adjacent Property Description	________________________



INTERSECTION CHARACTERISTICS/SIDEWALK ELEMENTS

Include all sidewalk elements (i.e. utility pole, sign, etc.) on the drawing to indicate their position.

Digital Image taken – frame # and description ____

Record any surface height transitions over 0.25 inches using a profile gauge.
Trace the transition on the back of this form, then indicate the location on drawing.

Curb Ramp Type:	Surface Material Type:	Recommended Action:	
Diagonal	Asphalt	Repair	Construct
Parallel	Concrete	Reconstruct	Monitor
Perpendicular	Other:______________	Other:______________	

Sample Driveway- Setback Data Collection Form

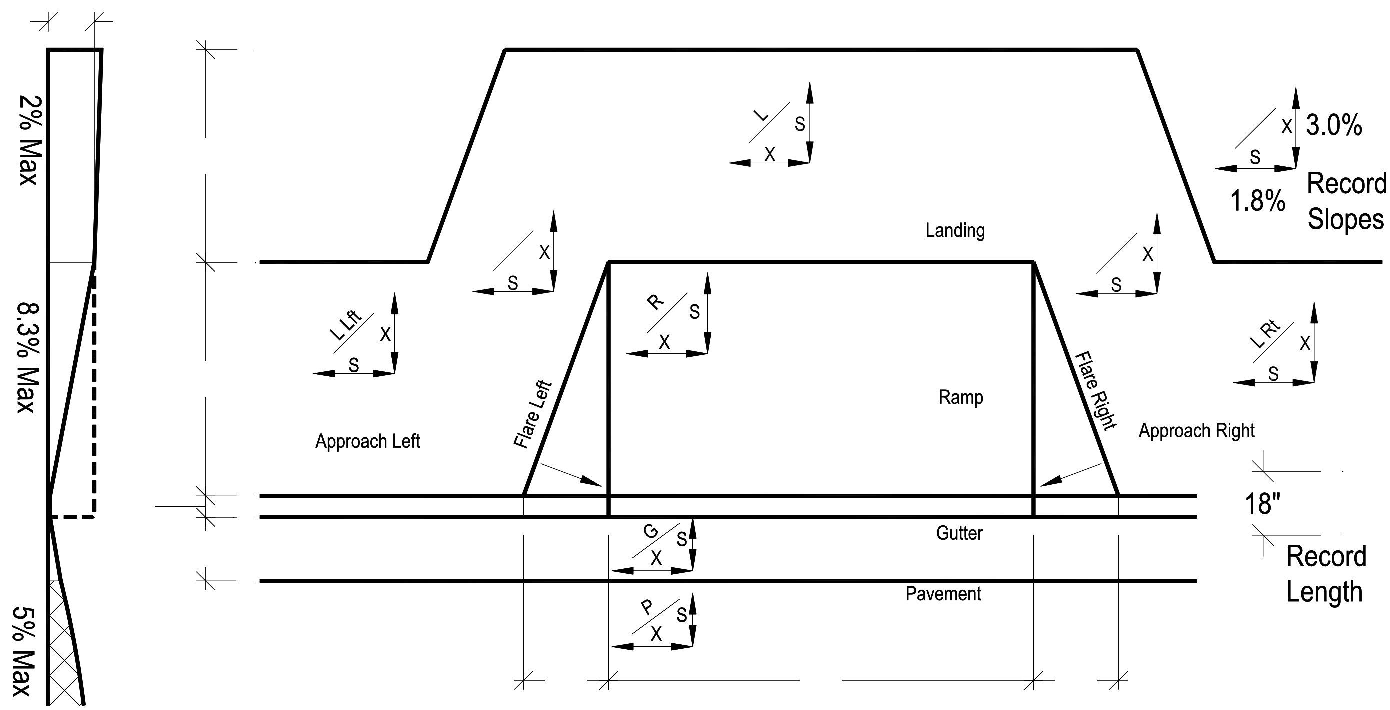
Date ____________ Data Recorder ________________________

DRIVEWAY- SETBACK LOCATION

Street Name ______________________ Side of Street N S W E

Nearest Cross Street(s) ______________________

GPS Coordinates N/S E/W ______________________ Adjacent Property Description ______________________



DRIVEWAY- SETBACK CHARACTERISTICS/SIDEWALK ELEMENTS

Include all sidewalk elements (i.e. utility pole, sign, etc.) on the drawing to indicate their position.

Digital Image taken – frame # and description ______________________

Record any surface height transitions over 0.25 inches using a profile gauge.
Trace the transition on the back of this form, then indicate the location on drawing.

Driveway Type:	Surface Material Type:	Recommended Action:	
Setback Sidewalk	Asphalt	Repair	Construct
	Concrete	Reconstruct	Monitor
	Other:_______________	Other:_______________	

Sample Driveway Data Collection Form

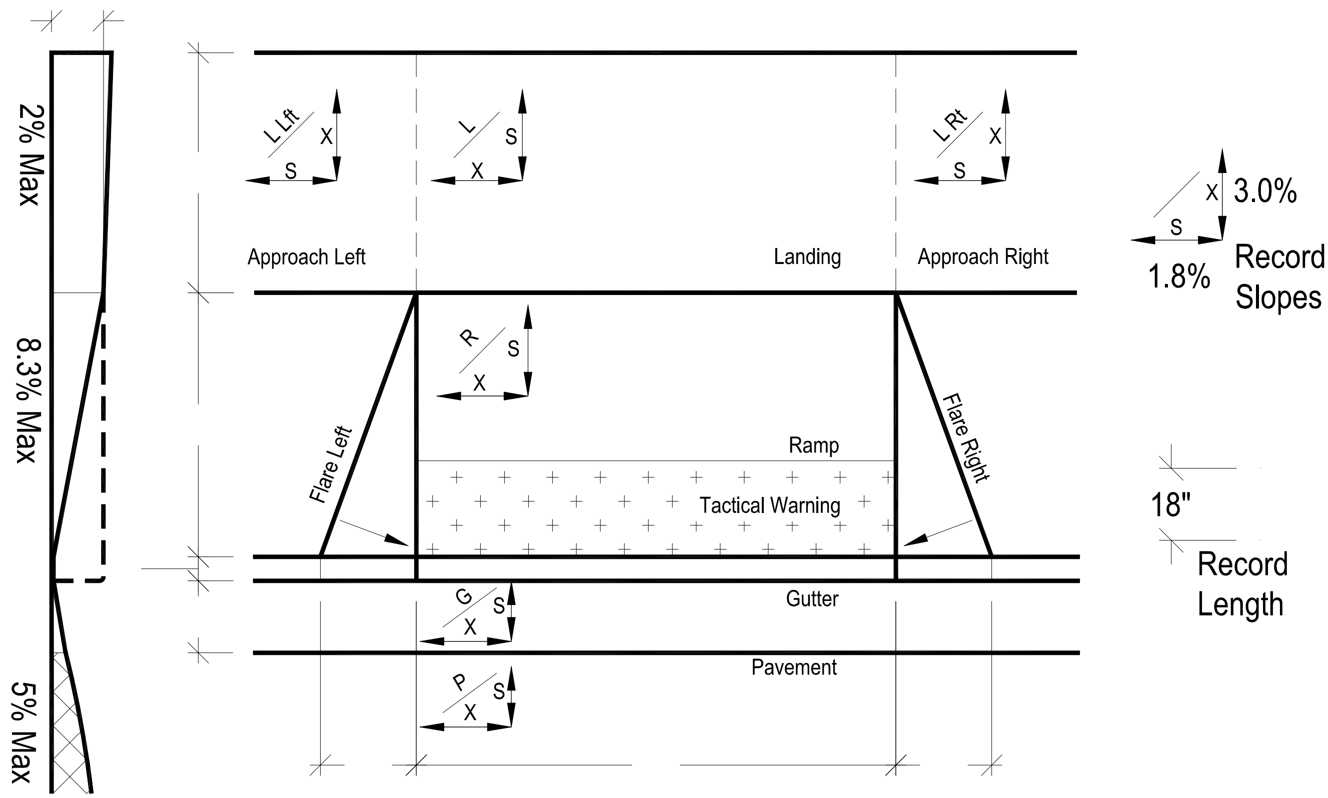
Date ____________ Data Recorder ________________________

DRIVEWAY LOCATION

Street Name ______________________ Side of Street N S W E

Nearest Cross Street(s) ______________________

GPS Coordinates N/S ________ E/W ________ Adjacent Property Description ______________________



DRIVEWAY CHARACTERISTICS/SIDEWALK ELEMENTS

Include all sidewalk elements (i.e. utility pole, sign, etc.) on the drawing to indicate their position.

Digital Image taken – frame # and description ______________________

Record any surface height transitions over 0.25 inches using a profile gauge.
Trace the transition on the back of this form, then indicate the location on drawing.

Driveway Type:	Surface Material Type:	Recommended Action:	
Offset Sidewalk	Asphalt	Repair	Construct
Parallel Approach	Concrete	Reconstruct	Monitor
	Other:______________	Other:______________	

Sample Curb Ramp- Parallel Data Collection Form

Date ____________ Data Recorder ________________________

CURB RAMP- PARALLEL LOCATION

Street Name ________________________________

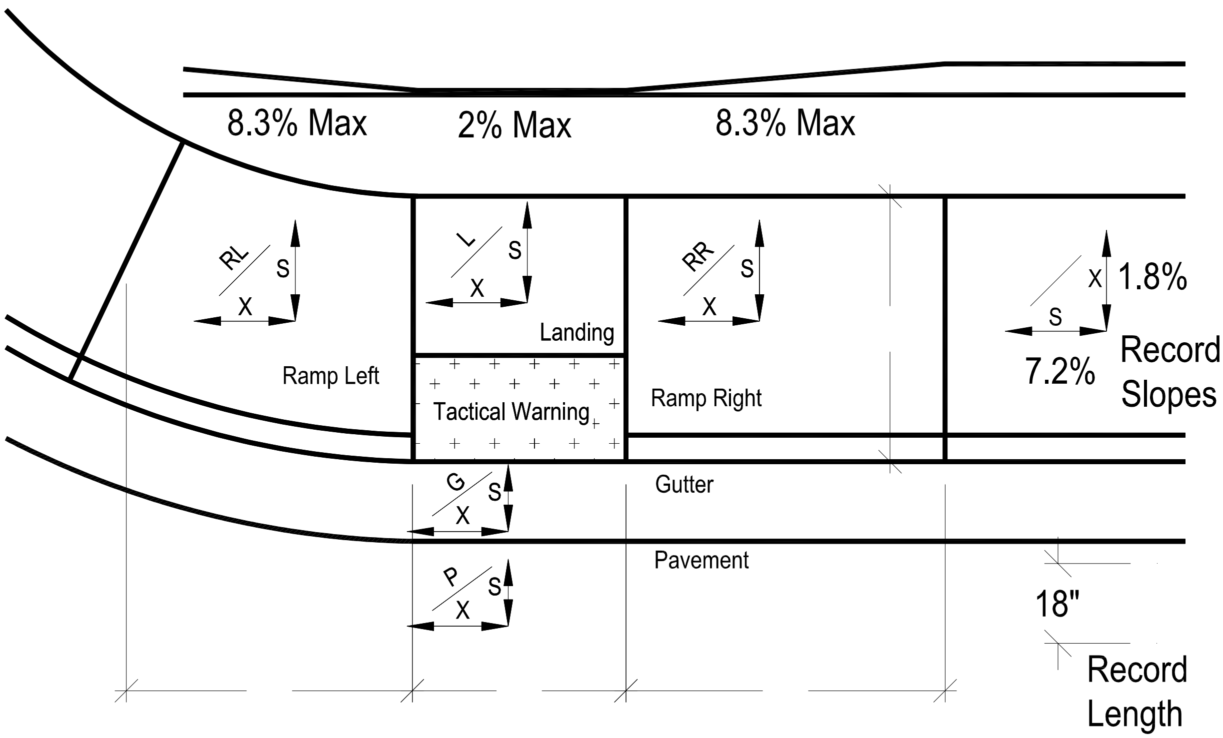
Side of Street N S W E

Nearest Cross Street(s) ________________________________

Indicate Corner of Intersection N S W E NW NE SW SE

GPS Coordinates N/S E/W ________________________________

Adjacent Property Description ______________________________



CURB RAMP- PARALLEL CHARACTERISTICS/SIDEWALK ELEMENTS

Include all sidewalk elements (i.e. utility pole, sign, etc.) on the drawing to indicate their position.

Digital Image taken – frame # and description ________________________________

Record any surface height transitions over 0.25 inches using a profile gauge.
Trace the transition on the back of this form, then indicate the location on drawing.

Curb Ramp Type:	Surface Material Type:	Recommended Action:	
Diagonal	Asphalt	Repair	Construct
Parallel	Concrete	Reconstruct	Monitor
	Other:_______________	Other:_______________	

Sample Curb Ramp Data Collection Form

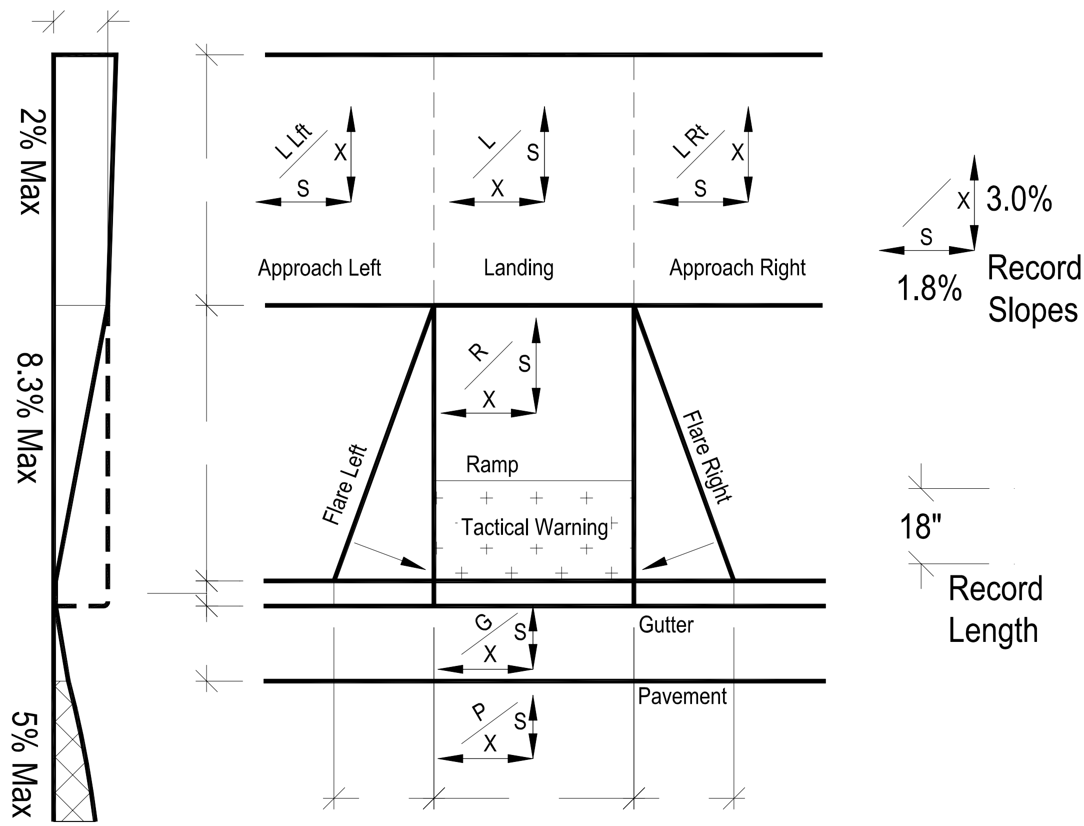
Date ____________ Data Recorder ________________________

CURB RAMP LOCATION

Street Name ________________________________ Side of Street N S W E

Nearest Cross Street(s) ________________________________ Indicate Corner of Intersection N S W E NW NE SW SE

GPS Coordinates N/S E/W ________________________________ Adjacent Property Description ____________________________



CURB RAMP CHARACTERISTICS/SIDEWALK ELEMENTS

Include all sidewalk elements (i.e. utility pole, sign, etc.) on the drawing to indicate their position.

Digital Image taken – frame # and description ____

Record any surface height transitions over 0.25 inches using a profile gauge.
Trace the transition on the back of this form, then indicate the location on drawing.

Curb Ramp Type:
- Diagonal
- Perpendicular

Surface Material Type:
- Asphalt
- Concrete
- Other:_______________

Recommended Action:
- Repair
- Construct
- Reconstruct
- Monitor
- Other:_______________

Sample Bus Stop Data Collection Form

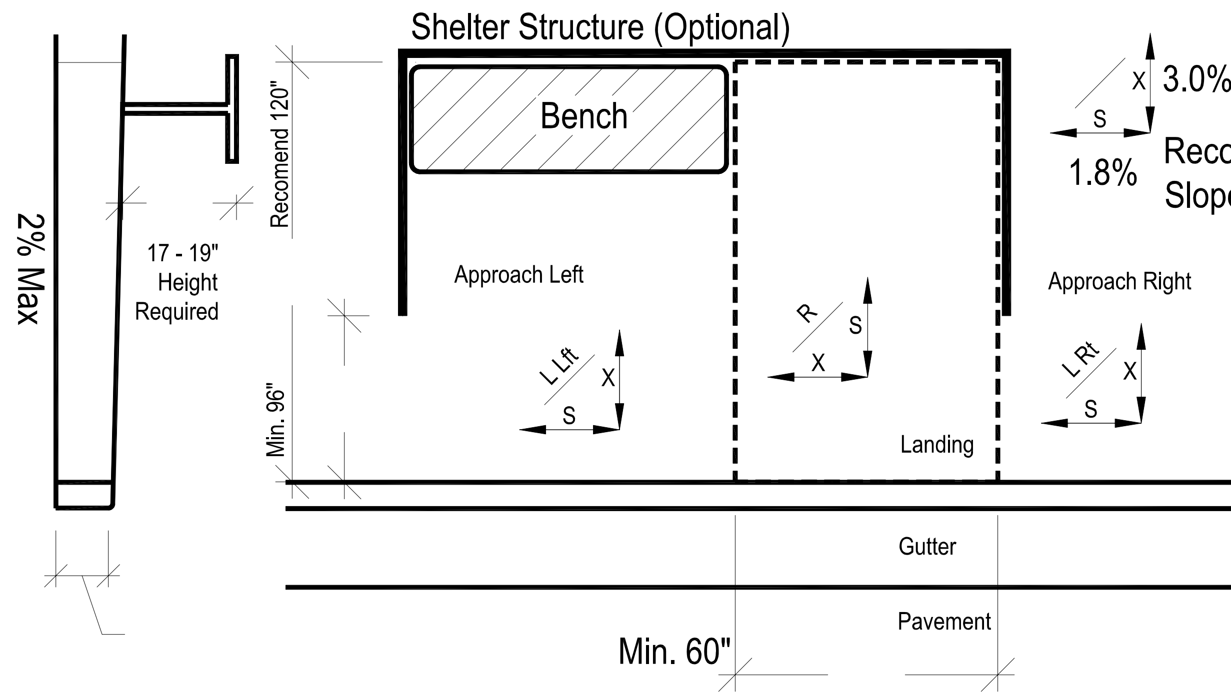
Date ____________ Data Recorder ________________________

BUS STOP LOCATION

Street Name ______________________________ Side of Street N S W E

Nearest Cross Street(s) ______________________________

GPS Coordinates N/S ________ E/W ________ Adjacent Property Description ______________________



BUS STOP CHARACTERISTICS/SIDEWALK ELEMENTS

Include all sidewalk elements (i.e. utility pole, sign, etc.) on the drawing to indicate their position.

Digital Image taken – frame # and description ______________________________

Record any surface height transitions over 0.25 inches using a profile gauge.
Trace the transition on the back of this form then indicate the location on drawing.

Features:	Surface Material Type:	Recommended Action:	
Bench	Asphalt	Repair	Construct
Trash Receptacle	Concrete	Reconstruct	Monitor
Bike Rack	Other:_______________	Other:_______________	

Sample Corner Refuge Island Data Collection Form

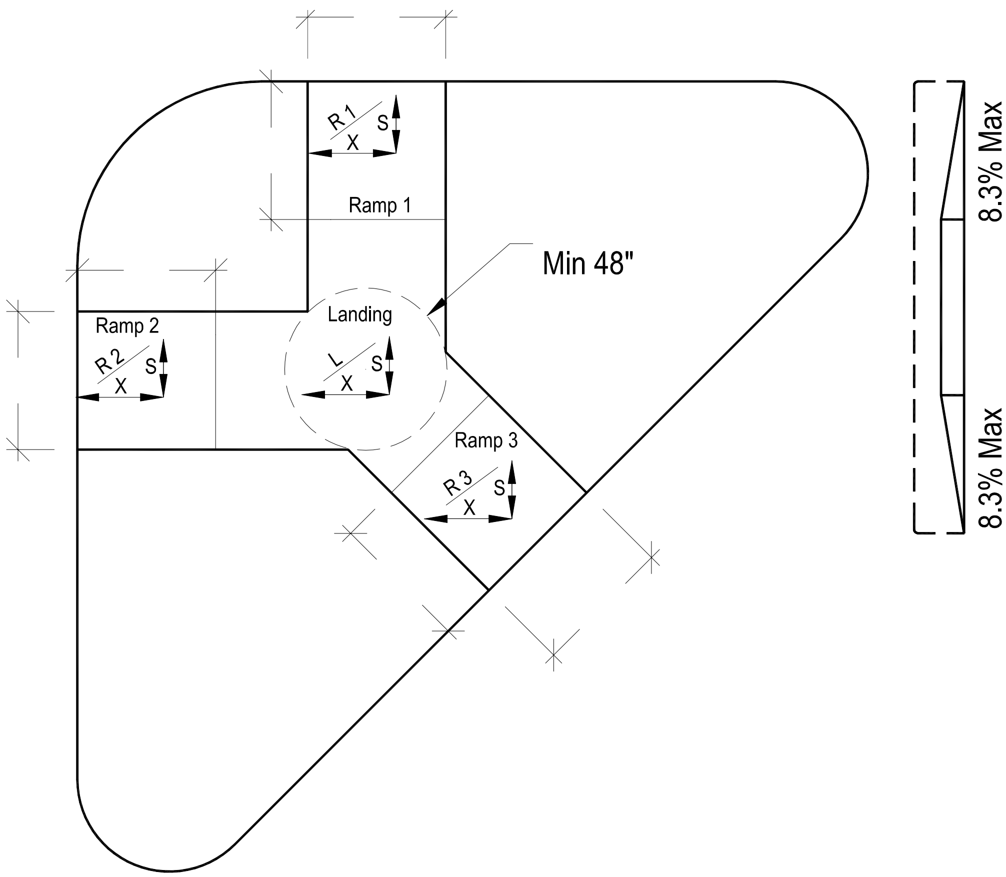
Date ____________ Data Recorder ________________________

CORNER REFUGE ISLAND LOCATION

Street Name ________________________________ Side of Street N S W E

Cross Street ________________________________ Indicate Corner of Intersection N S W E NW NE SW SE

GPS Coordinates N/S E/W ________________________________ Adjacent Property Description ____________________________



CORNER REFUGE ISLAND CHARACTERISTICS/SIDEWALK ELEMENTS

Include all sidewalk elements (i.e. utility pole, sign, etc.) on the drawing to indicate their position.

Digital Image taken – frame # and description ____

Record any surface height transitions over 0.25 inches using a profile gauge.
Trace the transition on the back of this form then indicate the location on drawing.

Refuge Island Type:	Surface Material Type:	Recommended Action:	
Ramped	Asphalt	Repair	Construct
Cut-Through	Concrete	Reconstruct	Monitor
	Other:_______________	Other:_______________	

Sample Center Refuge Island Data Collection Form

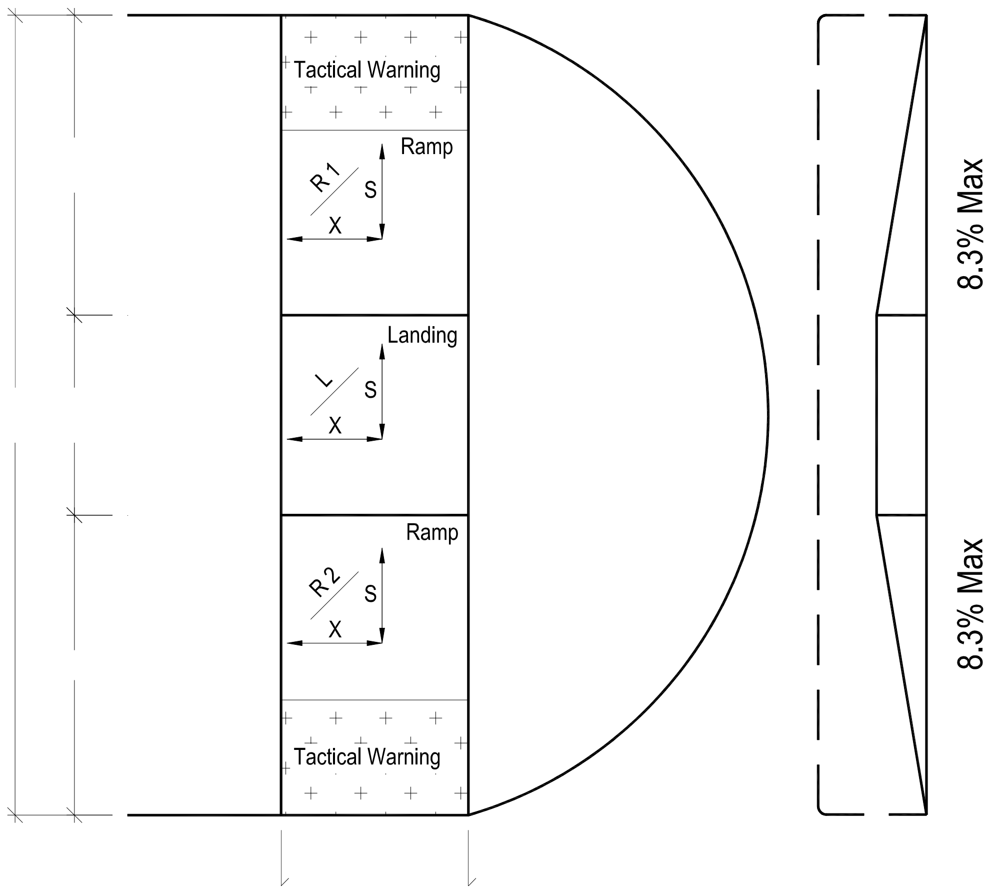
Date ____________ Data Recorder __________________________

CENTER REFUGE ISLAND LOCATION

Street Name ______________________ Direction of Median from Cross Street N S W E

Cross Street ______________________

GPS Coordinates N/S E/W ______________________ Adjacent Property Description ______________________



CENTER REFUGE ISLAND CHARACTERISTICS/SIDEWALK ELEMENTS

Include all sidewalk elements (i.e. utility pole, sign, etc.) on the drawing to indicate their position.

Digital Image taken – frame # and description ______________________

Record any surface height transitions over 0.25 inches using a profile gauge.
Trace the transition on the back of this form, then indicate the location on drawing.

Refuge Island Type:	Surface Material Type:	Recommended Action:	
Ramped	Asphalt	Repair	Construct
Cut-Through	Concrete	Reconstruct	Monitor
	Other:_______________	Other:_______________	

Transportation Master Plan
Pedestrian Element

Appendix 7-N
Latent Demand Technical Report

Introduction

As part of the Pedestrian Element of the City of Scottsdale's *Transportation Master Plan*, a pedestrian demand analysis was performed. Specifically, the latent demand method was used to estimate potential pedestrian trip activity throughout the City. The basis of this analysis was the results from a similar effort performed for and adopted in the Maricopa Association of Governments' (MAG) *Pedestrian Plan 2000*. That analysis (for horizon year 2020) was expanded and updated for Scottsdale. The following report documents various methods for estimating pedestrian demand, outlines the latent demand method procedure in detail, and describes the update that was performed for the City of Scottsdale.

Methods of Assessing Potential Pedestrian Trip Activity

There are three primary methods of assessing pedestrian trip activity. The first method is documenting revealed demand. This is accomplished by simply counting the existing number of people walking on the streets. A second method is to identify, map, and evaluate potential trip generators or attractors. In practice, this method tends to focus on major pedestrian trip attractors. The third method is to assess the latent demand throughout the study area. Assessing latent demand considers both existing and pent-up pedestrian activity. It also enables planners and engineers to anticipate and plan for future pedestrian travel needs. The following paragraphs briefly describe each of these three methods, their advantages and disadvantages.

Revealed Demand

This method consists of compiling counts of existing pedestrians on the roadways. Its usefulness is limited to areas that already have an extensive sidewalk network that provides an overall high-quality walking environment. This method is not usable for the vast majority of U.S. metro area transportation networks, due to their generally poor pedestrian accommodation.

Evaluation of Key Pedestrian Trip Generators and/or Attractors

Until recently, this method has been the most common method of estimating pedestrian travel demand. However, it has two major problems: the limited number of pedestrian attractors it considers, and the fact that it generally focuses only on attractors – therefore only one end of the pedestrian trip is considered.

The first problem with this method is that it tends to focus on major pedestrian trip attractors such as schools, parks, and neighborhood retail centers, and thus only a fraction of the existing and potential pedestrian trip attractors are represented. In fact, virtually every residence, every business, and every social and service establishment in a study area is a pedestrian trip generator or attractor. Thus this method, in practice, fails to account for that fact.

The method's second shortcoming is directly related to the first. Since the method focuses on major attractors, only one end of the pedestrian trip – the destination, is quantified. This is a problem because the method does not account for the production (or supply) of trips available to that attractor. For example, a particular park may have many amenities, and hence exhibit a high trip attraction rate, but if it is in a rather remote area (i.e., the surrounding population density is very low) the actual pedestrian trip activity (or interchange) between the attractor (park) and generator (population) would be low. Consequently, the method does not account for the pedestrian trip interchange reality that exists among generators and attractors.

Latent Demand

The method that quantifies both ends of the walking trip as well as considers all generators and attractors in a study area for both existing and potential trips is the Latent Demand Method. The Latent Demand Method is a logical extension of the second method, and it is rapidly becoming the method of choice for metropolitan areas throughout the United States. Numerous U.S. metro areas are using this method to estimate the potential of roadway corridors to serve bicycle and/or pedestrian trip activity; among them are Baltimore (MD), Birmingham (AL), Philadelphia (PA), Orlando (FL), Tampa (FL), Phoenix (AZ), Atlanta (GA), and Westchester, Rockland & Putnam Cos. (NY).

The Latent Demand Model is essentially a gravity model, based upon a theory similar to that used in the prevailing four step Urban Transportation Planning System-based travel demand models throughout the United States. The following sections outline its theory and technical application in a Geographic Information System (GIS) transportation planning environment.

The Latent Demand Method

Travel patterns in a metropolitan area are well described by Newton's law of universal gravitation as applied to trip interchanges, which is shown in Figure 1. This relationship essentially reflects that the number of trips, regardless of travel mode, between two areas is directly related to the number of trip productions (e.g. population residences) in one area and the number of trip attractions (e.g., workplaces, shopping opportunities, schools, etc.) in the other (destination) area. The relationship also shows that impedances (e.g., travel distance and/or time between the areas, conditions of the travel environment, etc.) play a significant role in reducing the amount of trips made between those areas.

Walking activity patterns can be described by a similar relationship, see Figure 2. However, unlike those for the automobile travel mode, the impedances to the walking mode play a greater role. For example, the distance between trip origins and destinations affects walking more dramatically than it does for automobile travel. Additionally, the condition of the walking environment affects whether a walking trip is made and how far, and what route, a person is willing to travel (see Figure 3). Furthermore, depending on the purpose of the walk trip, the carrying, or "payload" capacity plays a role in not only the walk travel distances but also whether or not a walking trip is even made.

Impedances are different for different trip purposes. For example, people are typically willing to walk a greater distance to work than they are to simply pick up a convenience item at a neighborhood store. This phenomenon is reflected in national survey data, as depicted for three trip purposes in Figure 4. Essentially, the trip making probability varies according to the distance between origins and destinations, and it also depends on the purpose of the trip.

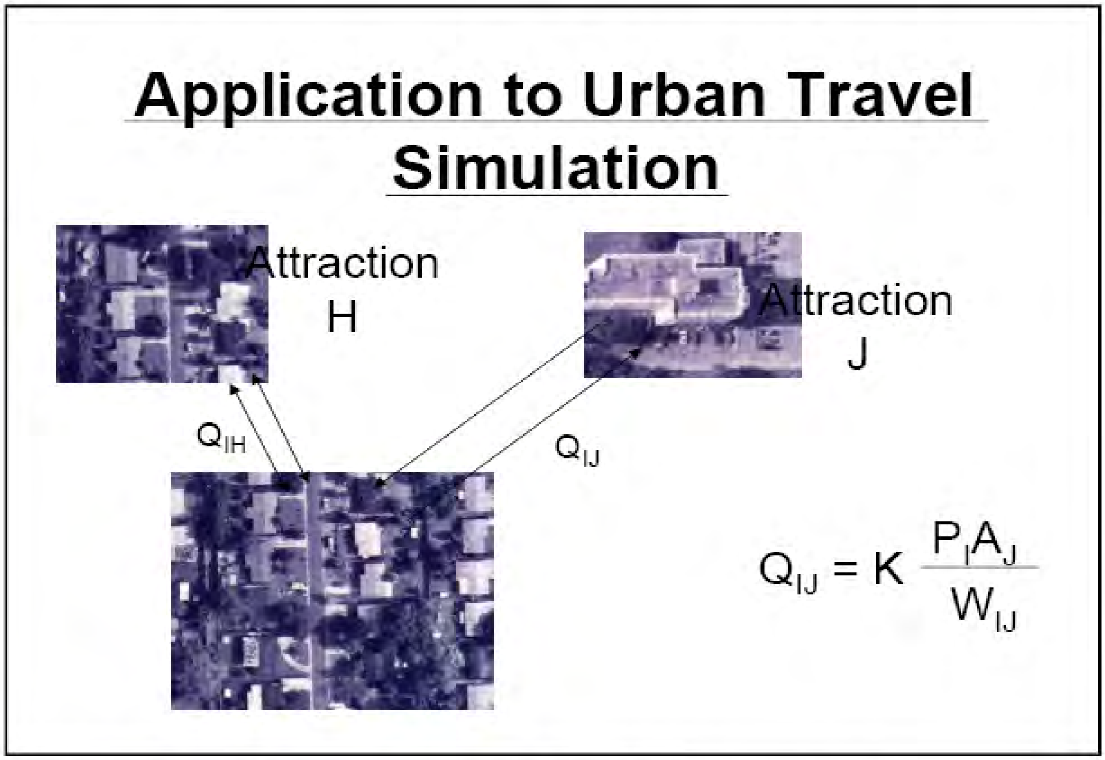


Figure 1 Newton's gravity model as applied to trip interchange.

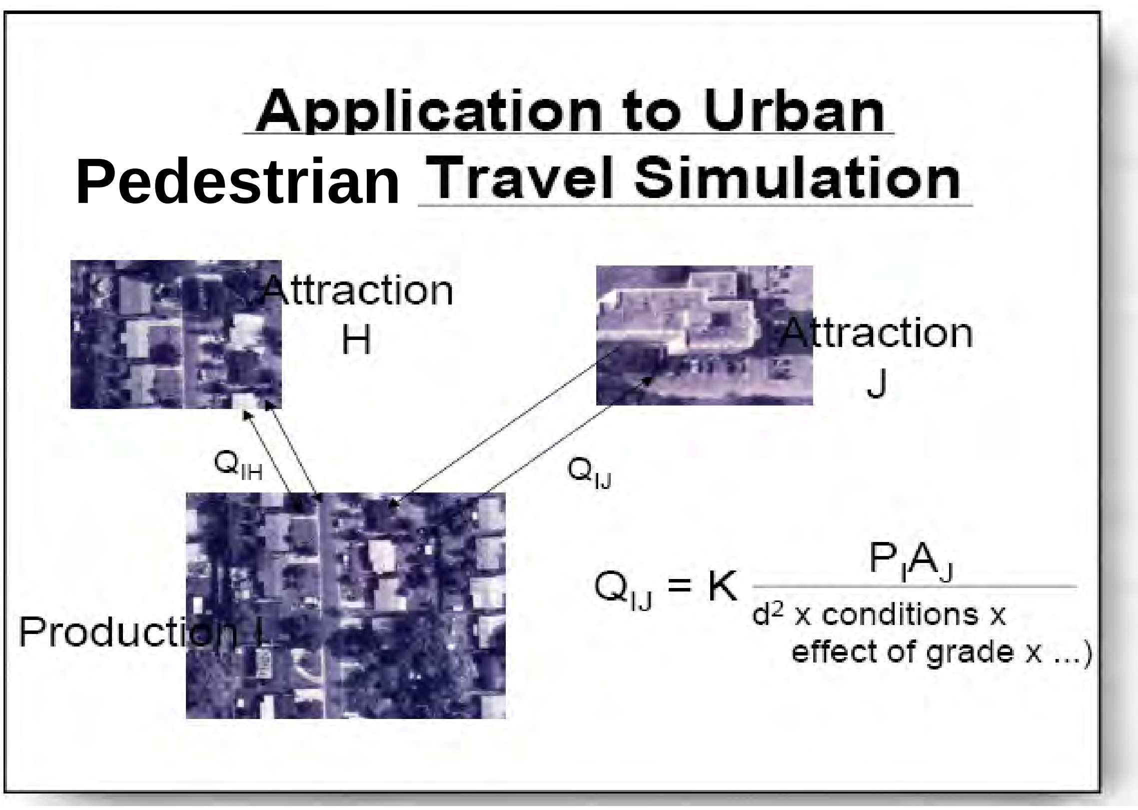


Figure 2 Walking Trip Interchange Relationship

Figure 3 Roadway conditions have a large effect on bicycling.

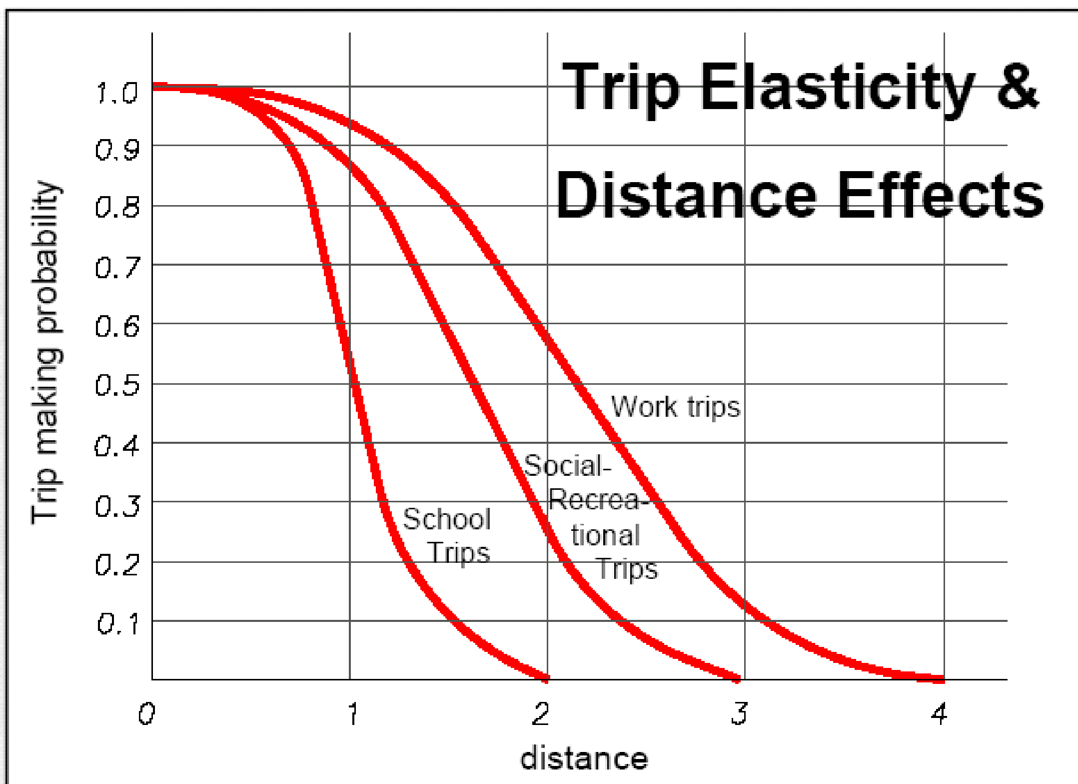


Figure 4 Typical trip making probability (impedance effects) due to distance.

The Latent Demand Method accounts for the above outlined characteristics of pedestrian travel in an area. While it is not a full and rigorous four-step travel demand model, it includes the trip interchange relationship in a gravity model trip distribution analysis but is conducted with a corridor focus. It models trips according to the four general utilitarian trip purposes identified in the National Household Transportation Survey (NHTS) shown in Figure 5. The Latent Demand Model is an analysis of the entire region, using a corridor-based, geographic information system (GIS) algorithm to quantify relative potential pedestrian trip activity.

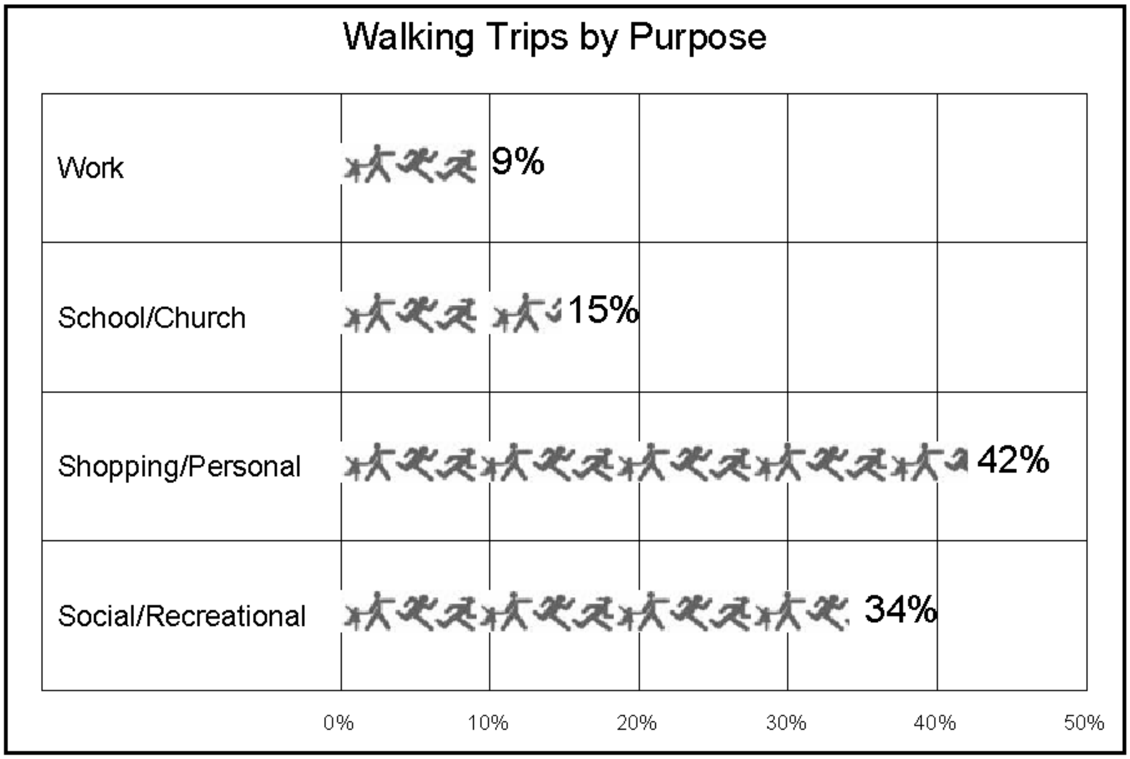


Figure 5 Walking Trips by Purpose.

The Latent Demand Method is an effective analysis tool for assessing pedestrian travel demand. It:

- Includes all potential trip generators and attractors
- Quantifies the potential trip interchange between generators and attractors
- Recognizes that different trip types account for differing shares of the total trips
- Estimates the trip making probability of each trip type as a function of distance, and
- Can be employed to assess the latent demand for any roadway network

As previously outlined, the impedances to walking as a transportation mode play a large role in the probability of a walking trip occurring. One of the significant impedances, the effect of motor vehicle traffic, is assumed not to exist for the purpose of calculating non-linked, or latent trips. This assumption is based on the premise that if motor vehicle traffic was not present, the “latent” pedestrian trips would become “revealed” trips.

Latent pedestrian travel activity is directly related to the frequency, magnitude, and proximity of trip generators and attractors to a roadway segment. Figure 6 is a stylized representation of the potential trip activity around a work trip attractor, such as an office complex. The intensity of the shading on the surrounding street network graphically depicts the relative trip activity given that the trips are coming from all directions and that there is no vehicular traffic on the streets. Figures 7 and 8 are stylized representations of this effect around attractors for social/recreational trips and school trips, respectively.

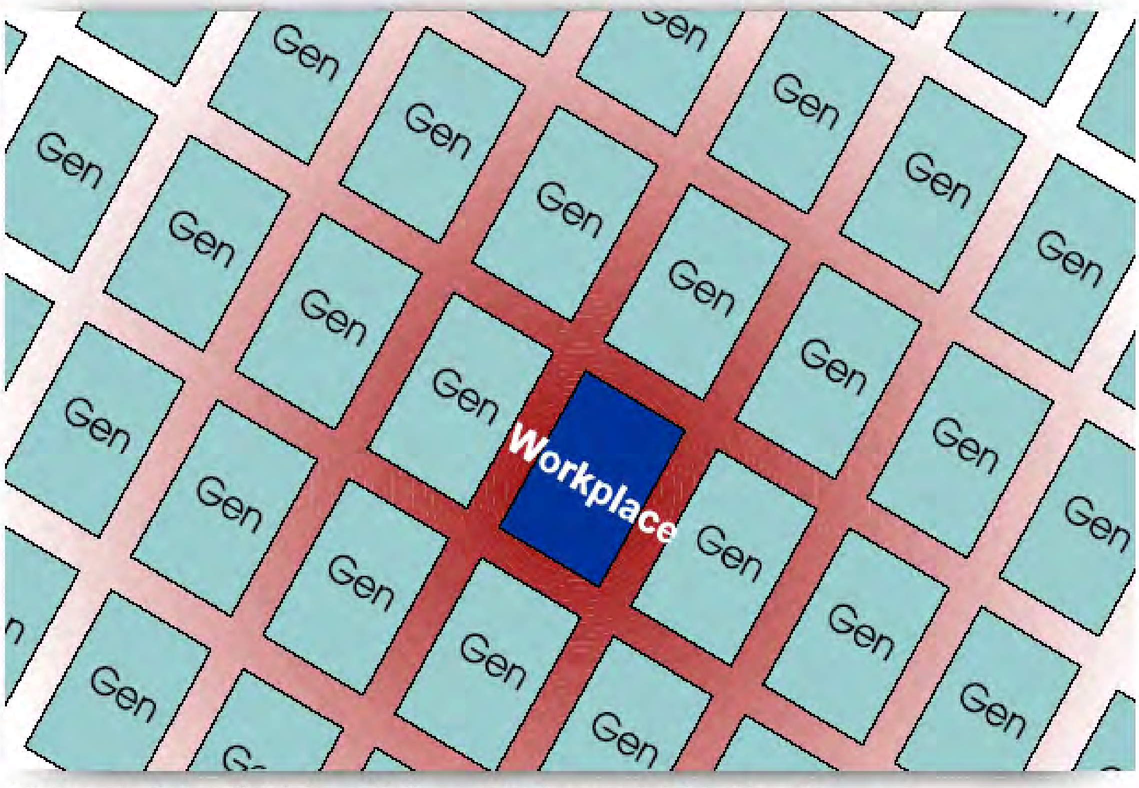


Figure 6 Potential trip activity around a work trip attractor.

The Latent Demand Model process takes these “snapshots” of the potential trip activity for all attractors and generators throughout the study area and essentially assembles them into a composite, as depicted in Figure 9. The intensity of the shading of the streets within this figure depicts the total relative potential pedestrian trip activity surrounding the generators and attractors. The street segments with the more intense areas of shading represent the corridor areas with the highest potential pedestrian trip activity. Figure 10 shows the mathematical expression of this GIS-based region-wide method.

Figure 7 Potential trip activity around a social/recreational attractor.

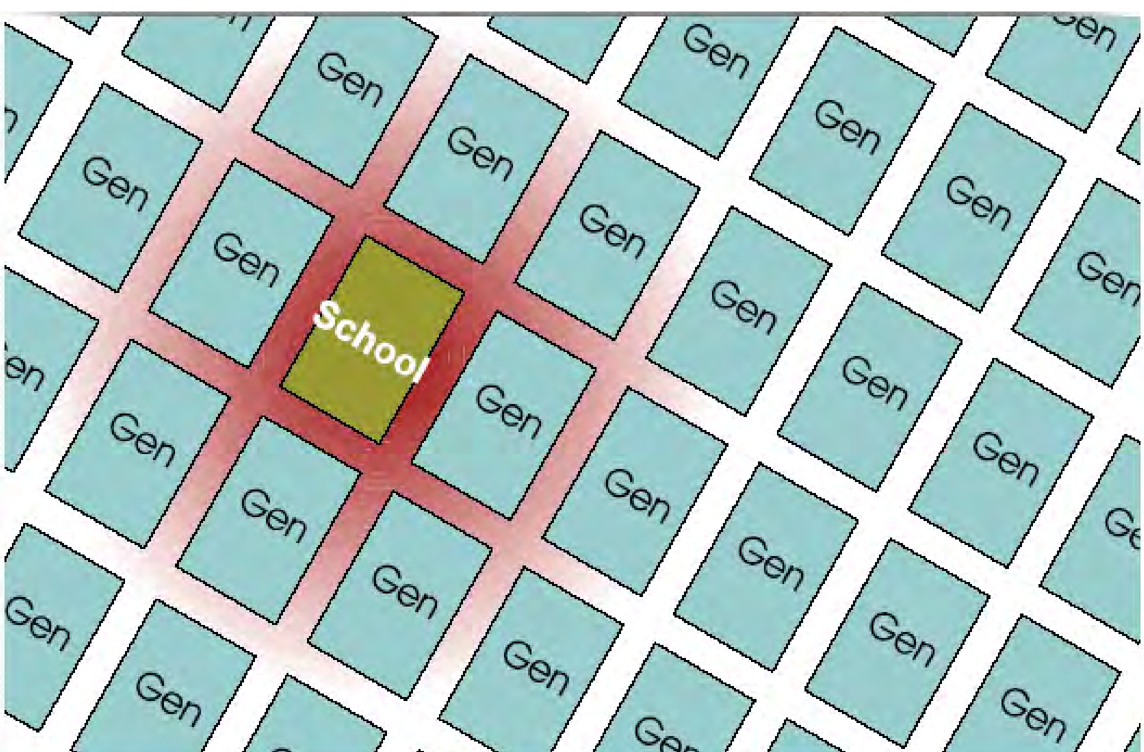


Figure 8 Potential trip activity around a school.

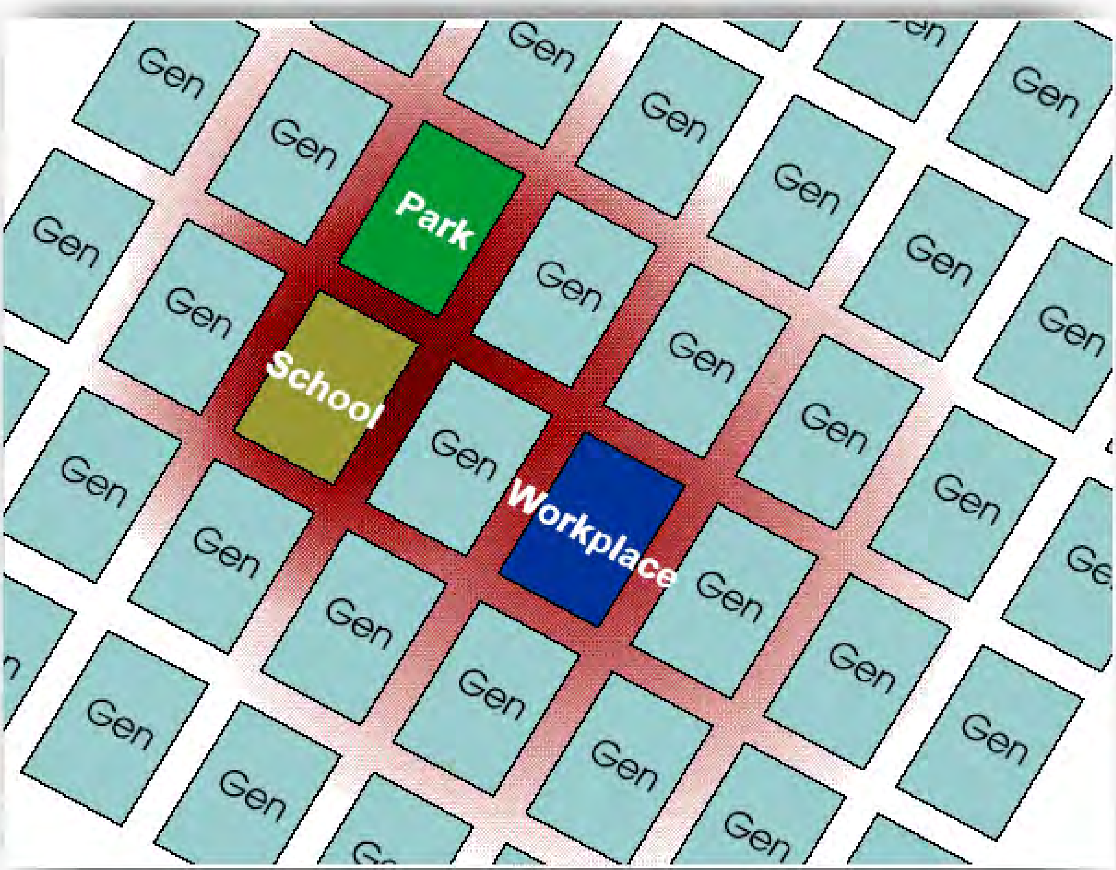


Figure 9 Composite of potential trip activity for three types of trip attractors.

$$LDS = \sum_{n=1}^{4} TTS_n \times \frac{\sum_{n=1}^{4}\left(GA_n \times \overline{TG}_n\right)}{\left(GA_n \times \overline{TG}_n\right)} \times \left[\overline{TG}_n \sum_{d=1}^{I} P_{nd} \times ga_n\right]$$

n	= bicycle trip purpose (e.g., work, personal/business, recreation, school)
TTS	= trip purpose share of all bicycle trips
GA	= number of generators or attractors per trip purpose
$\overline{TG}$	= average trip generation of attractor or generator
P	= effect of travel distance on trip interchange, expressed as a probability
ga	= number of generators or attractors within specified travel distance range
d	= travel distance range from generator or attractor

Figure 10 The Basic Latent Demand (score) Algorithm.

The following sections describe how the pedestrian travel demand analysis is performed. The following sections describe how the pedestrian travel demand analysis is performed The following sections describe how the pedestrian travel demand analysis is performed within a GIS environment.

Generators, Attractors, and Spatial Queries

The first step in the process is to identify the generators and attractors that represent the trip ends for the four general trip purposes. Generators are the origin end of the trip and are represented by every residence in the study area..

Attractors are the destination end and are represented by every business, school, park and trail, and social and service establishment. The generators and attractors form the foundation of the pedestrian travel demand calculations that the Latent Demand method follows.

While the locations of many of the generators and attractors are individually identified, particularly for the school and social-recreational (parks) trip purposes, aggregated data is used for modeling the other trip purposes. For example, while the Latent Demand Method quantifies the trip generation of every residence for work trips, it does not use the physical location of every residence within the study area. Rather, the Method uses the aggregated population, as compiled in the Traffic Analysis Zone (TAZ) data from the region’s transportation planning model. Likewise, the work trip and work errand demand analyses are based on TAZ employment data.

Once the generator and attractor data have been identified and geocoded or “mapped” into the GIS environment, spatial queries are performed around the network road corridors. The spatial queries “capture” the data for the calculation of potential trip interchange between origins and destinations within various travel distance ranges. The travel ranges are established from national survey data as reported in the NHTS study, and vary according to trip purpose. Each travel range represents a “buffer,” and the buffers are the geographic limits of the spatial queries.

As the spatial queries are performed, their results are used to populate a database. That database is then programmed to calculate the trips within each buffer, per trip purpose. The road segments are used to represent a corridor area or “travel shed.”

The following sections document, for each of the four trip purposes, the generators and attractors identified, the mathematical relationship between them, and how the spatial queries are performed.

Work (Wk.) Trips. The generators and attractors used to estimate the potential trip activity for this trip type are the TAZs’ population density and TAZ total employment, respectively. The following equation shows the computational form of the spatial queries.

$$Q_{Wk} = \sum_{d=1}^{n} P_d \times \left[\sum_{z=1}^{n} \left(E_z \times \frac{\rho_z}{E_z} \right) \right]$$

Where:

QWk = Total trip interchange potential for work trips
d = Spatial query buffer
n = Total number of buffers
P = Effect of travel distance on trip interchange, expressed as a probability (see Figure 4)

z = TAZ adjacent to network segment
E = Total employment within buffer
r = Population within buffer

Restriction:

$$\frac{\rho_z}{E_z} \leq 1$$

Figure 11a depicts the three spatial queries performed for work trips. The queries are segment-based which means that the queries/buffers are centered on the individual network segments. The buffer width of each query for this trip type (and indeed all of the trip types) is based on the pedestrian trip distances reported in the NHTS study.

While trips to colleges and universities might be considered as school trips, they are modeled as "work trips" due to the similarity of their trip characteristics with work trips (primarily trip length and regularity). Furthermore, the generator for trips to colleges and universities is the same as that for work trips - population. The attractors are the colleges and university locations. Their individual full-time enrollments (FTE's) are used in the calculation of the trip interchange. Equation 2 mathematically describes how this trip interchange is calculated and how the spatial queries account for this information.

$$Q_{C\&U} = \sum_{d=1}^{n} P_d \times \left[\sum_{A=1}^{n} (FTE) \times S \times \frac{\rho_z}{FTE} \right]$$

Where:

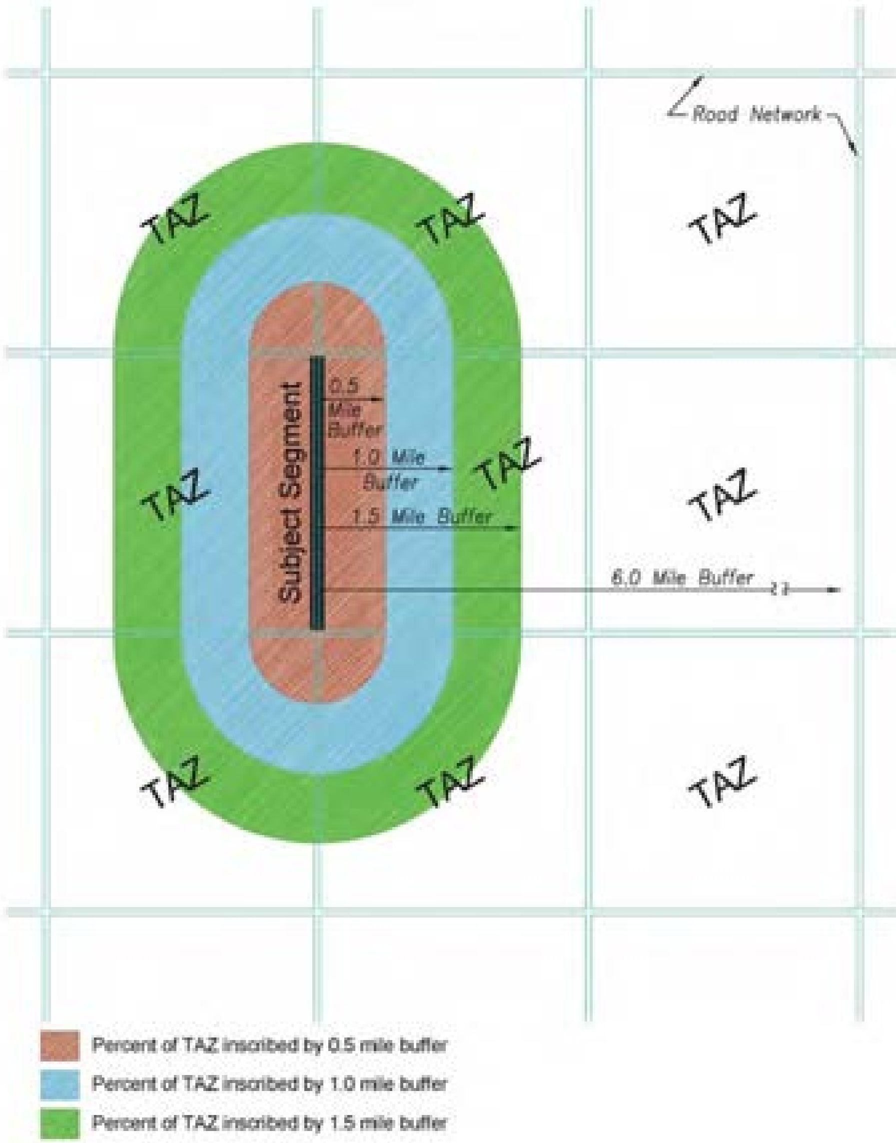
QC&U = Total trip interchange potential for college and university trips
d = Spatial query buffer
n = Total number of buffers
P = Effect of travel distance on trip interchange, expressed as a probability (see Figure 5)
A = Number of attractors
FTE = Full-time enrollment of college or university
S = Percent of segment within TAZ
r= Population within TAZ

Restriction:

$$\frac{\rho_z}{FTE} \leq 1$$

Figure 11a

Work Trip Spatial Queries
(Segment-Based)



The spatial queries for college/university trips are performed differently from the other work trips. The essential difference is that the spatial queries for colleges and universities are attractor-based rather than segment-based. This means that the spatial queries are centered on the individual colleges and universities (see Figure 11b), rather than the corridor. As Figure 11b illustrates, the percent of the corridor falling within each buffer is used to normalize the corridor's trip interchange potential.

Shopping and Errands (SE) Trips. As with the work trip, the generator for shopping and errand trips is population. The attractor is total employment per TAZ. The Latent Demand Method further subdivides this trip type into two categories of shopping and errand trips. The first is work-based errands, or those made by, and between, places of employment. For example, a person who picks up his/her dry cleaning during lunchtime is performing a work-based errand. The second category is home-based errands. An example of a home-based errand is a person going from their residence to a neighborhood store for a carton of milk or video rental.

Equation 3 is the mathematical expression that quantifies these two categories of shopping and errand trips.

$$Q_{SE} = \sum_{d=1}^{n} P_d \times \left[\sum_{z=1}^{n} \left(E_z + \rho_z \right) \right]$$

Where:

QSE = Total trip interchange potential for the shopping and errand trips
d = Spatial query buffer
n = Total number of buffers
P = Effect of travel distance on trip interchange, expressed as a probability (see Figure 5)
z = TAZ adjacent to roadway segment
E = Total employment
r= Population within buffer

Restriction:

$$\frac{\rho_z}{E_z} \leq 1$$

The spatial queries for the shopping and errand trips are segment-based. Figure 12 graphically illustrates the two spatial queries performed for this trip type.

Figure 11b

Spatial Queries for Colleges and Universities (Attractor-Based)

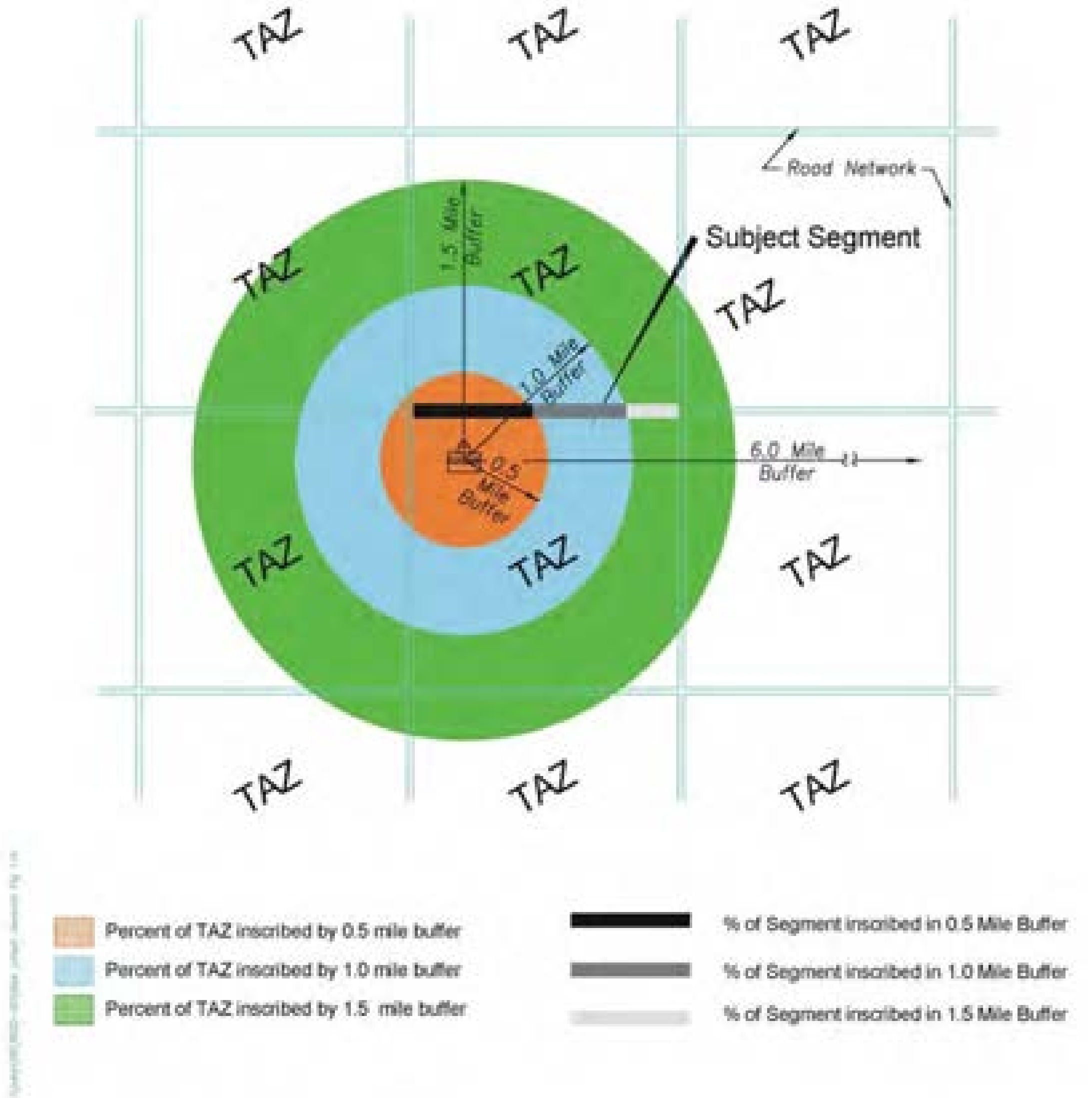
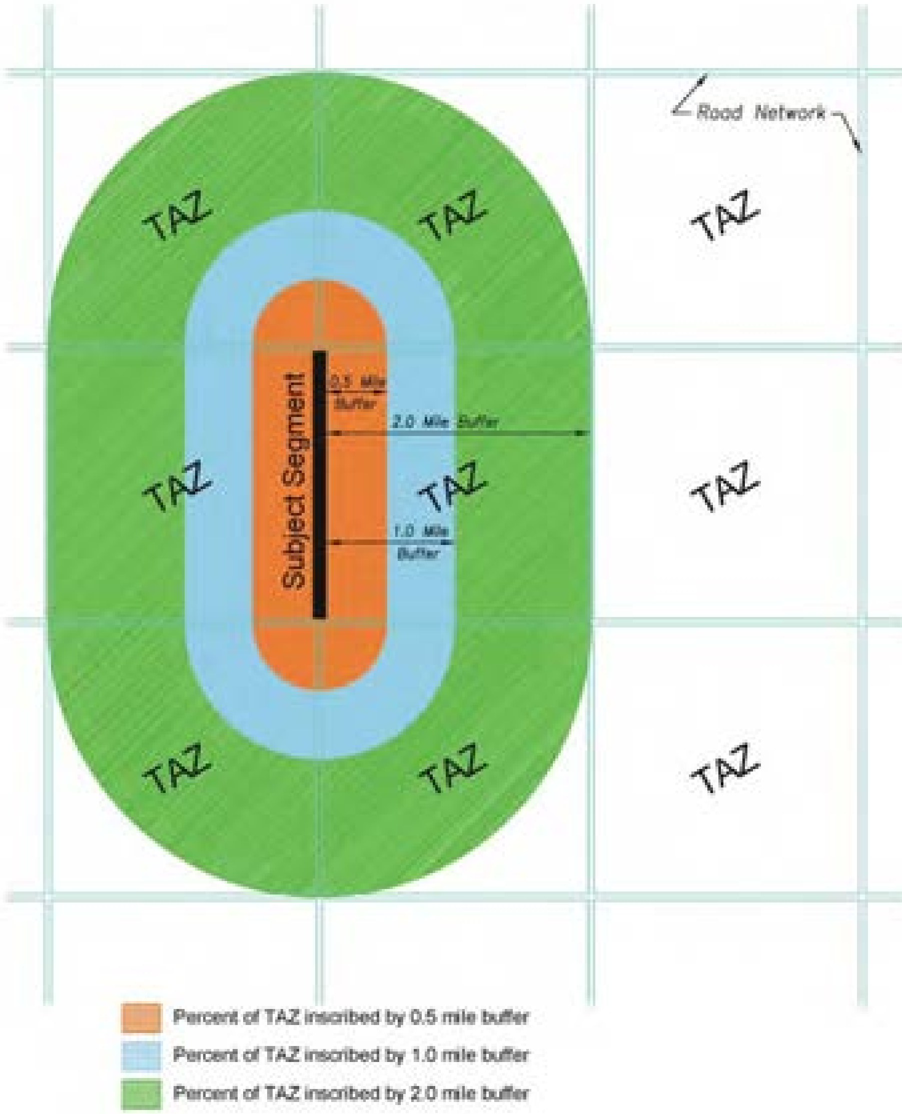


Figure 12

Spatial Queries for Shopping and Errands
(Segment-Based)



School (Sc) Trips. The locations of elementary, middle and high schools are the attractors for this trip type. Since students living within a two-mile radius of a school are generally not eligible to use the school transportation system, they are considered potential pedestrians. This two-mile radius constitutes a transportation exclusion zone for which potential pedestrian trip activity is measured. Equation 4 mathematically expresses the calculation of potential school trips. Average school enrollment for the entire school district is the base quantity used in determining potential trips.

$$Q_{Sc} = \sum_{d=1}^{n} P_d \times \left[\sum_{A=1}^{n} \left(2 \times ASE \times S \right) \right]$$

Where:

QSc =	Total trip interchange potential for home-based school trips
d =	Spatial query buffer
n =	Total number of buffers or TAZs
P =	Effect of travel distance on trip interchange, expressed as a probability (see Figure 5)
A =	Number of attractors
ASE =	Average school enrollment
S =	Percent of road segment within buffer

As with colleges and universities, the spatial queries for this trip type are attractor-based. Figure 13 illustrates the two spatial queries performed for this trip type, and how the percent of the transportation network segment falling within each "buffer" is likewise calculated.

Recreational and Social (RS) Trips

Public parks, trail heads, and trails are the attractors used for the Recreational and Social (RS) trip purpose demand assessment. They have been separated into two groups, 1) parks and trail-heads, and 2) urban trails.

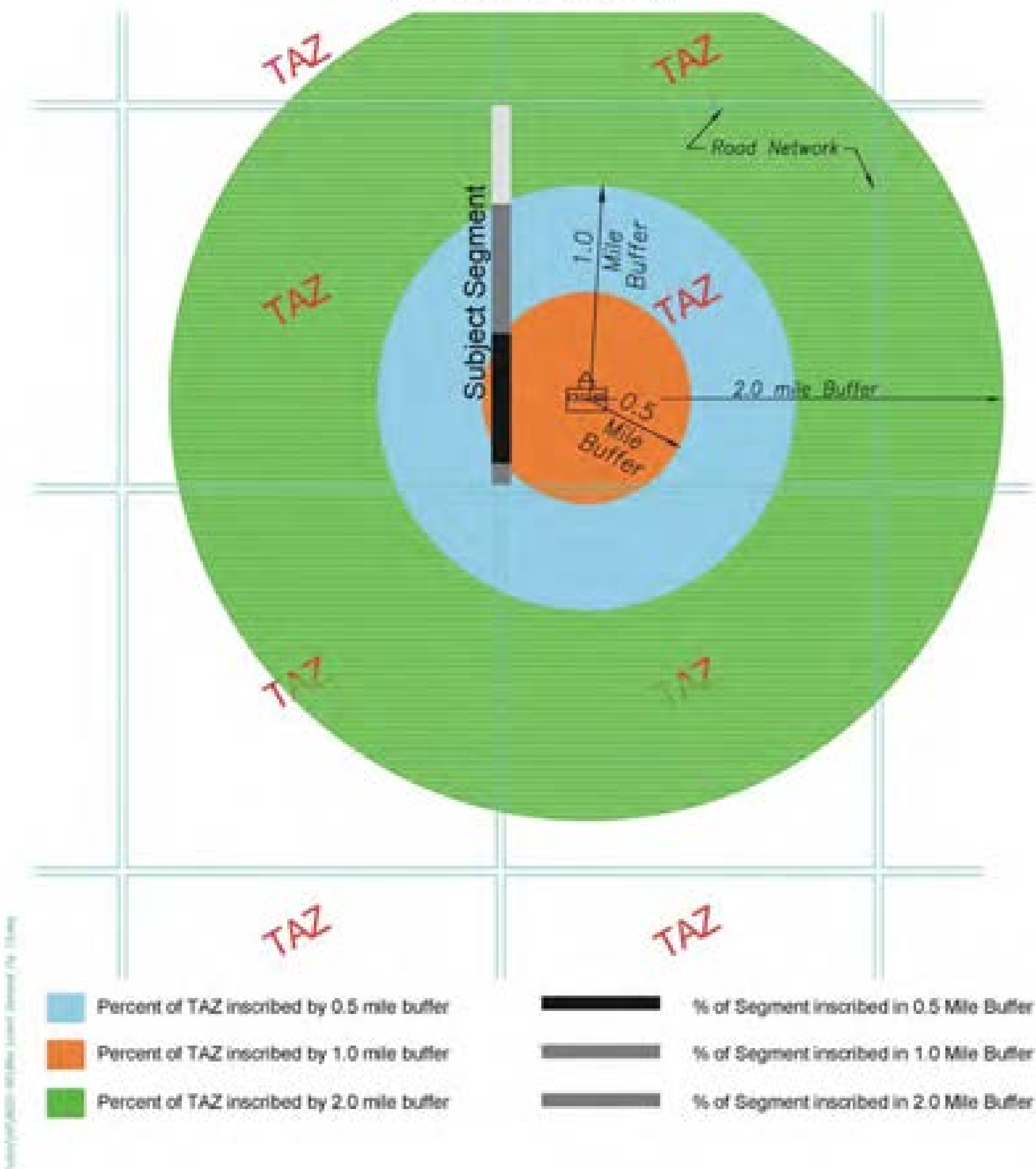
The reason for separating urban trails from the parks and trail-heads lies in how the spatial queries are performed. An urban trail is, in effect, a linear park. Therefore, the spatial query is performed from the trail itself to describe the portion of the road segment proximate to that portion of the attractor (the trail). Thus, the spatial queries for trails are attractor-based, whereas the spatial queries for parks and trail-heads are segment-based.

Prior to performing spatial queries on parks and trail-heads, the parks were stratified into three categories; major parks, staffed parks, and minor parks. The reason: the "attractiveness" of different types of parks. For example, a park that has ball fields and a swimming pool generally attracts more users than a park of equal size with fewer amenities. Accordingly, the trip attraction for the former will be higher than that for the latter. A definition of each park type along with its associated trip generation follows:

- Major Parks – these are characterized as parks that have regularly programmed events and large, staffed events. Trip generation = 2,058 trips. [This is based on an average major park size of 688 acres multiplied by a Trip Generation Rate of 2.99 per acre.]

Figure 13

Spatial Queries for School Trips
(Attractor-Based)



- Staffed Parks – these typically have intermittently programmed events and staffed events. Trip generation = 313 trips. [This is based on an average major park size of 16.3 acres multiplied by a Trip Generation Rate of 19.15 per acre.]
- Minor parks – these generally do not have programmed events nor do they have staffed events. Trip generation = 11 trips. [This is based on an average major park size of 6.9 acres multiplied by a Trip Generation Rate of 2.23 per acre.]

Additionally, due to their attractiveness, trail-heads are considered major parks, and are assigned the same trip generation. The quantification of trip interchange for parks and trail heads is shown in equation 5, below.

$$Q_{Parks} = \sum_{B=1}^{x}\left[\sum_{C=1}^{4}\left(A \times TG\right)\right] \times P_{nd} \qquad (5)$$

Where:

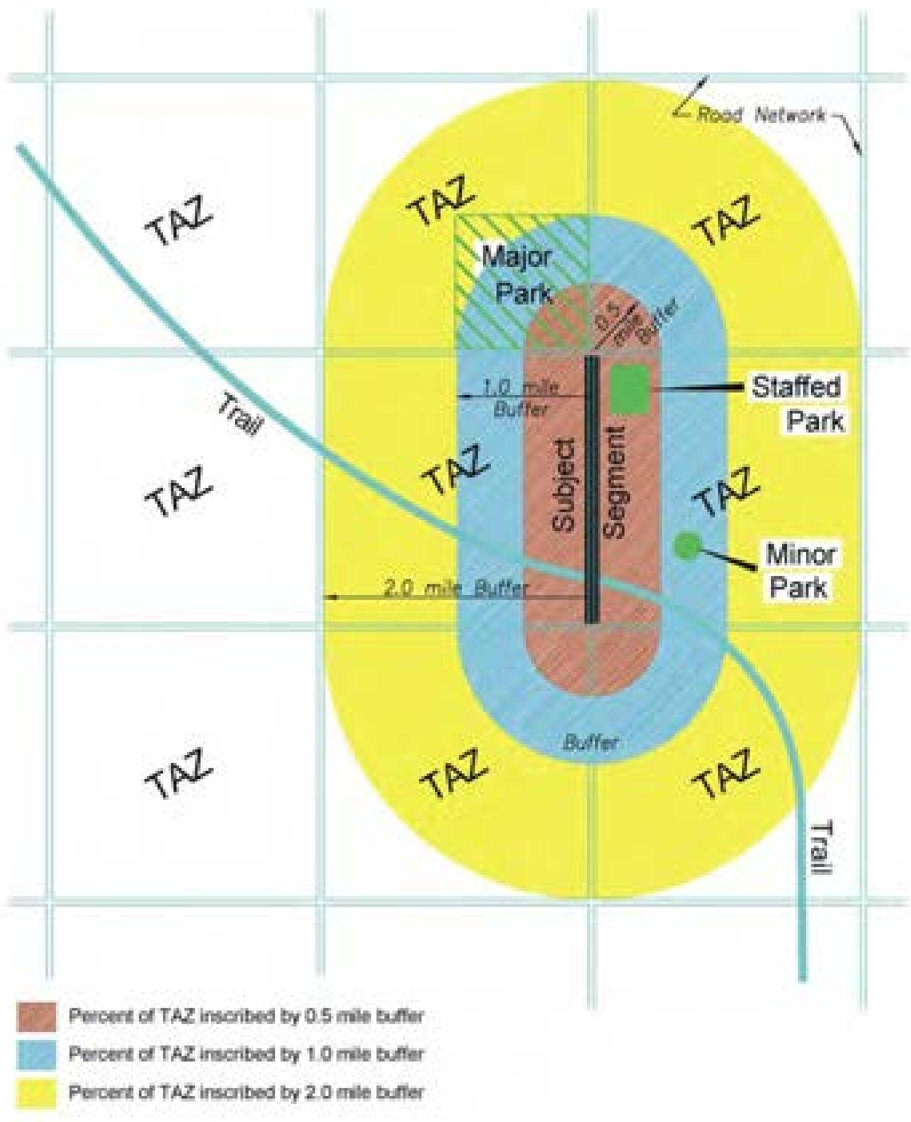
QParks =	Total trip interchange potential for park trips
B =	Spatial query buffer
x =	Total number of buffers
C =	Type of park
A=	Number of attractors
W =	Weighted population density surrounding a road segment, see Eqn. (1a)
TG =	Trip generation (attraction) for park type
P =	effect of travel distance on trip interchange, expressed as a probability (see Figure 5)
n =	Pedestrian trip purpose (e.g., work, personal/business, recreation, school)
d =	travel distance range from generator, attractor, or segment (i.e., buffer)

Figure 14a is a graphic representation of the segment-based spatial queries used for the parks and trail head LDS analysis.

As previously described, quantification of the travel demand associated with trails is separated from parks due to the fact that the spatial queries are attractor-based, or more appropriately centered on the trail itself. The generator used in the trip interchange calculation for this category is once again the population surrounding the subject road segment. The trip generation used for the calculation is the same figure as for a staffed park.

Figure 14a

Spatial Queries for Parks
(Segment-Based)



Equation (5b) represents the calculation of potential trip activity for trails:

$$Q_{trails} = \sum_{A=1}^{n} S \times TG$$

Where:

QTrails = Total trip interchange potential for trail trips
A = Number of attractors
n = Total number of buffers
S = Percent of segment within buffer
TG = Trip generation rate

Figure 14b depicts the two spatial queries performed for this trip purpose, which are attractor-based.

In addition to being recreational facilities, urban trails are also transportation facilities. The generator for this trail transportation trip is similar to the road network which includes population, employment, school locations, and transit routes. The attractor for trail transportation trips is the trail itself. Spatial queries are performed similar to those for trails (as depicted in Figure 14b), except that the subject segment is the trail.

Access To Transit. The attractors are transit routes, modified by the number of buses that serve each route daily. Equation 6 represents the calculation of potential trip activity.

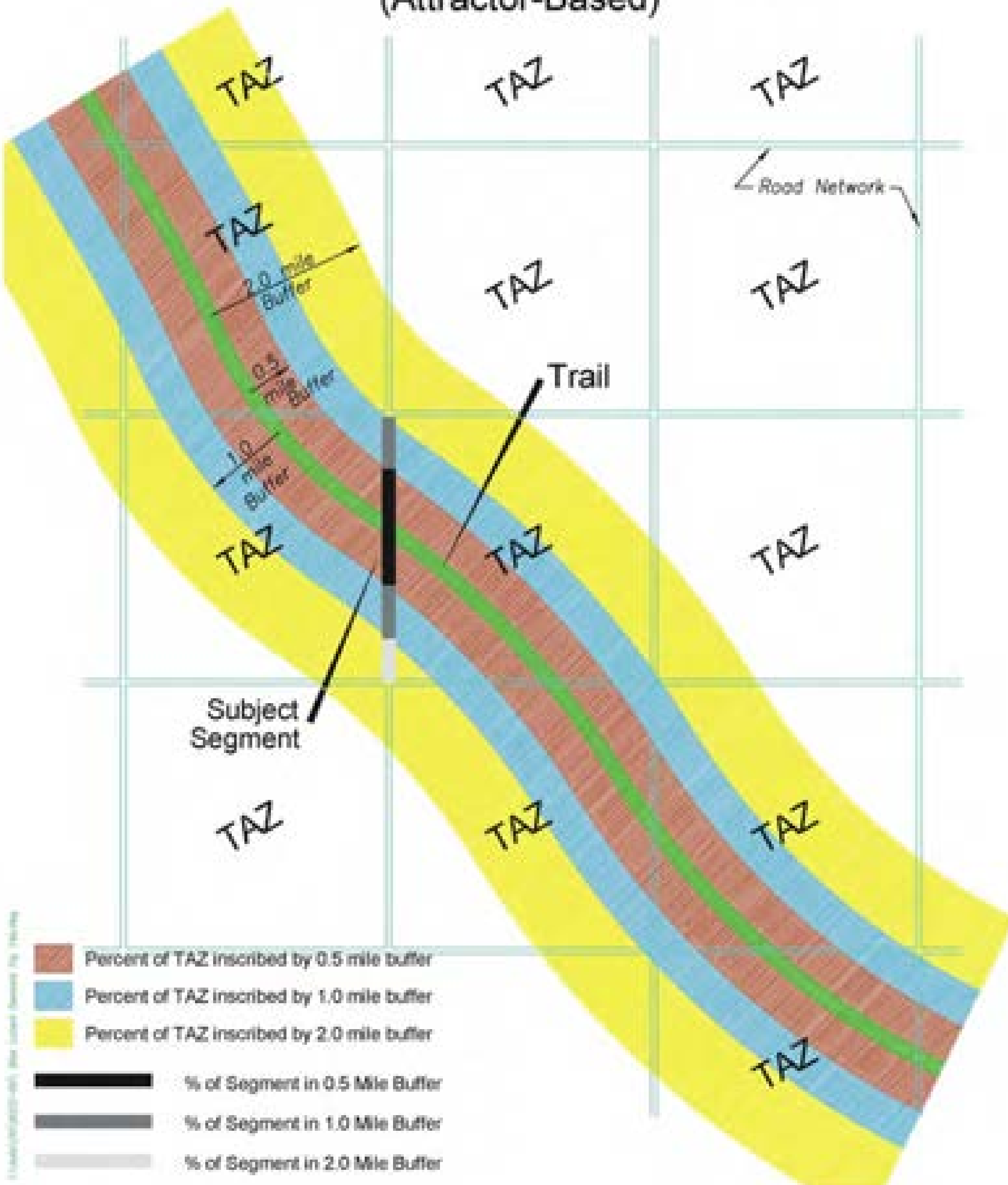
$$Q_{transit} = \sum_{R=1}^{n} T$$

Where:

R = Transit route
n = Total number of transit routes
T = Number of bus/transit trips

Figure 14b

Spatial Queries for Trails / Linear Parks (Attractor-Based)



Regional Results

Using the study network, the TAZ demographic and employment data, and the mapped trip attractors and/or generators, all corridor segments are analyzed according to the aforementioned method. After populating the database with the results from the spatial queries (all trip types), the values are ranked on a 100% scale for each trip purpose, with 100% representing the highest percentage of Latent Demand. The segments are sorted in descending order based on the highest Latent Demand score (LDS) of all trip types for that segment and are stratified by jurisdiction. The following equation shows the computations calculating the final 100% Latent Demand score for each network study segment:

$$LDS = \text{Max. Value} \left[\overline{TG}_n \sum_{d=1}^{I} P_{nd} \times ga_n \right]_1^5$$

n	= walking trip purpose (e.g., work, personal/business, recreation, school)
$\overline{TG}$	= average trip generation of attractor or generator
P	= effect of travel distance on trip interchange, expressed as a probability
ga	= number of generators or attractors within specified travel distance range
d	= travel distance range from generator or attractor

The corresponding results are contained in MAG's *Pedestrian Plan 2000*. The expansion/update of this analysis for the City of Scottsdale's *Transportation Master Plan* is outlined in the next section.

RESULTS UPDATE FOR CITY OF SCOTTSDALE TRANSPORTATION MASTER PLAN (PEDESTRIAN ELEMENT)

The preceding methodology was used to determine pedestrian latent demand for the entire MAG region as part of MAG's *Pedestrian Plan 2000.* The corresponding results have been expanded and updated for use in developing components of the pedestrian element of the City of Scottsdale's *Transportation Master Plan*. The socio-economic inputs are based on horizon year 2020 TAZ projections (as earlier approved by MAG); discussions with City staff indicate that this is a reasonable planning horizon for this expanded/updated analysis as well. However, because of some changes that have occurred within Scottsdale since the MAG plan was performed, certain elements were added for this analysis. Specifically, seven new public schools and one new major park were included as attractors in the analysis. Nine network segments have also been included that were not part of the original MAG results. These segments reflect recent growth patterns and are generally located in the airpark region of the City. All of these additions are reflected in the graphical and tabular results, which are shown in Figure 15 and Table 1, respectively.

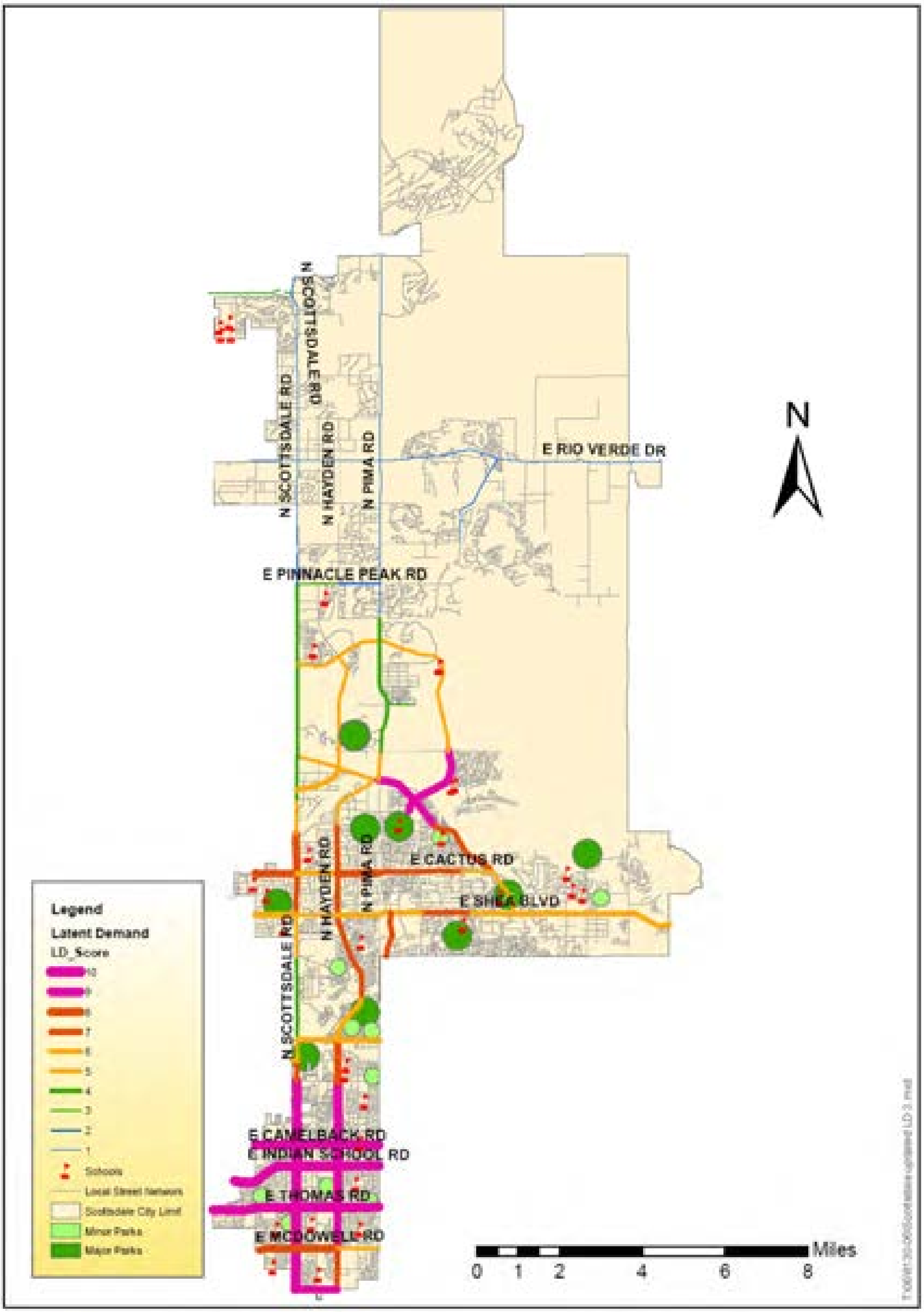


Figure 15 Scottsdale Pedestrian Latent Demand Results (expanded)

Transportation Master Plan
Central/Downtown Scottsdale Circulation Study

Appendix 10-A
Chaparral Road City Council Decision
Background Information

CITY COUNCIL REPORT

MEETING DATE: May 29, 2007 ITEM NO. GOAL: Transportation

SUBJECT Consideration of and possible action on alternatives to widening Chaparral Road and impacts of alternatives.

Summary

Per City Council direction, in response to a citizen petition, alternatives to widening Chaparral Road on the segment from Miller Road to 78th Street, and the impacts of the various alternatives will be presented for possible action.

A citizen petition was presented to the City Council on March 20, 2007 requesting:

> "We, the undersigned citizens of Scottsdale, DO NOT WANT THE CONDEMNATION AND REMOVAL OF HOMES FOR THE WIDENING OF CHAPARRAL ROAD. We do not believe it is in the best interest of the established neighborhoods or the City at large. WE WANT THE SCOTTSDALE CITY COUNCIL TO COMMIT TO NOT REMOVING HOMES OR WIDENING CHAPARRAL ROAD."

The City Council heard this petition on April 10, 2007 and directed staff to return by the end of May with alternatives to widening Chaparral Road, and a preliminary analysis of what impacts those alternatives may have on surrounding neighborhoods.

Related Policies, References:

- Scottsdale General Plan 2001
  - Community Mobility Element
  - Neighborhoods Element
  - Economic Vitality Element
- Streets Master Plan, 2003 (currently being updated)
- Downtown Plan (currently being updated)
- Citizen Petition, submitted March 20,2007

Key Considerations

- In response to a petition requesting the City Council remove the concept of widening Chaparral Road from consideration in the Transportation Master Plan, City Council directed staff to return with alternatives to widening the roadway and the impacts of alternatives on other neighborhoods.
- City staff collected updated traffic volumes for the area in April 2007 and prepared a preliminary traffic analysis using this data.

- Traffic volumes along Chaparral Road between Miller Road and 78th Street have ranged from 14,800 in 1986 to 17,100 in 2007. The lowest recorded counts were 12,000 in 1992 and the highest 20,900 in 2002.
- Updated Scottsdale transportation modeling will be completed in July and will be incorporated into findings for the Transportation Master Plan, including the Downtown/Central Scottsdale subarea study and updated Streets element of the plan.
- Chaparral Road street classification has been identified as "major street" or "major collector" (4 lane roadway) since the 1962 Scottsdale General Plan.
- The primary land use along the Chaparral Road corridor from Loop 101 to 68th Street is residential.
- Neighbors in the vicinity of Chaparral and 82nd Street have presented a petition to the City requesting that the City Council wait for the results of the Transportation Master Plan before taking action regarding Chaparral Road. The petition is attached.

Background

Chaparral Road street designation

Since the 1962 Scottsdale General Plan (prepared by Maricopa County for Scottsdale), Chaparral Road has been designated as a "major street". Chaparral was listed as a major street east of Miller Road in the 1962 Plan. The 1967 City of Scottsdale General Plan reiterated the designation of "major street" from Scottsdale Road to Pima Road. The 1981 and 1991 Circulation Elements of the General Plan designated Chaparral Road as a "major collector" (4-lane) road. The 2001 Community Mobility Element of the General Plan did not specify the street classification, however indicated Chaparral Road was a Citywide System street. The 2003 Streets Master Plan designated Chaparral Road as a "major collector" street from Scottsdale Road to Pima Road. In June 2002, the Transportation Commission approved a recommendation to consider changing the General Plan designation for Chaparral from a major collector to a residential street, and to adopt and monitor roadway modifications to address neighborhood traffic concerns on Chaparral Road. The City Council took the letter of recommendation under advisement, but no action was taken.

Transportation Master Plan process

The Transportation Master Plan was initiated in November 2005 with Council approval of a contract with HDR Engineering, Inc. The scope of this project includes updates to or new Streets, Transit, Bicycle and Pedestrian plans, as well as subarea studies for high capacity transit, north area, airpark area and downtown area planning, including an examination of the Central/Downtown area of Scottsdale to address Downtown transportation issues such as Chaparral Road. The Central/Downtown area circulation study is scheduled to be presented to the Transportation Commission for their review on Thursday, July 12. Examples of preliminary options (pending detailed modeling, additional data analysis, and technical/financial feasibility) for Chaparral Road under consideration in the Central/Downtown area circulation study :

- widening the ¼ mile segment between Miller Road and 78th Street to match the rest of the corridor;

- maintaining the existing three lane (one through lane in each direction and one center turn lane) configuration of the road, with operational improvements at cross-streets and driveway intersections;
- additional options such as making the center lane a reversible lane; converting the roadway to a one-way street; and diverting traffic at Hayden Road; and
- modifying the roadway and providing transit/other alternatives to reduce current and future volumes consistent with similar roadways with residential character.

The Master Plan subarea study was designed to provide objective data regarding existing and projected access and travel demand to and from, around, and through downtown, and options to address future demand. To provide the most accurate data and projections, the project team has worked closely with Maricopa Association of Governments (MAG) regarding their socio-economic projections and the transportation modeling based on those projections. In January 2007, MAG began transferring their modeling system to new software and helped train city of Scottsdale staff in the new modeling software. The MAG transportation model is a regional model for all of Maricopa County. The new model will enable Scottsdale staff to do more precise subregional modeling (as opposed to regional modeling) for Scottsdale and specific areas of Scottsdale, including the Central/Downtown area. The modeling data was transferred to Scottsdale in early April; it is expected that preliminary analysis will be completed for inclusion in the Transportation Commission's master plan deliberations in July.

Other citizen petitions regarding Chaparral Road

In August 2006, a petition asking City Council to widen Chaparral Road was presented to the Council by William Crawford and considered in September 2006. At that time, Council opted to wait until the results of the Transportation Master Plan were provided before making decisions regarding this roadway.

On May 15, 2007, residents of the Scottsdale Country Acres (generally at 82nd Street and Chaparral Road) neighborhood presented a petition to the City Clerk "urging City Council members to wait for the results of a currently commissioned master transportation plan before making decisions regarding the widening of Chaparral Road between Hayden and Miller Roads." These neighbors requested that the petition be included in the Council packet for the May 29, 2007 meeting, and the petition is attached to this report.

Downtown Plan update

In 1984, the City Council adopted the Downtown Plan, a long-range policy document intended to guide the growth and development decisions for the 1 ½ square miles of Downtown Scottsdale. The plan calls for a unified strategy to raise the quality, character, marketability, and overall viability of Downtown. The plan encourages Downtown to become a mixed-use center with an emphasis on the integration of historic resources, specialty retail, office, residential, restaurant and hotel uses. For the past 20 years, the Downtown Plan has framed public policy with regard to Downtown Scottsdale. In 2006, a comprehensive process to update the Downtown Plan was begun. A Scottsdale Downtown Town Hall was held in November 2006 as the “kick-off event” for the update of the Downtown Plan. Approximately 100 community leaders, business owners and residents participated in three days of intense discussion and debate. The final report from this independent process recommended, among other ideas for Downtown enhancement, the widening of Chaparral, Indian School, and Thomas Roads to enhance vehicular travel to Downtown. The final report was presented to City Council in February 2007.

The Town Hall report and recommendations are only the first step in a year long process to update the Downtown Plan by spring of 2008. While the Town Hall report and recommendations will help form the basis for some of the vision, goals and objectives to be achieved in an updated Downtown Plan, some of the more specific recommendations regarding circulation, cultural facilities and open space planning will need to be technically analyzed and evaluated through both the Transportation Master Plan and Downtown Plan Update processes, culminating in final adoption by the City Council.

<u>Villa Monterey neighborhood meeting</u>

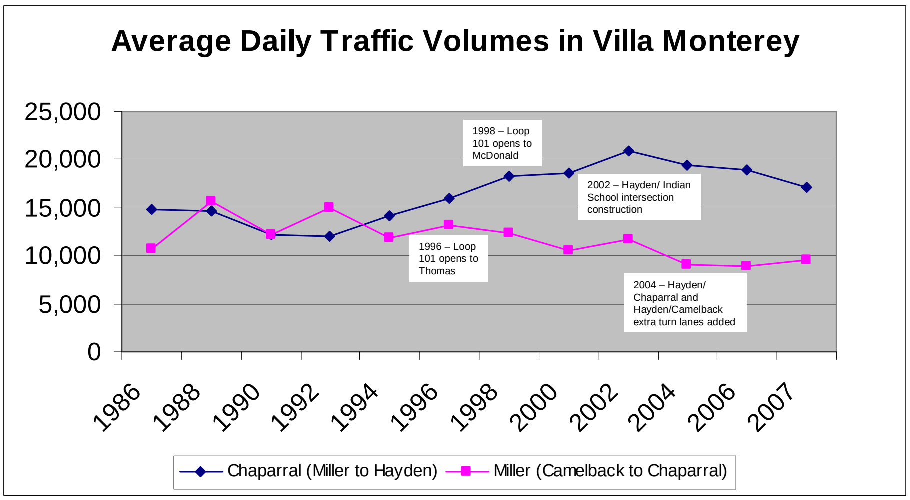
On April 25, 2007 several City Council members and city staff attended a meeting sponsored by Villa Monterey. Handouts by city staff included a listing of options that had been suggested through the public process by citizens, business owners, transportation professionals, and other interested parties. None of the options listed included widening of the Chaparral segment from Miller Road to 78th Street. Neighbors were asked to rate the options on a scale from 1 to 5 and return the listing to the City for additional input into this important issue. The homeowners association also developed a questionnaire for resident input. The report of results of both of these input requests is attached.

<u>Traffic background and data on Chaparral Road</u>

Beginning in 1986, the City has prepared a biennial report on traffic volumes and accident rates. The report focuses on streets designated as local collectors or above and is based on data collected from traffic counters placed in the street and from police accident reports. For the segment of Chaparral Road between Miller Road and Hayden Road, the average daily traffic volume in 1986 was reported to be 14,800. This volume grew to 18,900 vehicles per day (vpd) in 2006, a change of 27.7% over the 20 year period. During this time period, the highest average volume was 20,900 vpd in 2002, when major roadway construction in the Hayden/Indian School intersection was underway. The lowest average volume of 12,000 vpd was reported in 1992.

To make sure that the most recent data was available for use in deliberations, additional volume data for the segment of Chaparral Road between Miller and Hayden was collected last month (April 2007). The average daily volume totaled 17,100 vehicles per day, which is an increase of 15.5% over the 1986 totals but a decline from previous traffic counts since 1998.

The following chart shows daily traffic volumes along the Chaparral Road segment from Miller Road to Hayden Road and along Miller Road south of Chaparral; and some events that may have influenced traffic volumes. Other events that may have influenced traffic volumes over time are: the widening of Chaparral Road from Hayden to Pima to 5 lanes in 1996, and traffic mitigation measures installed on Chaparral Road in 2003/2004.



Traffic collisions on Chaparral Road

In addition to traffic volume data, the City collects the number of reported collisions on all major street segments and at all major intersections in the city. This data is published every two years along with the traffic volume data.

The data shows that since 1996 the collision rate for the section of Chaparral Road between Miller and Hayden Roads has exceeded the citywide average rate. In 2004 (the latest citywide collision average available) the citywide average was 1.84 collisions per million vehicle miles; the rate for Chaparral Road was 3.67 collisions per million vehicle miles. In 2006, the rate for Chaparral Road had declined in this roadway segment to 2.90 collisions per million vehicle miles. This section has also exceeded the rates on all other sections of Chaparral Road. A detailed review of the collisions that occurred in 2002 and 2004 show that over 80 percent of the collisions were identified as rear-end collisions within this segment. It is likely that the high collision rate is due to the street transitioning from 4 to 2 travel lanes, combined with the high number of access points from driveways along this section.

East and west bound traffic on Chaparral Road in April 2007

The directional split of traffic measures how much traffic is traveling in one direction versus the other during a given period. April 2007 counts showed that during the morning peak hours, fifty-eight percent (58%) of the traffic between Miller Road and Hayden Road was traveling westbound. It should be noted that Chaparral Road does not exhibit normal morning peak time characteristics, but instead shows a fairly flat level of increased traffic throughout the morning hours appearing to be oriented more to shopping, school, and business trip-related characteristics rather than employment related. During the evening peak hours, fifty-two percent (52%) of the traffic was traveling eastbound. The directional split eastbound and westbound is fairly balanced, indicating that traffic is traveling to destinations both east and west along Chaparral Road. This pattern is consistent with the land uses found at each end of the corridor – Downtown Scottsdale on the west and the Chaparral Business Park and Scottsdale Community College on the east.

<u>Historic Downtown development trends & Chaparral Road traffic data</u>
Over the past twenty years, major development under the Downtown Plan has typically occurred during particular years rather than being evenly spread over each year. When these "spikes" in major Downtown development trends are examined in comparison to the historic daily traffic volumes along Chaparral Road from Hayden to Miller Roads for the same time period (1986-2006), it is apparent that the majority of the major downtown development projects did not directly impact the daily traffic volumes along this section of Chaparral Road. Rather, it appears that the greater impacts to daily traffic volumes along the Hayden to Miller section of Chaparral Road occur at times when major transportation projects or impacts occur. A chart summarizing this information is in the May 2007 traffic analysis report.

<u>Traffic background and data on east/west streets parallel to Chaparral Road</u>
To test whether Chaparral Road west of Hayden Road has seen greater changes in volumes than other east-west corridors, historic traffic data was reviewed for the McDonald Drive, Camelback Road, Indian School Road and Thomas Road corridors. For the 1986-2006 period, average vehicle per day counts grew by 20% on McDonald Drive, 62.5% on Indian School Road and 31.5% on Thomas Road. As with Chaparral Road, each of these corridors is connected to a freeway interchange. Over the same 20-year period, volumes dropped by 23.4% on Camelback Road, which does not connect to Pima Road or the Loop 101 Freeway. Further review of changes in traffic volumes on nearby east-west corridors connected to the Loop 101 Freeway shows that growth in travel demand east of Hayden Road has been substantially greater. In large part, this is likely due to the fact that both Camelback Road and Osborn Road each provide four additional travel lanes for east-west travel on the west side of Hayden Road heading into the Downtown area. Among the corridors connected to the freeway, Indian School Road has become the main conduit to and from Downtown Scottsdale. The greater growth in traffic volumes along Indian School is likely due to its more direct access and to the fact that traffic flow has been improved through widening of the Hayden Road intersection and the installation of intelligent transportation system (ITS) features.

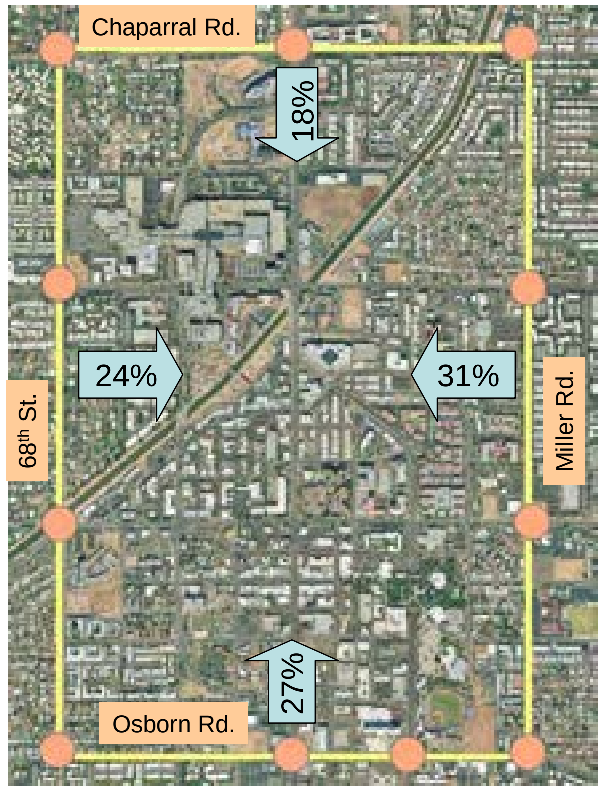
East- West Traffic Volumes						
	West of Hayden Rd.		***% Change***	***East of Hayden Rd.***		***% Change***
Street	**1986**	**2006**	**1986 to 2006**	**1986**	**2006**	**1986 to 2006**
Chaparral	14,800	18,900	27.7%	14,800	30,900	108.8%
McDonald	17,500	21,000	20%	14,000	19,100	36.4%
Camelback	26,500	20,300	-23.4%	no counts – local residential street	no counts – local residential street	no counts – local residential street
Indian School	25,600	41,600	62.5%	17,500	38,200	118.3%
Thomas	26,000	34,200	31.5%	18,600	30,100	61.8%

The general trend for traffic volumes in the southern portion of the City has been increases in volumes in the main east-west corridors and decreases in volumes for the main north-south corridors over the past ten years. This reflects a change in travel patterns due to the construction and opening of Loop 101. The freeway has been used for north and south travel, with more drivers traveling east and west to get to and from the freeway. Figures for the roadway segments east of Hayden Road indicate the greatest increases in traffic volumes.

Access into Downtown

Recent intersection counts have been examined to assess the directional splits for access into the Downtown area bounded by Miller Road, Osborn Road, 68^{th} Street and Chaparral Road. Based on these counts, approximately 31% of traffic enters the Downtown area from the east (on Chaparral, Camelback, Indian School, and Thomas Roads), 27% from the south (on 68^{th} Street, Goldwater, Scottsdale Road, Drinkwater, and Miller Road), 24% from the west (on Camelback, Indian School, and Thomas Roads) and 18% from the north (on 68^{th} Street, Goldwater, Scottsdale Road, Drinkwater, and Miller Road). On a typical day, approximately 24% of the traffic crossing Miller Road from the east uses Chaparral Road. This analysis shows that Chaparral does not by itself have a significant role in downtown access, thus modifications to the roadway will have minimal impact on downtown vitality.

Downtown Access Directional Splits



- **Additional background information provided in the attachments to this report includes:**
  - Traffic analysis May 2007;
    - Background: street classification, development along Chaparral Road, Downtown development, Chaparral Road improvements, traffic volumes, collision rates, traffic analysis;
    - Current conditions: regional and local street networks, residential frontage, Downtown development policy, roadway characteristics, traffic volumes and characteristics;
    - Future conditions estimates, to be refined upon availability of modeling information in July 2007;
  - Alternatives for Chaparral Road identified through the Transportation Master Plan process;
  - Suggestions from Villa Monterey neighbors for Chaparral Road street design.

PUBLIC COMMENT

Villa Monterey questionnaires

City Transportation staff met with Villa Monterey residents on April 25th, 2007, to discuss the Chaparral Road issues. Staff listened to resident concerns, provided information about the upcoming City Council Special Meeting, and answered questions about the study that was being undertaken. During that meeting, attendees were provided with a list of seventeen “alternatives to widening” that had been identified during the Transportation Master Plan discussions. Residents were also asked to suggest alternatives that were not on this list. The residents were asked to rank these options from one to five to identify their preferred solutions. A copy of the complete list of alternatives is provided in the attachments. It is important to note that the alternatives were not described in significant detail at the meeting, nor were they extensively reviewed by staff for engineering or other technical feasibility issues.

Staff received 82 responses to the listing of Chaparral Road alternatives. The top six options identified by responding Villa Monterey residents were the following:

- Install traffic diverters or similar devices to discourage through traffic.
- Improve signage on the Loop 101 Freeway to direct traffic on the freeway to downtown Scottsdale via alternate routes.
- Construct a direct Chaparral Road to Camelback Road connection using the former Villa Monterey golf course property.
- Install a traffic signal at the Chaparral Road and 78th Street intersection.
- Install signage that prohibits drivers from turning onto Chaparral Road during the peak traffic hours.
- Reduce the east-west through lanes on Chaparral Road at the Hayden Road intersection to one lane per direction and install a northbound to eastbound right turn lane on Hayden Road at the Chaparral Road intersection.

The six least desirable options identified were the following (listed in order of most acceptable to least acceptable):

- Convert Chaparral Road to a one-way, westbound street.
- Construct a wall, traffic diverter, or other device to close Chaparral Road at 78th Street, while leaving the section between Miller Road and 78th Street open to traffic.
- Modify Chaparral Road to become a “woonerf” street, which would eliminate curbs and add landscaping and parking.
- Convert the existing center turn lane on Chaparral Road to an additional eastbound or westbound through lane.
- Convert the existing center turn lane on Chaparral Road to operate as a reversible lane during peak hours.
- Rezone the lots along Chaparral Road to other than single family to allow redevelopment.

In addition to the 17 alternatives provided to the Villa Monterey residents by Transportation staff, meeting organizer Kathy Feld provided a list of options for the redesign of Chaparral Road to meeting attendees. The residents were asked to check their preferred options and list any options not indicated on the page. The list of options included: roundabouts, islands with landscaping, monument denoting the community, trolley route on Chaparral, cross walks, bike lanes, on-street parking, and traffic lights.

A total of 47 responses were received. The most preferred options were:

- Crosswalks
- Traffic lights
- Islands with landscaping
- Monument denoting the community
- Roundabouts/Trolley route on Chaparral Road (same number of positive responses).

The least desirable options identified were (listed in order of most acceptable to least acceptable)

- Bike lanes
- On-street parking.

A copy of the complete listing of suggestions is provided in the attachments.

Transportation Master Plan public comment about Chaparral Road

Throughout the Transportation Master Plan process public input has been solicited and encouraged through focus group meetings, one on one conversations, email, and website feedback.

The public input process has yielded a great diversity of opinion about solutions for Chaparral Road, with suggestions ranging from widening the section between Miller Road and 78th Street to reducing traffic and maintaining or reducing that section of roadway.

Citizen petitions

In August 2006, a petition asking the Council to widen Chaparral Road was presented to the Council by William Crawford and considered in September 2006. At that time, Council opted to wait until the results of the Transportation Master Plan were provided before making decisions regarding this roadway.

On May 15, 2007, neighbors of the Scottsdale Country Acres neighborhood (generally located at 82nd Street and Chaparral) presented a petition to the City urging City Council to wait for the results of the Transportation Master Plan before making decisions regarding the widening of Chaparral Road. This petition is attached to this report.

ALTERNATIVES

Per Council direction, alternatives to widening Chaparral Road have been examined. Alternatives generally fall into two categories: leaving the roadway generally as is without reducing traffic volumes, while attempting to improve livability conditions for the residents; and restricting traffic volumes to traffic levels from approximately 10-15 years ago. Under either category of alternatives, provision of better transit, bicycle and pedestrian mode choices and creation of incentives to change mode split may reduce overall vehicle trips and enhance livability. Examples of actions to improve these mode choices include improved east/west and north/south transit service, including high capacity transit; trolley expansion to the Chaparral Road area; canal bank path improvements; pedestrian improvements to roadways and to intersections including

Scottsdale/Chaparral and Scottsdale/Camelback.

Maintain existing/do not reduce traffic volumes

Discussion has occurred regarding several approaches which are addressed in more detail in the attached traffic analysis report, for example:

- Leave the road with the existing three lane cross-section between Miller Road and 78th Street as is.
- Redesign the section of road from Miller Road to 78th to operate as a one-way street westbound, including the following design options*****:
    - removal of planters/medians**;**
    - installation of a traffic signal at the 78th Street intersection**;**
    - re-striping to two lanes with on street parking on both sides of the street**;**
    - redesigning the Miller and Chaparral intersection to prevent northbound traffic from turning right/east on to Chaparral, and force east bound traffic on Chaparral to turn left or right on to Miller; and
    - redesign the Scottsdale Road and Chaparral intersection to allow two left hand turn lanes eastbound from Chaparral onto Scottsdale Road and Goldwater Boulevard, with those in the Goldwater turn lane having the option of going straight into the office complex.

* The design options listed here are not exclusive to this alternative, but could be used on other alternatives as well.

Restrict traffic volumes to 1992-1996 levels

Discussion has occurred regarding several approaches which are addressed in more detail in the attached traffic analysis report, for example:

- Redesign the road to be consistent with a local street. Move the travel lanes to the middle of the cross section by removing the center turn lane and use the additional land area to provide bike lanes, wider sidewalks, landscaping, on-street parking or low walls at the outside edges of the new cross section. Improve crossing alternatives by providing additional traffic control devices.
- Construct a direct Chaparral Road to Camelback Road connection using the land in the Villa Monterey Park just east of Hayden Road.

ASSESSMENT OF ALTERNATIVES

In the evaluation of alternatives to widening Chaparral Road, it was important to evaluate the impacts of reducing or maintaining existing and projected future traffic volumes on Chaparral Road between Miller Road and 78th Street. The following chart estimates the number of existing trips and how many trips would need to be relocated to reduce Chaparral Road traffic levels to 1992-1996 levels. Below is a chart that shows the two major alternatives to widening being considered.

Existing Conditions:

Action	Number of Trips	Trips to be Relocated
Maintain current volumes	17-19,000 vpd	
Restrict/divert traffic	12,000 vpd	5-7,000 vpd

A scenario assuming the relocation of 5,000 to 15,000 existing trips to achieve volumes of less than 5,000 vehicles per day was evaluated to determine outside impacts on the local street network. A 15,000 vehicle per day reduction would be the most extensive level of traffic restriction envisioned for Chaparral Road. Preliminary traffic assignments for this scenario indicate that Miller Road, 78th Street, Jackrabbit Road, Camelback Road, McDonald Drive, and Indian School Road would be most impacted; those impacts would not require widening, although some minor intersection improvements could be recommended.

Future Conditions

In advance of the availability of forecast travel demand from the modeling effort due in July 2007, various traffic growth rates were tested to determine how much additional growth in traffic could occur before the existing street network would need capacity improvements. Level of service (LOS) was determined for each movement, approach, and intersection for the morning and evening peak hours. LOS is generally a measure of roadway capacity and delay with LOS A, B, and C indicating that a road is operating under capacity, LOS D is at capacity, and LOS E or F indicating that roadway traffic is at or exceeding capacity and there is delay. At a thirty percent (30%) increase in traffic volumes, LOS is about equally divided between under capacity, near capacity, and at or exceeding capacity. At a fifty percent (50%) increase in traffic volumes, more movements are at or exceeding capacity. It is anticipated through this analysis that total traffic volumes could be increased by between thirty percent (30%) and fifty percent (50%) without requiring major street improvements. The growth of traffic volumes does not occur uniformly across all possible routes. It can be expected that as traffic volumes increase, Chaparral Road volumes would not grow as fast as volumes on McDonald, Camelback, Indian School or Thomas. This is because the alternate routes have more excess capacity than Chaparral and so they would remain more attractive routes for a longer period of time. However, a number of specific intersections and movements within the area would operate at LOS E or F, including: McDonald /Hayden and Camelback /Hayden during the morning peak; and Indian School /Hayden, Camelback /Hayden, and Camelback /Miller during the evening peak. This information is illustrated in the May 2007 Traffic Analysis.

Summary Assessment

- If Chaparral Road were to be widened to four through lanes in the segment from Miller Road to 78th Street, current and future traffic volumes will increase to match the additional capacity in the Chaparral Road corridor. If the one way options are used, traffic volumes would also tend to increase.
- All alternatives that would maintain the existing roadway configuration of Chaparral Road would likely increase traffic volumes or maintain current traffic volumes over time.
- Redesigning the roadway in the section between Miller Road and 78th Street to a local/residential street, or otherwise diverting traffic could disperse 5,000 to

7,000 vehicles per day (existing conditions), depending on the level of restriction, to other nearby roadways as drivers seek alternative routes. In future conditions up to approximately 8,000 to 10,000 vehicles per day would be dispersed to other adjacent and parallel roadways. A more refined analysis will be available for future conditions upon completion of modeling information in July 2007.

- The alternative using the former Villa Monterey golf course property for a connection between Chaparral Road and Camelback Road needs to consider the following: deed restrictions on the property which may not allow the use of the land for a roadway; the public process has garnered support for parkland not roadway; homes that currently have open space adjacent would now have roadway adjacent; and drainage features, grade differences and construction would be costly to mitigate.
- Alternatives that suggest widening additional roadways in the surrounding area or connecting Camelback and Osborn to Pima Road would impact established neighborhoods by the increase in traffic along these roadways. Elementary schools are adjacent to Camelback and Osborn Roads.
- Increasing use of transit, bicycle and pedestrian modes to and around Downtown could reduce impacts on Chaparral and adjacent roadways. This could require both physical and policy changes to encourage a higher mode split (percentage of use).
- The option of widening Chaparral Road could be eliminated without major transportation system impacts or impacts to Downtown growth and revitalization; however, there would be moderate increases in traffic on adjacent and parallel roads if the existing configuration is retained.
- Diversion of existing traffic would not have major street system impacts, however, local streets in the surrounding area would be impacted, specifically Miller Road, 78th Street, and Jackrabbit Road.
- It appears that traffic volumes could be increased on parallel and connecting roads without requiring widening of those roads, however some intersections and traffic movements would operate at levels of service below what is identified as the City's goal in the current Streets Master Plan.

Next Steps

Staff will continue to work on completing subregional modeling including refined estimates of future conditions and impacts of potential mode split goals, as well as cost and technical feasibility of preferred options, prior to presentation of a draft report to the Transportation Commission for review at their July 12th meeting.

RESPONSIBLE DEPT(S) Transportation
Planning and Development Services

STAFF CONTACT(S)

Mary O'Connor
Transportation General Manager
480-312-2334
E-mail: moconnor@scottsdaleaz.gov

John Lusardi
Advance Planning Director
480-312-7501
E-mail: jlusardi@scottsdaleaz.gov

APPROVED BY

____

Mary O'Connor Date
General Manager, Transportation

____

Ed Gawf, Assistant City Manager Date

ATTACHMENTS

1. Petition from Kathy Feld/Villa Monterey
2. Petition from neighbors in the Scottsdale Country Acres area (generally 82nd Street and Chaparral)
3. April 10, 2007 City Council meeting minutes regarding response to the Chaparral Road petition
4. Summary of resident responses to alternative options presented at the April 25, 2007 Villa Monterey meeting
5. Report of May 2007 Traffic Analysis

CHAPARRAL ROAD
MILLER ROAD TO HAYDEN ROAD
ROADWAY EVALUATION

May 2007

TABLE OF CONTENTS

I. History

Chaparral Road Street Classification:
Chaparral Road is located on a Maricopa County section line, one mile south of McDonald Drive and one mile north of Indian School Road. This section line is the Camelback Road alignment in the majority of the Valley. Due to the Camelback Mountain land feature, Camelback Road bends to the south at 48th Street in the City of Phoenix, and continues east on an alignment one-half mile to the south of the section line through the City of Scottsdale. Because Chaparral Road lies on the section line, it has always been identified as a major street.

The 1962 Scottsdale General Plan, prepared by Maricopa County for the City of Scottsdale, indicates that there was a decision to maintain Camelback Road on the half-mile alignment. It was noted that Camelback Road should not be a major street east of Miller Road due to concerns that this would increase traffic adjacent to the existing Navajo Elementary School. "Coronado Drive" (on the Chaparral Road alignment) was designated as the major east-west street for this corridor. It was shown as a major street from Miller Road to Pima Road, with "Proposed Expressway, Freeway, or Parkway" alignment options shown along the Indian Bend Wash and Pima Road alignments.

The 1967 City of Scottsdale General Plan designates Chaparral Road as a Major Street from Scottsdale Road east to a future "Freeway-Expressway" located along the Pima Road alignment. The plan shows Chaparral Road continuing east into the "Salt River Indian Reservation." Camelback Road is shown terminating as a major street at the Indian Bend Wash.

The Circulation Element of the 1981 City of Scottsdale General Plan designates Chaparral Road as a Major Collector Street (four lane road) from 64th Street to Pima Road. Pima Road is identified as an Expressway. Camelback Road is classified as a Major Arterial Street from the City boundary to Scottsdale Road and a Minor Arterial Street from Scottsdale Road to Hayden Road. The plan did not indicate a Camelback Road intersection with Pima Road.

The 1991 Circulation Element of the City of Scottsdale General Plan designates Chaparral Road as a Major Collector Street from 64th Street to Pima Road. It indicates the planned Outer Loop Freeway on the Salt River Indian Community land with an interchange planned at Chaparral Road.

The 2001 Community Mobility Element of the City of Scottsdale General Plan designates Chaparral Road as a Citywide Systems Street for its entire length. McDonald Drive, Indian School Road, and Thomas Road are all also classified as Citywide Systems Streets from Scottsdale Road to Pima Road. Camelback Road is also classified as a Citywide Systems Street east of Scottsdale Road, but does not indicate a connection to Pima Road.

The 2003 Streets Master Plan designates Chaparral Road as a Major Collector Street from Scottsdale Road to Pima Road, with an interchange at the Loop 101 Freeway. West of Scottsdale Road, Chaparral Road is designated as a Minor Collector Street.

Copies of the 1962 Scottsdale General Plan, the 1967 City of Scottsdale General Plan, the Circulation Element of the 1981 City of Scottsdale General Plan, the 1991 Circulation Element of the City of Scottsdale General Plan, the 2001 Community Mobility Element of the City of Scottsdale General Plan, and the Street Classification Map of the 2003 Streets Master Plan are contained in Appendix A.

Development Along Chaparral Road Between Miller and Hayden Roads:
The primary land use along the section of Chaparral Road from Miller Road to Hayden Road is residential. There are three subdivisions that have frontage along this section of Chaparral Road – Villa Monterey (Units Four, Six, and Seven), Scottsdale Monterey, and La Villita. There is also a shopping center, Chaparral Plaza, located on the northwest corner of Hayden Road and Chaparral Road.

The Villa Monterey subdivision was approved over a period of time, beginning in 1961 and ending in 1976. The first plat for Villa Monterey, Unit One, was approved by the Town of Scottsdale in March of 1961. The plat for the portions of Units Four, Six, and Seven with direct residential frontage on Chaparral Road were approved in 1963, 1966, and 1967 respectively. There are 52 lots within Villa Monterey that were approved that have their front yards and driveways along Chaparral Road.

The Scottsdale Monterey Subdivision plat was approved by the City of Scottsdale in 1978. The La Villita Subdivision plat was approved 1983. Neither of these developments have lots with direct residential frontage on Chaparral Road.

The Chaparral Plaza shopping center, located on the northwest corner of Hayden Road and Chaparral Road, includes businesses such as Blockbuster Video, Safeway, and other commercial uses that serve the surrounding residential areas. The zoning district and site plan for the shopping center were approved by zoning cases in 1977 and 1978.

Downtown Development:
The Downtown area of Scottsdale has served as the functional and symbolic center of the City since its incorporation in 1951. As the City grew, the role of Downtown shifted from a country town center serving the surrounding agricultural activity to a community center for a budding array of single family homes. The city's growth has led to continuous change in the Downtown.

As the City has grown and the Downtown was no longer the geographic center of the community, Downtown Scottsdale has been redefined as the commercial, cultural, civic and symbolic center of the community. Downtown's character is defined in a multitude of ways: as a tourist attraction; as a specialty retail environment; as a place where the visual and performing arts flourish; as a burgeoning employment center; and as a unique blend of the historic and contemporary.

In 1984, the City Council adopted the Downtown Plan, a long-range policy document intended to guide the growth and development decisions for the 1 ½ square miles of the community that compromise Downtown Scottsdale. The plan calls for a unified strategy to raise the quality, character, marketability, and viability of Downtown. The plan also encourages Downtown to become a mixed-use center with an emphasis on the integration of historic resources, specialty retail, office, residential, restaurant and hotel uses. One of the primary components of the Downtown Plan was to create residential land uses to ensure "24-hour occupancy" in the Downtown – thus preventing the urban decay often experienced in downtown areas. For the past twenty years, the Downtown Plan has framed public policy with regard to Downtown Scottsdale. Some milestone projects approved under the Downtown Plan include:

- Scottsdale Fashion Square Mall (1986)
- Marriott Hotel (1986)
- Scottsdale Financial Center Office Complex (1986)
- Scottsdale Galleria Mall (1987)
- Scottsdale Stadium Expansions (1990, 2006)
- San Marin Multi-Family Residential (1991)
- Couplet Roadway System (1991)
- Loloma Transit Center (1995)
- Medical Campus Expansion (1996-Present)
- Scottsdale Fashion Square Nordstrom Expansion (1996)
- Finova Office Headquarters (1997)
- Lincoln Towne Center Mixed-Use(1999)
- Scottsdale Waterfront Mixed-Use Commercial/Office (2003)
- Loloma/Main Street Plaza Mixed-Use Commercial/Residential (2004)
- Optima Camelview Residential (2004)
- Hotel Valley Ho/Main Street Residential (2004)
- Stetson/South Canal Mixed-Use Commercial/Office (2004)
- Rose Garden Residential (2005)
- Portales Corporate Center II Office (2005)
- W Hotel (2005)

Since 1984, the Downtown Plan and subsequent community efforts have been successful at guiding the growth, both financially and physically, of Downtown Scottsdale. Downtown's more recent successes under the plan include the addition of more than 2,500 new residential units as well as public and private development investment totaling $2 billion.

Chaparral Road Modifications:

The section of Chaparral Road from Scottsdale Road to Miller Road was widened to five lanes (two travel lanes in each direction with a center turn lane) in 1974 as a capital improvement project. A bridge structure was constructed over the Arizona Canal as a separate capital improvement project prior to this street project.

The three lane section (one lane each direction with center turn lane) from Miller Road to 78th Street was completed with the development of the Villa Monterey Subdivision. These improvements were likely completed between 1965 and 1970. Eighty feet of right-of-way was dedicated for Chaparral Road adjacent to this section. This was consistent with Maricopa County requirements for major roadways along section lines.

The five lane section from 78th Street to Hayden Road was constructed with the adjacent development of the Scottsdale Monterey Subdivision, the La Villita Subdivision, and the shopping center. These improvements were completed between 1978 and 1983. The City of Scottsdale constructed the five lane bridge section of Chaparral Road over a portion of the Indian Bend Wash immediately west of Hayden Road during this same time period.

The section from Granite Reef to Pima Road was widened to five lanes in 1991 as a capital improvement project. This project included the construction of frontage roads for the portions of Chaparral Road with single family residential lot frontage.

The section from 82nd Street to Granite Reef was widened to five lanes in 1996 as a capital improvement project. This project also included the construction of frontage roads for the portions of Chaparral Road with single family residential lot frontage on the south side and town home lot frontage on the north side.

A series of median islands and median enhancements were constructed along Chaparral Road between the Arizona Canal and Hayden Road in 2003. The intent of the project was to improve the pedestrian environment by providing refuge areas, improve aesthetics in the corridor, and prevent vehicles from passing in the two-way left turn lane. StreetPrint and left turn striping were added in the section between 78th Street and Hayden Road to control routing and improve left turn safety.

At approximately the same time as the median enhancement project was constructed, several intersection capacity improvements were completed to encourage traffic to use Camelback Road west of Hayden Road as an alternative route. These included an additional westbound left turn lane on Chaparral Road at Hayden Road, an additional eastbound left turn lane on Camelback Road at Hayden Road, a northbound right turn lane on Hayden Road at Chaparral Road, and a southbound right turn lane on Hayden Road at Camelback Road.

Traffic Volumes:
The City's Traffic Engineering Division collects traffic volume data on all major street segments and at all major intersections in the city. This data is published every two years along with collision data. The traffic volumes data collected on Chaparral Road is shown in the table below. The traffic volumes can vary significantly from year to year due to changes in travel patterns, street construction, new development, and other factors.

Chaparral Road Daily Traffic Volumes											
Segment	**1986**	**1988**	**1990**	**1992**	**1994**	**1996**	**1998**	**2000**	**2002**	**2004**	**2006**
Pima to Granite Reef	5,700	12,600	15,500	6,600	6,000	15,600	21,400	22,900	28,000	26,400	27,500
Granite Reef to Hayden	14,800	12,600	12,400	10,100	15,400	17,600	23,400	26,900	26,200	25,300	30,900
Hayden to Miller	14,800	14,700	12,100	12,000	14,200	16,000	18,200	18,600	20,900	19,400	18,900
Miller to Scottsdale	13,000	15,500	14,900	14,600	16,400	19,700	16,700	19,500	25,300	19,200	17,800
Scottsdale to 68th Street	9,800	14,400	6,600	6,200	7,100	8,900	8,200	7,500	6,100	3,200	5,900

The data shows that the greatest growth in traffic volumes has occurred in the two sections closest to the 101 Freeway, Pima Road to Granite Reef Road and Granite Reef Road to Hayden Road. The primarily three lane section of Chaparral Road between Miller Road and Hayden Road has experienced a 28 percent growth in traffic volumes during the twenty year period from 1986 to 2006. It has experienced an 18 percent growth in traffic volumes during the ten year period from 1996 to 2006.

Two major events occurred during the time period from 1986 to 2006 that impacted the Chaparral Road volumes. The first was the construction of the 101 Freeway. The freeway was opened from the south to Thomas Road in October of 1996. It was opened to McDonald Drive in July of 1998. The second event was a major intersection improvement project at Hayden Road and Indian School Road, which occurred in 2002.

It appears that traffic growth began increasing in the Chaparral Road corridor from Scottsdale Road to Pima Road in approximately 1996. This coincides with the widening of the section from Hayden Road to Pima Road to five lanes. Volumes increased again in 1998 with the opening of the 101 Freeway. It also appears that traffic volumes were highest in 2002 while the Hayden Road and Indian School Road intersection was under construction.

The general trend for traffic volumes in the southern portion of the City of Scottsdale has been for increases in volumes in the main east-west corridors and decreases in volumes for the main north-south corridors over the past ten years. This reflects a change in travel patterns due to the construction of the 101 Freeway. More drivers are traveling east and west to access the freeway, which is the primary travel route for north and south travel.

Tables with historic traffic volumes for other east-west and north south streets in this area are included in Appendix B. This information is also shown in Figures 1 and 2 in Appendix B for the major streets in the Chaparral Road vicinity.

Historic Downtown Development Trends and Chaparral Traffic Data:
Over the past twenty years, major development under the Downtown Plan has typically occurred during particular years rather than being evenly spread over each year. When these “spikes” in major Downtown development trends are examined in comparison to the historic daily traffic volumes along Chaparral Road from Hayden to Miller Roads for the same time period (1986-2006), it is apparent that the majority of the major Downtown development projects did not directly impact the daily traffic volumes along this section of Chaparral Road. Rather, it appears that the greater impacts to daily traffic volumes along the Hayden to Miller section of Chaparral Road occur at times when major transportation projects or impacts occur (see chart below).

Daily Traffic Volumes Chaparral Road (Hayden Road to Miller Road) Since 1986

Year	Daily Traffic Volumes	Major Downtown Development Projects	Major Transportation Project/Impact
1986	14,800	Fashion Square expansion #1, Marriott Hotel, Scottsdale Financial Center office complex	
1988	14,700		
1990	12,100	Scottsdale Stadium expansion #1; Galleria	
1992	12,000	San Marin Apartments, Couplet roadway system	
1994	14,200		
1996	16,000	Fashion Square Nordstrom expansion; Scottsdale Healthcare Medical Campus expansion	Widened Chaparral to 5 lanes from Hayden to Pima; L101 freeway opens to Thomas Road
1998	18,200	Finova Office complex	L101 freeway open to McDonald Drive
2000	18,600		
2002	20,900		Hayden/Indian School intersection construction
2004	19,400		Traffic mitigation measures installed (2003-04); Hayden/Chaparral and Hayden/Camelback extra turn lanes added
2006	18,900	Scottsdale Waterfront retail	
2007 (Apr 2007)	17,100	Main Street Plaza residential, Stetson/South Canal mixed-use, Hotel Valley Ho	

Collision Rates:

In addition to the traffic volume data, the City's Traffic Engineering Division collects the number of reported collisions on all major street segments and at all major intersections in the City. This data is published every two years along with the traffic volume data. The collision rates for the segments of Chaparral Road are shown in the table below. The collision rates represent the number of collisions per million vehicle miles along that segment of roadway.

Chaparral Road Daily Segment Collision Rates											
Segment	**1986**	**1988**	**1990**	**1992**	**1994**	**1996**	**1998**	**2000**	**2002**	**2004**	**2006**
Pima to Granite Reef	3.85	2.17	1.06	1.66	9.13	2.10	1.63 (1) 1.02 (2)	1.91	0.98	2.28	1.00
Granite Reef to Hayden	1.67	0.43	0.88	0.00	0.36	1.86	0.75 (1) 1.40 (2)	1.02	0.84	2.38	0.89
Hayden to Miller	1.67	0.75	0.45	1.83	0.39	2.74	3.01	5.60	4.73	3.67	2.90
Miller to Scottsdale	1.26	1.77	0.37	1.13	1.67	1.11	1.31	2.53	0.65	1.71	1.23
Scottsdale to 68th Street	1.12	0.00	0.86	0.00	0.00	1.23	2.00	0.73	0.00	0.00	0.00
Citywide Average	**2.72**	**1.86**	**1.14**	**1.68**	**1.69**	**1.67**	**1.70**	**1.70**	**1.49**	**1.84**	**n/a**

1 – Rate prior to the Loop 101 opening to McDonald Drive
2 – Rate after the Loop 101 opening to McDonald Drive

The data shows that since 1996, the collision rate for the section of Chaparral Road between Miller Road and Hayden Road has exceeded the citywide average rate. This section has also exceeded the rates on all other sections of Chaparral Road. It is likely that the high collision rate is due to the transition of the cross section from five lanes to three lanes, which creates unexpected vehicle queues and merging, combined with the high number of access points.

A detailed review of the collisions that occurred in 2002 and 2004 between Miller Road and Hayden Road on Chaparral Road show that over 80 percent of the collisions were identified as rear-end collisions within this segment. The majority of the rear-end collisions occurred between 78th Street and Miller Road. These rear-end collisions are typically caused by sudden stops in the traffic flow, which is likely related to the congestion created by the narrow cross section and vehicles slowing to enter the residential driveways. The other collisions within the segment were angle and right or left turning collisions. The majority of these collisions occurred in front of the Chaparral Plaza shopping center; they are likely the result of vehicles entering and exiting the shopping center driveways.

2002 Traffic Analysis:
In response to Villa Monterey resident concerns, the Traffic Engineering Division staff conducted a traffic analysis for Chaparral Road between Miller Road and Hayden Road in 2002. At the time the concerns expressed by the Villa Monterey residents were: increased traffic volumes, increased travel speeds, increased number of trucks disregarding the “No Trucks” sign, and a decrease in the quality of life due to traffic noise and pollution for those with frontage along Chaparral Road. The residents requested that traffic calming be utilized to divert drivers from traveling on Chaparral Road between Miller Road and Hayden Road. Staff assumed that 8,000 daily vehicles would be diverted from Chaparral Road between Miller Road and Hayden Road.

The conclusions of the analysis were the following:

Traffic calming alone would not be sufficient to divert 8,000 vehicles from this section of Chaparral Road.

Traffic calming was not suggested as a mitigation measure for a major roadway with volumes exceeding 10,000 vehicles per day.
Adding traffic calming devices between Miller Road and Hayden Road would increase congestion, noise, and delay along this section of roadway thus decreasing quality of life.
Local streets in the Chaparral Road vicinity would likely be impacted. Streets such as Coolidge Street, 78th Street, Vista Drive, Camelback Road (east of Hayden Road), 82nd Street, and 86th Street could all see significant increases in traffic volumes.

The results of the analysis were presented to the Transportation Commission on June 20th, 2002. The Commission chose not to recommend installing formal traffic calming devices. They recommended (by a 4-1 vote) changing the roadway classification from Major Collector Street to a Residential Street. They also recommended that staff install some median enhancements on Chaparral Road between Miller Road and Hayden Road to prevent vehicle passing in the center turn lane, improve pedestrian access, and encourage alternative routes. This resulted in the series of roadway modifications constructed in 2003 that were discussed previously. The City Council took the letter of recommendation regarding changing the roadway classification under advisement, but no action was taken.

A copy of the approved minutes from the June 20th, 2002, Transportation Commission Meeting is included in Appendix C.

II. Current Conditions

Regional Area Street Network:
The north-south corridors are well defined in this area of the Valley. The Loop 101 Freeway is the main regional roadway for this area with daily volumes exceeding 100,000 vehicles. Scottsdale Road, Hayden Road, and Pima Road are all north-south arterial roadways that also accommodate regional traffic.

The major east-west corridors in this area are not as well established. Between Shea Boulevard and the Loop 202 Freeway the primary regional roadways are Lincoln Drive, Camelback Road, Indian School Road, Thomas Road, and McDowell Road. Lincoln Drive and Camelback Road extend west through Paradise Valley and the City of Phoenix to connect to other regional north-south corridors such as the Piestewa Freeway; however, they do not connect to the Loop 101 Freeway in the east. Indian School Road, Thomas Road, and McDowell Road all connect the 101 Freeway to the major north-south corridors to the west; however, this leaves a six-mile wide section between Shea Boulevard and Indian School Road with no continuous major east-west roadways.

Local Area Street Network:
In the immediate area, the east-west section line streets McDonald Drive, Chaparral Road, and Indian School Road, all have interchanges on the Loop 101 Freeway. Chaparral Road and Indian School Road both extend to the east serving the Salt River Pima-Maricopa Indian Community. McDonald Drive extends west of Scottsdale Road into Paradise Valley, but not as a major street. Similarly, Chaparral Road also extends west of Scottsdale Road, but not as a major street. Indian School Road is the only street that continues as a major street west of Scottsdale Road.

The half mile east-west streets in the immediate area consist of Jackrabbit Road, Camelback Road, and Osborn Road. All of these roadways are somewhat discontinuous; none of them connect Scottsdale Road to Pima Road. Both Camelback Road and Osborn Road connect Scottsdale Road to Hayden Road; Jackrabbit Road does not connect across the Arizona Canal.

The area street system is depicted in Figure 3 in Appendix D. This figure also identifies the existing number of lanes for each street. The local street network in the vicinity of Villa Monterey is shown in Figure 4.

Residential Frontage:
All three major east-west streets discussed above have some segments with direct residential frontage. The term "direct frontage" implies that the building orientation and front yard face the street. An aerial showing the homes along these three major east-west corridors is provided in the appendix.

There are thirty-two townhouses between 82nd Street and Granite Reef Road with their direct frontage on McDonald Drive. There were 19 single family houses removed along McDonald Drive between Pima Road and 86th Street to accommodate a roadway widening project along this section.

There are 62 townhouses between 82nd Street and 85th Street with their direct frontage along Chaparral Road. There are twenty-seven single family houses between 85th Street and Pima Road with their direct frontage along Chaparral Road. All of the single family houses and most of the townhouses along this section of Chaparral Road are separated from the roadway by a frontage road; however, there are twenty-three townhouses between Granite Reef Road and 85th Street that do not have a frontage road. As noted previously, there are 52 townhouses between Miller Road and 78th Street with their direct frontages, including driveways, along Chaparral Road.

There are 22 single family houses between 81st Street and Granite Reef Road with direct frontage along Indian School Road; these houses are separated from the roadway by a frontage road.

The half-mile streets in this area all have single family homes with direct frontage between Hayden Road and Pima Road (no frontage roads). There are elementary schools on both Camelback Road and Osborn Road.

The number of residential units fronting McDonald Drive, Chaparral Road, and Indian School Road is shown in Figure 5 of Appendix D.

Downtown Development Policy:
In 2001, the citizens of Scottsdale voted to approve the *City of Scottsdale 2001 General Plan*. The 2001 General Plan establishes a three-level approach to planning including city-wide planning, character planning and neighborhood planning. As part of this tiered planning approach, the Downtown Plan was adopted as the Character Plan for the Downtown area.

As public policy, market conditions and building technologies change over time, the ability to reevaluate and revise long-range policies is important. The 1984 Downtown Plan was intended to provide the framework for downtown decision making for a period of twenty years. The recommended implementation programs under the plan have been successfully achieved. Consequently it is time for the Scottsdale community to embark on a comprehensive update to the existing Downtown Plan.

To begin the extensive public outreach effort associated with the Downtown Plan update, the Scottsdale City Council approved the Downtown Scottsdale Town Hall event which occurred in November 2006. The three half-day event brought a broad cross-section of community members together to discuss the future of Downtown Scottsdale over the next decade. In February 2007, the Arizona Town Hall organization presented the final citizen report and recommendations from the Downtown Town Hall event to the Scottsdale City Council.

This Town Hall report and recommendations are only the first step in a year-long process to update the Downtown Plan by the end of 2007. While the Town Hall report and recommendations will help form the basis for the some of the vision, goals and objectives to be achieved in an updated Downtown Plan, some of the more specific recommendations regarding circulation, cultural facilities, and open space planning will need to be technically analyzed and evaluated through both the Transportation Master Plan and Downtown Plan Update processes, culminating in final decision making by the Scottsdale City Council.

Chaparral Road Characteristics:
Chaparral Road extends from 64th Street/Invergordon Road in the City of Phoenix and Town of Paradise Valley, east past the Loop 101 Freeway and into the Salt River Pima-Maricopa Indian Community. There is an existing freeway interchange at the Loop 101 Freeway.

The section of this roadway from 66th Street to Pima Road lies within the City of Scottsdale. The section from 66th Street to Scottsdale Road is primarily a two lane roadway. The section immediately west of Scottsdale Road has been diverted into the Portales Development at the request of area residents to discourage non-residential traffic from continuing west into the adjacent residential area.

Chaparral Road is a five-lane roadway from Scottsdale Road to the 101 Freeway with the exception of the three-lane section from Miller Road to 78th Street. It extends east of the Loop 101 Freeway as a four-lane divided roadway adjacent to the Scottsdale Community College.

The posted speed limit for Chaparral Road is 35 miles per hour east of Scottsdale Road to Woodmere Fairway, which is immediately west of the Arizona Canal. The section from Woodmere Fairway to Hayden Road is posted at 30 miles per hour. From Hayden Road to Pima Road it is posted at 40 miles per hour.

2007 Traffic Data:
Traffic counts collected in April of 2007 indicate that the current daily traffic volumes on Chaparral Road are as follows:

Pima Road to Granite Reef Road – 25,200 vehicles
Granite Reef Road to Hayden Road – 25,500 vehicles
Hayden Road to Miller Road – 17,100 vehicles
Scottsdale Road to Miller Road – 25,000 vehicles

The mean or average speed along Chaparral Road between Miller Road and 78th Street is 30 miles per hour. Between 78th Street and Hayden Road the mean speed is 41 miles per hour. The 85th Percentile Speed is considered to be approximately one standard deviation from the median travel speed and is considered by traffic engineers when establishing speed limits. For the section of Chaparral Road between Miller Road and 78th Street, the 85th percentile speed is 36 miles per hour. Between 78th Street and Hayden Road, the 85th percentile speed was measured to be 47 miles per hour.

The directional split of traffic volume measures how much traffic is traveling in one direction versus the other during a given period. During the a.m. peak hour, 58 percent of the traffic between Miller Road and Hayden Road was traveling westbound. During the p.m. peak hour, 52 percent of the traffic was traveling eastbound. Chaparral Road does not have a distinct peak in the a.m. peak period as do other roadways like McDowell Road, Thomas Road, Indian School Road, McDonald Drive, or Shea Boulevard. This is illustrated in Figure 6 in Appendix D.

The traffic counts included classification data, which identifies the percentage of traffic that are considered commercial truck traffic (gross vehicle weight over 50,000 pounds). The current percentage of truck traffic on the section between Miller Road and 78th Street is 9 percent. This percentage reduces to 7 percent truck traffic between 78th Street and Hayden Road. Chaparral Road, west of Hayden Road, is not designated as a truck route, and is posted to prohibit truck traffic; however, as is true for all non-truck routes, local delivery by trucks is allowed.

III. Traffic Analysis

Introduction:
The City Traffic Engineering Division staff conducted a traffic analysis to determine the impacts of reducing the traffic volume on Chaparral Road between Miller Road and Hayden Road to be consistent with typical local residential street daily volumes. Paul Basha of Morrison Maierle consulting engineers participated in the preparation of the scope of work, data analysis, and results discussion. The study area was generally bounded by the Loop 101 Freeway to Scottsdale Road, and McDonald Drive to Indian School Road.

Traffic data was collected at seventeen major intersections within the study area that were considered to be the most likely to be impacted by the diverted traffic. Traffic data was also collected at 23 mid-block locations to determine the current daily and peak hour volumes on the area roadways.

Using the gathered traffic data, existing levels of service were computed for the seventeen major intersections within the study area. Currently, in the a.m. peak hour, all study intersections are operating at level of service (LOS) D or better, with the exception of the intersection of Indian School Road and Hayden Road. In the p.m. peak hour, all study intersections are operating at LOS D or better, with the exception of the intersections of Indian School Road and Hayden Road, and of Chaparral Road and Hayden Road.

Results of Analysis:
To determine the impact on the existing transportation network if traffic volumes on Chaparral Road between Miller and Hayden were decreased to residential street vehicle volume levels, staff developed a

traffic simulation that reduced the volume on Chaparral Road in this area by 15,000 daily vehicles and re-distributed those vehicles in different percentages to other major street corridors within the study area. The percent of vehicle volume redistributed to each corridor was based upon existing travel patterns and routes, assumptions of the origins and destinations of vehicles, observations of existing traffic conditions, and available roadway and intersection capacity in the study area. The current major travel paths assumed in the analysis for eastbound and westbound traffic are shown in Figures 7 and 8 of Appendix E.

Using the redistributed traffic data, levels of service were computed for the seventeen major intersections within the study area. With the redistributed traffic in the a.m. peak hour, all study intersections are operating at LOS D or better, with the exception of the intersection of McDonald Drive and Hayden Road. In the p.m. peak hour, all study intersections are operating at LOS D or better, with the exception of the intersections of Indian School Road and Hayden Road, Camelback Road and Miller Road, and Camelback Road and Hayden Road.

The 2007 segment volumes and percent change with the redistribution of traffic from Chaparral Road is shown in the table below for those routes most impacted by diverted traffic. Traffic volume increases are predicted for the east-west paralleling routes of McDonald Drive, Jackrabbit Road, Camelback Road, and Indian School Road. The north-south streets with the largest increases in traffic volumes are Miller Road, 78th Street, 82nd Street, and 86th Street.

Daily Traffic Volumes on Routes with Diverted Traffic				
Segment	**Limits**	**2007 Volume**	**New Volume w/ Diverted Traffic**	**% Change**
Camelback Rd	Scottsdale to Miller	21,201	31,026	+46%
Camelback Rd	Hayden to 82nd	8,638	11,038	+28%
Miller Rd	Chaparral to Camelback	9,491	11,591	+22%
Miller Rd	Chaparral to Jackrabbit	3,896	7,751	+94%
Jackrabbit Rd	Miller to 78th	2,152	8,677	+303%
Jackrabbit Rd	78th to Hayden	2,152	4,102	+91%
Granite Reef	Camelback to Chaparral	5,093	5,393	+6%
Granite Reef	Chaparral to McDonald	4,871	5,546	+14%
78th Street	McDonald to Jackrabbit	2,000	3,725	+86%
82nd Street	Camelback to Indian School	4,093	4,918	+20%
82nd Street	Camelback to Chaparral	2,007	2,307	+15%
86th Street	Camelback to Chaparral	1,328	1,628	+23%
86th Street	Chaparral to Jackrabbit	3,684	3,984	+8%
McDonald Dr	Scottsdale to Miller	19,578	22,353	+14%
McDonald Dr	Miller to 78th Street	19,578	22,353	+14%
McDonald Dr	78th Street to Hayden	19,578	24,078	+23%
McDonald Dr	Hayden to Granite Reef	20,701	30,001	+45%
McDonald Dr	Pima to the L101	20,758	30,058	+45%
Chaparral Rd	Miller to Hayden	17,100	2,100	-88%
Indian School Rd	Miller to Hayden	40,383	41,733	+3%
Indian School Rd	Pima to the L101	39,446	43,496	+10%
Hayden Rd	Jackrabbit to McDonald	31,764	36,564	+15%
Hayden Rd	Chaparral to Jackrabbit	31,764	34,914	+10%

Hayden Rd	Camelback to Chaparral	35,654	39,254	+10%

The three intersections listed below would experience decreased delay for certain approaches and movements with the diversion of traffic from Chaparral Road between Miller Road and 78th Street.

- Scottsdale Road and Chaparral Road
- Hayden Road and Chaparral Road
- Pima Road and Chaparral Road

The six intersections listed below would experience increased delay for certain approaches and movements with the diversion of traffic from Chaparral Road between Miller Road and 78th Street.

- Scottsdale Road and Indian School Road
- Miller Road and Indian School Road
- Pima Road and Indian School Road
- Loop 101 Freeway and Chaparral Road
- Hayden Road and Jackrabbit Road
- Pima Road and McDonald Drive

The seven intersections listed below would experience decreased delay for some approaches and movements and increased delay for other approaches and movements with the diversion of traffic from Chaparral Road between Miller Road and 78th Street.

- Hayden / Indian School
- Miller / Camelback
- Hayden / Camelback
- Miller / Chaparral
- Granite Reef / Chaparral
- Hayden / McDonald
- Granite Reef / McDonald

The number of intersections operating at LOS E or F would not increase dramatically, yet the poorly operating intersections would change from intersections along Chaparral Road to intersections along Indian School Road, Camelback Road, and McDonald Drive. The traffic volume would also increase on adjacent roadways within the study area. This shows that if traffic is diverted from the section of Chaparral Road between Miller Road and Hayden Road, the traffic volumes will likely be shifted to other major street corridors and neighborhood streets.

The projected traffic volume increase resulting from the redistributed traffic is shown graphically in Figures 9, 10, and 11 of Appendix E.

Figures 12, 13, 14 and 15 in Appendix E illustrate the level of service impact of the redistributed traffic. The level of service is identified for each study intersection approach for the existing and redistributed traffic conditions during the a.m. and p.m. peak hours.

Figures 16, 17, and 18 in Appendix E identify the level of service by movement, approach, and intersection for the study intersections during the a.m. peak hour. This information is shown in Figures

19, 20, and 21 for the p.m. peak hours. These figures show the total number of movements, approaches, and intersections operating at near or under capacity (LOS A thru D) and at or over capacity levels of service (LOS E and F) under the existing and redistributed traffic conditions (identified as "Maximum Impact"). Figure 22 summarizes the number of intersections at the different level of service conditions.

Suggested Intersection Improvements:
There are eight intersections that have approaches operating at LOS E or LOS F during the peak hours under the redistributed Chaparral Road traffic scenario. Implementing some minor intersection improvements at these intersections can improve the levels of service. Three of the eight intersections can be improved by installing east-west left turn arrows to accommodate the increased traffic volumes for those east-west turning movements. Five intersections can be improved by modifying the existing traffic signal timing to redistribute green time from the north-south movements to the east-west movements. These intersections and the suggested improvements are listed below:

East/west left turn arrows are required for the following intersections:

- Granite Reef and McDonald Drive
- Granite Reef and Chaparral Road
- Indian School Road and Pima Road

Modified traffic signal timing is required for the following intersections:

- Hayden Road and McDonald Drive
- Hayden Road and Camelback Road
- Hayden Road and Jackrabbit Road
- Miller Road and Camelback Road
- Miller Road and Indian School Road

IV. Future Conditions

Anticipated Downtown Development:
Projected build-out numbers relating to potential land use development under the existing Downtown Plan for Downtown Scottsdale have been recently calculated under two alternative scenario analyses as described below.

In the two scenarios, build out is assumed to occur utilizing the Transportation Master Plan dictated year of 2030. All properties in the area - with the exception of the Civic and Medical centers - are assumed to be of a 'mixed-use' character; i.e., residential, hospitality, retail, commercial, office and support services.

The two alternative scenarios under examination reflect Dwelling Unit Density and Gross Floor Area Ratio allowances at 80% and 60% of the existing Downtown Plan. As is typical with development projections, 100% build out is exempted from the alternative scenario options. Due to changes in market forces, building technologies and community needs over time, 100% build-out is assumed to be unachievable.

The existing Maricopa Association of Governments 2005 Update numbers for the Downtown Scottsdale area provide a baseline to compare the two alternate projection scenarios.

The area examined comprises a total of 634 acres. The primary land use impacts reflected include: Number of Dwelling Units, Resident Population, Number of Hotel Rooms, Gross Floor Area of Non-Residential Development, Number of Employees and Weekday (vehicular) Trips.

The impact results for the 80% DU Density and GFAR Ratio are:

- Dwelling Units 9,800
- Resident Population 17,800
- Hotel Rooms 1,800
- GFA (square feet) 25,028,000
- Employees 49,100
- Weekday Trips 232,900

The impact results for the 60% DU Density and GFAR Ratio are:

- Dwelling Units 7,400
- Resident Population 13,400
- Hotel Rooms 1,400
- GFA (square feet) 18,800,000
- Employees 36,900
- Weekday Trips 174,600

Maricopa Association of Governments 2005 Update: Downtown Scottsdale

- Dwelling Units 4,154
- Resident Population 6,090
- Employees 29,015

Traffic Analysis of Future Conditions:
Traffic volumes in the study area were increased incrementally based on the redistributed traffic assumptions to determine how much additional traffic the street system could handle before beginning to experience failure. Level of service was determined for each movement, approach, and intersection for the study intersections during the a.m. and p.m. peak hours. At a 30 percent increase in traffic volumes, the number of movements operating at under capacity conditions (LOS A, B, or C), near capacity conditions (LOS D), and at/over capacity conditions (LOS E or F) are approximately equal during the p.m. peak hour. Under these conditions, 60 of the movements at the study intersections are at LOS E or F, and the system is beginning to fail. At a 50 percent increase in traffic volumes, the number of movements that are at LOS E or F is greater than the number of movements at LOS D or better. Therefore, it is anticipated that the street system can handle the 30 percent increase in traffic volumes without failure. A number of intersections within the study area will operate at LOS E or F; however, the system will continue to function without major street modifications. This information is illustrated in Figures 23 thru 30 in Appendix F.

<u>V. Options for Chaparral Road Identified Through the Transportation Master Plan Process</u>

Introduction:
The options for improving conditions along the three lane section of Chaparral Road between Miller Road and 78th Street consist of three categories: widening the roadway to accommodate the current and future traffic demand, retaining the current three lane cross section while attempting to improve the conditions for the residential frontage, or narrowing the roadway and/or reducing traffic volumes to be more consistent with a local street. Widening the roadway has not recently been discussed as a desired option; however, given the current and historic street classification of Chaparral Road as a five lane street, it is included here as an alternative. These options are discussed below.

Five Lane Options:

Option 5A - Widen to five lanes using the existing eighty feet of right-of-way; leave the existing residential units along both sides of the roadway. This option would require undergrounding the existing 69kV power lines on the north side of the roadway. .

Considerations: The residential units would be closer to the adjacent roadway, decreasing their front yard area and driveway lengths. Livability would be decreased.

Option 5B - Widen to five lanes using the existing eighty feet of right-of-way; remove the residential units along both sides of the roadway. This option would require under grounding the existing 69kV power lines on the north side of the roadway.

Considerations: Existing residents along both sides of the roadway would have to be relocated. Removing residential units along Chaparral Road would still have an impact on those interior units that would now have frontage along the major roadway. Some type of buffering would likely be required.

Option 5C - Widen to five lanes using the existing eighty feet of right-of-way; remove the residential units from one side of the roadway. Construct a frontage road along the remaining residential frontage, similar to the sections of Chaparral east of Hayden Road.

Considerations: Some residents would have to be relocated. Removing residential units along Chaparral Road would still have an impact on those interior units that would now have frontage along the major roadway. Some type of buffering would likely be required.

Additional comments: All options that would widen this section of Chaparral Road to five lanes would likely increase traffic along the corridor. Some vehicles would be diverted to Chaparral Road with the increased capacity, improving conditions along parallel routes such as Camelback Road and Indian School Road. Local streets in the area would likely see the benefits from reduced neighborhood cut-through traffic. Intersection capacity improvements would be necessary at the Chaparral Road and Scottsdale Road intersection.

Three Lane Options:

Option 3A - Retain the existing three-lane cross section of roadway as is with full public access to remain per the current conditions.

Considerations: Livability along this section of roadway would not be improved.

Option 3B - Retain the existing three-lane cross section of roadway as is; install raised medians, roundabouts, stop signs, traffic signals or other traffic calming/traffic control devices to discourage through traffic.

Considerations: The effectiveness of these types of devices would not be certain prior to installation. Typically traditional traffic calming devices are not recommended for traffic volumes exceeding 10,000 vehicles per day. Any new traffic control devices should meet established warrants. Traffic signals, especially at the 78th Street intersection, would likely increase traffic on the adjacent streets.

Option 3C – Retain the three-lane cross section on Chaparral Road; however, install traffic diverters or signage to prohibit certain movements (through traffic or turning traffic) to reduce the volume of traffic on Chaparral Road between Miller Road and Hayden Road.

Considerations: Traffic would be diverted to other streets within this corridor. Enforcement of the restrictions may become an on-going issue. Access to the Chaparral Plaza shopping center could be impacted.

Option 3D – Retain the three lane cross section on Chaparral Road and construct a wall or other device that would eliminate through traffic at a location between Miller Road and Hayden Road.

Considerations: Traffic would be diverted to other streets within this corridor. Local access for area residents would be affected. Access to the Chaparral Plaza shopping center would be impacted.

Option 3E - Convert the existing center lane to operate as a reversible lane during morning and afternoon peak hours (similar to 7th Street and 7th Avenue in the City of Phoenix).

Considerations: May decrease safety as drivers adjust to the reversible lane operation. Left turns into the residential driveways along this section would be prohibited during the peak hours. Traffic volumes would likely increase with the increased capacity. Livability along this section of roadway would not be improved.

Option 3F - Convert center lane to second westbound or eastbound travel lane

Considerations: Left turns into the residential driveways along this section would be prohibited. Neither eastbound nor westbound travel is dominant throughout the entire day. Traffic volumes would likely increase with the increased capacity. Livability along this section of roadway would not be improved.

Additional comments: Some options that would retain the three-lane section along Chaparral Road would either increase traffic volumes along the corridor or maintain current traffic volumes. Some drivers will continue to look for alternative routes on local streets. Intersection capacity improvements would still be necessary at the Scottsdale Road intersection. Options that prohibit certain movements or completely block access will impact access for the residential properties along Chaparral Road and the Chaparral Plaza shopping center. Drivers may choose to use local streets to avoid these restrictions.

Two Lane Options:

Option 2A - Redesign the section from Miller Road to Hayden Road to operate as a one-way street, either eastbound or westbound. Eliminate the existing center turn lane and use this area to add bike lanes, landscaping, and low walls.

Considerations: Travel speeds would likely increase with one-way operation. Traffic volumes would not be reduced to local street levels. Safety would likely be reduced due to disparity in travel speeds, vehicles changing lanes, turning vehicles, and driver confusion. Neither eastbound nor westbound traffic is currently dominant for the entire day. Some increase of traffic volumes on the area local streets would be likely due to vehicles using the corridor to travel in the opposite direction.

Option 2B - Narrow the cross section to be consistent with a local street. Create a local street environment by reducing the existing three lane cross section to two lanes by removing the center turn lane.

Considerations: Left-turning vehicles would stop in the through travel lanes obstructing through traffic. Other east-west roadway capacity would have to be added in this area to accommodate the diverted Chaparral Road traffic (likely along Indian School Road, Camelback Road, or McDonald Drive). Drivers would need incentives to use alternate routes as well as penalties for using Chaparral Road. This could only be accomplished by turn restrictions, diverters, or other punitive devices. Traffic volumes would likely increase on area local streets as drivers seek alternative routes.

Other Concepts:

Option 1A - Construct a direct Chaparral Road to Camelback Road connection using the land in the Villa Monterey Park immediately east of Hayden Road.

Considerations: The deed restrictions may not allow the use of the land for a roadway. Homes that currently have open space adjacent would now have a new roadway adjacent. This proposal would be in direct opposition to long standing community intent for the public use of the Indian Bend Wash corridor as a green belt/recreation area. The City has already discussed new uses for the park land with area residents. This would be an expensive roadway project due to the drainage features, grade differences, and construction costs. Traffic volumes along the section of Chaparral Road west of Hayden Road may not decrease significantly.

Option 1B – Create an offset intersection for Chaparral Road at Hayden Road using a portion of the Villa Monterey Park.

Considerations: Some vehicles would navigate the offset and continue on Chaparral Road. The close spacing of the two major intersections would create a highly congested area on Hayden Road, one of the City’s major north-south corridors.

Option 1C - Increase the capacity of other east-west streets in this area. This could include widening Indian School Road, widening Thomas Road, extending Camelback Road to Pima Road, and extending Osborn Road to Pima Road.

Considerations: Established neighborhoods would be impacted by the increase in traffic along these roadways. Elementary schools are adjacent to both Camelback Road and Osborn Road.

Option 1D –Improve the pedestrian crossings available in the section of Chaparral Road between Miller Road and Hayden Road via additional traffic control devices.

Considerations: This option would allow safer pedestrian crossings for the area residents to travel across Chaparral Road. This option alone would not decrease the traffic volume on Chaparral Road.

Option 1E – Provide better transit, bicycle, and pedestrian mode choices for the area residents.

Considerations: This would not likely result a significant reduction in traffic volumes on Chaparral Road but could improve area access and help reduce traffic volumes in conjunction with other measures.

Option 1F - Eliminate the age restriction on the residential units with front yards and driveways along Chaparral Road. Younger residents may be more accepting of the traffic conditions along Chaparral Road.

Considerations: The Villa Monterey Homeowners' Association would have to amend their Codes, Covenants, and Restrictions (CC&R's) to allow this. This does not improve the current conditions along this section of roadway; it may allow residents to occupy these residential units that have more tolerance for the conditions, however families with children may have similar concerns about traffic volumes.

Option 1G – Use a combination of the elements described above. For example, redesign the section from Miller Road to 78th Street to operate as a one-way, westbound street with two lanes; eliminate the existing center turn lane and medians; provide on-street parking; install a traffic signal at 78th Street; and improve the Scottsdale Road and Chaparral Road intersection to provide dual westbound left turns.

Considerations: Travel speeds would likely increase with one-way operation, and may not be consistent with on-street parking. Traffic volumes would not be reduced to local street levels. Some increase of traffic volumes on the area local streets would be likely due to vehicles using the corridor to travel in the opposite direction. A traffic signal is not likely to be warranted at the 78th intersection.

Resident Commentary:

City Transportation staff met with Villa Monterey residents on April 25th, 2007, to discuss the Chaparral Road issues. Staff listened to the residents' concerns, provided information about the upcoming City Council Special Meeting, and answered questions about the current study. During that meeting, attendees were provided with a list of seventeen "alternatives to widening" that had been identified during the

Transportation Master Plan discussions. They were also able to suggest alternatives that were not on this list. The residents were asked to rank these options from one to five to identify their preferred solutions. A copy of the complete list of alternatives is provided in Appendix G.

Staff received 82 responses to the listed options for Chaparral Road alternatives. The top six preferred options identified by the responding Villa Monterey residents were the following:

1. Install traffic diverters or similar devices to discourage through traffic.
2. Improve signage on the Loop 101 Freeway to direct traffic on the freeway to downtown Scottsdale via alternate routes.
3. Construct a direct Chaparral Road to Camelback Road connection using the former Villa Monterey golf course property.
4. Install a traffic signal at the Chaparral Road and 78th Street intersection.
5. Install signage that prohibits drivers from turning onto Chaparral Road during the peak traffic hours.
6. Reduce the east-west through lanes on Chaparral Road at the Hayden Road intersection to one lane per direction and increase the northbound to eastbound right turn lane on Hayden Road at the Chaparral Road intersection.

The six least desirable options identified were the following (listed in order of most acceptable to least acceptable):

12. Convert Chaparral Road to a one-way, westbound street.
13. Construct a wall, traffic diverter, or other device to close Chaparral Road at 78th Street, while leaving the section between Miller Road and 78th Street open to traffic.
14. Modify Chaparral Road to become a “woonerf” street, which would eliminate curbs and add landscaping and parking.
15. Convert the existing center turn lane on Chaparral Road to an additional eastbound or westbound through lane.
16. Convert the existing center turn lane on Chaparral Road to operate as a reversible lane during peak hours.
17. Rezone the lots along Chaparral Road to other than single family to allow redevelopment.

In addition to the 17 alternatives provided to the Villa Monterey residents by Transportation staff, meeting organizer Kathy Feld provided a list of options for the redesign of Chaparral Road to meeting attendees. The residents were asked to check their preferred options and list any options not indicated on the page. A total of 47 responses were received. A copy of the page of suggestions is provided in Appendix G.

Suggestions:	Yes	No
Roundabouts	16	7
Islands with landscaping	18	6
Monument denoting our community	17	7
Trolley route on Chaparral	16	10
Crosswalks	27	

Specifically at 77th and 78th Street	1	
Bike lanes	12	6
On-street parking	7	11
Traffic lights	25	3
Specifically stated 78th Street	11	
Specifically stated 77th Street	3	

A complete listing of the other alternatives suggested by the Villa Monterey residents is included in Appendix G.

Base Existing and Future Traffic Conditions

Scottsdale Transportation Master Plan

April 23, 2007

Prepared for:

City of Scottsdale

Prepared by:

HDR

Table of Contents

List of Figures

List of Tables

Base Existing and Future Traffic Conditions

1.0 INTRODUCTION

This Appendix consists of two reports:

- o Section 1: The Base Existing and Future Traffic Conditions; and
- o Section 2: The Scottsdale Travel Demand Model Report.

Section 1 was developed from the Maricopa Association of Governments (MAG) traffic forecast model to describe the base existing and future (2030) traffic conditions throughout the City of Scottsdale. Section 2, the Travel Demand Model Report, documents the development and validation of the transportation model that was created for the City of Scottsdale, as a sub-component of the *Transportation Master Plan*. The model was developed as a tool to more thoroughly project potential future traffic conditions throughout the City's street network. It was built using the TransCAD transportation forecasting microcomputer software and was calibrated using the year 2006 transportation network and estimated 2006 socioeconomic data.

1.1 Traffic Forecast Model Background

This Travel Demand Model, implemented using a multi-platform transportation planning package known as EMME/2, is improved every year through ongoing data collection efforts by MAG. The MAG travel demand model is used as an analysis tool in region-wide highway and transit planning studies, as well as for development impact studies. MAG also develops multi-year socioeconomic forecasts that are used as key inputs into the travel demand model. The current planning horizon is the year 2030.

The MAG travel demand model is calibrated using a verity of sources. The major sources for model calibration/validation are:

- o 2000 Census;
- o 2000 CTPP (Census Transportation Planning Package);
- o 2000 MAG Region-wide Home Interview Survey;
- o 2001 System-wide Transit Origin – Destination Survey;
- o 2001 Parking Study;
- o 2000 Traffic counts;
- o 2002 Travel Speed Study;
- o 2005 Vehicle Occupancy Study;
- o 2006 Freeway Level of Service Study;
- o On –Going Collection of local jurisdiction traffic counts;
- o Sky Harbor Vehicle Counts; and
- o ASU data collection efforts.

The MAG model is a sequential four-step model that includes the following steps:

1. Trip Generation: Product is total number of person trips generated in the region;
2. Trip Distribution: Product is the total number of person trips destined to each area;

3. Model Choice: Product is trips destined to each area and the mode (auto, transit, and carpool) used to make the trip; and
4. Traffic and Transit Assignments: Product is the assignment of these trips by model to the roadway network and transit system.

In addition to the traditional travel demand steps, the MAG model contains special generators to estimate demand at major destinations, such as Sky Harbor Airport. The demand is based on surveys at the site, and produces estimates of vehicle trips rather than person trips.

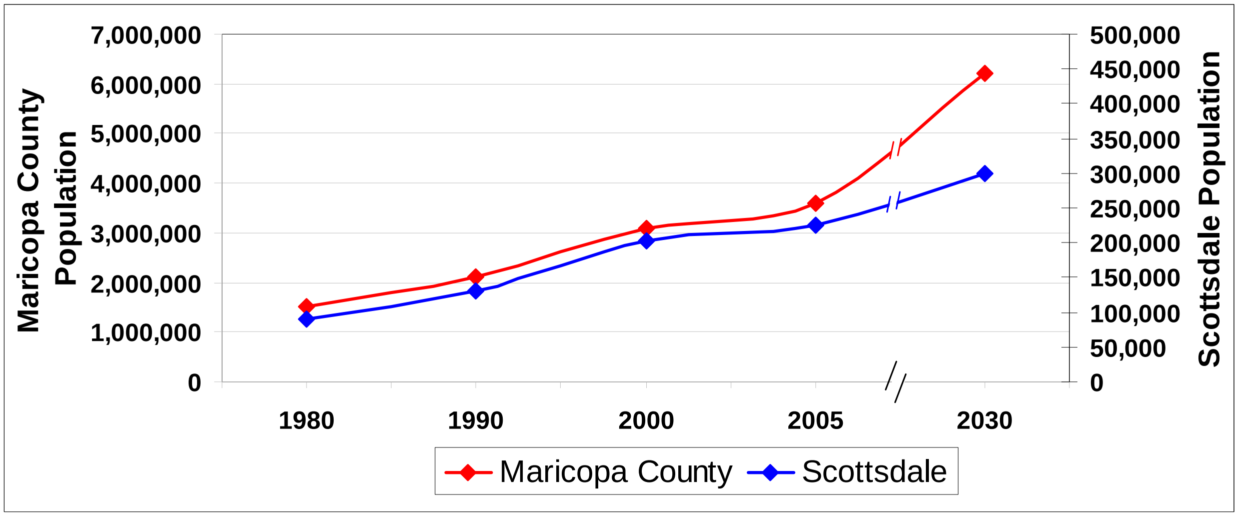
HDR worked with the City and MAG to review the network and socioeconomic data that was included in the MAG model for Scottsdale and its adjacent communities, including the Salt River Pima-Maricopa Indian Community (SRPMIC), Maricopa County, Paradise Valley, Carefree, Cave Creek, Tempe, and Phoenix. The base future network has been determined through close coordination with Scottsdale staff, and includes the existing transportation system, projects from the 2000 Bond Program, and the current five-year Capital Improvement Program.

2.0 SOCIOECONOMIC DATA

A key element in forecasting future traffic volumes in a region is the magnitude and distribution of population and employment growth within that region. As Scottsdale is one of 25 cities and towns within Maricopa County, the growth in both the City itself and the entire County are important factors in developing traffic forecasts for the *Transportation Master Plan*.

Scottsdale's population growth trend has mirrored that of Maricopa County up to approximately 2005. However, after 2005, Scottsdale's population growth rate is expected to proceed at a less aggressive pace than that of the County (*Figure 1*). On the other hand, Scottsdale's employment is generally expected to increase, with the highest growth expected in the Retail and Business Services sectors (*Table 1*).

Figure 1: Population Growth for Scottsdale and Maricopa County



The median age in Arizona and Scottsdale is expected to increase. According to the 2000 U.S. Census, the median age in Arizona and Scottsdale was 34 and 41 years respectively. Approximately 17 and 13 percent, respectively, of the population in the City and State was over the age of 65. U.S. Census projections indicate that by 2030 the median age in Arizona will be 39 years, with 22 percent over the age of 65. It is reasonable to assume, therefore, that the percentage of adults who potentially can't or won't drive will grow significantly by 2030, thus changing the region's transportation needs.

MAG is currently updating the socioeconomic data projections based upon the 2005 special census. This data will be available for future traffic forecasts in 2007. The socioeconomic data now available were developed in 2003 and were based upon the 2000 federal census.

Table 1
Scottsdale Employment by Industry

Employment By Industry	2000 Employment	2000 Percent	2030 Employment	2030 Percent
Agriculture	1,918	1.50	2,583	1.35
Mining	122	0.10	124	0.06
Construction	7,077	5.50	8,904	4.66
Low Tech Mfg.	2,985	2.30	4,436	2.32
High Tech Mfg.	8,138	6.30	9,434	4.94
Transport	3,842	3.00	4,245	2.22
Wholesale Trade	6,674	5.20	10,518	5.51
Retail Trade	18,725	14.50	29,508	15.46
FIRE	16,440	12.80	20,017	10.49
Business Services	26,848	20.90	48,490	25.40
Health Industry	12,785	9.90	17,445	9.14
Hospitality	14,652	11.40	21,868	11.46
Personal Services	8,446	6.60	13,304	6.97
TOTAL	**128,652**	**100**	**190,876**	**100**

Source: 2006 Economic Vitality Strategic Plan

A number of changes have occurred since the 2003 projections were prepared which affect the traffic forecasts. These include the following:

- Population and employment projections for the Desert Ridge area of Phoenix are substantially underestimated. This area is located in the City of Phoenix, north of Loop 101 and adjacent to Scottsdale Road. The 2003 MAG socioeconomic data projected the number of households within Desert Ridge would be approximately 16,000 by the 2030. The City of Phoenix now projects that the Desert Ridge area and adjacent State Land areas will have a build-out of 70,000 housing units and 55,000 employees.

- The SRPMIC is now planning to develop the land along the Loop 101 corridor, zoned commercial, with an anticipated 66,000 employees. The 2003 MAG socioeconomic data projected an estimated 6,800 employees and residents.

The socioeconomic data used for the traffic assignments in this Scottsdale analysis were modified to reflect both the Desert Ridge and SRPMIC changes in socioeconomic data.

In addition, specific to the City of Scottsdale:

- The assumption was made that land within the McDowell Sonoran Preserve Area would not be developed beyond current conditions.
- The Downtown Scottsdale residential and mixed-use development that is taking place today is consistent with the *General Plan* and thus is reflected in the 2003 socioeconomic projections, thus no modifications in the data were needed.

This traffic assignment prepared with the aforementioned socioeconomic modifications was used in the traffic analysis for the *Transportation Master Plan* project and is referred to as the "Scottsdale Special Assignment" in this text.

3.0 TRAFFIC DATA

3.1 Freeway Volumes

The Arizona Department of Transportation's 2004 freeway volumes in conjunction with the data obtained from the MAG 2030 assignment were used to prepare an analysis for the Loop 101 segments in Scottsdale and Loop 202 segments adjacent to Scottsdale as seen in *Table 2*.

The data collected to perform the analysis includes existing number of lanes, 2004 Average Daily Traffic (ADT) traffic volumes, 2030 MAG forecast traffic volumes, and 2030 planned number of lanes. The column labeled *2004 Traffic Volume per Lane* reveals that the volume per lane on Loop 101 ranges from 17,200 vehicles per lane (vpl) per day between Princess Drive and Scottsdale Road, a peak hour Level of Service (LOS) D, to 30,300 vpl per day between McDonald Drive and Indian Bend Road (LOS F). On Loop 202, the volume per lane ranges from 15,100 vpl east of Country Club Road/SR 87 (LOS D) to 20,600 vpl between McClintock Drive and Center Parkway (LOS E).

The column labeled *2030 Forecasted Traffic Volume per Planned Lane* reveals that on Loop 101, the forecast 2030 volume per lane ranges from 18,800 vpl west of Scottsdale Road to 29,300 vpl between McDonald Drive and Indian Bend Road. Fifteen of the 16 segments of Loop 101 in Scottsdale will carry over 20,000 vpl in 2030 (compared to nine segments in 2004), even with planned widenings to ten lanes from the six or eight lanes on the freeway today. Thus, even though the maximum volume per lane will not increase between 2004 and 2030, the number of segments that carry this higher volume will increase.

For Loop 202, the forecasted 2030 volume per lane ranges from 18,800 west of Center Parkway to 25,300 vpl east of Country Club Drive/SR87. Seven of the nine segments of Loop 202 will carry over 20,000 vpl in 2030 (compared to two segments in 2004). As with Loop 101, the number of segments that carry volumes over 20,000 vpl will increase, even with increased capacity. Thus, congestion in Loop 101 and Loop 202 will not improve, and will likely be worse in 2030, with the freeway continuing to operate at a LOS F for three to five hours per day.

The final column in *Table 2, % Increase in Traffic Volume per Lane,* shows the percent increase in traffic per lane on Loop 101 from the actual 2004 ADT traffic volumes to the 2030 forecasted traffic volumes. The nine segments that carry over 20,000 vpl in 2004 experience minimal change in traffic volume per lane between 2004 and 2030. The percent increase in the remaining segments is over ten percent, with the highest increase of 26 percent experienced south of McKellips Road.

The four segments of Loop 202 that are west of the Loop 101 interchange experience an increase in traffic volume of ten percent per lane. The five segments east of the Loop 101 interchange experience a dramatic increase in volume, ranging from 22 percent between Alma School Road and the Loop 101 interchange to 68 percent east of Country Club Drive/SR 87.

Figure 2 illustrates the 2004 daily traffic volumes on the Scottsdale segments of Loop 101 and adjacent segments of Loop 202. The volumes range between 100,000 and 182,000 vehicles per day (vpd) on Loop 101 and between 91,000 and 206,000 vpd on Loop 202. The highest volume occurs on the segment between McDonald Drive and Indian Bend Road with 182,000 vpd on Loop 101 and on the segment between McClintock Road and Scottsdale Road with 206,000 vpd on Loop 202.

The dramatic increase in traffic volume presented in the final column of *Table 2* is further illustrated by the 2030 volumes shown in *Figure 3*, with volumes ranging between 188,000 to 293,000 vpd on Loop 101 and 197,000 to 273,000 on Loop 202. On Loop 101, the segment between McDonald Drive and Indian Bend Road experiences the highest forecasted volume, with 293,000 vpd. The highest forecasted volume on Loop 202 is experienced on the segment between Scottsdale Road and Center Parkway with 273,000 vpd. The daily volumes per lane for the years 2004 and 2030 are shown in *Figure 4* and *Figure 5*, respectively.

Table 2
Loop 101 and Loop 202 Average Daily Traffic Volumes

From	To	Existing Number of Lanes	2004 Traffic Volume	2004 Traffic Volume per Lane	2030 Planned Number of Lanes **	2030 Forecast	2030 Forecasted Traffic Volume per Planned Lane	% Increase in Traffic Volume per Lane
Loop 101								
	South of McKellips Road	8	158,000	19,800	10	249,000	24,900	26
McKellips Road	McDowell Road	6	166,000	27,700	10	269,000	26,900	-3
McDowell Road	Thomas Road	6	150,000	25,000	10	246,000	24,600	-2
Thomas Road	Indian School Road	6	147,000	24,500	10	241,000	24,100	-2
Indian School Road	Chaparral Road	6	142,000	23,700	10	236,000	23,600	0
Chaparral Road	McDonald Drive	6	159,000	26,500	10	260,000	26,000	-2
McDonald Drive	Indian Bend Road	6	182,000	30,300	10	293,000	29,300	-3
Indian Bend Road	Via de Ventura	6	165,000	27,500	10	266,000	26,600	-3
Via de Ventura	Pima Road	6	162,000	27,000	10	270,000	27,000	0
Pima Road	Shea Boulevard	6	152,000	25,300	10	261,000	26,100	3
Shea Boulevard	Cactus Road	6	119,000	19,800	10	222,000	22,200	12
Cactus Road	Raintree Drive	6	118,000	19,700	10	225,000	22,500	14
Raintree Drive	Frank Lloyd Wright Boulevard	6	110,000	18,300	10	215,000	21,500	17
Frank Lloyd Wright Boulevard	Princess Drive	6	105,000	17,500	10	203,000	20,300	16
Princess Drive	Scottsdale Road	6	103,000	17,200	10	214,000	21,400	24
	West of Scottsdale Road	6	100,000	16,700	10	188,000	18,800	13
Loop 202								
	East of Country Club Drive/SR 87	6	91,000	15,100	10	253,000	25,300	68
Country Club Drive/SR 87	McKellips Road	6	94,000	15,700	10	223,000	22,300	42
McKellips Road	Alma School Road	6	94,000	15,700	10	201,000	20,100	28
Alma School Road	Dobson Road	6	97,000	16,200	10	197,000	19,700	22
Dobson Road	Loop 101	6	100,000	16,500	10	202,000	20,200	22
Loop 101	McClintock Drive	10	172,000	17,200	12	229,000	19,100	11
McClintock Drive	Scottsdale Road	10	206,000	20,600	12	272,000	22,700	10
Scottsdale Road	Center Parkway	10	206,000	20,600	12	273,000	22,800	11
	West of Center Parkway	10	168,000	16,800	12	225,000	18,800	12

* 2004 ADOT Traffic Counts
** Planned number of lanes includes 1 HOV lane and 1 additional general purpose lane in each direction.

Figure 2: 2004 Loop 101 and Loop 202 Traffic Volumes

Figure 3: 2030 Loop 101 and Loop 202 Traffic Volumes

Figure 4: 2004 Loop 101 Volume per Lane

Figure 5: 2030 Loop 101 Volume per Lane

3.2 Arterial Street Volumes

3.2.1 Screenline Analysis

Scottsdale's 2004 traffic volumes, in conjunction with the data obtained from the MAG Scottsdale Special Assignment, were used to prepare a screenline analysis for key locations throughout the City. A screenline analysis compares 24-hour traffic volumes crossing an imaginary line to determine the traffic flow in an area of the City. The analysis compares existing and planned roadway capacity to existing and forecasted traffic volumes to determine where increased roadway capacity or reduction should be considered. The vehicle capacity of an arterial roadway varies depending upon roadway geometrics, access management, and traffic signal spacing and timing. For this general analysis of existing and future traffic service, a capacity of 8,000 vpd per lane is assumed.

Table 3 shows the results of 11 screenlines located in key locations throughout the City (*Figure* 6). The data collected to perform the analysis includes existing number of lanes, 2004 Scottsdale traffic volumes, 2030 MAG forecast traffic volumes, and 2030 planned number of lanes. The column labeled *2004 Traffic Volume/Capacity* (V/C) compares actual 2004 Scottsdale traffic volumes to existing roadway capacity, based upon an average lane capacity of 8,000 vpd. As the V/C approaches 1.0, the traffic volume equals the average capacity, thus additional person capacity should be considered in the corridor either through roadway widening, operational improvements such as intersection improvements and signal timing, or enhanced transit, bicycle, and pedestrian facilities to accommodate future growth. As shown in *Table 3* there is only one location, Screenline 9 north of Thompson Peak Parkway, where the V/C is 1.0 in 2004. By 2030, Screenline 8, north of Bell Road/Frank Lloyd Wright Boulevard, will also have a V/C greater than 1.

The screenline analysis reveals that traffic flowing into and out of Downtown Scottsdale, represented by Screenlines 1 through 4, will continue to have adequate capacity through 2030. Traffic volume is forecasted to increase about 12 to 34 percent in this area. The largest forecasted traffic volume increase is 95 percent (primarily because of the low 2004 volume) at Screenline 11, in northern Scottsdale, east of Scottsdale Road. This screenline cuts through Carefree Highway, Lone Mountain Road, Dixileta Drive, Dynamite Boulevard, Jomax Road, and Pinnacle Peak Road. Even with the large increase in traffic volumes along this screenline, existing and proposed capacity is more than adequate to support actual and forecasted traffic volumes.

Figure 6: Screenline Locations

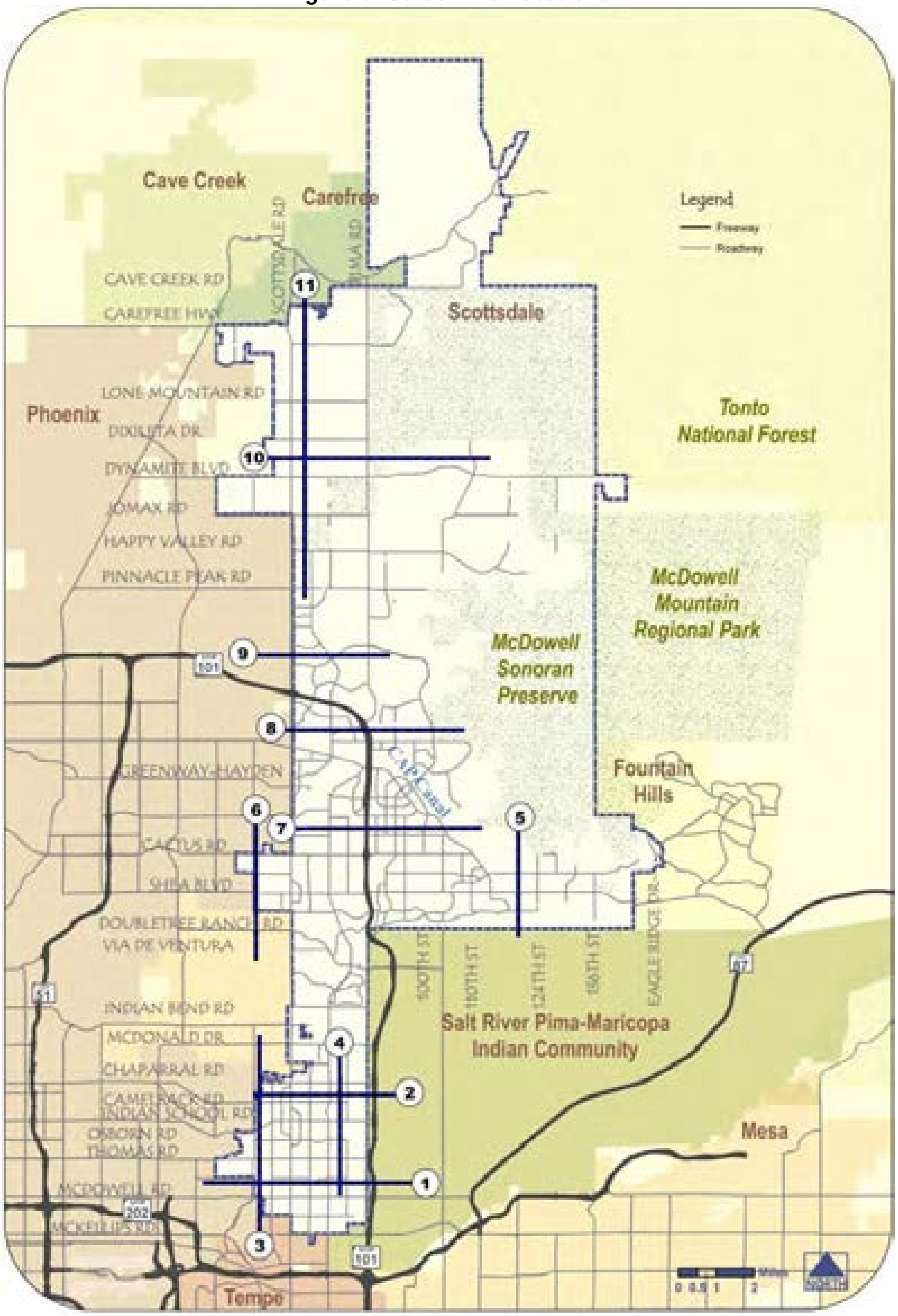


Table 3
Screenline Analysis

Screenline	Corridor	Cross Street	Existing Number of Lanes	Existing Capacity	2004 Traffic Counts	2004 Traffic Volume/ Capacity	2030 Planned Number of Lanes	2030 Planned Capacity	2030 Forecast	2030 Forecasted Traffic Volume/ Planned Capacity	% Increase in Traffic Volume
1	North of McDowell Road	64th Street	4	32,000	16,414	0.66	4	32,000	31,800	0.75	24.0
		68th Street	2	16,000	10,840		2	16,000	10,700		
		Scottsdale Road	6	48,000	42,343		6	48,000	42,700		
		Miller Road	2	16,000	8,964		2	16,000	8,700		
		Hayden Road	6	48,000	32,223		6	48,000	33,300		
		Pima Road	2	16,000	4,626		4	32,000	15,900		
2	South of Chaparral Road	68th Street	2	16,000	12,386	0.69	4	32,000	15,000	0.73	26.6
		Scottsdale Road	6	48,000	39,222		6	48,000	41,500		
		Miller Road	2	16,000	9,005		2	16,000	9,100		
		Hayden Road	6	48,000	36,047		6	48,000	38,400		
		Granite Reed Road	2	16,000	4,802		2	16,000	5,400		
		Pima Road	2	16,000	9,574		4	32,000	31,200		
3	West of 68th Street	Camelback Road	6	48,000	31,741	0.57	6	48,000	37,400	0.64	12.1
		Indian School Road	6	48,000	23,660		6	48,000	25,300		
		Osborn Road	2	16,000	3,953		2	16,000	2,700		
		Thomas Road	6	48,000	30,421		6	48,000	37,700		
		Oak Street	2	16,000	3,236		2	16,000	4,600		
		McDowell Road	6	48,000	35,774		6	48,000	36,700		
4	West of Granite Reef Road	Chaparral Road	4	32,000	25,333	0.79	4	32,000	29,800	0.94	34.4
		Camelback Road	2	16,000	5,795		2	16,000	5,300		
		Indian School Road	4	32,000	36,817		4	32,000	60,600		
		Osborn Road	2	16,000	4,796		4	32,000	7,400		
		Thomas Road	4	32,000	27,850		4	32,000	32,100		
5	West of 120th Street	Mountain View Road	2	16,000	6,129	0.67	2	16,000	6,300	0.92	35.8
		Shea Boulevard	6	48,000	42,851		6	48,000	63,800		
		Via Linda Road	4	32,000	15,808		4	32,000	17,900		
6	East of 64th Street	Shea Boulevard	6	48,000	48,975	0.86	6	48,000	48,100	0.86	-0.1
		Cholla Street	2	16,000	4,686		2	16,000	3,800		
		Cactus Road	4	32,000	29,286		4	32,000	31,000		
7	South of Thunderbird Road	Scottsdale Road	6	48,000	46,555	0.60	6	48,000	52,500	0.67	12.0
		Hayden Road	4	32,000	20,502		4	32,000	25,000		
		94th Street	4	32,000	10,570		4	32,000	6,300		
		96th Street	4	32,000	3,224		4	32,000	12,300		
		Frank Lloyd Wright Boulevard	4	32,000	25,002		4	32,000	22,500		
8	North of Bell Road/ Frank Lloyd Wright Boulevard	Scottsdale Road	4	32,000	44,276	0.85	6	48,000	63,000	1.16	59.6
		Hayden Road	4	32,000	17,439		4	32,000	35,600		
		Thompson Peak Parkway	4	32,000	19,657		4	32,000	31,300		
9	North of Thompson Peak Parkway	Scottsdale Road	4	32,000	43,102	1.00	6	48,000	71,000	1.11	47.9
		Hayden Road	4	32,000	16,857		4	32,000	36,800		
		Pima Road	4	32,000	35,997		6	48,000	34,100		
10	North of Dynamite Boulevard	Scottsdale Road	4	32,000	26,212	0.83	6	48,000	33,600	0.64	54.1
		Pima Road	2	16,000	13,765		6	48,000	28,000		
11	East of Scottsdale Road	Carefree Highway	2	16,000	14,038	0.47	4	32,000	26,600	0.46	95.0
		Lone Mountain Road	2	16,000	4,300		4	32,000	4,800		
		Dixileta Drive	2	16,000	1,800		4	32,000	5,500		
		Dynamite Boulevard	2	16,000	8,256		6	48,000	16,000		
		Jomax Road	2	16,000	1,500		2	16,000	4,600		
		Pinnacle Peak Road	2	16,000	15,700		4	32,000	31,400		

3.3 Arterial Volumes

3.3.1 Overview

In 2004, Scottsdale's street network consisted of approximately 293 miles and 1,054 lane miles of arterial and collector streets. In order to get a feel for the change in arterial street volume over time, the 133 miles of streets for which 2004 daily traffic volumes were used. *Table 4* and *Table 5* summarize the traffic volume by classification for 2004 and 2030, respectively. The lane classification was obtained from the City of Scottsdale 2003 *Streets Master Plan*. *Table 5* data from 2030 was derived from the Scottsdale Special Assignment for the same streets. In 2004, 50 percent of the 133 mile sample of streets carried over 15,000 vpd whereas in 2030, 75 percent of the same 133-mile sample of streets is projected to carry similar daily volumes.

Illustration of these changes is provided in *Figure 7* and *Figure 8.* Traffic volumes from 2004 are shown in *Figure 7*, with many arterials and collectors showing volumes less than 15,000 vpd. Traffic volumes from 2030 are shown in *Figure 8* with an increase of arterials with volumes over 45,000 vpd. The following section discusses the volume changes from 2004-2030 in three geographic segments.

Table 4
2004 Traffic Volume Summaries

Vehicles Per Day	Roadway Length (miles)					Percent
	Major Arterial	Minor Arterial	Major Collector	Minor Collector	Total	
0 - 15,000	16	11	6	23	56	50
15,001 -30,000	6	13	4	3	26	23
30,001 -45,000	11	3	1	1	16	14
45,001 -60,000	12	2	0	1	15	13
60,001 -75,000	0	0	0	0	0	0

Table 5
2030 Traffic Volume Summaries

Vehicles Per Day	Roadway Length (miles)					Percent
	Major Arterial	Minor Arterial	Major Collector	Minor Collector	Total	
0 - 15,000	3	6	2	17	28	25
15,001 -30,000	11	13	8	6	38	34
30,001 -45,000	17	8	1	4	30	27
45,001 -60,000	13	2	0	1	16	14
60,001 -75,000	1	0	0	0	1	1

Figure 7: 2004 Traffic Volumes

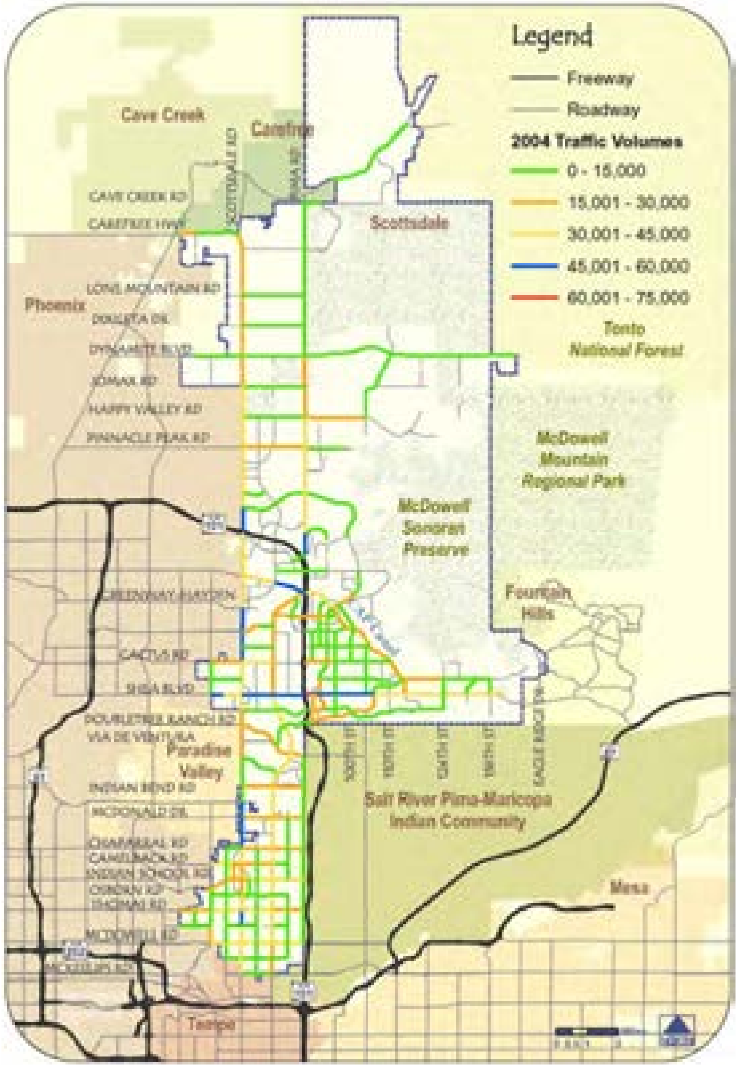
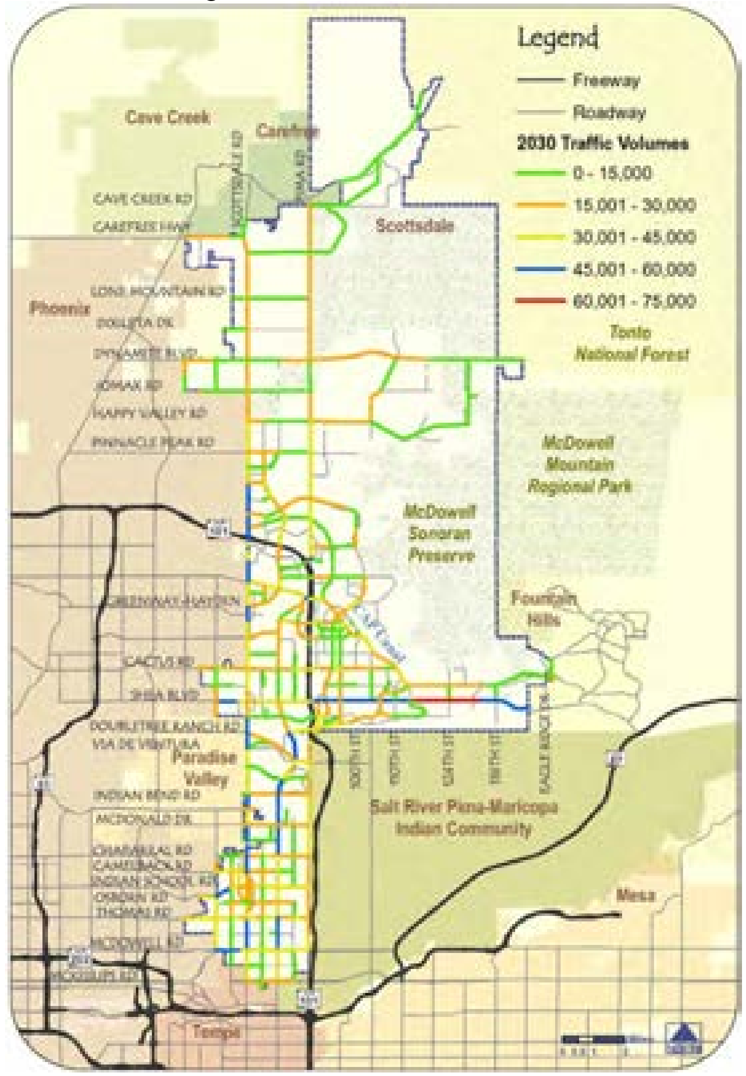


Figure 8: 2030 Traffic Volumes



3.3.2 Southern/Central/Northern Scottsdale

Figure 9, Figure 11, and *Figure 13* display the change in traffic volumes for three areas of Scottsdale: Southern, Central, and Northern, for the eight-year period from 1996-2004. The change in traffic volume from 2004-2030 for each of the three areas and are shown in *Figure* 10, *Figure 12,* and *Figure 14*.

In Southern Scottsdale, from 1996-2004, an increase in traffic of over 50 percent was seen in east/west arterials with direct access to Loop 101, which opened in this time frame, in the Hayden Road to Pima Road sections. The majority of the segments of the north/south arterials and collectors experienced a decrease, due to the opening of the freeway, of at least 25 percent, as illustrated in *Figure 9.* The trend continues from 2004-2030 for the east/west arterials with Loop 101 access. The majority of these arterials experience an increase of at least 25 percent, as shown in *Figure 10.* The largest increases in traffic are experienced on Indian Bend Road, Chaparral Road, and Indian School Road, with some segments increasing over 50 percent. For the north/south arterials and collectors, an increase in traffic is also seen, particularly on Pima Road, which is planned for widening to four lanes, with an increase of over 50 percent.

In Central Scottsdale, new development along the east-west segment of Loop 101 from 1996-2004 resulted in an increase in volume of over 50 percent on Frank Lloyd Wright Boulevard and on segments of Scottsdale Road and Pima Road north of Frank Lloyd Wright Boulevard, as illustrated in *Figure 11.* The change in volume from 2004-2030 is shown for the same area in *Figure 12* with a continuing increase in volume throughout most of the area.

In Northern Scottsdale from 1996-2004, Scottsdale Road, from Loop 101 to Dynamite Boulevard, and Pima Road, from Loop 101 to Happy Valley Road, experienced an increase in volume of over 50 percent. North of Dynamite Boulevard, volumes on Pima Road increased by over 25 percent (*Figure 13*). The change in volume from 2004-2030 (*Figure 14)* shows a volume increase throughout much of Northern Scottsdale.

Volumes for a sampling of individual streets (2004 and forecast 2030) in each of the three areas are shown in *Table 6, Table 7,* and *Table 8*.

Figure 9: Southern Scottsdale –
1996-2004 Change in Traffic Volumes

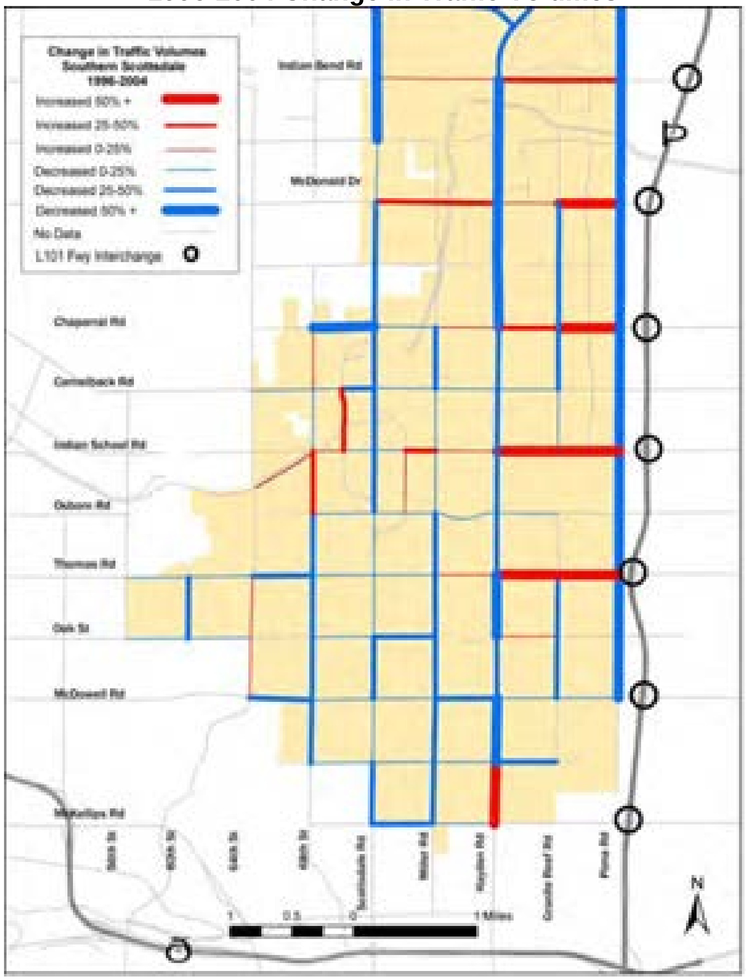


Figure 10: Southern Scottsdale –
2004-2030 Change in Traffic Volumes

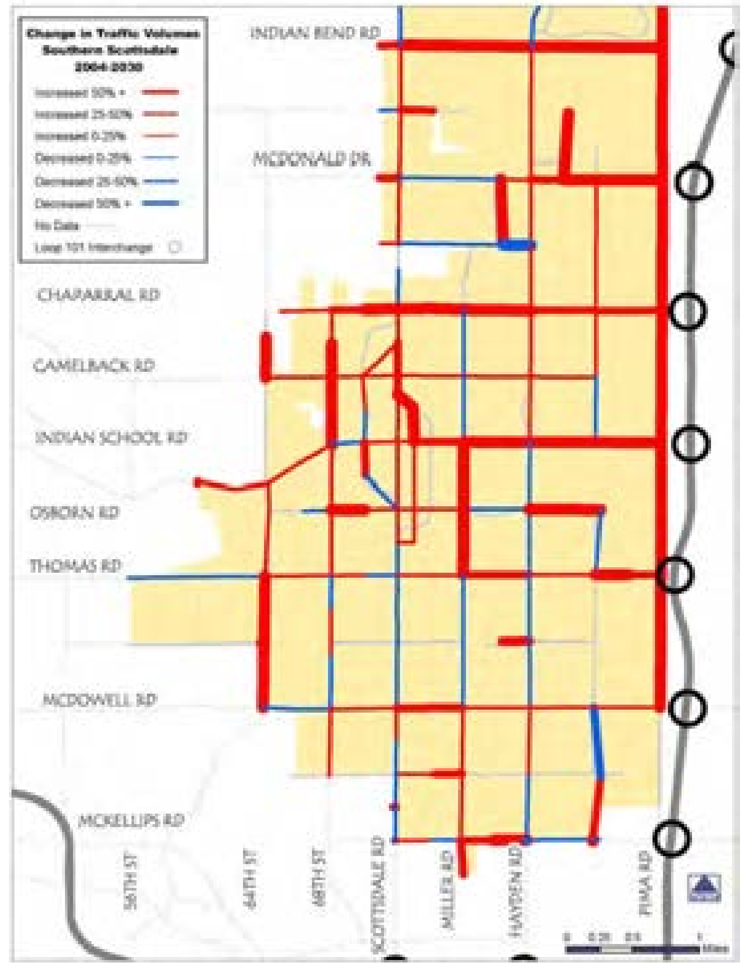


**Figure 11: Central Scottsdale –
1996-2004 Change in Traffic Volumes**

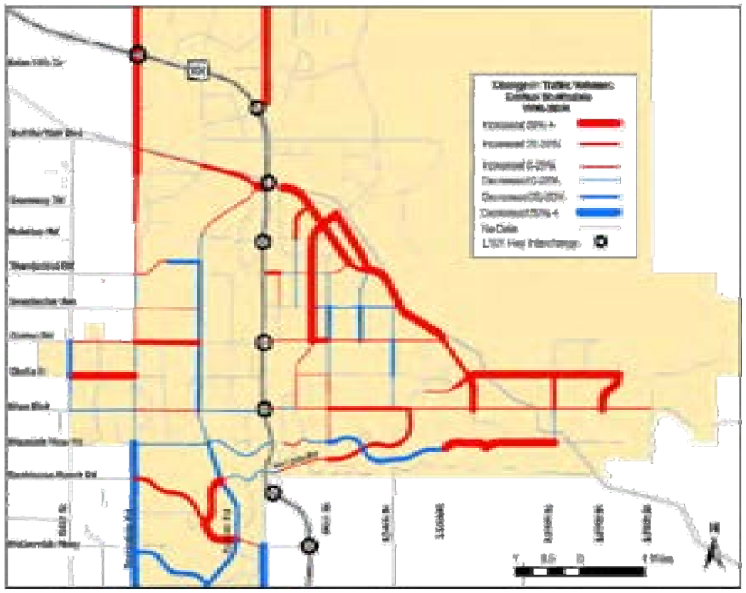


**Figure 12: Central Scottsdale –
2004-2030 Change in Traffic Volumes**

Figure 13: Northern Scottsdale –
1996-2004 Change in Traffic Volumes

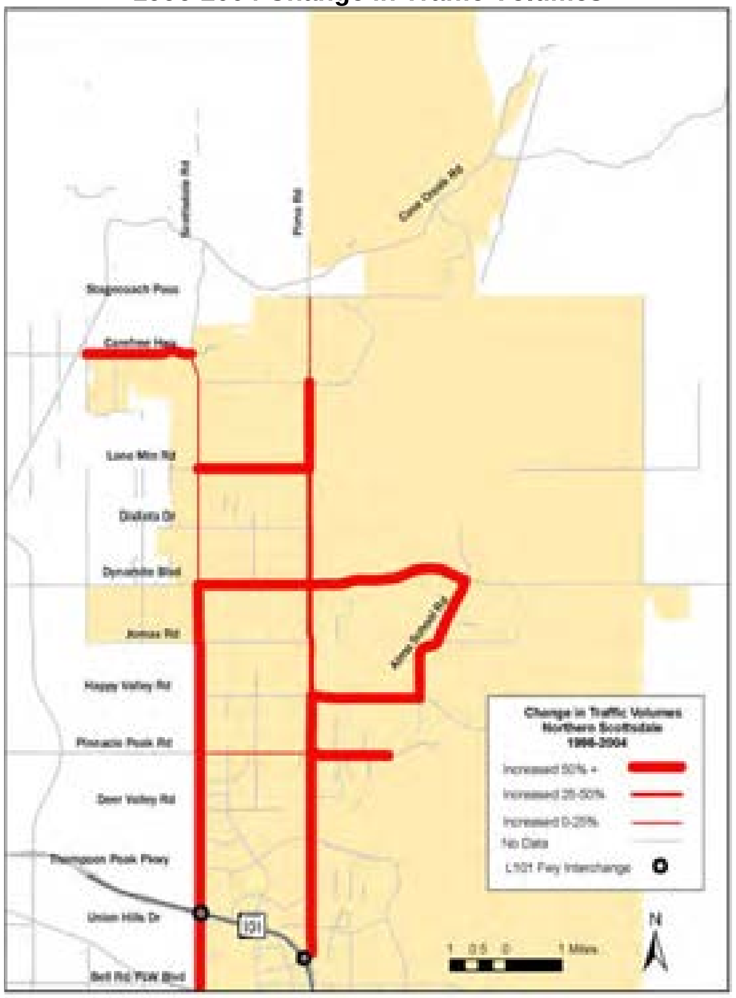


Figure 14: Northern Scottsdale –
2004-2030 Change in Traffic Volumes

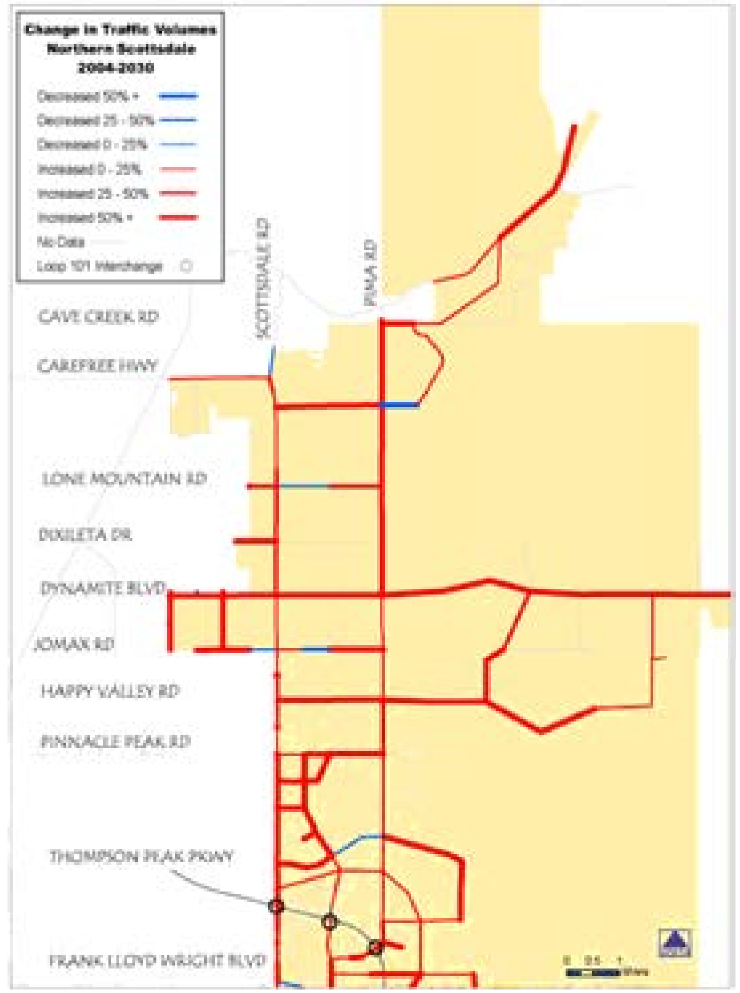


Table 6 Selected Streets in Southern Area Traffic Forecast					
Location			Scottsdale Daily Traffic Count	Forecasted Traffic Volumes	Projects % Traffic Volume Increase
Road	**From**	**To**	**2004**	**2030**	**2004 to 2030**
Osborn Road	68th Street Scottsdale Road Drinkwater Blvd	Scottsdale Road Drinkwater Blvd Miller Road	6,316 12,862 14,928	12,400 13,300 16,400	23
Indian School Road	68th Street Goldwater Blvd Scottsdale Road Drinkwater Blvd	Goldwater Blvd Scottsdale Road Drinkwater Blvd Miller Road	26,116 23,654 25,816 35,288	24,200 23,900 28,600 50,500	15
Camelback Road	68th Street Marshall Way Scottsdale Road	Marshall Way Scottsdale Road Miller Road	34,232 16,935 19,882	38,900 15,800 19,000	4
Chaparral Road	68th Street Scottsdale Road	Scottsdale Road Miller Road	3,186 19,168	3,800 28,400	44
68th Street	Thomas Road Osborn Road Indian School Road Camelback Road	Osborn Road Indian School Road Camelback Road Chaparral Road	13,408 13,160 14,945 12,386	15,400 13,700 26,800 21,200	43
Goldwater Boulevard	Scottsdale Road Indian School Road Camelback Road	Indian School Road Camelback Road Chaparral Road	18,330 22,507 17,250	16,800 21,700 22,800	6
Scottsdale Road	Thomas Road Osborn Road Indian School Road Camelback Road	Osborn Road Indian School Road Camelback Road Chaparral Road	40,403 29,123 26,158 39,222	38,300 30,100 39,300 41,500	11
Drinkwater Boulevard	Osborn Road Indian School Road	Indian School Road Scottsdale Road	14,036 5,445	17,100 6,800	23
Miller Road	Thomas Road Osborn Road 2nd Street Indian School Road Camelback Road	Osborn Road 2nd Street Indian School Road Camelback Road Chaparral Road	13,889 13,889 13,889 14,224 9,005	23,600 20,600 19,600 15,900 9,100	37

Table 7 Selected Streets in Central Area Traffic Forecast					
Location			Scottsdale Daily Traffic Count	Forecasted Traffic Volumes	Projects % Traffic Volume Increase
Road	**From**	**To**	**2004**	**2030**	**2004 to 2030**
Thunderbird Road	Scottsdale Road	76th Street	25,692	31,200	21
Raintree Drive	Hayden Road Northsight Blvd	Northsight Blvd SR101L	18,461 28,341	39,000 32,800	54
Greenway Hayden Loop	Scottsdale Road	Frank Lloyd Wright Blvd	10,076	9,800	-3
Paradise Lane	Scottsdale Road	Greenway Hayden Loop	3,500	3,500	0
Frank Lloyd Wright Boulevard	Scottsdale Road Hayden Road	Greenway Hayden Loop SR101L	36,751 47,600	37,500 58,700	14
Princess Drive	Perimeter Drive	Pima Road	9,816	14,200	45
Scottsdale Road	Cactus Road Sweetwater Avenue Thunderbird Road Butherus Drive Paradise Lane Frank Lloyd Wright Blvd Princess Blvd	Sweetwater Avenue Thunderbird Road Butherus Drive Paradise Lane Frank Lloyd Wright Blvd Princess Blvd SR101L	46,761 46,555 45,185 39,526 44,061 44,276 42,759	51,700 52,500 60,900 54,800 55,900 63,000 61,400	29
Hayden Road	Cactus Road Redfield Road	Redfield Road Frank Lloyd Wright Blvd	20,502 26,031	25,000 47,700	56

Table 8
Selected Streets in Northern Area Traffic Forecast

Location			Scottsdale Daily Traffic Count	Forecasted Traffic Volumes	Projects % Traffic Volume Increase
Road	**From**	**To**	**2004**	**2030**	**2004 to 2030**
Scottsdale Road	Loop 101	Thompson Peak Pkwy	48,200	81,600	40
	Thompson Peak Pkwy	Deer Valley Road	43,102	71,000	
	Deer Valley Road	Pinnacle Peak Road	43,076	57,500	
	Pinnacle Peak Road	Jomax Road	33,820	39,500	
	Jomax Road	Dynamite Boulevard	29,558	35,000	
	Dynamite Boulevard	Dixileta Drive	26,212	33,600	
	Dixileta Drive	Lone Mountain Road	21,942	30,700	
	Lone Mountain Road	Carefree Highway	21,501	26,000	
Pima Road	Princess Drive	Thompson Peak Pkwy	45,410	58,700	38
	Thompson Peak Pkwy	Pinnacle Peak Road	35,997	34,100	
	Pinnacle Peak Road	Happy Valley Road	36,995	40,700	
	Happy Valley Road	Dynamite Boulevard	18,310	19,900	
	Dynamite Boulevard	Lone Mountain Road	13,765	27,800	
	Lone Mountain Road	Westland Road	13,398	30,100	
	Westland Road	Stagecoach Pass Road	10,228	28,700	
130th Street	Shea Boulevard	Via Linda Road	3,400	5,700	68
136th Street	Shea Boulevard	Via Linda Road	5,400	9,600	78
Via Linda Road	Frank Lloyd Wright Blvd	124th Street	15,808	22,000	41
	124th Street	132nd Street	10,171	13,800	
	132nd Street	136th Street	4,000	6,500	
Shea Boulevard	Frank Lloyd Wright Blvd	124th Street	42,851	63,800	52
	124th Street	130th Street	36,376	56,100	
	130th Street	136th Street	34,955	53,300	
Bell Road	Loop 101	Thompson Peak Pkwy	8,735	25,800	195
Thompson Peak Parkway	Scottsdale Road	Hayden Road	12,568	20,300	48
	Hayden Road	Pima Road	9,020	6,500	
	Pima Road	Union Hills Drive	10,956	21,500	
Pinnacle Peak Parkway	Scottsdale Road	Pima Road	16,836	28,900	72
Happy Valley Road	Scottsdale Road	Pima Road	2,643	28,000	222
	Pima Road	Alma School Road	16,374	33,200	
Jomax Road	Scottsdale Road	Pima Road	1,525	4,400	189
Dynamite Boulevard	56th Street	64th Street	11,356	30,800	172
	64th Street	Scottsdale Road	8,256	16,400	
	Scottsdale Road	Pima Road	8,120	28,300	
	Pima Road	Alma School Road	12,593	32,600	
	Alma School Road	136th Street	9,050	26,400	
Carefree Highway	56th Street	60th Street	15,222	28,400	88
	60th Street	Scottsdale Road	14,038	26,600	
Stagecoach Pass Road	Pima Road	Legend Trail	1,738	7,200	314

4.0 INTERSECTION OPERATIONS IN DOWNTOWN SCOTTSDALE

Level of Service (LOS) is used to determine if a road or intersection is operating at ideal, average, or poor efficiency. For signalized intersections, LOS is defined in terms of control delay, which is a measure of driver discomfort and increased travel time. The *Highway Capacity Manual* (HCM 2000) prepared by the Transportation Research Board Committee on Highway Capacity and Quality of Service outlines six levels, ranging from A to F:

LOS A - Describes when movement is highly favorable and many vehicles do not stop at all at the intersection.

LOS B - Generally occurs with good movement at the intersection, but more vehicles stop than with LOS A.

LOS C - May result from only a fair amount of movement and/or longer cycle lengths. There are a significant number of vehicles stopping, although many still pass through the intersection without stopping.

LOS D - The influence of congestion becomes more noticeable and the percentage of vehicles not stopping declines.

LOS E - Indicates poor movement, long cycle lengths and high v/c ratios.

LOS F - Considered unacceptable to most drivers and may occur at high volume/capacity ratios, long cycle length and poor movement.

More detailed descriptions of LOS for all modes are provided in the *Transportation Master Plan* Glossary.

Cycle failure begins to appear at LOS C conditions and become more apparent with each following LOS. A cycle consists of the green, yellow, and red phases and cycle failure is when the green phase does not serve all the queued vehicles at the given approach. *Table 9* shows the range in vehicle delay represented by each LOS.

Table 9
Delay and Level of Service

LOS	Vehicle Delay (seconds/vehicle[sec/veh])
A	< 10
B	10 – 20
C	20 – 35
D	35 – 55
E	55 – 80
F	> 80

In 2006, Otak, Inc. prepared a study titled *Scottsdale Road Downtown Circulation Study* which included an existing intersection LOS analysis for the Downtown Scottsdale intersections listed in *Table 10*. The analysis was repeated for this report without adjusting intersection geometrics or signal timing utilizing 2030 volumes from the Scottsdale Special Assignment.

The results for the existing conditions reveal that in 2006 the intersections perform at LOS C or better in the AM peak hour and LOS D or better in the PM peak hour. However, in 2030, intersection operations worsen, with the intersections of 68th Street and Indian School Road and Goldwater Boulevard and Indian School Road performing at LOS E or worse in the AM peak period. For the PM peak period, 11 of the 17 analyzed intersections perform at LOS E or worse.

Table 10
Downtown Scottsdale Intersection Level of Service

ID	Street	Cross Street	AM				PM			
			Existing*		2030		Existing*		2030	
			LOS	Vehicle Delay (sec/veh)	LOS	Vehicle Delay (sec/veh)	LOS	Vehicle Delay (sec/veh)	LOS	Vehicle Delay (sec/veh)
1	Scottsdale Road	Chaparral Road	C	24.7	C	23	D	51.7	F	191
2	Miller Road	Chaparral Road	B	17.3	D	47	C	34.4	F	142
3	68th Street	Camelback Road	C	20.8	B	17	C	28.6	B	17
4	Goldwater Boulevard	Camelback Road	C	28.3	D	48	C	32.6	E	58
5	Scottsdale Road	Camelback Road	C	23.4	B	17	C	23.5	E	60
6	Miller Road	Camelback Road	B	18.7	B	19	C	22.8	C	27
7	Scottsdale Road	Drinkwater Boulevard	B	14.5	C	25	B	10.7	D	43
8	68th Street	Indian School Road	C	23.0	F	120	C	24.4	F	220
9	Goldwater Boulevard	Indian School Road	C	30.9	E	59	C	31.3	F	110
10	Scottsdale Road	Indian School Road	C	22.8	C	29	D	36.9	D	47
11	Drinkwater Boulevard	Indian School Road	C	22.0	D	36	D	38.7	F	177
12	Miller Road	Indian School Road	B	18.9	B	20	D	50.5	E	62
13	68th Street	Osborn Road	A	8.7	C	30	B	12.3	C	24
14	Miller Road	Osborn Road	C	22.3	B	19	C	21.6	C	26
15	Scottsdale Road	Earll Drive	A	5.3	D	42	A	6.7	F	317
16	68th Street	Chaparral Road	B	14.4	C	29	B	12.0	F	111
17	Drinkwater Boulevard	Osborn Road	B	15.2	B	13	B	17.2	E	71

*Existing LOS from Otak

The average delay in 2004 and 2030 is shown in *Table 11*. The average delay doubles for the AM peak period from 20.6 to 42.3 seconds and there is almost a four-fold increase for the PM peak period from 29.9 to 116.2 seconds. Based on the average delay in 2004, the intersections operate at LOS C in the AM and PM peak periods. However, the dramatic increase in average delay corresponds to LOS D and F for the AM and PM peak periods, respectively in 2030. In 2004, the majority of the vehicles approaching an intersection pass without stopping, but the percentage of vehicles passing an intersection in 2030 will decrease. As a driver, this means increased travel time and increased waiting time at an intersection.

Table 11
Weighted Average Delay (in seconds)

	2004	2030	Percent Increase
AM	20.6	42.3	105
PM	29.9	116.2	289

5.0 CONCLUSIONS

The traffic analysis presented in this paper is based upon a number of socioeconomic assumptions, whose key assumptions are:

- A regional population in the year 2030 of over six million persons;
- Development within the City of Scottsdale consistent with the currently adopted *General Plan*;
- No additional development within the McDowell Sonoran Preserve area;
- Development of the Desert Ridge and State Land properties in the City of Phoenix west of Scottsdale Road to include 70,000 housing units and 55,000 employees; and
- Development of a major employment corridor on the SRPMIC in the Loop 101 corridor with 66,000 employees.

As socioeconomic data is an important input into the traffic forecasting process, it will be important to monitor these key assumptions and periodically update the *Transportation Master Plan* as conditions evolve.

Another key assumption in the analysis is that, in accordance with the MAG *Regional Transportation Plan*, Loop 101 will be widened to ten lanes with the addition of one general purpose and one HOV lane in each direction. Even though the analysis indicates that the LOS provided on the freeway will not improve with the additional lanes, Loop 101 will carry an additional 100,000 vehicles per day that would have to be accommodated on the City's street system if it were not widened.

In general, the analysis indicates that although traffic volumes will increase, the City's street system will be able to handle the increase without any major widening or the construction of new corridors. It will, however, be important to optimize the efficiency of each corridor through monitoring of traffic and making operational improvements such as adding turn lanes and adjusting traffic signal timing. Enhanced mobility, where safe and efficient movement for all users is assured, particularly non-motorized modes in the more pedestrian-oriented areas of the City, will be important in the future. Expansion and enhancement of the City's transit system, bicycle networks and pedestrian facilities will be essential components that provide more mode choices over time, as these systems are expanded and improved. Other specific street system improvements, including connections to the HOV/express bus lanes on the Loop 101, will be needed to advance this objective of improved mode choice.

Review of the forecast traffic volumes indicates that the most serious capacity problems are likely to occur on Scottsdale Road in the Loop 101 area, and on Shea Boulevard east of Frank Lloyd Wright Boulevard. Other issues that have been raised through public workshops and other outreach efforts include access to and around Scottsdale Airpark, access to Downtown Scottsdale, and the need for more north-south mobility in northern Scottsdale. These issues, and others, are addressed in the three area studies that are being completed as appendices to the Transportation Master Plan, that is, the Airpark, Downtown, and North area, and also in the Streets element of the Plan.

Traffic Demand Modeling Memo

To	City of Scottsdale
From	Brent Cain, Faisal Chowdhury
Date	April 15, 2008
Subject	Scottsdale Travel Demand Modeling Documentation

1.0 INTRODUCTION

This section documents the development and validation of the transportation model for the City of Scottsdale. The model was developed using the TransCAD transportation forecasting microcomputer software and was calibrated using the year 2006 transportation network and estimated 2006 socioeconomic data. The year 2006 was chosen as this was the most comprehensive and readily information that was available. This model was developed with the most recent release of TransCAD version 4.8, Build 470. Figure 1 illustrates the model study area.

The baseline (or initial), street network and attributes were developed using the Maricopa Association of Governments (MAG) travel demand model. The baseline network was subsequently refined to ensure consistency with existing roadway characteristics, verified through field observation. In addition, the 2006 socioeconomic information, the traffic analysis zone structure and link attributes were adjusted based on input from the City of Scottsdale staff, and adjustments to current conditions in the City of Scottsdale.

This report presents a brief description of the transportation demand modeling process: trip generation; trip distribution; trip assignment; and model calibration, along with an explanation of the logic behind the development of the roadway network. Trip generation and trip distribution are discussed in detail, followed by the methodology assumed for assignment of vehicle trips. The report concludes with the results of the model calibration and validation. A glossary of modeling terms is included at the end of the report, to facilitate broad understanding of the process.

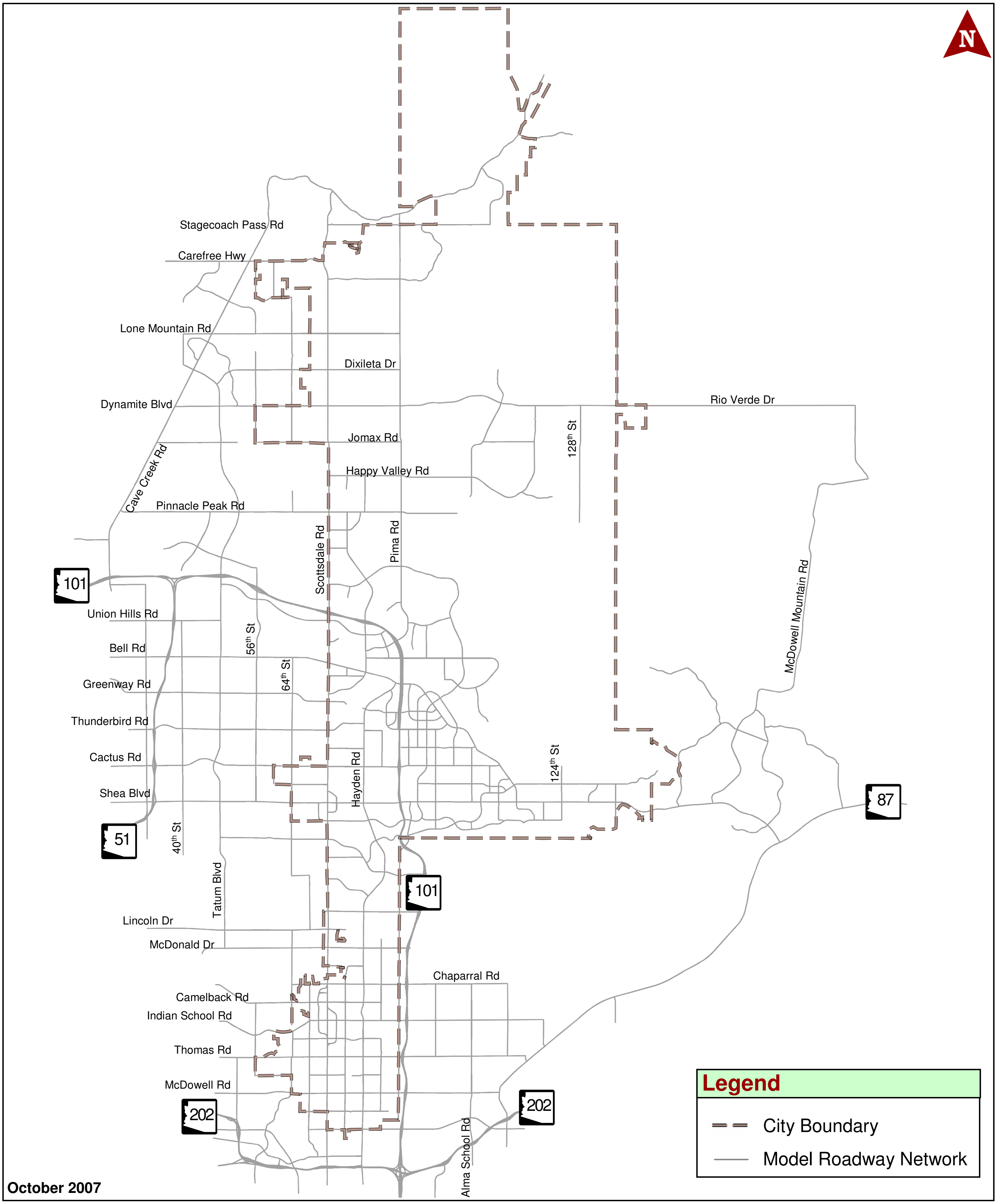
1.1 Transportation Modeling Process

The transportation demand model is a representation of the transportation facilities within the City of Scottsdale and the observed or documented travel patterns on these facilities. The traffic model contains inventories of the existing roadway facilities and of residential and non-residential units, organized by traffic analysis zones (TAZs).

The development of the City's Transportation Model followed this sequence of activities:

1. Development of the 2006 transportation roadway network;
2. Determination of 2006 land use data;
3. Trip generation and estimates of the number of daily vehicle trips by TAZ from the socioeconomic inventory;
4. Trip distribution or geographical distribution of vehicle trips by TAZ, as well as trips between origin and destination zones; and
5. Trip assignment, or assignment of traffic volumes to specific network routes.

During the process, once traffic model assignments were developed and compared with current traffic counts. Typically, when the model matches the traffic counts within acceptable ranges of



Scottsdale Travel Demand Model Documentation	**Study Area and Roadway Network**	**Figure 1**

error, the model can then be used to test future year scenarios. These scenarios may contain variations in numbers of housing units, size, number and geographic distribution of employment centers, travel behavior patterns, or alternative assumptions of roadway improvements. The traffic forecasting model may be used to project future traffic volumes, as a facilitative tool in the planning and programming process.

1.2 Transportation Model Development

1.2.1 Roadway Network Definition

The initial step in the travel demand modeling process was the development of the geographical roadway network comprised of nodes and links. A node is an intersection of two or more links such as an intersection of two street segments. A network link is a street segment between two nodes.

The 2006 Scottsdale TransCAD model network was developed using the MAG model roadway network. Roadway network characteristics and revisions and updates to the database were made to include and populate the necessary model network parameters. Field observations and consultation with the City staff also played a key role in refining the network assumptions. The TransCAD model network database includes the following information:

- Roadway Functional Classification
- Link Distance
- Speed
- Daily Link Capacity
- Daily Traffic Volume (ground counts)
- Link Number of Lanes
- Area Type

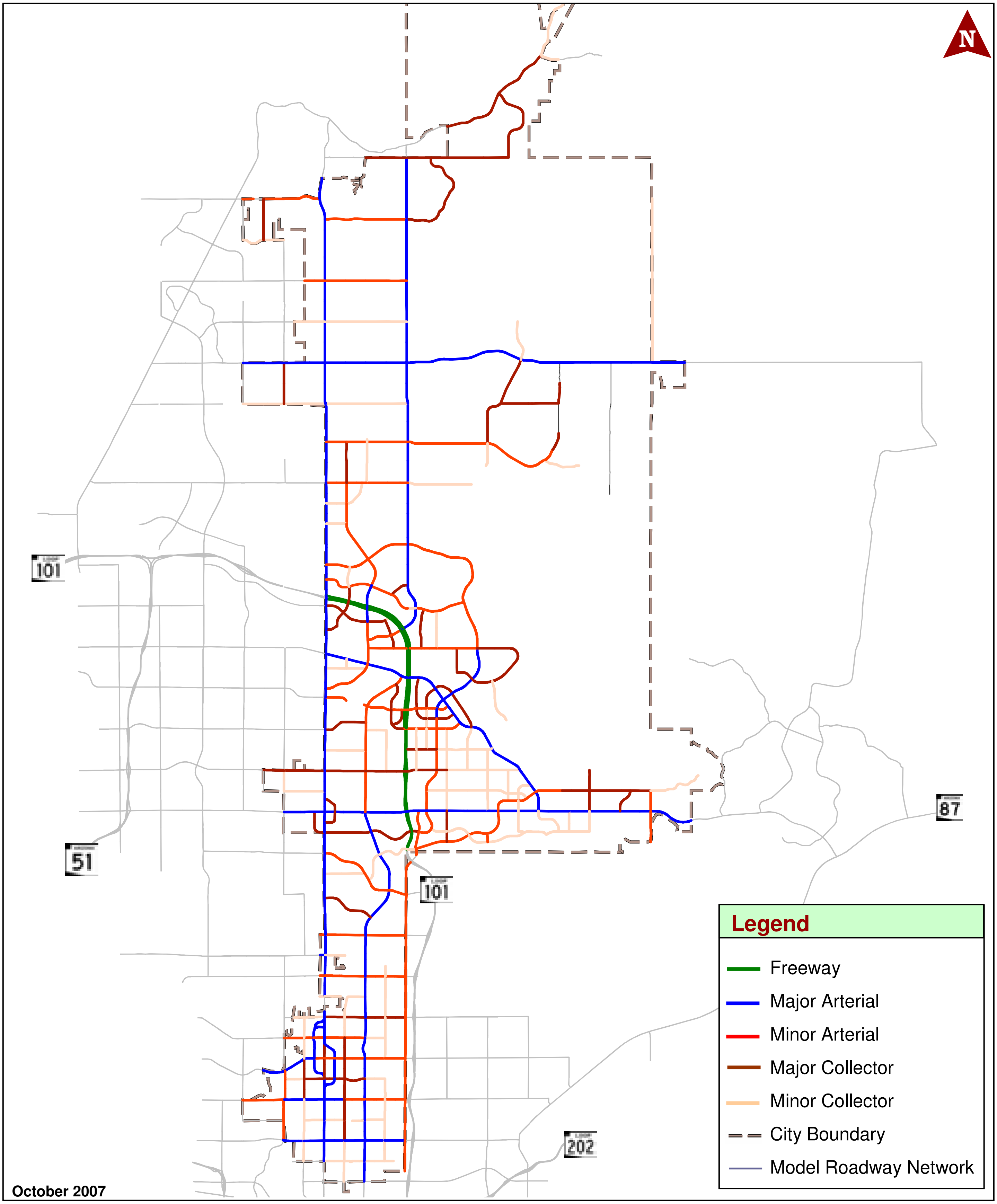
The model network comprised of local streets or higher, as determined by City of Scottsdale. Figure 2 illustrates the defined network based on the City's roadway functional classification.

1.2.2 Land Use Data

Land use was developed for different categories and allocated to TAZs. The TAZs are generally bounded by either the roadway network or another geographic or municipal boundary. Within the model network, a TAZ is defined by a node called a centroid. For transportation modeling, it is assumed that all trips within a TAZ begin and end at the zone centroid. Each TAZ centroid is connected to at least one roadway link by centroid connectors, which represent the local streets feeding traffic to the major streets.

The Scottsdale model consists of two zone types: internal and external. Internal zones are those zones central to the study area, and external zones were placed along roadways entering and leaving the Scottsdale model area.

The TAZs developed for the 2006 study were initially based on the existing MAG TAZ boundaries and refined more specifically for the City of Scottsdale. However, the MAG TAZ structure was retained for consistency of future data exchange. Figure 3 shows the TAZ boundaries used in the transportation model. The external zones are numbered from 432 through 471. The TAZs total 471, with 426 internal and 40 external zones. Note that several internal zones have been reserved for future use (427-431) to simplify coding when needed. The estimated 2006 study area land use data was updated and provided by City staff. The land use was summarized by TAZ and by land use classification codes. The land use codes consisted of 15 land use categories. Classifications were initially used from the MAG regional model and were imported to provide further refinement for trip generation purposes.



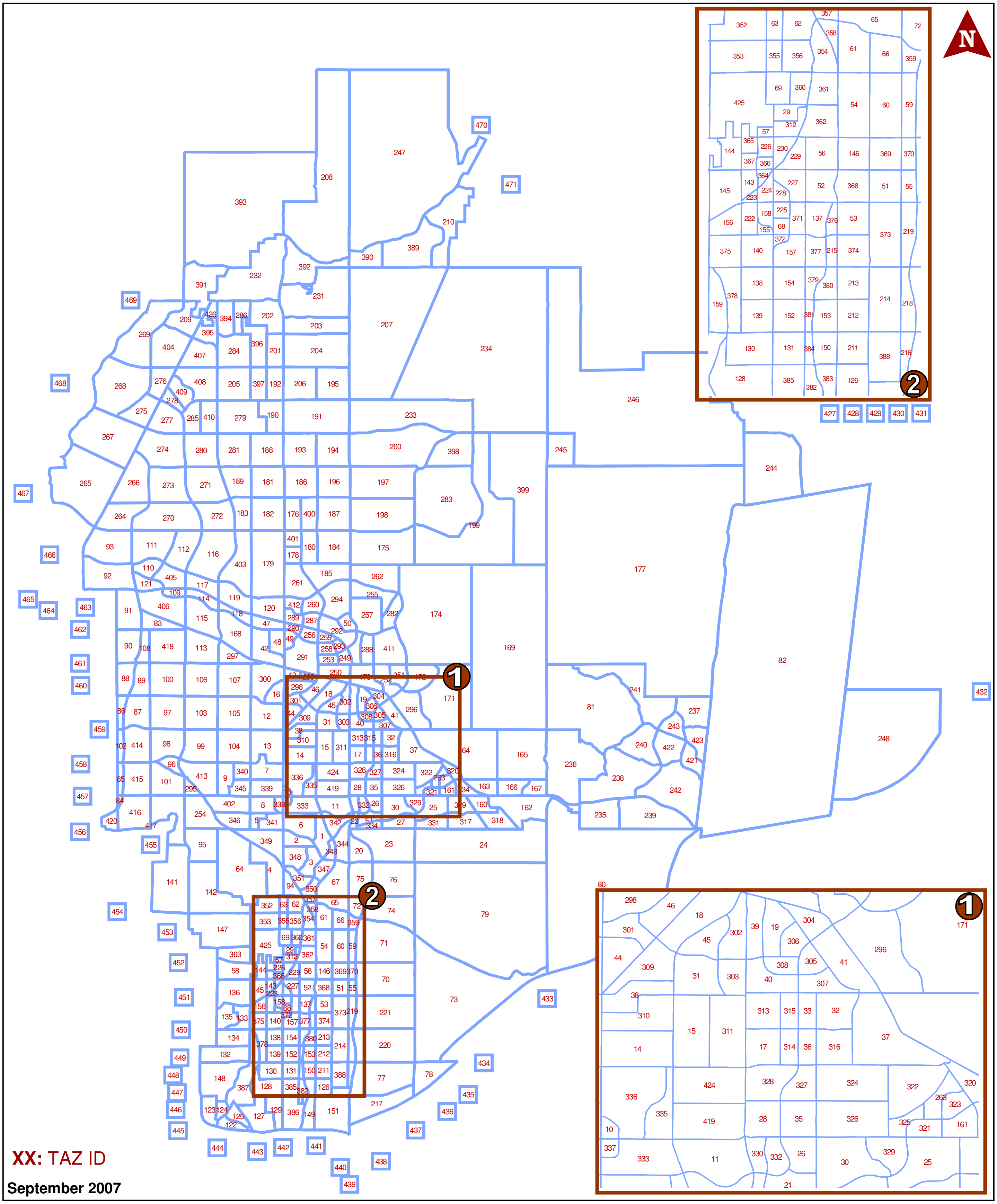
Scottsdale Travel Demand Model Documentation

HDR

Roadway Functional Classification

Figure 2

CITY OF SCOTTSDALE



Scottsdale Travel Demand Model Documentation

HDR

Traffic Analysis Zones

Figure 3

CITY OF SCOTTSDALE

1.2.3 Trip Generation

The final product of the trip generation phase is the summation of trips produced within and/or attracted to each TAZ. (A trip is defined as a one-way trip between an origin and a destination). Trips are generated based on person-trips and then converted to vehicle-trips during the assignment process.

The number of trips generated by a TAZ is a function of the residential and/or commercial land use characteristics. Residential land uses are generally referred to as trip "producers", which in turn is a function of the number of dwelling units; commercial land uses are generally referred to as trip "attractors" which is a function of employment.

1.2.4 Trip Distribution

The final product of the trip distribution phase is a vehicle trip table that specifies the number of vehicle trips that occur among all the TAZs. Trip tables are estimated for each of the trip purposes. The distribution of trips between TAZs (for example, Zones i and i) is a function of the following variables:

- The number of trips produced in Zone i;
- The number of trips attracted to Zone j;
- The travel time between Zone i and Zone j; and
- The magnitude of the total "attractiveness" of all the zones in the network.

The number of trips traveling between Zone i and Zone j are directly proportional to the total number of trips generated in Zone i and the total number of trips attracted to Zone j. For example, the total number of trips traveling between Zones i and j increase as the number of residential trips increases in Zone i. The number of trips between Zones i and j are inversely proportional to the travel time between the two zones. The number of trips traveling between the two zones decreases as the travel time increases between the zones.

1.2.5 Traffic Assignment

The traffic assignment phase allocates each trip to one specific network route based on the travel times between the various zones. The traffic assignment process includes the following:

- Computation of the minimum time paths between the TAZs based on free-flow link speeds (i.e., posted speed limits);
- Initial assignment of the trips to the links which lie on the minimum time paths between the TAZs;
- Computation of volume-to-capacity (v/c) ratios on the links after initial assignment;
- Computation of travel times on the links as a function of the v/c ratio; and
- Reiteration of the assignment process until the traffic volumes on the links replicate the traffic ground counts and travel behavior.

1.2.6 Model Calibration

The transportation model was calibrated and validated using the transportation network, Year 2006 socioeconomic estimates and traffic counts.

Numerous series of calibration simulation runs were conducted that involved the review of the assumptions used to construct the model. In the distribution portion of the simulation, the exponents to the distance function of the gravity model were examined. During the assignment portion of the simulation, the assumptions for link speeds, capacities, and delay parameters were studied. Between each run, different parameters were evaluated and necessary adjustments made so that the desired results (i.e., calibration) were reached. Before any adjustments to the Scottsdale model parameters were made, they were justified either through the collected travel pattern data, local knowledge of travel conditions from the City, or by empirical knowledge of the Consultant. The model validation included review of several performance measures such as percent assignment error, root mean square error (RMSE), and coefficient of determination (R2).

2.0 ROADWAY NETWORK

A simulation of typical travel conditions in the city of Scottsdale on an average weekday in Year as 2006 was replicated to ensure reliable results. As discussed earlier in this report, link attributes in the network database were refined with input from City staff. Table 1 summarizes the key parameters of the network database.

Figure 4 illustrates the 2006 roadway network for the study area with the corresponding number of lanes.

2.1 Roadway Link Capacity

Capacity is expressed in terms of vehicles per day for each link by direction. Due to the number of links contained in the Scottsdale model, it was not possible to complete individual capacity analyses on each link to find suitable capacities. Therefore, a global link capacity system was used based on functional classification, area type, presence of two-way-left-turn lanes (TWLTL), and on-street parking. The capacities are based on the Highway Capacity Manual, Transportation Research Board, 2000.

The capacities are used for both model operation and network analysis. In the context of model operation, the capacities are used in conjunction with link speeds, link lengths, and link delay functions to derive a realistic travel speed to be used in the distribution of travel and the derivation of appropriate travel routes. In the context of network analysis, the capacities are used to identify deficiencies and recommend improvements. In both cases, it is desired that the capacities used in the model be as accurate and realistic as possible. Table 2 includes the capacities used for the model.

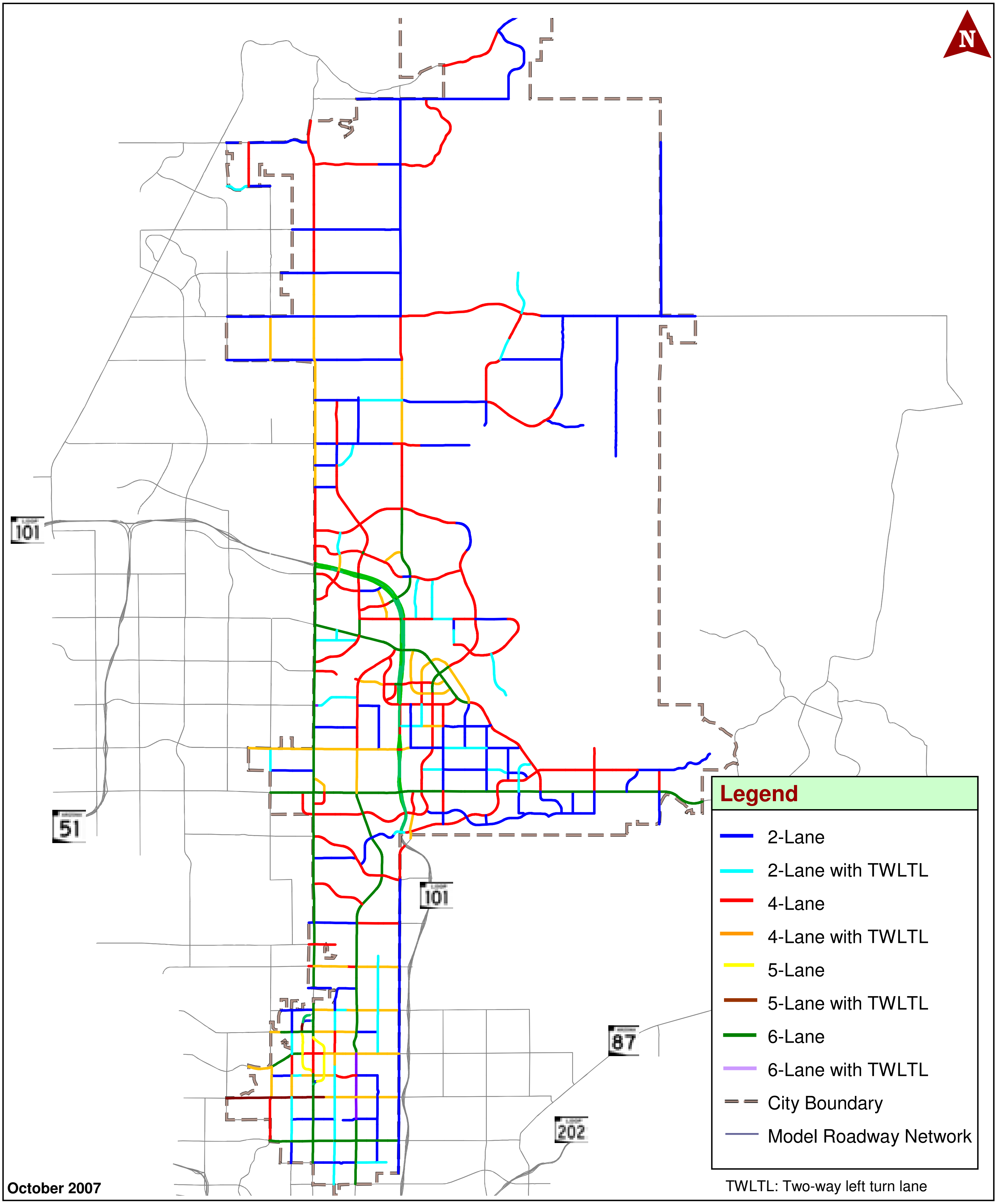
Table 1: TransCAD Link Attributes

Attribute	Description
ID	Link ID Number
Length	Length (miles)
Dir	One-way or Two-way (1,0,-1)
AdjLength	Length (feet)
Roadway Name	Street Name
Network	1 = Model Network 2 = Future Roadway Network 3 = Non Model Network (background streets)
Roadway Class Name	Roadway Classification (see Table 2)
Roadway Class (Code)	Roadway Classification Number (see Table 2)
Area Type	1 = Rural 2 = Urban 3 = Central Business District (CBD)
HOV	High Occupancy Vehicle (0 or 1)
Aux	Auxiliary Lane (0 or 1)
Jurisdiction	Jurisdiction ID
Jurisdiction Name	Agency Name
OrigSpeed	Original Speed (Posted)
Speed	Modeled Speed
AB_Lanes/ BA_Lanes	Directional Number of Lanes
Lanes	Number of Lanes
TWLT	Center Two-Way Left Turn Lane (0 or 1)
OnStreet Parking	On Street Parking (0 or 1)
Lane Capacity_Daily	Directional Daily Lane Capacity (see Table 2)
Capacity_Daily	Total Daily Roadway Capacity
AB_Capacity_Daily BA_Capacity_Daily	Directional Daily Roadway Capacity
Alpha	Volume Delay Function
Beta	Volume Delay Function
AB_Time/BA_Time	Directional Travel Time
2005 Counts_Daily	2005 Daily Counts
2006 Counts_Daily	2006 Daily Counts
2007 Counts_Daily	2007 Daily Counts

For Freeways with High Occupancy Vehicle Lanes (HOV), directional capacities were increased by 16,000 vehicles per day. As part of this effort, the travel demand model does not explicitly Roadways with TWLTL included an additional capacity of 750 vehicles per day.

Table 2: Roadway Classification and Link Capacity

Roadway Classification	Directional Daily Lane Capacity by Area Type (Level of Service E)		
	CBD	Urban	Rural
1. Freeway	24,000	24,000	24,000
2. Ramp	15,000	15,000	15,000
3. System Interchange Ramp	20,000	20,000	20,000
4. Frontage Road	8,000	8,000	8,000
5. Major Arterial	8,700	9,200	9,500
6. Minor Arterial	7,800	8,300	8,600
7. Major Collector	6,000	6,500	6,800
8. Minor Collector	4,500	5,000	5,000
9. Unpaved	--	--	500
10. Expressway	15,000	15,000	15,000



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2006 Roadway Network with Number of Lanes

Figure 4

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2.2 Turn Prohibitors and Penalties

In order to accurately reflect travel behavior for the study area, turn prohibitors and penalties were applied in the model. Turn prohibitors are typically used where specific turning movements are not allowed or are physically restrained. Turn penalties apply added delays to certain travel movements that would likely result from unique intersection operations and driver behavior. However, in locations where one-way links are coded within the model, TransCAD automatically prohibits travel in the opposite direction, thus voiding the need for turn prohibitors at these intersections.

2.3 Volume-Delay Function

Travel time on each individual link typically increases as the traffic volume on the link approaches capacity. The amount of travel time increase depends on the functional classification of the link as well as the region and the behavior of the drivers using that link. TransCAD offers the ability to update travel times iteratively based on link performance functions, which are mathematical descriptions of the relationships between travel time and v/c ratio.

The conical volume-delay function incorporated in TransCAD was used in the development of the Scottsdale model. The equation is included at the bottom of Table 3.

During calibration analysis, link operating speeds were reviewed. This analysis was used in comparison with collected operating speeds to adjust the volume delay function. The final values used in the model calibration are shown in Table 3.

Table 3: Volume-Delay Function Parameters

Roadway Classification	Facility Type	α	β
1.	Freeway	0.15	4.80
2.	Freeway Ramps	0.71	2.10
3.	Interchange Ramps	0.71	2.10
4.	Frontage Road	0.71	2.10
5	Major Arterial	0.71	2.10
6.	Minor Arterial	0.71	2.10
7.	Major Collector	0.71	2.10
8.	Minor Collector	0.71	2.10
9.	Unpaved	0.71	2.10
10.	Expressway	0.71	2.10

Volume-Delay Function

$$f(x) = 2 + \sqrt{\alpha^2(1-x)^2 + \beta^2} - \alpha(1-x) - \beta$$

Where:

$\beta = \dfrac{2\alpha - 1}{2\alpha - 2}$, x = V/C, α = constant > 1

3.0 TRIP GENERATION AND DISTRIBUTION

3.1 Trip Generation

Trip generation for the Scottsdale travel demand model was accomplished using a trip rate model. Person trips were generated based on socioeconomic variables, such as the number of dwelling units and income level, and a daily trip generation rate for each socioeconomic variable. Initial vehicle trip rates were obtained from the MAG regional model, ITE's Trip Generation (7th Edition, 2003), and NCHRP 365. Trip attractions for the internal commercial land uses were estimated using a trip rate per unit (employees, students, etc.). Table 4 includes the trip generation characteristics and trip attraction rates for the various land-use categories used in the trip generation analysis.

Table 4: Trip Attraction Rates

Model Land Use Designation	Description	Units	Trip Purposes		
			HBW	HBO	NHB
SF_HH	Single Family Occupied Households	Households	0.00	1.74	0.27
MF_HH	Multi-Family Occupied Households	Households	0.00	1.74	0.27
RETAIL_REG	Regional Retail	Employees	1.45	4.73	3.60
RETAIL_DOW	Downtown Retail	Employees	1.45	9.45	7.20
RETAIL_GEN	General Retail	Employees	1.45	2.36	1.80
OFFICE	Office	Employees	1.45	0.25	0.68
OFFICE_GOV	Government Employment	Employees	1.45	0.50	1.34
OFFICE_MED	Medical Office	Employees	1.45	0.88	2.36
RESORT	Resorts	Employees	1.45	0.00	2.03
HOTELMOTEL	Hotel/Motel	Employees	1.45	0.00	2.83
HOSPITAL	Hospital	Employees	1.45	0.36	0.97
NON_RETAIL	Non Retail	Employees	1.45	0.25	0.68
INDUSTRIAL	Industrial/Manufacturing	Employees	1.45	0.35	0.35
COLLEGE	Scottsdale Community College	Students	0.13	0.39	0.13
SCHOOL	Elementary and Middle Schools	Students	0.08	0.25	0.08
HIGH_SCHOO	High Schools	Students	0.11	0.11	0.11
HBW: Home-Based Work; HBO: Home-Based Other; NHB: Non Home-Based					

The trips were then estimated based on three trip purposes:

- Home-Based Work (HBW)
- Home-Based Other (HBO)
- Non Home-Based (NHB)

Trip purposes are broken down based on varying trip lengths by land use classification. For example, home-based work (HBW) trips are longer trips that occur between the home and work. Home-based other (HBO) and non-home based (NHB) trips are typically shorter trips and are representative of trips from work to the shopping center or a trip from the day-care to home.

Trip productions for internal residential trips were estimated using a daily trip rate per dwelling unit by using cross-classification based on income level. Five income quintiles were used with respect to household size. Table 5 shows the trip production rates used for this modeling effort. The year 2006 socioeconomic estimates are allocated by TAZ and are listed in the Appendix A.

Table 5: Trip Production Rates

Household Size (Person)		1			2			3			4			5			6		
		HBW	HBO	NHB	HBW	HBO	NHB	HBW	HBO	NHB	HBW	HBO	NHB	HBW	HBO	NHB	HBW	HBO	NHB
Income Quintiles ($)	1	0.86	1.32	0.68	0.86	2.57	1.13	0.86	3.59	1.32	0.86	4.34	2.56	0.86	4.45	2.56	0.86	4.45	1.33
	2	1.67	1.55	1.73	1.67	2.99	1.85	1.67	4.62	1.99	1.67	6.06	2.87	1.67	6.07	2.87	1.67	6.07	2.67
	3	2.06	1.64	1.73	2.06	3.06	1.85	2.06	4.93	1.99	2.06	6.52	2.87	2.06	6.38	2.87	2.06	6.38	2.67
	4	2.51	1.59	1.97	2.51	3.01	2.68	2.51	5.37	3.46	2.51	7.29	3.95	2.51	7.30	3.95	2.51	7.52	3.55
	5	3.29	1.89	2.36	3.29	3.65	3.22	3.29	6.42	4.15	3.29	8.75	4.74	3.29	8.75	4.74	3.29	8.83	4.26

Note:
Income Quintile 1: Households in Lowest 20% Income Quintile Range
Income Quintile 2: Households in Lowest 20% Income Quintile Range
Income Quintile 3: Households in Lowest 20% Income Quintile Range
Income Quintile 4: Households in Lowest 20% Income Quintile Range
Income Quintile 5: Households in Lowest 20% Income Quintile Range
HBW: Home-Based Work; HBO: Home-Based Other; NHB: Non Home-Based

3.2 Trip Distribution

The purpose of the trip distribution step is to produce a trip table of the estimated number of trips from each TAZ to every other TAZ within the study area. Vehicle trip distribution for this study was estimated using the TransCAD Gravity Model program. The Gravity Model assumes that the number of trips between two zones is 1) directly proportional to the vehicle trips produced and attracted to both zones, and 2) inversely proportional to the travel time between the zones.

The Gravity Model formulation defines the number of trips between each zone pair (Tij), as shown at right. Friction factors (Fij) express the effect that travel time has on the number of trips traveling between two zones.

Vehicle trips were distributed for the three trip purposes. The number of vehicles to be assigned was calculated using the base year land use data and trip generation rates by trip purpose. Data from the external traffic zones were combined with the internal zone trips to create the total productions and attractions for the model. The productions and attractions were balanced to ensure that for each production generated by the model there was an attraction. Table 6 gives a summary of the vehicle trip productions and attractions by trip purpose for the whole study area.

The percent of trips by trip purpose appear reasonable as compared to the report Travel Estimation Techniques for Urban Planning, NCHRP Report 365, 1998. Similarly with variation of trip generation rates, the breakdown of trip purpose is a function of the local travel behavior of the Columbia region.

The friction factors were created using the gamma function illustrated at the bottom of Table 7. The parameters a, b, and c were initially used from the report Travel Estimation Techniques for Urban Planning. However, these parameters can vary by model size and local travel behavior.

Gravity Model Formulation

$$T_{ij} = \frac{P_i A_j F_{ij}}{\sum (A_j F_{ij})}$$

Where:

T_{ij} = number of trips between zone i and zone j

P_i = number of trips produced in zone i

A_j = number of trips attracted to zone j

F_{ij} = an empirically derived friction factor which is a function of the travel time between zone i and zone j.

Table 6:
2006 Vehicle Trip Summary

Trip Purpose	Total Trips	Percent Trips
Home-Based Work	487,769	27%
Home-Based Other	799,449	45%
Non Home-Based	504,703	28%
Total Trips	1,791,921	100%

Table 7:
Final Friction Factor (Gamma Function) Parameters

Trip Purpose	a	b	c
HBW	28507	139173	219113
HBO	-3.55	-3.35	-3.20
NHB	.34	.53	.51

Gamma Function: $F(c_{ij}) = a c_{ij}^{-b} e^{-c(c_{ij})}$

4.0 VEHICLE TRIP ASSIGNMENT

The purpose of trip assignment is to assign vehicle trips to specific paths, or routes, in the transportation network. Trip assignment is a function of 1) the shortest travel time along paths between zones, and 2) the level of congestion of the links within those paths. Vehicle trips for the study area were assigned to the transportation network using the TransCAD Stochastic User Equilibrium Assignment Algorithm.

TransCAD provides several other traffic assignment methods. The User Equilibrium (UE) is a commonly used assignment method that is widely used in other regional models. The UE uses an iterative process to achieve a convergence in which no travelers can improve their travel times by shifting routes. However, with the Stochastic User Equilibrium (SUE) method, assignments produce more realistic results from the UE method since SUE permits use of less attractive as well as the most attractive routes. Less attractive routes will have lower utilization, but will not have zero flow as they do under the UE method.

The SUE assignment reads in the vehicle origin-destination trip table and the roadway network and assigns the vehicle trip table to the network based on the modified equilibrium assignment method. The SUE assignment is premised on the assumption that travelers have imperfect information about the network paths and/or vary in their perceptions of network attributes. Equilibrium occurs when a trip in the system cannot be made by an alternate path without increasing the total travel time of all trips in the network.

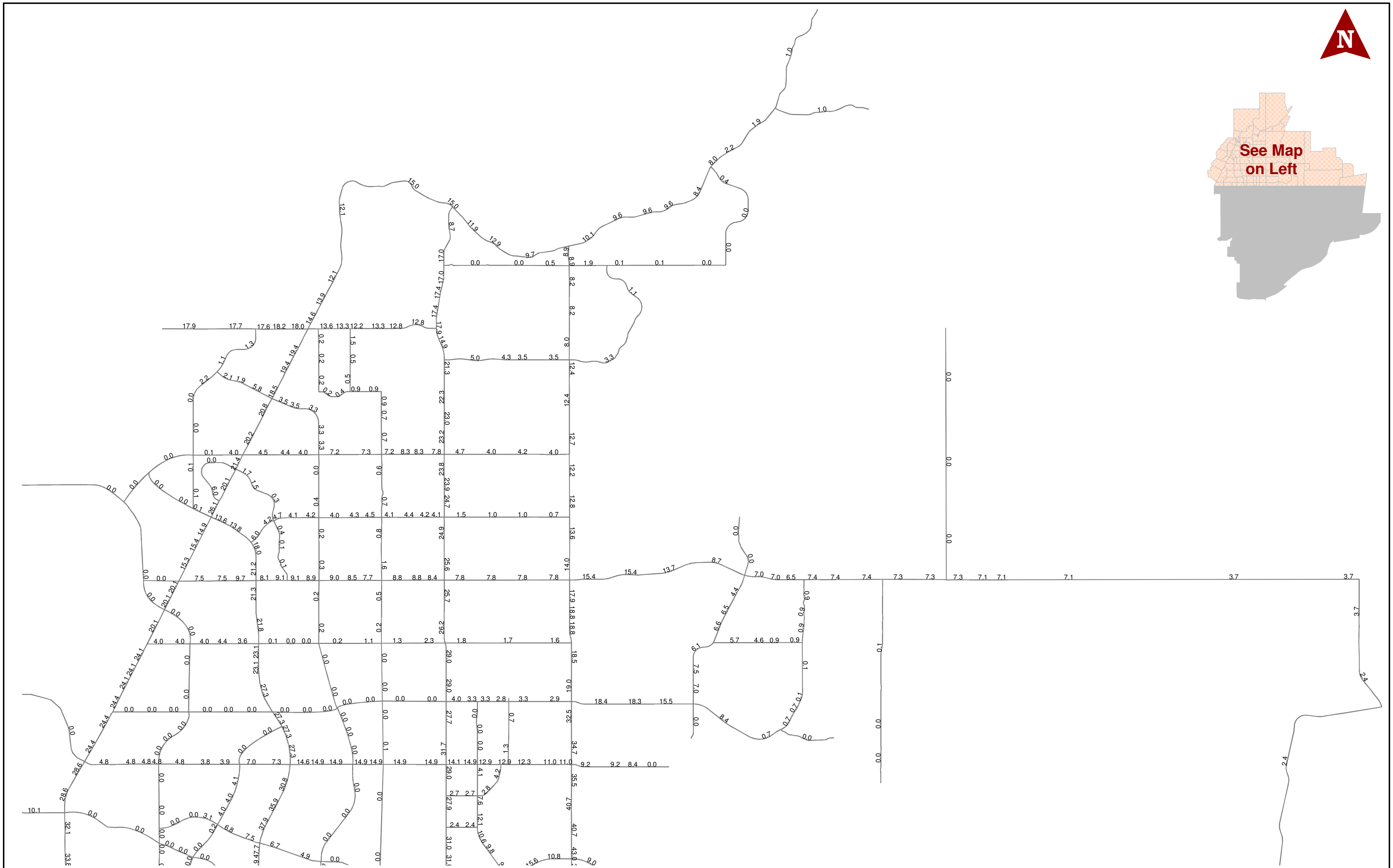
The assignment process assigns both internal and external vehicle trips to the network. Internal vehicle trips are those trips with either an origin or a destination inside the study area. The gravity model described in the previous section produces an internal vehicle trip table. However, vehicle trips through the study area must also be assigned to the network. External-to-external (X-X) trips are through trips: those with both an origin and destination outside of the study area.

The X-X vehicle trip table was synthesized from the MAG regional model and incorporated into the Scottsdale model. The internal vehicle trip table was then added to the external trip table to give a total vehicle origin-destination table. This origin-destination table was then assigned to the regional network. Table 8 lists the external stations, which can be seen geographically by referring back to Figure 3.

Appendix B contains the external-to-internal (X-I) and external-to-external (X-X) trip estimates. The resulting traffic assignments volumes for the year 2006 are shown in Figure 5.

Table 8:
External TAZ Locations
(see Figure 3)

Eastern Externals	
432	SR-87
433	L202
Southern Externals	
434	Gilbert Rd
435	Mckellips Rd
436	County Club Dr
437	Alma School Rd
438	Dobson Rd
439	L101
440	Frontage-L101
441	McClintock Dr.
442	Rural Rd
443	Mill Ave
444	Priest Dr
445	Sky Harbor Blvd
Western Externals	
446	Washington St
447	Van Buren St
448	L202
449	McDowell Rd
450	Thomas Rd
451	Indian School
452	Camelback
453	McDonald Dr
454	Lincoln Dr
455	40th Street
456	SR-51
457	Shea Blvd.
458	Cactus Rd
459	Thunderbird Rd
460	Greenway
461	Bell Rd
462	Union Hills
463	Cave Creek Rd
464	Frontage-101L
465	L101
466	Deer Valley Rd
467	P Peak Rd
468	Sonoran Pkwy
469	Carefree Hwy
Northern Externals	
470	N Cave Creek Rd
471	E Bartlett Lake Rd



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XX: Daily Traffic Volumes in 000's

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Year 2006 Modeled Traffic Volumes

Figure 5a

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Year 2006 Modeled Traffic Volumes

Figure 5b

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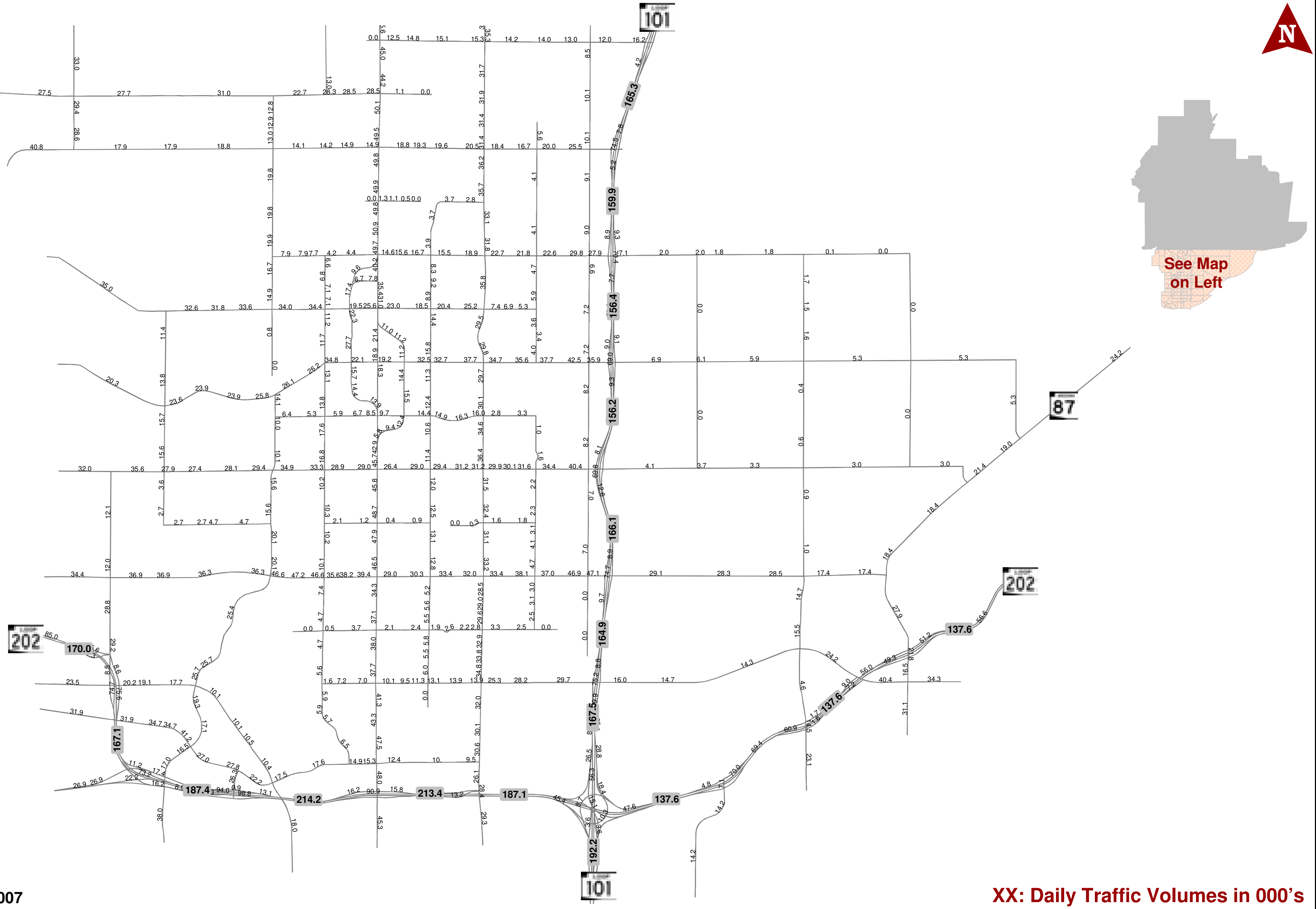

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XX: Daily Traffic Volumes in 000's

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Year 2006 Modeled Traffic Volumes

Figure 5c

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5.0 MODEL CALIBRATION/VALIDATION

Calibration is an iterative process whereby upgrades or adjustments to data are made, including adjustments to program coefficients or parameters, and assumptions on successive simulation runs, until the volumes and traffic patterns produced by the model approximate known traffic counts within acceptable limits.

One source that was utilized for acceptable limits is the report Calibration and Adjustment of System Planning Models, Federal Highway Administration, December 1990. The primary premise behind these guidelines is that simulated model data should not significantly differ from actual count data to cause inappropriate under- or over-design of roadway facilities. However, the percent difference between modeled volumes and actual counts may be large, but is only significant in relation to its functional classification and the magnitude of the volume itself. The performance measures listed at right were reviewed, and the findings are discussed in this chapter.

Performance Measures

Percent assignment error: -5%

Root Mean Square Error (RMSE): 17.4%

Coefficient of Determination (R^2): 0.95

The assigned 2006 daily traffic volumes were compared with the counted daily traffic volumes for individual links. The comparison included the computed vehicle miles traveled (VMT) in the modeled area, the estimated vehicle hours traveled (VHT) in the modeled area, and the average daily speed on the network. The modeled values are illustrated at right. These summary statistics do not include the centroid connectors.

Summary Statistics

Total VMT: 27,855,309

Total VHT: 42,158,942

Average Daily Speed: 29.5 mph

5.1 Percent Error of Traffic Assignment

The percent error of traffic assignment indicates the accuracy with which the transportation model replicates the actual traffic counts. Percent error is the difference between the assigned traffic volumes and the counted traffic volumes divided by the counted traffic volumes. The report Calibration and Adjustment of System Planning Model suggests the error limits included in the bottom of Table 9. However, Since the Scottsdale model's functional classifications differ from those in the FHWA report, the classifications were regrouped in order to provide a similar comparison with the model classifications. The computed percent error is given in Table 9 in comparison to the suggested error limits. As the table shows, the percent error of the traffic assignment for the network as a whole was 5.0 percent, and the errors for the individual functional classifications were within acceptable tolerances.

Table 9: Percent Assignment Error

Functional Class	Percent Error	
	Computed	Suggested Range*
1. Freeway	-3.3%	± 7%
2. Ramp	2.1%	--
3. System Interchange Ramp	--	--
4. Frontage Road	--	± 25%
5. Major Arterial	-3.6%	± 10%
6. Minor Arterial	-9.4%	± 15%
7. Major Collector	-13.2%	± 25%
8. Minor Collector	-18.3%	± 25%
9. Unpaved	--	--
10. Expressway	--	± 10%
Overall	-5.0%	N/A

*Source: *Calibration and Adjustment of System Planning Models,* Federal Highway Administration, December 1990. The original published values use a slightly different functional classification system:

Freeways	± 7%
Principal Arterials	± 10%
Minor Arterials	± 15%
Collectors	± 25%
Frontage Roads	± 25%

5.2 Root Mean Square Error

Another measure of the model's ability to assign traffic volumes is the percent RMSE. The RMSE measures the deviation between the assigned traffic volumes and the counted traffic volumes; the calculation is shown at the bottom of table 10. A large percent RMSE indicates a large deviation between the assigned and counted traffic volumes; whereas, a small percent RMSE indicates a small deviation between the assigned and counted traffic volumes. The percent RMSE by facility type for the study area is given in Table 10.

Currently, there are no national guidelines for model verifications of RMSE. However, common engineering practice is that a model with a RMSE of 35% and lower is representative of a good model. Therefore, the 17.4% RMSE for the Scottsdale model appears to fall within reasonable limits.

5.3 Coefficient of Determination

Another tool to measure the overall model accuracy is the coefficient of determination or R^2 (see formula at right). The R^2, or "goodness of fit", statistic shows how well the regression line represents the assignment data. The desirable R2 is 0.88 or higher. A value of 1.00 is perfect, but even if traffic counts were compared against themselves, the daily variation would not allow for a regression coefficient of 1.00. The value of 0.95 achieved for the Scottsdale illustrates that the model validation is also very good.

Table 10: Percent Root Mean Square Error (RMSE)

Facility Type	RMSE
Freeway	6.4%
Ramp	32.2%
Interchange Ramps	--
Frontage Road	--
Major Arterial	16.6%
Minor Arterial	26.1%
Major Collector	32.3%
Minor Collector	39.9%
Unpaved	--
Expressway	--
Overall	17.4%

$$\%RMSE = \frac{100 * \sqrt{\dfrac{\sum_j (Model_j - Count_j)^2}{(NumberofCounts - 1)}}}{\left(\dfrac{\sum_j Count_j}{NumberofCounts}\right)}$$

Coefficient of Determination

$$R^2 = \left(\frac{n\sum(x_i y_i) - \left(\sum x_i\right)\left(\sum y_i\right)}{\sqrt{\left[n\sum x_i^2 - \left(\sum x_i\right)^2\right]\left[n\sum y_i^2 - \left(\sum y_i\right)^2\right]}} \right)^2$$

Where:
x = counts
y = model volumes
n = number of counts

5.4 2030 Traffic Forecasts

Traffic forecasts were developed for the 2030 horizon year. This entails updating the model to reflect 2030 conditions which includes projected socioeconomic growth and roadway network improvements.

A 2030 'base' condition was created including projected land use and socioeconomic data and roadway network improvements. The following outlines the process and assumptions as part of the forecast development.

5.4.1 2030 Land Use and Socioeconomic Data

The projected land use and socioeconomic data was developed based on available documents and coordination with the City of Scottsdale. The MAG SE data was used as an initial resource and closely reviewed and updated by Scottsdale staff within the City limits. The SE forecasts outside of Scottsdale were retained from the MAG regional model.

The population, dwelling unit, and employment estimates for 2006 and 2030 within the model area are summarized in Table 11. The socioeconomic estimates are also allocated by TAZ and are listed in the Appendix A.

Table 11: Land Use and Socioeconomic Data

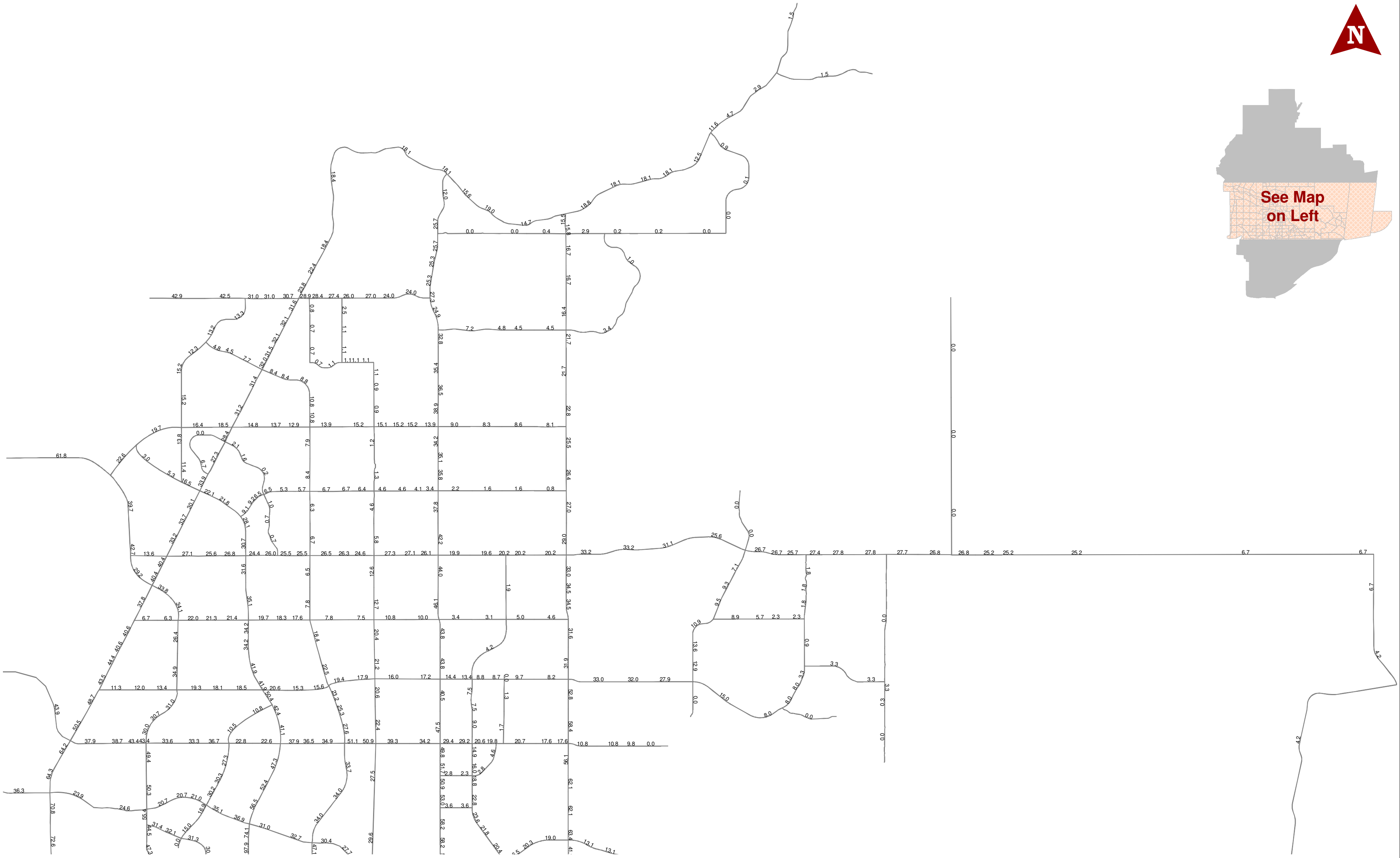
Location	Year 2006		Year 2030	
	Dwelling Units	Employees	Dwelling Units	Employees
City of Scottsdale	107,828	193,637	127,081	252,032
Model Area	193,522	295,923	277,789	514,767

5.4.2 2030 Roadway Network

Documents were reviewed to determine the projected 2030 roadway network to be incorporated within the travel demand model. City of Scottsdale staff led the development of the 2030 model network.

5.4.3 2030 Traffic Assignment

Based on the year 2030 roadway network, land use and socio-economic data, traffic assignments were generated and reviewed for reasonability and trends. The year 2030 modeled traffic assignment is presented in Figure 6.



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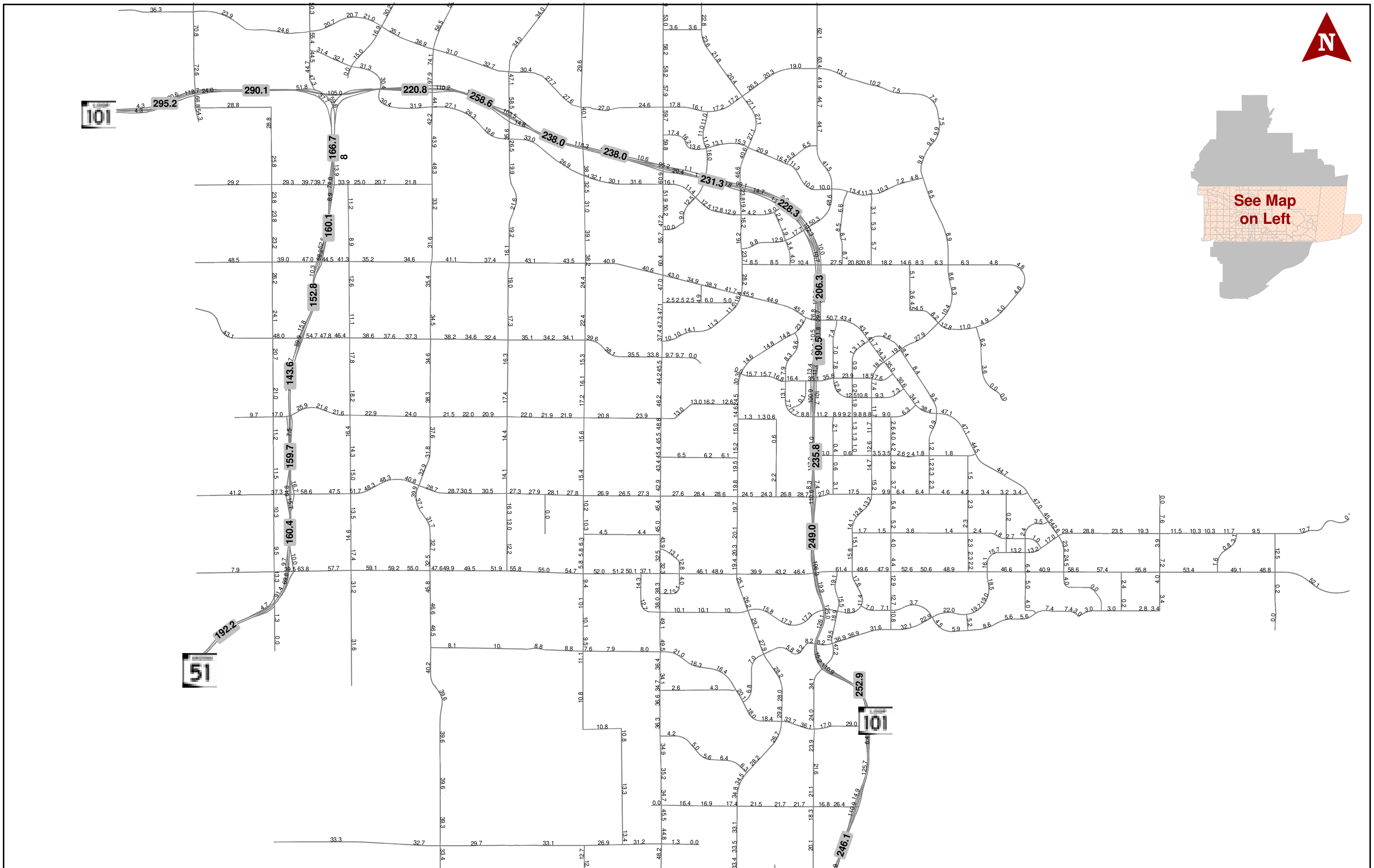
Year 2030 Modeled Traffic Volumes

Figure 6a

City of Scottsdale



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Year 2030 Modeled Traffic Volumes

Figure 6b

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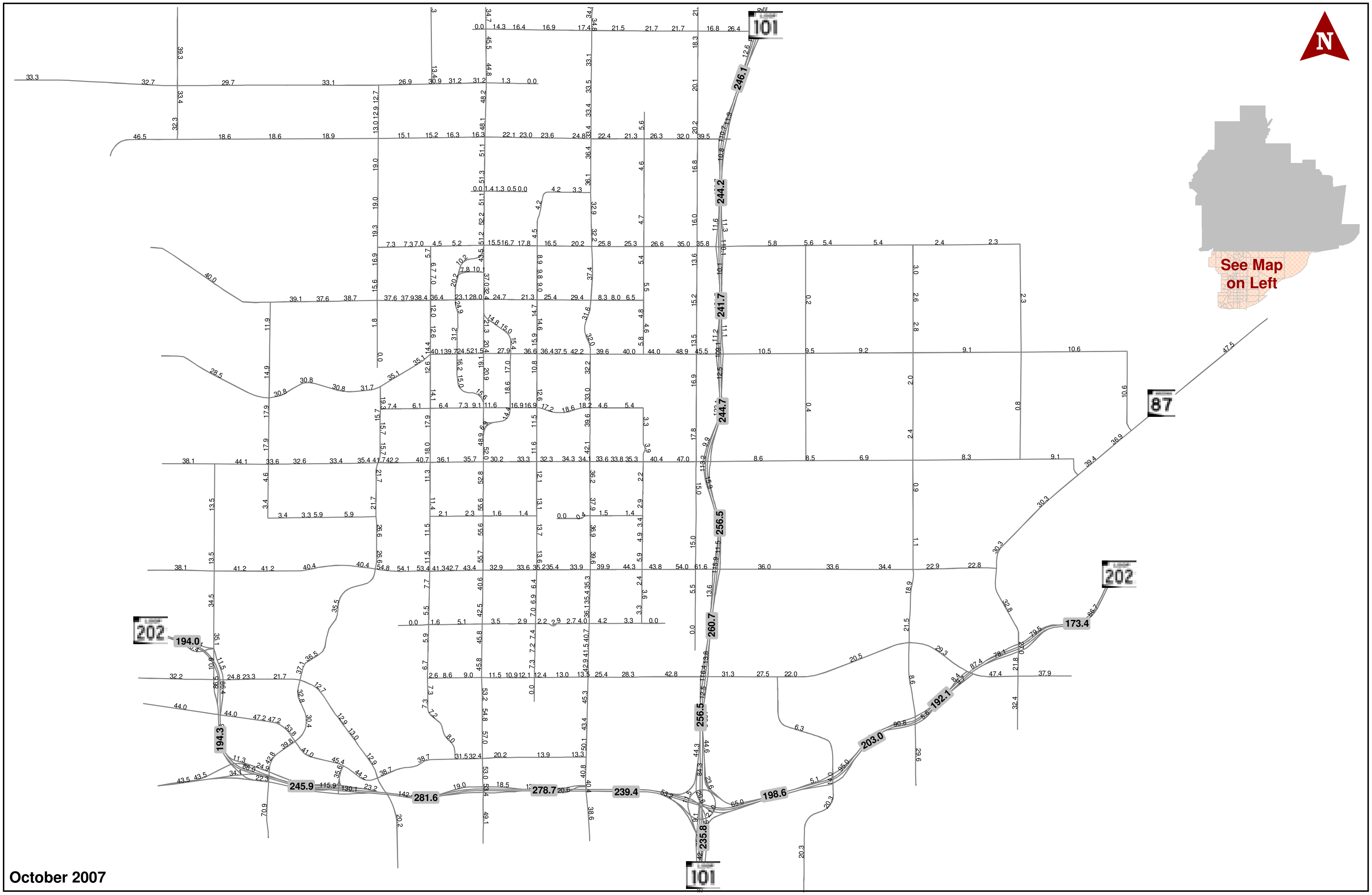

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Year 2030 Modeled Traffic Volumes

Figure 6c

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Federal Highway Administration, Calibration and Adjustment of System Planning Models, 1990.

Institute of Transportation Engineers, Trip Generation, 6th Edition, 1997.

Transportation Research Board, NCHRP 365. Travel Estimation Techniques for Urban Planning, 1998.

APPENDIX A

Land Use Data

Year 2006 Socio-Economic Data																
TAZ	SF_HH	MF_HH	Retail Reg	Retails Downtown	Retail Gen	Office	Office Gov	Office Med	Resort	Hotel Motel	Hospital	Non Retail	Industrial	College	School	High School
1	607	0	0	0	0	0	0	0	0	0	0	24	47	0	0	0
2	347	0	1,045	0	0	1,300	0	269	0	220	0	0	0	0	0	0
3	649	0	0	0	0	0	0	0	651	0	0	154	0	0	0	0
4	285	0	0	0	0	0	0	0	773	0	0	174	78	0	0	0
5	90	0	0	0	0	0	0	0	0	0	0	32	0	0	0	0
6	507	0	0	0	300	2,729	0	200	800	0	0	0	0	0	0	0
7	369	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	100	261	0	0	125	224	0	0	0	0	0	53	0	0	0	1,849
9	61	100	0	0	120	44	0	0	0	318	0	100	3	0	0	0
10	0	0	300	0	300	0	0	0	0	178	0	0	0	0	0	0
11	750	288	0	0	0	0	0	0	0	0	0	81	0	0	0	0
12	406	298	0	600	0	2,000	0	100	0	0	0	30	112	0	445	0
13	938	0	0	692	0	434	49	10	0	40	0	125	91	382	0	0
14	440	0	0	0	0	0	238	0	0	0	0	104	0	0	624	0
15	300	0	0	0	0	0	0	0	0	0	0	69	0	0	0	0
16	0	200	0	950	0	774	0	0	811	0	0	30	100	0	0	0
17	377	0	0	0	7	0	0	0	0	0	0	53	0	0	0	0
18	0	0	877	0	520	209	0	0	0	193	0	19	1,058	0	0	0
19	500	700	0	0	0	0	0	0	0	200	0	0	0	0	0	0
20	0	0	0	0	37	138	0	0	0	0	0	222	82	0	0	0
21	0	953	300	0	298	550	0	0	0	0	0	85	0	0	0	0
22	0	0	350	0	152	550	0	0	0	0	0	74	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	92	0	0	0	0
24	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	363	200	0	0	0	0	0	0	0	0	0	100	0	0	0	0
26	0	0	300	0	235	3,809	0	400	0	0	0	390	55	0	0	0
27	447	353	300	0	402	139	0	0	0	0	0	92	0	0	0	0
28	127	373	0	0	447	455	0	120	0	364	0	134	0	0	0	0
29	50	0	0	0	0	0	0	0	264	0	0	0	0	0	0	0
30	584	328	0	0	0	0	0	0	0	0	0	105	0	0	0	0
31	76	0	0	0	148	2,777	0	250	0	213	0	0	742	0	0	0
32	600	0	0	0	0	0	0	0	0	0	0	73	0	0	624	0
33	100	200	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	150	602	100	0	300	25	0	0	0	100	0	86	0	0	0	0
35	211	367	0	0	0	0	0	0	0	0	0	150	0	0	0	0
36	140	0	0	0	18	0	53	0	0	0	0	27	0	0	0	0
37	856	0	0	0	19	0	0	0	0	0	0	72	0	0	0	0
38	0	0	0	398	0	597	0	0	0	0	0	10	1,019	0	0	0
39	0	0	500	0	149	1,301	0	200	0	0	0	124	37	0	0	0
40	204	902	0	0	2	181	0	50	0	0	0	138	0	0	588	0

Year 2006 Socio-Economic Data (Cont.)																
TAZ	SF_HH	MF_HH	Retail Reg	Retails Downtown	Retail Gen	Office	Office Gov	Office Med	Resort	Hotel Motel	Hospital	Non Retail	Industrial	College	School	High School
41	720	373	161	0	187	0	0	0	0	0	0	97	0	0	0	0
42	0	784	0	0	44	82	0	0	0	0	0	95	0	0	0	0
43	0	0	0	2,000	0	0	0	0	0	342	0	0	0	0	0	0
44	0	0	0	355	0	1,725	0	0	0	250	0	709	1,418	1,004	0	0
45	0	0	600	0	911	45	0	0	0	0	0	222	400	0	0	0
46	0	0	290	0	112	622	0	0	0	0	0	1,093	2,885	0	0	0
47	0	0	600	0	300	105	0	0	0	0	0	0	0	0	0	0
48	0	459	0	0	500	445	0	0	0	0	0	117	0	0	0	0
49	0	0	0	0	152	47	0	0	0	0	0	33	0	0	0	0
50	0	0	0	0	0	0	324	0	0	0	0	0	0	0	0	0
51	408	221	0	0	0	375	0	0	0	0	0	0	0	0	0	0
52	1,600	413	200	0	169	0	0	0	0	0	0	92	0	0	0	0
53	485	90	0	0	200	79	0	0	0	0	0	0	0	0	640	0
54	1,190	0	0	0	59	0	261	0	0	0	0	35	0	0	0	0
55	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
56	257	1,101	0	0	0	0	0	0	0	0	0	158	0	0	0	0
57	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
58	139	0	0	0	0	0	0	0	1,198	0	0	0	0	0	0	0
59	0	0	0	0	36	937	0	0	0	0	0	115	57	0	0	0
60	1,167	177	112	0	188	66	0	0	0	0	0	110	0	0	598	0
61	579	391	0	0	29	31	0	0	0	0	0	102	0	0	519	1,748
62	50	200	0	0	0	0	0	0	0	0	0	0	0	0	0	0
63	100	0	0	0	0	1,064	0	200	0	0	0	100	0	0	0	0
64	688	0	0	0	0	0	0	0	0	0	0	0	0	0	601	0
65	110	120	279	0	100	101	0	0	0	0	0	33	0	0	0	0
66	668	0	0	0	133	0	0	0	0	0	0	123	0	0	0	0
67	1,289	272	0	0	352	2,962	0	400	0	147	0	18	0	0	0	0
68	0	0	0	0	65	100	700	650	0	0	2,691	0	0	0	0	0
69	366	0	0	0	21	340	0	0	0	0	0	64	0	0	0	0
70	96	0	0	0	0	0	0	0	0	0	0	0	41	0	0	0
71	44	0	0	0	0	0	0	0	0	0	0	0	0	10,569	0	0
72	0	0	514	0	200	0	0	0	0	0	0	88	0	0	0	0
73	682	4	0	0	0	0	220	0	0	0	0	64	69	0	0	0
74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
75	0	0	609	0	200	158	0	0	0	0	0	224	0	0	0	0
76	0	0	200	0	8	300	0	0	0	0	0	431	0	0	0	0
77	236	24	0	0	366	0	0	0	0	0	0	22	23	0	0	0
78	0	0	0	0	50	0	0	0	0	0	0	0	0	0	0	0
79	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80	0	0	0	0	0	0	0	0	0	0	0	0	43	0	0	0

Year 2006 Socio-Economic Data (Cont.)																
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81	546	0	0	0	57	0	0	0	0	0	0	0	3	0	0	0
82	233	0	0	0	771	0	49	0	362	0	0	53	20	0	250	150
83	1,206	746	0	0	0	0	0	0	0	0	0	79	0	0	0	0
84	0	0	200	0	0	356	0	0	0	0	0	35	106	0	0	0
85	167	0	300	0	381	250	0	30	0	0	0	22	191	0	0	0
86	1,230	0	0	0	326	100	0	0	0	0	0	43	20	0	0	0
87	816	414	0	0	314	100	0	0	0	0	0	43	20	0	530	0
88	888	244	692	0	467	32	0	0	0	0	0	15	19	0	0	0
89	585	0	0	0	130	1,018	0	0	0	0	0	0	8	0	0	0
90	759	0	224	0	158	0	0	0	0	0	0	26	0	7,250	0	0
91	1,952	0	0	0	81	45	0	0	0	0	0	74	0	0	529	0
92	97	0	0	0	163	0	0	0	0	0	0	19	137	0	0	1,906
93	0	0	0	0	0	0	0	0	0	0	0	31	0	0	0	0
94	0	0	0	0	371	790	0	0	0	298	0	43	0	871	0	0
95	381	0	0	0	97	0	0	0	0	0	0	55	0	0	0	0
96	0	908	1,142	0	200	757	0	70	0	0	0	26	19	0	0	0
97	1,785	0	850	0	0	278	0	0	0	0	0	65	60	0	406	1,151
98	650	2,561	4,542	0	0	29	0	0	0	0	0	162	17	180	442	0
99	1,031	0	1,300	0	151	204	36	54	0	0	0	169	19	0	0	0
100	998	0	1,509	0	0	100	0	0	0	0	0	471	12	0	584	0
101	1,138	0	100	0	309	242	0	30	0	0	0	26	19	0	0	0
102	359	0	0	0	443	86	0	0	0	0	0	0	12	0	0	0
103	1,657	0	959	0	0	25	0	0	0	0	0	154	25	0	1,259	0
104	929	0	0	0	31	23	0	0	0	0	0	84	11	0	1,317	0
105	1,529	0	100	0	185	108	0	0	0	0	0	133	22	0	460	2,473
106	1,637	530	209	0	367	273	454	0	0	0	0	238	21	0	0	0
107	1,856	691	0	0	370	316	0	25	0	0	0	211	22	0	500	0
108	0	0	0	0	100	0	0	0	0	0	0	100	22	0	0	1,843
109	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111	692	0	0	0	80	20	0	0	0	0	0	227	3	0	500	0
112	1,171	0	0	0	0	0	0	0	0	0	0	87	0	0	1,487	0
113	775	351	138	0	424	220	97	0	0	0	0	255	0	0	731	0
114	0	0	0	0	0	0	0	0	0	0	0	42	0	0	0	0
115	0	0	0	0	35	1,370	0	0	0	0	0	86	552	0	0	0
116	1,037	329	0	0	26	2	0	0	797	0	0	500	11	0	0	0
117	6	0	1,259	0	0	0	0	0	0	0	0	0	0	0	0	0
118	0	0	0	0	0	0	0	0	0	0	0	55	0	0	0	0
119	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120	0	0	0	0	49	0	0	0	0	0	0	25	0	0	0	0

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121	300	132	0	0	0	0	0	0	0	0	0	0	0	0	0	0
122	0	225	0	0	62	0	4	0	0	0	0	60	0	0	0	0
123	0	367	0	0	237	83	0	0	0	0	0	80	1,325	0	0	0
124	0	0	0	0	0	4,691	0	0	0	0	0	131	0	0	0	0
125	0	0	0	0	12	2,570	0	0	0	0	0	167	83	0	0	0
126	100	900	0	0	112	0	56	0	0	0	0	246	0	0	0	0
127	0	0	0	0	0	0	178	0	0	0	0	47	0	0	0	0
128	1,024	613	0	0	212	33	120	0	0	0	0	43	0	0	0	0
129	586	444	0	0	211	529	111	0	0	0	0	19	4	132	0	0
130	656	212	800	0	300	0	79	0	0	0	0	87	0	0	632	0
131	265	345	300	0	370	0	96	0	0	0	0	0	7	0	0	0
132	13	0	0	0	0	23	568	0	0	0	0	0	0	0	0	300
133	561	546	162	0	0	1,229	0	200	0	0	0	0	0	0	0	0
134	622	103	0	0	232	658	0	0	0	0	0	123	0	0	0	0
135	304	0	0	0	225	0	0	0	0	0	0	120	0	0	0	0
136	686	0	0	0	66	7	0	0	0	0	0	179	0	0	579	0
137	250	362	0	0	134	96	0	0	0	0	0	18	0	0	250	0
138	499	54	0	0	356	40	0	0	0	0	0	28	2	0	0	0
139	536	55	523	0	435	0	0	105	0	0	0	0	0	0	609	0
140	662	631	0	424	0	136	0	0	0	0	0	76	11	0	0	0
141	678	0	0	0	0	0	0	0	0	0	0	104	0	0	0	0
142	497	0	0	0	97	0	0	0	1,082	0	0	77	0	0	0	0
143	156	300	0	0	0	580	0	0	0	0	0	68	0	0	0	0
144	298	276	0	0	14	259	0	0	0	0	0	22	0	0	0	0
145	336	0	0	0	0	0	0	0	0	0	0	15	0	0	0	0
146	706	0	0	0	50	0	0	0	0	0	0	54	0	586	0	0
147	509	0	0	0	5	0	55	0	1,023	0	0	98	0	0	0	0
148	53	1,376	0	0	0	200	381	0	0	45	0	8	5	0	0	0
149	0	0	200	0	246	150	83	0	0	0	0	0	800	0	0	0
150	446	0	0	0	150	0	0	0	0	100	0	32	127	0	250	0
151	509	3	0	0	0	53	63	0	0	0	0	52	0	0	0	0
152	406	94	100	0	671	0	129	0	0	0	0	51	0	0	350	0
153	400	0	200	0	232	0	42	0	0	0	0	39	0	0	0	0
154	370	0	216	0	282	41	0	30	0	0	0	0	0	0	0	1,314
155	7	35	0	268	0	54	0	0	0	45	0	0	0	0	0	0
156	245	601	0	0	0	36	0	0	0	0	0	0	0	0	0	0
157	400	419	0	400	0	400	0	1,038	0	300	0	50	115	0	0	0
158	0	0	0	860	0	281	160	0	0	0	0	11	13	0	0	0
159	623	0	300	0	496	100	0	0	0	0	0	0	48	0	0	0
160	267	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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161	253	500	500	0	105	0	0	0	0	0	0	0	0	0	0	0
162	603	0	0	0	0	0	0	0	0	0	0	67	0	0	0	0
163	412	49	0	0	0	0	0	0	0	0	0	49	0	0	0	0
164	789	0	0	0	0	0	271	0	0	0	0	188	0	24	0	0
165	867	0	0	0	0	0	0	0	0	0	0	143	0	0	605	0
166	329	0	0	0	0	0	0	0	0	0	0	30	0	0	1,023	2,449
167	0	0	0	0	0	104	0	0	0	0	2,075	119	0	0	0	0
168	0	0	0	0	304	0	34	0	0	0	1,896	97	0	0	0	0
169	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
170	0	0	0	0	0	0	0	0	0	0	0	190	98	0	0	0
171	1,762	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
172	1,078	141	0	0	0	0	0	0	0	0	0	158	0	0	0	0
173	0	0	0	0	410	0	0	0	0	0	0	281	396	0	0	0
174	96	0	0	0	15	0	0	0	0	0	0	89	0	0	0	0
175	763	6	645	0	0	0	15	0	0	0	0	98	0	0	0	0
176	700	0	305	0	215	992	0	182	0	0	0	0	0	0	0	0
177	94	0	0	0	23	0	0	0	0	0	0	130	0	0	591	0
178	234	12	0	0	321	329	41	0	0	0	0	0	120	0	0	0
179	0	0	0	0	0	0	0	0	0	0	0	45	0	0	0	0
180	540	0	0	0	159	0	0	0	0	0	0	63	0	0	902	0
181	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
182	0	0	0	0	0	0	0	0	0	0	0	161	0	0	0	0
183	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
184	517	0	900	0	0	209	140	0	0	0	0	68	0	0	0	0
185	1,175	0	0	0	0	44	0	0	0	328	0	163	0	0	0	0
186	0	0	0	0	0	0	0	0	0	0	0	18	0	0	0	0
187	403	0	260	0	0	120	0	0	0	0	0	50	0	0	0	0
188	257	5	0	0	0	0	0	0	0	0	0	32	0	0	0	0
189	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
190	241	0	0	0	0	0	0	0	0	0	0	32	0	0	0	0
191	173	2	0	0	0	0	0	0	0	0	0	42	0	0	0	0
192	73	0	0	0	17	1	0	0	0	0	0	10	0	0	0	0
193	271	8	0	0	74	136	0	0	0	0	0	37	0	0	0	0
194	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
195	264	0	0	0	0	0	0	0	0	0	0	35	0	0	0	0
196	255	0	0	0	0	0	0	0	0	0	0	89	0	0	0	0
197	600	0	0	0	29	0	0	0	0	0	0	57	0	0	0	0
198	154	0	512	0	0	0	49	0	0	0	0	82	0	0	0	0
199	56	0	0	0	0	0	151	0	0	0	0	16	0	0	0	0
200	432	18	0	0	238	3	0	0	583	0	0	77	0	0	0	0

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201	330	0	0	0	0	0	0	0	0	0	0	45	0	0	0	236
202	608	0	300	602	0	0	0	0	0	0	0	184	0	0	0	0
203	496	0	0	0	25	108	0	0	0	0	0	44	82	0	0	0
204	124	0	365	0	0	0	0	0	0	0	0	85	0	0	0	0
205	333	0	0	0	0	0	0	0	0	0	0	91	269	0	0	0
206	518	6	0	0	3	0	0	0	0	0	0	70	0	0	0	0
207	471	41	0	0	0	0	0	0	0	0	0	250	0	0	0	0
208	530	120	0	0	75	0	0	0	500	0	0	0	0	0	0	0
209	745	22	300	0	294	10	0	0	0	0	0	44	80	0	0	0
210	106	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
211	0	0	0	0	0	0	0	0	0	0	0	19	4,643	0	0	0
212	506	0	0	0	461	0	19	0	0	0	0	89	0	0	0	0
213	473	272	0	0	35	180	0	57	0	0	0	0	5	0	0	0
214	965	475	0	0	113	0	0	0	0	0	0	64	0	0	586	0
215	0	200	100	0	252	159	0	150	0	0	0	58	0	24	0	0
216	0	0	0	0	0	0	0	0	0	0	0	19	0	0	0	0
217	0	0	0	0	0	0	0	0	0	0	0	394	74	0	0	0
218	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
219	0	0	0	0	17	0	0	0	0	0	0	0	0	0	0	0
220	119	0	0	0	0	0	0	0	0	0	0	15	14	0	250	250
221	115	0	0	0	0	0	35	0	0	0	0	37	486	0	0	0
222	249	212	0	160	0	189	0	0	165	0	0	0	0	0	0	0
223	0	0	0	208	0	483	0	0	0	0	0	0	0	0	0	0
224	0	0	0	859	0	158	0	105	0	0	0	0	0	0	0	0
225	0	0	0	666	0	26	155	0	0	200	0	0	0	0	0	0
226	0	0	0	0	379	599	0	0	0	50	0	183	0	0	0	0
227	200	285	636	532	0	2,815	43	400	0	400	0	0	0	0	0	0
228	0	0	0	326	0	2,034	124	300	0	300	0	0	0	0	0	0
229	343	138	0	0	0	81	0	0	0	0	0	37	0	0	0	0
230	100	326	0	0	475	385	0	0	0	300	0	0	0	0	0	0
231	727	23	200	0	42	50	0	0	493	0	0	90	0	0	0	0
232	554	96	0	245	0	154	0	13	0	0	0	130	0	0	0	0
233	900	15	0	0	6	0	0	0	0	0	0	338	0	0	0	0
234	0	0	0	0	0	0	0	0	0	0	0	37	0	0	0	0
235	398	23	0	0	210	0	0	0	0	0	0	69	0	0	0	0
236	916	0	100	0	121	0	0	0	0	0	0	103	0	0	0	0
237	1,196	196	0	0	51	20	0	0	0	0	0	0	36	0	505	0
238	789	112	0	0	41	0	21	0	0	0	0	131	0	0	0	0
239	311	0	208	0	629	37	0	0	0	0	0	105	279	0	0	0
240	939	158	0	0	0	0	0	0	0	0	0	98	0	0	0	0

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241	547	0	0	0	0	0	0	0	0	0	0	233	3	0	473	881
242	1,121	497	0	0	534	90	0	10	0	0	0	100	50	0	0	0
243	452	514	0	0	350	0	0	0	0	0	0	77	0	0	0	0
244	792	0	0	0	11	67	31	0	0	0	0	260	109	0	0	0
245	55	0	0	0	0	0	0	0	0	0	0	8	0	0	8	8
246	990	10	0	0	46	0	0	0	0	0	0	161	54	0	0	0
247	721	0	0	0	912	200	0	0	0	0	0	244	0	0	0	0
248	45	0	0	0	0	0	0	0	0	0	0	68	0	0	0	0
249	0	0	0	0	0	1,899	0	0	0	0	0	46	182	0	0	0
250	24	14	0	0	119	614	131	0	0	139	0	15	0	0	0	0
251	200	499	305	0	0	0	86	0	0	0	0	199	0	0	0	0
252	0	415	0	0	0	0	0	0	0	0	0	0	0	0	0	444
253	0	0	0	0	0	1,472	0	0	0	0	0	40	253	0	0	0
254	437	0	0	0	0	150	154	50	0	0	0	93	0	0	0	0
255	417	220	123	0	251	0	0	0	0	0	0	27	0	0	0	0
256	0	0	0	0	72	47	0	0	0	0	0	19	0	0	0	0
257	841	6	0	0	0	130	0	0	0	0	0	160	173	0	0	0
258	161	0	0	0	0	1,449	0	0	0	0	0	100	390	0	0	0
259	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
260	66	530	0	0	0	63	0	0	0	0	0	155	0	0	0	0
261	1,100	0	159	0	37	498	0	200	0	0	0	134	0	0	1,073	0
262	312	0	0	0	0	0	0	0	0	0	0	53	0	0	0	0
263	385	0	0	0	0	0	0	0	0	0	0	93	0	0	0	0
264	0	0	0	0	0	0	0	0	0	0	0	122	0	0	0	0
265	38	0	0	0	0	0	0	0	0	0	0	164	0	0	0	0
266	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
267	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
268	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
269	315	0	0	0	20	0	0	0	0	0	0	102	0	0	0	0
270	0	0	0	0	0	0	0	0	0	0	0	96	0	0	0	0
271	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
272	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
273	948	0	0	0	132	0	0	0	0	0	0	97	0	0	0	0
274	815	0	0	0	45	3	0	0	0	0	0	245	0	0	0	0
275	64	61	0	0	50	20	80	0	0	0	0	1	2	0	0	0
276	1,052	0	100	0	193	12	0	15	0	0	0	284	0	0	641	0
277	712	56	100	0	66	0	165	0	0	0	0	0	16	0	0	0
278	395	5	0	0	122	0	0	0	0	0	0	86	0	0	0	0
279	459	2	0	0	36	0	63	0	0	0	0	43	218	0	0	0
280	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,083	0

Year 2006 Socio-Economic Data (Cont.)																
TAZ	SF_HH	MF_HH	Retail Reg	Retails Downtown	Retail Gen	Office	Office Gov	Office Med	Resort	Hotel Motel	Hospital	Non Retail	Industrial	College	School	High School
281	247	11	0	0	0	0	101	0	0	0	0	42	0	0	489	0
282	0	0	0	0	0	0	0	0	0	0	0	109	0	0	959	0
283	1,832	11	0	0	149	90	0	0	0	0	0	434	0	0	0	0
284	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
285	836	5	0	0	160	0	0	0	0	0	0	91	116	0	0	0
286	315	1	0	0	0	0	0	0	0	0	0	104	0	0	0	0
287	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
288	138	28	0	0	0	0	0	0	0	0	0	187	0	0	0	0
289	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
290	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
291	581	297	704	0	0	501	0	0	0	1,125	0	126	0	0	0	0
292	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
293	0	0	0	0	0	1,170	0	0	0	0	0	30	103	0	0	0
294	368	494	150	0	216	0	0	0	0	0	0	258	0	0	0	0
295	0	537	401	0	663	1,016	0	180	0	0	0	57	16	0	0	0
296	272	0	0	0	250	0	0	0	0	0	0	307	0	0	1,290	0
297	951	176	0	0	587	0	104	0	0	239	0	313	0	0	0	0
298	0	0	0	715	0	617	0	0	0	0	0	26	1,337	0	0	0
299	0	0	0	750	0	0	0	0	0	0	0	18	285	0	0	0
300	300	180	0	0	200	1,000	0	180	0	0	0	30	112	0	0	0
301	0	0	0	355	0	1,705	20	0	0	831	0	54	1,419	0	0	0
302	0	0	849	0	862	50	0	0	0	0	0	65	0	0	0	0
303	0	0	0	0	148	2,776	0	250	0	212	0	128	714	0	0	0
304	0	460	0	0	0	0	147	0	0	0	0	0	0	0	0	0
305	206	520	150	0	59	51	0	0	0	0	0	214	0	0	0	0
306	96	402	0	0	0	1,302	0	200	0	0	0	0	0	0	0	0
307	174	300	0	0	0	61	0	0	0	0	0	200	0	0	0	0
308	201	501	0	0	0	0	0	0	0	0	0	0	0	0	0	0
309	0	0	0	597	0	718	0	0	0	425	0	11	1,821	0	0	0
310	218	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
311	300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
312	75	298	0	0	178	219	69	0	0	297	0	0	0	0	0	0
313	770	0	0	0	0	0	0	0	0	0	0	178	4	0	0	0
314	200	0	0	0	0	0	144	0	0	0	0	0	0	0	0	0
315	214	0	0	0	0	81	0	105	0	0	0	170	0	0	0	0
316	200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
317	699	0	0	0	0	0	0	0	0	110	0	165	0	0	0	0
318	267	49	0	0	0	0	0	0	0	0	0	0	0	0	0	0
319	267	49	0	0	0	409	0	0	0	0	0	0	0	0	0	0
320	269	331	0	0	84	101	0	0	0	0	0	60	0	0	0	0

Year 2006 Socio-Economic Data (Cont.)																
TAZ	SF_HH	MF_HH	Retail Reg	Retails Downtown	Retail Gen	Office	Office Gov	Office Med	Resort	Hotel Motel	Hospital	Non Retail	Industrial	College	School	High School
321	304	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
322	300	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0
323	200	0	0	0	0	0	0	0	0	0	0	10	0	0	944	0
324	270	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
325	150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
326	354	0	0	0	0	0	106	0	0	0	0	222	0	0	0	0
327	400	0	0	0	0	0	0	0	0	0	0	131	0	0	0	0
328	740	160	0	0	0	0	0	0	0	0	0	200	0	0	0	0
329	456	0	0	0	0	0	0	0	0	0	0	0	0	0	658	0
330	0	0	0	0	1,250	400	0	0	0	0	0	69	0	0	0	0
331	800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
332	0	0	0	0	0	0	0	750	0	0	3,824	0	0	0	0	0
333	466	238	0	0	300	500	0	66	0	274	0	31	0	0	0	0
334	0	0	0	0	198	1,110	943	0	0	0	0	74	408	0	0	0
335	396	0	0	0	58	0	0	0	0	0	0	40	0	0	0	0
336	395	0	0	0	200	499	0	48	0	0	0	36	0	0	0	0
337	0	0	0	0	537	250	0	50	0	0	0	33	0	0	0	0
338	0	560	500	0	444	350	0	0	0	100	0	33	6	0	0	0
339	104	563	1,380	0	0	614	0	100	0	268	0	200	3	0	1,049	0
340	221	0	0	0	0	0	0	0	0	0	0	0	0	0	610	0
341	134	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
342	366	234	0	0	250	315	0	43	0	0	0	65	0	0	567	0
343	107	200	200	0	343	852	0	0	0	0	0	127	0	0	0	0
344	483	308	0	0	250	1,240	0	464	0	0	0	65	417	0	0	0
345	161	0	0	0	0	13	0	0	0	0	0	100	3	0	0	0
346	200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
347	324	325	0	0	0	0	0	0	0	0	0	0	0	0	0	0
348	649	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
349	250	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
350	100	177	0	0	0	0	0	0	0	0	0	0	0	0	0	0
351	200	0	0	0	323	0	0	0	0	0	0	0	0	0	0	0
352	54	0	0	0	0	0	15	0	0	0	0	0	0	0	0	0
353	121	0	0	0	30	0	320	0	0	0	0	48	0	0	0	0
354	35	510	0	0	0	0	0	0	0	0	0	256	0	0	0	0
355	290	0	0	0	575	532	0	100	552	0	0	0	0	0	0	0
356	240	0	0	0	0	224	0	0	0	0	0	0	191	0	0	0
357	75	0	0	0	0	0	40	0	0	0	0	0	0	0	0	0
358	272	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
359	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
360	183	0	0	0	20	335	0	0	0	0	0	0	0	0	0	0

Year 2006 Socio-Economic Data (Cont.)																
TAZ	SF_HH	MF_HH	Retail Reg	Retails Downtown	Retail Gen	Office	Office Gov	Office Med	Resort	Hotel Motel	Hospital	Non Retail	Industrial	College	School	High School
361	402	750	0	0	0	0	0	0	0	0	0	0	0	0	0	0
362	506	0	150	0	100	0	0	0	0	0	0	167	0	0	0	0
363	70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
364	0	0	0	778	261	400	0	0	0	0	0	0	0	0	0	0
365	76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
366	182	0	0	0	2,300	600	0	0	0	0	0	0	0	0	0	0
367	0	126	0	0	1,299	628	0	0	0	50	0	0	0	0	0	0
368	260	447	0	0	250	0	0	0	0	0	0	50	0	586	0	0
369	612	0	0	0	16	196	0	0	0	0	0	82	0	0	543	0
370	0	0	261	0	0	0	0	0	0	0	0	0	0	0	0	0
371	100	58	0	100	0	409	1,007	0	0	0	0	0	0	0	0	0
372	0	0	0	100	0	305	0	432	0	100	0	69	0	0	0	0
373	969	198	0	0	150	80	0	0	0	0	0	0	460	0	0	0
374	485	90	0	0	67	208	0	0	0	0	0	0	0	0	0	0
375	200	645	0	0	742	0	335	0	0	0	0	38	0	0	0	0
376	0	312	0	0	69	20	0	0	0	0	0	0	0	0	0	0
377	250	386	0	0	0	170	0	300	0	0	0	38	0	24	0	0
378	269	353	335	0	0	324	0	0	0	0	0	0	45	0	0	0
379	200	0	0	0	0	0	44	0	0	0	0	0	0	0	0	0
380	145	145	0	0	100	0	0	0	0	0	0	0	0	0	0	0
381	100	0	0	0	35	0	0	0	0	0	0	0	0	0	0	0
382	107	193	0	0	45	0	0	0	0	0	0	0	0	0	750	0
383	107	110	0	0	150	10	0	0	0	0	0	59	100	0	0	0
384	107	93	0	0	175	0	0	0	0	0	0	0	0	0	0	0
385	557	0	0	0	154	62	0	0	0	100	0	0	0	0	0	0
386	651	624	311	0	200	53	0	0	0	0	0	260	407	0	490	0
387	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
388	1,180	477	250	0	114	0	0	0	0	0	0	0	41	0	0	0
389	200	0	0	0	18	0	0	0	0	0	0	189	0	0	0	0
390	140	100	0	0	0	40	0	0	0	0	0	0	0	0	40	0
391	271	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0
392	213	37	0	1,069	0	270	100	75	0	0	0	118	50	0	0	0
393	1,314	131	1,725	0	0	229	442	23	0	0	0	210	5	0	0	0
394	50	0	0	0	0	0	0	0	0	0	0	0	0	0	1,344	1,586
395	74	1	0	0	0	133	0	0	0	0	0	41	0	0	0	0
396	333	1	0	0	0	0	0	0	0	0	0	210	0	0	0	0
397	156	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
398	298	2	0	0	100	0	0	0	0	0	0	0	0	0	0	0
399	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
400	355	0	0	0	0	400	0	45	0	0	0	0	0	0	0	0

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401	0	0	0	0	0	0	0	0	0	0	0	31	0	0	0	0
402	405	303	0	0	0	0	0	0	0	0	0	211	0	0	0	0
403	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
404	376	10	0	0	30	20	0	0	0	0	0	0	0	0	0	0
405	301	132	268	0	0	170	0	30	0	0	0	10	18	0	0	0
406	0	0	0	0	79	343	0	0	0	0	0	263	31	0	0	0
407	469	10	0	0	0	132	0	0	0	0	0	41	0	0	0	0
408	198	2	0	0	0	0	0	0	0	0	0	0	0	0	583	0
409	512	8	0	0	120	7	0	0	0	0	0	96	0	0	0	0
410	99	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
411	120	0	0	0	46	0	0	0	0	0	0	58	0	0	0	0
412	300	324	0	0	94	66	0	0	0	100	0	174	0	0	0	0
413	913	0	401	0	663	900	0	252	0	0	0	57	16	0	0	0
414	1,506	0	283	0	215	45	0	0	0	0	0	9	24	0	675	0
415	1,592	0	0	0	99	381	0	10	0	0	0	22	191	0	500	0
416	659	0	0	0	300	213	0	0	0	0	0	0	20	0	0	0
417	988	0	300	0	313	300	0	0	0	0	0	0	50	0	0	0
418	2,309	620	0	0	198	0	0	0	0	0	0	100	22	0	505	0
419	340	0	400	0	217	778	0	0	0	0	0	82	0	0	0	0
420	183	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
421	400	83	0	0	790	21	200	0	0	0	0	165	200	0	0	0
422	439	300	200	400	700	140	266	50	0	157	0	443	200	82	0	0
423	300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
424	350	0	0	0	202	0	0	0	0	0	0	0	0	0	0	0
425	379	0	0	0	0	0	0	0	0	0	0	61	0	0	752	0
426	46	0	0	0	0	25	0	0	0	0	0	0	0	0	0	0
427	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
428	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
429	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
430	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
431	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	146,535	46,981	39,298	15,409	46,134	90,132	10,817	9,666	10,054	9,458	10,486	30,487	29,138	21,714	36,792	18,588

Year 2030 Socio-Economic Data																
TAZ	SF_HH	MF_HH	Retail Reg	Retails Downtown	Retail Gen	Office	Office Gov	Office Med	Resort	Hotel Motel	Hospital	Non Retail	Industrial	College	School	High School
1	607	0	0	0	0	0	0	0	0	0	0	24	47	0	0	0
2	353	0	1,026	0	200	1,300	0	269	0	220	0	27	0	0	0	0
3	649	0	0	0	5	0	2	0	653	0	0	147	0	0	0	0
4	285	0	0	0	34	0	0	0	783	0	0	163	78	0	0	0
5	90	0	0	0	0	0	0	0	0	0	0	43	0	0	0	0
6	507	0	0	0	300	2,729	0	200	800	0	0	0	0	0	0	0
7	369	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	168	261	0	0	125	224	0	0	0	0	0	53	0	0	0	1,849
9	71	100	0	0	120	44	0	0	0	353	0	100	3	0	0	0
10	0	0	300	0	300	0	0	0	0	178	0	0	0	0	0	0
11	761	288	0	0	0	0	0	0	0	0	0	82	0	0	0	0
12	440	298	0	600	0	2,000	0	100	0	0	0	33	0	0	445	0
13	945	0	0	692	0	434	54	0	0	0	0	117	91	382	0	0
14	440	0	0	0	0	0	238	0	0	0	0	116	0	0	624	0
15	327	0	0	0	9	0	8	0	0	0	0	67	0	0	0	0
16	0	200	0	950	0	860	0	0	807	0	0	34	100	0	0	0
17	445	0	0	0	72	0	0	0	0	0	0	87	0	0	0	0
18	0	0	877	0	578	209	0	0	0	214	0	3	1,058	0	0	0
19	500	700	0	0	0	0	0	0	0	200	0	0	0	0	0	0
20	0	0	200	0	800	6,350	0	0	0	0	0	100	1,500	0	0	0
21	0	987	300	0	298	550	0	0	0	0	0	63	0	0	0	0
22	0	0	350	0	152	550	0	0	0	0	0	63	0	0	0	0
23	0	0	0	0	1,205	3,404	0	0	0	0	0	1,280	0	0	0	0
24	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	393	200	0	0	0	0	0	0	0	0	0	100	0	0	0	0
26	0	0	300	0	243	5,000	0	693	0	0	0	5	55	0	0	0
27	474	370	300	0	450	139	42	0	0	0	0	87	0	0	0	0
28	127	373	0	0	447	575	19	0	0	786	0	109	0	0	0	0
29	50	0	0	0	0	0	0	0	313	0	0	0	0	0	0	0
30	584	328	0	0	0	0	0	0	0	0	0	101	0	0	0	0
31	100	0	0	0	148	3,085	0	250	0	237	0	21	793	0	0	0
32	642	0	0	0	0	0	0	0	0	0	0	67	0	0	624	0
33	100	200	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	150	602	100	0	300	25	0	0	0	100	0	123	0	0	0	0
35	211	373	0	0	0	0	0	0	0	0	0	150	0	0	0	0
36	167	0	0	0	18	0	53	0	0	0	0	30	0	0	0	0
37	898	0	0	0	85	0	6	0	0	0	0	75	0	0	0	0
38	0	0	0	399	0	603	0	0	0	0	0	11	1,132	0	0	0
39	0	0	500	0	149	1,501	0	200	0	0	0	141	16	0	0	0
40	223	902	0	0	9	231	0	50	0	0	0	128	0	0	588	0

Year 2030 Socio-Economic Data (Cont.)																
TAZ	SF_HH	MF_HH	Retail Reg	Retails Downtown	Retail Gen	Office	Office Gov	Office Med	Resort	Hotel Motel	Hospital	Non Retail	Industrial	College	School	High School
41	817	378	200	0	229	0	0	0	0	0	0	88	0	0	0	0
42	1,794	784	0	0	44	774	0	0	0	0	0	314	0	0	0	0
43	0	0	0	2,000	0	0	0	0	0	380	0	0	0	0	0	0
44	0	0	0	394	0	1,725	0	0	0	250	0	835	1,348	1,004	0	0
45	0	0	600	0	1,012	45	0	0	0	0	0	247	400	0	0	0
46	0	0	290	0	112	622	0	0	0	0	0	1,214	2,885	0	0	0
47	0	2,757	600	0	300	273	0	0	0	0	0	385	0	0	0	0
48	0	533	0	0	502	2,450	0	500	0	0	0	128	0	0	0	0
49	0	98	400	0	555	2,151	0	0	0	0	0	237	0	0	0	0
50	0	0	0	0	60	200	1,000	0	0	0	0	76	0	0	0	0
51	450	221	0	0	0	375	0	0	0	0	0	31	0	0	0	0
52	1,600	413	200	0	169	0	0	0	0	0	0	84	0	0	0	0
53	485	90	0	0	200	79	0	0	0	0	0	0	0	0	640	0
54	1,194	0	0	0	0	0	261	0	0	0	0	90	0	0	0	0
55	0	0	200	0	500	1,500	0	0	0	0	0	150	0	0	0	0
56	270	1,101	0	0	0	0	0	0	0	0	0	158	0	0	0	0
57	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
58	139	0	0	0	0	0	0	0	1,186	0	0	9	0	0	0	0
59	0	0	200	0	300	2,455	0	0	0	0	0	105	400	0	0	0
60	1,208	177	112	0	188	66	0	0	0	0	0	106	0	0	598	0
61	579	400	0	0	29	36	0	0	0	0	0	93	0	0	519	1,748
62	50	200	0	0	0	0	0	0	0	0	0	0	0	0	0	0
63	100	0	0	0	0	1,064	0	200	0	0	0	100	0	0	0	0
64	800	0	0	0	0	0	0	0	0	0	0	0	0	0	601	0
65	110	120	279	0	100	352	0	0	0	0	0	15	0	0	0	0
66	668	0	0	0	133	0	0	0	0	0	0	121	0	0	0	0
67	1,289	280	0	0	352	2,962	0	400	0	0	0	123	0	0	0	0
68	0	0	0	0	60	0	906	259	0	0	2,322	0	0	0	0	0
69	366	0	0	0	21	430	0	0	0	0	0	45	0	0	0	0
70	102	0	0	0	0	0	0	0	0	0	0	0	41	0	0	0
71	45	51	0	0	0	0	0	0	0	0	0	14	0	10,569	0	0
72	0	0	400	0	734	0	0	0	0	0	0	185	0	0	0	0
73	702	4	0	0	55	0	220	0	0	0	0	63	69	0	0	0
74	0	0	592	0	200	5,752	0	0	0	1,030	0	136	0	0	0	0
75	0	0	2,150	0	1,600	5,500	0	0	0	0	0	800	650	0	0	0
76	0	0	200	0	316	4,683	0	0	739	1,000	0	62	0	0	0	0
77	250	126	400	0	710	626	0	0	0	0	0	639	24	0	0	0
78	0	0	0	0	86	0	0	0	0	0	0	2	14	0	0	0
79	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80	0	0	0	0	0	0	0	0	0	0	0	0	43	0	0	0

Year 2030 Socio-Economic Data (Cont.)																
TAZ	SF_HH	MF_HH	Retail Reg	Retails Downtown	Retail Gen	Office	Office Gov	Office Med	Resort	Hotel Motel	Hospital	Non Retail	Industrial	College	School	High School
81	914	0	0	0	296	0	0	0	0	0	0	84	0	0	0	0
82	365	0	400	0	886	0	49	0	548	0	0	56	20	0	250	150
83	1,001	811	0	0	0	0	0	0	0	0	0	56	0	0	0	0
84	0	0	200	0	0	450	0	0	0	0	0	53	0	0	0	0
85	167	0	300	0	381	365	0	30	0	0	0	54	191	0	0	0
86	430	0	0	0	200	0	356	0	0	0	0	71	0	0	0	0
87	1,651	414	0	0	314	100	0	0	0	0	0	131	20	0	530	0
88	914	244	692	0	467	0	0	0	0	0	0	63	0	0	0	0
89	624	12	0	0	75	1,024	36	0	0	0	0	35	0	0	0	0
90	765	0	200	0	136	0	0	0	0	0	0	62	0	7,250	0	0
91	2,003	0	0	0	111	0	0	0	0	0	0	115	0	0	529	0
92	325	20	0	0	200	0	0	0	0	0	0	33	275	0	0	1,906
93	943	125	0	0	0	0	14	0	0	0	0	192	0	0	0	0
94	0	0	0	0	374	790	0	0	0	298	0	29	0	871	0	0
95	407	0	0	0	105	0	10	0	0	0	0	49	0	0	0	0
96	0	1,011	1,200	0	200	757	0	70	0	0	0	76	0	0	0	0
97	1,785	0	885	0	0	99	0	0	0	142	0	155	3	0	406	1,151
98	704	2,561	4,542	0	0	432	114	0	0	285	0	280	0	180	442	0
99	1,031	0	1,300	0	168	204	40	54	0	0	0	188	19	0	0	0
100	1,093	0	1,334	0	0	121	0	0	0	579	0	91	0	0	584	0
101	1,208	0	200	0	54	200	109	0	0	229	0	100	0	0	0	0
102	359	0	0	0	400	0	162	0	0	0	0	54	0	0	0	0
103	1,657	0	959	0	0	25	0	0	0	0	0	171	25	0	1,259	0
104	929	0	0	0	31	23	0	0	0	0	0	96	11	0	1,317	0
105	1,529	0	100	0	193	108	0	0	0	0	0	148	22	0	460	2,473
106	1,637	530	210	0	367	273	504	0	0	0	0	264	21	0	0	0
107	1,856	703	0	0	411	316	0	25	0	0	0	235	22	0	500	0
108	0	0	0	0	100	0	0	0	0	0	0	158	22	0	0	1,843
109	0	0	0	0	100	725	0	0	0	0	0	14	0	0	0	0
110	293	899	0	0	100	0	0	0	0	0	0	100	0	0	0	0
111	1,798	0	0	0	478	0	286	0	0	0	0	338	0	0	500	0
112	1,763	0	0	0	0	0	0	0	0	0	0	106	0	0	1,487	0
113	900	351	138	0	424	220	104	0	0	0	0	255	0	0	731	0
114	0	0	0	0	385	0	0	0	0	194	0	8	175	0	0	0
115	0	0	0	0	175	7,000	0	0	0	256	0	99	2,706	0	0	0
116	1,159	2,297	0	0	20	0	51	0	1,137	0	0	298	0	0	0	0
117	0	1,079	2,300	0	137	2,700	993	524	0	377	0	404	0	0	0	0
118	0	0	0	0	106	2,542	0	0	0	189	0	305	144	0	0	0
119	452	353	0	0	0	0	23	0	0	0	0	59	0	0	0	0
120	0	1,000	575	0	3,000	4,000	0	0	0	400	0	92	0	0	0	0

Year 2030 Socio-Economic Data (Cont.)																
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121	300	898	0	0	100	0	258	0	0	0	0	100	0	0	0	0
122	0	563	0	0	862	29	280	0	0	434	0	39	0	0	0	0
123	0	466	0	0	237	57	125	0	0	0	0	53	1,692	0	0	0
124	0	0	0	0	0	5,408	0	0	0	0	0	131	0	0	0	0
125	0	0	0	0	43	5,333	0	0	0	0	0	167	83	0	0	0
126	121	900	0	0	86	0	56	0	0	0	0	594	0	0	0	0
127	0	0	0	0	0	0	178	0	0	0	0	13	0	0	0	0
128	1,031	785	0	0	212	0	120	0	0	0	0	93	0	0	0	0
129	587	768	0	0	454	261	112	0	0	0	0	146	0	132	0	0
130	656	212	800	0	300	0	79	0	0	0	0	77	0	0	632	0
131	365	382	0	0	250	750	334	250	0	0	0	0	0	0	0	0
132	13	0	0	0	0	0	689	0	0	0	0	0	0	0	0	300
133	571	546	0	0	114	1,229	0	200	0	0	0	41	0	0	0	0
134	653	110	0	0	75	181	0	0	0	0	0	757	0	0	0	0
135	319	0	0	0	38	104	0	0	0	193	0	12	0	0	0	0
136	708	0	0	0	66	7	0	0	0	0	0	179	0	0	579	0
137	261	362	0	0	134	174	0	0	0	0	0	65	0	0	250	0
138	499	54	0	0	356	28	0	0	0	0	0	40	2	0	0	0
139	536	55	523	0	435	3	74	0	0	0	0	25	0	0	609	0
140	662	649	0	449	0	136	0	0	0	0	0	67	11	0	0	0
141	771	0	0	0	50	0	23	0	0	0	0	118	0	0	0	0
142	556	0	0	0	97	0	0	0	1,120	0	0	73	0	0	0	0
143	156	300	0	0	0	580	0	0	0	0	0	44	0	0	0	0
144	298	276	0	0	14	259	0	0	0	0	0	22	0	0	0	0
145	363	0	0	0	12	0	0	0	0	0	0	25	0	0	0	0
146	706	0	0	0	50	0	0	0	0	0	0	30	0	586	0	0
147	528	0	0	0	0	0	55	0	1,023	0	0	177	0	0	0	0
148	54	1,417	0	0	9	200	381	0	0	0	0	37	46	0	0	0
149	0	0	300	0	246	150	0	0	0	0	0	118	1,241	0	0	0
150	446	0	0	0	150	0	0	0	0	123	0	32	127	0	250	0
151	519	3	1,000	0	1,149	1,006	425	0	0	1,329	0	92	1,274	0	0	0
152	411	94	100	0	671	0	129	0	0	0	0	46	0	0	350	0
153	400	0	200	0	232	0	42	0	0	0	0	49	0	0	0	0
154	373	0	316	0	200	9	0	30	0	0	0	12	0	0	0	1,314
155	7	99	0	305	0	54	0	0	0	0	0	8	0	0	0	0
156	245	601	0	0	0	36	0	0	0	0	0	0	0	0	0	0
157	425	419	0	466	0	400	0	1,038	0	1,157	0	50	115	0	0	0
158	146	0	0	885	0	368	160	0	0	0	0	18	13	0	0	0
159	623	0	300	0	496	100	0	0	0	0	0	0	42	0	0	0
160	267	85	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Year 2030 Socio-Economic Data (Cont.)																
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161	286	500	500	0	222	0	0	0	0	0	0	50	0	0	0	0
162	1,149	0	0	0	167	0	76	0	0	0	0	240	0	0	0	0
163	665	50	0	0	87	0	35	0	0	0	0	104	0	0	0	0
164	950	0	0	0	0	0	271	0	0	0	0	188	0	24	0	0
165	1,243	0	0	0	0	74	0	0	0	0	0	166	0	0	605	0
166	401	0	0	0	0	0	0	0	0	0	0	69	0	0	1,023	2,449
167	0	0	0	0	0	437	122	0	0	0	2,657	7	0	0	0	0
168	0	300	400	0	692	174	121	0	0	0	2,034	23	0	0	0	0
169	38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
170	0	0	0	0	115	300	0	0	0	150	0	30	1,769	0	0	0
171	1,823	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
172	1,078	141	0	0	0	0	0	0	0	0	0	154	0	0	0	0
173	0	0	0	0	635	775	328	0	0	0	0	2,241	486	0	0	0
174	507	0	0	0	171	0	80	0	0	0	0	123	0	0	0	0
175	1,084	6	750	0	0	0	62	0	0	0	0	176	0	0	0	0
176	900	0	305	0	215	1,266	0	250	0	0	0	70	0	0	0	0
177	1,703	0	0	0	81	70	0	0	0	0	0	387	0	0	591	0
178	235	12	0	0	621	983	0	100	0	0	0	44	200	0	0	0
179	1,181	2,008	0	0	1,200	400	0	0	0	839	0	416	0	0	0	0
180	542	0	0	0	159	0	128	0	0	0	0	61	0	0	902	0
181	910	0	0	0	475	250	112	150	0	131	0	196	0	0	500	0
182	836	396	1,000	0	2,000	1,500	0	400	0	300	0	238	350	0	500	0
183	1,459	0	0	0	751	0	178	0	0	210	0	152	0	0	750	0
184	523	0	900	0	0	209	142	0	0	0	0	59	0	0	0	0
185	1,206	0	0	0	0	463	0	0	0	566	0	141	0	0	0	0
186	0	0	0	0	0	0	0	0	0	0	0	18	0	0	0	0
187	408	0	260	0	0	120	0	0	0	0	0	50	0	0	0	0
188	619	5	0	0	113	0	53	0	0	0	0	130	0	0	0	0
189	1,083	0	0	0	231	0	104	0	0	0	0	226	0	0	0	1,200
190	429	0	0	0	51	0	26	0	0	0	0	91	0	0	0	0
191	1,017	0	0	0	239	0	183	0	0	139	0	149	0	0	0	0
192	307	0	0	0	95	0	32	0	0	0	0	75	0	0	0	0
193	642	8	0	0	179	136	51	0	0	0	0	144	0	0	0	0
194	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
195	350	0	0	0	30	0	14	0	0	0	0	56	0	0	0	0
196	475	0	0	0	69	0	31	0	0	0	0	150	0	0	0	0
197	825	0	0	0	143	0	50	0	0	0	0	131	0	0	0	0
198	731	0	589	0	0	0	49	0	0	332	0	103	0	0	0	0
199	500	0	0	0	372	0	326	0	0	0	0	182	0	0	0	0
200	665	18	0	0	238	3	0	0	583	0	0	79	0	0	0	0

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201	433	0	0	0	41	0	17	0	0	0	0	71	0	0	0	236
202	610	0	300	602	0	0	0	0	0	104	0	75	0	0	0	0
203	753	0	0	0	64	46	115	0	0	0	0	86	82	0	0	0
204	583	0	545	0	0	0	0	0	0	0	0	85	0	0	0	0
205	645	0	0	0	130	0	53	0	0	0	0	150	269	0	0	0
206	518	6	0	0	3	0	0	0	0	0	0	68	0	0	0	0
207	494	41	0	0	0	0	0	0	0	0	0	231	0	0	0	0
208	715	120	0	0	275	100	0	0	520	0	0	74	0	0	0	0
209	1,003	0	300	0	294	0	0	0	0	0	0	44	30	0	0	0
210	390	0	0	0	0	0	0	0	0	0	0	128	0	0	0	0
211	0	0	0	0	0	0	0	0	0	0	0	0	4,643	0	0	0
212	512	0	0	0	461	0	19	0	0	0	0	123	0	0	0	0
213	484	272	0	0	35	180	0	57	0	0	0	0	5	0	0	0
214	981	475	0	0	163	0	0	0	0	0	0	60	0	0	586	0
215	0	200	100	0	261	200	0	150	0	0	0	33	0	24	0	0
216	0	0	0	0	800	1,600	0	0	0	0	0	50	0	0	0	0
217	0	0	0	0	318	0	0	0	0	0	0	831	267	0	0	0
218	0	0	0	0	400	3,150	0	0	0	0	0	300	0	0	0	0
219	0	0	0	0	750	3,100	0	0	0	0	0	100	0	0	0	0
220	125	0	0	0	276	710	141	0	0	0	0	118	0	0	250	250
221	117	0	0	0	0	0	35	0	0	0	0	37	486	0	0	0
222	250	310	0	196	0	189	9	0	100	0	0	17	0	0	0	0
223	0	0	0	262	0	483	0	0	0	0	0	20	0	0	0	0
224	0	0	0	859	0	295	6	105	0	0	0	35	0	0	0	0
225	0	0	0	666	0	26	155	0	0	195	0	2	0	0	0	0
226	0	0	0	0	379	737	0	0	0	0	0	38	0	0	0	0
227	266	285	600	672	0	2,815	43	567	0	400	0	19	0	0	0	0
228	0	0	0	310	0	1,600	0	700	0	250	0	0	0	0	0	0
229	667	281	0	0	174	81	0	0	0	0	0	185	0	0	0	0
230	100	326	0	0	583	385	0	0	0	172	0	22	0	0	0	0
231	1,335	23	200	0	50	50	6	0	493	0	0	132	0	0	0	0
232	809	96	0	445	0	302	0	13	0	0	0	74	0	0	0	0
233	908	15	0	0	15	0	8	0	0	243	0	88	0	0	0	0
234	0	0	0	0	0	0	0	0	0	0	0	37	0	0	0	0
235	562	25	0	0	210	0	0	0	0	0	0	69	0	0	0	0
236	1,406	0	100	0	254	0	58	0	0	0	0	202	0	0	0	0
237	1,196	196	0	0	90	51	0	0	0	0	0	0	36	0	505	0
238	1,100	292	0	0	388	0	275	0	0	351	0	241	3	0	0	0
239	519	0	300	0	359	130	0	0	0	0	0	240	457	0	0	0
240	1,136	182	0	0	80	0	30	0	0	0	0	119	3	0	0	0

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241	913	0	0	0	0	0	0	0	0	0	0	300	0	0	473	881
242	1,211	497	0	0	728	140	0	10	0	0	0	100	39	0	0	0
243	453	545	0	0	357	0	0	0	0	0	0	70	0	0	0	0
244	1,049	0	0	0	147	67	87	0	0	0	0	316	109	0	0	0
245	415	0	0	0	103	0	51	0	0	0	0	110	0	0	8	8
246	4,432	0	400	0	752	0	559	0	0	655	0	744	108	0	0	0
247	754	0	0	0	1,245	250	0	0	0	209	0	162	90	0	0	0
248	1,774	0	200	0	307	0	566	0	0	286	0	282	0	0	0	0
249	0	0	0	0	0	1,900	0	0	0	0	0	0	202	0	0	0
250	24	14	0	0	132	682	146	0	0	145	0	17	0	0	0	0
251	301	496	305	0	0	0	86	0	0	0	0	199	0	0	0	0
252	415	0	0	0	47	742	0	0	0	0	0	218	0	0	0	444
253	0	0	0	0	0	1,635	0	0	0	0	0	0	292	0	0	0
254	437	0	0	0	6	0	157	0	0	207	0	82	0	0	0	0
255	417	220	123	0	250	16	0	0	0	0	0	92	0	0	0	0
256	0	0	200	0	433	783	56	0	0	0	0	70	0	0	0	0
257	1,184	6	0	0	0	634	0	0	0	0	0	129	600	0	0	0
258	180	0	0	0	0	1,610	0	0	0	0	0	37	434	0	0	0
259	0	207	0	0	143	1,214	0	0	0	0	0	72	0	0	0	0
260	93	802	0	0	0	125	0	0	0	0	0	36	0	0	0	0
261	1,100	0	196	0	0	1,700	111	600	0	0	600	85	0	0	1,073	0
262	392	0	0	0	39	9	17	0	0	0	0	53	0	0	0	0
263	385	0	0	0	0	0	0	0	0	0	0	93	0	0	0	0
264	2,072	1,163	0	0	150	100	0	0	0	366	0	449	0	0	1,348	0
265	1,183	0	200	0	172	41	157	0	0	187	0	128	118	0	0	0
266	1,537	235	0	0	834	100	241	0	0	416	0	287	0	0	500	0
267	769	0	0	0	0	0	0	0	0	0	0	122	0	0	0	0
268	551	0	0	0	143	0	70	0	0	0	0	157	0	0	0	0
269	604	0	0	0	92	0	39	0	0	0	0	189	0	0	0	0
270	4,048	100	1,000	0	1,146	388	519	300	838	0	0	496	0	0	500	0
271	1,825	0	0	0	755	150	170	75	0	400	0	211	0	0	900	1,378
272	2,396	0	0	0	589	0	266	0	0	307	0	386	0	0	505	0
273	3,043	156	0	0	1,260	200	301	100	0	350	0	467	0	0	500	0
274	1,473	0	0	0	274	3	296	0	0	0	0	232	0	0	0	0
275	449	127	300	0	402	0	0	0	0	0	0	102	0	0	0	0
276	1,072	29	100	0	193	0	167	0	0	0	0	145	0	0	641	0
277	857	57	200	0	210	0	0	0	0	0	0	94	16	0	0	0
278	398	0	0	0	122	0	0	0	0	0	0	87	0	0	0	0
279	724	2	0	0	125	63	33	0	0	0	0	100	218	0	0	0
280	1,783	0	0	0	499	0	221	0	0	252	0	223	0	0	1,083	1,300

Year 2030 Socio-Economic Data (Cont.)																
TAZ	SF_HH	MF_HH	Retail Reg	Retails Downtown	Retail Gen	Office	Office Gov	Office Med	Resort	Hotel Motel	Hospital	Non Retail	Industrial	College	School	High School
281	514	11	0	0	0	0	101	0	0	0	0	76	0	0	489	0
282	476	122	0	0	0	0	0	0	0	0	0	50	0	0	959	1,200
283	1,636	11	0	0	518	624	117	0	0	407	0	202	0	0	0	0
284	823	0	0	0	0	260	128	0	0	0	0	169	158	0	0	0
285	913	0	0	0	160	0	0	0	0	0	0	91	116	0	0	0
286	315	1	0	0	50	0	0	0	0	0	0	79	4	0	0	0
287	0	0	1,154	0	1,609	0	0	0	0	0	0	206	290	0	0	0
288	425	105	0	0	0	311	23	0	0	150	0	28	0	0	0	0
289	0	501	1,024	0	1,609	0	0	0	0	622	0	205	291	0	697	0
290	0	0	200	0	300	600	0	0	0	0	0	71	0	0	0	0
291	591	301	782	0	0	557	0	0	0	1,135	0	140	0	0	0	0
292	69	0	0	0	83	788	233	0	0	0	0	100	185	0	0	0
293	0	0	0	0	0	1,300	0	0	0	0	0	0	103	0	0	0
294	394	601	200	0	263	90	204	0	522	0	0	176	728	0	0	0
295	0	537	401	0	663	1,129	0	200	0	0	0	63	16	0	0	0
296	302	0	0	0	250	0	0	0	0	0	0	302	0	0	1,290	0
297	1,179	176	0	0	652	0	115	0	0	262	0	348	0	0	0	0
298	0	0	0	727	0	617	0	0	0	0	0	24	1,485	0	0	0
299	0	0	0	750	0	0	0	0	0	0	0	20	285	0	0	0
300	300	180	0	0	200	1,000	0	200	0	0	0	33	112	0	0	0
301	0	0	0	394	0	1,705	20	0	0	923	0	60	1,348	0	0	0
302	0	0	849	0	937	50	0	0	0	0	0	65	225	0	0	0
303	0	0	0	0	148	3,084	0	250	0	236	0	21	793	0	0	0
304	0	460	0	0	0	0	465	0	0	0	0	1,074	0	0	0	0
305	283	520	150	0	59	50	0	0	0	0	0	200	0	0	0	0
306	96	402	0	0	0	1,506	0	200	0	0	0	0	0	0	0	0
307	174	350	0	0	0	61	6	0	0	0	0	200	0	0	0	0
308	201	501	0	0	0	0	0	0	0	0	0	0	0	0	0	0
309	0	0	0	597	0	718	0	0	0	472	0	12	1,821	0	0	0
310	218	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
311	322	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
312	75	298	0	0	178	219	69	0	0	297	0	0	0	0	0	0
313	770	0	0	0	0	0	0	0	0	0	0	178	3	0	0	0
314	300	0	0	0	0	0	171	0	0	0	0	0	0	0	0	0
315	214	0	0	0	0	86	0	105	0	0	0	170	0	0	0	0
316	220	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
317	729	0	0	0	0	0	0	0	0	131	0	162	0	0	0	0
318	267	84	0	0	0	0	0	0	0	0	0	0	0	0	0	0
319	300	49	0	0	39	668	20	0	0	0	0	0	0	0	0	0
320	269	331	0	0	84	350	0	0	0	0	0	60	0	0	0	0

Year 2030 Socio-Economic Data (Cont.)																
TAZ	SF_HH	MF_HH	Retail Reg	Retails Downtown	Retail Gen	Office	Office Gov	Office Med	Resort	Hotel Motel	Hospital	Non Retail	Industrial	College	School	High School
321	334	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
322	357	0	0	0	0	0	0	0	0	0	0	9	0	0	0	0
323	200	0	0	0	0	0	0	0	0	0	0	10	0	0	944	0
324	300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
325	150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
326	376	0	0	0	22	0	114	0	0	0	0	233	0	0	0	0
327	422	0	0	0	0	0	0	0	0	0	0	131	0	0	0	0
328	795	160	0	0	0	0	0	0	0	0	0	200	0	0	0	0
329	456	0	0	0	0	0	0	0	0	0	0	0	0	0	658	0
330	0	0	0	0	1,679	0	35	0	0	0	0	0	0	0	0	0
331	875	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
332	0	0	0	0	87	351	0	1,046	0	0	3,824	0	0	0	0	0
333	486	238	0	0	300	537	0	0	0	274	0	0	0	0	0	0
334	0	0	0	0	198	1,173	943	0	0	0	0	71	483	0	0	0
335	445	0	0	0	58	0	0	0	0	0	0	44	0	0	0	0
336	444	0	0	0	200	499	0	0	0	0	0	40	0	0	0	0
337	0	0	0	0	537	387	0	0	0	0	0	54	0	0	0	0
338	0	560	500	0	444	350	0	0	0	104	0	47	6	0	0	0
339	104	563	1,380	0	0	614	0	100	0	298	0	200	0	0	1,049	0
340	221	0	0	0	0	0	0	0	0	0	0	0	0	0	610	0
341	151	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
342	366	234	0	0	250	315	0	43	0	0	0	65	0	0	567	0
343	107	200	200	0	343	852	0	0	0	0	0	127	0	0	0	0
344	483	308	0	0	250	1,240	0	464	0	0	0	65	417	0	0	0
345	161	0	0	0	0	13	0	0	0	0	0	100	3	0	0	0
346	200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
347	324	325	0	0	0	0	0	0	0	0	0	0	0	0	0	0
348	649	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
349	250	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
350	100	177	0	0	0	0	0	0	0	0	0	0	0	0	0	0
351	200	0	0	0	323	0	0	0	0	0	0	0	0	0	0	0
352	80	0	0	0	0	0	15	0	0	0	0	0	0	0	0	0
353	161	0	0	0	185	0	348	0	0	0	0	43	0	0	0	0
354	35	510	0	0	0	0	0	0	0	0	0	62	191	0	0	0
355	290	0	356	0	219	532	0	100	630	0	0	0	0	0	0	0
356	240	0	0	0	0	400	0	0	0	250	0	0	0	0	0	0
357	75	0	0	0	0	0	0	0	0	250	0	0	0	0	0	0
358	272	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
359	0	0	200	0	300	2,400	0	0	0	0	0	90	400	0	0	0
360	211	0	0	0	20	500	0	0	0	0	0	0	0	0	0	0

Year 2030 Socio-Economic Data (Cont.)																
TAZ	SF_HH	MF_HH	Retail Reg	Retails Downtown	Retail Gen	Office	Office Gov	Office Med	Resort	Hotel Motel	Hospital	Non Retail	Industrial	College	School	High School
361	402	750	0	0	0	0	0	0	0	0	0	0	0	0	0	0
362	506	0	150	0	100	0	0	0	0	0	0	156	0	0	0	0
363	82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
364	0	214	0	778	276	400	0	0	0	0	0	0	0	0	0	0
365	312	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
366	382	0	2,300	0	0	600	0	0	0	0	0	0	0	0	0	0
367	0	226	1,200	0	0	848	0	0	0	131	0	0	0	0	0	0
368	260	447	0	0	250	0	40	0	0	0	0	29	0	586	0	0
369	617	0	0	0	16	196	0	0	0	0	0	82	0	0	543	0
370	0	0	261	0	439	1,500	0	0	0	0	0	150	0	0	0	0
371	103	58	0	130	0	409	1,214	0	0	0	0	0	0	0	0	0
372	0	0	0	100	0	305	0	432	0	100	0	69	0	0	0	0
373	969	198	0	0	150	80	0	0	0	0	0	0	460	0	0	0
374	485	90	0	0	67	208	0	0	0	0	0	0	0	0	0	0
375	220	645	0	0	750	0	335	0	0	0	0	63	0	0	0	0
376	0	312	0	0	69	174	0	0	0	0	0	65	0	0	0	0
377	257	386	0	0	0	150	0	300	0	0	0	33	0	24	0	0
378	269	353	335	0	0	319	0	0	0	0	0	47	0	0	0	0
379	200	0	0	0	0	0	44	0	0	0	0	0	0	0	0	0
380	145	145	0	0	100	0	0	0	0	0	0	0	0	0	0	0
381	120	0	0	0	35	0	0	0	0	0	0	0	0	0	0	0
382	107	193	0	0	45	0	0	0	0	0	0	0	0	0	750	0
383	107	110	0	0	150	10	0	0	0	0	0	59	100	0	0	0
384	157	93	0	0	175	0	0	0	0	0	0	0	0	0	0	0
385	557	0	0	0	233	62	0	0	0	78	0	52	0	0	0	0
386	662	691	311	0	270	198	0	0	0	0	0	260	400	0	490	0
387	0	466	0	0	0	0	246	0	0	0	0	0	0	0	0	0
388	1,180	477	250	0	114	0	0	0	0	0	0	0	41	0	0	0
389	820	21	0	0	347	0	158	0	0	0	0	229	0	0	0	0
390	340	130	0	0	0	140	0	0	0	0	0	74	0	0	40	0
391	421	84	0	0	0	0	0	0	0	0	0	84	0	0	0	0
392	401	64	0	1,469	0	500	233	75	0	0	0	74	49	0	0	0
393	1,740	149	2,241	0	0	239	619	100	0	405	0	200	54	0	0	0
394	56	0	0	0	0	0	0	0	0	0	0	0	0	3,000	1,344	1,586
395	200	0	0	0	223	132	83	0	0	0	0	102	0	0	0	0
396	421	0	0	0	0	0	0	0	0	0	0	210	0	0	0	0
397	211	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
398	850	0	0	0	100	0	0	0	0	0	0	100	0	0	0	0
399	816	0	0	0	0	0	0	0	0	0	0	200	0	0	0	0
400	494	0	0	0	0	500	0	100	0	0	0	70	0	0	0	0

Year 2030 Socio-Economic Data (Cont.)																	
TAZ	SF_HH	MF_HH	Retail Reg	Retails Downtown	Retail Gen	Office	Office Gov	Office Med	Resort	Hotel Motel	Hospital	Non Retail	Industrial	College	School	High School
401	0	364	300	0	277	800	205	0	0	0	0	88	0	0	0	0
402	445	303	0	0	0	0	0	0	0	149	0	64	0	0	0	0
403	1,522	205	0	0	12	0	189	0	0	0	0	232	0	0	0	0
404	503	0	0	0	49	0	0	0	0	0	0	100	0	0	0	0
405	301	1,532	400	0	225	0	0	30	0	0	0	35	18	0	0	0
406	55	0	0	0	334	1,000	72	0	0	532	0	100	1,329	0	0	0
407	726	233	0	0	0	134	0	0	0	0	0	101	0	0	0	0
408	610	0	0	0	142	0	0	0	0	0	0	92	0	0	583	0
409	523	0	0	0	120	0	0	0	0	0	0	96	0	0	0	0
410	255	0	0	0	100	0	30	0	0	0	0	100	0	0	0	0
411	965	0	0	0	161	1,481	0	0	0	0	0	118	0	0	0	0
412	200	802	0	0	130	125	0	0	0	100	0	174	0	0	0	0
413	930	0	401	0	663	1,000	0	280	0	0	0	63	16	0	0	0
414	1,528	0	283	0	215	45	0	0	0	0	0	90	24	0	675	0
415	1,597	0	0	0	99	470	0	30	0	0	0	59	0	0	500	0
416	679	0	0	0	300	249	0	0	0	0	0	50	20	0	0	0
417	1,031	0	200	0	213	450	126	0	0	0	0	50	0	0	0	0
418	2,700	700	0	0	141	0	0	0	0	0	0	160	22	0	505	0
419	360	0	400	0	217	778	0	0	0	0	0	78	0	0	0	0
420	183	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
421	496	83	0	0	826	21	200	0	0	0	0	159	200	0	0	0
422	498	501	400	400	700	175	522	50	0	598	0	65	0	82	0	0
423	300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
424	387	0	0	0	209	0	0	0	0	0	0	0	0	0	0	0
425	399	0	0	0	0	0	0	0	0	0	0	57	0	0	752	0
426	53	0	0	0	121	0	0	0	0	0	0	8	0	0	0	0
427	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
428	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
429	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
430	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
431	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**210,334**	**67,455**	**57,351**	**16,497**	**82,385**	**178,845**	**24,483**	**13,024**	**12,795**	**27,199**	**11,437**	**48,120**	**42,577**	**24,714**	**43,492**	**23,666**

APPENDIX B

External Trip Breakdowns

Year 2006 External Vehicular Trips

Zone	Location	Total ADT	X-X Trips	% X-X	I-X & X-I
432	SR-87	10,800	8,642	80%	2,158
433	Gilbert Rd	14,300	1,397	10%	12,903
434	L202 (East limit)	113,300	82,163	73%	31,137
435	McKellips Rd	34,300	12,717	37%	21,583
436	County Club Dr	31,100	10,761	35%	20,339
437	Alma School Rd	23,100	9,026	39%	14,074
438	Dobson Rd	14,200	11,647	82%	2,553
439	L101	192,150	85,954	45%	106,196
440	Frontage-L101	7,200	3,421	48%	3,779
441	McClintock Dr.	29,300	19,877	68%	9,423
442	Rural Rd	45,300	19,889	44%	25,411
443	Mill Ave	18,000	16,349	91%	1,651
444	Priest Dr	38,000	13,931	37%	24,069
445	Sky Harbor Blvd	53,864	34,273	64%	19,591
446	Washington St	31,900	18,932	59%	12,968
447	Van Buren St	23,500	21,059	90%	2,441
448	L202 (West limit)	170,000	110,112	65%	59,888
449	McDowell Rd	39,400	9,690	25%	29,710
450	Thomas Rd	36,000	8,103	23%	27,897
451	Indian School	22,300	601	3%	21,699
452	Camelback	30,000	1,433	5%	28,567
453	McDonald Dr	40,800	938	2%	39,862
454	Lincoln Dr	28,200	0	0%	28,200
455	40th Street	12,900	756	6%	12,144
456	SR-51	145,600	18,894	13%	126,706
457	Shea Blvd.	8,000	1,793	22%	6,208
458	Cactus Rd	40,500	7,923	20%	32,577
459	Thunderbird Rd	8,800	3,531	40%	5,269
460	Greenway	34,500	636	2%	33,864
461	Bell Rd	46,000	2,705	6%	43,295
462	Union Hills	26,000	1,463	6%	24,537
463	Cave Creek Rd	30,600	1,467	5%	29,133
464	Frontage-101L	4,244	0	0%	4,244
465	L101	166,900	35,396	21%	131,504
466	Deer Valley Rd	10,100	0	0%	10,100
467	P Peak Rd	19,000	0	0%	19,000
468	Sonoran Pkwy	6,400	67	1%	6,333
469	Carefree Hwy	17,900	1,578	9%	16,322
470	N Cave Creek Rd	1,000	733	73%	267
471	E Bartlett Lake Rd	1,000	596	60%	404
	TOTAL	1,626,458	578,453	36%	1,048,005

Year 2030 External Vehicular Trips

Zone	Location	Total ADT	X-X Trips	% X-X	I-X & X-I
432	SR-87	13,926	10,426	75%	3,500
433	Gilbert Rd	43,580	4,232	10%	39,348
434	L202 (East limit)	173,388	128,848	74%	44,540
435	McKellips Rd	37,930	13,831	36%	24,098
436	County Club Dr	32,444	5,890	18%	26,554
437	Alma School Rd	29,611	15,367	52%	14,245
438	Dobson Rd	20,318	17,689	87%	2,628
439	L101	235,843	93,889	40%	141,954
440	Frontage-L101	18,268	2,606	14%	15,662
441	McClintock Dr.	38,642	17,277	45%	21,365
442	Rural Rd	49,139	32,246	66%	16,893
443	Mill Ave	20,151	19,086	95%	1,065
444	Priest Dr	70,877	26,667	38%	44,210
445	Sky Harbor Blvd	87,090	44,630	51%	42,460
446	Washington St	44,002	10,018	23%	33,984
447	Van Buren St	32,205	13,823	43%	18,382
448	L202 (West limit)	193,942	154,110	79%	39,832
449	McDowell Rd	38,067	6,249	16%	31,818
450	Thomas Rd	38,098	2,412	6%	35,686
451	Indian School	28,522	1,818	6%	26,704
452	Camelback	39,984	3,626	9%	36,358
453	McDonald Dr	46,460	563	1%	45,897
454	Lincoln Dr	33,275	32	0%	33,243
455	40th Street	31,566	2,629	8%	28,936
456	SR-51	192,257	55,645	29%	136,613
457	Shea Blvd.	7,894	3,115	39%	4,779
458	Cactus Rd	41,161	5,885	14%	35,276
459	Thunderbird Rd	9,695	6,132	63%	3,562
460	Greenway	43,074	7,842	18%	35,231
461	Bell Rd	48,503	1,713	4%	46,790
462	Union Hills	29,158	1,730	6%	27,428
463	Cave Creek Rd	54,258	5,428	10%	48,830
464	Frontage-101L	8,667	0	0%	8,667
465	L101	295,106	78,943	27%	216,163
466	Deer Valley Rd	36,326	2,011	6%	34,316
467	P Peak Rd	36,678	700	2%	35,978
468	Sonoran Pkwy	61,835	2,277	4%	59,558
469	Carefree Hwy	42,900	2,921	7%	39,979
470	N Cave Creek Rd	1,500	851	57%	649
471	E Bartlett Lake Rd	1,500	641	43%	859
	TOTAL	2,307,839	803,798	35%	1,504,041

No.	Source of Comment	Date	Citizen/Group/Interviewee	street address	city	state	zip	email	Comment	Response	Area
1	Comment Cards	3/16/2006	JymeSue McLaren						As a resident of the residential neighborhood directly south of Scottsdale Airport, I would encourage the city to develop creative alternatives to the airport tunnel. Sky Harbor Airport is 2 miles wide, and traffic circulation is accomplished by other arterials. The airport tunnel is a costly solution for a local circulation problem.		Airpark
2	Focused Interviews	3/1/2006	Andrea Michaels						Help build out Airpark at higher densities; the area has tremendous potential. Make sure airport, and surrounding area, is kept vital, and well served by transportation		Airpark
3	Focused Interviews	3/1/2006	Steven Voss						Airport: new over flight issues don't work		Airpark
4	Focused Interviews	3/1/2006	Don Couvillon						Serve Airpark area with the regional system - access to jobs. Is the airport as an airport really necessary and positive? Could it be redeveloped and add more value? Could it be moved to the SRP-MIC?		Airpark
5	Focused Interviews	3/1/2006	Lynne Lagarde						Airpark circulation is a big issue - if not the tunnel, then what can be done?		Airpark
6	Focused Interviews	3/1/2006	Bill O'Connor						Airport - will volume of flights continue? Will it increase? Tunnel, or next best option, but improve circulation around the Airpark.		Airpark
7	Focused Interviews	3/1/2006	Rick Loomis						Interested in PRT - ASU to Airpark - connecting to Skysong, ball park, etc. Why not be innovative and be the first to build it?		Airpark
8	Focused Interviews	3/1/2006	George Adams						Transit circulation from the Airpark to the southern edge of the City or to ASU.		Airpark
9	Focused Interviews	3/1/2006	John Coyne, Doug Sydnor, Dean Sheppard						This city plan needs to explain to the public all the issues. We are not sure if the airpark underpass will work, this also needs to be evaluated. Must look at how the Airpark will redevelop.		Airpark
10	Focused Interviews	3/1/2006	Paul Melhorn, George Adams, Greg Kruger, Dean Sheppard						Recruitment and retention are difficult at the Airpark because of transportation issues. Airpark congestion/employee retention is Scottsdale's biggest Challenge. JDA is on the wrong side of the Airpark – How do we link with Scottsdale Road? Access at Raintree backs up and the airport is a physical barrier. Land is expensive at the Airpark and densification will occur. Hope this masterplan can address all the issues at Airpark. Loop 101 development, look at "Generation 7" Plan. This includes 40,000 employers along the 101 on the Indian Community. (The same number of employees as the Airpark.) Airpark businesses are worried that they can't get lower wage earners to work. In the short term, improvements could be made at Thunderbird and Redbird. Is aware that the Airpark tunnel has security issues.		Airpark
11	Focused Interviews	3/1/2006	Bonnie Halley, Neil Gustafson, Bill Heck-an, Dean Sheppard						Around 1999, the City conducted a study of employee zip codes who worked in the Airport. Look this study up and use in the development of the master plan. At the Airpark, go vertical (development) because the price of land. As bad as the Airpark is, flow on the arterials is okay. Would like to see Redfield with 1 more lane in each direction.		Airpark
12	Focused Interviews	3/1/2006	Doug Zimmerman, Bill Bergdoll, Peter Menna, Stephanie Steel, Dean Sheppard						Address Airpark and Indian reservation development impacts. A park-and-ride from the west valley serving the Airpark is suggested. Bus service needs to be dependable, comfortable and safe (something like Phoenix's Rapid Service). More dense and mixed-use development at the Airpark could make better use of the land.		Airpark
13	Focused Interviews	3/1/2006	Eric Larson, Bob Edwards, Mike Ryan, Pete Bolton, Clinton McCaw, Art DeCabooter, Dean Sheppard						Market Skysong to the region, attract business.		Airpark
14	Focused Interviews	3/1/2006	Curt Smith, Heidi Schaefer, Ted, Dean Sheppard						No good walking points (for transit) in the Airpark. City should put the Airpark tunnel in. Look at shift and off-setting shifts for the Airpark. The Airpark is the #2 employment center in the region and is not served by a regional transit system.		Airpark
15	March Workshop Summary of Comments	3/30/2006							Provide for future high capacity transit connection to the Airpark. Develop aerial LRT that connects SkySong, downtown and the Airpark. Provide for transit linkages to the Airpark		Airpark
16	Scottsdale TMP Meeting Minutes	11/10/2005	Jennifer Lewis						•Circulation around Airpark need to be examined. •East side to west side access needs to be improved. •Evaluate tunnel solution •Airpark in midst of modifying roadways within airport •Include taxi drivers and bus drivers in planning discussions •Airport land use is changing from warehouse to office, which has caused an increase in on-street parking and is impacting circulation •Need on-street parking policies		Airpark
1	Bike & Ped Meeting Notes	12/6/2005							Locations for grade separated crossings. Box culverts under new roadways – consider making larger for bicyclists and pedestrians. Need more than census data to determine how many people are riding their bike. Wayfinding system. Mileage markers		Bicycle
2	Comment Cards	3/16/2006	Jonathan Reed						Ms. O'Connor is a great asset to the city. I believe the single greatest act residents can take to improve their lives and the quality of life in their community is to leave their car and go by bicycle. I am glad to see that the '94 bike/ped plan is being updated with an eye toward integrating with other cities and transport modes but more money spent on bike/ped planning will be well worth it. Please increase the percentage! Cheers!		Bicycle
3	Comment Cards	3/16/2006	Darlene Petersen						30 years ago 74th Street from Wilshire to McDowell we had painted bike lane, it has not been marked for years. This is by Coronado High School.		Bicycle
4	Focused Interviews	3/2/2006	Howard Myers						Bike lanes and paths are critical for north area recreation. De-fragmentize trail system		Bicycle
5	Focused Interviews	3/1/2006	Bob Vairo and Linda Whitehead						Continuity in bicycle lanes (prefer striped lanes) – no vertical curbs, rolled or none. Bike/Ped bridge over canal at 64th Street and Indian School		Bicycle
6	Focused Interviews	3/1/2006	Ray Wiseman						Equestrian/Bike/Ped trails are now discontinuous – need to connect		Bicycle
7	Focused Interviews	3/2/2006	Vicki French						Bike paths are hidden in some areas, by trees and walls, creating dangerous visibility conditions.		Bicycle
8	Focused Interviews	3/2/2006	Karl Isenburg						Speed issue – what is the City willing to do to protect bikers and pedestrians?		Bicycle
9	Focused Interviews	3/2/2006	Andrea Michaels						Emphasis placed on more efficient bike circulation; few bike lanes exist. Encourage more bike lanes and paths.		Bicycle
10	Focused Interviews	3/1/2006	Sonnie Stevens						More bikes integrated with bus use. Need complete bike path system		Bicycle
11	Focused Interviews	3/1/2006	Amy MacAulay						Expand and improve on the off-street bicycle system. Get list of bike connections from Reed Kempton or Amy MacAulay		Bicycle

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12	Focused Interviews	3/2/2006	Coalition of Arizona Bicyclists						The plan needs to identify more on-road bicycle facilities, correct existing facilities, the ones the CoAB wants are on the list.Commuters (on bicycle) will pick shorter route and get less traffic.Coordinate with City of Phoenix to connect on street routes.Signs for motorist yields to cyclist “share the road” signs.ADOT need to provide bike access lanes on 101 (#5) from Princess South to Raintree both sides.Before it was a frontage road Pima was a straight commuter route – bicyclists want straight commuter route. There is a bike lane on part of Miller Road that probably connects to a bike path along canal, would like a bridge at Jackrabbit.There is a bike lane on part of Miller Road that probably connects to a bike path along canal, would like a bridge at Jackrabbit.Bike/Pedestrian Bridge at Sweetwater would be nice.Its bike lanes on a bridge. Once you get ove it, it Ts into a paved street Its bike lanes on a bridge. Once you get over it, it Ts into a paved street. No signs for bikes that tells how to continue.Cholla could have a bike bridge over 101 – its the next obvious cross over		Bicycle
13	Focused Interviews	3/1/2006	Tiffany Carlson						More ability to walk, bike safely.		Bicycle
14	Focused Interviews	3/1/2006	Jeff Mangers						Driver behavior a problem with bike and pedestrians. Be realistic about destinations and preferences with respect to bike paths, facilities.		Bicycle
15	Focused Interviews	3/1/2006	Carla, and Solange Whitehead						Make it safer to be a pedestrian or bike rider. Trail easements must be maintained. True connectivity of bike and pedestrian systems - better sidewalks. Sidewalks too narrow.		Bicycle
16	Focused Interviews	3/1/2006	Peter Hol-rook,Calder Holbrook						More space for bikes and pedestrians, less for cars. Better connectivity of trails		Bicycle
17	Focused Interviews	3/1/2006	Susan Wood						Bike lanes must be on mile streets. All 4 and 6 lane roads must have bike lanes.		Bicycle
18	Focused Interviews	3/1/2006	Jim Slaker						Multi modal solution to transportation including street widening, transit service, bike paths, hiking trails, alternative fuel vehicles		Bicycle
19	March Workshop Notes	3/30/2006							Bike lanes on collector streets are good except at arterial crossings – need push button activators for bicyclists		Bicycle
20	Email		Solange Whitehead						1. Look at the bike map to determine all the “breaks” 2. Slow down traffic 3. Widen sidewalks and provide ways across busy roads (tunnels or bridges).You also asked for some real specifics in my area. Here they are: 1. 100th Street (between Sweetwater and Frank Lloyd Wright) has a bike lane and cars continually park in the bike lane. The police will not enforce or ticket it -- some one on the phone said there are two different types of bike lanes. One that cars can park on top of and one kind that they can not. Obviously, in your masterplan, I would like to make sure this bike lane is a no park zone. 2. You mentioned that stop signs are an integral part of the traffic circle for slowing cars down. Can you provide me with the information on circles needing stop signs. 96th street/Sweetwater intersection needs stop signs installed asap. (I nearly got hit today) Can you tell me who should be contacted in the City to ensure that? 3. 96th Street dead-ends at Redfield. There is a bike path just across Redfield. Road is semi-circle and cars are exceeding 50+ miles per hour and visibility is limited as they make the curve. There is a ‘cross walk’ and the best bet is to place t		Bicycle
21	Comment		JoAnn Handley						In the Downtown area, Scottsdale Road cannot be widened. Better bus scheduling and trolley routes may help. Bicycle lanes should be put on both couplets.		Bicycle
22	April Workshop	Apr-06	Richard Schoonover						Bicycling to the store, pharmacy, Dr. office, post office, and library cuts down on wear and tear on cars and provides needed physical activity. Bike stores and city pictures of bikes with baskets and grocery carriers on panniers would help get this idea across better.		Bicycle
23	April Workshop	Apr-06	Steve Bass						Bicycle lanes on all arterial streets are essential (that narrow white lane dramatically affects driver behavior).		Bicycle
1	Focused Interviews	3/2/2006	John Enkoji						Downtown – external parking/bus shuttle. Scottsdale Road thru Downtown – no parking/street access – use as through route;		Downtown
2	Focused Interviews	3/2/2006	Howard Myers						Better access to Downtown in order to save it.		Downtown
3	Focused Interviews	3/2/2006	Randy Brown						Protect the Downtown. Scottsdale Downtown revitalized with new residential condo's. Look more closely at city “districts” that have evolved or been created. Parking ticket system is unfair. Employees and business owners park at the three hour meters, and prevent customer parking (e.g., 5th, 6th, Main St.). On street parking policies need to be revisited.		Downtown
4	Focused Interviews	3/2/2006	Tom Mason						Downtown – will grow if kept walkable with amenities		Downtown
5	Focused Interviews	3/2/2006	Sonnie Stevens						Need “park-once” system in Downtown, and free parking. Downtown businesses need extended hours		Downtown
6	Focused Interviews	3/1/2006	Thaddeus Lenick						We see high demand for Downtown living – a very deep market. That will require transit. An already great Downtown which will now further intensify.		Downtown
7	Focused Interviews	3/1/2006	Gary Peterson						Retail has been trending north and more toward open air centers, as opposed to enclosed malls. How to keep Downtown Scottsdale going - to achieve the Mill Avenue (Tempe) character?		Downtown
8	Focused Interviews	3/1/2006	Tiffany Carlson						Residential growth in Old Town - 1,000s of new residents - need to respond with transportation.		Downtown
9	Focused Interviews	3/1/2006	Tom Silverman, Mike Fernandez						Generally, keep Downtown as is.		Downtown
10	Focused Interviews	3/1/2006	Bill O'Connor						Hoping that the new urban residents in Downtown Scottsdale travel differently.		Downtown
11	Focused Interviews	3/1/2006	Peter Holbrook, Calder Holbrook						Look at pedestrianizing some streets in Downtown core.		Downtown
12	Focused Interviews	3/1/2006	John Coyne, Doug Sydnor, Dean Sheppard						(John) Residents in the north part of the city need a way to get Downtown and vice-versa.		Downtown
13	Focused Interviews	3/1/2006	Mike Merrill, Dean Sheppard						Residents to shop and ride buses to Downtown. Provide more Downtown trolley frequency.		Downtown
14	Focused Interviews	3/2/2006	Eric Larson, Bob Edwards, Mike Ryan, Pete Bolton, Clinton McCaw, Art DeCabooter, Dean Sheppard						Develop a system that brings people Downtown. The cure for Downtown is density (more people, more pedestrian access, better working transit)		Downtown
15	March Workshop Notes	3/30/2006							New high density residential in Downtown will create more congestion – demographics of those who can afford the condos do not match demographics of those who typically use transit Density is too high Downtown Scottsdale congested in Downtown area Mostly visitors riding Downtown trolley and resort shuttle Need provisions for those who can't walk well in new condos area near Downtown Big problem = 3000 new residents in condos near Fashion Square		Downtown
16	March Workshop Summary of Comments	3/30/2006							Link SkySong to Downtown Scottsdale and ASU Tempe campus		Downtown

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17	Comment		JoAnn Handley						In the Downtown area, Scottsdale Road cannot be widened. Better bus scheduling and trolley routes may help. Bicycle lanes should be put on both couplets.		Downtown
18	April Workshop Comment Card	Apr-06	Kathy Howard						As soon as the first occupants move into the high-rise condos, gridlock at Scottsdale and Camelback Roads will worsen. What is the plan to alleviate this situation? Many residents of the condos may not be able to walk long distances.		Downtown
19	April Workshop Comment Card	Apr-06	Terry Hanson						The "stream fountain" at Indian School and Marshall Way is ill conceived. The purpose of pushing the street south of Indian School Road was purportedly to connect Main Street area with area north of Indian School. The way to do that is not with a fountain and empty lots, but with retail. Shops would connect Marshall Way to that area by encouraging pedestrians to venture there. There is nothing to entice foot traffic north from Main Street, or south from Marshall Way. The transportation hub is not working. Perhaps with high density it will become visible. It is not welcoming at present. More the "stream fountain" there and tear down that God –awful domino clock. The proposal to close Scottsdale Road to vehicular traffic in Downtown area should be approached with grea caution. It might be better to widen sidewalks, plant trees between sidewalk and curb, reduce traffic to one lane in each direction (with left turn and right turn lanes) and have parking curbside. This should work better than Mill Avenue in Downtown Tempe because of our Goldwater and Drinkwater diversion couplets. Downtown (Old Town) sidewalks could be concrete with wood boards stamping and dyed concrete to resem		Downtown
20	Comment Cards Scottsdale Leadership		Brian Bednar						Provide more parking in the Downtown corridor, especially with the waterfront project coming on board.		Downtown
21	April Workshop	Apr-06	Steve Bass						Pedestrian focused Downtown/no cars on Scottsdale Road through Downtown. – Great for creating a sense of "place" and maintaining Downtown Scottsdale as a vibrant destination.		Downtown
22	April Workshop	Apr-06	Paul Reich						Plan future traffic patterns/roads before allowing building permits to be issued. Example: Camelback and Scottsdale Road should have been improved before granting permits for the waterfront. Same is true for the high density buildings being built at Scottsdale Road and Chaparral.		Downtown
1	Focused Interviews	3/2/2006	John Enkoji						Horse trailers need longer clearance interval for stopping		Equestrian
2	Focused Interviews	3/2/2006	Howard Myers						De-fragmentize trail system		Equestrian
3	Focused Interviews	3/1/2006	Ray Wiseman						Equestrian/Bike/Ped trails are now discontinuous – need to connect		Equestrian
4	Focused Interviews	3/1/2006	Rick Loomis						Maintain the equestrian option where possible.		Equestrian
5	Focused Interviews	3/1/2006	Peter Hol-rook,Calder Holbrook						Better connectivity of trails		Equestrian
6	Focused Interviews	3/1/2006	Bonnie Halley, Neil Gustafson, Bill Heckman, Dean Sheppard						Look to make more bike and pedestrian extensions/connections.		Equestrian
7	April Workshop Comment Card	Apr-06	Kathy Howard						Equestrian trail plans are obsolete and do not serve the areas they traverse. Horse ranches along Cactus and else where have been replaced by developments with homes and no horses. The horse is an image of Scottsdale's past, not its future. Why are we spending tax dollars to build equestrian paths that a few horse owners occasionally use?		Equestrian
1	Focused Interviews	3/1/2006	Bob Vairo and Linda Whitehead						Bike/Ped bridge over canal at 64th Street and Indian School		Pedestrian
2	Focused Interviews	3/1/2006	Ray Wiseman						Equestrian/Bike/Ped trails are now discontinuous – need to connect		Pedestrian
3	Focused Interviews	3/1/2006	Dana Baum						Crosswalk at McDonalds and Granite allow pedestrians to walk in front of cars.		Pedestrian
4	Focused Interviews	3/3/2006	Vicki French						Sidewalks that are directly adjacent to streets are dangerous on Frank Lloyd Wright, Hayden and Indian Bend		Pedestrian
5	Focused Interviews	3/3/2006	Karl Isenburg						Speed issue – what is the City willing to do to protect bikers and pedestrians?		Pedestrian
6	Focused Interviews	3/1/2006	Amy MacAulay						Where decisions are being made about signals and traffic flow more priority would be given to pedestrians. Thomas and Scottsdale Road light timing for example. 8' sidewalk at Shea constructed.		Pedestrian
7	Focused Interviews	3/1/2006	Karen Fulton						Internal circulation between developments needed. Sidewalks through parking lots don't exist.		Pedestrian
8	Focused Interviews	3/1/2006	Laurie McCammon, Lee McCammon						With aquatic center - kids from area south of CAP will walk across FLW at 100th and take Thompson Peak Parkway - it's not safe!		Pedestrian
9	Focused Interviews	3/1/2006	Scottsdale Unified School District (Mary Lou Muccino, Greg Milbreand , Trina Ganstier)						Desert Mountain High School issue: Many students cross at 124th Street and Shangri La. This is a dangerous intersection. A student got hit by a car a couple of weeks ago. There needs to be a traffic light there; left turns are dangerous because drivers and pedestrians can't see around median. There are 5 +/- accidents at this intersection every year. What makes this intersection especially dangerous is that there is a pedestrian path from a subdivision to the east that connects to the sidewalk and brings kids directly to this intersection. It would be nice to have crosswalk walking lights; these would help slow down traffic in front of school (Desert Mountain). Desert Mountain also has major concerns about pedestrians. Challenges-Need more pedestrian ways over big streets. With waterfront development - there is nowhere to cross - too difficult.		Pedestrian
10	Focused Interviews	3/1/2006	Thaddeus Lenick						Need more respect for pedestrians.		Pedestrian
11	Focused Interviews	3/1/2006	Monroe Klein						Audible pedestrian signals needed. More complete sidewalk system.		Pedestrian
12	Focused Interviews	3/1/2006	Tiffany Carlson						More ability to walk, bike safely. Goldwater & 2nd - no crosswalk - an example of a gap in the system.		Pedestrian
13	Focused Interviews	3/1/2006	Jeff Mangers						Driver behavior a problem with bike and pedestrians.		Pedestrian
14	Focused Interviews	3/1/2006	Tom Silver-erman, Mike Fernandez						Pedestrian-friendly character and transit might be in conflict. Sidewalk widths/safety for pedestrians is an issue - more buffers, more space.		Pedestrian
15	Focused Interviews	3/1/2006	Carla, Solange Whitehead						Make it safer to be a pedestrian or bike rider Trail easements must be maintained. True connectivity of bike and pedestrian systems - better sidewalks. Sidewalks too narrow. Look at 96th Street & Sweetwater - Cactus Road roundabouts and pedestrian safety. Strict enforcement of speed - motorist's responsibility to yield to pedestrians.		Pedestrian

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16	Focused Interviews	3/1/2006	Peter Hol-brook,Calder Holbrook						More space for bikes and pedestrians, less for cars. Look at pedestrianizing some streets in Downtown core. Better connectivity of trails		Pedestrian
17	Focused Interviews	3/1/2006	Bonnie Halley, Neil Gustafson, Bill Heckman, Dean Sheppard						Look to make more bike and pedestrian extensions/connections.		Pedestrian
18	Focused Interviews	3/2/2006	Curt Smith, Heidi Schaefer, Ted, Dean Sheppard						Use the CAP as a pedestrian corridor.		Pedestrian
19	Focused Interviews	3/1/2006	Jim Slaker						Multi modal solution to transportation including street widening, transit service, bike paths, hiking trails, alternative fuel vehicles		Pedestrian
20	March Workshop Notes	3/30/2006							Need provisions for those who can't walk well in new condos area near Downtown		Pedestrian
21	Email		Solange Whitehead						My family LOVES the pedestrian bridge on Sweetwater over the 101. I wish there were pedestrian bridges everywhere. Cars could speed and do their thing and we could bike and do our thing!		Pedestrian
22	April Workshop	Apr-06	Steve Bass						Mid-block crossings are a priority for pedestrians		Pedestrian
23	CWG Meeting Notes	1/26/2006							The challenges of the climate Although the climate here is benign much of the year, the summer's very high temperatures affect transportation; some particular issues: •Some months, it is very difficult to be a pedestrian The pedestrian environment is where we experience "place," but improvements are needed •A small amount of pedestrian space in some areas where more is needed and would encourage more pedestrian activity •Obstacles in the pedestrian zone •Need for more shade •Linkages die out outside of the core areas •Intersections (example: Indian School and Marshall Way) are uninviting Places and concepts to emulate: •San Antonio – another Sunbelt city with good transit and a great pedestrian environment		Pedestrian
24	April Workshop Comment Card	Apr-06	Terry Hanson						Crosswalks that occur on thoroughfares that are not controlled by a signal should have high reflective markings (slightly raised) on the street surface and should have intensely bright overhead lights illuminating the crosswalk like exists in other cities for years. If feasible a blinking caution light could be installed that a sidewalk post button could engage a red for the pedestrian wishing to cross – 18th Street and Indian School for example. The "stream fountain" at Indian School and Marshall Way is ill conceived. The purpose of pushing the street south of Indian School Road was purportedly to connect Main Street area with area north of Indian School. The way to do that is not with a fountain and empty lots, but with retail. Shops would connect Marshall Way to that area by encouraging pedestrians to venture there. There is nothing to entice foot traffic north from Main Street, or south from Marshall Way. The transportation hub is not working. Perhaps with high density it will become visible. It is not welcoming at present. Move the "stream fountain" there and tear down that God		Pedestrian
1	Comment Cards	3/16/2006	Ed Miksch						Lighted street signs on major intersections for tourist visitors.		Traffic & Road
2	Comment Cards	3/16/2006	Hanna A. Norton						Also, if paths consider lighting issues, as well as, landscape to ensure safe at dusk.		Traffic & Road
3	Comment Cards	3/16/2006	Alice Jacobsen						Since there is consideration to widen Pima Rd. PLEASE raise the sound wall. We are getting the deluge of noise from the 101. Thank you		Traffic & Road
4	Comment Cards	3/16/2006	Bonnie O'Day						I strongly urge you to preserve the ambience of our Desert Valley Area – with special attention to the scenic North Corridor/Scottsdale Road…. I live at the NE Corner of Scottsdale Rd. and Cholla. Just the Road noise that abuts this property is annoying and structurally our homes in this community are affected by the movement of Scottsdale Road as evidenced in cracks in our private streets and in our homes/foundations within our community. Due to our proximity to Scottsdale Road. Our homeowners association Does Not Want Light Rail adding to our current issues.		Traffic & Road
5	Comment Cards	3/16/2006	Darlene Petersen						Will need a stop light at Miller and Virginia. Will need a stop light at Scottsdale Road and Wilshire. Students crossing to get to Coronado.		Traffic & Road
6	Comment Cards	3/16/2006	Elaine Langsner						McDonald between Scottsdale & Freeway – lights don't seem to be coordinated. If you get one red light you get them all.		Traffic & Road
7	Comment Cards	3/16/2006	Michele Cohen						I feel it would be worthwhile to make a presentation to EQAB regarding air quality considerations to be included in your planning transportation master plan. We are having our work plan session on April 14 and perhaps this would be a good time.		Traffic & Road
8	Comment Cards	3/16/2006	Jack Wifler						Interested in Hayden to Scottsdale Rd. via Chaparral – bad planning at Scotts & Chap intersection and beyond. Mid-street landscaping is ridiculous and block visibility and access. Pure B.S.		Traffic & Road
9	March Workshop Comment Card	3/30/2006	Mark Edelman						The most important thing for everyone to know is that we cannot and will not solve traffic congestion by expanding road capacity. Central and South Scottsdale will do best by achieving a balance of land uses and transportation – artfully and skillfully designed.		Traffic & Road
10	March Workshop Comment Card	3/30/2006							Waterfront is an important destination as well as recreational corridor (along AZ Canal, Goldwater eastbound especially). Let's be sure that there is a connection then across Scottsdale Road. Improved ped + vehicular signage and circulation in Downtown is badly needed. Get the rest of us to use the trolleys. Be careful with "gateways". What are they for? Imageability and wayfinding is as importation to this plan.		Traffic & Road
11	March Workshop Comment Card	3/30/2006							Transportation efficiency such as cost per passenger mile or capacity or capacity per width of ROW required or some other means of measure needs to be addressed.		Traffic & Road
12	Focused Interviews	3/1/2006	Pete Celestina and Tom McLean						Los Gatos residents – finally got their signal – now working on sound walls (10 foot acceptable); Photo radar is good – smoothed out traffic flow Maintain planned densities; Finish roadway system as planned		Traffic & Road

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13	Email		Susan Wood						1. Signal Timing. Much of the traffic congestion is due to poor signal timing. There is a set program, and even though that program does not work, no one is accountable for that. The technicians leave at 5:00 on weekdays and do not work on weekends. They should be required to work before and after rush hour every day and also on weekends. 2. Decisions are being made to schedule road construction projects based on feelings, not facts. Example: The upcoming Cactus Rd. project. From the 101 east to 96th St., Cactus is 2 lanes which need to be expanded to 4 lanes. The traffic counts o that section are more than 20,000 cars per day. However, that part of the project is being postponed until 2007, when there may not be any money left in the budget. The priority has been given to the section of Cactus from 96th St. east to Frank Lloyd Wright which has between 6000 and 10,000 cars per day. This is the "traffic calming" section. Because a handful of neighbors have complained about speeding, they are given priority over the thousands of commuters who need access		Traffic & Road
14	Focused Interviews	3/2/2006	John Enkoji						Turnbays on Scottsdale/Pima Road 45 mph speed limit Maintain rural character in north Scottsdale – no vertical curbs, no street lights, landscape medians but be aware of sight distance, minimal access, minimal commercial signs need Phoenix cooperation to improve 56th/64th Eliminate access to 101L on Chaparral Road Downtown – external parking/bus shuttle Scottsdale Road thru Downtown – no parking/street access – use as through route; Improve Miller and Granite Reef to carry traffic; Jomax/Scottsdale Road – many crashes Keep dirt roads		Traffic & Road
15	Focused Interviews	3/2/2006	Gil Lustig						Build roads before development occurs Widen and reduce speed on Scottsdale and Pima Roads Extend Green Belt further north – grade separate trails Increase speed limit in school zones to 20 mph Maintain plants in medians – sight distance issue Vehicles turning left into opposing left turn lane and waiting for opening in traffic to continue Concerned with placement of traffic lights at 101L – not over lanes Carefree Highway becoming another Bell Road		Traffic & Road
16	Focused Interviews	3/1/2006	Tim Montgomery						Reduce speed/crashes on Scottsdale/Pima Roads – 4 fatalities on Pima in 2005; Speeding trucks are major problem Reduce speed limit on Pima/Scottsdale Roads – 45 mph Maintain "dark skies" Council needs to control development to match roadway system, rather than retrofitting roadway to serve development Pima/Scottsdale Roads are designated scenic corridors; NB 101L – weaving problems in Bell/Pima area; Would like to see speed study results; Heavy weekend traffic – recreation vehicles; Need better enforcement on Pima Pima/Dynamite is high volume intersection Development patterns are not respecting need for ingress/egress – all access to Pima and Scottsdale Roads – no circulation between developments		Traffic & Road
17	Focused Interviews	3/2/2006	Howard Myers						No street lights All arterial access should be signalized – develop internal circulation system to reach signals; Better access to Downtown in order to save it; Direct parking to freeway access Keep Environmentally Sensitive Cross-Sections Development patterns do not allow inter-development circulation – all traffic forced to go to arterials; City abandons ROW too quickly; Does not like diamond Traffic Interchanges COS Traffic Impact Studies using 3% growth rate – way too low; also using less than 5% seasonal change; March is heaviest traffic month;		Traffic & Road
18	Focused Interviews	3/1/2006	Linda Shaw						101L SB – always bogs down at south of Shea Boulevard; Cameras are good – traffic flows smoother on the freeway		Traffic & Road
19	Focused Interviews	3/1/2006	Bob Vairo and Linda Whitehead						Need to determine ultimate cross-section of Scottsdale/Pima Roads and finish them (now always under construction) – 6 lanes max; Stop abandoning ROW, then realize its needs for continuity; Condemn property if needed for right turn lanes; Traffic studies ignore seasonality – huge increase in winter months; Carefree Highway/Scottsdale Road becoming peripheral route – improve Carefree Highway		Traffic & Road
20	Focused Interviews	3/2/2006	Abbott Wainwright						Get roadways caught up with development Widen Scottsdale and Pima Roads		Traffic & Road
21	Focused Interviews	3/1/2006	Ray Wiseman						Maintain rural/rustic north of Dynamite; Freeways are not the solution Like photo enforcement – smoothes up traffic flow; traffic speeds up after last camera HOV lanes are important		Traffic & Road
22	Focused Interviews	3/1/2006	Dana Baum						On-going construction is a tremendous problem – need to shorten construction schedules by night shift. Monsoon flooding at dips; Indian Bend wash. 101 cameras have helped control speeders. I do not understand congestion – how and why it happens – explain graphically. 101 North used a lot – saves travel time.		Traffic & Road
23	Focused Interviews	3/2/2006	Randy Brown						Road construction should take place at night – can't close during the day Need to synchronize traffic lights a no-brainer. For retailers, better continuous 25 mph than stop and go Bad – Scottsdale Rd from Thomas through Old Town – no couplet Hayden and Cave Creek – why is it so congested? Scottsdale Rd. around Lincoln will densify! Miller/Camelback bottleneck has been corrected		Traffic & Road

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24	Focused Interviews	3/2/2006	Tom Mason						Indian School/Chaparral – connect up and widen Connect Camelback to 101 Congestion is waiting for more than 2 traffic lights, not due to road repairs or accidents Where are the congestion points? 101 is a bypass. Not continuous congestion now, but it's coming later We can't rely on condo vans Indians will lease their land for residential as well as commercial, and congestion will be on or generated by Indian land development One way streets are not necessary		Traffic & Road
25	Focused Interviews	3/2/2006	Janice Davis and John Armstrong						Biggest issue is lack of North-South connections -Easier to ride a bike than drive a car north/south. Start connecting up as many streets as possible, even if we can just plan them today. Rubberize streets where noise reduction is critical, such as Miller Rd. Washington St. was good, now is bad. Eliminate driveways which cause problems. Left turn prohibitions at key locations Synchronize signals like Phoenix Connect up minor arterials (e.g., 68th and 64th). Pima – work with the Indian tribe to make it benefit everyone. Tempe built shopping center that has loaded up Hayden which can't be widened Indian School – landscaping is as important as the roadway, enjoyment to drive through.		Traffic & Road
26	Focused Interviews	3/2/2006	Vicki French						Need to synchronize signals Shea south 101 road curves as vehicles speed up Don't divide neighborhoods with big roads – preserve the neighborhoods -Example – Don't open Camelback; use McDonald instead. Make beautiful streets Indian School/Scottsdale Rd. will become more congested with more housing, businesses Shea and 97th and 90th is bad 101 bad at most times, but especially afternoons. Indian Bend at 101 is bad Hayden construction causes problems Chaparral/Grant Reef bad Pima Rd, turning west to Indian School bad Older residences along Thomas and Osborne constrain widening 101 exit is bad, north on Pima – a bad merge. Take Pima to avoid, especially after a big event		Traffic & Road
27	Focused Interviews	3/2/2006	Karl Isenburg						Speed issue – what is the City willing to do to protect bikers and pedestrians? Look at full build out; Indian leased land will impact traffic Bad – Shea E/W from 17th First, understand (e.g., 84th and Cactus takes 20-30 minutes to Middle School at Scottsdale Rd. and Shea.) Scottsdale Rd. and 101 – largest development		Traffic & Road
28	Focused Interviews	3/2/2006	Andrea Michaels						Street planning in Maricopa County in '80's included a number of bridges across the canals. Connect to 87 from Scottsdale's roads. Consider this now; Indians may be favorable to the idea, since it helps them by adding casino traffic. Need disaster relief routes A more global view of Scottsdale's circulation system is required Link 101 to Tatum or CaCreek Need more bridges! Need to make circulation easy for tourist, especially 50 + year olds and disabled.		Traffic & Road
29	Focused Interviews	3/2/2006	Mark Ortega						Concern with Indian Bend Road and Hayden at Scottsdale during rainy season. Need frontage roads along 101, 2-3 lanes from FLW Blvd. To Scottsdale Rd.; West to Tatum Rd, to Bell Rd. to Princess. City did not add south side of loop (John Little) Real problem – 101/Scottsdale area Scottsdale Rd. levees Need elevated frontage road along drainage basin near Hayden. Paradise Ridge – consider tunnel at Thompson Peak Parkway, north of Peak. Public place, roads, retention pond issues to Frank Lloyd Wright		Traffic & Road
30	Focused Interviews	3/2/2006	Sonnie Stevens						Locate a north-south route to 101 (not Pima); rubberize Hayden; Need consistent signage and landscape, logo, color, etc. at south and east – branding Scottsdale. Need scenic roads designation; example - ADOT signage. Need in-city signage – 202/Chandler sign change to north. Need traffic calming in neighborhoods – not speed bumps. Example – Sweetwater/Hayden at Scottsdale Road. Need way-finding signage. Night club areas need traffic calming but maintain flow and parking. Rubberize Hayden Road at neighborhoods Median is critical at Scottsdale Road with low landscaping Use caution about changes to Scottsdale Road, between Camelback and Osborne – not light rail. Improve Redfield from Hayden to Scottsdale Road Close off eastern egress to shopping center at eastbound/101 Reduce dip at Via Linda and 90th. Improve Happy Valley need signage.		Traffic & Road
	Focused Interviews (cont)								Pima Road at Pinnacle Peak needs protected and longer left turn lane Indian School and 64th St. to Sky Harbor Airport – needs options Need better police motorcycle patrol to ticket speeders Need way finding signage at Happy Valley, Rodeo Pass, Pinnacle Peak Need better signage at Scottsdale exit at Stagecoach Improve north-bound right turn lane at 90th St. on to Ventura Canyon – it's backing up. Widen Dynamite, and provide better cross-over for those entering left turn lane. Need turn lanes at congested areas Adjust street signage to reflect Scottsdale Move the traffic that wants to move around the city. No way of moving traffic on west side. Pima Service Rd. to 101 – better alternative. Improve identity of gateway to city. Improve identity at Thomas also. Street maintenance very good Traffic flow form Phoenix is OK		Traffic & Road

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31	Focused Interviews	3/1/2006	Steven Voss						Need to standardize LAMPs Need change to driveway widths Need input on scenic corridors, median breaks, width, etc. Need to accommodate EMT access and NFPA – with flexibility Need TIMA threshold mitigation One east-west connection is a disaster, numerous accidents; add Rio Verde east Regional roadway improvements – what are the warrants? Phil Kercher's responsibility Should roads and lanes be eliminate or added? Concern with Indian Bend Road and Hayden at Scottsdale during rainy season.		Traffic & Road
32	Focused Interviews	3/1/2006	Amy MacAulay						Let roads get congested – don't signalize for through traffic. If things have to be built and land is acquired, it should be done to consistently high standards. Example – of bad construction - - Chaparral at Pima. Good example - Pima at (1 mile north) of Chaparral, where sound walls were built, open space and public art included. If road widening were done to standard of McDonald Road - everyone would be happy. 86th and Chaparral – this intersection needs a stop light. Noise from 101 and the sight of 101 big problem in her neighborhood (Highland east of 86th Street). Wall near her neighborhood is only 6' tall – there are higher walls elsewhere. This is kind of thing that worries her. Doesn't want them to do anything to Pima Road on Scottsdale Road – instead widen the 101. There are too many exits already on the 101. Widening Pima Road and Camelback Road would wreck the neighborhood there and cut into the school. Giants stadium at Camelback. The City took out the tunnel under Hayden and the connection to parks on both sides of Indian School Road and both sides of Hayden Road.		Traffic & Road
33	Focused Interviews	3/1/2006	Doug Maxwell						Carpool would be nice if the traffic lights were timed on Scottsdale Road. Synchronize signals. There are no one-way streets in Scottsdale. Think about providing streets like Washington or Jefferson in Phoenix. These streets work well. North of 101 is going to be a disaster. Detours that need lefts need cops to manage traffic. Lights aren't synchronized on Shea. Keep on hearing that volume of traffic on Scottsdale Road north of 101 will make it impossible to navigate. Some high capacity mode o.k. on Scottsdale or Hayden - Hayden could be good location for high capacity. 101 need a carpool lane tomorrow. There is a ton of activity around Airpark and Westworld – that area is total gridlock. For transportation to Downtown, no turn w/b on Indian School near Miller. City wants people to turn on Miller to get to hospital. Signs need to change. Traffic will get worse w/ Waterfront project between Goldwater and Drinkwater. Drinkwater "T " intersection into Scottsdale Road is a death trap. City needs more one-way roads north of 101.		Traffic & Road
34	Focused Interviews	3/1/2006	Cave Creek Unified School District						Lot of dirt roads in District that they would like to have paved to provide school bus access. Dixileta and Lon Mountain west of Scottsdale Road; North of Jomax Road to Dynamite Road. Provide service to Desert Sun and main school buildings complex in Scottsdale: Black Mountain elementary; Sonoran trails and Desert Arroyo Middle and Cave Creek Mountain High and new university going in at 60th Street and Carefree Highway . . . . so getting in and out is important. Most buses come up to Carefree Highway and go east or west so - access important. Also use Dove Valley Road. The schools also take field trips to Downtown Scottsdale . . .School busses are 8' wide bus with mirrors that stick out . . . . and very difficult to maneuver on narrow lanes. Because jurisdiction on Carefree Highway is split, there is not clear information on who to call when, for example, there are traffic accidents or problems with the roadway.		Traffic & Road
	Focused Interviews (cont)								The left turn arrows in Scottsdale need to be consistent with other jurisdictions. Scottsdale Road and Ashler Hills - floods very badly at shopping center - by Target. Scottsdale Road from Jomax to Carefree Highway - lots of flooding there. Overhang from trees in medians and at corners is problematic. If you can't see around corner until you start turn and the traffic lane isn't wide to start, you can't take evasive action if you see a pedestrian or vehicle once you start the turn. Are streets adequate to handle mass evacuation? With cul de sacs - need area to turn. If cul de sac is big enough, bus can turn; otherwise bus needs to go as much as 5 miles out of the way to turn around. On gated roads, dirt or cul de sacs (good example: at Jomax Road; the bus turns at 40th Street and gets to both sides of road. It's also a divided so only need stop traffic going in one direction. On Main streets where there is no median and the bus needs stop, traffic must also stop in both directions. "People don't stop - police would make quota on Pima, Scottsdale, Cave Creek, and		Traffic & Road
35	Focused Interviews	3/2/2006	Garth Saager for McCormick Ranch						There is a plan in place to widen Indian Bend from Scottsdale to Hayden. There was a group of people opposed to the plan to put in the tunnel, so the idea was abandoned. Aqueduct plan is ok. Pima – Via De Ventura to 90th Street with all industrial build-up, it seems to me that there is going to be traffic. Access to the industrial uses on the Reservation is going to have to come from Pima Road, it can't all come from the 101. From his personal standpoint, the worst intersection on McCormick Ranch is at 94th St. & Shea. There is to much traffic and you can't turn onto Shea. (See attached Map.) 94th Street & Via Linda, can't turn left. School busses go north on 91st Street & take 91st Street north to Sar Victor Dr. to 90th St. and the go right on Mtn. View because they can't turn left on Via Linda. Wants stop lights on 91st & Via Linda. Won't let employees turn left there, either. From McCormick Ranch Standpoint, these are big issues.(Via Linda and 94th Street) •Cars leaving the 101, coming through reservation at 50 mph and then driving that fast when they hit Via De Ventura. •Accident clearance needs to be faster.		Traffic & Road

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36	Focused Interviews	3/1/2006	Laurie McCammon, McDowell Mountain Ranch homeowner						When there is an event at West World, all traffic brought on Frank Lloyd Wright onto bridge at 98th Street; or across Raintree and its wreaking hell on neighborhood. Should bring traffic off 101 through industrial area. When Airpark and West World traffic comes out it is a mess at 90th Street. During events no-one uses Bell Road. Seems like it is backed up all the time. Signals not synchronized at Scottsdale and 101. Signal timing huge. Should advertise if you drive speed limits, you'll make lights. Left turn signal at Thompson Peak Parkway and FLW too short. When they talk about the shopping center at 101 – The City can't keep up now with traffic generated from Scottsdale Road and the 101. The neighborhood doesn't want city to make Thompson Peak/98th major road to accommodate traffic from West World. Make developers fix traffic first and then continue to build and build. There is No access to 101 from Bell. You need to take Pima. A barrier is the access route between Pima and Bell. It is suicide if you're going in on 101→ so you have to		Traffic & Road
37	Focused Interviews	3/1/2006	Scottsdale Unified School District						District is rebuilding Chaparral High School. Biggest transportation issue is parent drop-offs and pickups. There are too many vehicles and they create huge traffic impacts. Traffic backs up in every direction from the school. There needs to be a traffic lane for school drop offs to provide relief to through traffic. It's a short period of time but during that time it's a gridlock. If there was an emergency – there would be no access to the school. Schools have asked for City to consider changes to signal timing. City has done this on occasion. Schools not constructed to manage traffic load. Desert Mountain High School issue: Many students cross at 124th Street and Shangri La. This is a dangerous intersection. A student got hit by a car a couple of weeks ago. There needs to be a traffic light there; left turns are dangerous because drivers and pedestrians can't see around median. There are 5 +/- accidents at this intersection every year. What makes this intersection especially dangerous is that there is a pedestrian path from a subdivision to the east that connects to the sidewalk and brings kids directly to this in OUTCOMES Whole component is needed in the transportation plan on how to address safety around schools with regards		Traffic & Road
	Focused Interviews (cont)								CHALLENGES •Roads never adequate. Need to get ahead of curve. •Before they build a high school in McDowell Mountain Ranch, the City better make sure Thompson Peak Parkway is completed. •If Copper Ridge Elementary is converted to a high school on McDowell Mountain Ranch the street system will be inadequate. •Why don't we have an exit at Camelback Road that goes to Fashion Square instead of using Chaparral so the traffic doesn't go directly through neighborhoods. STUDENT SAFETY •Terrible - on city streets. Most kids take paths of least resistance. •Connections on City streets not good. Subdivisions have pedestrian facilities that dump them onto streets that don't have safe connection to school and connect at the same intersections used by vehicles with high school drivers, buses, and parents. •When traffic exits school, it can go both ways onto Mountain View - lots of accidents happen. Should be right turn only - could mean changing signals.		Traffic & Road
38	Focused Interviews	3/1/2006	Lisa Haskell						Better accessibility and don't compromise it with overdone aesthetics. Hearing a concern about doing the streetscape project on Scottsdale Road before addressing the traffic volume. Opposition to traffic calming projects.		Traffic & Road
39	Focused Interviews	3/1/2006	Don Couvillon						Expectations about traffic/"rural" ideas handicap our thinking. Pattern of commercial design mandates auto driving.		Traffic & Road
40	Focused Interviews	3/2/2006	Tim Serey						Knows Littfield, McClaugh & Osterman, well (State Reps). Wrote letter to Mayor & Council re: congestion & traffic and felt it was well received. His opinion is that the #1 public issue is speeding & traffic fatalities. Copy of letter was provided. Safety is a key issue. Need to look at all available technology to make transportation system safer. "Enforcements important." •Believes that the City should positively sanction good behavior & aggressively punish unsafe behavior. Make it painful for people to speed and disobey traffic laws. •Speeds on arterials need to come down & "gang tackled" – no tolerance. •Enforce speeds where potential for serious accidents are high e.q. Cactus. Major public relations campaign needed to get people to obey traffic laws. Media public service announcements and signs. •Look at best practices for speeds. •Benchmark & determine what works elsewhere. •Get buy in from the public. Big issues •Speeds •Safely (vehicular)		Traffic & Road
41	Focused Interviews	3/1/2006	Monroe Klein						More local circulation options. Fix the gaps - Camelback to Fashion Square Mall.		Traffic & Road
42	Focused Interviews	3/1/2006	Gary Peterson						Access matters more than speed on the arterials serving the project. Continued ability to reach workable, site-specific solutions. Figure out Hayden Road northern Phil Kercher alignment/extension.		Traffic & Road
43	Focused Interviews	3/1/2006	Tiffany Carlson						Dangerous intersections need to be addressed.		Traffic & Road
44	Focused Interviews	3/1/2006	Jeff Mangers						Look again at the tunnel option as a better traffic solution and a better solution for the wash. (Indian Bend Rd.) Seek balance for neighborhoods in how we handle regional traffic. Once other options are there, make streets more local. All east-west arterials should share in the burden - Chaparral versus Indian Bend, for example. Inertia about policy and decisions prevents some decisive action - why don't we make traffic flow work better where we can? Driver behavior a problem with bike and pedestrians. Proposed a tunnel for Indian Bend versus bridge - some misinformation from the City resulted in defining the project in a way (expressively standard) that this option would be prohibitively expensive. More ITS More photo enforcement		Traffic & Road

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45	Focused Interviews	3/1/2006	Lynne Lagande						Doing something about Scottsdale Road as a City initiative rather than waiting for developers to do it - 6 lane with median (like at Boulders/Terravista). Push Dynamite through to the east (maybe 4 lanes versus 6). Lagging lefts work well. Reconsider 6-lane Pima Road north of Dynamite. Look at vanpool rides for small-scale transit needs.		Traffic & Road
46	Focused Interviews	3/1/2006	Rachel Sacco, Caroline Stoeckel, Lauren Kapinos, Brent DeRaad						Transportation is the most critical issue for convention and visitors bureau industry. Sixty percent (60%) of the business is groups, 40% leisure. Highly reliant on rental cars. •Engaging the SRP-MIC - some street connections cut off.		Traffic & Road
47	Focused Interviews	3/1/2006	Howard Myers						Need to worry about Scottsdale, Hayden and 67th (actually, east-west flows are a bigger #s). EMME 2 tends to focus effort on big criteria (actually a distributed pattern of traffic flow is better). "We've got lots of roads" - gone to conventional route want criteria focused road system.		Traffic & Road
48	Focused Interviews	3/1/2006	Carla, and Solange Whitehead						Increase access to the Preserve. Look at Dynamite and 128th - land bridge with Dynamite under it -- in Preserve Master Plan. Could be funded as a City CIP project - City $ and heritage grant. Look at 96th Street & Sweetwater - Cactus Road roundabouts and pedestrian safety. Strict enforcement of speed - motorist's responsibility to yield to pedestrians.		Traffic & Road
49	Focused Interviews	3/1/2006	Mary Kay Rieke						1999: 90,000 contacts 2005: 160,000 contacts More population = more transportation demand.		Traffic & Road
50	Focused Interviews	3/1/2006	Bill O'Connor						Concerned about the traffic impacts of growth . . . . both regionally and locally. Pima, north of the 101 Loop - juxtaposition of current design and more entertainment uses is dangerous. Photo radar very unpopular - informative effort good, but could be better. More use of "green wave" signal synchronization? Was the current signal priority policy created before or after the 101? Suggestion: Put up signs that tell people about lagging left turns. But some exceptions do make sense - like Camelback & Hayden. "Blocking the box" congestion at on-ramps to 101. Look at McDowell exit on the 202 as an example of a good transition from the expressway to the environment of a city street.		Traffic & Road
51	Focused Interviews	3/1/2006	George Adams						Use the greenbelt as a transportation corridor.		Traffic & Road
52	Focused Interviews	3/1/2006	Peter Holbrook and Calder Holbrook						Not advocates for more freeways		Traffic & Road
53	Focused Interviews	3/1/2006	Sandra Francis						Speed/safety on Indian School an issue - motorist needs better signals that they are on a city street. Holding down traffic volumes through holding down density. Pleased with design of Indian School improvements - landscaping.		Traffic & Road
54	Focused Interviews	3/1/2006	John Coyne, Doug Sydnor,Dean Shephard						We are proud to be the first city with photo radar on the freeways. I do not want 136th Street to go thru to the south. It would bring more garbage trucks through Scottsdale neighborhoods. The 101 is filled up. The couplet does not work; this should be evaluated in the plan. Signals need to be timed and there needs to be fewer signals. Traffic travels at a speed that is too fast. Traffic needs to be slowed down.		Traffic & Road
55	Focused Interviews	3/1/2006	Paul Melhorn, George Adams, Greg Kruger, Dean Sheppard						A major issue is that 85% of General Dynamics 4,200 employees come from other cities. The 101 is a key connector, however as the Indian lands are developed this will be a major impact on the 101. Up north, there is no good way to get south from the 101 and Scottsdale interchange. Loop 101 development, look at "Generation 7" Plan. This includes 40,000 employers along the 101 on the Indian Community. (The same number of employees as the Airpark.) lock the driveway out of McDonalds onto Frank Lloyd Wright – going north is a problem, do an underpass at Pima. Strongly suggests and requests that we evaluate an eastbound and northbound underpass at Frank Lloyd Wright and Hayden intersection. Look at an option providing a slip ramp from Thunderbird to the Loop 101.		Traffic & Road
56	Focused Interviews	3/1/2006	Bonnie Halley, Neil Gustafson, Bill Heckman, Dean Sheppard						Improve quality of life. Most people are frustrated due to traffic. Take off the blinders, 96th Street through the Indian Community needs to be implemented and add 96th as a north/south street in Scottsdale. Make Pima Road an express road. Underground it where there are conflicts. We need to address which streets continue in and through the Indian Community. Must do something with Camelback (discussed making a connection to the 101). Must think about aesthetics of east/west entry road corridors. Loop 101 expansion is not enough (1 general purpose lane & 1 HOV lane). Traffic on Chaparral and McDowell is bad, employees don't take the 101. Lincoln Road – look at making connections better (this could be an alternative to Chaparral). We understand that there are no easy answers. Hayden and Pima Roads dump traffic a block apart, look at and fix this. Where Hayden turns to Miller, extend this further north. Need north/south transportation facilities that work (Hayden, 96th, Pima and 101 access roads). Regarding east/west routes, look at priorities (Camelback or Lincoln may be a better way to go than		Traffic & Road
57	Focused Interviews	3/1/2006	Doug Zimmerman, Bill Bergdoll,Peter Menna, Stephanie Steel, Dean Sheppard						Alleviate future traffic. Focus on those that move through Scottsdale (those that don't stop in Scottsdale). Loop 101 is a disaster.		Traffic & Road
58	Focused Interviews	3/1/2006	Mike Merrill, Dean Sheppard						Signal timing in the city is horrible, it is not really a congestion issue, it is signal delays. Do street construction at night. A traffic calming policy is needed. Look to smart transportation solutions (ITS). Hayden progression does not work. For Scottsdale Road look at over and underpasses at Shea and hospital to free up intersection. There is a good example in Corpus Christi, TX. Change ¼-mile streets to lights that only change when triggered.		Traffic & Road

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59	Focused Interviews	3/1/2006	Susan Wood						Reduce traffic congestion. Correct poor planning on 101 and 90th north to Shea. 90th does not go through. McCormick Parkway does not go through. The city is comprised of streets that do not go through, this is not good planning. There is no signal timing. Lights seem to be set at 55 mph. Shea is very bad. Photo radar at Hayden/McCormick is incorrectly set to give tickets to drivers obeying the law. City needs to listen to citizen for signal timing requests. Hayden should go through north of the 101. Don't like what happened with 96th Street. A study in 1992 stated that it should have a horse trail, and now it has 1 lane. Cholla and 96th has a traffic circle that is unneeded. The city changed the definition of the 4 lane road to a 2 lane road overnight (in 2001). I believe roads should remain 4 lanes and not calmed down to 2 lanes. For the new development coming, we need a through road every ½ mile. The city is putting speed bumps on ½-mile streets (this is crazy.) There is no accountability for built projects (City comes along later and changes streets despite past input.) Developers not providing adequate roadways.		Traffic & Road
	Focused Interviews (cont)								This new Transportation Master plan is very important because it will be used as a basis for all transportation decisions that will come in the future such as land use and new development applications. It is imperative that the study be unbiased and not based on the consultant's predetermined views on mass transit, photo radar, traffic calming, etc. The purpose of a transportation system is to enable vehicles from the neighborhoods to collect on streets that will take them to the arterials. These arterials need to be expanded and kept moving by proper signal timing. And collector streets must stay open and free of obstacles in order to provide safe open transit. A poorly planned system will result in cars diverting from the arterials and spilling out onto neighborhood streets to try to avoid gridlock. Example: Cactus Rd. is a Major Collector on the 2003 Streets Master Plan. It connects several Major Arterials - Hayden Rd., Scottsdale Rd., Frank Lloyd Wright, and also the 101 freeway and thus functions as a Major Collector, no matter how the City decides to reclassify it. Cactus is an east/west alternative to Shea B		Traffic & Road
60	Focused Interviews	3/2/2006	Eric Larson, Bob Edwards, Mike Ryan, Pete Bolton, Clinton McCaw, Art DeCabooter, Dean Sheppard						Look at reversible lane solutions like 7th St. and 7th Ave. in Phoenix. Need better access roads from the north and south to Scottsdale Community College. Address traffic on 101. Try reversible lanes on Hayden.		Traffic & Road
61	Focused Interviews	3/2/2006	Curt Smith, Heidi Schaefer, Ted, Dean Sheppard						Reduce congestion and increase economic development. Redfield, increase to 4 lanes. There are two lights at the runway. Look at these, they are too close and should not turn at the same time. They should allow progression. Must look at and determine the trip generation of the resorts (resort corridor). Understand urban congestion and take a stand in the region.		Traffic & Road
62	Focused Interviews	3/1/2006	Les Conklin						Build a maximum of 4 lanes on Scottsdale Rd. north of Happy Valley. Secure bond money for the Scenic Drive (Scottsdale Rd. north of Happy Valley Rd.). Scenic Drive to become the example for other Scenic Drives in the City. Designation of Scenic Drive on street signs (like in Historic neighborhoods). Include turn off areas (along the Scenic Drive) for plant exhibits / education. Six lanes on Scottsdale Rd. are too many for the area / the surrounding desert. Maintain the theme of the Drive. Maintain the character of the desert. Beautification of the Scenic Drive. Set-backs are important on the Scenic Drive.		Traffic & Road
63	Focused Interviews	3/2/2006	Pete Fredrickson						Reduce the speed limit on Scottsdale Rd., - 50 mph is too fast. Roads have not kept up with growth and development in the area. The variations of road height/level result in blind spots – Scottsdale Rd. needs to be resurfaced at a consistent level. Suicide turn lanes would help facilitate access to Scottsdale Rd. from adjacent neighborhoods The merge lane at Pima and Dixileta is a good solution and should be used more Scottsdale Rd. and Pima are the only north/south access in this part of the City – however I'm still not sure that widening Scottsdale Rd. is the right answer. What will happen in the north part of the City in an emergency situation? Current roads may not be able to accommodate the volume of traffic. Concerned about access to the east to SR 87. Neighborhoods are built with only one access / this is a safety concern. Concerned about Police and the frequent shut down of streets at traffic accident scenes – this can result in up to a 4 hour delay. Improved commute times from North Scottsdale Hayden needs to be extended North.		Traffic & Road
64	March Workshop Notes	3/30/2006							•Too many traffic signals on Indian School Road east of Scottsdale Road •Westbound/southbound left turn movement at Drinkwater and Scottsdale (south of Indian School Road) is difficult – no traffic signal •Scottsdale/Indian School: southbound left turn storage inadequate •Scottsdale/Camelback: need additional left turn lane on Camelback (EB-NB) •Need better access to/from 101L on Chaparral •Scottsdale congested in Downtown area •Scottsdale congested around 101L – too much commercial •Shea very congested immediately east of 101L (for ~4 to 6 blocks east of 101L) •Eliminate protected left turns •FLW/Scottsdale area – "too much stuff" – especially between FLW and CAP Canal •Congestion as measured by the number of cycles sat through: 1- okay; 2-frustrating; 3-congested •40,000 new employees on SRPMIC in 101L corridor will create congestion problems •Add traffic intersection at 101L/Camelback: enough right of way to widen Camelback – or provide extended ramps, e.g. 40th / 44th street and 202L •Protected LT at Chaparral/Hayden is a problem •Actuated traffic signals at minor streets create problem when right turn vehicle trips actuation and then leave		Traffic & Road
	March Workshop Notes (cont)								•The signal at Hayden and Shea is "screwed up" •No one is using the "bypasses" at Scottsdale Rd and Shea – would these operate better as one-way streets? •Need to provide dual left turn from westbound Chaparral to soutbound Scottsdale Rd •Not worth it (ie not working well) to use Gold Dust as by pass for Scottsdale Rd and Shea •Scottsdale Road is a mess between Camelback and Osborn		Traffic & Road
65	Comment		JoAnn Handley						Every attempt should be made to extend Hayden/Miller Road north of Pinnacle Peak Road. Traffic signalization needs to be refined from Hayden Road to 108th Street to move east/west traffic better with less backup on Indian School Road.		Traffic & Road

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66	CWG Meeting Notes	1/26/2006							The pressures of change and development •Design standards intended to preserve character as growth and redevelopment takes place •Phoenix's developable lands along the Scottsdale's northwestern edge could produce as many as 90,000 new dwelling units •The development of the Salt River Pima-Maricopa Indian Community's lands could take place at higher intensities and at a faster rate than anticipated, resulting in a very large transportation impact •Chaparral Road – speed and convenience versus neighborhood scale and impact •The "bypass effect" of the 101 on retail areas •Cut-through traffic (example: using Miller Rd. for Downtown access) •New facilities with traffic impact (example: the new Coronado High School) Resources for modifying the transportation system •In many cases, road corridors in the city have lots of right-of-way, providing the space for a number of potential solutions (this should be preserved)		Traffic & Road
67	Suggestions for Transportation Program		Nan Nesvig						TRAFFIC CALMING Traffic calming should be applicable to neighborhoods where necessity dictates same; neighborhoods with safety related issues should take precedent over those with aesthetic wants/needs; public involvement is key to implementation of these programs; the City needs to listen to the residents and go the extra mile to make sure ALL residents are well-informed and involved in all decision making processes before any final decisions, plans or construction is implemented; traffic calming is fine if applied correctly and not according to hidden agendas; funding should be closely scrutinized and applied only if safety dictates it. Restricting traffic flow is not a positive outcome of calming methodologies; traffic needs to flow efficiently and effectively with little to no disruption; traffic calming is not a solution for all areas and should not be applied broadly - each area should be analyzed individually; traffic circles are the least desirable forms of traffic calming for most neighborhoods and can not offer good traffic flow when there is high volume; Circles are expensive and in most areas, unnecessary; neighborhoods must be educated on the use of traffic circles to reduce incidents c		Traffic & Road
	Suggestions for Transportation Program (cont)								TRANSPORTATION MASTER PLAN A master infrastructure design must be applied with the forethought of growth within our City. We must not assume that major arterial travel routes will accommodate extended traffic needs, especially if they are somehow interrupted by construction or accidents at peak performance times. Residents will seek to utilize smaller less traveled routes if congestion continues on major arteries within the City, thus driving traffic into areas which are not designed to accommodate it.		Traffic & Road
68	April Workshop Comment Card	Apr-06	Kathe Barnes						SCRA worked for over 5 years, meeting with the City and SRPMIC extensively to abandon 96th St. (South of Mission Ln.) to the SRPMIC. City Council overwhelmingly voted to abandon to preserve the neighborhood and protect future development directly along the southern border of Scottsdale Ranch. The opinion of reversing that decision should not be a part of the Master Plan. 96th St. is a minor collector to the north and now not designed for this type of traffic. Also, the widening of Shea Blvd. to 8 lanes should be seriously looked at as having an extreme negative impact on Scottsdale Ranch as the homes are so close to Shea.		Traffic & Road
69	April Workshop Comment Card	Apr-06	Kathy Howard						As soon as the first occupants move into the high-rise condos, gridlock at Scottsdale and Camelback Roads will worsen. What is the plan to alleviate this situation? Many residents of the condos may not be able to walk long distances.		Traffic & Road
70	April Workshop Comment Card	Apr-06	Grant Smith						Go intense plan. Open streets through reservation. More streets and crossings over the CAP canal. West World may have to go. Time lights to control traffic. Reduce the number of lights on major streets.		Traffic & Road
71	April Workshop Comment Card	Apr-06	Greg Paske						On your "Idea Maps" I don't see extending 96th Street south from Via Linda to Indian Bend Road. Given that 5 million square feet of retail and commercial space is under development on the 101 corridor on the Indian reservation, it is vital to add north-south alternatives. Work with the Indian Community, existing 96th Street (an existing Arterial Road) would provide that alternative. It would greatly reduce traffic volumes at the intersections of 90th & Via Linda and 90th and 101.		Traffic & Road
72	April Workshop Comment Card	Apr-06	Tim Wilson						What improvements are necessary in the Downtown area to provide Level of Service D by 2030? I.e. what # of lanes are necessary on Indian School, Thomas, Osborn, Goldwater, Hayden Road and Pima Road? What improvements are necessary to provide Level of Service D in year 2003 in Downtown area due to increased population density approved by build out according to existing zoning?		Traffic & Road
73	April Workshop Comment Card	Apr-06	Terry Hanson						96th Street should connect from Shea all the way south to McKellips or further. The Pima Indian Community should be approached as partners. It certainly isn't going to be successful for their retail, office, and lodging developments if there is no way to handle the traffic. The same is true with Pima Road, which should be four lanes, divided with turn outs and bus bays. That way we would have Scottsdale Road, Hayden Road, Pima Road, 101 Freeway and 96th Street as north/south corridors. A great improvement and promise for the future. I feel the idea of a Camelback exit/entrance on the 101 is a bad one as it would cause excessive congestion as drivers "braid" into and out of access lanes in less than one mile. In this case a ½ mile – a major bottle neck. Better to have Camelback exit at Chaparral and Indian School, with surface access to Camelback and a bridge under the 101 to give access. Regarding the Sough Mountain Freeway alignment, it is nothing short of catastrophic to not connect the western terminus with the 101 at Tolleson. If this alignment is not determined, all north/south traffic on the 10		Traffic & Road
74	Citizen Call to Teresa Huish		Darlene Peterson						We definitely need a traffic signal at Virginia and Miller Roads. It is dangerous and there are times that you can't make a turn onto the street because there's too much traffic. (Coronado High School is nearby). She knows that the engineers may say that it's too close to the signal at Oak Street, but it's really necessary.		Traffic & Road
75	Scottsdale Leadership Comment Card		Teresa Quale						Buy the homes, bite the bullet and widen Chaparral Road.		Traffic & Road
76	Scottsdale Leadership Comment Card		Brain Bednar						Widen 101 through Scottsdale as quickly as possible.		Traffic & Road
77	April Workshop		Jeffrey Mangers						Need regional east/west focus between Shea and McDowell. This has been a major deficiency of past plans and reservation growth will make things much worse. This is not city or local – regional traffic zig-zags throug this area seeking the best path (but there is none now and all 3 ideas fail to make needed progress).		Traffic & Road

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78	April Workshop		Inge Vairo						Bring Hayden Road further north.		Traffic & Road
79	April Workshop		Susan Wood						Expand capacity of roads. Improve signal timing. We need a multi lane alternative to Shea Blvd. When an accident closes Shea cars are forced on small neighborhood streets. Traffic signals are not timed correctly. In other cities like Mesa and Phoenix, the signals are timed. In Scottsdale we are stopping at even small driveway signals like Jack Rabbit (at Hayden) and Inner Circle (on Pima). Certainly these signals can be timed to work with the lights on Major one mile arterials. Discussion have been made to add multi use paths. This on the surface seems like a good idea. But when you take out lanes in major collectors to accomplish the paths, you create problems with traffic congestion. No major arterials east/west north of Shea. Forget about public art and spend the money on street expansion. This city spends more time discussing trails and art, and ignores gridlock. Go back and look at the history – one mile grid system worked great. But now we have a mess that will be hard to fix.		Traffic & Road
80	April Workshop		Kathe Barnes						Widen Cactus Road west of 96th Street only.		Traffic & Road
81	April Workshop		Gregory V. Keller, AZ State Land Dept.						There was no treatment given to 118th Street or 136th Street north of Dynamite Boulevard. Both of these north-south streets are important for access to State Trust lands north of Dynamite Boulevard should these Trust lands be developed per the City's General Plan.		Traffic & Road
82			Ann Corley						My main concern is traffic on 68th St. Many houses on the east side between McDowell and Thomas have to back out onto the street. The traffic needs more control through enforcement of heavy equipment and speed Smaller buses should be used since the buses are seldom used on that section of 68th and the large buses ruin our quality of life. Is anything being done to better encourage traffic on 64th which has all the amenities.		Traffic & Road
1	Comment Cards	3/16/2006	Angie Valenzuela						I would like to see more of a focus placed on transit for youth. Just as the plan focuses on the elderly. I believe that if there were more available transportation resources for youth they could participate in more recreational and recreational activities. This could help keep these kids out of trouble, in school, more involved and better responsible citizens. *The schools cannot always afford to provide these services.		Transit
2	Comment Cards	3/16/2006	Ed Miksch						For 15 years took 510 bus from McCormick Ranch to Downtown Phx. We have riders that must drive 5-8 miles from N. Scottsdale because the 510 terminated @ McCormick. Need to extend express routes north.		Transit
3	Comment Cards	3/16/2006	Bill Barnes						Why not phase in systems i.e. if you are considering some rapid transit to heart of city and then connections to "SkySong" (whatever) why not have interim system of buses, cabs, etc. using designation lanes that get you to rapid transit lines until we solve problem of 101 and Hayden/Scottsdale bumper to bumper log jams o current through ways?		Transit
4	Comment Cards	3/16/2006	Bonnie O'Day						I believe in the necessity of having a plan to address transportation issues of the ever growing city of Scottsdale. I strongly urge you to preserve the ambience of our Desert Valley Area – with special attention to the scenic North Corridor/Scottsdale Road. I do not perceive Light Rail going North on Scottsdale road as it would be obtrusive and not aesthetically pleasing. Streetcars however would be a nice option. I live at the NE Corner of Scottsdale Rd. and Cholla. Just the Road noise that abuts this property is annoying and structurally our homes in this community are affected by the movement of Scottsdale Road as evidence in cracks in our private streets and in our homes/foundations within our community. Due to our proximity to Scottsdale Road. Our homeowners association Does Not Want Light Rail adding to our current issues.		Transit
5	Comment Cards	3/16/2006	Darlene Petersen						I have lived here 48 years and we have had terrible bus service from here to all over the Valley. Times cut off @ 9"30 pm. Running only every hour or not at all. Don't waste millions on light rail when you can put on more buses going frequently and day and night. Dial a Ride is a joke. Old people waiting for long (1 hr) periods.		Transit
6	March Workshop Comments	3/30/2006							If high capacity transit is to progress northward how can we place any form of fixed guideway system through Downtown affordably without destroying the character of the area or sacrificing vehicular capacity?		Transit
7	FW: feedback from Nautilus to HDR		Karen Loftus						As a member of the Scottsdale Chamber Economic Development Advisory Council, you know I strongly support the effort our group is doing to drive a forward-thinking, systemic Transit Plan forward. As Vice President of Human Resources for Nautilus Insurance, a partner council member of the Chamber and a 235+ person employer in the Scottsdale Airpark, I would ask that you forward my thoughts on to HDR for their consideration. One of my roles in HR is to watch the trends of the hiring world and take steps to pro-actively address the needs within our organization. As such, a few observations become apparent to me as we look at the role of transportation in relationship to the staffing & retention of an employee base.		Transit
	FW: feedback from Nautilus to HDR (cont)								The high-end household income demographics of Scottsdale are such that finding a local, interested employment base is becoming more and more challenging. In our situation, we have a mix of exempt and non-exempt employees. With our non-exempt (relatively non-skilled) staff making an hourly wage, living in Scottsdale with our housing costs, is not affordable to many. That means we need to draw those employees from other communities. Thus the commute becomes an issue. Where these people come from, how long the commute is, and how convenient our location is to alternate transportation modes is an issue. Even from an exempt perspective, we contend with 2 distinct issues. One is the diminished employment base in Scottsdale, as many people "don't need / want to work." Thus, we have to got out further in the Valley to loo for employees. The 2nd aspect is the very niche within the Insurance industry that we are in. In general, the aren't an abundance of Excess & Surplus lines Underwriters or Claims people in the Valley anywhere, so we need to attract them from where ever they might be -- either in the area or out of state. Because we employ more than 50 employees, we already participate in the Maricopa County TRP (Trip Red		Transit
8	Focused Interviews	3/2/2006	Pete Celestina and Tom McLean						Support transit (rail or bus) if located in an area that will use another north-south route;		Transit
9	Focused Interviews	3/2/2006	John Enkoji						Rail or bus on Scottsdale Road to 101L – prefers rail Airpark – 2nd largest employee center in region; Shared public/private expense for employer shuttle to major employment hubs; "mandatory, coercive" public transit – e.g. no parking, alternate parking days by license plate number in Downtown, Airpark; Downtown – external parking/bus shuttle LRT to Sky Song and possibly to Fashion Square		Transit
10	Focused Interviews	3/1/2006	Tim Montgomery						LRT would be good with park and ride lots near 101L- three stations: WestWorld, Airpark, Downtown		Transit

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11	Focused Interviews	3/2/2006	Howard Myers						Does not like rail or bus		Transit
12	Focused Interviews	3/1/2006	Linda Shaw						Need to improve transit in Scottsdale; LRT on Scottsdale Road to 101L Bus service to special events Transit – large P&R lots Rail No bus service to north Scottsdale – drive to P&R lot near 101L to access transit		Transit
13	Focused Interviews	3/1/2006	Bob Vairo and Linda Whitehead						LRT to Sky Song; Change location of LoLoma Bus Terminal to somewhere more visible;		Transit
14	Focused Interviews	3/2/2006	Abbott Wainwright						Supports transit as far north as possible – need bus service in North Scottsdale to Carefree (fixed route)		Transit
15	Focused Interviews	3/1/2006	Ray Wiseman						Bus on Scottsdale Road (not rail)		Transit
16	Focused Interviews	3/1/2006	Dana Baum						Public transportation – bus routes are not convenient; 20 minutes by car, three hours by bus, McDonald to Scottsdale.		Transit
17	Focused Interviews	3/2/2006	Randy Brown						Public transit can't handle the time and scale of the demand; efficient bus system is limited to evenings and weekends.		Transit
18	Focused Interviews	3/2/2006	Janice Davis and John Armstrong						Use designated express buses (e.g., Tempe/Los Arcos to Fashion Square), and local buses for intermediate connections – uses and places for each – local and express		Transit
19	Focused Interviews	3/2/2006	Vicki French						Identify better solutions for mass transit, especially for elderly, workers, and children/students. Resort shuttles would provide an option. Need direct Downtown to Sky Harpbairport shuttle Need direct north-south and east-west express with prioritized route. Transit should extend to weekends, with rail as an option. Need "village" concept areas, with higher intensity centers and low density edges that make transit more efficient. Propose cool transit system options. What happened with the bus terminal? Is it used? It was supposed to include bikes.		Transit
20	Focused Interviews	3/2/2006	Tom Mason						Seriously consider LRT and/or streetcar Bus system – few use it in reality Car use dominates – the transit facility is a huge waste Need a jitney transit like Atlantic City, for grocery shopping, for example, in a park and ride system Jitney system could serve workers, domestics No bus to routes Michael Crow – plan for train accommodates his goals but not Scottsdale's Problems created if routes are fixed or if we eliminate travel lanes Flexibility is most important to transportation		Transit
21	Focused Interviews	3/2/2006	Andrea Michaels						Community centers should be linked with transit Look at trends in public transit, particularly the last ten years; the progressive cities and systems Speak to Darren Petrucci, ASU professor – Idea for transit between Downtown and Airpark; and Duke Reiter , ASU Dean of Architecture.		Transit
22	Focused Interviews	3/2/2006	Glenn Smith						Need to serve by transit – activity centers; work centers (e.g., airport); old town; entertainment; Fashion Square. Create a transfer station fed from other areas. Central Ave. is a disaster for LRT "Glenn's shuttle" – a version of the airport baggage system or Disney's: transit buses with attached cars that can navigate the streets and expand or contract as needed.		Transit
23	Focused Interviews	3/2/2006	Sonnie Stevens						Need public transportation for employees Use caution about changes to Scottsdale Road, between Camelback and Osborn – not light rail. Tour busses use Chaparral; stop at Hayden.		Transit
24	Focused Interviews	3/2/2006	Doug Maxwell						Need cooperation between jurisdictions that allows people to change busses & get to work. Need bus pull outs because busses stop traffic. (Mike Brinkley – its unfortunate that the City makes developers pay for the pull outs – and its frustrating that the City makes developers provide a right turn into a Shopping Center & the City doesn't provide a right turn lane if it has to pay for it them self City wanted a transit campus at Scottsdale Health Care North. Dawn Coomer (city staff) was given $1.5 million for land acquisition. When the Scottsdale Healthcare site was zoned, the City had a two year window to purchase land for a transit center from us. They didn't act and now the land is gone and the funds they have to purchase other land are insufficient. Need smaller busses. Could use smaller areas to turn busses around. There should be a light rail stop at Airpark and go down Shea to east. There should be light rail on 101 & Spurs. At Osborne: •If someone doesn't step up Scottsdale HealthCare will buy its own busses like resorts. •Mentioned Mayo Clinic's bus service in Phoenix.		Transit
25	Focused Interviews	3/1/2006	Karen Fulton, Scottsdale Health Care						Whole valley is service area. Employees live all over valley because a lot can't afford to live in Scottsdale. The hospital is a 24/7 facility and employees need to come and go at all hours of the day and night. The hospital is building new facility with 150 beds at Thompson Peak Parkway & Scottsdale Road (South East Corner). 5,000 employees at this location. Their (and the hospital's) main concern is getting staff to work because Scottsdale not an affordable place fo many of them to live. These staff rely on bus service and Scottsdale Healthcare provides bus passes to all staff and volunteers. Highest use routes are 72, 76, 81, 106 and 512 express. On a regular basis, 200 employees use bus service. Not always same ones. Some would use it more if routes and timing better – especially if they have to change busses. Taking the bus route can take twice as long to commute. Scottsdale Healthcare operates their own shuttle to move employees and equipment between their two (soo to be three) sites. Scottsdale City did a plan where there were main transit lines with neighborhood connections 8-10 years ago Not funded yet. They would like that for patients – senior patients might take local bus. Other transit users c ISSUES		Transit
	Focused Interviews (cont)								Light rail on 202 and 101 median looping around the city. At least ½ employees are paid less than $12.00/ hour (or so). Lots of staff concerned about air quality.		Transit

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26	Focused Interviews	3/1/2006	Scottsdale Unified School District						No alternative modes - mass transit. Kids don't ride or walk to school. Many high-school students have their own vehicles. This group believes that people would use transit instead of sitting on 101 every morning. Kids do take city buses – but they are unreliable, and if the bus is late, the child is late. Many don't want to risk that. Challenges In redeveloping area - where are you going to get more land for lanes? Need to come up with lanes. Transit can't buy land for roads because it's not available. Fuel costs (look into trains . . . .)		Transit
27	Focused Interviews	3/1/2006	Lisa Haskell						Her Mom uses dial-a-ride system - RTA-MV is the contractor. Mary has suggested the idea of using trolleys in summertime. Cab connection plus trolleys being better utilized would allow dial-a-ride to really focus on ADA riders. (Ask Tim Millick about dial-a-ride) Better utilization of trolley system. NOTE: Lack of amenities at Loloma Station - poor shape at bus stations. What about adding misters at stops?		Transit
28	Focused Interviews	3/1/2006	Don Couvillon						ASU facility will be $1.2 Million phase - starting with grading next week - first building - $150,000 phase study in April - computer-based tenants and ASU itself. Need for 15 minute or better transit service to connect to main campus. Get some kind of transit up to the vicinity of Westworld. Serve Airpark area with the regional system - access to jobs.		Transit
29	Focused Interviews	3/1/2006	Thaddeus Lenick						We see high demand for Downtown living – a very deep market. That will require transit. An already great Downtown which will now further intensify. RE: depth of market (Q1) - many of those immigrating here are from the Midwest - they have an urban context. Scottsdale trolley is helpful - provides good local circulation.		Transit
30	Focused Interviews	3/1/2006	Monroe Klein						Uses buses to go to gym and other key destinations - long waits, confusion (two #50 buses - one goes farther east than others), short service hours; poor schedule reliability. More available transit. Willingness to fund adequate level of transit service.		Transit
31	Focused Interviews	3/1/2006	Gary Peterson						Valley is so spread out in its design pattern that transit will be tough. Transit project design is a big issue for his retailers. Need for park-and-rides to support transit Cities interested in siting these at shopping centers - not possible given the partnerships with major retailers in shopping centers. Maybe can be done by negotiating into new projects.		Transit
32	Focused Interviews	3/1/2006	Tiffany Carlson						Transit connection ASU/ASUF/Fashion Square. Cost of living a real concern - LRT provides access to jobs.		Transit
33	Focused Interviews	3/1/2006	Jeff Mangers						Use transit for regional flow. More attention to public transportation, but most people here haven't lived where that was possible. LRT a good idea.		Transit
34	Focused Interviews	3/1/2006	Lynne Lagande						Connections between the MPCs need attention. Move attention to transit (make it comfortable). Should definitely consider role of light rail, express buses Look at vanpool rides for small-scale transit needs.		Transit
35	Focused Interviews	3/1/2006	Rachel Sacco, Caroline Stoeckel, Lauren Kapinos, Brent DeRaad						Meeting planners very supportive of LRT - guests isolated at resorts. Trolley helps, but not sufficient. More options; LRT, move access for taxis. Connecting people to prime attractions. Access to jobs for resort employees. How aggressive does the SRP-MIC want to be? (with LR) Look at FLASH and ALEX shuttles as good examples.		Transit
36	Focused Interviews	3/1/2006	Tom Silverman, Mike Fernandez						Pedestrian-friendly character and transit might be in conflict. We need to keep what's special about Scottsdale . . . . LR in the middle of Scottsdale Road would be very invasive. We should be downzoning or stop upzoning.		Transit
37	Focused Interviews	3/1/2006	Howard Myers						Scottsdale Road is the spine of transit trips. (Actually, sources and destinations of trips might meander east and west of Scottsdale Road.)		Transit
38	Focused Interviews	3/1/2006	Carla, and Solange Whitehead						No bus service to Preserve - no bus north of Bell Road. There should be such service. Also poor schedule and headways. Smaller buses, running more often like Tempe FLASH.		Transit
39	Focused Interviews	3/1/2006	Mary Kay Rieke						Lack of bus service - 68th Street is the closest service to Paiute center, and that has long headways. Could there be a Trolley route in the area? Need for more local circulation. Large transit-dependent population. Employees, clients -- all could use better transit circulation. Need to attend to senior needs. New trolley connection to senior center on McDowell a good example. Valley Metro claimed not enough space for bus turning movements.		Transit
40	Focused Interviews	3/1/2006	Rick Loomis						Interested in Personal Rapid Transit - ASU to Airpark - connecting to Skysong, ball park, etc. Why not be innovative and be the first to build it? See SkyTran.net What were the assumptions in the transit plan? Why no new transit possibilities or overhead options?		Transit
41	Focused Interviews	3/1/2006	George Adams						Transit circulation from the Airpark to the southern edge of the City or to ASU.		Transit
42	Focused Interviews	3/1/2006	Peter Holbrook, Calder Holbrook						Pursue light rail! Current bus system is pretty dysfunctional - not convenient or reliable. Very car-oriented community - difficult to make transit work. Make transit very user-friendly in order to get people out of their cars.		Transit
43	Focused Interviews	3/1/2006	John Coyne, Doug Sydnor, Dean Sheppard						There needs to be transit system that takes people from ASU to Downtown to the resorts and the Airpark. Mentioned Portland as an example. Light rail would only benefit a limited zone. Buses are more efficient. Address growth areas (Sky song/Papago Shopping Center, Triangle of transit service for 101/ASU Sky Harbor, McDowell –hot east/west corridor).		Transit

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44	Focused Interviews	3/1/2006	Paul Melhorn, George Adams, Greg Kruger, Dean Sheppard						Only way to bring employees to work is light rail. Secondly, entertainment districts need transit support. Lig rail needs a feeder system of buses that support its use. This study should look at the Indian Bend Wash as a transit corridor. Scottsdale is a net importer of lower wage jobs and these workers need a way to get in. It is easier to add more trains than widen roads. We know what does not work. We need rail/mass transit and a good feeder bus system. There is strong sentiment against light rail, thinking it is outdated and not effective. (We need a strong argument that rail is modern and effective.		Transit
45	Focused Interviews	3/1/2006	Bonnie Halley, Neil Gustafson, Bill Heckman, Dean Sheppard						Large employers need a point to point transit system. Light Rail to Skysong, (then to the 101 and north to Via de Ventura).		Transit
46	Focused Interviews	3/1/2006	Doug Zimmerman, Bill Bergdoll, Peter Menna, Stephanie Steel, Dean Sheppard						Like to see rail along the 101 from Tempe to Glendale. Make transit work, currently a bus trip from Troon to Micro Semi on the bus takes 3 transfers and 3 hours. We need rail very badly. Heavy rail (not light rail) around the 101. Light rail on Scottsdale Road. Bring employees in and out of the city easily. Light rail or trolleys on east/west streets and Scottsdale Road. The time to implement light rail is too long (need solutions faster). Light rail is inflexible. A park-and-ride from the west valley serving the Airpark is suggested. Bus service needs to be dependable, comfortable and safe (something like Phoenix's Rapid Service). Look into bus bays. They can work, now they do not.		Transit
47	Focused Interviews	3/1/2006	Mike Merrill, Dean Sheppard						Don't see light rail happening in Scottsdale, rapid bus may be more feasible and may be more beneficial and more reasonable for more residents. Need a good feeder bus system and circulating branches to reduce traffic. (Buses) having flexibility is good. A better job of transit from the residential areas to the shops and shopping areas. Weekend bus routes More special event bus routes. More effort on focusing transit to residents. Residents to shop and ride buses to Downtown. Need to educate residents that buses are there and that transit works. Need public relations promoting transit. Market transit to businesses. Oppose any thought of light rail (except to McDowell). North of McDowell would be a battle. Provide more Downtown trolley frequency. Need to look at more bus circulators to the neighborhoods		Transit
48	Focused Interviews	3/1/2006	Susan Wood						Bus lanes are cost effective and may work Downtown, keep the trolley.		Transit
49	Focused Interviews	3/2/2006	Eric Larson, Bob Edwards, Mike Ryan, Pete Bolton, Clinton McCaw, Art DeCabooter, Dean Sheppard						Can't keep adding lanes, (I am an) advocate of light rail as it can relieve some traffic. A park-and-ride is needed along the 101. Light Rail Transit to Skysong (also look at streetcar for other connections). Not interested in a bus solution for the HCT. Take the Council on a trip to Portland to look at and experience rail.		Transit
50	Focused Interviews	3/2/2006	Curt Smith, Heidi Schaefer, Ted, Dean Sheppard						Long term transit between 101 and the Scottsdale border, need to look at long term Indian Community plans. Make a hub and spoke transit system rather than along linear route. Intensity in south Scottsdale does not justify rail. Need to develop safe ways to schools and reduce the number of buses.		Transit
51	Focused Interviews	3/2/2006	Pete Fredrickson						Transit improvements, we need to get cars off of the road – use Park-and-Ride lots with connections to bus or train It is important to forecast growth and build transit ahead of it (growth) The longer we wait to make transit improvements = the more they will cost.		Transit
52	Focused Interviews	3/1/2006	Jim Slaker						Multi modal solution to transportation including street widening, transit service, bike paths, hiking trails, alternative fuel vehicles		Transit
53	Focused Interviews	1/29/2006	Jim Slaker						The Summit Transit Center: There is a structure in the shopping center on the northeast corner of Scottsdal Road and Ashler Hills. It looks like the developer has provided a bus transit center in the shopping center. An express bus route should be provided to service this transit center and the rest of Scottsdale north of the 101.		Transit
54	March Workshop Notes	3/30/2006							New high density residential in Downtown will create more congestion – demographics of those who can afford the condos do not match demographics of those who typically use transit Mass transit does not fit Scottsdale life style BRT rather than Light Rail Transit – more flexible Dial-a ride interfacing with fixed route service would be best transit system Smaller busses, more frequent service Mostly visitors riding Downtown trolley and resort shuttle Need better bus service – more frequent		Transit
55	March Workshop Summary of Comments	3/30/2006	Transit Break-Out Table						There is concern about the street interruption of rail. Scottsdale Road needs transit, however the needs are different to the north and south. Let's look at different modes and grade elevated transit. Look at transit connecting on Galvin Parkway (a Galvin Parkway solution). Make sure transit delivers time savings. Transit should be elevated through Downtown and to the north. All aspects should be environmentally friendly. Develop a transit friendly shopping cart that can be taken on the bus and also used as a seat. Initiate a design competition to design this. Elements should include a seat and umbrella. The bus system needs to ensure intelligent bus information and phone operators. Communication needs to be clear. Incorporate a next bus system that also includes a light indicating that a taxi is wanted (and that a voucher system could pay for the taxi trip). Hold a competition to design bus shelters (include art, aesthetics, etc.) Improve the perception of transit, that it is easy to use, well maintained, on-time, etc. Currently, the buses		Transit
	March Workshop Summary of Comments (cont)								Improve bus maintenance (well kept buses), communication, informed staff and available schedules at bus stops. Provide for transit linkages to the Airpark (One persons comment) Don't provide transit. Extend L ight Rail Tranist to SkySong from Tempe		Transit

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56	Comment		JoAnn Handley						To alleviate traffic mass transit will need to be improved. However, light rail will not work well north of Skysong. In the Downtown area, Scottsdale Road cannot be widened. Better bus scheduling and trolley routes may help. Buses should be extended to at least Pinnacle Peak on both Scottsdale Road and Pima Road. Every attemp should be made to extend Hayden/Miller Road north of Pinnacle Peak Road.		Transit
57	Scottsdale TMP–Contact Report		Michelle Korf, City of Scottsdale						When Scottsdale submitted their projects for the Regional Transportation Plan, there was no support for transit in the community. That has changed -- a little late for Prop 400 funding. However, Scottsdale may want to consider a 1/2-cent sales tax for transit -- at the conclusion of this study. The ASU investment at Los Arcos has really triggered this discussion along with the density of development in Downtown Scottsdale. Thus, this study will probably need to result in an implementation plan.		Transit
59	CWG Meeting Notes	1/26/2006							Resources for modifying the transportation system •The possibilities for customized transit solutions for unique areas Places and concepts to emulate: •San Antonio – another Sunbelt city with good transit and a great pedestrian environment Shaping the city (to an extent) around transit; more favorable to non-automobile modes		Transit
60	20060331082108731.pdf.pdf								To displace residents, and reconstruct Chaparral, at the cost of millions of dollars which, in all probability, would only invite more vehicle traffic and thus become self defeating. Our quest must be to reduce, not encourage more traffic. to this end I submit that the various identities charged with creating, implementing, and overseeing a transportation plan should concentrate on creating a user friendly bus network. Other publi transportation options in Scottsdale are non-existent, at least in the foreseeable future. Limited light-rail? Perhaps someday. A personal critique of the existing bus system reveals obvious reasons the rider-ship is woefully small. A frequency in many cases of thirty minutes, or longer in one hundred degree plus heat; bus stops that provide residents, and visitors, with absolutely no route or schedule information; and inadequate, or in many cases, no shelter from the elements, certainly do not qualify as user friendly. In addition to correcting the obvious discrepancies, many other elements must be addressed to encourage individuals to leave their autos at home and make the bus their primary choice of transportation. Bus hubs/te		Transit
61	Suggestions for Transportation Program		Nan Nesvig						Our current situation dictates the need for a multi-versed transportation system. No one solution will handle this problem. To that end, light rail, which is phenomenally expensive, takes a long time to construct and requires density, is not the only viable solution to our City's transportation issues. There must be an adequate mixture of short and long distance alternatives implemented here and tied to other transportation systems in the Phoenix metro and surrounding city areas. To that end, one must examine many alternate sources of transportation to alleviate our transportation woes. System to system transportation must not interfere with our regular street travel routes. If light rail or a similar system is considered, it is suggested that it be placed on the strip of land running adjacent to the 101 freewa and connect with the Tempe, Mesa and Phoenix light rail systems. Of course, consideration has to be given to the Native American Indian Nation, as this is their property. With the onset of new jobs and transportation needs in their area, we should consider a joint effort in this arena. To transport persons to and from the rail s		Transit
62	April Workshop Comment Card		David Bentler						I appreciate the opportunity to review your plans. I'm a big fan of the streetcar concept. Lower cost, less intrusive. I like your alternative I, alternative B and alternative D. I probably favor alternative D the most at th point as it will eventually be important to extend at least to the Airpark. I would be happy to help with this in any fashion. I was on the Scottsdale Transportation Commission for 3 years and looked into this intensely. I am also a member of the Scottsdale Chamber Economic Development Advisory Board.		Transit
63	April Workshop Comment Card	Apr-06	Bill Lindley						Realign existing bus routes to compliment currently-under construction Light Rail Transit – example: #56 Priest should continue north after Washington, past Zoo and Gardens up 64th to Indian School/Loloma Sta. #81 Hayden discontinue ASU diversion and add Indian School/Loloma diversion. Express bus routes from North Scottsdale to Light Rail Transit instead of Downtown Phoenix…move Loloma if needed.		Transit
64	April Workshop Comment Card	Apr-06	Rick Loomis						Apparently a decision made in 1996 is preventing us from considering new technology such as skytran created in the last five years. Isn't that short sighted?		Transit
65	April Workshop Comment Card	Apr-06	No name						High capacity transit(HCT), while important, should not be at the expense of the current dominant mode, aut travel. The viability of HCT should depend on its benefits to the user and not artificially constraining auto trav or parking availability.		Transit
66	April Workshop Comment CarD	Apr-06	Inge Vairo						Light rail only up to the new technology center, Skysong. Rapid buses in the north are fine. No elevated transit please!		Transit
67	April Workshop Comment Card	Apr-06	Tim Wilson						Any high capacity corridors should be Express Bus. Do not waste $ on light rail. Busses can adjust, light rail cannot.		Transit
68	April Workshop Comment Card	Apr-06	Mark Booth						Would like to see more rapid transit Light Rail Transit into Scottsdale and major cities of the valley. Have buses to get to major drop off points to distribute people for the light rail stations. Also later hours for transit – towards a 24 hour schedule.		Transit
69	Scottsdale Leadership Comment Cards		Brian Bednar						Bring light rail or mass transit up Scottsdale Road.		Transit
70	April Workshop	Apr-06	Richard Schoonover						Comments from the general public that we don't use buses we have and therefore rapid transit won't ease traffic are short sighted. It's like which came first, chicken or eggs. If adequate pubic transportation is available at times when people need it, they will use it.		Transit
71	April Workshop	Apr-06	Susan Wood						We need buses to run longer hours and routes need to connect. Rapid ride along Pima.		Transit
72	April Workshop	Apr-06	Steve Bass						High capacity transit needs to extend to at least Camelback Road to maintain the economic vitality of Downtown/Scottsdale Fashion Square.		Transit
73	April Workshop	Apr-06	Jeffrey Mangers						I really don't want to change modes frequently (I don't want to change buses or trains either). Thus a lot of your "hub" and "center" ideas are mixed blessings.		Transit
74	April Workshop	Apr-06	Darlene Petersen						No light rail. Too expensive and doesn't pay for itself. More buses every 10 minutes - Stops at any corner to let people on and off.		Transit

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75	April Workshop		Gregory V. Keller, AZ State Land Department						On the “Enhanced General Plan” alternative, the people mover should take in all four quadrants of the Scottsdale Road and Loop 101 intersection, as proposed by the Multi –Modal Study completed by URS for the Land Department in 2002. This study found that movement of people between all four quadrants was the most efficient alternative.		Transit
76	Phone Conversation with Teresa Huish		Dave MacDonald						grade separated line (overhead personal rapid transit) recommends the transit connection from Skysong to ASU Phoenix - Scottsdale transit line directly without going to Tempe transfer Shopping cart created with fold down seats - do a design study re seats and cart that could fold down to go on buses Analytical tools that citizens can use: how much does it cost for light rail or overhead; target speed for transit; elapsed time to get from Airpark to Downtown. Think in terms of an election - sample survey @election precinct level then do it again later you may see a slight increase in knowledge of process. Think in terms of how people will benefit from time savings. Start transit systems both in the north and south. Grade separated transit line - up Scottsdale Road to Frank Lloyd Wright, west on Shea back to Scottsdale Rd. Dave worked for Southern Calif. Association of Governments and says he co-wrote a book on traffic calming for State of Washington.		Transit
77			David Vaughan						To displace residents, and reconstruct Chaparral, at the cost of millions of dollars which, in all probability, would only invite more vehicle traffic and thus become self defeating. Our quest must be to reduce, not encourage more traffic. To this end I submit that the various identities charged with creating, implementing, and overseeing a transportation plan should concentrate on creating a user friendly bus network. Other publi transportation; options in Scottsdale are non- existent, at least in the foreseeable future. Limited light rail? Perhaps someday. A personal critique of the existing bus system reveals obvious reasons the ridership is woefully small. A frequency in many cases of thirty minutes, or longer in one hundred degree plus heat; bus stops that provide residents, and visitors, with absolutely no route or schedule information; and inadequate, or in many cases, no shelter from the elements, certainly do not qualify as user friendly. In addition to correcting the obvious discrepancies, many other elements must be addressed to encourage individuals to leave their autos at home and make the bus their primary chose of transportation. Bus hubs/te		Transit
1	North Area	1/17/2006							Dealing with four distinct groups in the North Area: •Low Density (Rio Verde area): 1-5 acre lots; unpaved streets; lots are divided as opposed to subdivisions; residents do not want to be in the city; want horse trails; don’t like paved streets, sidewalks, curbs; do not want services, employment within area – totally residential; do not see value in transit. •Golf Course/Resort Lifestyle: strong HOA and CC&R’s; active internal government; increasing property value is important; sophisticated; do not see value in transit. •Very large subdevelopments (Grayhawk, DT Ranch, McDowell Mountain Ranch): want available services, but must be top notch; family oriented; organized/sophisticated; see value in transit; have integrated walkway systems. •Others scattered throughout: want access A number of multiple lane streets are planned, but because of lower density than was originally planned, the planned street width may not be needed. Specific unbuilt streets mentioned: Miller/Hayden and 118th Street Are interim solutions needed/appropriate. Some residents want speed limit increased; others want it decreased.		North Scottsdale
2	North Area	1/17/2006							Design Aesthetics: residents are very image conscious – image more important than convenience; expect higher quality than elsewhere; street lights, if needed, must be tasteful and subdued; fit into romantic desert setting; “Disneyland Desert” – controlled, not wild, desert environment; do everything well. Drainage is an issue that must be dealt with. Liability/Accessibility – should discuss with risk management what we’re trying to accomplish through whatever we propose. Sound Walls are not allowed in scenic corridors, however some residents now want walls with increasing traffic noise. Roadways included in Guidelines are segments of Scottsdale, Pima, Dynamite, Shea, Carefree Highway, Cave Creek. Pedestrians/ADA requirements are an issue. In some areas sidewalks are not needed/wanted, but are required through ADA.		North Scottsdale
3	March Workshop Public Comments	3/30/2006							Does it really matter where the southern boundary of “North Scottsdale” is? Issues problems and solutions need to be more independent of place “labels” but more about the place itself.		North Scottsdale
4	Focused Interviews	3/2/2006	John Ekoji						Maintain rural character in north Scottsdale – no vertical curbs, no street lights, landscape medians but be aware of sight distance, minimal access, minimal commercial signs		North Scottsdale
5	Focused Interviews	3/2/2006	Howard Myers						Needs Plans for three north areas: Sonoran Corridor; McDowell Mountain Ranch/DC Ranch/WestWorld area, north of Pinnacle Peak Road; Transportation Plan for north Scottsdale; Maintain rural character of north Scottsdale; Develop compatible land use and transportation plans and then stick to them; Bike lanes and paths are critical for north area recreation		North Scottsdale
6	Focused Interviews	3/2/2006	Tom Mason						North Scottsdale – 101 has cut off growth, and doesn’t connect		North Scottsdale
7	Focused Interviews	3/1/2006	John Coyne, Doug Sydnor, Dean Sheppard						(John) Residents in the north part of the city need a way to get Downtown and vice-versa.		North Scottsdale
8	Focused Interviews	3/2/2006	Pete Fredrickson						What will happen in the north part of the City in an emergency situation? Current roads may not be able to accommodate the volume of traffic. Improved commute times from North Scottsdale		North Scottsdale

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9	March Workshop Notes	3/30/2006							Sonoran Foothills a.k.a. North Scottsdale North Scottsdale group decided that the south border would be the CAP canal. East of Pima at Cave Creek – it is important to consider development in the area and how it will impact access and circulation to, from and within the area Comments on Scottsdale and Pima Roads •Scottsdale -Scottsdale will likely continue to be commercial development -It is important for the City of Scottsdale to be aware future development along the Scottsdale/Phoenix border -Who will decide what develops on Scottsdale – developers or citizens? -Scottsdale needs to be improved, part of these improvements are rolling curbs that will make the road more like a Parkway -A variety of traffic concerns were identified along Scottsdale road including the need for lower speed limits, the addition of bike lanes, less congestion on the road – however the group determined that bus service on Scottsdale was not a priority •Pima -Pima should be maintained as the City's scenic corridor		North Scottsdale
10	April Workshop		Gregory V. Keller, AZ State Land Department						There was no treatment given to 118th Street or 136th Street north of Dynamite Boulevard. Both of these north-south streets are important for access to State Trust lands north of Dynamite Boulevard should these Trust lands be developed per the City's General Plan.		North Scottsdale
1	Focused Interviews	3/1/2006	Amy MacAulay						Very concerned about loss of open space at south end of the City. Supposed to provide open space at Los Arcos. An example of where open space was supposed to be provided but wasn't is the WWTP at McDonald. The plant is two times as large as it was in the concept plan. City said its ok because they bought extra park land – but there is no park there		South Scottsdale
2	Focused Interviews	3/1/2006	Don Couvillon						Need to make the zoning decisions and other changes to shape southern Scottsdale into a sustainable place.		South Scottsdale
3	Focused Interviews	3/1/2006	Tom Silverman, Mike Fernandez						68th South of Indian School. Southern Scottsdale both need help.		South Scottsdale
4	Focused Interviews	3/1/2006	George Adams						Transit circulation from the Airpark to the southern edge of the City or to ASU.		South Scottsdale
5	Focused Interviews	3/2/2006	Curt Smith, Heidi Schaefer, Ted, Dean Sheppard						Intensity in south Scottsdale does not justify rail.		South Scottsdale
6	April Workshop	Apr-06	Amy MacAulay						South Scottsdale has a character of quiet resident streets that should be regarded as equally important as the North vistas, etc. Most gridlock in South Scottsdale is due to people who don't live here – just going thru. How much should we give up or pay to accommodate this? South Scottsdale has the highest percentage of population and we need all possible open space. Don't use our open space roads and where possible acquire more along with transit projects. Mitigation enhancement to neighborhoods needs to be consistent in southern Scottsdale. Compare 64th Street south of Thomas with Hayden south of Indian School. Compare the southwest corner of Pima & McDonald to the southwest corner of Pima & Chaparral.		South Scottsdale
1	Comment Cards	3/16/2006	Hanna A. Norton						Outreach to community – include "Interfaith Network of Scottsdale" – close to 200 faith communities – the group can arrange forums/discussion groups. Most seniors/members state transportation as a high issue in their faith community. Our parish of 2,200 families recently surveyed members & cost and availability of transportation for seniors was highest need.		Miscellaneous
2	Comment Cards	3/16/2006	Steve Hammond						Great meeting. Avoided too much jargon! Knowledgeable speakers		Miscellaneous
3	Comment Cards	3/16/2006	Jack Wifler						Brochure of 3/16 meeting maps terrible, small dark indiscernible.		Miscellaneous
4	March Workshop Public Comments	3/30/2006	James McCay, Coronado Park Estates HOA						Rick Cole is spot on – This transport plan must focus on people and the community – not simply transport systems. I think Mayor and Council should get to see the end of his presentation. Then the entire transport plan should match the vision for the General Plan, Scenic Corridor Design Guidelines, and all other relevant documents. Open minds and open the City – challenge status quo and revisit current guidelines and even rules that insist on single-use land laws. We need more multi-use and sustainable communities Plan for the future NOT present and past. This plan should work forever.		Miscellaneous
5	March Workshop Public Comments	3/30/2006							Please ask the professionals for the solutions – we the people don't know about this stuff and our ideas – well, some of them sound crazy/stupid/ignorant. Rick Cole's presentation was excellent. Thank you for an intelligent approach to public participation.		Miscellaneous
6	Email		Susan Wood						1. The Transportation Dept. for the City of Scottsdale needs a comprehensive program for Public involvement. This process needs accountability. In the past, the City has made decisions that affect the residents in an area without adequate input from those citizens. Fox example, roads are being "reclassified" and redesigned. A resident may purchase a home in a neighborhood based on accessibility to destinations. When the City proceeds to downgrade arterials and major collector streets, the end result is traffic congestion which affects the resident's lifestyle. 2. Focus Groups must have guidelines for minimum numbers of people required to participate. The City has, in the past, drawn conclusions from focus groups of less than 10 people. The City will tally results from focus groups which are not representative of a wide variety of opinions. If the City wants to secure a particular conclusion from a Focus group, the invitations go out to ONLY those people who share a common philosophy with the City, ie. traffic calming cults, ie. light rail and public transit		Miscellaneous
7	Focused Interviews	3/1/2006	John Enkoji						COPP – Coalition of Pinnacle Peak – concerned with quality of life, environment, density, transportation		Miscellaneous
8	Focused Interviews	3/2/2006	Howard Myers						De-fragmentize trail system "Build to Zoning"		Miscellaneous
9	Focused Interviews	3/1/2006	Bob Vairo and Linda Whitehead						Labor import is a major issue (Stack Forty is now One Scottsdale)		Miscellaneous
19	Focused Interviews	3/1/2006	Abbott Wainwright						Pollution is a major problem		Miscellaneous
11	Focused Interviews	3/1/2006	Dana Baum						Need tax breaks for those who live close to work. Monsoon flooding at dips; Indian Bend wash.		Miscellaneous

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12	Focused Interviews	3/2/2006	Randy Brown						Show implications of fully built out Scottsdale Improve connections between Phoenix and Scottsdale Look at full build out when you plan. Rethink the City boundaries Look at the physical structures; without the historic, the City's charm evaporates, but only activism saves them The City's character is so important. Indian land will be developed Stand up to the vocal few, and prevail in both short and long term thinking. Eminent domain has not been utilized but might be necessary. Tax conflict between Phoenix and Scottsdale should be resolved Scottsdale is a city of entrepreneurs Parking ticket system is unfair. Employees and business owners park at the three hour meters, and prevent customer parking (e.g., 5th, 6th, Main St.). On street parking policies need to be revisited. $50-$60 for developable land. Development potential at Frank Lloyd Wright, Beardsley, and Stack 40 Parking issue is driving development; in lieu system is deeply flawed ($10K a stall) City relies on private sector to solve parking; the cost of parking is stymieing good development Cost of ventilated (subsurface) garages is $33,000 a stall Developers need the building height to gain the densities; with greater heights, we would be able to buil		Miscellaneous
13	Focused Interviews	3/2/2006	Janice Davis and John Armstrong						Automate/consolidate garbage collection rather than picking up individual trash containers. Get people to agree on what's best for everyone – example, what to do on Chaparral City has lost its innovative edge Special interests should not dominate the process Indian Bend parkway – good example of long range planning 101 is an example of good planning		Miscellaneous
14	Focused Interviews	3/2/2006	Vicki French						City Hall is too decentralized. Need a central City Hall like Glendale? Ugly cable along Hayden detracts value from the corridor, dangerous for small children. What does the city intend to do about it? Divisions in the City: would the City have installed that cable up north? No. What's going to happen when the Waterfront is finished, relative to transit and traffic? Get City to support car-pooling We identify more with streets than places – this is not good. Go to the community; inform residents; use good images; gather input; be real; propose possibilities; use translators where necessary. Communication is most important – example: wall along 65th, 68th, 96th and Cactus – citizens were well informed.		Miscellaneous
15	Focused Interviews	3/2/2006	Karl Isenburg						Where will the money come to make the fixes? -Example – people who live on Sweetwater love it, the compromise and the success, but the community hates it if they don't know about it. Need minimum standards Describe and balance what should be with what we can afford Process is complicated because people don't understand the implications of HOA's spending money for their own improvements; traffic mitigation competing with commute times; older and newer Buena Vente Outreach to Indian community Scottsdale is three or four areas – south to Indian Bend; middle to Thunderbird, and Shea west, and the north To complainers, community doesn't matter Citizen views – noise, traffic safety, pedestrian safety, aesthetics, congestion Differences in landscaping north to south, for example, creates problems		Miscellaneous
16	Focused Interviews	3/2/2006	Tom Mason						Identify 10 sites for parking structures Find another place for dumpsters – they take up three spaces Grab parking sites now and/or add parking levees No parking requirements needed if sufficient public parking is provided. City should put in transportation amenities to help development and circulation Need population clusters, not sprawl Scottsdale does not need cabs Flexibility is most important to transportation		Miscellaneous
17	Focused Interviews	3/2/2006	Andrea Michaels						Need better communication than four years ago (e.g., high school issue) Coronado should be linked with Barker Center, to provide transportation means for kids who work after school. Get employers involved in providing solutions, particularly resorts that use much low wage workers who commute from out of town. Ditto at other potential population centers, especially where employment and housing can be developed in close proximity. City leaders do not have a real, holistic vision and defer to special interests (e.g., Chaparral widening issue) Scottsdale has a bad history of working relations with the tribes Talk to Betty Drake		Miscellaneous
18	Focused Interviews	3/2/2006	Mark Ortega						Need "out-of box" understanding of demographics; we could be doing things differently depending on market etc. Need to integrate Phoenix and Scottsdale sides to leverage best of both. City Council says that tourism needs to be leading edge. The forward edge – everything that is Scottsdale Get ahead of the curve now. Yes, political will involves taking risks. What happens on the Phoenix side?		Miscellaneous
19	Focused Interviews	3/2/2006	Glenn Smith						Need economic development		Miscellaneous
20	Focused Interviews	3/2/2006	Sonnie Stevens						Make identifiable, consistent, and attractive entries at all main city borders; Need a long range plan to sustain inevitable economic and other changes. Failure of previous long term planning; Adversity to General Plan adjustments; fear of change Improve identity of gateway to city. Give facts – avoid selling, and editorializing Use before and after graphics Drainage has been improved at northern holding areas. Future city demographics will remain similar		Miscellaneous

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21	Focused Interviews	3/1/2006	Steven Voss						Include better notification of agreements Transportation plan should match the 5 or 6 areas comprising the city. Parking ordinance of 2 spaces per bedroom to 2 per dwelling and in-lieu of alternative. Conflicts: Strong links – Local Area Master Plan(LAMP); difference between General Plan, Lamp, and TPL Work with State Lands Dept. Perception of lack of parking Scottsdale has done a great job in transportation issues.		Miscellaneous
22	Focused Interviews	3/1/2006	Amy MacAulay						Change parking fees. Important to determine who the Plan is for. The city needs to recognize different constituencies will be in conflict. There is no way the City can address all the needs of all its constituencies. How is this plan different from Streets Master Plan? Who is this plan for? People in neighborhood; stores; residents; developers who are building houses in southeast valley and will subsidize regional cut through; local merchants or regional merchants? FHWA website good link.		Miscellaneous
23	Focused Interviews	3/1/2006	Cave Creek Unified School District						District route planning is done over summer months. Road closure and construction coordination with school districts should be done during this time. Last minute information affects everything. Boulder View could be interesting when it rains. Education - lot of people who don't stop don't know the rules relating to school busses.		Miscellaneous
24	Focused Interviews	3/2/2006	Doug Maxwell						What plan needs to do: •Solve traffic congestion. •Smaller/more busses •Address issues important to Scottsdale Health Care – which are the same kinds of things resorts need with how do they get low wage ($10-$12 Hr.) to work? •Scottsdale Airpark employees? How do they get people there?		Miscellaneous
25	Focused Interviews	3/1/2006	Karen Fulton						Whole valley is service area. Employees live all over valley because a lot can't afford to live in Scottsdale. The hospital is a 24/7 facility and employees need to come and go at all hours of the day and night. The hospital is building new facility with 150 beds at Thompson Peak Parkway & Scottsdale Road (South East Corner). Parking is expensive. Wouldn't need to dedicate as much land for parking if there was better transit. People only have ½ hour for lunch - so they eat in cafeteria. SHCC offers carpooling and vanpooling and a compressed work week. Average distance one way to work is 15 miles for their employees. Gas price increases are a concern because lowest wage staff lives furthest from the hospital. Transportation gets more expensive and staff quits. Plan needs to move people efficiently from point A to B eliminating cars and reducing pollution.		Miscellaneous
26	Focused Interviews	3/1/2006	Laurie McCammon, McDowell Mountain Ranch homeowner						•Doing a lot of stuff without connecting dots - e.g. expanding Airpark/West World/Preserves but not looking a future impacts of development. •Tried as a community to have input on the development of the lots behind West World . . . (7-10 AC). Initially, the communities agreed to low in density condos in 2003 or so. A second developer came back in 2005 with high density at 98th Street. The Second developer included additional State Land in his development application that was to be on loop road for aquatic center. The original loop road was suppose to go under Thompson Peak Parkway. •Part of it is development. Development and planning department all know each other. Neighborhoods are outsiders.		Miscellaneous
27	Focused Interviews	3/2/2006	Tim Serey						He read the ITS plan….thought it was transpo plan. Need to fix the web link Master Plan should : •Have crisp clearly defined goals & outcomes. •Metrics to measure outcomes •The plan shouldn't be set in stone. Plan can be rolling so it can be tweaked. Flexible. •Wants dispassionate assessment of what's done well, not so well done & badly done in the City. •Believes that to get implemented, the plan needs a very strong "buy-in" process. He gets feeling that process of implementing traffic solutions has been with an agenda that he doesn't understand or with arrogant rebuttal to citizen ideas that amounts to a "take it or leave it" attitude. An example in his neighborhood with regards to traffic calming…people were very upset about the City's ideas. (116th & MV.) Buy in important because in Scottsdale there are a small number of people who are really passionate. Need to reach beyond those people & bring them in. As a citizen I don't want to hear we're going to spend money on a street improvement and cut back on traffic officers that patrol our neighborhoods and streets. Need political will to make hard choices. Big issues		Miscellaneous
28	Focused Interviews	3/1/2006	Thaddeus Lenick						Accessibility of greenspaces. Use canals as the amenity they can be. "This market has a vertical future." If Scottsdale wants to mature, it has to look clearly at reality of urbanization. Scottsdale needs to be integrated, not isolated with respect to Tempe and Phoenix. Fear of Phoenix/Scottsdale/Tempe - need for unique identity - integration = assimilation. Scottsdale's Downtown is not difficult to get to. RE: depth of market (Q1) - many of those immigrating here are from the Midwest - they have an urban context.		Miscellaneous
29	Focused Interviews	3/1/2006	Monroe Klein						Will input actually be heard and acted on or will they just politely listen.		Miscellaneous
30	Focused Interviews	3/1/2006	Gary Peterson						Access points, median breaks are the point of debate with the City on his projects (330 feet for RI/RO, 660 feet for a median break, etc.). More clarity in the rules would be helpful, but every site is different. SRPMIC land will produce lots of office, also Wal-Mart, along with more industrial parks. Desert Ridge will be, meanwhile, high-density office, commercial and residential.		Miscellaneous
31	Focused Interviews	3/1/2006	Tiffany Carlson						Alleys in HOA need to be maintained - have been raising this issue with the City. More attention needed. Access to the greenbelt - more active, young residents. Allowing kids to travel to and from school and community destinations. Look for unconventional ways to get people involved - use schools as an access point for involving people. People who want to retire here are investing now or buying second homes.		Miscellaneous

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32	Focused Interviews	3/1/2006	Jeff Mangers						Balance - then mitigation. Inertia about policy and decisions prevents some decisive action - why don't we make traffic flow work better where we can? Make sure we get the word out - March 16 council breakfast - not sending notices out is a bad move. Use e-mail, website. Decibel meters on photo enforcement sites!		Miscellaneous
33	Focused Interviews	3/1/2006	Lynne Lagande						"I hope we will be far more big picture and less parochial and be willing to make the big decisions." Her firm worked on most of the major master plans for the big MPC developments. ASU Center will spark more urban development.		Miscellaneous
34	Focused Interviews	3/1/2006	Rachel Sacco, Caroline Stoeckel, Lauren Kapinos, Brent DeRaad						Connecting people to prime attractions. Access to jobs for resort employees. Cab issue - lack of regulations, quality control, supply - taxi system not up to standard. Connecting to Desert Discovery Center, if it is developed. Demographic change in visitors - more night life, more outdoor activities.		Miscellaneous
35	Focused Interviews	3/1/2006	Tom Silverman, Mike Fernandez						Maintain/enhance public art tradition. Find a location for the Winfield Scott sculpture/memorial. Canal banks - kaleidoscope project will be a nice draw. Heat/sun - need shade. We need to keep what's special about Scottsdale . . . . Light Rail in the middle of Scottsdale Road would be very invasive. We should be downzoning or stop upzoning. Public restrooms needed.		Miscellaneous
36	Focused Interviews	3/1/2006	Howard Myers						Transportation was being done piecemeal and with poor citizen dialogue. City has a credibility problem in some neighborhoods. Need to be more receptive to unconventional ideas.		Miscellaneous
37	Focused Interviews	3/1/2006	Carla, and Solange Whitehead						Kids can't get to school by bike, bus and foot. Standards for cabs -- unreliable, dirty, not up to anyone's expectation. Look at Dynamite and 128th - land bridge with Dynamite under it -- in Preserve Master Plan. Could be funded as a City CIP project - City $ and heritage grant. Involve the police department in this plan. Need public information campaign.		Miscellaneous
38	Focused Interviews	3/1/2006	Bill O'Connor						Photo radar very unpopular - informative effort good, but could be better.		Miscellaneous
39	Focused Interviews	3/1/2006	George Adams						4,200 employees - about 3,000 from outside of Scottsdale - need a way for them to access a system at Scottsdale's end of the 101. Scottsdale is an attractive destination - helps for recruitment and retention. •Getting employees to work - large cohort of engineers who live throughout the region. Attitude of keeping Scottsdale like it was in the 50s.		Miscellaneous
40	Focused Interviews	3/1/2006	Sandra Francis						•Project design should support character of the area and property values.		Miscellaneous
41	Focused Interviews	3/1/2006	John Coyne, Doug Sydnor, Dean Sheppard						It can support infill & densification and encourage mixed use development along McDowell, Thomas and Scottsdale Road. Would like to bundle housing/zoning as one package. Our top priority is a plan that is progressive, different and bold. This is our city heritage. Scottsdale is a progressive city and our top objective is to see real leadership from the Council. (all attending agreed). Maintain and enhance the brand as a "World Class City"! It doesn't matter if you are a visitor or a resident, transportation needs to function at a high level. Scottsdale needs to be regionally interconnected – A cooperative spirit with adjacent cities is needed. Council decision-making is way too democratic. No one is willing to make hard decisions for the good of the entire city. There is a "rules don't apply to me mentality in the community", in particular to speeding. Political Leadership & Political Will – leadership and buy-in is needed from the Mayor, City Council and City Groups/major Focuseds. Planning processes and public hearings are an opportunity for the vocal minorities to get heard and more attention than they really deserve. I have no solutions or a good understanding of all the issues. This city plan needs to explain to the public all		Miscellaneous
42	Focused Interviews	3/1/2006	Paul Melhorn, George Adams, Greg Kruger, Dean Sheppard						To keep the Scottsdale Mystic. The transportation impacts to business (in the short and long term). Boomers looking for 2nd homes. The price of gas, (freeways, death and pollution) should be considered in the plan. We need to import workers for the entertainment venues.		Miscellaneous
43	Focused Interviews	3/1/2006	Bonnie Halley, Neil Gustafson, Bill Heckman, Dean Sheppard						Getting employees to Raintree (PV Doubletree). There is a high turnover currently. Congestion from Phoenix is also a hot issue. Make the transportation plan balance neighborhood needs for a win-win outcome. (discussed how the City is currently too biased towards individual neighborhoods and not focused on overall transportation needs.) The City is at a tipping point where there is a no-win situation for transportation decision making. Political will to take corrective action is required. Don't miss something (land uses or TODs), in the framework of the plan identify the (future) TOD sites. Scottsdale is a city of village centers (series of neighborhoods, by location), clan like. There are no provision for expanded parks. Facilities need to be built closer to where they live.		Miscellaneous
44	Focused Interviews	3/1/2006	Doug Zimmerman, Bill Bergdoll, Peter Menna, Stephanie Steel, Dean Sheppard						Biggest fear – employers fed up with getting to Scottsdale no longer will locate business in the city. Focus on moving people in and out of Scottsdale. Development is creating problems, need to provide infrastructure. Desert Ridge is a market threat to Scottsdale. Citynorth is a threat to Scottsdale with 90,000 dwelling units on the Phoenix side. Getting employees in and out of Scottsdale is the big picture issue. Quality of life is not the 1960's. New business and urban mixed use opportunities are driving the demand ar markets. Economic future of Scottsdale is dependant on transportation.		Miscellaneous
45	Focused Interviews	3/1/2006	Mike Merrill, Dean Sheppard						Transportation is not as big a problem as others seem to make it. Police need to move traffic wrecks out of the way. Did not like how the transportation master plan committee was formed. This will have a negative effect on the planning effort. The city policy for selecting committees (on the city web site) was not adhered to. (This is a negative scar, smells of something wrong.) Look to smart transportation solutions (ITS).		Miscellaneous

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46	Focused Interviews	3/1/2006	Susan Wood						Need to keep the people along 96th informed of upcoming meetings. People won't come to the meetings. For the next generation of developments, we need a transportation system-grid. The Transportation Dept. for the City of Scottsdale needs a comprehensive program for Public involvement. This process needs accountability. In the past, the City has made decisions that affect the residents in an area without adequate input from those citizens. Fox example, roads are being "reclassified" and redesigned A resident may purchase a home in a neighborhood based on accessibility to destinations. When the City proceeds to downgrade arterials and major collector streets, the end result is traffic congestion which affects the resident's lifestyle. Focus Groups must have guidelines for minimum numbers of people required to participate. The City has, in the past, drawn conclusions from focus groups of less than 10 people. The City will tally results from focus groups which are not representative of a wide variety of opinions. If the		Miscellaneous
47	Focused Interviews	3/1/2006	Eric Larson, Bob Edwards, Mike Ryan, Pete Bolton, Clinton McCaw, Art DeCabooter, Dean Sheppard						Getting people from A to B is the challenge. Phoenix will not listen to Scottsdale, they will develop as dense as possible along the Scottsdale Road Borde and 101. Address growth along the 101 in the Indian Community. Reservation development will be a big impact. Need to meet with the Indian Community! (How is the Council meeting with the Indian Community?) Go to the top leaders of the Indian Community. Need short/mid-term/long term solutions for this plan. Build relationships with all the surrounding communities. Need "political will" from the top to make hard decisions (example Chaparral Road). Develop political will, if people have confidence in the plan, they will stand up for it. The cost of congestion is the need for 3 or 4 new fire stations, to maintain response times. Need a district system in the city to address hard issues.		Miscellaneous
48	Focused Interviews	3/1/2006	Curt Smith, Heidi Schaefer, Ted, Dean Sheppard						Transportation is critical, it is expensive to live here so we need to get people in and out to work (the 101 is a parking lot). It is a dilemma, we increase density with a poor circulation system, we need to provide transportation for the employment in Downtown and north. Partner with the Indian Community. Recognize what are appropriate land uses in the Transportation master plan, do not use the general plan for planning – use a denser/intense scenario. Work with regional neighbors. Bring out the high density areas in this plan regardless of the general plan and zoning. Recognize Scottsdale is part of the region. Worried that there is no political will to do good transportation planning or hard decision making. Making political will to fund these (improvements). Recognize the financial needs of transportation solutions. Public fear of density. Embellish the Indian Bend Wash Make the CAP an asset.		Miscellaneous
49	Focused Interviews	3/1/2006	Les Conklin, The Peak Magazine						•Maintain the heritage of the area, the character of the desert.		Miscellaneous
50	Focused Interviews	3/2/2006	Pete Fredrickson						Plan now for the future, don't listen to the City's "old timers" Educate and convince people that funding is important to adequately plan for the future. City and City Council are the leaders of the community and need to be outspoken on transportation needs and solutions – don't fold to political pressure from citizens. Get people involved, keep them involved – let them know that they are being listened to and are a part of the process and the solution. Full-time vs. part-time residents / part-time residents don't get involved; they do not believe the City or the Council will listen to their concerns. Development competes with itself, stores leave one location for a new location / shopping center, the result i abandoned storefronts.		Miscellaneous
51	Focused Interviews	3/1/2006	Jim Slaker						Shorter commute times Air quality improvement in the area Consensus building – always people who will not support new ideas Funding for transportation projects and improvements		Miscellaneous
52	March Workshop Summary of Comments	3/20/3006							There are no political boundaries for transportation. Connect the dots (all the various communities) Research other cities worldwide (for information on successful transportation solutions. Create more activity nodes throughout the city so you don't have to travel so far for goods and services.		Miscellaneous
53	Scottsdale TMP Contact Report		Michelle Korf						The City Manager has told all the Division Managers that each project will have a comprehensive public involvement plan for the life of the project -- through construction. This should be a part of our proposal. Because it's Scottsdale, show a regard for their public arts program. We don't need to have an artist on the team -- just recognize the importance of working with them. The City feels their transportation system could be much better "linked" in the big picture.		Miscellaneous
54	CWG Meeting Notes	1/26/2006							Scottsdale's unique geography •Long North-South axis •Bounded by mountains and reservation land along the east side •Limited North-South circulation •Somewhat limited East-West Circulation and connection •Transected by the canals •The need for access to and from the larger region, in particular the connections to Tempe Scottsdale's unique identity •Scottsdale is " a brand, an image, a choice" •Localized character of different areas within the city (but some areas do not have a clear local identity) •Downtown ambience at one end… •A low-density, equestrian-friendly environment on the other		Miscellaneous

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	CWG Meeting Notes CWG (cont)								The pressures of change and development •Design standards intended to preserve character as growth and redevelopment takes place •Phoenix's developable lands along the Scottsdale's northwestern edge could produce as many as 90,000 new dwelling units •The development of the Salt River Pima-Maricopa Indian Community's lands could take place at higher intensities and at a faster rate than anticipated, resulting in a very large transportation impact The challenges of the climate •Although the climate here is benign much of the year, the summer's very high temperatures affect transportation; some particular issues: •Some months, it is very difficult to be a pedestrian •We need close access to parking An economic magnet •The Airpark is a major employment area •Large commuting workforce •Lack of affordable housing exacerbates the transportation impact of being an employment center Resources for modifying the transportation system •In many cases, road corridors in the city have lots of right-of-way, providing the space for a number of potential solutions (this should be preserved) •Scottsdale is now more conscious of the need to coordinate transportation decisions and strategies with nei		Miscellaneous
55	Congestion.doc								Scottsdale's Transportation Master Plan must encompass the entire transportation system - all modes, all levels of connectivity and the dynamic behavior of that system throughout the daily transportation cycle. Congestion avoidance must be a primary goal of the Plan. Streets are in the public domain, they belong to all. Devising a system that works smoothly serves the overarching economic best interest. Only demonstrable, quantitative problems should justify exceptions to this rule. Pet rocks cannot be part of the long range Scottsdale plan. The urban myth that congestion encourages travelers to use mass transportation is false – it only encourages voters to replace elected leaders. The Scottsdale transportation system must be designed based on realistic simulations of the origins and destinations of the preponderance of trips, now and in the future. Routing and constructing roads, rails and paths to meet wishful or esthetic but not functional goals guarantees serious future problems (e.g., the decision to place the freeway exit at Chaparral and not Camelback.) To accomplish the above, Scottsdale must avail itself of the absolute best tools to simulate present and futur		Miscellaneous
56	Suggestions for Transportation Program		Nan Nesvig						A master infrastructure design must be applied with the forethought of growth within our City. We must not assume that major arterial travel routes will accommodate extended traffic needs, especially if they are somehow interrupted by construction or accidents at peak performance times. Residents will seek to utilize smaller less traveled routes if congestion continues on major arteries within the City, thus driving traffic into areas which are not designed to accommodate it. Our current situation dictates the need for a multi-versed transportation system. No one solution will handle this problem. To that end, light rail, which is phenomenally expensive, takes a long time to construct and requires density, is not the only viable solution to our City's transportation issues. There must be an adequate mixture of short and long distance alternatives implemented here and tied to other transportation systems in the Phoenix metro and surrounding city areas. Scottsdale must take into account the opinions and advice of more than localized residents in heavily trafficked areas before making any traffic related decisions. Too often we limit our resident input to a few who		Miscellaneous
	Suggestions for Transportation Program (cont)								To that end, one must examine many alternate sources of transportation to alleviate our transportation woes. System to system transportation must not interfere with our regular street travel routes. If light rail or a similar system is considered, it is suggested that it be placed on the strip of land running adjacent to the 101 freewa and connect with the Tempe, Mesa and Phoenix light rail systems. Of course, consideration has to be given to the Native American Indian Nation, as this is their property. With the onset of new jobs and transportation needs in their area, we should consider a joint effort in this arena. To transport persons to and from the rail system, we will need busses or like vehicles running on a timely schedule. Parking lots could be as close as the Pima Rd. area. Park and Ride has worked quite well in larger metropolitan areas. While this connection system may work well on a north-south basis, it does not accommodate the east-west traffic, which, in some cases, is heavier than the north-south traffic flow. A more elaborate grid network of traffic solutions must be entertained for this route. Whatever the solution, we must utilize more than just one		Miscellaneous
57	April Workshop Comment Card		Terry Hanson						The Indian School Improvement Project from Drinkwater to the Pima Freeway should use non-deciduous trees, primarily in its streetscape (landscape) design, to; 1. Continue the "look" of the portion west of Drinkwater; 2. Have the attractive appearance (rather than bare branches) during our winter visitor season; 3 Ameliorate the dust and pollution (and noise) all year long rather than just during the summer when we are hermetically sealed in our homes anyway and windows are never open.		Miscellaneous
58	Public Arts Board								The Salt Lake City transit art is an example of what not to do. It looked good when first installed but now it looks terrible. They wanted to know how the Public Art Master Plan will be integrated – we explained that they will integrate, but the Transportation Master Plan will not be doing a public art plan, just making sure that we can dovetail in the future. The also asked if there were Federal Transit dollars available for public art on the HCT? We did say that yes there are monies available for public art, and that will be what the art staff and others will be working on once we have projects.		Miscellaneous
59	April Workshop		Steve Bass						Remember the "little people" who may not be represented in the planning process. Clean air and a safe walk to school or a ride to the park or library are critical elements in the lives of children who will shape Scottsdale into the future. Scottsdale's image in the region is unique, active recreation, "western", prosperous, maintain and enhance these images through design.		Miscellaneous
60	April Workshop		Jeffrey Mangers						Need to control other sources of noise especially diesel trucks (pick-ups and SUV's as well as heavy trucks) and exhaust noise (especially motorcycles – I can hear them over a mile away).		Miscellaneous
61	April Workshop		Paul Reich						City Manager needs to plan future traffic patterns/roads before allowing building permits to be issued. Example: Camelback and Scottsdale Road should have been improved before granting permits for the Waterfront. Same is true for the high density buildings being built at Scottsdale Road and Chaparral.		Miscellaneous
62	AZ State Land Department		Gregory V. Keller, AZ State Land Department						The "Growth Area" depicted on the alternatives in the vicinity of Scottsdale Road and the Loop 101 should be expanded both south and east to encompass those Trust Lands not yet developed in the Core South and Core North approved development plan areas.		Miscellaneous

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63	March Workshop Public Comments	3/20/2006	James McCay, Coronado Park Estates HOA						Rick Cole is spot on – This transport plan must focus on people and the community – not simply transport systems. I think Mayor and Council should get to see the end of his presentation. Then the entire transport plan should match the vision for the General Plan, Scenic Corridor Design Guidelines, and all other relevant documents. Open minds and open the City – challenge status quo and revisit current guidelines and even rules that insist on single-use land laws. We need more multi-use and sustainable communities. Plan for the future NOT present and past. This plan should work forever.		Miscellaneous
64	March Workshop Public Comments	3/30/2006	Mark Edelman						Please ask the professionals for the solutions – we the people don't know about this stuff and our ideas – well, some of them sound crazy/stupid/ignorant. Rick Cole's presentation was excellent. Thank you for an intelligent approach to public participation. Waterfront is an important destination as well as recreational corridor (along AZ Canal, Goldwater eastbound especially). Let's be sure that there is a connection then across Scottsdale Road. Improved ped + vehicular signage and circulation in Downtown is badly needed. Get the rest of us to use the trolleys. Be careful with "gateways". What are they for? Imageability and wayfinding is as important to this plan. 1) Does it really matter where the southern boundary of "North Scottsdale" is? Issues problems and solutions need to be more independent of place "labels" but more about the place itself. 2) If high capacity transit is to progress northward how can we place any form of fixed guideway system through Downtown affordably without destroying the character of the area or sacrificing vehicular capacity? 3) Transportation efficiency such as cost per passenger mile or capacity or capacity per width of ROW requi The most important thing for everyone to know is that we cannot and will not solve traffic congestion by expa		Miscellaneous
	email	20-Feb-07	Valerie Glickman	8596 E. Davenport Drive	Scottsdale	AZ	85260	val@glickman.com	I am writing to you all as a concerned homeowner and resident of Scottsdale. I found out over the weekend about the city's Transportation Master Plan which is in the works. I understand that there was a meeting (or meetings?) that dealt with Airpark traffic flow. I live near this area of concern. I am very troubled to hear that one proposal that is being considered is to make Thunderbird road a larger road from Scottsdale road which would be connected with the current four lane road on the east side of the freeway. I have lived in this area for fifteen years, in this current home in Mcdowell Shadow Estates for two years. I never even knew that this idea was in the realm of possibility. We lived on 84th street just south of Cactus road prior to moving here. We sold our home on 84th street due to the excessive traffic and speeding that we experienced. Having a young child, we looked for a nearby neighborhood that was more child-friendly. The McDowell Shadow Estates neighborhood fit the bill with it's large population of school age children, close proximity to Northsight Park, Pretty Penny Ranch and biking and horse trails. The 101 freeway noise is something that we endure a		
	email to council	13-Feb-07	Steve Smith	10575 E. Tierra Buena Lane	Scottsdale	AZ	85255	stevenasmith@cox.net]	I thought you might like to see how the French did light rail in Bordeaux France. No no overhead wires like Phoenix. I'd hate to see those wire in our beautiful city! Note the tracks in photo 149. Compare that to what we see happening down Washington in Phoenix. (pics were attached to email)		transit
	email	23-Feb-07	Phillip Graham	14350 North 87th Street, Suite 165	Scottsdale	AZ	85260	pgraham@professionalemploymentsolutions.com	Thank you for you letter to our neighborhood. We are all adamantly opposed to any changes in the commute flow in and around the Thunderbird area. I live at 84th and Thunderbird and we already have a problem with traffic flying up and down our streets. I have three children that would be dramatically effected by this as they go back and forth to the park everyday. We all utilize it with the kids visiting and playing there. This would als severely impact our land values. Please use this letter to dissuade any changes to the commuter situation. Thanks for listening.		airport
	email	19-Feb-07	Barbara A. Cooper, MD	8116 E. Gray Rd				Barbara.Cooper@USONCOLOGY.COM	I am a physician practicing in Scottsdale and have been a resident at 8116 E. Gray Rd in Patterson Ranch since 1990. I am alarmed because I have been informed by a neighbor that the city of Scottsdale is considering making Thunderbird Road a through street between Scottsdale Road to the 101. My neighborhood was developed about 1978 and on buying I was told by the original owner that the city had made a promise not to make this a through street when the Scottsdale Airport was built as that was a concern at that time. Also it was my understanding when Cactus and Raintree close south and north of Thunberbird were made access roads to the 101 that the city agreed to preserve our unique neighborhood. The prime purpose of the way our neighborhod was developed, a purpose preserved by our current		
									Other equally major concerns include the certain drop in property values and loss of quality of life due to noise, higher risks of robberies or personal violent crime, and loss of privacy when our minimal residential traffic becomes a high flow traffic sight easily accessible to large volumes of commuters passing by daily. Myself and most of my neighbors have remodeled with high investments into their homes with the understanding that we would remain not immediately accessible from the freeway when Frank Lloyd Wright, Raintree, Cactus and Shea were made access roads to the freeway. I personally have		
									Spent $250,000 in remodeling and building horse stalls and a coral and I am on the verge of redoing the fror of my house and drive. Many other homes have invested that much and five homes are currently actively adding on to their homes or making major remodeling changes just in my neighborhood. In short, we have been a neighborhood constantly significantly growing in value over the last twenty years to make us an upscale area to live. Three neighborhoods adjacently east of me are actively building or remodeling with many of these homes presently worth well over a million dollars. This is not a declining area but a robust area. Our neighborhoods have invested time and money to make these areas upscale and changing Thunderbird to a high flow traffic area with commuters would make our investments a loss. Several of my neighbors have said they would move ir Thunberbird here is a main thoroughfare. Essentially that change would collapse my neighborhood and the growing tax support we provide to Scottsdale will plummet. Also Northsight Park is along this stretch of Thunderbird and attracted home buyers as well as providing a shelter		
									Changing the traffic pattern away from Raintree off Scottsdale Road will also likely negitavely impact on the multitude of commercial companies along this road or on many of the branching side streets.		
									I believe making Thunberbird a through street in this area will worsen rather than improve traffic flow in the area . Rush hour commuter traffic would require a stoplight at Thunberbird and Hayden spacing multiple sto lights on Hayden over a small distance, with lights at Raintree east, Raintree west, Thunberbird, Sweetwater, and Cactus. Hayden would be overburdened with stoplights in a short distance causing congestion and creating much slower flow along Hayden.		
									In summary, making a through street to the freeway out of Thunderbird at Hayden would be a catastrophe for my neighborhood and several surrounding ones. Our living situation is unique and cannot be duplicated by moving further north in Scottsdale. I implore you to find alternative solutions for traffic flow.		
									If any meetings are upcoming where traffic flow in this area is being discussed I would like the opportunity for myself and my neighbors to attend and express are varied view.		
	email to council	9-Feb-07	Sharon Lee	7632 E. Chaparral Rd	Scottsdale	AZ	85250	WebSiteUser@scottsdaleaz.gov	Due to the expense and bad feelings in the community that would be created if the long time Chaparral Road residents would be forced to move to widen Chaparral Road between Miller and 77th street, I would like to propose that Chaparral be made into a one way street and that Mcdonald, Jackrabbit, Camelback, Indian school Roads and Thomas Road part or all be made into one way streets thus improving the traffic flow		

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									to and from downtown Scottsdale, the Fashion Square mall, the new Condo		
									developements in and around the Fashion Square Mall and Scottsdale		
									Community College.		
	email		Olivia Twiford		Scottsdale	AZ		russandpat@cox.net	My name is Olivia Twiford. I am 10 years old and I live in McDowell Shadows Estates. It was brought to my attention that the city is going to make a 4 lane street in my back yard, our neighborhood park, and through the beautiful wash. When you are doing this you are killing the environment crushing me(not literally), never letting me or my family go to a park or ride our bikes safely, and last making it harder to breath because of pollution. The pollution would be horrible because my brother and I both have asthma. Yesterday I saw the most amazing and horrible things. There were two falcons and a baby. The parents were trying to make the baby fly. I also saw many beautiful birds and mammals. But when I was driving home I saw a beautiful little woodpecker with a red head and in the middle of the body there was a big gash. It was dead. I buried it and cried. Cried until I got to bed. If that could happen with barely any cars around just think about what would happen if there were a lot of cars.When you put in the lanes you will be killing the animals I just told you abo and even more.		
									30 years ago Scottsdale city planners stated they would protect our neighborhood when the airpark went in. Now you are all breaking that promise. By the way we are not the only one's who don't want what you're doing. E-mail me back and tell me what you're choice is. Saving our sreet or killing the enviorment and our wondrous place. E-mail me at russandpat@cox.net or call me at (480)-443-5290. Please don't do this.		
	email to mayor	18-Feb-07	Mark Preul	8628 E. Davenport Dr.	Scottsdale	AZ		mpreul@cox.net]	Last Tuesday, four of us from our neighborhood attended the Airport Commission meeting at the airport specifically to hear Teresa Huish's briefing to the commission about the Airport/Airpark Transportation Master Plan. We are most fearful of what we believe may be one of the options for traffic management in our area, and that is to open Thunderbird from Scottsdale Road across the 101. This would be devastating for our neighborhood, and we believe not within the scope of the neighborhood preservation mission of Scottsdale a city. We discussed at length with Teresa and expressed our concerns. We recognize that there are no firm plans in place to manage traffic and that currently policy plans are being firmed. However, Teresa informed us that plans are expected to be in place for traffic options by October 2007. Teresa encouraged us to make our thoughts known to her, you and the council. Our goal as a neighborhood is to become organized so that you and the Scottsdale Transportation Dept know from the start of your planning that we are totally opposed to any option that would change Thunderbird to a through street or bring more traffic into our neighborhood c		
	email	16-Feb-07	Mark Preul	8629 E. Davenport Dr.	Scottsdale	AZ		mpreul@cox.net]	I wanted to follow up on our meeting at the airport commission this week... It is imperative that any master plan protect the neighborhood between Scottsdale Rd and the 101, north of Cactus. This should involve nothing of the idea of putting T-Bird through from Scottsdale Rd across the 101, nor any 101 exit/entrance at T-Bird. Scottsdale should want to preserve a beautiful older neighborhood -- one of the most highly sought after neighborhoods in the city -- a place within the city where there are still quiet streets and peaceful surroundings. The traffic option cannot be just to satisfy commuters. Opening up T-Bird in our area would be like ripping the lid off of a can and it will be devastating. Other options of taking the traffic on raintree west, closer to the runway, then south to redfield should be considered -- or tunneling raintree under the runway -- but NOT through our neighborhood. Attached is a flyer circulating the area this weekend. The neighborhood organizing to make sure that the city planners and our elected representatives know that preservation of our way of life in Scottsdale takes precedence over making bigger, busier roads -- especially through neighborho		
	email	19-Feb-07	Neal Deacon	8576 E. Sharon Drive	Scottsdale	AZ		NDeacon@aztec.us	One word……….Irresponsible. Thunderbird access to the 101 goes against all prior planning and most importantly, common sense. We proudly show Scottsdale to the world as a great place to do business, a great place to visit and most importantly, a great place to live. Smart planning decisions have allowed business and residential to co exist. Our neighborhood is a perfect example of how this has worked. I see children at the park, horses walking along trails, people exercising along carefully planned trails and paths through residential neighborhoods. To even start thinking about making plans to exchange residential living for warehouse access is against everything that Scottsdale represents. We all understand that the Airpark is a commercial venture that is growing and that access is important. Raintree/101 exit , Scottsdale Road, Butherus, Raintree, Hayden rd, Frank Lloyd Wright, Greenway Pkwy……. all specifically designed to move traffic directly into commercial areas, providing access to Scottsdale Airpark. Task HDR with real world transportation solutions that build off of existing commercial traffic movement.	Thank you for your email regarding the Thunderbird Road connection concept from the Airpark circulation study. The idea of connecting Thunderbird Road to the east is one example of some suggestions and ideas provided to staff and the transportation consultant for consideration in the Airpark area circulation study of th Transportation Master Plan. None of these ideas are intended as recommendations or proposed projects. The meeting where this was originally discussed was regarding the entire Transportation Master Plan and it included all possibilities – with no exclusions. At the February 14, 2007 meeting of the Airport Advisory Commission a status update of the Transportation Master Plan was provided to the Commission, however none of these concepts were presented to them. A number of you were in attendance at the Airport Commission meeting and we discussed these ideas following the Airport Commission meeting. A variety of factors including costs and neighborhood impacts will be considered before any options or recommendations are presented to the Transportation Commission or the City Council for their approval. Your comments and others will be considered when the evaluation of proposed solutions to Airpark traffic an	
									Push them to create solutions not problems and keep the residential communities livable.		
									Do not act irresponsibly when planning a city. If the City planners cannot understand this, I personally invite all of you to my home any Sunday morning for breakfast in my back yard.		
									Watch the children at the park; see the horseback riders remind us of how the rest of the world views Scottsdale. Experience first hand how residential and commercial can co-exist. This is a great opportunity for Transportation officials and HDR to get out from behind their desks and CAD drawings and see the real impact.To continue to have Thunderbird and the 101 as an agenda option will be met with opposition from a very strong organized community. Our community is not an aerial photo…………….it is a real live functioning community.		
	email	19-Feb-07	Bob Roth	8715 East Celtic Drive	Scottsdale	AZ		bobroth@cypresshomecare.com	Good Evening Mayor Manross: I am not certain if you you remember meeting me, but I assisted you in your most recent campaign re-election. In the past I have not requested your involvement on any political issues, until now. Once you have had a chance to review the issue at hand (see below) you will understand why my neighbors and I need your immediate help. I have lived in Scottsdale Arizona at my current address for 12 years. Our neighborhood is deeply concerned about the thought of opening Thunderbird Rd. from Scottsdal Road across the 101. This would be devastating to our neighborhood, and we believe this would not be in the scope of the 30 year plus neighborhood preservation mission of the City of Scottsdale. Please take the time to read some of the comments listed below by some very concerned neighbors. Your attention on this matter is greatly appreciated. We would be happy to meet with the Scottsdale City Council, and or the Scottsdale City Planning and Development and Scottsdale Transportation Department.		
	email to the mayor	19-Feb-07	Mark & Ronda Speno	8647 East Davenport Drive	Scottsdale	AZ		mark@sfgfunds.com	Dear Mayor Manross, et al, We are deeply upset that any consideration is being given to dismantling our neighborhood by providing access to the 101 & thoroughfare on Thunderbird Road. Our primary decisions to buy in the McDowell Shadows community were the benefits of peace, quite and safety for us and especially our children. Ours is a community where kids can ride their bicycles to Northsight Park without having to cross a busy road and horses are able to ride designated trails. There aren't many neighborhoods left in Scottsdale where the same can be said. Widening and extending Thunderbird Road will take all of this away and absolutely change the face of what is now a beautiful place to live. Furthermore, in purchasing our home in McDowell Shadows we made a significant financial reliance that our city officials would continue to follow a 30 year history of preserving the City of Scottsdale Ordinances 996 and 1233. If violated, home values in the area will plunge as will the revenue from property taxes and the City will face the liability from homeowners who will most certainly incur a very real/measurable financial loss. Now add to that the project		

No.	Source of Comment	Date	Citizen/Group/Interviewee	street address	city	state	zip	email	Comment	Response	Area
	email	18-Feb-07	Jim Fusaro					jfusa@amkor.com	Please allow me to introduce myself. My name is Jim Fusaro and I currently live in Paradise Valley Ranchos II, Scottsdale AZ. The Paradise Valley Ranchos II community is located south of Thunderbird Rd. and north of Sweetwater Rd. The east and west boundaries are Hayden and Miller(76th St.), respectively. I have been a resident of this community for the better part of 32 years. I grew up in the very neighbor I now live, with my wife and children. As like many other long time residents of Scottsdale, I have seen significant growth. It has come to my attention that the City of Scottsdale, namely the Transportation Commission are considering a plan to open up Thunderbird Road from Scottsdale road east to the 101 Freeway. For the record, I am against this plan for the reasons I shall list below: 1) SAFETY. Today Thunderbird road from 76th street to just west of the 101 Freeway is surrounded by single family homes, a school (Thunderbird Adventist		
									Academy) and a park (North Site). It was for safety reasons, as well as preservation of existing neighborhood communities that Ordinance 996 was established, when the Scottsdale Airpark was in its infancy. Reference attached document entitled "Ordinances 996 and 1233.pdf". Up until now, the neighborhood residents, Thunderbird Adventist Academy and Airpark have lived in relative harmony. The existing ordinances are serving their purpose, i.e. keeping everyone safe. The proposed plan to open up Thunderbird road will have an adverse impact by increasing the car count and cut-through traffic in the existing residential communities, thereby putting our children and residents at risk of serious injury and/or death. I've reviewed the current Level of Service(LOS) report for 2004 (attached) and the traffic that is now concentrated at Thunderbird Rd west of Scottsdale Rd. will certainly find its way through the residential neighborhoods. Many of the children in my neighborhood walk and/or ride bicycles to the Sonoran Sky Elementary School, including my own. Opening up Thunderbird Rd. will certainly invite more cut-through tra		
									Timing traffic lights might also provide greater relief. 3) HOME VALUATION Roads do not generate revenue, to the contrary homes with high valuation do. Homes adjacent to major streets and/or highways have lower property value than homes with residential roads. Home owner equity is at stake, as well as the city of Scottsdale's revenue base. 4) DIVERSITY OF NEIGHBORHOODS. The character and dominant lifestyle of the neighborhoods adjacent to Thunderbird Rd. are truly unique. These homes are on large lots (~1acre) with equestrian privileges and easements. It is rare to find this combination of attributes in homes in Scottsdale. Additionally, these attributes are some of the primary catalysts for growth. Preservation of this unique neighborhood character is at serious risk. 5) ENVIRONMENTAL IMPACT Increased cut-through traffi and subsequent traffic lights and/or stop signs will not only increase noise pollution, but will also increase air pollution via vehicles idling. Cars idling produce no "work" only pollution. Currently, Thunderbird Rd. east of Miller to Hayden Rd. is a residential street with one half of the road unpaved and a culvert separating Paradi		
	email to mayor, references previous entry	18-Feb-07	Jim Fusaro					jfusa@amkor.com	I hope this message finds you well. My name is Jim Fusaro and I am a Corporate Officer with Amkor Technology, Inc. (NASDAQ: AMKR). We briefly met last year through a mutual acquaintance. Recall -- Amkor is a leading provider of contract semiconductor assembly and test services, with 2006 revenues of over $2.7 billion. On June 3,		
									2005 we elected to move our head quarters to Arizona (http://www.amkor.com/news/pressreleases/ShowPR.cfm?ID=333). Today, 3 of the 5 officers of the company reside in Scottsdale AZ, myself included. The reason I bring this to your attention is not only do I have the luxury of working in Arizona, but I have the privilege of living in Scottsdale. Moreover, I'm extremely blessed to now live in the very neighborhood I grew up in! This neighborhood being Paradise Valley Ranchos II, where I spent the better part of 32 years! From my message below you can see I am in contact with Teresa Huish, who is the Principle Transportation Planner for the City of Scottsdale. I have taken the liberty of adding Teresa to the distribution list above.		
									While I have not met Teresa, I have several friends and neighbors who have and they all speak quite highly her. With that being said, I do want to bring to your attention to the matter of the potential expansion of Thunderbird Road (ref. my message to Teresa below). To me, one of the biggest assets of the City of Scottsdale has been its ability to properly differentiate, plan and manage both commercial and residential interests. Providing access to the Scottsdale Airpark and potentially the 101 via Thunderbird Rd will certainly have adverse effects on the surrounding neighborhoods and schools. This access is not meant to service those who live in the adjacent neighborhoods, but rather those who commute to the Air Park or those who desire a "quicker" route to the 101. Increasing "cut through" traffic in neighborhoods with children (including my own) who walk or ride bicycles to school puts them at risk of serious injury and/or death. This plan is flawed and is of grave concern to me for many reasons. I am, however, hopeful that working with you and the city we can collectively find a good solution.		
	email	19-Feb-07	Ralph Monaco	14350 N. 87th St., Suite 150	Scottsdale	AZ	85260	Ralph.Monaco@rtmcb.com	There has been quite a bit of consternation in my neighborhood this past weekend over the possibility of widening Thunderbird Road from Hayden to the 101. I don't know if you are the right person to be contacting about this possibility but I'm interested in getting more information as to what may or may not be going on. FYI – I live at 8595 E. Sharon Drive and I have my office on 87th St. north of Northsight so I have a strong interest in any changes to the streets in this area. If there is specific information on line or there is someone else to contact, I'd appreciate getting that information. On a separate note, I wonder if someone could explai why Hayden Road, in the lanes on the west side of the road, doesn't align in a north-south direction at the Redfield intersection. It looks to me like there was either an error in construction or poor planning.		
	email	22-Feb-07	Elaine Wright					kazan7151@aol.com	I have been told that there is a plan to make T-bird between Hayden and the freeway 4 lanes with an access to the highway? Truth or fiction? I also want to know when there is to be a community meeting to discuss the development at Pretty Penny Ranch?	Thank you for your email regarding the Thunderbird Road connection concept from the Airpark circulation study. The idea of connecting Thunderbird Road to the east is one example of some suggestions and ideas provided to staff and the transportation consultant for consideration in the Airpark area circulation study of th Transportation Master Plan. None of these ideas are intended as recommendations or proposed projects at this point. The meeting where this was originally discussed was regarding the entire Transportation Master Plan and it included all possibilities – with no exclusions. At the February 14, 2007 meeting of the Airport Advisory Commission a status update of the Transportation Master Plan was provided to the Commission, however none of these concepts were presented to them. A number of you were in attendance at the Airport Commission meeting and we discussed these ideas following the Airport Commission meeting. A variety of factors including costs and neighborhood impacts will be considered before any options or recommendations are presented to the Transportation Commission or the City Council for their approval. Your comments and others will be considered when the evaluation of proposed solutions to Airpark traffic an	
	email	23-Mar-07	Neil Deacon					NDeacon@aztec.us	The response to the website www.parcaz.org has been unbelievable! 110 residents and the majority of thes are around 1 acre lots……….. This is a huge response covering an enormous area surrounding the Northsight Park. Within a few short days we have had over 110 residents respond back to us stating that the oppose any changes to Thunderbird Road between the 101 and Hayden and Scottsdale road for access to the airpark. The same people have also made it very clear that they disagree with the Calvis-Wyant plans to create an entrance to their gated community plans at 84th St and Thunderbird. (City of Scottsdale 2pp-2007-CWestates). I encourage City officials to look at the website, as it represents the opinions of the community. We believe that this will help the city formulate their decision making rather than dealing with residents one o one. As meetings with the City Transportation and development Review Commissions move forward, it is important that the voices of these concerned residents are heard, so please add this email to the files of both the Transportation Commission and the DRV commission. Thank you.		

No.	Source of Comment	Date	Citizen/Group/Interviewee	street address	city	state	zip	email	Comment	Response	Area
	phone call with mayors office	30-Jan-07	Ms. Harriett Thompson	6405 E. Indian School road, Apt. 21	Scottsdale	AZ	85251		Lisa Haskell called Mayor's office and suggested we call Ms. Harriett Thompson, who has expressed concer about the condition of ISR to Lisa. Natalie Lewis (with Mayors office) called her and explained the issue of four-lane design and some concern/questions now being expressed that we should consider a 6-lane design instead. Also told her it was my understanding that if we moved forward with four-lane design, overlay work would be done in April/May 2008 timeframe. If we move forward to design six-lane road, much more proces required and we'd schedule a maintenance overlay in/around that same time period in spring 2008. Ms. Thompson was dismayed that nothing is being fully planned to improve the roadway until spring of next year. She asked me to let you guys know that she feels strongly that ISR should remain four lanes. She said that the neighbors have always been told that the roadway would remain four lanes and that six lanes would change the character of the area. She also feels we ought to move forward to begin work as quickly as possible, as ISR condition today is bad and only getting worse. Main concern (as an elderly woman) is the j		
	email	5-Feb-07	Marshall Gerston					marshall@mscaz.com	I saw an article in the paper the other day about future transportation issues in the City of Scottsdale and it encouraged citizen input. I hope this is the right forum for some opinions, if not, perhaps you can forward it the correct place. The article mentioned freeway on ramp monitors. I assume these are the red/green lights at the top of the freeway on ramps - indicating one car per green. These devices are the most wasteful, pollution causing, traffic hazards ever. You stop at the first light to the freeway under pass - then you stop again at the second light (because these freeway entry lights are rarely timed to allow the smooth flow of traffic, then after already stopping and waiting twice (causing wear and tear on the car, and creating pollution for hundreds of cars sitting idle waiting for a green light, then you get going, using lots of gas (spewing lots of pollution) building up a head of steam (usually on a uphill freeway on ramp), only to have to haul your car down to a stop again, for the third time just trying to get on the freeway. Now you sit in line while the drivers in front of you screw up the rotation of who goes next, then when your little flashing red/green light goes green,		
	email	1/16/2007	Heidi Horchler					heidi.horchler@cox.net	My family and I reside on the southern border of the Airpark area, on the 7900 block of Thunderbird Rd. I an interested in finding out what, if any, plans the City of Scottsdale has in mind for this area. We are a residential, equestrian neighborhood. Most of the houses are on acre, more or less. Many of the residents i the immediate area are investing in major remodeling/rebuilding projects. The real estate values in the area are increasing. With all of the business and new building that the Airpark is generating, we have noticed an increase in traffic. I would like to know what is in the Master Plan for Thunderbird Road. Please Email me at heidi.horchler@cox.net. I appreciate your time and effort.		
	email	19-Jan-07	Bob Vairo					Sonoran@aol.com	Based on a recent Channel 11 program about the TMP, it appears that the consultant, Charlie Hales, is sole focused on HCT for Scottsdale Road. The Transportation Commission chairman, Josh Weiss who was also present, commented that transportation issues had not yet been identified and defined. As you know, the latter is a concern I expressed on behalf of COPP at the last CC public hearing on the subject	Bob: The scope of the TMP remains as was originally approved by the City Council. The scope has always been much more than HCT on Scottsdale Road. The elements of the study as contracted for are, Citywide policy (TDM, speed limits, public art, mode equity/primacy), Streets (design speeds and other safety related elements, ITS, traffic management, functional classification, area specific standards-e.e .equestrians in North area, emergency response), Transit (HCT including area specific portions), Bike (lanes, way finding signage), Pedestrian (area specific portions/improvements/cost estimates/recommendations on primacy-buttons or not, countdown timers, assumed walk speeds, ADA compliance, safe routes to school), Financing and Implementation, Airpark Area Study, North Area Study, Central/Downtown Area Study, High-Capacity Transit Study. The final report will also address the regional context, and overview of policies, plans, history, growth and development trends and planning issues and opportunities. The consultant team is working on all of these elements and I expect future reports and discussions to be much broader than HCT on Scottsdale Roa Jan Dolan	
									Question: has the direction and scope of the TMP been redirected as confirmed in your email of 12/14? If so, can you provide an outline or other material that would describe what issues and questions are now being addressed, other than HCT on Scottsdale Road?		
	email	5-Jan-07	Brian Haynes					42101720@cox.net'	Is there anything to the rumor that, Thunderbird is to go straight East to the 101?	Mr. Haynes, The city is currently in the process of creating a Transportation Master Plan which includes new or updated street, bicycle, pedestrian, and transit plans as well as area circulation plans. One of the area circulation plans is the Airpark. The consultant for the Master Plan has been brainstorming ideas to address Airpark area circulation concerns and the one of the many ideas mentioned is continuing Thunderbird Road to the east. All of these ideas need to be analyzed for neighborhood impacts, cost/benefit and many other considerations before any recommendations will be made. If you have any concerns about the Transportatio Master Plan please contact me directly. Thank you for your interest. Thank you, Teresa	
	phone call	10-Apr-07	Lloyd Christiansen	7430 E. Chaparral, Unit #253-A	Scottsdale	AZ			Create an additional turning movement at Hayden by curving down through Villa Monterey golf course to meet up with Camelback Road. Or provide additional turning movements to go south on Hayden from westbound Chaparral to connect to Camelback Road. Reduce traffic on Chaparral by making this route more attractive. Could consider going all the way to Indian School also.		
	email btwn Debbie Astin, Trans. Mgr and scottdale employer	26-Mar-07	Keefe, Robin	7501 E. Thompson Peak Parkway	Scottsdale	AZ	85255	RKeefe@hyattclassic.com	Employer comment: Yes, we are located right on Thompson Peak Pkwy across from the new hospital being built. What would the employer co-op involve? We may be interested in providing that from the park n ride lot from 101 and Scottsdale Rd for our employees. Thank you – We look forward in being involved in the Master Transportation Planning efforts to better server our employees' transportation needs. Response from Debbie Astin: The employer co-op could be anything we create. For instance, your employer and the hospital could agree to provide a van and driver who makes round trips to the park and ride during peak hours. The employer could own the van and the driver could be an employee. The van would be available for other uses during the day. Or the employers could contract with a charter company (or a taxi company) to provide the service for a fixed and allocated fee. As your employees are unlikely to park at Loop 101/Scottsdale, perhaps a similar arrangement could be created as early as this July at the bus stop on Mayo Boulevard just west of Scottsdale Road. What do you think?		
	email	21-Mar-07	Daniel R. Porth	8241 E. Corrine Drive	Scottsdale	AZ	85260-5247	drporth@navalissystems.com	As a resident and property owner in the area, I am greatly concerned and want to voice my concern and position on two items that face our neighborhood and community. The proposed expansion of Thunderbird Road between Hayden Road (maybe even Scottsdale Road) and the Loop 101. BAD IDEA!! For all the City says about preserving the residential integrity, this would be a disaster of the first magnitude. Thunderbird (east of Hayden Road) and 84th Street (Cactus Road to Thunderbird Road), as they currently exist, serves the neighborhood and the Northsight Park well for residential traffic, walkers and bikers. It is not appropriate for the City to consider this type of change to an existing and established neighborhood. Not an acceptable solution While I sure this is but one of numerous alternatives that are being considered to improve the traffic situation in the "airpark" area, this proposed solution is unacceptable and needs to be removed from consideration…now. The Calvis Wyant redevelopment plan for the Pretty Penny Ranch (2-PP-2007- CW Estates) should be required to access the subdivision from the most logical location, 83rd Street. Accessing a ten lot subdivisio		
	email	Mar 18-07	Thomas Mehen	7831 E. Highland ave	Scottsdale	AZ	85251	tmehengolf@cox.net	I am a resident of Villa Monterey. I strongly oppose any widening of Chaparral. The traffic is very bad, let alone trying to encourage more. The off ramp of 101 should have been Camelback and McDonald that can handle the traffic. Traffic should b encouraged to take Camelback or McDonald at the intersection of Hayden if they are on Chaperral. Speeding is becoming a real problem even though the speed radar is in place at times. I will do everything I can to prevent the widening of Chaparral		

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	email	19-Mar-07	Joan Sanders	7656 E. Highland Ave.	Scottsdale	AZ		Jmsand0834@aol.com	It is your job to keep the citizens of Scottsdale safe, content, and happy with the community! It is your job to protect these citizens, and it is your job to listen to what they have to say, and how they feel about your decisions. It is your job! The citizens who live in Villa Monteray, Units 1 thru 9, have been in Scottsdale since the 1950's. We love our neighborhoods and we do not wish to make our streets into major arteries. You must not even consider changing Chaparral Road into the high density traffic artery that it would become if you tear out 27 of our homes. McDonald is an under-utilized road just west of the 101, those that wish to drive west can use this exit with very little difficulty. Please hear us.........all nine units hold over a thousand voters!!!	Thanks for your e-mail. There are many things to consider in the Transportation Master Planning process. We will analyze and evaluate the results with a lot of opportunity for public input. - Councilman Ecton	
	email	3/15/2007	Baier, Marguerite	111 S. 34th Street MS 503-3AB	Phoenix	AZ	85034	Marguerite.Baier@Honeywell.c	I recently moved back to Scottsdale from Tucson with my new position at Honeywell. We chose this home because it most reminded us of the great place we had in Oro Valley, a nice country like setting, with a great school and finding out great neighbors too. I was recently informed that there are plans to extend Little Thunderbird to make it like Big Thunderbird from Scottsdale road to the 101. As a resident I am vehemently opposed to disrupting my lifestyle and most probably devaluing my home. I have lived with traffic noise that was a quarter mile away and heard it due to the elevation that our home was at. I understand that there is je noise now, that we accept (it is my business), but we did not buy into this neighborhood to deal with traffic ar traffic noise. I would like to be posted on what the city is planning so we are not blindsided by this.	Ms Baier, Thank you for your email to the City Council regarding the Thunderbird Road connection concept from the Airpark circulation study - a part of the Transportation Master Plan. As the project manager for the Transportation Master Plan, I have been asked to respond to your email. The idea of connecting Thunderbird Road to the east is one example of some suggestions and ideas provided to staff and the transportation consultant for consideration in the Airpark area circulation study of th Transportation Master Plan. None of these ideas are intended as recommendations or proposed projects at this time. The meeting where this was originally discussed was regarding the entire Transportation Master Plan and it included all possibilities – with no exclusions. At the February 14, 2007 meeting of the Airport Advisory Commission a status update of the Transportation Master Plan was provided to the Commission, however none of these ideas or concepts were presented to them. A number of your neighbors were in attendance at the Airport Commission meeting and we discussed these ideas following that meeting. A	
	email	10-Mar-07	Mary Waddle					mmwaddle@cox.net	I have been a resident of Scottsdale for almost 20 years and a homeowner for the last 12+ years. In November of 2004, my husband and I purchased an older home just North East of Hayden and Thunderbird Road. It was a fixer upper but we felt it was well worth the investment due to the "country" feel and isolation it seemed to give us from the city life. This is unusual since our community is surrounded by the Scottsdale Airpark, the 101, Cactus and Thunderbird (road recently expanded). We and our children have been able to step back in time to better days. We have horses as neighbors, can ride our bikes without fear of the traffic and can walk to and play at Northsight Park (definitely a neighborhood park). Because of this lifestyle, we have made many friends in our area and the community is much closer than the previous we have known. I was recently informed that there are plans in the works to reroute traffic, possibly through our neighborhood by creating through access by way of Thunderbird Road as well as creating more lanes to accommodate all of the additional traffic. Scottsdale is a beautiful city and I know that everyone involved is concerned about preserving what we h	Dear Ms. Waddle: Thank you for taking the time to write me regarding your opposition to the extension of Thunderbird Road and the impact t your neighborhood. At a recent meeting in your area, staff presented an update of the process of creating a city-wide Master Transportation plan. At that meeting, in the interest of full disclosure, staff presented all of the potential options, even those that are unlikely to be recommended, that must be studied by the consultants to ensure a comprehensive analysis. Impacts to the neighborhoods and residents will be given great consideration in any recommendations. I am copying the Transportation General Manager, Mary O'Connor and staff member Teresa Huish who made the presentation you reference. Teresa can provide more details regarding the study and Thunderbird Road in particular. Again, thank you for letting me know of your concern and thank you for making an investment in our community and your neighborhood. Jan Dolan	
	email	20-Feb-07	Karl H. Rothermund					:Karl.Rothermund@morgans	Extending Thunderbird to the 101- This is not an acceptable option for traffic flow. Is this a rumor or is the city really considering this? I live on E. Voltaire Ave. and it is very quiet and peaceful. This plan would cause GREAT harm to our wonderful neighborhood. I would love to hear your thoughts.	Dear Mr. Rothermund:Thank you for taking the time to write to me and voice your obvious concern for the preservation of the character of your wonderful neighborhood. Right now, this is only in the conceptual stage. The Transportation Master Plan consultants are at a point where they are considering many alternatives to improve the area circulation. This particular idea has not been finalized, nor is it even considered a recommended strategy at this time. A variety of factors, including neighborhood input, will be considered before the consultants present their final recommendations. In the meantime, I have forwarded your e-mail to the Transportation Department so that your concerns are included as pa of the project record. Also, I wanted to make sure you were aware of an upcoming joint Airport and Transportation Commissions meeting scheduled for Wednesday, April 18th at 6:00 p.m. at the Scottsdale Airpark Terminal. The purpose of this discussion will be so the two Commissions can learn about and discuss all of the Airpark-area circulation concepts and to hear about the public feedback both the consultant and the City has heard thus far. Because of your interest in this Again, thank you for taking the time to write to me. Please be assured that I will continue to follow this issue closely as it p	
	email	18-Feb-07	Lawrence DeRogatis					sderogatis@aol.com	(Regarding the possibilities expansion of Thunderbird west of 101) We are greatly opposed to this change to the master plan, for the following reasons. 1. Huge volumes of traffic in a neighborhood of exclusive custom homes. 2. With the traffic increase comes the safety concerns for our children who play at the nearby park. 3. With a traffic increase there will also be rezoning of properties to accommodate strip malls and other commercial properties. 4.Noise issues due to the traffic volume. It's bad enough we have to deal with the airport that allows flights earlier than their supposed to.(helicopter as early as 5:00 AM). 5. Huge property value lost to these custom home owners.		
	email	31-Jul-06	Bonnie Godfrey					bgodfrey4@cox.net	how can I get active to support building rail transit in Scottsdale? We don't want the Phoenix metro area to turn into another L.A. I was born there and moved to No. Calif. in the late '70s.	I appreciate your interest and willingness to get involved. Please call Mary O'Connor, Transportation General Manager, and she will fill you in on what we are doing. From Theresa - Thank you for your email (from the city's webpage) regarding rail transit and how you can get involved. I am the project manager for the Transportation Master Plan project. The Master Plan will include the selection of a mode for high capacity transit in the Scottsdale Road corridor. There are several ways you can keep up to date on the process and become involved. Let me list a few here: I will include your email address in my distribution listing for information and announcements about the Master Plan and when there are meetings or events or topics of discussion, I will send out an email to you. If you'd rather not have email alerts, I can send you information through the regular mail or by phone if you prefer, but I currently do not have this contact information for you. subscribe to the email subscription service for the Master Plan at https://www.scottsdaleaz.gov/listserve/default.asp check out the website for the Master Plan at:	
	email	1-Aug-06	Sherry Kesling					skesling@cox.net	Will Miller Road go through from Pinnacle Peak Rd. to Happy Valley Road? If so, do you have a time frame for when that might happen?	Miller Road is not scheduled in the city's adopted 5 year Capital Improvements Plan to go north of Pinnacle Peak Road at this time. If, through the Transportation Master Plan process, a recommendation comes forward to extend it north, that recommendation (along with the Master Plan) will have to go through the public hearing approval process, and specific capital improvements project will have to be created. Part of the Master Plan is to have implementation plans and recommendations for capital improvements. The Master Plan should go through the public hearing approval process sometime early 2007.	
	email	10-Aug-06	Robert Jackson					bobj@ais.phxcoxmail.com	What has been done on a Special Circulation Area Study for the Airpark area?	The consulting team has collected existing data and run traffic counts and projections for the Airpark circulation area study In addition to the focused efforts of modeling, the team has collected the input from citizens throughout the process and as those ideas, comments, and concerns pertain to Airpark circulation, they are applied to find possible solutions to concerns and to see how the ideas will work. The will be analyzed based on the criteria established to evaluate the Transportation Master Plan. A first draft of the study will be available near the end of September. Near the first of October I anticipate having some small group discussions with Airpark interests. If you have any further questions, just let me know.	
	email	11-Aug-06	Robert Jackson					bobj@ais.phxcoxmail.com	Thank you Teresa. I might like to sit in on the small group discussion. How does one get invited? We manage nine properties in the Airpark. Thank you.	I'll put you on the list and make sure you are contacted about it!	
	email		Jennifer Bohac,	City of Scottsdale Traffic Engineering - OCC 201 7447 E. Indian School Rd, Suite 205	Scottsdale	AZ	85251	JBohac@ScottsdaleAZ.Gov	I just received a request for a signal at Jomax/Pima Rd. It does not meet warrants at this time, however, I noticed in the adopted Streets Master Plan Pima Road Policy that Jomax is not listed as a future signal location. Yearling/Desert Highlands is listed, but not Jomax. This is a 1/2 mile signal spacing location, Can you consider including Jomax on the new list of future signals along Pima Rd as you develop the new Pima Road Policy through the latest Transportation Master Planning process that you are undertaking?		
	phone call	8/23/2006	Chad Miller	did not provide					Rcvd a transfer call re: parks & recreation, in passing, caller (Mr Chad Miller) suggested the City put in a wide bike lane (about 10' wide) along Pima all the way up to Cave Creek Rd as a lot of bike tours use that road.		
	email	24-Aug-06	shawna.greiner	111 S. 34th St.	Phoenix	AZ	85034	shawna.greiner@honeywell.	Reed, First, I just want to mention that I think Scottsdale does a great job promoting bicycling. Thanks for all your work! I wouldn't even bother writing this email if I didn't know that you guys are very responsive to the needs of us alternate transportation users. With that, I just have a couple comments. Can you change the sensitivity at the corner of Oak and 64th? Especially when I'm traveling Eastbound, it seems my bike will not trigger the light. I've had it "tease" me a couple of times by flashing the "don't walk" light and then reverting back. There is a button, but it is offset and hard to access. Plus, it's kind-of hidden behind a bush so cars can't really see you once you get there. My next comment is really just a suggestion. I like the new pedestrian crosswalk on Oak and 60th (although I'm not sure what it's for- the access to Papago is further West?), but it has made the bike lane a little dangerous. I pick my son up from school each day in a bike trailer and we head westbound on Oak to 60th , then we turn north. There really aren't many other options for traveling Westbound, however Oak formerly had a large bike lane and I felt fairly comfortable riding		

No.	Source of Comment	Date	Citizen/Group/Interviewee	street address	city	state	zip	email	Comment	Response	Area
	email	8/28/2006	Sue Adatto					sueadatto@cox.net	Intersection - Pima/Princess light intersecting 101 North Freeway entrance ramp. Sometimes as few as 2 vehicles can go straight through to the 101 because the light is so short. Problems occur with all the trucks that move very slowly. And the light is extremely short. Need to have 2 lanes going North on that entrance. I have waited 8 minutes at that light, I have never experienced that kind of wait at any other signal in town.		
	email	29-Aug-06	Howard Myers	6631 E. Horned Owl Trail	Scottsdale	AZ	85262	howard.myers@sensor-tech	Can you e-mail me the HDR presentation they went over the other night? I prefer to keep electronic copies of everything rather than paper. On the presentation itself, there are a host of questions that need answers which I have listed below. This whole thing seems to be in the reverse order. The usual progression of such a study would be to identify the problems to be solved, identify constraints that must be dealt with, identify the possible solutions, and then analyze the results of the first three to make recommendations on the solutions. The concept of starting with mass transit seems to be doing the last thing first which is to define a solution to a problem that hasn't been identified. Questions on what was presented. 1. Where are the numbers that support the implementation of mass transit? Predicted number of riders, predicted impact on vehicle transportation, traffic congestion, trip times, etc.. Getting people out of their cars will be difficult unless the advantages clearly outweigh the inconvenience, longer trip times, etc. There is a delicate balance. Without the number of riders, the times between cars will be longer, number of stations fewer, trip times greater, costs gre 2. How do people get to and from the mass transit stations from starting location or eventual destination? Some form of lo	Because of all the graphics etc. the presentation is about 11 mg. I'll put it on a CD and send it to you. Thank you for all the questions - they are well thought out and thankfully represent the path we will be taking with the Master Plan process including the high capacity transit portion of the study. We will pull all the segments of this plan together by the end of the year, then we can tweak, test, and run our assumptions through the gauntlet. To get to that poir though, we have broken the Master Plan into elements that are easily understood (Streets, Transit, Bicycles, Pedestrians, High Capacity Transit, Airpark, Northern area, Central/Downtown area) and then will evaluate the connections between elements. As I mentioned at the meeting, every meeting we had held seemed to gravitate to the discussion of the high capacity transit, so we decided to focus on that at the meeting. I totally agree that we will need to look at the Plan in total and make sure the gaps are taken care of with recommended projects, that the system works. Thanks again for taking the time to provide well thought questions and comments. We'll make sure to address them in the	
	email	31-Aug-06	Bob Vairo					Sonoran@aol.com	I would like to add my support to the comments and recommendations made by Howard Myers in his email to you of 8/29. I must say that I was disappointed with the arguments for an HCT system made by HDR at our recent meeting. It is still unclear to me what transportation problems a system will solve. In the city's annual poll of the public, the number one problem is traffic congestion. COPP's own polls of its members lists it as the number one problem, as well. If that is a legitimate definition of the problem to be solved by HCT, then is should be stated and well defined so staff and the committee can validate it and get on with the selecting the best way to solve it, short and long term; that may or may not be with an HCT system. As we discussed at the meeting, this has not been done. One cannot solve a problem without defining it. Right now, it looks like HCT is a solution looking for a problem. We who volunteered for the Community Working Group are serious minded citizens who want to help the city to complete the Study and with a well thought out set of recommendations. We can only do that if we are respected in that capacity an I hope that at the meeting in October, HDR and the city staff will provide the kind of information we requested and was pro	Thank you for your reactions and feedback on the presentation at the working group meeting as well as Howard's comments. I'm sorry to hear that you were disappointed with the presentation. Please be assured that it was intended to b an introductory session to get the dialogue doing and that we will have more meetings and discussion on all of the topics/elements of the Transportation Master Plan. The staff and the consultants will pull together the information the group requested and whatever data helps us describe the problem statement. I appreciate the time and effort you and others have put into this process so far. It's important that we continue the dialogue and the group truly is the "feedback loop" it was intended to be.	
	email	5-Sep-06	Kristi Altman					altmancpa@yahoo.com	We are looking to purchase a home near 64th St and Sequoya Elementary and would like to find out what, if any, plans there are for expanding 64th St. I would appreciate any help you may be able to offer us regarding this question.		
	public comment email	May 01, 2007	Ed Ciccolo					edciccolo@cox.net	Ms. Huish I live on 84th St. and Aster Dr. I have lived here for 22 years. I'm writing you about concepts under consideration, specifically the Connecting of Thunderbird rd to Northsight and the building of ramps off the 101 at Thunderbird/Northsight I walk this route every morning and enjoy the lack of vehicle exhaust and the beauty of the Greenbelt. It is peaceful and calm. The 101 has of ramps at Cactus and Raintree. That is only 1 mile. We do not need 3 off ramps in a linier mile. We have access to Scottsdale road from Shea, Cactus, Redfield, and Frank Lloyd Wright. Our tax dollars could be spent more wisely. I would also like to say that this would affect my quality of life. The noise, it would expose more crime. (I'm already experiencing minor burglary to my autos and possession from the 84th St side). Increase access would surely increase thi risk. It adds pollution to my neighborhood. I also think this negatively affect property values. Please do not approve these propositions and keep Scottsdale a great place to live. A reply is appreciated.		
	email	28-Aug-06	Sue Adatto					sueadatto@cox.net	Intersection - Pima/Princess light intersecting 101 North Freeway entrance ramp. Sometimes as few as 2 vehicles can go straight through to the 101 because the light is so short. Problems occur with all the trucks that move very slowly. And the light is extremely short. Need to have 2 lanes going North on that entrance. I have waited 8 minutes at that light, I have never experienced that kind of wait at any other signal in town.		
	email	22-Jun-06	Edd Bradt					edd_brady@yahoo.com	Hi Reed, > I have a question about bike lanes. Is there a minimum width required for a bike lane to be legal? Does the city or state set th minimums? Miller Rd has narrow lanes South of Camelback. Scottsdale Rd Southbound approaching IndianBend gets very narrow.	Edd, > Each city or government agency adopts their own standards based on > guidelines provided by the AASHTO Guide for the Development of Bicycle Facilities. If we don't have enough space to provide 4' of asphalt, we won't use a bike lane sign or pavement markings. > We may install a bike route sign. Miller south of Camelback is signed > as a bike route and the facility there is not considered a bike lane. > The Scottsdale Bike Map incorrectly identifies that segment as having > bike lanes. If there is no pavement marking and no bike lane sign, the white stripe is considered nothing more than an edge line. A major > task in the bicycle component of the Transportation Master Plan is to > evaluate all the streets with edge lines to see if they can be > upgraded to bike lanes. > Here is a link to our Design Standards and Policy Manual. The bicycle > facilities are located in Chapter 5-7. > http://www.scottsdaleaz.gov/design/DSPM/Ch-05.pdf > Call me if you want to discuss this. -Reed	
	response email to Reed's email	23-Jul-06	Edd Bradt					edd_brady@yahoo.com	Thanks, Reed, that is good info about what is and what is not a bike lane. Without your help, I'll bet few people would ever find it, especially motorists that aren't interested enough to even read the vehicular section of the A.R.S. . I'm concerned with being unaccepted by motorized traffic. I believe narrow bike "routes" with a white line not adjacent to the gutter pan are bad for cyclists. I'd bet most Motorists see a 2 or 3 foot "zone" as being put there for cyclists and don't know the difference in meaning between a designated bike route sign and a bike lane sign. They sure get upset when cyclists are not riding to the right of that white stripe. Is this confusion intentional? If not, what the heck is the purpose of a bike route sign? I'd rather see an international negative sign (red border and diagonal stripe) through the words "bike lane" than the words bike route and a 3 foot wide zone (what do you call that "non-bike lane", anyway). We don't need the cities providing confusion that causes Motorists to dislike us. Cycliists that disobey traffic laws already do a great job of that. So, what is the purpose of these stripes 2 or 3 feet from the gutter pan? Please explain how these "non-bike lane" lines cla I would much rather see just two options for the white line; either next to the gutter pan (<6 inches away) or the bikelane minimum distance of 4 feet from the gutter pan	to: Brodzinski, Walt; Williams, Jr., George - This is one of the emails I received about what is or is not a bike lane. I responded briefly to Edd last week but promised a more detailed follow-up. Walt and I discussed using an 8" line instead c a 6" to help differentiate the difference between a bike lane and the space to the right of an edge line. I plan on sending Edd a response early next week and may need some clarification on when diagonal striping is typically used.Reed	
	email	30-Jul-06	reid watson					rwatson@ScottsdaleAZ.gov	There are no bicycle lane signs on 90th St between Cactus and T-Bird. There are no diamonds or other markings in the lanes as well. The lanes are painted and should be properly posted.	Reid, 90th St. has edgelines that have not been designated as bike lanes with pavement markings or signage. It is shown on the bikeways map as a bicycle route. Evaluating whether streets with edgelines should be signed and marked as bike lanes is something we are working on through the Transportation Master Plan. The first draft map that I have prepared identifies bike lanes for 90th St. -Reed Kempton	
	email	19-May-07	Craig Hazeltine	4820 N. Granite Reef Road	Scottsdale	AZ	85251	hazeltines.arizona@worldnet.att.net	Comment for 05/29/07 Item 1 (Consideration of Alternatives...Chaparral Rd): The council should take NO action on Chaparral Road until the current study produces transportation recommendations to the Transportaion Commission. Any action after the study must take into account the impact on all other neighborhoods. (I live in one of the other nearby neighborhoods.) While keeping Chaparral the same may not impact downtown vitaltiy, the impact on the surrounding neighborhoods is not benign. Traffic increases on nearby residential streets and intersections exceeding capacity are significant issues. WAIT. LEARN. DECIDE THE BIG_PICTURE.		
	Telephone conversation btwn Teresa Huish and Christine Andres								She lives near McDonald Dr. on Berridge Lane and is concerned about the Chaparral Road options being considered by the City Council. If Chaparral does reduce traffic somehow, she feels her neighborhood would be impacted. Already have lot of noise from fire trucks and roadway traffic.		

No.	Source of Comment	Date	Citizen/Group/Interviewee	street address	city	state	zip	email	Comment	Response	Area
	email	2-Mar-07	Nate Lemons	49 Apache, Desert Mountain	Scottsdale	AZ	86478	jbicycleking@hotmail.com	Good Day; I am really enjoying seing just what an idiot you and your council are, not only is the light rail going to be built,with or with out public money, when it is operationable, it will continue to grow every year,and when morans like you do deciede to have it come to places like old towne it will cost the city of Scottsdale perhaps as 100 times what it will cost you now,you obviously have never been to Japan, so I'll tell you what, I am willing to pay @ my expense just to educate yo all a private jet to Japan ride their trains, and see if that doesn't change your attitude,please I say get your political head out of your ass and do for once what's good for all us not your special chosen fewMr. Lemons		
	email	12-Apr-07	Kathryn R. Schultz					amarettogolden@cox.net	Dear Ms. Huish, We live between Dixileta and Lone Mountain of Scottsdale Rd. A couple of items stuck me as I read the article in Friday's paper. Not posting a lower speed limit because the commissioners aren't sure if the "lower limits would be observed". Well, I would equate that comment as ridiculous as saying I'm not going to tell my kids not to smoke or take drugs because they might not listen. Obviously there would have to be enforcement. In my experience, and many other's as well, people tend to drive about 5 - 10 miles over the speed limit and feel somewhat confident that they won't be ticketed. This tends to be reinforced when drivers don't get tickets in that range. Here it has been actually specified that if you "only" go 10 miles/hour faster than the posted 65 mph limit on the photo enforced section of the 101 in Scottsdale you wont' get a ticket. Well, if the posted speed is 45 mph vs. 50 mph then most people won't be going over 55 mph vs. 60 mph. Even that small difference makes it safer to be able to get to the opposite side of the road. We NEED 3 lanes in each direction North of Pinnacle Peak up to at least The Summit. They keep building houses and no The fact is that whether or not there are 3 lanes in each direction, there will still be the same number of vehicles driving u		
	email	13-Apr-07	Lisa Raben					Lisa@jeffraben.com	Hi Teresa,I am writing you about my concerns for future plans with Thunderbird and the 101. I know myself as well as many others chose this neighborhood for numerous reasons. One of the main reasons is the escape of major traffic congestion. We are close enough to the 101 without it running through our neighborhood. If Thunderbird becomes a major road, I feel that my kids as well as others are in grave danger!! I do understand that the city is growing, but please do not disturb our neighborhood. Thank you for your time.		
	group email	13-Sep						F8713@aol.com	Dear Friends, As you are well aware the city has begun a Master Transportation Plan for the city that is overloaded with Light Rail supporters and has never included the input from local businesses along Scottsdale Road. Today we are opening an online citizens petition asking for your support and signatures to ask the Scottsdale City Council to support placing an Advisory question on the ballot for Public Transportation as allowed by State Laws. We are asking for your help to make the voters voice heard as it has been claimed by council members that "the citizens will decide this issue." Talk is cheap in this city anymore and it is time to make your voices heard in how our tax dollars are spent and the options we decide on for our Transportation needs. Please take a minute of your day and make your voice heard without leaving your chair by logging into our site and signin your name. www.lightrailpoll.com This petition will be presented to the City Council and the Mayor on October 17th at the Regular City Council Meeting. More information on this issue is on the web page and soon we will open a web page link to take you to even more inform Don't be fooled by the city lines we will soon hear supporting rail transit from the powerful entities wanting to break into th		
	email	4-Sep-06	Hannah Keogh						I feel that it is necessary to have a sidewalk between 84th street and 86th on Indian Bend Road. Every other section of Indian Bend road between Pima and Hayden has a nice sidewalk and every day I see countless people walking through catci on a tough, dirt road to get to their destination. I think as apart of the Scottsdale revitalization program their should be a nice sidewalk between 84th and 86th street on Indian Bend Road. Many people would be very grateful.		
	email	23-Feb-07	Mark Preul					notbird@mac.com	Thank you for your response. As you can see from the amount of messages coming in and the neighborhood reaction contained in them, any consideration of opening up T-bird is a no go with this neighborhood. We want other options considered from the start of this planning process. By knowing how we think of this as a neighborhood, we believe this will make your job simpler because it takes out one option. As a neighborhood we believe that we must organize to have our voice heard in the same way that the airport advisory commission has had special briefings about this, at least with regard to policy. Policy decisions of course lead to construction decisions, thus we want to let you know, including other city planners and the council, that any consideration of this option will meet with complete disapproval in this large neighborhood on the east and west of Hayden. We are at this time forming a citizens group composed of residents in the neighborhood and we will be contacting you to have special discussions regarding this planning process. Sincerely, Mark Preul	Thanks Mark, We'll be happy to share the planning options with you as we go through this process, and we do have other ideas for helping travel in the Airpark area. I have received numerous emails and have a good idea where people stand - all of this feedback is important to the planning process. Please remember that these are ideas, not recommendations and we'll be weighing many issues with the feasibility of these ideas, especially neighborhood concerns. Teresa	
	email	18-Jul-06	David Smith	9627 E. Adobe Dr	Scottsdale	AZ	85255	vidsmith@cox.net	I moved to Scottsdale almost two years ago after living most of my life in Washington, DC. I was really looking forward to the climate and the recreational opportunities Scottsdale would provide especially biking. Once I got here, I was shocked to see the limited number of bicycle lanes in a city that is so well managed as Scottsdale. One quick look at the map that highlights bicycle lanes shows that they seem to start and stop with no clear plan. I am especially concerned about the lack of bicycle lanes on very popular biking routes such as Dyamite. This is a road that is heavily used by bicyclists and also by people pulling their boats and horse trailers making a very dangerous situation. Another popular route is along the eastern portion of Shea Blvd. going towards Fountain Hills. I can very close to being hit by a truck there and will no longer ride on Shea.I think one of the great aspects of living in Scottsdale is that is a beautiful city that is extremely well run. I am very happy with my decision to move here. What I would love to see is having the City Council and Scottsdale work to increasing the number of bike lanes especially on bus	Mr. Smith, thanks for your email regarding the city's bicycle facilities. Reed Kempton, the City's Transportation Planner responsible for bicycle issues, will be calling you to discuss the specific problem areas you mentioned. Generally, the City's policy is to install bicycle lanes with all new or modified roadway construction; there are some exceptions based on policies in the Streets Master Plan that are being reviewed currently during the development of the City's first Transportation Master Plan. The Transportation Master Plan will also include an updated Bicycle Plan, with updated design standards and prioritization of new facilities. We'd really appreciate any input you can provide us on the Transportation Master Plan; Teresa Huish, Principal Transportation Planner, is the city staff contact for that project. She can be reached at thuish@scottsdaleaz.gov, or 480-312-7829. Information on the project is also available on the city's website, www.scottsdaleaz.gov./traffic/transmasterplan .	
	email	29-May-07	Amy MacAulay	8738 East Highland Ave	Scottsdale	AZ	85251	amacaulay@cox.net	I encourage you to vote tonight in favor of leaving Chaparral Road alone. Monterey Villa is an interesting neighborhood; it should be receiving an historic designation, rather than being damaged. Leaving the two-lane stretch as is would probably do as much as anything towards keeping traffic volumes as low as possible. This issue of road-building versus the quality of neighborhoods has been around before. Looking back at some previous decisions-and the apparent criteria for those decisions-it appears to me that the Chaparral Road issues are very similar to two other notorious cases. I recall the proposed extension of 96th street into the SRMPIC property, and the protests from people in surrounding areas who feared a negative impact to their neighborhoods. This project was killed and buried. Then there was the extension of Via Linda to Fountain Hills. This connection had been in General Plans and Transportation Plans for many years; it was endorsed by all public safety people and by Fountain Hills. Shea Blvd was and is the only direct route, and there are those occasions when Shea Blvd. is closed down or highly congested. Nevertheless, this project was also dropped due to the strong opposition from coalitions, people, and associat		
	email	30-Sep-06	René LeBlanc					leblancr@qwest.net	Dear David, It has been some time since we have spoken. I did a small volunteer task for the city of Scottsdale shortly after I retired, surveying the conditions of a number of sidewalks and bike paths that were scheduled for upgrading. Then, I suddenly discovered how busy one can become after retirement, and sadly I haven't found the time for more volunteer work. However, the important issue of public transportation continues to escalate in importance, and as always, the subject is fraught with controversy. It has been quite a few years since Hoyt Stearns, a colleague of mine, and I came to a meeting of a City of Scottsdale planning group and presented information regarding a proposed Personal Transit System that would use light weight cars individually guided on a low cost elevated track system. I thought it was a very promising idea because instead of having large expensive trains carrying passengers along highly concentrated routes, the PST more closely emulated the way people travel in their cars. The elevated rail system was of small scale and relatively low cost. It would not occupy existing traffic lanes on our roadways, and due to lower cost the elevated rail could be distributed much more widely over a geogra Unoccupied cars would queue up on waiting tracks, distributed among various stations, based on traffic needs. When som		

No.	Source of Comment	Date	Citizen/Group/Interviewee	street address	city	state	zip	email	Comment	Response	Area
	email	25-Sep-06	Carrie and Jeff Abts					abtsfamily@qwest.net	Teresa, It was nice meeting you at the public input transit meeting last week. As promised, I have put some of my opinions in writing for you. Traffic This topic seems to be consistently singled-out as the number one problem and complaint that citizens have. It is portrayed to be absolutely terrible, nearing grid-lock. I don't believe our traffic congestion is that bad. Sure, there are more vehicles on the road now than before, but the roadways and traffic control systems serving them are better too. I don't see in-town Scottsdale traffic to be such a problem, except in certain areas, but I will address it. Also, the traffic congestion solution is not always widening the road (there are appropriate times for this, see Chaparral Road below). I don't believe it should be our goal to continually accommodate more and more traffic. I believe that if traffic gets too bad for an individual, they will work to find alternative solutions to their pain. That may include working closer to home or living closer to work. I may include alternate work schedules, carpools, or alternate modes of transportation. As more people tire of a congested Public Transportation		
	email	16-Sep-06	Charles Poston					chazz21@qwest.net	Dear Teresa, I'm a senior citizen and a long time resident of Scottsdale. I'm a member of TOPS, a retired Electrical Engineer, and sincerely concerned for the best interests of our people. I live at 8550 East Bonita Drive, my Zip is 85250, my cross streets are 86th Street and Chaparral E-W. Here are my recommendations: I ask that you please put them into the record of citizen's recommendations at your April 18-21 Town Hallmeetings. 1. Scottsdale Road: Future traffic density will determine the choices for public transportation. Lowest-buses, next highest-modern street cars, highest-light rail. I recommend light rail because of the very high density anticipated on Scottsdale Road as well as to insure Scottsdale ge connected into the light rail system.---to extend north as far as Shea Blvd. possibly to Bell Road It should go underground northbound at the Goldwater Blvd. intersection and resurface at Chaparral. That will avoid major congestion downtown and will counter the obvious arguments against any form of rapid transit on Scottsdale Road through downtown. Costs will never get lower than now, so timing NOW. Stop-gap such as buses and street cars now will only avoid the issue and resul		
	email	22-Sep-06	Charles Poston					chazz21@qwest.net	Dear Teresa: Please add the following to my E-mail to you dated 9/16/2006: The City of Scottsdale is very large North to South-32 miles and is located about 15 miles form the City Of Phoenix and 8 miles from Sky Harbor Airport. These distances call for a faster method of public transportation than can be had by bus. Light Rail is by far the fastest, most comfortable, most environment-friendly and esthetically attractive. Real estate costs are rising rapidly in Scottsdale and will no doubt continue to do. As a result, affordable housing for working people is rapidly becoming a thing of the past here. We must provide fast, safe transportation for workers living outside the city in order to be competitive in the job market. Light rail is by far the fastest, and most comfortable means available. We need light rail to keep our businesses fully manned at competitive rates. It is, for many, an emotional issue. It is fear of the unknown. People who have not experienced light rail are reluctant to accept it because they don't understand. My experience with other communities is that once their light rail system is operational and they are able to see how superior it is to the altern		
	email	22-Sep-06	Lisa Haskell					FELDEX@aol.com	We should not let the negativity that is generated by the dreaded phrase " light rail " detract from the mass transit debate that we , as a rapidly growing city, must have. The debate should be focused on the variety of transit alternatives that are available rather than on all the reasons a vocal group of residents and certain politicians find the light rail alternative unappealing. Whether you are a business owner, resident or tourist, if traffic congestion reaches the point that noone can get to their homes, businesses, the downtown and other trendy Scottsdale hot spots, you have created a 24/7 (a phrase that should be banned from Scottsdale banter) environment that noone will want to live , work or play in It is hoped that politicians, many of whom are up for reelection in the near future, have the conviction and vision to understand that. An improved mass transit system is critical for Scottsdale's quality of life. Afterall, if activists can't get to City Council meetings due to traffic congestion, what will the rest of us do for entertainment? Of course, if politicians can't get to City Council meetings maybe something might actually be accomplished. Maybe we don't need mass transit afterall		
	email	2-Jan-07	Lisa Haskell					FELDEX@aol.com	With all the controversy over appropriate trolley logos (Have you heard? The Scottsdale Trolley logo is not " western " enough. The fact that most of Scottsdale is not a western theme park seems to have escaped the notice of some folks) the fact that Scottsdale seems to have a new city motto seems to have gone all but unnoticed. Yes, a new city motto and it is not " the west's most western town "' Nope. Our western " image ' seems to have lost its luster with the departure of Rawhide and the addition of Trump Towers I mean the canals AKA the Waterfront project in downtown Scottsdale. The City of Scottsdale's new motto? "Just say No" (to everything) The best part? Scottsdale did not have to utilize the talents of high priced consultants. No siree - This motto was created by the same group of self appointed, progressive city watch dogs/activists and their council mentors - the same group of folks that say no to heights, no to subsidies, no to arenas, no to apartments, no to Walmarts, no to tech centers - sure glad I wasn't found guilty of this infraction, no to cameras on the 101, no to logos, no to strip clubs, no to mass transit - in any form, - but - Yes to ethics codes that have thus far only impa Saying " no " when appropriate is a fine and noble thing to do. Alas, some say no to everything in Scottsdale. In fact, it s		
	email	22-Sep-06	Matt Kalina	8342 E. Weldon Ave.	Scottsdale	AZ	85251	mattkalina@yahoo.com	Support a light rail connection on Scottsdale Road to the ASU Scottsdale Innovation Center and Old Town, especially as the city is in the design phase of improving the signature road into the southern part of the city. Interestingly, San Diego's own light rail system connects with its famous Gas Lamp District: www.lightrail.com/maps/sandiego/sandiegomap.htm. Here is a comprehensive site on the subject: www.lightrail.com/. Let's not miss out on the opportunity light rail will have for economic development, employment oppportunities, commuting alternatives, affordable housing, environmental benefits in Phoenix, Tempe, Mesa, Glendale		
	email	19-Sep-06	Nathan Sleeper					The Internet user did not provide a return email address	Dear Teresa, I would like to voice my sincere opposition to bringing light rail to Scottsdale. As I am sure you are aware, light rail in every location in which it has been tried is a huge waste of money. I lived previously in San Jose, and light rail, beyond any traffic or other related issues was only able to return 15 cents on every dollar of operating costs. That means, that my fellow citizens and I will be spending our hard earned dollars subsidizing this system. If it mass transit is really such a necessity, please look at more cost effective options, such as rapid bus transport (which does the job of light rail for a lot less). I know that Light Rail is a prestige project, but please don't put prestige for the politicians in front of the interests and wallets of the greater community. Thank you for your time.		
	Citizen Call	3/14/2007	Cleio Bennett	5006 N. 78th Street	Scottsdale	AZ	85250		Lives off of Chaparral Road. Says neighbors very upset. Folks love their neighborhood. Don't want Chaparral Road to be widened -- heart of their community. We have something special here-- please don't widen and "put a knife through the heart of the community." Petition process underway, she says to provide feedback to City NOT to widen it. Uncertainty is making everyone talk and become worried. I let her know that this decision was being factored within the TMP, scheduled for release in summer or fall this year. More public involvement opportunities at that time. Also told her I'd provide her name and contact info. to Transportation staff so her comments would be part of project record and she'd be informed of upcoming meetings about TMP.		
	Verbal comments from 3/7 wg meeting								Where in the plan will the Preserve's adopted plan to have Dynamite go under the Preserve be reflected and how? Pedestrian Safety should be added to the list of problems to be addressed.		
	email	6-Mar-07	Krystal Shaw					kkshaw@cox.net	Hello Teresa, This is Krystal Shaw, resident on Thunderbird Road. I thought I would touch base and see if the transportation consultant's report has come in. Also have there been any updates to the Transportation Committee meeting schedule? I still have April 18th as the tentative Airpark/Transportation Joint Commission hearing. Is this still on the schedule? I look forward to hearing from you at your earliest convenience. Thank you.	Krystal, I don't yet have the report from the consultants. April 18 is the correct date for the Transportation Commission/Airport Advisory Commission first look at the report and some of the ideas. We have scheduled the Airport terminal for the meeting to allow enough space for neighbors to attend. I will let you know as soon as I do get the report from the consultants. thanks, Teresa	

No.	Source of Comment	Date	Citizen/Group/Interviewee	street address	city	state	zip	email	Comment	Response	Area
	email	26-Jul-06	Debbie Schumacher					dlschuma@msn.com	The 2nd run in-bound 510 Express broke down again this morning. Fortunately, it was in the morning with cooler temperatures, and it was at the traffic light of the exit ramp. Although this situation was safer and cooler, the fact that the 510 broke down again is unacceptable. The riders did unload and walk approximately 3 blocks to the next stop and were picked up by the Tempe 521 Express to continue our commute. However, one asthmatic rider was struggling due to the high humidity, physical activity and stress of the situation. As we continued our ride in, we noticed how nice and new the Tempe 521 Express bus was. The A/C was much more efficient on the 521 than any we have ever had for the 510. The 521 Riders commented that it was an "old" bus, but they did get a new one from time to time. The 510 riders live and pay taxes in Scottsdale. Why doesn't Scottsdal provide us newer buses? Scottsdale definitely has a much stronger tax base than Tempe. It is embarrassing that a financially secure city like Scottsdale would not support public transportation any better than it does. They need to stop wasting our tax money on O There are 6 in-bound runs of the 521. The majority of the 510 riders would like to see at least one later run of the 510 in-bo Once the weather cools off, and the gas prices rise again, we are often standing room only. Please ensure that all future runs of the 510 Express are comfortable and efficient	Ms. Schumacher, Thanks for communicating to us regarding the recent problems with the 510 Express. This route is funded by the Regional Public Transportation Authority and operated by the City of Phoenix's contractor, Veolia; however, Scottsdale staff has been working closely with those two agencies to assure that the problems you have experienced are resolved, including working with the region on the vehicles assigned to the route. We'll also work with the region on the overcrowding issues that you mentioned. A staffmember from Phoenix will be contacting you shortly to provide info on the actions being taken to address the maintenance issues with the current vehicles. I've copied Debra Astin, Scottsdale's Transit Manager, so she can continue to follow up with you on issues with the 510 Express. Scottsdale is committed to improving transit service availability and quality for our residents, and a series of bus service improvements began just this week. Please keep in touch with Debra and I so that we are aware of and can address your concerns with express service in Scottsdale.	
	email	9-Apr-07	arch rambeau					archr3@peoplepc.com	In the weekend Az Rep there was a report of an HDR Inc recommendation to keep some north Scottsdale streets narrow for the future vs widening them as stated in the Master Plan. Where can I get detail inofrmation on this insane recommendation!	Mr. Rambeau, The concepts presented to the Transportation Commission are preliminary - they are not part of any formal report or recommendation at this time. There was a map provided to the Commission that showed the same streets mentioned in the newspaper article as remaining at four lanes instead of being expanded to six. There are a lot of things to consider before any decision is made, however going strictly by projected (2030)traffic volumes , the additional lanes are not needed for automobile travel. As w get more detailed information available through our traffic modeling, we'll be able to confirm the traffic numbers projected. Other considerations may be: our assumption is that the McDowell Sonoran Preserve area that the city has stated it will acquire will not have development on it, if that were to turn out to be in error, then additional travel demand would be shown. It is also an option to keep the current designations of the roads of our Streets Master Plan (6 lanes) but maintain the roads at four lanes until six are absolutely necessary. It is an option to maintain the designation of our Streets Master Plan (6 lanes) and the rights-of-way needed for those roadways and build other transportation facilities As you can see, we are still providing concepts for discussion with the Transportation Commission, no firm recommendatio	
		29-Dec-06	Michael Fernandez					potteryparadise1@qwest.ne	Greetings Teresa, I was wondering when HDR is going to make the Tier 2 analysis presentation to council. I thought it was supposed to be sometime in Jan. 2007. When the presentation comes out would it be possible to get a copy of the packet the council will get with all the information? Thank you. Have a good new year. I had the stomach flu last Thursday that's why I missed th Trans. Comm. meeting. What a long day & night that was.	Mike, We won't be taking the Tier 2 analysis of the high capacity transit (HCT) section to Council in January, but when we do take it you can get a copy of the Council packet and information. With the discussion of possible revisions to the scope going on, I asked HDR to work on the other elements of the Transportation Master Plan instead. Originally HCT was scheduled to be first, but we'll concentrate on the other elements now. We will start meeting twice a month with the Transportation Commission so they can go through all the pieces of this plan - if they are all available, the first meeting in January will be the 11th over at the Pinnacle Room. Keep a look out for it to be posted. Sorry to hear you had the stomach flu - it was the longest night of the year and I can imagine if you didn't feel well how much longer it seemed! Hope 2007 is a happy and prosperous one for you, Teresa	
	email	23-Dec-06	Niki Galiano					ngaliano@cox.net	Hi, I have a question. With all the interesting and new condominiums going in along the canal system, and all the interesting new projects, will Scottsdale be putting in any bike paths along the canal system for those of us who live in the area? It would be great if we could get more of the green belt and canal system to link together, to provide a smooth, seamless bike path, and not have to get out into traffic. Right now, biking around Scottsdale is kind of a pain, because we constantly have to stop and start and cross streets. It would be a HUGE benefit to bikers in the area if we could put in more bike paths (multi use paths). Thanks	Thanks for your inquiry. Scottsdale is working on connecting a multi-use path system along the canals in Scottsdale, some which will be built by developers of the projects along the canals and some built by the city. I am copying Reed Kempton, the city's bicycle coordinator so Reed can give you more detail about the projects and the plan. An updated bicycle element will be included in the Transportation Master Plan as well and Reed and I are working closely with the consulting team to make sure that the element includes what we need.	
	email	18-Dec-06	Austin P Rubino					thebigaaustin@yahoo.com	I would to take the opportunity in this email to make some comments in regards to the service of ROUTES 72 ROUTE 170 & ROUTE 106. Let me start off by mentioning i have been taking the bus for the last 2 1/2 yrs. The Route 72 is the route i would give the most credit too as far as service being in place, & when i make a complaint or comment either Ron Murphy or Jose Morales as well as Bill Jackson get back in touch with me, & i mean pronto. The service has improved since the last bus book which was late July 2006. I am so far pleased with the service & any issues and concerns i have had, they have handled, whether it be the bus coming late, the fare box not working, no a/c, and some other issues when i have told them about it, i get a response & the issue gets resolved. However now we go to the problem area of the buses, THE ROUTE 106, this bus has had so many problems from the early morning bus 726 am SCOTTSDALE & SHEA WESTBOUND, where the bus doesnt come at all, or is 25 min or more late, to buses with NO A/C in 116 degrees, and buses with windows that dont open, and drivers who yell at passengers to hutty up because they are running late to drivers running red lights, & stop signs at PV TRANSIT CENTER. The situation What i want to know is this transit plan that you are working on, how is this going to change the ROUTE 106 ROUTE 170	I appreciate you taking the time to acknowledge our efforts here at Veolia RPTA. We really are serious about giving you and all the best service possible. We know it is an on-gong process that's why we can never rest on our laurels. If we have problems we want to know about them so they can be addressed. Thank you for your input during 2006. I want to take this opportunity to wish you and yours a happy holiday season. Kindest Personal Regards, Ron Murphy	
		12-Dec-06	***David Vaughan***					DAVONPAA@aol.com	Tom, As you requested here are the area(s) I feel we are in agreement as to things that could, and should, be accomplished in the near future to at least make the current bus system more 'user friendly' pending a more comprehensive 'down the road fix: 1/ Post information relative to schedule and the route at all existing stops, including major connection points along the route. 2/ Begin a program, with adequate oversight, to improve, and standardize, existing bus stop structures giving priority to shading. Consideration could be given to lighting at remote locations for night time security. 3/ Concurrent with #2, address the need to provide protective structures where none exist at this time. 4/ Increase the frequency, particularly during 'rush' hours on potential high density routes. 5/ Create a minimum intracity express service to compliment the 'local' service; for example between a northern and southern 'hub' while diligently pursuing agreements with neighboring communities designed to create an intercity 'hub' to 'hub' style express service. 6/ Continue to create more convenient 'park-n-ride' locations CO-located at, or near, primary 'hubs' and express stop	David, Great job of putting into words what we have been discussing. Please feel free to forward your comments to Mary and Teresa.	
	email	14-Dec-06	Bob Vairo					Sonoran@aol.com	Dear Mayor and Council Members: I started to write a letter, but after rereading the letter previously sent to you on October 25th, another letter would largely repeat the same observations made last time on behalf of the Coalition; a copy of that letter is attached . Because the scope of the Transportation Study was artificially narrowed to preclude the consultant's consideration of other options than Scottsdale Road for HCT, because it also failed to define the problem that HCT is intended to solve, because it apparently doesn't deal with the bottleneck on Chaparral Road and similar traffic problems, the credibility and viability of the resulting report and whatever recommendations flow from it will be severely compromised. In a conversation with City Manager Dolan after the hearing, I believe she agrees that the focus of the consultant and staff has been too narrow. Ms. Dolan agrees that a broader scope will be needed to provide the information necessary for short and long term solutions. It is not too late to set the study on a new direction that will identify, define and prioritize transportation problems, so that appropriate solutions can be developed for you to consider. We urge that you take this course correction now to assure th	Thank you for taking the time to share your concerns. The overall scope of the consultant's work is to develop recommendations to improve the city's transportation system to ensure the safe, efficient and affordable movement of people and goods. The result would be the adoption of a Master Transportation Plan that reflects the City Council's decisions based on the recommendations and data supplied by the consultant and citizen input. It is designed to be much more than a transit study. In 2003, a majority of the then City Council reviewed the Major Investment Study and selected Scottsdale Road as the north/south High Capacity Corridor for the City. The purpose of that study was to study options for HCT (routes and forms). The selection of a HCT corridor made the city eligible for federal funds for transit on the selected corridor. They did not select one form of transit for the corridor, but instead chose to narrow the options to three-- - bus rapid transit, modern street car and light rail. One of the components in the City Council approved contract with the current consultant for development of a Transportation Master Plan is focused on selecting one form of transit for the previously Council app A great deal of the press and public discussion of the Master Plan work to date has focused on transit on Scottsdale Road Again, thank you for the time you have dedicated to providing feedback on the Master Transportation Plan, including your Jan	
	email	6-Nov-06	Graham Kettle					gkettle@cox.net	Mary, Thank you for sending me the papers for the City Council Work Study Session 10/26/06 which I have now had a chance to thoroughly review. It appears that the most significant piece of information in this pack (146 pages) is contained in the slid headed "Screenline Analysis" - Projected % Increase In Traffic volumes from 2004 to 2030. This is obviously the heart of the issue and it is most interesting to note that the traffic growth projected on the north/south routes south of Thunderbird are only projected to grow by only 0.45% per annum and south of Chapparal by only 0.55% per annum over this 26 year period. This therefore leads me to the following two conclusions: 1) A high speed transit corridor is not required on Scottsdale Rd. Certainly not the huge investment that a light rail system would require, not to mention the unnecessary burden on the taxpayers. 2) The key requirements of this TMP should be to improve east/west routes south of Bell/FLW and to improve both north/south and east/west routes north of Bell/FLW		

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	email	17-Nov-06	Michael Fernandez	4338 N. Scottsdale Road	Scottsdale	AZ	85251	potteryparadise1@qwest.net	Good Morning Mary, I am doing a follow up from last night about the funding questions I had asked you. Again, the questions were, do you (City of Scottsdale) have a source for funding the yearly operations, maintenance, and rider subsidies of a fixed rail transit system if adopted by the City of Scottsdale? If yes, could you please explain all the details you know or have. If no, who would make those decisions and when. Thank you in advance for your timely reply.	Mike, as I replied at last night's meeting when you included these questions in your public comment to the Transportation Commission, part of HDR's scope is to prepare a prioritized list of capital and operating projects, as well as potential funding sources, for the various elements of the Transportation Master Plan; that information is currently scheduled to be presented in draft form to the Transportation Commission and the City Council in March 2007. Thanks again as always for taking the time to attend the Transportation Commission meetings. Mike, in case my comments last night didn't address all of your questions below, I'll attempt to clarify: we don't have any funds currently set aside for rail transit; any funding, if this mode is selected, would be from new or reallocated sources. It will be up to the Council to decide how they want to proceed. Please feel free to call me at 480-312-2334 if you would like to discuss further.	
	email	17-Nov-06	Nancy Cantor					nancyanncantor@cox.net	If we are going to be pitting the Downtown Town Hall, the > Transportation Study Committee, Phoenix Transportation Committee, > Scottsdale Transportation Commission, MAG and ADOT against one another > by having transportation constantly up for debate.....disband the > Transportation Study Committee. > Seriously, we are not getting answers to questions in a timely > way....We should be meeting at least twice a month and we should be > holding a hearing process or at have public survey created by the > Transportation Study Committee published to gain public perspective. > With the particular participants in the Downtown Town Hall and the > meetings that the Transportation Committee has not been privvy to, and > the lack of info provided regarding the widening of Pima Road.....it > is hard to see this process as being more than organized chaos.	> Nancy, > I'm not sure what you mean when you say Transportation Study Committee. Are you talking about the community working group for the > Transportation Master Plan? As you know we have canceled the November 30 meeting of the working > group until we do have information to share with the group as a whole. > That will most likely be in February 2007. The purpose of the working group from the start has been to be an information gathering and > sharing body - not a hearing body that will be making recommendations > or create, edit, or test the Plan alternatives, but react and provide > feedback through overall review and discussion. When the group was > being set up we intended it to meet approximately four or five times > throughout the process. If I'm confused about which Transportation Committee you are referring to, let me know, please! Thanks, Teresa	
	email - follow up to previous email above	17-Nov-06	Nancy Cantor					nancyanncantor@cox.net	That is the group that I am talking about. I see no goal for the group. There are critical decisions that must be made soon if a solid master plan is to be accomplished. Most of us leave those meetings wondering what is happening and what we are supposed to influence. With staff meeting in what is called the South Scottsdale Revitalization Staff Committee, and with the Scottsdale Rd. streetscape taking the transit center to the intersectin of McDowell & Scottsdale Rds., contrary to what the SkySong site planning group discussed, there is very little faith that the will heed the voices of the committee, or residents for that matter. Sorry that is just the discussion that is taking place...... Nancy		
	email	11-Nov-06	Rick Edward Richards					ReRVailCo@aol.com	Dear Editor, There are so many reasons that make the Monorail vastly superior to any other form of mass transit, that it defies logic as to why it's continually relegated by our leaders, consultants and so-called experts, to that of an unrealistic pipe dream and futuristic fantasy. But one need only set aside their myopic viewpoint for the moment, to see the true possibilities, efficiency, flexibility, safety and economy of such a system. Some of the reasons are as follows: *Monorails operate above traffic, not in traffic such as busses and light rail. *Monorails have a smaller footprint than that of light rail *Monorails could operate in the median of the 101, Scottsdale Rd., Pima Rd. etc. (Monorails tracks could even be placed in, and operate above, the canals running thru Scottsdale and Phoenix, provided the cities could negotiate right-of-way details with Salt River Project and Central Arizona Project). *Monorails are extremely fuel efficient and environmentally friendly. *Monorails are quiet. *Monorails have a great safety record		
	email	14-Nov-06	Frances Rosario-P	1 Dag Hammarskjold Plaza 885 2nd Avenue, Suite 2100B	New York	NY	10017	FRosarioPuleo@Ansaldobred	Dear Ms. Huish, I sent an E-mail message through your website, but it does not show that it was sent, so I am trying again. Your website states that an Alternatives Analysis Study should be partially completed, that Tier 1 analysis should have been completed in early October 2006 and that Tier 2 analysis will be completed in November or December 2006. I would like to obtain the Tier 1 results and, if completed, the Tier 2 results as well. Please let me know if this is possible	I did receive your other email as well as this one. We expected to have the Tier 1 and Tier 2 analysis completed at this time, however, we anticipate some new direction fro our City Council on December 12 regarding the high capacity transit section of the Transportation Master Plan. We may revise the scope of that section, so the Tier 1 and 2 reports are still in the review process until we do receive their directior When completed I'll be happy to send them to you. thank you,Teresa	
	email	14-Nov-06	Frances Rosario-P	2 Dag Hammarskjold Plaza 885 2nd Avenue, Suite 2100B	New York	NY	10017	FRosarioPuleo@Ansaldobred	What are the results of the Alternatives Analysis Study? Tier 1 analysis was projected to be completed in early October 2006, and Tier 2 should be completed this month or next.		
	email	November 08, 2006	Sara Reinstein					scottsdalesara@yahoo.com	I would like to put togehter a petition to complete Miller Road between Pinnacle Peak and Happy Valley. What forms would I need to complete and approxiamtely how many signatures would be needed?	Sara, The city generally does not use petitions to create major capital improvements projects. Projects must go through a process of city staff, Commission and City Council review before being included in the City's 5-year Capital Improvements Plan. Since we are in the midst of the Transportation Master Plan, the best way to let your wishes regarding Miller Road be known is to get as many signatures on a letter of support (it doesn't have to be a formal petition) for extending Miller Road to the north as you can. Your input will be included in the Transportation Master Plan deliberations, which need to determine how many travel lanes may be needed in that area and when a project should be funded. You can send such a letter to me through email or US mail. Thanks, Teresa Huish	
	From a neighbor at the Trails neighborhood event 11/4/06	11/4/2006							Frequent, regionalwide system makes transit work		
	email	2-Nov-06	Jim Stack					jstackeaa@yahoo.com	The Scottsdale are only have a few bike lanes. The green belt area is great but many other areas are very hard to bicycle. Maybe a few low traffic streets could be marked for bicycle traffic	Hi Jim, Thanks for your comments. We are about to start the bicycle section of our Transportation Master Plan and I would like to hear your suggestions for which streets we should prioritize for bicycle facilities. Here is the link to our current bike map. http://www.scottsdaleaz.gov/Traffic/AltTransMethod/BikeMap/ and the link to the TMP http://www.scottsdaleaz.gov/Traffic/TransMasterPlan/?catID=6&linkID=266&lType=1 I look forward to talking to you and discussing some of the projects already under way. (FYI – I will be out of the office Nov 7-10 so it may be next week before we can chat.) –Reed Reed Kempton	
		30-Oct-06	Krystal Shaw						As resident along Thunderbird Road between Miller and Hayden, I was surprised that the connecting of T-bird from Scottsdale Road to Hayden has again come up as a alternative to resolving traffic problems. We are very concerned that our horse friendly residential community will be greatly effected if this occurs. Please advise as to the probability of this alternative and what can a resident do to state opposition to it. Looking forward to hearing from you.	Ms. Shaw, Thank you for your email regarding the examples of Airpark circulation ideas presented at the City Council work study session last Tuesday, October 24. The ideas presented for the Airpark circulation study were examples of some suggestions and ideas provided to staff and the transportation consultant for consideration in the Transportation Master Plan. They are not in any way intended as recommendations or proposed projects. The presentation was one of several ways we hope to receive feedback from the City Council and citizens in attendance or watching it on TV. Your email will be included in the public comment for the Transportation Master Plan, and as such states your opposition to this idea. Your comments and others will be considered when the evaluation of proposed solutions to Airpark traffic and congestion come forward. Please recognize that the concerns of neighbors are of paramount consideration in our review of these options. Thank you again for your feedback. If you have any further questions or comments, feel free to call or email Teresa Huish, project manager, at 480-312-7829 or thuish@scottsdaleaz.gov.	
	email	31-Oct-06	Krystal Shaw					kkshaw@cox.net	As a resident of the Paradise Valley Ranchos #2 community, I am greatly concerned with the alternative suggested to connect Thunderbird Road between Scottsdale Road and Hayden Road. Our neighborhood is one of the few remaining horse property neighborhoods and routing a 3 plus lane road on our northern boundary will eliminate the easement that provides a buffer to the airpark and a walking and horseback riding use area, as well as, help to diminish our property values. Please reconsider this alternative to the Airpark Transportation Problems. Thank you for your time.	Ms. Shaw has contacted the Council as well. Please make sure they are copied on any response.	

No.	Source of Comment	Date	Citizen/Group/Interviewee	street address	city	state	zip	email	Comment	Response	Area
	email	17-Jan-07	Krystal Shaw					kkshaw@cox.net	Hello Ms. O'Connor, Ms Huish, and Mr. Meinhart: Ms. O'Connor I was grateful for your response to my email in the fall regarding the circulation study for the Airpark. With this email I was just hoping to obtain any current information as to the status of the circulation study. As a citizen living in the area I would like to be proactive in my response to any suggestions that would effect our neighborhood. (Paradise Valley Ranchos 2 - specifically Thunderbird Road between Miller and Hayden) If you have any information or could direct me to those that do I would appreciate any input. I look forward to hearing from you. Thank you.		
	email	20-Oct-06	Sara Reinstein					scottsdalesara@yahoo.com	Todd, Has the city ever looked at completed Miller Road between Pinnacle Peak and Happy Valley (actually it starts at Parkview) I talked to people in our neighborhood and it seems like we would all like another way out. Would it help if we put together a petition? Thanks for looking into this matter,	Todd, This is one of the roadways that will be looked at in the Master Plan. I don't have an answer now, but should have an idea in the near future what the recommendation will be. Teresa	
	email	11-Oct-06	Jeff Shoup					JJShoup@webtv.net	I live at 7333 E. Chaparral rd between Miller and Scottsdale rd. I was wondering why with all the increased traffic has the city not put in rubberized asphalt to quiet it. The portion between Miller and Hayden was done years ago and is less populated. One is not able to have windows open and hear the tv or stereo without it being on the highest volume. I live on the 3rd floor and have been living there prior to the freeway being built. It has severely diminished the quality of life along Chaparral for residence as well as those staying at Caleo and Chaparral Suites. Having spoken with visitors staying there, they stated that it affected their stay in a negative way. It truly reflects badly on the City of Scottsdale. I would hope that this issue could be addressed and hopefully rectified. Thank you for you time. Jeff	Jeff Please accept my apology for the length of time it has taken to respond to your email. I checked with the City's Field Services and Transportation areas to find out about the plans for resurfacing in this area. The City has a contractor, HDR Engineering, Inc., currently studying Chaparral Road between Scottsdale Road and the Loop 101 Freeway, as part of the City's Transportation Master Plan update. Their report is currently anticipated in January 2007. I have forwarded your comments to the staff who are working with the contractor on the master plan so that they are aware of your suggestions for this section of Chaparral Road. By way of background, the use of rubberized asphalt has been the City's standard pavement for overlays since 1999. Rubberized asphalt is applied as a preferred overlay material when the roadway pavement condition warrants an overlay versus a slurry seal. It is used for pavement preservation purposes, rather than for noise abatement. This section of Chaparral Road received a slurry seal in May 2005 preceded by crack fill in July of 2004. This segment was previously overlaid in 1996 and 1989 including base repairs. This was before the City moved to overlaying with rubbe To determine when a street needs an overlay, the City uses a laser technology to assess the condition of streets. This seg Please let me know if you have any questions or need additional information. Feel free to call me directly at (480) 312-728 Sincerely, Brent Stockwell Assistant to the Mayor/Council	
	email to Leslie Dornfeld	19-Oct-06	Thom Barsch	7330 E Edgemont Ave	Scottsdale	AZ	85257	thomas.barsch@sccmail.maricopa.edu	Why is Personal Rapid Transit (PRT's) not part of the mass transit study. They are cheaper, flexible, adaptable, and easily expandable. Everything you want in public transportation.	We included Personal Rapid Transit in the technologies studied in the 2001-2003 Major Investment Study. To date, no personal rapid transit system has been built in the US. We can forward a website developed for the technology.	
	email	19-Oct-06	leon spiro	7814 East Oberlin Way	Scottsdale	AZ	85262	leonspiro@hotmail.com	Leslie Dornfeld, Coordinator, HDR, INC.; Mrs. Dornfeld: May I say that you are a pretty sharp Young Lady. Your comment summary to Therese Huish is practically verbatum. Now, your informing me of the Design Manual is appreciated. But I wish to know,will you also be guided by and adhere to the City Code as well? This Design Manual could contain flaws. I don't believe a statement, as was made by a Senior Staff Member to the City Council, "that the Code is flexible" is acceptable from an organization with your reputation. So the question to you once again is this," will you also be guided by and adhere to the Scottsdale City Code, as well"? Which will take precedence? I await your reply. Leon Spiro, A Citizen of Scottsdale and A GLO Property Homeowner. PS: I am mainly interested in what is planned for my neighborhood. I feel I have been left out of the equation. There could be many others as well. LS.	from Leslie to Theresa regarding Leon Spiro email 1. Mr. Spiro was not aware of meetings for the Master Plan. Please add him to our mailing list. 2. Mr. Spiro is concerned with abandonment of federal patent easements in his area - which includes QS 49-46, 50-46, 51-46 etc. He feels that the current City policy to abandon these federal patent easements and then allow them to be blocked so there is no access (road or trail) within neighborhoods is not in accordance with the federal patent. He has spoken to council about this and wants this issue considered as we develop the Master Plan. He is aware that his homeowner association may not have the same opinion as he does. His HOA is known as Desert Property Homeowners Assocation. Howard Meyers is it's president.	
	email	18-Oct-06	Chris Lank					chris@ivis.com	Todd, Thanks for your help in this matter. I apologize for missing your call yesterday and I hope all goes well with your new addition to your family. A couple of things. One, the re-striping on the turn lane is not working. Just look at the marks on the stripes and you can see that people are still just running over them which indicates people are still using that as a through lane. Secondly, the speed. I and others in the neighborhood appreciate the enforcement with additional officers and the photo vans but I think there needs to be a more permanent solution to this issue since the fixes you have implemented are probably temporary. Since FLW is such a long stretch of road between 100th street and Thompson Peak, I think we are running into the same problem that was occurring between Scottsdale Road and Greenway on FLW before the permanent photo radar was installed. Since this stretch of road is mostly residential, I think a reduction in the speed limit to 40mph would be a good starting point followed up by a permanent photo radar at FLW and Thunderbird. If there is something I and others living in this neighborhood can do to start the process on these actions please let me know. Thanks again for your time.	Dear Mr. Lank: We appreciate your calls and emails to the City of Scottsdale regarding your concerns about speeding on Frank Lloyd Wright Boulevard. The Transportation Department and Police Department are working together to implement solutions to address your concerns. Since our last discussion, City staff has worked to resolve the issue of drivers cutting through the "right turn only" bay and using it as an acceleration lane. City forces completed a restriping on October 3, 2006. Staff will make observations to see if this is working. Any input that you could give us on the effectiveness of this striping would be helpful for our evaluation. Transportation staff also met with the Police Department's photo enforcement program administrator. There is an approved site for the photo enforcement vans located to the northwest of Frank Lloyd Wright and Thunderbird. You will begin seeing photo enforcement vans in the coming month on this stretch of Frank Lloyd Wright Boulevard. We requested that the van be placed southbound in the morning and northbound in the evening on Frank Lloyd Wright Boulevard between Thunderbird Road and Raintree Drive. Although I cannot give an exact location of the photo enforcement van or	
	email	11-Oct-06	Jeff Shoup	7333 E. Chaparral rd	Scottsdale	AZ		JJShoup@webtv.net	I live at 7333 E. Chaparral rd between Miller and Scottsdale rd. I was wondering why with all the increased traffic has the city not put in rubberized asphalt to quite it. The portion between Miller and Hayden was done years ago and is less populated. One is not able to have windows open and hear the tv or stereo without it being on the highest volume. I live on the 3rd floor and have been living there prior to the freeway being built. It has severely diminished the quality of life along Chaparral for residence as well as those staying at Caleo and Chaparral Suites. Haven spoken with visitors staying there, they stated that it affected their stay in a negative way. It truly reflects badly on the City of Scottsdale. I would hope that this issue could be addressed and hopefully rectified. Thank you for you time. Jeff		
	email	10/12/2006	Richard Jacobs	7955 E. Chaparral Road, Uni	Scottsdale	AZ		rjacobs72@cox.net	Mr. Littlefield, As a member of the board and a seventeen year resident of La Villita, I want to thank you for taking the time to see and hear our concerns first hand. Here is my (personal) view of issue number one, the access into and out of our community to Chaparral Road. Our (only) entrance is on the south side of Chaparral about midway between the two entrances to the Safeway center on the north side. Consequently there are many vehicles entering and leaving Chaparral Road on both sides of the street, many of them making left turns. When the street was modified and re-striped a few years ago, we were left with eight separate turn bays within a space of 200 to 300 yards (between Hayden Road and Randy's Restaurant west of Hayden). There is no physical barrier separating any of these turn bays; the one barrier we previously had was removed. It has become very difficult to make a left turn out of our entrance, and very hazardous to make a left turn "into" our entrance. Coming west on Chaparral, we have a very short turn bay, with two opposing turn bays in the other direction, one into Safeway, the other for Hayden Road. Drivers often		
	email	6-Oct-06	Matt Lucky					mLucky@RussLyon.com	Teresa - I'm enjoying the Scottsdale City Government 101 class. Your name came up as a good contact. Let me know if someone else should answer my question. I live off of Jomax Road near 116th. Traffic is a hot topic. Can you point me to a traffic study showing current and future traffic projections along Jomax Road east of Alma School. What is the projected density of housing/traffic coming from undeveloped land east of 116th Street? The intersection of Jomax and Alma School is dangerous and will become worse with an increase in traffic along Jomax. Thanks for your help. - Matt		
	email	1/16/2007	Heidi Horchler					heidi.horchler@cox.net	Hello, My family and I reside on the southern border of the Airpark area, on the 7900 block of Thunderbird Rd. I am interested in finding out what, if any, plans the City of Scottsdale has in mind for this area. We are a residential, equestrian neighborhood. Most of the houses are on acre, more or less. Many of the residents in the immediate area are investing in major remodeling/rebuilding projects. The real estate values in the area are increasing. With all of the business and new building that the Airpark is generating, we have noticed an increase in traffic. I would like to know what is in the Master Plan for Thunderbird Road. Please Email me at heidi.horchler@cox.net. I appreciate your time and effort. Thank You, Heidi Horchler	Heidi, Thank you for your interest in the Transportation Master Plan. One of the specific areas that is under study in the Transportation Master Plan is the Airpark which includes Thunderbird Road. A lot of ideas have been generated and the consulant team is working on options to present to the Transportation Commission in the near future. It has not yet been determined what if any changes to Thunderbird Road will be proposed, however, the area circulation studies should be ready for discussion with the Transportation Commission in March or April. Beginning in February, the Transportation Commission will meet approximately every other week to focus on the all the separate sections of the Master Plan. I will have those dates posted on the website soon with the topics to be addressed at each meeting indicated. I will put your name and contact information in a database for the Master Plan and let you know when we have public meetings or other information to share. In addition you may be interested in subscribing to the email subscription bulletin for the Master Plan at https://www.scottsdaleaz.gov/listserve/default.asp. There hasn't been a lot of news to share just yet Feel free to contact me at your convenience at 480-312-7829 or thuish@scottsdaleaz.gov. Thanks again for your interest. Teresa Huish	

No.	Source of Comment	Date	Citizen/Group/Interviewee	street address	city	state	zip	email	Comment	Response	Area
	response to a prior conversation		Alex Skoczen					pops2@cox.net		Mr. Skoczen, >To follow-up after our conversation last week, I contacted Rod Ramos, >the City's Field Services Director, who oversees road maintenance. He >said he will have his crew drive the road segments and accomplish >necessary repairs. >According to Mr. Ramos, slurry seal was applied on the section of >Scottsdale Road from Pinnacle Peak to Lone Mountain in 2004, and Lone >Mountain to Dove Valley in 2006. Scottsdale Road from Dove Valley to >Carefree was crack filled in 2005. >In addition, the City has budgeted in the Capital Improvement Plan for >roadway widening, landscaping and resurfacing for the section of >Scottsdale Road from Thompson Peak to Pinnacle Peak by 2010, and Prop >400 funding for the balance up to Happy Valley in 2014-15, and from >Happy Valley to Carefree Highway in 2018-19. However, the section of >Scottsdale Road north of Pinnacle Peak may not be recommended for >widening as a result of the Transportation Master Plan findings. Even >if it is not widened, the resurfacing and landscaping improvements could still occur.	
	email	5-Feb-07	Alex Skoczen					pops2@cox.net	Thanks Brent, This information is helpful. I now know that all these plans are 100% inadequate and we as Scottsdale residents need do something about this. Scottsdale road should have been widened five years ago not eleven years from now. This dangerous road will cost lives and the City of Scottsdale will have their greedy blood on their hands along with allot of law suits. I will be in touch. I would appreciate you forwarding this e-mail to the Mayor & City Counsel. Thanks Alex	Mr. Skoczen, Sorry for the delay in writing back to you. I discussed your concerns with Dan Worth, City Engineer/Municipal Services Department Head and Mary O'Connor, Transportation Dept. Head. I have copied them on this email, as well as the City Council, as you requested. Dan has personally driven this area and he told me that he agrees that the road condition is deteriorating. The challenge comes in how to repair it because the underlying road base is inferior and any new overlays or surfacing will only work for limited period of time. In short, the road needs to be rebuilt. In addition, the Transportation Master Plan Update process currently underway will be making a recommendation on the ultimate width of the road in this location, so it is important that decision be made before a project is initiated to rebuild and/or widen the road. I have forwarded your comments to the Transportation Master Plan Update project manager so they will be a part of the public record. As I mentioned before, both the planning and maintenance areas responsible for City streets are coordinating future treatment of Scottsdale Road and are also looking at strategies to gap the years before Scottsdale Road gets rebuilt. How Sincerely, Brent Stockwell	
	email	11-Sep-07	Dan Archey	Home - 480-275-6997				darchey@cox.net]	Hello Theresa, Reed suggested that I send you this email about the problem we've been having here in Hidden Hills for quite some time with bicyclists. Far too many bicyclists don't follow the rules of the road and on the few occasions that I've rolled down my window and indicated that they needed to, each time I was rudely responded to. Each time the conversation got heated and each time I was challenged to get out of my car to fight them (usually a group of 3 to 10). It's funny to me how brave they are in large groups. These bikers often go way too fast in our community and they often ride in swarms of 5 to 10 and often times there is one swarm after another. Sometimes in a span of one minute, 40-50 bikers will go by in 4 to 6 swarms and that's not the high end gated community I thought I was buying into. These bikers often ride in swarms or 2 to 4 side by side taking up the entire road or at least the side my car is going in, and they will not move out of the way to let a vehicle pass them. This happens in the community and on Via Linda from our gate down to 136th St. From what I understand, bikers were given the privilege to ride through our community via an easement, but they have abused this privilege repeatedly in my 2 ½ yea		
	email	12-Jun-07	Rich Rumer / Bill	P.O Box 54488	Phoenix	AZ	85078	coalitionazbicyclists@yahoo	Dear Ms Huish The Coalition of Arizona Bicyclists is contacting you and requesting that the City of Scottsdale incorporate the Complete Streets Program in the Transportation Master Plan that is being developed at this time. The Coalition of Arizona Bicyclists is a Statewide Bicycle Advocacy Organization that represents cyclists that ride, live or work in Scottsdale Various members of the Coalition have been involved in previous open houses relating to bicycle facilities on this plan and believe that the Complete Street Program not only deals with improved bicycle facilities but also includes pedestrians, transit users, freight and ADA compliance The Complete Street Program has been adopted in various Cities and States and the Coalition of Arizona Bicyclists is leading the campaign to have this program adopted throughout Arizona. I am including the recent approved policy from Seattle, Washington for your review. Complete Street web site can be reviewed at www.completestreets.org . The Coalition of Arizona Bicyclists all volunteer staff will assist the City of Scottsdale to achieve this goal and attend future meeting if needed.		
	email	10-Jul-07	Bill Lindley	8550 E. McDowell #245	Scottsdale	AZ	85257	wlindley@wlindley.com	Dear Ms. Huish, We have spoken at some of the transportation meetings. I am a Scottsdale resident, a Valley resident since 1991, a longtime transit user and advocate, and am a director of the Arizona Rail Passenger Association. I offer the following inputs for the Transportation Master Plan: 1. I suggest that the upcoming Transportation Master Plan speak to the relocation of the downtown transit center from its current location at Loloma to Drinkwater south of Indian School Road. This new Drinkwater Transit Center would: * Provide better transit connections to City Hall, the library, Scottsdale Stadium, the Main Street Mall, and the hospital on Osborn. * The Indian School Road bus line would extend to Drinkwater, providing full frequency to all of those destinations. The Camelback and Thomas bus routes could potentially serve or terminate there as well. * Drinkwater Road should be considered as part of the Scottsdale Road alignment for the future high-capacity transit corridor. Specifically, the southbound lanes are nearly redundant given the use of Goldwater as the southbound express bypass, and Drinkwater southbound could be just one lane, with the remainder of the current right-of-way used for buses, 2. The establishment of a transit center at or near Scottsdale Community College on Chaparral, with frequent connections		
	email	17-Jun-07	Robin Scotford					rl1104s@cox.net	Dear Transportation Committee Member, We live in a wonderful equestrian neighborhood called Patterson Ranch in Scottsdale near Hayden and Thunderbird Roads. When we first moved into this neighborhood 12 years ago, we were amazed at the rural, rustic setting right smack in the middle of the city and we could not believe our luck. This is an oasis in the desert! We love the quiet and serenity c this dark sky neighborhood. Where neighbors actually know each other by name, know each others children's names, pet names and even life stories. This is a special place where folks watch out for each others children, houses, horses, pets, etc. and look out for the good of the neighborhood as a whole. My husband and I told each other we never want to move and we haven't. But recently with the threat of our neighborhood being destroyed, we have given serious consideration to moving out of Scottsdale. All of the residents and surrounding neighborhoods are very concerned about the possibility of Thunderbird Road being widened and expanded to allow access from Scottsdale Road through to the Pima Freeway. This was something that our I hope that the current transportation committee and city council members have the courage and the wisdom to decide to		
	email	20-Nov-06	Nancy Cantor					nancyanncantor@cox.net	Teresa: Because I have known you as long as I have (and Mary, too) I did not want to just blow off a response to your question. So, here is what is going on inside my head (Rita's, too). I know the ADOT due to the Pima Rd. alignment battle starting back in 1987. And…..I know MAG……MAG concerns me greatly. Transportation is not, cannot be, a strictly Scottsdale decision making process. Whether we are talking bus systems, trolley cars, light rail, Dial-A-Ride, any decisions made will be impacted by MAG and ADOT. You know we do our homework and the questions that we have submitted come from thinking outside of the box. The trac to get outside of the box has been convoluted. If we had a more open communication path with leadership, by that I mean the Mayor, City Manager and all members of Council, I would not be asking questions or writing this letter. Open minds do not reign on Council and when serious questions are asked, particularly of late, members tend to get angry and discussion stops. We will grant that some of our fellow citizens do get upset, largely do to frustration. We know that staff can only do what they are instructed to do and all of you get your marching orders from the City Manager and Mayor and Council. Often we		

No.	Source of Comment	Date	Citizen/Group/Interviewee	street address	city	state	zip	email	Comment	Response	Area
	letter	10/25/2006	Bop Vairo					COPPeak@coppeak.org	Dear Mayor and Council Members: I watched the presentation made by the staff and consultant last evening on Channel 11. As a member of the TMP workin group I have also attended all the meetings arranged by the staff to solicit feedback from this citizen group. One can easily understand why Council members could be somewhat confused and overwhelmed by the amount of information that was presented and the responses to questions raised. It seemed that the consultant and staff surfaced many ideas, but never clearly defined the problem or the objectives of the study – a definition of the specific traffic problems the city wants to solve. In every survey taken by the city in recent years, residents have listed traffic congestion as the most important concern. This has been confirmed by surveys we have taken of our members, as well. As the most important problem, it should be clearly articulated and focused to assure that proposed solutions will directly address the issue both short and long term. Since traffic congestion is the primary concern for Scottsdale residents it should at the top of the list to solve. Further, if conventional wisdom says that the overwhelming percentage of residents will not abandon their car, then the city should c If, for another example, bringing a work force from outside the city to Scottsdale is another high priority issue to be solved, In any case, one cannot solve a problem without understanding the problem. This has yet to be done by the consultant or		
	email	24-Oct-06	leon spiro	7814 E. Oberlin Way	Scottsdale	AZ	85262	leonspiro@hotmail.com7	City Clerk Jagger: Please see that this correspondence to the council, is made a part of this nights material presentation to this City Council. Leon Spiro. City Council, City of Scottsdale; Council Members: I reference this nights Work Study Session for Item #1, Neighborhood Traffic Management Policy and Procedures and #2, Transportation Master Plan. I, and others, feel that we have been left out "in regard to input" for this study. This you should address, for the city is paying hansomely for this outsourcing. I ask the following questions of the Council, I do hope that you will address them in this Work Study Open Meeting for all to hear: 1. My neighborhood was annexed from the County into the City in 1983. What was the County Neighborhood Circulation Pla accepted at this time of annexation? 2. Why is the Transportation Section using a "proposed circulation plan" for neighborhood street design rather than the " grid/acreage plan" of the County? 3. Will the Scottsdale City Code be considered by all when the final "outsourced plans" are presented for review and approval? I reference, a "For the Public Record" letter of 18 August 2000, that I addressed to then Transportation Director John Little in which I asked this question: "who is the Other issues have to be addressed as well, such as Fire Protection and Police Protection which are being ignored. Anoth addressed as well, such as illegal/fraudulent release of the "cities interest" in abandoning of the "cities and the publics right to use" a Federal Land Patent Roadway Easement (commonly r If this is an illegal release of the cities interest in this roadway, it has certainly complicated ,I believe, the transportation flo		
	email	10/10/2006	keith fenton	8270 N Hayden Rd #2055	Scottsdale	AZ	85258	keithfenton@earthlink.net	Ms Huish >>Hope you will see if this might be good solution for Scottsdale. Would appear much less expensive, more efficient for riders, no long waits in the heat, faster to destinations, no long construction on beautiful Scottsdale Rd, etc Please investigate. Thank you. >>Keith Fenton >>>-----Forwarded Message----- >>>From: Mike Branom <mike.branom@aztrib.com> >>>Sent: Oct 10, 2006 3:32 PM >>>To: KEITH FENTON <keithfenton@earthlink.net> >>>Subject: Re: Jitney buses >>>Interesting suggestion. Have you passed this on to the city transportation folks? >>>http://www.scottsdaleaz.gov/Traffic/TransMasterPlan/ >>>Thanks for reading, >>>mb >>>On Tuesday, October 10, 2006 11:42 AM, KEITH FENTON <keithfenton@earthlink.net> wrote: >>>>Oct 10, 2006 >>>>Mike, Enjoyed your article Saturday about light rail and >>>>Randal O'toole's remarks. A numbers of years ago I was in Atlantic >>>>City, NJ and they had jitney buses..about the size of the airport >>>>pickup vans..held maybe 15 people plus those who stood. During the >>>>busy times. two to four of the jitneys, a few minutes apart would >>>>speed down the street and pick up people. Don't know if they would		
	email	18-Apr-07	Guinevieve dance					gdance@cox.net		Dear Ms. Dance: My name is Jim McIntyre, Public Information Coordinator with the City of Scottsdale. My colleague, Shannon Wallace requested that I respond to your inquiry about Indian School Road resurfacing. Indian School Road is currently being reviewed as part of a large, city-wide process called the Transportation Master Plan. The Transportation Master Plan is th first comprehensive look at the city's entire transportation system since the late 1980's. The master plan will work from the goals outlined in the city's 2001 General Plan to identify specific projects and programs that will be used to address transportation needs and objectives. The rebuilding project planned for Indian School Road has been put on hold until the master plan process has been completed and a definitive answer has been decided for the roadway. If widening is the approved strategy decided upon, then it would probably be a phased process of resurfacing initially and followed later by a widening project. It is likely a widening project would take time in order to purchase all of the property needed. If a widening project is not approved, then the city would immediately begin the the rebuilding project that has been put on hold. (This is the project with which	
	call to Jennifer Lewis from crystal shaw	23-Feb-07							I just talked with Crystal Shaw (about 15 minutes) regarding her concerns and interest in the Thunderbird/Hayden piece fo the Transportation Master Plan (TMP). She and her husband have talked with Teresa Huish, sent emails to Mary O'Connor and Mayor Manross expressing their position on any widening or realignment of Thunderbird to accommodate increased traffic volumes. She wanted the airport's support for maintaining Thunderbird as a residential street in that area. My "support" was for her to participate in the workshops, submit formal comments to be included in the study (and transportation commission meetings), and stay involved in the process to ensure her specific concerns were "heard." I clarified that the Airport Advisory Commissioners would be receiving draft TMP documents with the various alternatives for their review and comment, but she would have to address the Airport Advisory Commissioners during public comment at any of the Airport Commission meetings, or as an agendized item when the item is included on the agenda. She was grateful that we returned her call, and thought the information was helpful. I believe we will be seeing her at the Please let me know if you have any questions, or if you would like me to forward this information to Teresa...		
		11/3/2007	Clare Faye Ware	The Gardens on 78th St, Unit 104				fware@waremfginc.com	I am a resident of the Gardens on 78 Street, and I strongly oppose having reverse lanes on Indian School. This is already an unsafe road, and this would only make the situation worse. We are already taking our lives in our hands when we try t turn west on Indian School, or make a left turn into 78 street from Indian School, (going west.) It's is quite difficult turning into Miller, when school is in session, to go the red light. When the winter visitors arrive, it will be very confusing for them to understand this, I know I do not travel the reverse lanes in Phoenix, for this reason. I understand there are no plans for a red light to turn into 78 Street, so please do not make this road any more dangerous than it already is. I oppose having reverse lanes on Indian School.		
	email	11/2/2008	Betty Miller	4015 N 78th St #136	Scottsdale	AZ	85251	bettymiller@cox.net	I have lived at 78th St and Indian School Road for over 13 years. I disagree with the recommendation of the Transportation Plan to make the center lane reversible. While this may be a solution to move more traffic, it does not consider the impact upon the residents of this area. It will be an impossible situation for us and very very unsafe. I also oppose widening this road. I propose that the City do two things regarding this roadway and traffic in general: 1-Take a long term view with some vision. This plan is for 20-30 years. What happens after that???? There will still be more vehicles and more vehicles. If you build it they will come!!! Why not start now to move the area towards public transport???? If we don't start now the gridlock we talk about now will be upon us within our lifetimes. 2- Have concern for the safety of the residents of this area as the primary goal, not the moving of commuter traffic! The previous plan which was in place for Indian School Rd. to add a median with left turn lanes and move the sidewalks away from the edge of the roadway was far better than wither the widening or reversible lane proposals. 480-945-9190		
	email	12/4/2007	Robert Kinghorn	4015 N. 78 St.,#129	Scottsdale	AZ	85251	rbtking2000@yahoo.com	I strongly appose widening and/ora reversible lane on Indian School Rd. Think Safety! Open Camelback to Pima and reduce the Ind.Sch. traffic flow.		

No.	Source of Comment	Date	Citizen/Group/Interviewee	street address	city	state	zip	email	Comment	Response	Area
	email	12/11/2008	Robert Kinghorn	4016 N. 78 St.,#129	Scottsdale	AZ	85251	rbtking2000@yahoo.com	I have lived adjacent to Indian School Road for more than 30 years. Traffic flow has increased with the opening of the 101 and development on the Reservation. Reversing lanes has been proposed as a way to speed up the traffic flow. It will not work! Look at 7th Street in Phoenix. Confusion, accidents, restricted left turns. The answer is to provide off street parking, buses, carpooling, stagger work schedules and reconsider widening Chaparral. Also, opening Camelback to Pima Rd. would help.		
		19-Sep-07	from workshop flip chart						Give Scottsdale School District the option of no in-town school bus service. Develop a generation of 8-12th grade public transportation riders.		
		19-Sep-07	from workshop flip chart						Eastbound Chaparral Road (to SCC) should dedicate two northbound left turn lanes onto 101. SCC does no need two forward, eastbound lanes.		
		19-Sep-07	from workshop						(A picture was drawn recommending the closure of the right-out only driveway on the south side of Frank Lloyd Wright between Hayden and the Loop 101 on-ramps.		

SCOTTSDALE TRANSPORTATION MASTER PLAN
Existing Conditions Report

January 11, 2007

CITY OF SCOTTSDALE TRANSPORTATION MASTER PLAN

EXISTING CONDITIONS REPORT

1/11/2007

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

1 INTRODUCTION

1.1 Purpose of This Report

The purpose of this report is to provide an understanding of the breadth and scope of the present transportation systems and options within the City of Scottsdale. This report also identifies areas in which current enhancements or modifications to existing or proposed transportation policies and / or facilities are appropriate to support the Community Mobility Element and the type and pattern of development envisioned in the City of Scottsdale *General Plan 2001 (General Plan)*.

1.2 How Information in This Report is Presented

Scottsdale residents recognize that modes and routes of transportation shape community development. Consequently, the understanding of the City of Scottsdale's transportation conditions that is detailed in this report includes:

- An historic overview of some of the decisions that brought the City to this point;
- A discussion and analysis of the transportation options available within the City;
- The existing and planned development patterns that will influence, and be influenced by, transportation facilities and policies; and
- Identification of areas that need to be addressed if the City's transportation system is to support the implementation of the Scottsdale *General Plan 2001*, and contribute to the character and quality of Scottsdale experienced by residents and visitors.

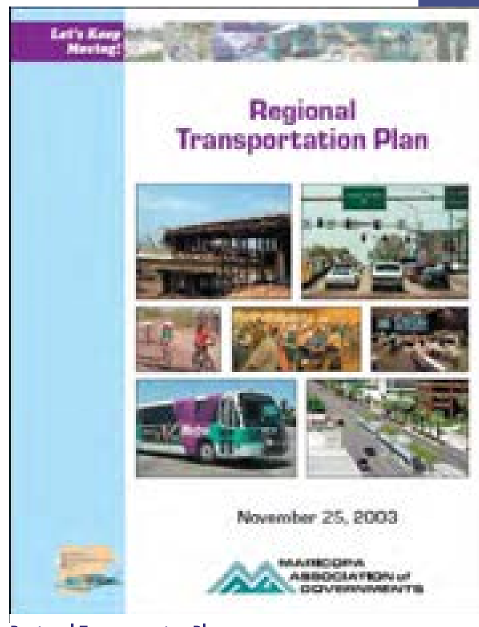
1.3 Study Area

1.3.1 Regional Context

The City of Scottsdale is located in eastern Maricopa County, Arizona (Figure 1, *Regional Map*). Maricopa County is the fourth most populous county in the United States. With 9,224 square miles, it is also the 14th largest county in the United States. Within the county, there are 26 jurisdictions as well as the Gila River, Fort

Figure 1: REGIONAL MAP

McDowell, the Salt River Pima-Maricopa (SRPMIC) and Papago Indian Communities. By 2025, Maricopa County's population is expected to increase to 5.66 million residents and be the location of 3.0 million jobs. Maricopa County's 3.7 million[1] residents account for over half of the State's population. Between 2000 and 2005, Maricopa County had the largest population increase (563,000 persons) of any county in the nation.



Regional Transportation Plan

Within Maricopa County, numerous regional transportation improvements are planned as a result of Proposition 400, which voters approved in 2004. Proposition 400 extends the existing transportation sales tax to fund the following projects:

- New freeways in the Valley's high-growth areas;
- New interchanges and lanes for existing freeways;
- Two-hundred-seventy-five miles of new or improved arterial streets;
- Twelve-hundred new bus pullouts, forty regional bus routes, and 2,100 new buses; and
- Twenty-seven additional miles of light rail, augmenting the currently planned system in Phoenix, Tempe, and Mesa.

Proposition 400 also provides funding for projects in Scottsdale, which are described in Chapter 4.

1.4 Description of the Planning Area– City of Scottsdale Overview

1.4.1 Political and Physical Geography

Scottsdale began as a small agricultural community. It was founded in the late 1800s and incorporated in 1951. The City has steadily increased in population and employment growth since its incorporation. Scottsdale, a nationally known City, is a highly desirable place to live, offers diverse employment opportunities, and is a popular tourist destination.

Currently, the City of Scottsdale covers 185 square miles and accounts for two percent of the total land area within Maricopa County. The City is 31 miles long and nearly 12 miles wide at its widest point. The City of Scottsdale is adjacent to the cities of Tempe and Phoenix, the towns of Paradise Valley, Fountain Hills, Carefree and Cave Creek, SRPMIC, the Maricopa County-owned McDowell Mountain Regional Park, unincorporated Maricopa County, and National and State lands (Figure 2, *Scottsdale and Surrounding Communi-*

1 U.S. Census Bureau, 2005 Population Estimates

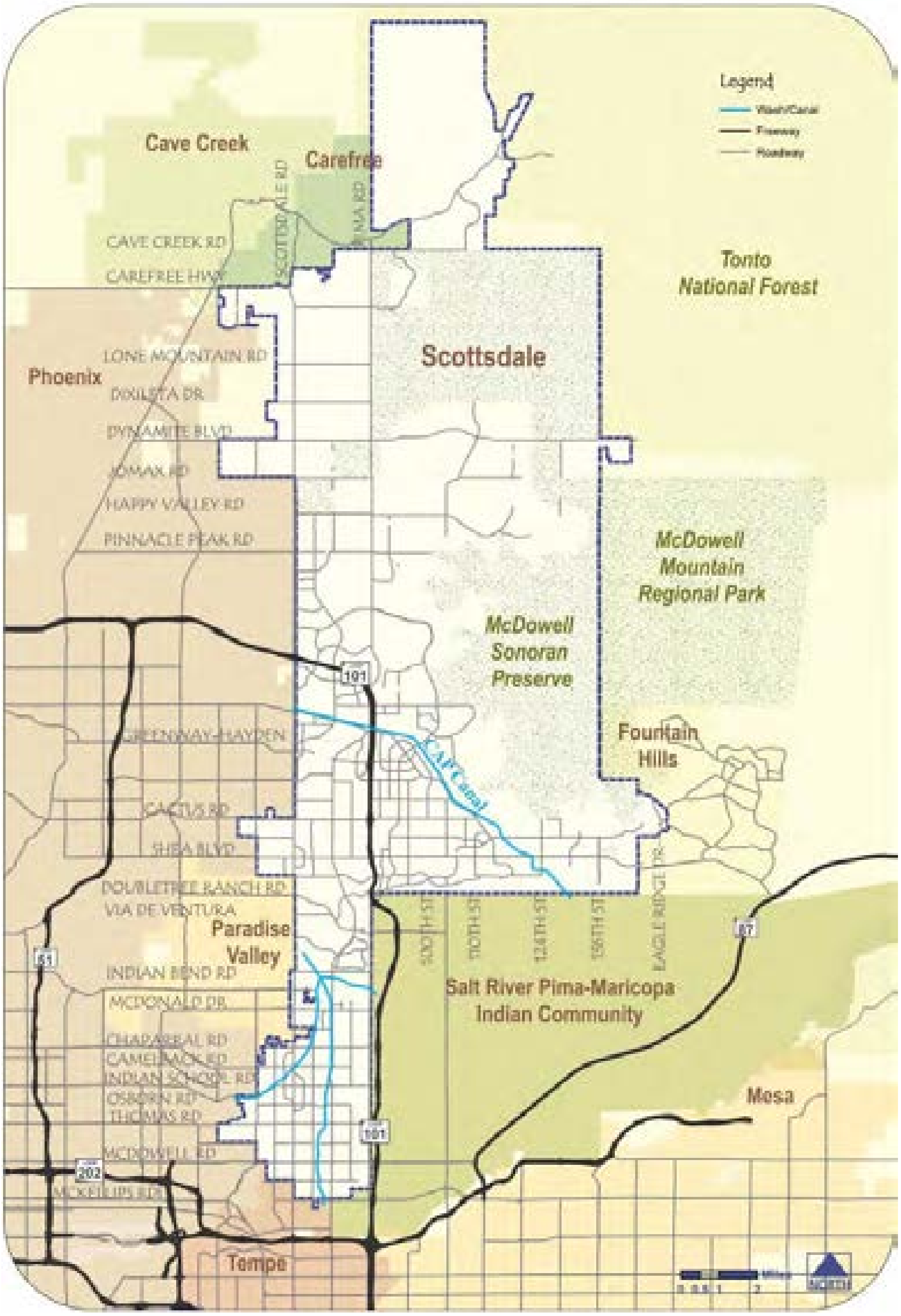


Figure 2: SCOTTSDALE AND SURROUNDING COMMUNITIES

ties). These political boundaries have influenced the transportation connections east to SR 87, the Beeline Highway, a major route to northern and central Arizona.

The City has two major geographic features that affect connectivity. The Central Arizona Project Canal (CAP), north of Frank Lloyd Wright Boulevard, limits north-south connections as does the McDowell-Sonoran Preserve, which includes approximately 56.8 square miles of mountainous desert terrain. The City proposes to conserve this area as open space, obviating future access to and from the City from the northeast.

1.4.2 Regional Connections

Because the southern portion of the City is bordered by the SRPMIC and the north region by the McDowell-Sonoran Preserve, Scottsdale is the terminus of many regional routes. Additionally, non-motorized regional connections (such as multi-use trails) pass through the City and provide access to resources and destinations to the east and west. Westbound connections from Scottsdale are provided through most of the City's major arterial streets, such as McDowell Road and Shea Boulevard via the Pima Freeway (Loop 101). Scottsdale Road is the only continuous north-south connection in the City.

1.4.2.1 Motorized Transportation

Currently, there are few roads that pass through Scottsdale that provide access to SR 87 and Loop 101, and can be considered regional connectors. Shea Boulevard provides the only major access to SR 87 and Fountain Hills north of McDowell Road. Indian School, Thomas, and McDowell roads provide access to Loop 101 from east Phoenix and north Tempe.

Regional north-south routes are limited to three arterials. The only roads that cross over the Salt River and pass through Scottsdale are Hayden and Scottsdale roads and 64th Street, which terminates at Indian School Road. Scottsdale Road ends at Cave Creek Road, in Carefree. Hayden Road breaks at the south side of Frank Lloyd Wright Boulevard near the Scottsdale Airpark.

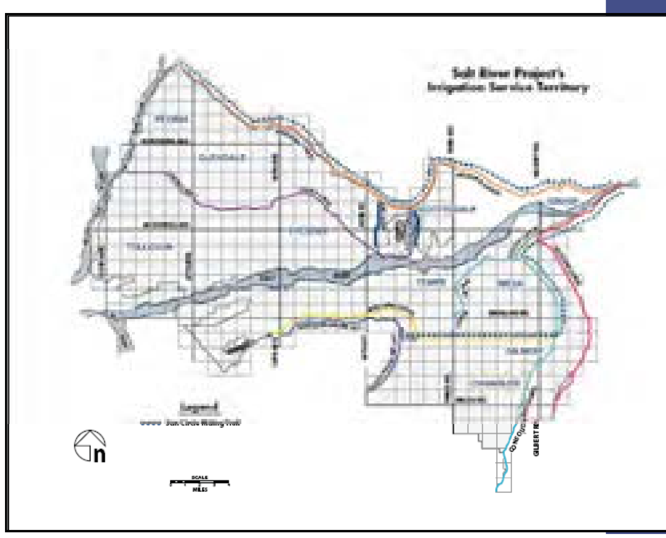


Figure 3: SRP CANALS PROVIDE NON-MOTORIZED ROUTES

1.4.2.2 Non-Motorized Transportation

Regional non-motorized routes, such as multi-use trails, also pass through the City (Figure 3, *SRP Canals Provide Non-motorized Routes*). The CAP Canal enters Scottsdale at

Bell Road and connects to Shea Boulevard at approximately 120th Street. The Sun Circle Multi-Use Trail follows the CAP through Scottsdale. The Crosscut, Grand, and Arizona canals pass through the southern portion of the City and provide regional connections east and west of the City. The Arizona Canal passes through downtown at Central and Scottsdale roads and anchors the City's Waterfront project. The Crosscut Canal passes through the City's downtown and southern residential areas and has been improved as a recreation amenity.

The Indian Bend Wash is a renowned, open space resource connecting Papago Park in south Scottsdale with Mountain View Road in north Scottsdale. It includes open space and recreation amenities as well as a continuous multi-use path.

1.4.3 Demographics

1.4.3.1 Population

Approximately 226,390 people lived in Scottsdale in 2005[2]. By 2025, the City's population is expected to increase to 289,600, or 22 percent. In 2005 employment was approximately 145,000. In 2025, the total number of jobs within the City is projected to increase 30 percent to 209,800[3]. Population and employment information is discussed further in Chapter 4, *Land Use–Transportation Connection*.

2 City of Scottsdale Economic Vitality Department. Demographic Trends Analysis. October 2005.
3 Maricopa Association of Governments. 2003 Interim Projections.

2 HISTORIC OVERVIEW

2.1 Introduction

A variety of factors have shaped Scottsdale's current transportation system. Such factors include natural topographic features, Maricopa County's planning decisions prior to the City's incorporation, influence from neighboring communities, development strategies of the Arizona Department of Transportation (ADOT), and the City of Scottsdale. An understanding of the decision-making history that precedes this Transportation Master Plan effort helps one to appreciate the opportunities and constraints of the current system's "built environment." It also allows one to see how decisions have been made on particular parts of the system in the past. Finally, the history of prior decisions reveals, in its length and scope, the impact of many individual decisions.

2.2 Prior Transportation System Decisions

In this report, previously identified decisions mainly consist of those made by the City of Scottsdale or by the City in conjunction with other governmental entities. These decisions are considered to have greater than localized or neighborhood impact on the configuration of the City's transportation system. (Figure 4, *Prior Transportation Related Decisions*). Many of these actions were the result of extensive public processes.

This report (or Transportation Master Plan) does not intend to reopen issues related to any of these decisions; however, should changes be made due to evaluation and recommendation, citizen participation and a City-staff review will be integral to the decision- making process.

The context for each decision is discussed below.

Decision: **Widening 64th Street from McDowell Road to Thomas Road. Connecting 64th Street from Thomas Road to Indian School Road.**

Context: In the mid-1980s, Scottsdale decided to extend a portion of the one-mile arterial grid system on its border with the City of Phoenix. A previous study in the City of Phoenix suggested that 64th Street would be a preferred alignment to the alternatives of

Figure 4: PRIOR TRANSPORTATION RELATED DECISIONS

48th Street and 52nd Street. The City of Scottsdale considered widening either or both 64th Street and 68th Street. 64th Street extended from the City of Tempe, US 60, and (the planned) Loop 202, and served Papago Park, the Phoenix Zoo, and the Desert Botanical Gardens. Therefore 64th Street was selected to become a four-lane roadway with a raised median. Previously, it existed as a two-lane roadway from McDowell Road to Thomas Road and did not exist from Thomas Road to Indian School Road. A bond election in 1992 provided the funds for construction of this project.

Decision: **Terminating 64th Street at Indian School Road**

Context: The 64th Street improvements were terminated at Indian School Road for three reasons: the large expense of constructing a bridge over the Crosscut Canal; opposition to the construction by residents near 64th Street north of the Crosscut Canal; and annexation by the City of Phoenix of the road right-of-way.

Decision: **Restriping 68th Street from Roosevelt Road to Camelback Road**

Context: In the late 1970s, this portion of 68th Street consisted of two through lanes per direction without left-turn lanes. The road was restriped to consist of one through vehicle lane per direction, with one bicycle lane per direction, and a center two-way left-turn lane.

Decision: **Scottsdale Road Improvements from Roosevelt Road to Osborn Road**

Context: In the mid-1980s, there was a design to provide extensive roadside and median landscaped for this portion of roadway – similar to portions of Scottsdale Road further north. This project would have required consolidation of access of many businesses and the denial of left-turn access for other businesses. Therefore, the City did not proceed with these improvements.

Decision: **Creating Goldwater Boulevard and Drinkwater Boulevard**

Context: In the early 1980s, due to traffic congestion, Scottsdale Road through downtown Scottsdale was planned to be widened to three through lanes per direction. This would have resulted in the destruction of many historic buildings and a dramatic change to the integrity of Downtown Scottsdale. Additional north-south roads were conceived one-quarter mile west and east of Scottsdale Road to connect with Scottsdale Road south and north of Downtown Scottsdale. These roads provided three lanes in the dominant travel direction and two lanes in the opposite direction, and enabled Scottsdale Road to remain two lanes per direction.

Decision: **Retaining Through Traffic Signal Timing on Scottsdale Road**

Context: The original intention of the couplet roadways of Goldwater Boulevard and Drinkwater Boulevard was to encourage through traffic to utilize these two streets and to preserve Scottsdale Road in Downtown Scottsdale for slow-moving local traffic. On two different occasions in the 1990s, the traffic signal timing for Scottsdale Road between Osborn Road and Camelback Road was adjusted to dramatically favor east-west streets to reduce travel speeds on Scottsdale Road and to encourage pedestrian and non-vehicle travel. On both occasions, the traveling public demanded that the signal timing be returned to favor higher travel speeds on Scottsdale Road in Downtown Scottsdale.

Decision: Intersection Design of the Junctions of the Couplet Ends with Scottsdale Road

Context: As a part of the design objective of the couplet roadways, the terminal intersections with Scottsdale Road have been designed (and in the case of the northerly intersection of Drinkwater Boulevard and Scottsdale Road, re-designed and modified) to preserve a large volume of through traffic movement on Scottsdale Road itself. The signage and intersection designs send "inconsistent messages" to the motorist as to the desirability of using the "Express" option of bypassing the downtown core, or simply transecting the downtown on a longer trip by not deviating off of Scottsdale Road. The net effect of these decisions is that a significant volume of through trips remains on Scottsdale Road, while the couplet is underutilized.

Decision: Designating Scottsdale Road as a High-Capacity Transit Corridor

Context: In the mid-1990s, five corridors were considered. Both 68th Street and Miller Road were eliminated because of the immediately adjacent residential neighborhoods. Indian Bend Wash was eliminated because of its recreational use importance. Scottsdale Road was selected over Hayden Road because of its employment and tourism concentrations.

Decision: Downtown Parking Garages

Context: Several different studies of downtown parking have occurred. Parking meters were removed in the early 1980s to encourage parking in downtown. Several parking structures and lots have been constructed and improved throughout Downtown Scottsdale in the past fifteen years. These parking areas are primarily small, well-designed, and well-located to serve local businesses.

Decision: Terminating Hayden Road at Frank Lloyd Wright Boulevard

Context: In the 1970s, Hayden Road was planned to continue north in a tunnel beneath the Scottsdale Airport and on a bridge over the Central Arizona Project Canal. Due to the very large expense and anticipated low traffic volume, the project was eliminated from further consideration.

Decision: Re-aligning Hayden Road to Intersect Frank Lloyd Wright near Loop 101

Context: During the late 1980s, Loop 101 was planned to curve west south of the Central Arizona Project Canal. Hayden Road was funded and designed by two improvement districts to have an interchange with Loop 101 at its curve from a north-south freeway to an east-west freeway and to align with Pima Road north of Loop 101. ADOT moved the Loop 101 alignment two miles north, and the Hayden Road alignment was not altered.

Decision: Widening Hayden Road from Indian Bend Road to Shea Boulevard

Context: Hayden Road was originally constructed as two lanes per direction with a landscaped median wide enough to accommodate an additional through lane in each direction. In the late 1980s, as the design was nearing completion, residents from adjacent neighborhoods expressed considerable opposition to the widening project. After considerable discussion, the design and construction was completed.

Decision: Terminating Granite Reef Road

Context: In the late 1970s, Granite Reef Road was planned to become two lanes per direction with a center two-way left-turn lane from Roosevelt Road to Indian Bend Road. Due to the residential nature of the adjacent property and the close proximity of Pima Elementary School, the project was removed from consideration. Granite Reef Road was terminated at Osborn Road and a park was created. Granite Reef Road continued to exist from south of Indian School Road to north of McDonald Drive. A bridge was planned over the Crosscut Canal, north of McDonald Drive. This right-of-way was abandoned in the mid-1980s.

Decision: Restriping Granite Reef Road from Indian School Road to McDonald Drive

Context: In the late 1980s, this portion of Granite Reef Road consisted of two through lanes per direction without left-turn lanes and intermittent parking. The road was restriped to eliminate all parking and to consist of one through vehicle lane per direction, with one bicycle lane per direction, and a center two-way left-turn lane.

Decision: Terminating 96th Street, South of Via Linda

Context: In the early 1990s, it was anticipated that 96th Street would extend south into the Salt River Pima-Maricopa Indian community to connect with Via de Ventura and perhaps extend further south to cross the Salt River and connect with Dobson Road in Mesa. Due to the desire to protect residential neighborhoods, it was decided to terminate 96th Street south of Via Linda.

Decision: Narrowing 96th Street from Shea Boulevard to Thunderbird Road

Context: This portion of 96th Street had previously been planned as a Major Collector that would consist of two through vehicle lanes per direction with a center two-way left-turn lane. Through discussions with representatives of adjacent residential neighborhoods in the late 1990s and early 2000s, it was determined that the street would remain as one through lane per direction with a center two-way left-turn lane, and raised traffic circles at major intersections.

Decision: Terminating 104th Street, South of Mountain View Road

Context: In the early 1990s, it was anticipated that 104th Street would extend south into the Salt River Pima-Maricopa Indian community to connect with Via de Ventura and perhaps extend further south to cross the Salt River and connect with Alma School Road in Mesa. Due to the desire to protect residential neighborhoods, it was decided to terminate 104th Street south of Mountain View Road.

Decision: Locating Loop 101, South of Via Linda, East of Pima Road

Context: In the mid to late 1980s as ADOT was planning the Loop 101, two strong community groups of Scottsdale residents and property owners formed. One group favored the location of Loop 101 on the Pima Road alignment for its entire length adjacent and through the City of Scottsdale to its curvature to the west. Another group advocated its relocation one-quarter to one-mile east on the Salt River Pima-Maricopa Indian Community. The eventual decision was to locate Loop 101 one-quarter mile to one-half mile east of the Pima Road alignment.

Decision: Constructing a Buffer Wall on Pima Road, from McDowell Road to Indian Bend Road

Context: In the late 1980s, as ADOT was planning the Loop 101, it was determined that a sound and physical barrier should be constructed immediately west of Pima Road. The barrier was intended to protect the residential neighborhoods adjacent to Pima Road, to limit access to one-mile locations, and to minimize the potential for widening Pima Road. The project was funded by a 1992 bond election.

Decision: Retaining the Width of Shea Boulevard from Pima Road to 96th Street

Context: In the early 1990s, a plan was conceived to depress the through lanes of Shea Boulevard from the planned Loop 101 to 96th Street. Loop 101 would have remained elevated from Via Linda to north of Shea. The plan included directional access lanes at ground level to provide access to adjacent businesses. The intention was to reduce traffic congestion in the immediate vicinity of the Loop 101 / Shea interchange. Because of the large expense and a belief that the traffic volumes on Shea Boulevard would never increase to the point of congestion, the project was discontinued prior to design.

Decision: Retaining the Disconnection of Lincoln Drive and Indian Bend Road

Context: In the late 1980s, a plan was conceived to connect Lincoln Drive, west of Scottsdale Road to Indian Bend Road, east of Scottsdale Road, a distance of one-half mile. The intention of the plan was to minimize traffic congestion at the Scottsdale / Lincoln and Scottsdale / Indian Bend intersections. Because of the large expense and the disruption to residential neighborhoods, businesses, and the McCormick Railroad Park; the project was discontinued prior to design.

Decision: Retaining the Disconnection of Camelback Road and Chaparral Road

Context: In the late 1980s, a plan was conceived to connect Camelback Road, west of Hayden Road to Chaparral Road, east of Hayden Road, a distance of one-half mile. The intention was to protect residential neighborhoods and to provide another direct connection between Loop 101 and Downtown Scottsdale. Because of the large expense and the disruption to residential neighborhoods, businesses, and the Indian Bend Wash Park; the project was discontinued prior to design.

Decision: Terminating Via Linda, East of 136th Street

Context: In the late 1990s and early 2000s, a plan was conceived to connect Via Linda through the southern end of the McDowell Mountains to provide an alternate to Shea Boulevard. Because of the large expense, the disruption to the topography and vegetation, and the disruption to residential neighborhoods; the project was discontinued prior to design.

Decision: Retaining Chaparral Road as Two Lanes from Miller Road to 78th Street

Context: In the late 1980s and early 1990s, Chaparral Road from Hayden Road to Pima Road was widened from one lane per direction to two lanes per direction to accommodate the Loop 101 / Chaparral interchange. The intention was to also provide two through lanes per direction from Miller Road to 78th Street, the only one-quarter-mile segment with one through lane per direction. To protect the adjacent residential neighborhoods, the project was discontinued prior to design.

Decision: Removing Future Roadways from the McDowell Mountain Preserve

Context: The original plan for this portion of Scottsdale was large-acreage residential development and minimal commercial development, which would have required some major streets. With the adoption of the McDowell Sonoran Preserve, streets are not necessary in this portion of Scottsdale.

2.3 Previous Comprehensive Transportation Planning Efforts

2.3.1 Circulation Element. 1989-1991 Comprehensive Plan

In the late 1980s, the City of Scottsdale activated two committees to evaluate and improve transportation in the City. The Citizens for Better Transportation Committee considered all modes but focused primarily on streets and transit while the Bicycle Task Force focused on bicycle travel in the City. The two committees held joint meetings at key points during their study processes to discuss common issues. The results of their efforts provided input into the Circulation Element of the *General Plan 1991* update, which included six transportation-related elements: Streets, Street Standards, Bicycles, Trails, Transit, and Airport. The *General Plan 1991* guided development in Scottsdale until the *General Plan 2001* update.

3 TRANSPORTATION MODES

3.1 Introduction

According to the *General Plan 2001*, Scottsdale citizens envision that "there will be a diversity of mobility systems to match the character and lifestyle of different areas of the community. Mobility choices will provide alternatives to the automobile, increase accessibility, improve air quality, enrich the community and its neighborhoods, and contribute to the community's quality of life."

How we travel is a function of many factors: personal choice, available facilities, time, money, ability, and age. Current City transportation options consist of streets, transit, bicycle facilities, pedestrian facilities, and multi-use trails and paths. This section describes the existing transportation systems and conditions throughout the City of Scottsdale.

3.2 Streets

Scottsdale's street network consists of approximately 1,400 roadway miles. There are approximately 1,000 lane miles of arterial and collector streets. Of this street network, only 55 miles are unpaved. The City's street network provides regional, City, and local travel for vehicles, pedestrians and bicycles alike. Table 1, *Lane Miles and Street Miles*, shows the number of street miles in Scottsdale by type and the total number of lane miles.

TABLE 1: LANE MILES AND STREET MILES

STREET TYPE	TOTAL MILES	LANE MILES
Major Arterial	82	400
Minor Arterial	69	248
Major Collector	55	201
Minor Collector	87	205
TOTALS	293	1054

3.2.1 Existing Plans and Policies

The three main governing documents for Scottsdale's street network are the Scottsdale *General Plan 2001*, *Streets Master Plan (2003)*, and the *Design Standards and Policy Manual (2006)*. The Scottsdale *General Plan 2001* is summarized in Chapter 4, *Land Use-Transportation Connection*. The *General Plan* includes a community mobility element that establishes the policy framework for the Transportation Master Plan update, these policies are discussed in Chapter 4.

Streets Master Plan (SMP)

The SMP is primarily a reference document that serves as a guideline in the decision-making process for street classifications and right-of-way requirements, and defines the City of Scottsdale's long-range roadway plans. The SMP is intended to serve as a "handbook" for City staff, the local community, businesses, and developers through the daily decision-making process in detailing potential street improvements.

The objective and purpose of the SMP are designed to implement the vision of the *General Plan*. The vision of the SMP is to "plan, program, build, operate and maintain a street network that allows for the safe, efficient and free movement of people and goods . .". The highlights of the objectives are: improved regional and citywide traffic circulation; efficient use of ITS strategies; maintenance of appropriate levels of service on City streets (LOS D in peak periods); creation and maintenance of a multi-modal network through physical accommodation of non-motorized travel modes; and neighborhood preservation through application of appropriate traffic calming and access management strategies.

The SMP determines the future street network in the City. Specifically it indicates the potential locations of new streets, and improvement concepts for existing facilities over the next 10 to 20 years, as well as the form and function of the future street network. Build-out network.

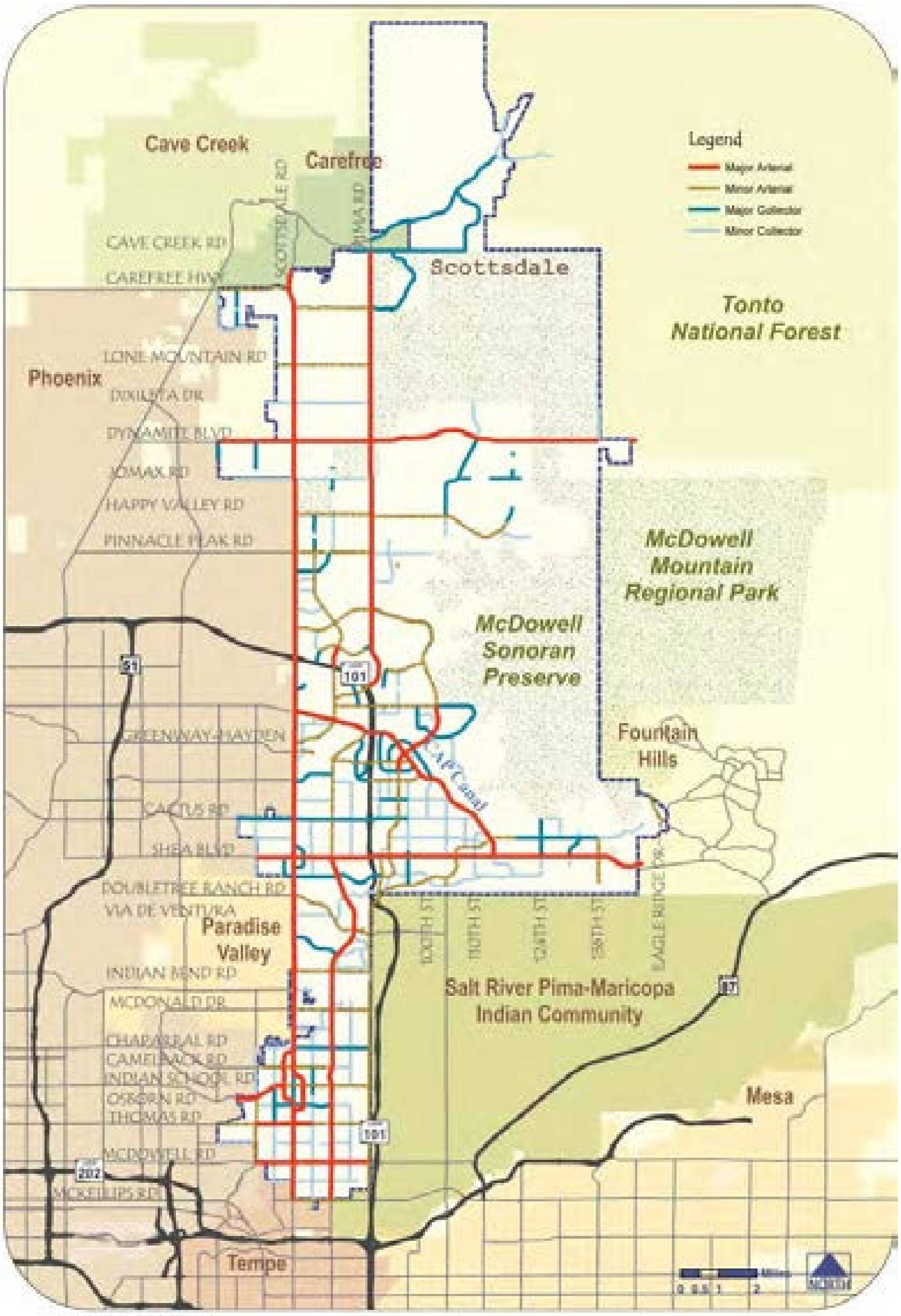
Design Standards and Policy Manual (DSPM)

The DSPM provides design and construction standards for roadway design based on street classifications.

3.2.2 Roadways

Scottsdale's roadways are classified based on the characteristics or functional class of service they provide. Each functional class of street has a different typical cross section, capacity, cross street access, and connections with other major roadways. A functional classification is assigned to a street based on its purpose in the regional, citywide, and local transportation system.

Scottsdale's functional classifications include major and minor arterial and collector streets, and local and residential collector streets (Figure 5, *Functional Classification*). All street classifications typical cross sections vary depending on the nature of the adjacent land use.



Source: City of Scottsdale

Figure 5: FUNCTIONAL CLASSIFICATION

3.2.2.1 Freeway

Administered by ADOT, Loop 101 connects the City of Scottsdale to the metropolitan regional freeway system. Today, the section of Loop 101 through Scottsdale is a six-lane divided freeway. It originally opened to the public in segments as outlined below in Table 2, *Freeway Segments Timelines*. Along this freeway, Scottsdale is served by 16 interchanges from McKellips Road on its southern end to Scottsdale Road at its northern extent (Figure 6, *Loop 101 Interchanges*).

TABLE 2: FREEWAY SEGMENTS TIMELINES

LOOP 101 SEGMENT	MILES	OPEN TO TRAFFIC
Cave Creek Road to Scottsdale Road, Phase B (Phoenix)	6.3	August 2001
Scottsdale Road to Pima Road	2.3	April 2002
Scottsdale / Pima Interim (construction of structures at Scottsdale and Pima Roads)	–	April 2001
Pima Road to Shea Boulevard	4.4	February 2001
Shea Boulevard to 90th Street	1.2	December 1999
90th Street to McDonald Drive	3.2	May 1999
McDonald Drive to Thomas Road	3.2	July 1998

Source: MAG Area Life Cycle Construction Program, Fiscal Year 2004 – 2008

The Regional Transportation Plan (RTP), funded by public vote through Proposition 400 (2004) calls for the widening of Loop 101 (Figure 7, *Programmed Widenings*) through the addition of one general purpose and one High Occupancy Vehicle (HOV) lane in each direction. Widening of the portion of Loop 101 from Shea Boulevard south to the Loop 202 interchange, will be designed and constructed in phase two (fiscal year (FY) 2011–FY (2015) of the RTP. Widening of Loop 101 in Scottsdale north of Shea Boulevard will be completed in phase four (FY 2021–FY 2026) of the RTP. The design and construction of the HOV lanes on Loop 101 through Scottsdale will also be completed in two phases (Figure 8, *New Interchanges, HOV Lanes, And HOV Ramp Connections*). Loop 101 HOV lanes south of Princess Drive will be completed in phase one (FY 2005–FY 2010). North of Princess Drive will be completed in phase two (FY 2011–FY 2015) of the RTP.

3.2.2.2 Arterial Streets

Arterial streets provide regional continuity and carry high volumes of traffic over long distances at higher speeds throughout the City and region. The primary purpose of arterial streets is to move traffic; therefore, full access to abutting commercial and multi-family land uses is limited. Grade-separated pedestrian and bicycle crossings along arterials are provided when feasible for multi-use paths.

In general, major arterials serve regional travel and connect developed areas within the region. In Scottsdale, major arterials typically have six vehicle lanes and one bicycle lane in

Figure 6: LOOP 101 INTERCHANGES

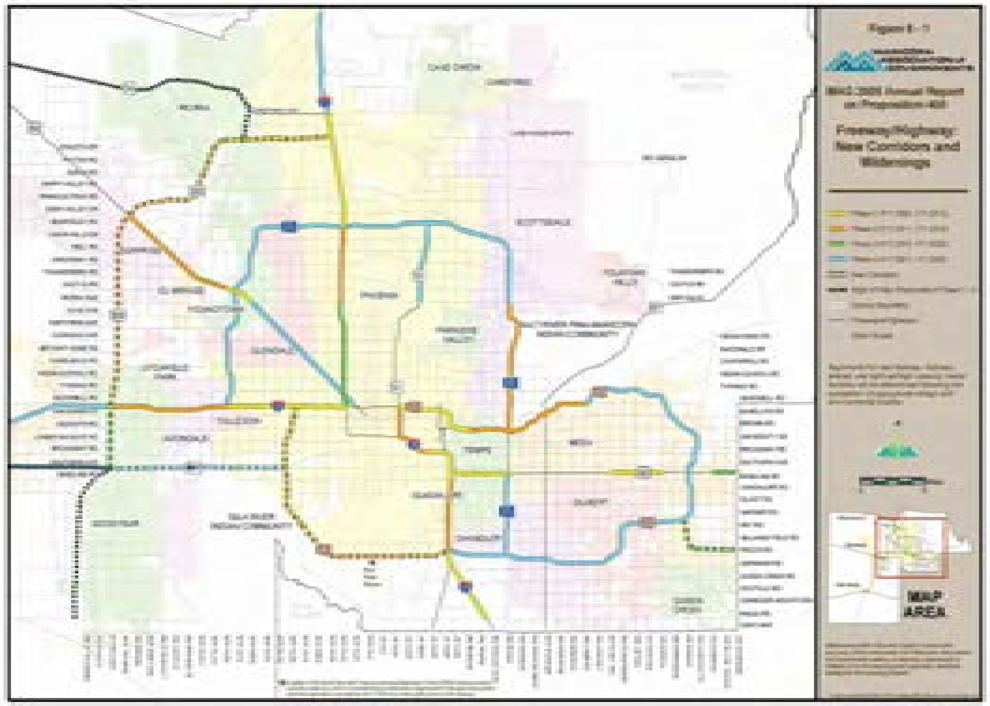


Figure 7: PROGRAMMED WIDENINGS

Figure 8: NEW INTERCHANGES, HOV LANES, AND HOV RAMP CONNECTIONS

each direction with a raised landscaped median. Turn lanes are provided at intersections for all movements, and sidewalks are detached from the curb due to the high vehicular traffic speeds. Scottsdale Road is an example of a major arterial street.

Scottsdale's streets reflect the character of their surrounding areas by using typical cross sections that are sensitively integrated into the character of the natural and "built environments". The three typical sections for major arterials are rural, suburban, and urban (DSPM 2004)(Figure 9, *Major Arterial Typical Cross Sections*). Right-of-way (ROW) requirements for major arterials are 150 feet. Additional scenic easement is required when the arterial is located in a scenic corridor. Major arterials make up approximately 84 roadway miles, or 400 lane miles, of Scottsdale's street network.

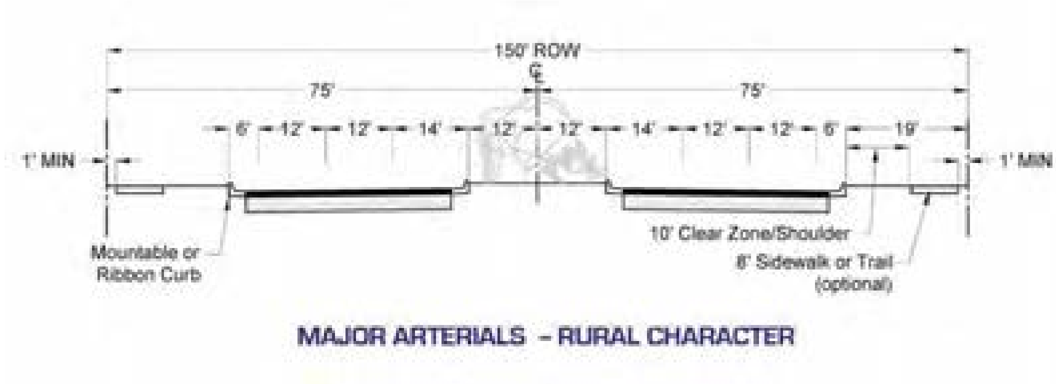
Minor arterial streets, such as Indian Bend Road, provide citywide travel that connect developed areas. They provide moderate traffic volume capacity and travel at lower speeds than the major arterials. Minor arterials typically have four vehicle lanes and two bicycle lanes with a raised landscaped median and require only 110 feet of ROW (Figure 10, *Minor Arterial Typical Cross Sections)*. The three typical cross sections for minor arterials are rural / Environmentally Sensitive Lands (ESL), suburban, and urban. There are approximately 69 centerline miles, or 248 lane miles, of minor arterials within Scottsdale's street network.

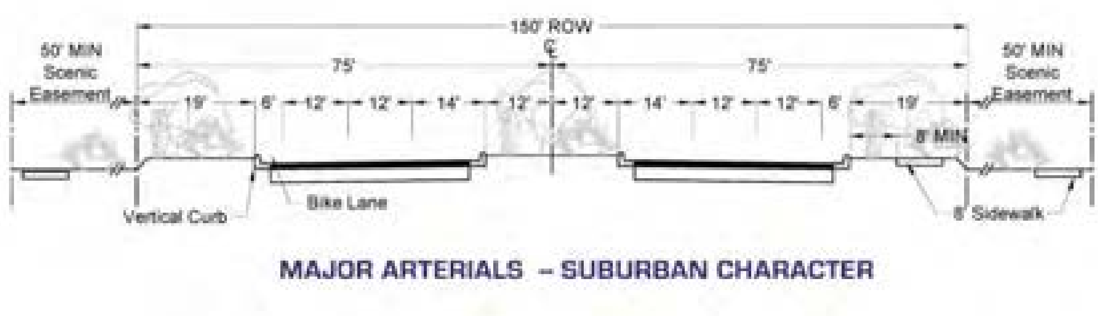
3.2.2.3 Collector Streets

Collector streets link local traffic generators such as grocery stores with less intensely developed areas. They traverse shorter distances and facilitate moderate speeds. There are two types of collector streets, major and minor collectors.

Major collector streets have four to five vehicle lanes and bicycle lanes. The four typical cross sections are rural / ESL with trails, rural / ESL, suburban, and urban (see Figure 11, *Major Collector Typical Cross Sections)*. Major collectors require 100 feet of ROW, unless they are located in an environmentally sensitive area where they require 90 feet of ROW. Major collectors make up approximately 56 roadway miles, or 185 lane miles, of Scottsdale's street network.

Minor collector streets link local traffic generators with rural areas. They cover shorter distances at moderate speeds. Minor collectors have two to three vehicle lanes and bicycle lanes. The four character typical sections are rural / ESL with trails, rural / ESL, suburban, and urban (see Figure 12, *Minor Collector Typical Cross Sections)*. Minor collectors require 70 feet of ROW. Minor collectors located within an environmentally sensitive area, which include a trail, require 80 feet of ROW. Scottsdale's network is made up of approximately 86 roadway miles, or 177 lane miles, of minor collectors.





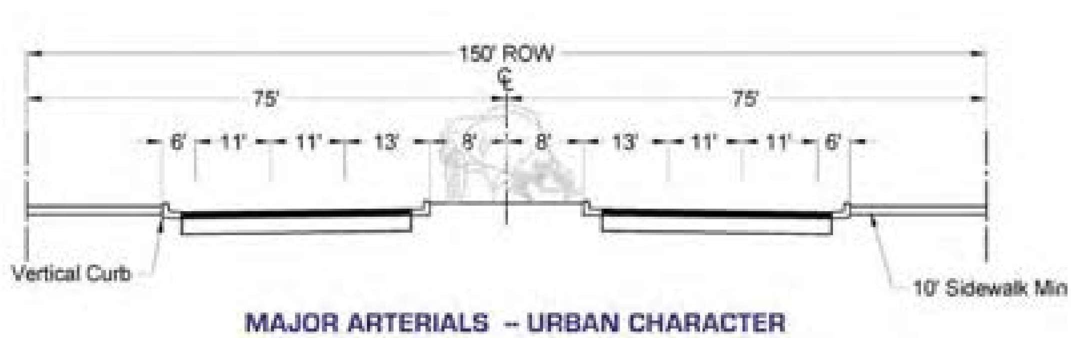
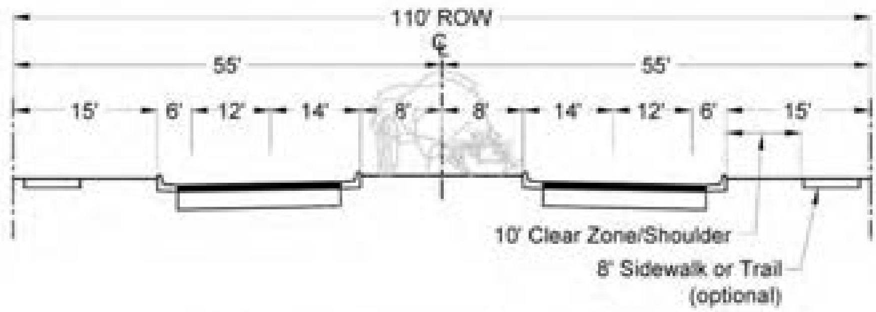
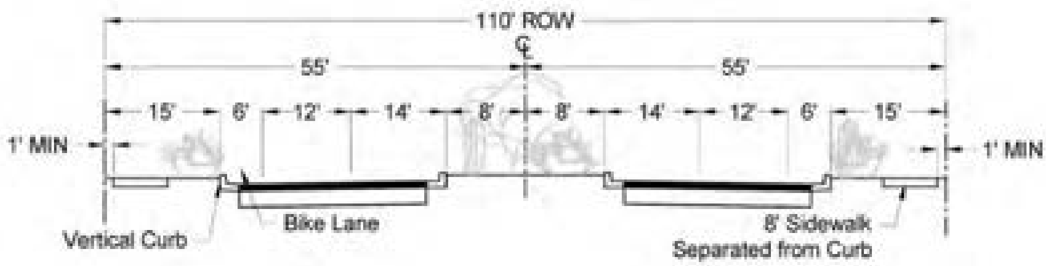


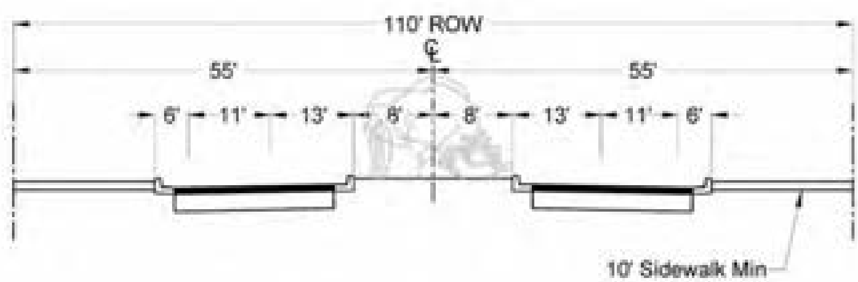
Figure 9: MAJOR ARTERIAL TYPICAL CROSS SECTIONS



MINOR ARTERIALS – RURAL/ESL CHARACTER

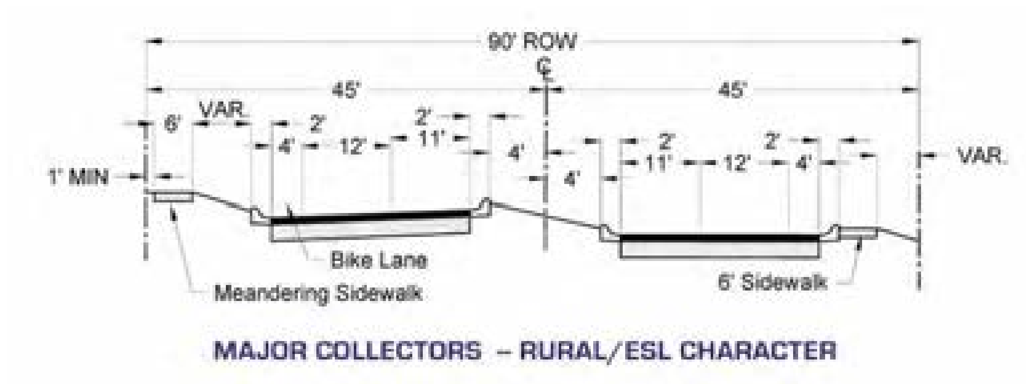


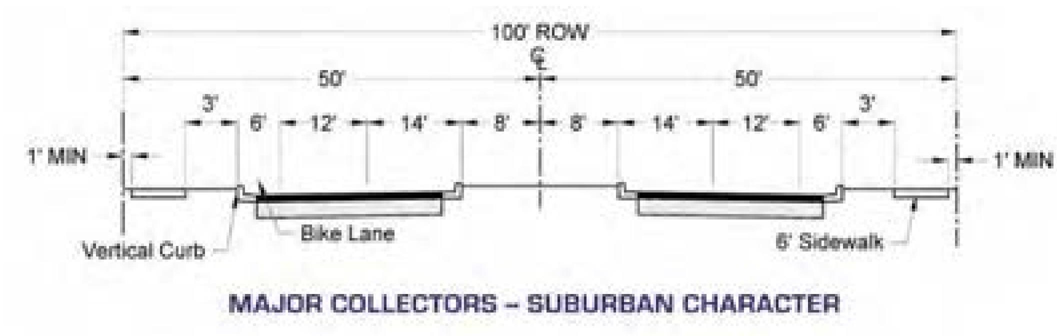
MINOR ARTERIALS – SUBURBAN CHARACTER



MINOR ARTERIALS – URBAN CHARACTER

Figure 10: MINOR ARTERIAL TYPICAL CROSS SECTIONS





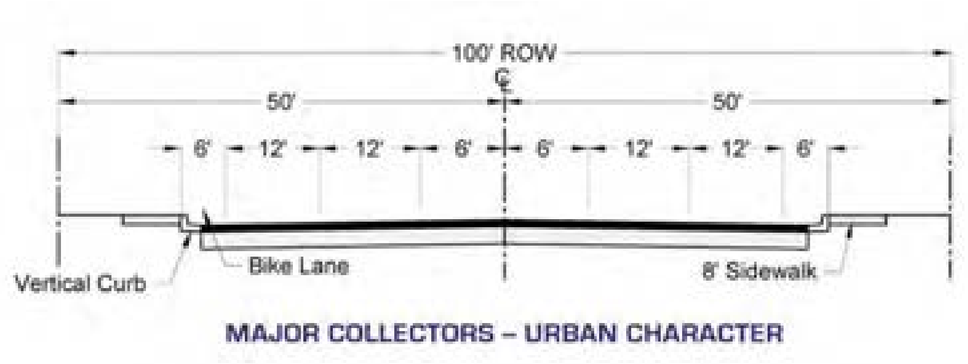


Figure 11: MAJOR COLLECTOR TYPICAL CROSS SECTIONS

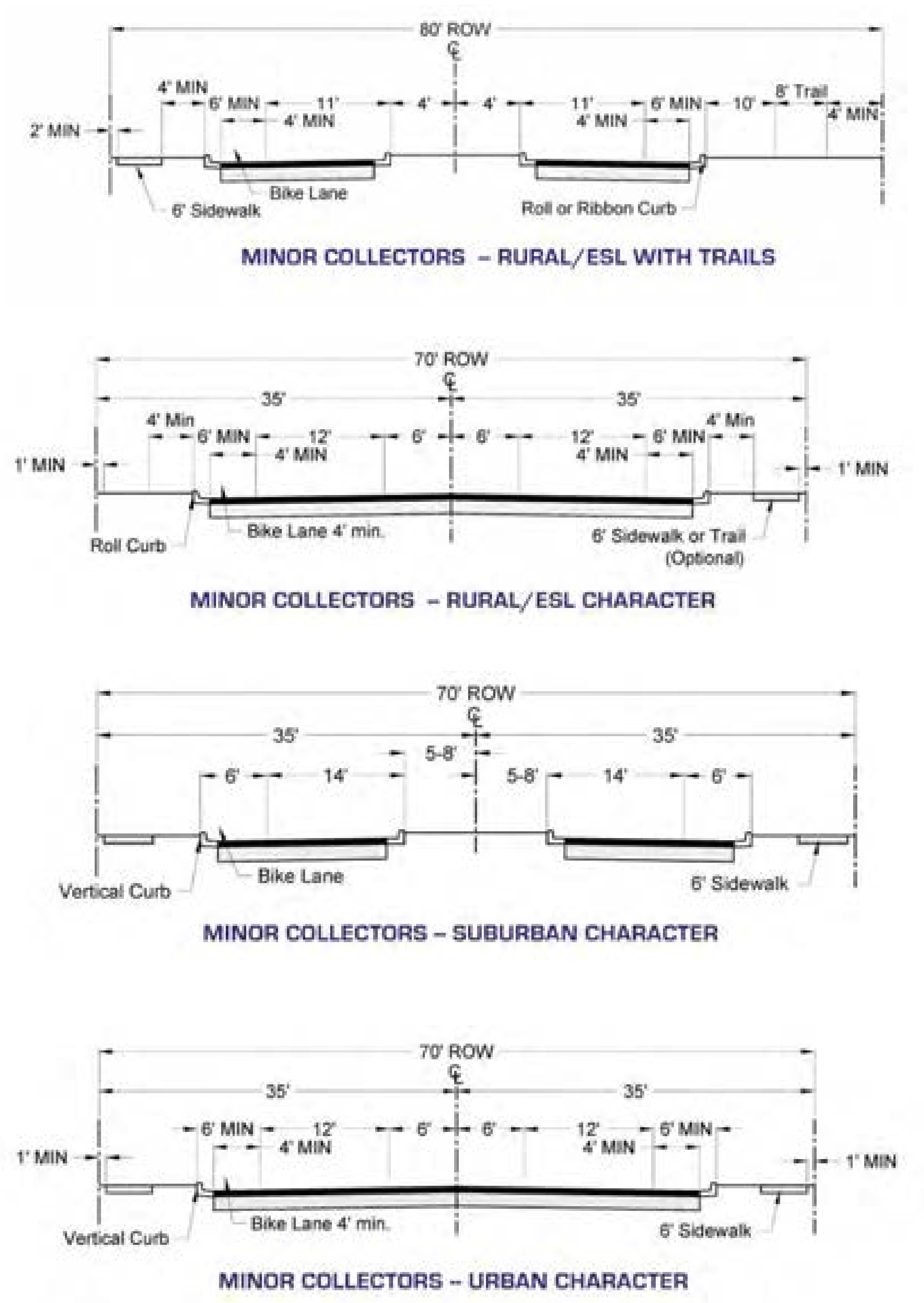


Figure 12: MINOR COLLECTOR TYPICAL CROSS SECTIONS

3.2.2.4 Local Streets

Local streets accommodate low traffic volumes and provide direct access to abutting land uses. Depending on the adjacent land uses, local streets can also be designated as a local collector, local residential, or local commercial / industrial street. The area character of rural / ESL or suburban also influences the roadway design. Right-of-way requirements for local streets vary from 40 feet to 70 feet depending on the location and typical cross-section (Figures 13, 14, and 15). Local roads are typically constructed by the parcel developer.

3.2.3 Truck Routes

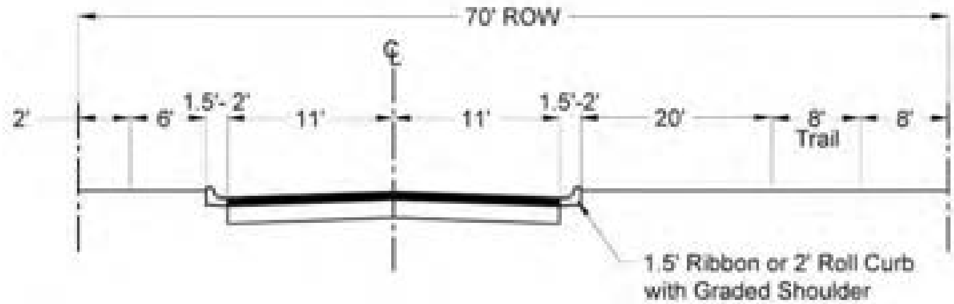
Truck routes are designated roads with adequate geometry and capacity to effectively transport goods in large vehicles to their destination. The City of Scottsdale has eleven designated truck routes within the City limits. The City's truck routes were designated before northern Scottsdale was fully developed and have never been updated (Figure 16, *Designated Truck Routes*). Today the majority of the designated truck routes within Scottsdale lie south of Frank Lloyd Wright Boulevard.

3.2.4 Number of Lanes

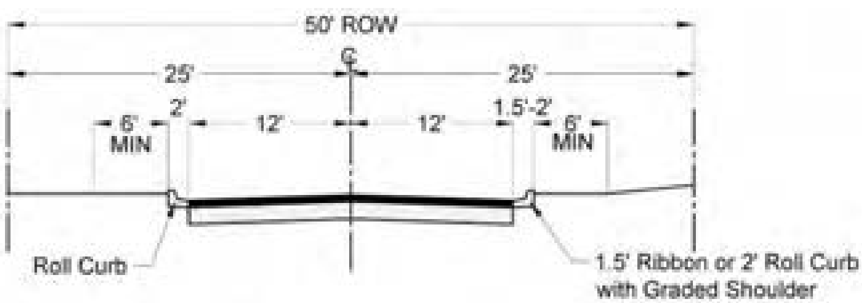
The City's streets have from two to seven travel lanes, including two-way center left-turn lanes (Figure 17, *Number of Travel Lanes on Existing Streets*).

3.2.5 Traffic Volumes

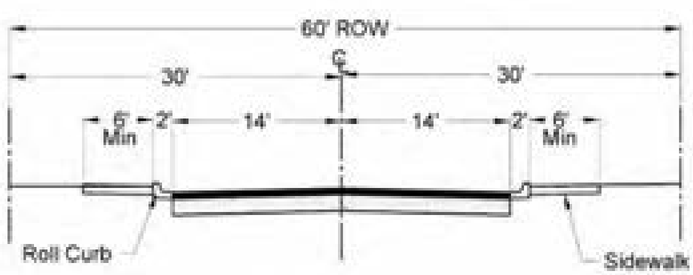
The completion of Loop 101 through Scottsdale between 1998 and 2001 significantly changed traffic conditions throughout the City of Scottsdale. The Loop 101 increased north-south travel capacity east of the City and east-west travel capacity through northern Scottsdale. Year 2004 traffic volumes, the latest counts available, are shown in Figure 18, *Year 2004 Traffic Volumes from the City of Scottsdale*. With the opening of Loop 101, north-south streets in southern Scottsdale, such as Hayden and Scottsdale Roads, experienced a decrease in traffic volume. With just a few exceptions, traffic reductions were greater than 25 percent on all north-south arterials and collectors (Figure 19, *Southern Scottsdale – 1996-2004 Change In Traffic Volumes*). Conversely, traffic volumes increased by more than 50 percent between Pima and Hayden Roads for east-west arterials that had access to the freeway; changes in east-west volumes were much less to the west of Hayden Road. In central Scottsdale (Figure 20, *Central Scottsdale – 1996-2004 Change In Traffic Volumes*), new development in the general vicinity of the east-west segment of Loop 101 resulted in volume increases of 50 percent or more on Scottsdale and Pima roads from Frank Lloyd Wright Boulevard to the north, a trend that continued into northern Scottsdale (Figure 21, *Northern Scottsdale-1996-2004 Change In Traffic Volumes*).



LOCAL COLLECTORS – RURAL/ESL WITH TRAILS



LOCAL COLLECTORS – RURAL/ESL CHARACTER



LOCAL COLLECTORS – SUBURBAN CHARACTER

Figure 13: LOCAL COLLECTOR TYPICAL CROSS SECTIONS

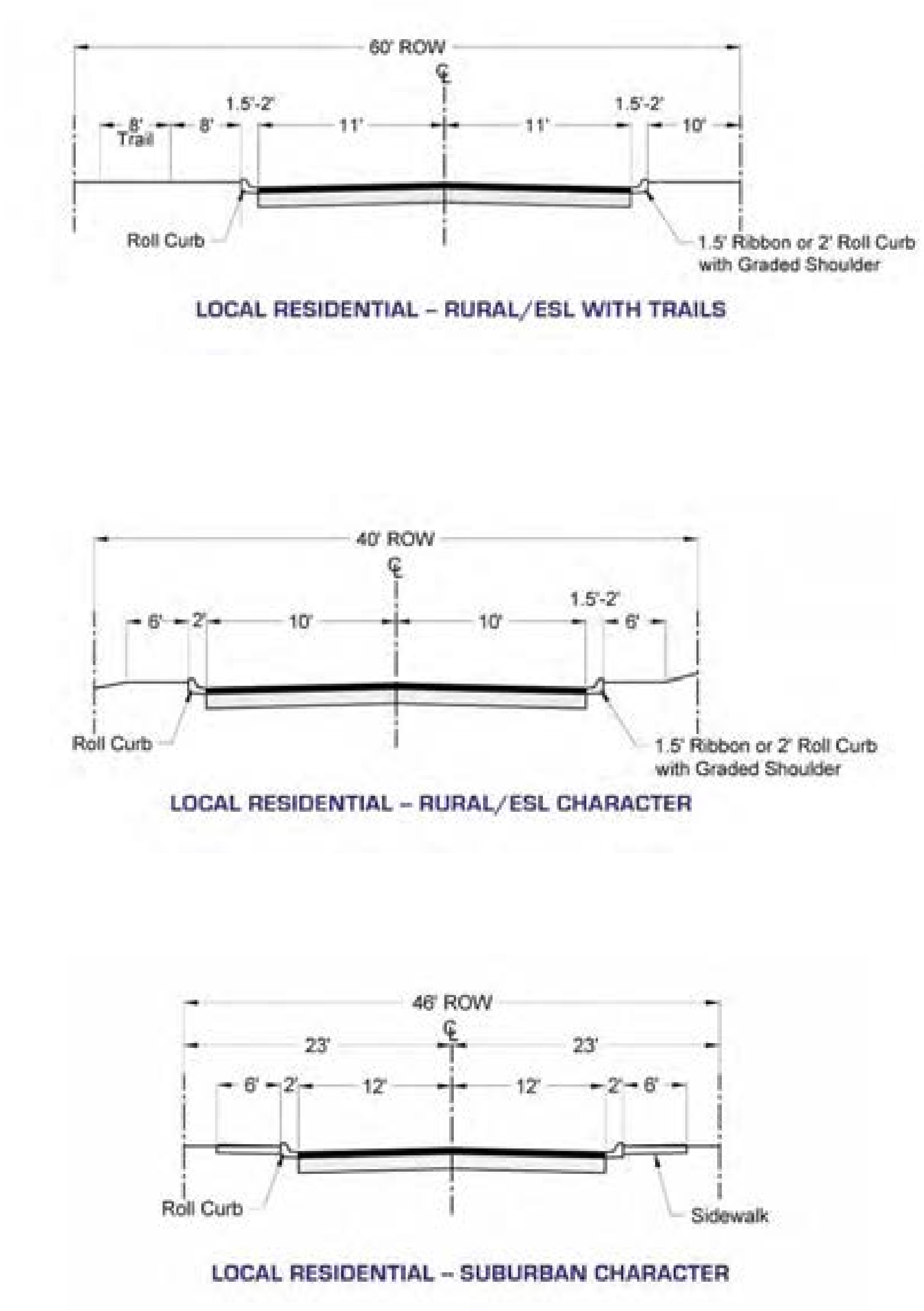


Figure 14: LOCAL RESIDENTIAL TYPICAL CROSS SECTIONS

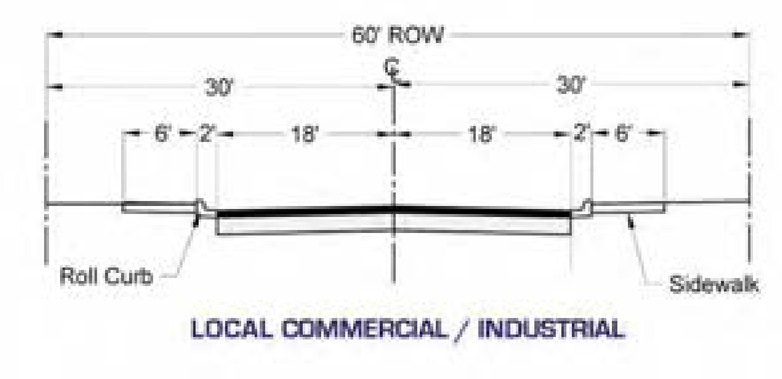


Figure 15: LOCAL COMMERCIAL/INDUSTRIAL TYPICAL CROSS SECTIONS

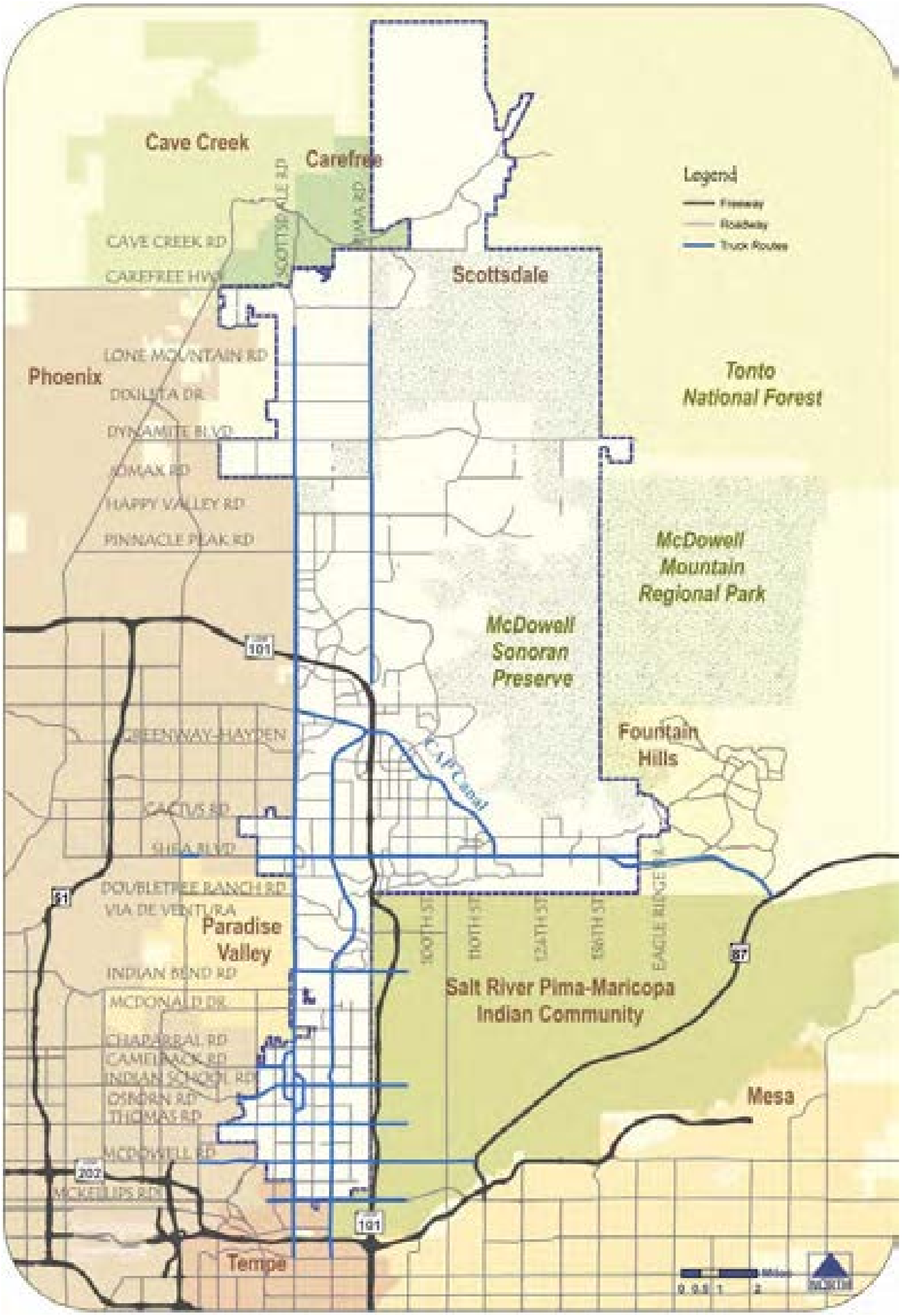


Figure 16: DESIGNATED TRUCK ROUTES

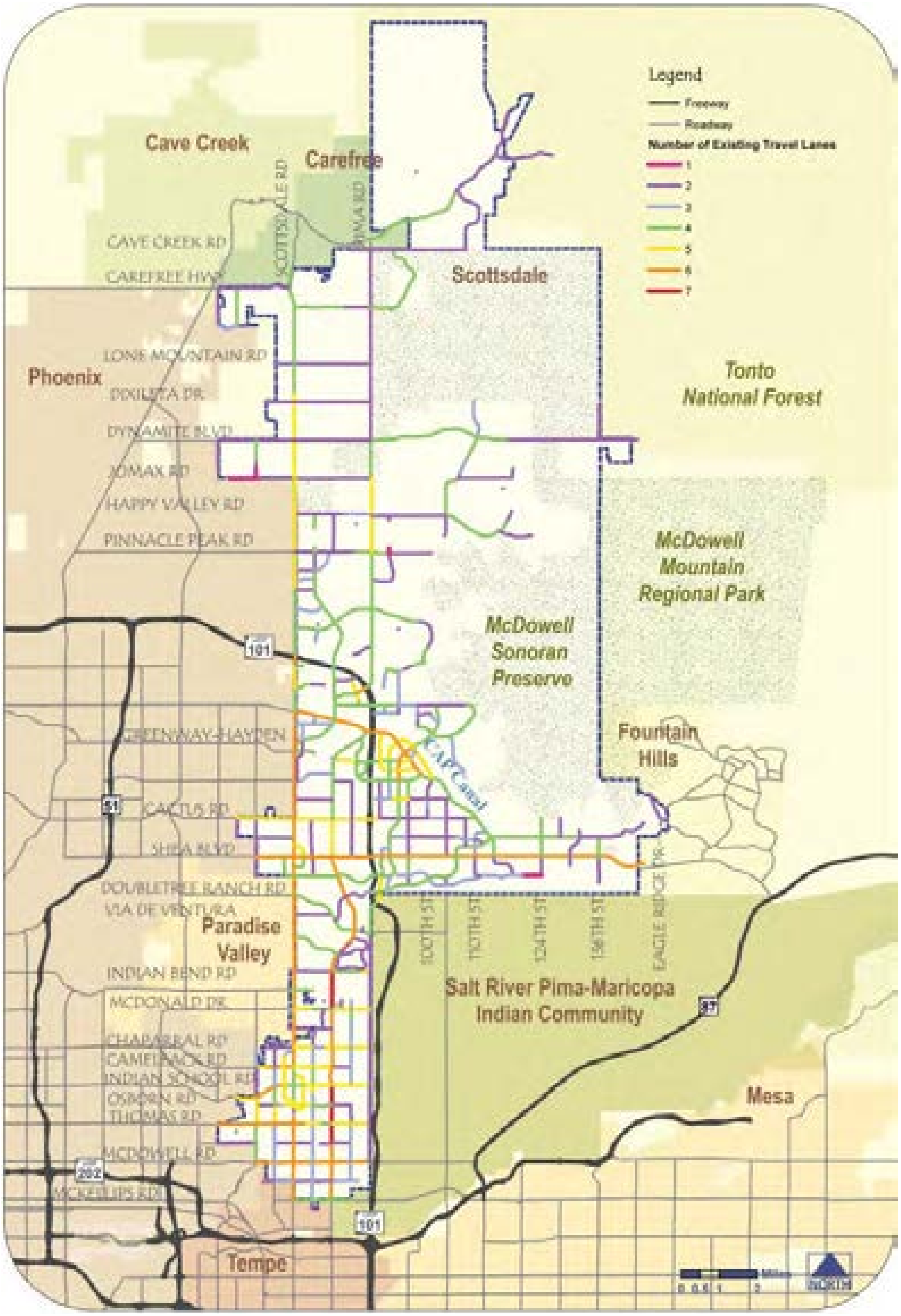


Figure 17: NUMBER OF TRAVEL LANES ON EXISTING STREETS

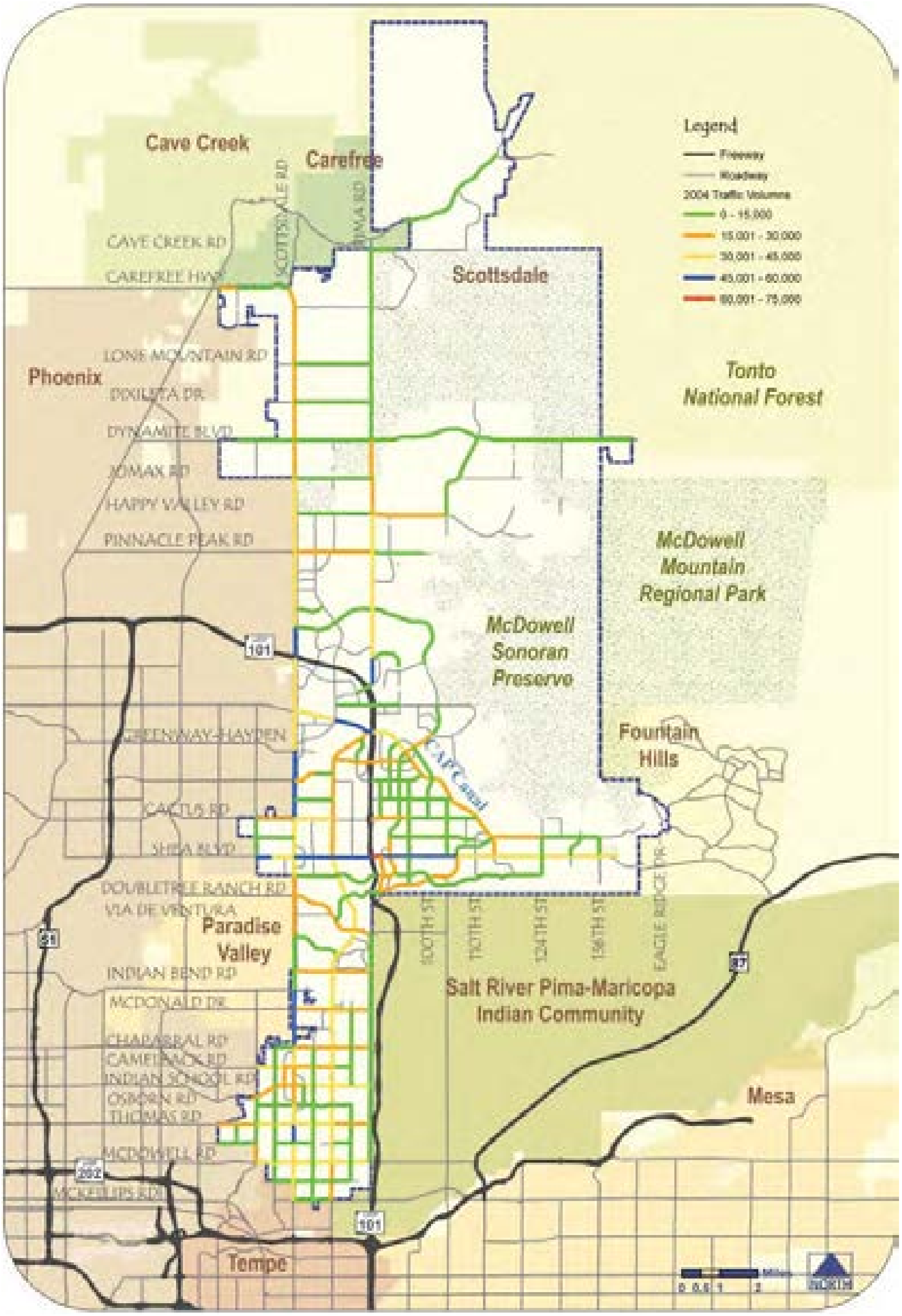


Figure 18: YEAR 2004 TRAFFIC VOLUMES FROM THE CITY OF SCOTTSDALE

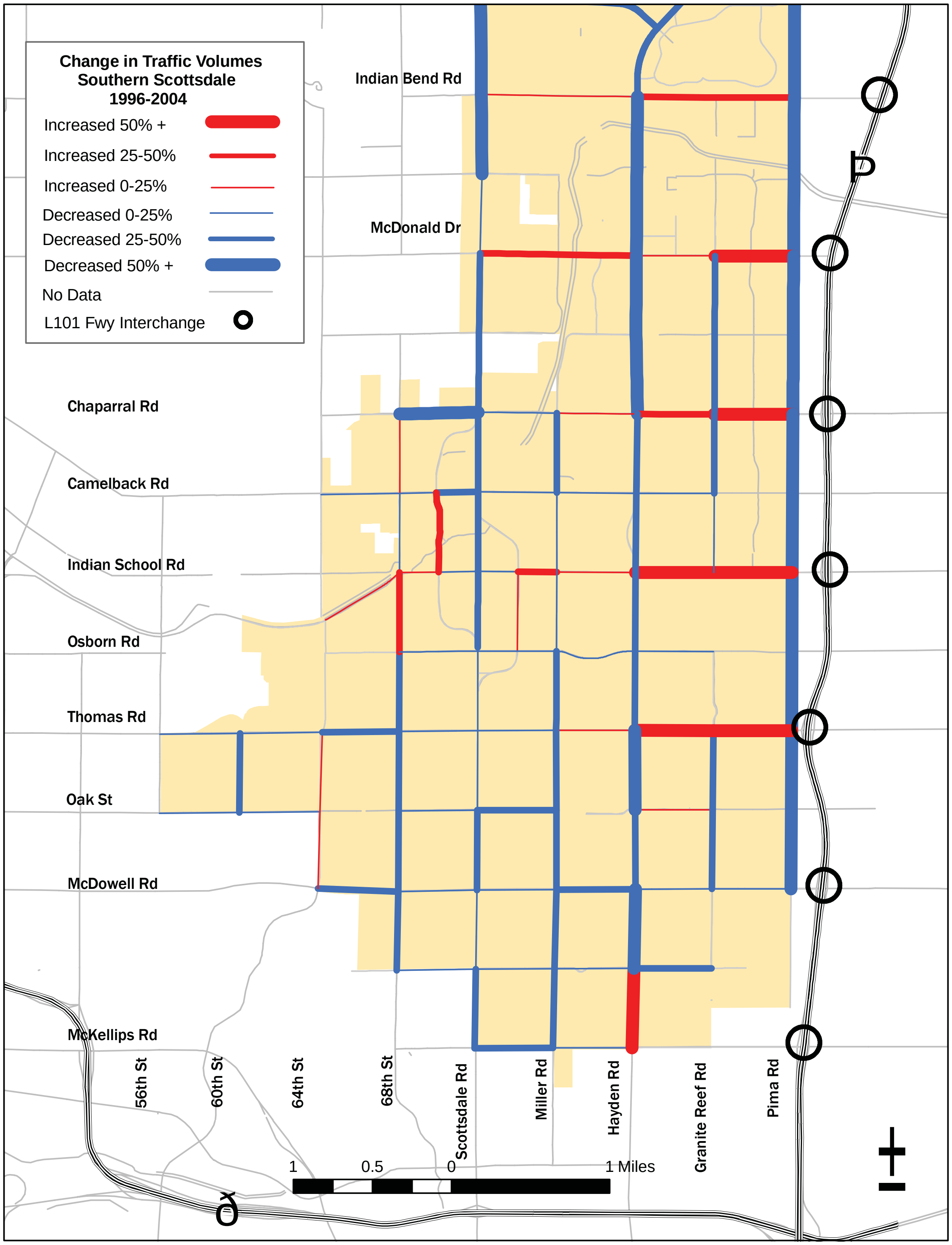


Figure 19: SOUTHERN SCOTTSDALE - 1996-2004 CHANGE IN TRAFFIC VOLUMES

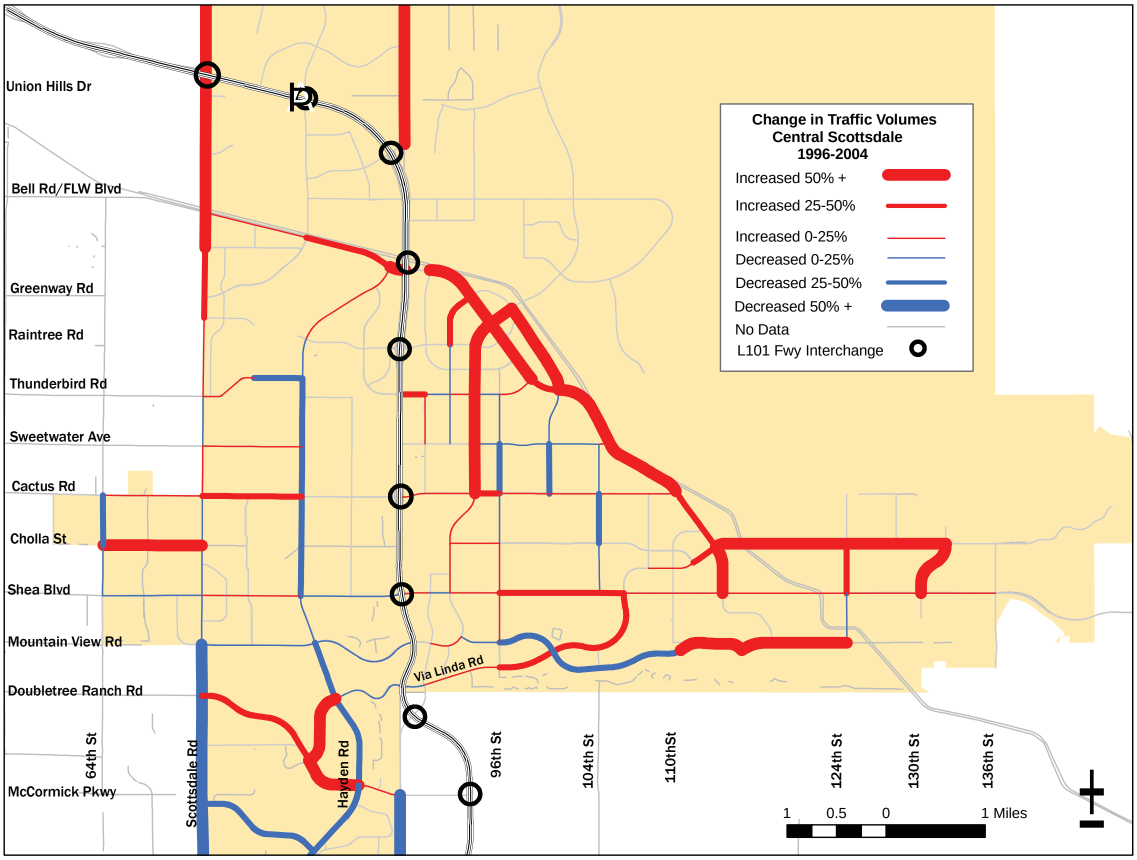


Figure 20: CENTRAL SCOTTSDALE - 1996-2004 CHANGE IN TRAFFIC VOLUMES

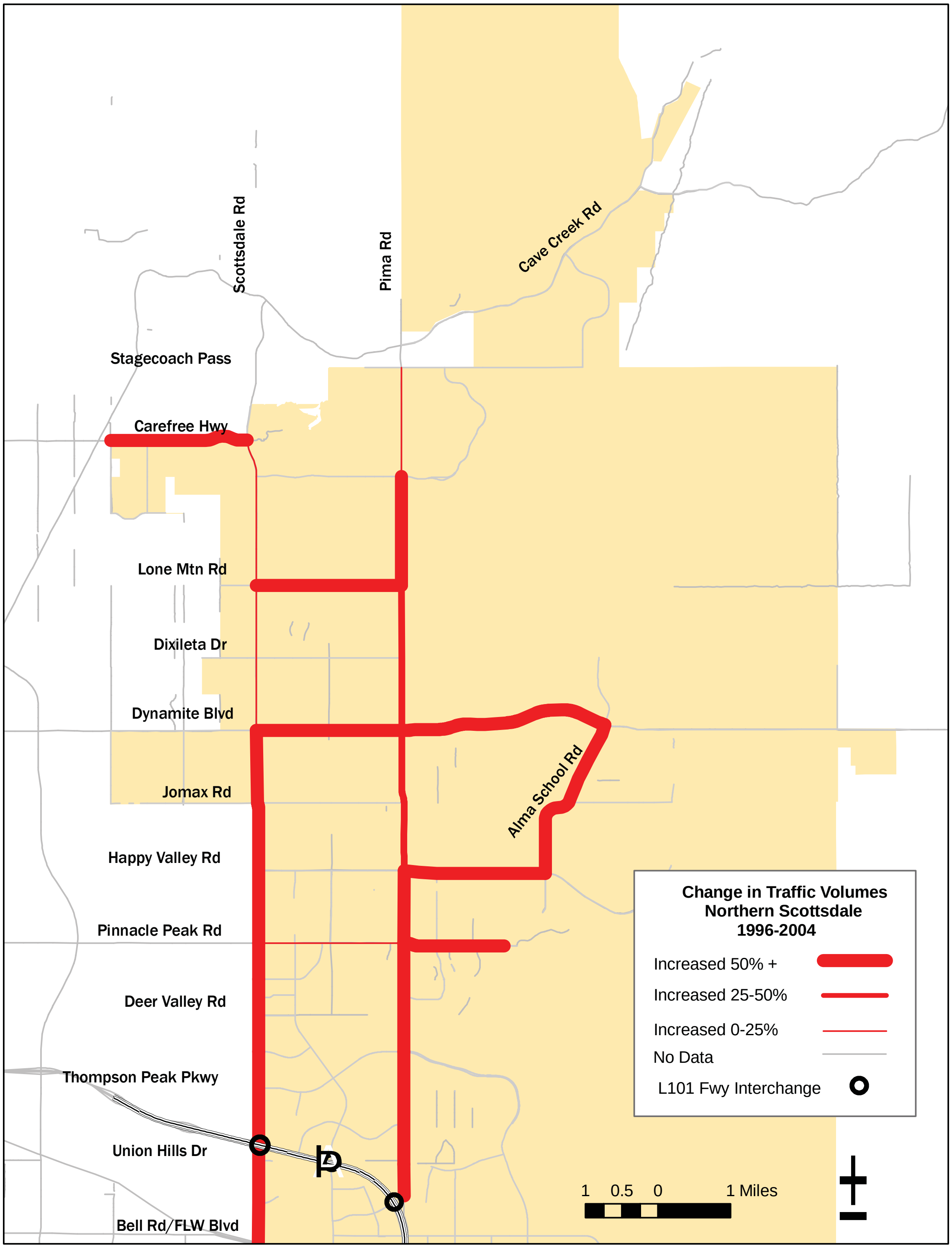


Figure 21: NORTHERN SCOTTSDALE - 1996-2004 CHANGE IN TRAFFIC VOLUMES

As shown in Table 3, *Traffic Volume Summary*, 13 miles of arterial streets carry over 45,000 vehicles per day (vpd), and a short piece of Shea Boulevard as it approaches Loop 101 from the east exceeds 60,000 vpd. The longest stretch of heavy traffic is Shea Boulevard, which carries over 45,000 vpd between Scottsdale Road and Via Linda. Short segments of Scottsdale Road (Oak Street to Thomas Road, Chaparral Road to Indian Bend Road, Cactus Road to Greenway-Hayden, and Loop 101 to Thompson Peak Parkway) carry over 45,000 vpd as does a short segment of Pima Road immediately north of Loop 101 and Frank Lloyd Wright Boulevard between Hayden Road and Loop 101.

TABLE 3: TRAFFIC VOLUME SUMMARY

VEHICLES PER DAY	ROADWAY LENGTH (MILES)					PERCENT
	MAJOR ARTERIAL	MINOR ARTERIAL	MAJOR COLLECTOR	MINOR COLLECTOR	TOTAL	
0 - 15,000	16	11	6	23	56	50 %
15,001 - 30,000	6	13	4	3	26	23 %
30,001 - 45,000	11	3	1	1	16	14 %
45,001 - 60,000	12	2	0	1	15	13 %
60,001 - 75,000	0	0	0	0	0	0%

Overall, 161 miles of Scottsdale's arterials, 75 percent of the total, carry volumes less than 30,000 vpd, a volume that a four-lane roadway can comfortably accommodate. The other 53 miles, the portion that carries over 30,000 vpd, are those that form the core of Scottsdale's street transportation system and, thus, deserve special consideration in the preparation of the Scottsdale Transportation Master Plan. These heavier volumes occur on:

- Scottsdale Road from the southern City limits to Jomax Road;
- Hayden Road between McDowell Road and Shea Boulevard;
- Pima Road from Loop 101 north to Happy Valley Road;
- Shea Boulevard from City limit to City limit;
- McDowell Road from City limit to City limit; and
- Indian School Road from Drinkwater Boulevard to Pima Road.

3.2.6 Collision Data

Based on a review of Scottsdale's traffic and collision data, vehicle collisions remained constant over 10 years. The annual number of vehicle collisions in the City, based on collisions reported to the Scottsdale Police Department, for 1994 through 2004 is shown in Figure 22, *Total Vehicle Collisions from 1994 to 2004* The annual number of vehicle collisions averaged 4,528 over these 11 years, ranging from a low of 4,026 in 2003 to a high of 5,181 in 2004. Thirty percent of the collisions that occurred during this period resulted in injury to one or more persons.

Accounting for 39 percent of the incidents reported in 2004, rear-end crashes are the predominant type of collision in the City (Figure 23, *2004 Collisions by Type – All Collisions*). Left turn (15 percent), angle (14 percent), and sideswipes (11 percent) make up another 40 percent of the collisions. The remaining 21 percent of collision by type are single vehicle, bicycle, pedestrian, right turn, head-on and other (2004 Scottsdale Collision Data).

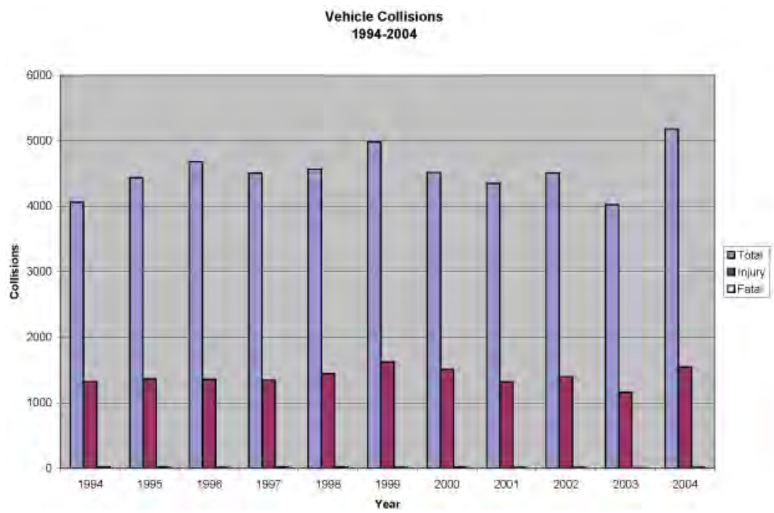


Figure 22: TOTAL VEHICLE COLLISIONS FROM 1994 TO 2004

3.2.7 Traffic Capacity

Scottsdale's 2004 traffic volume data (2004 Scottsdale Average Weekday Traffic Counts) provides a baseline for comparison of planned transportation enhancements in future years. This data was used for a screenline analysis of eleven areas throughout Scottsdale. A screenline analysis of 24-hour traffic volumes crossing an imaginary line for person-trips compares roadway capacity to actual traffic volumes to determine where increased capacity is needed. A person-trip is the product of vehicles per day with an average vehicle occupancy rate of 1.2 persons. This calculation does not include transit ridership. The person capacity of a roadway assumes 8,000 vehicles per day per lane with average vehicle occupancy of 1.2. This typical capacity can be influenced up or down by the access and land use characteristics of the roadway.

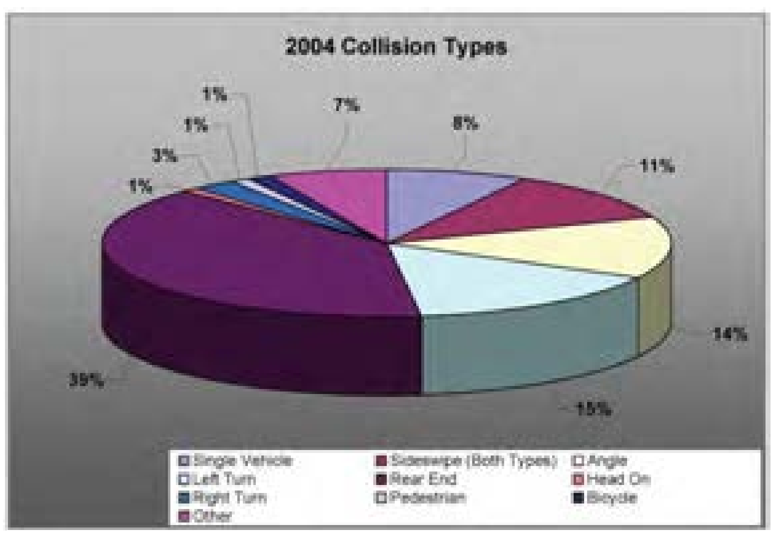


Figure 23: 2004 COLLISIONS BY TYPE - ALL COLLISIONS

Table 4, *Screenline Analysis of 2004 Traffic Volumes*, depicts the numerical results of the eleven screenlines studies throughout the City. The final column of this table compares person-trips to capacity and reveals locations where roadway capacity may be lacking. As this number approaches 1.0, the traffic volume equals that of the typical capacity indicating that transportation capacity may need to be added to accommodate future growth. As shown in Table 4, vehicle person-trips consume anywhere from 50 to 90 percent of the daily roadway capacity with significant trends differentiating southern Scottsdale and northern Scottsdale. A graphical representation of the screenline analysis is shown in Figure 24, *Screenline Analysis*. The blue dotted line is the screenline while the red arrow shows the flow of traffic across the screenline.

TABLE 4: SCREENLINE ANALYSIS OF 2004 TRAFFIC VOLUMES

SCREENLINE	CORRIDOR	CROSS STREET	EXISTING NUMBER OF LANES	EXISTING PERSON CAPACITY	POTENTIAL 2030 PERSON CAPACITY	2004 PERSON TRIPS	2004 TRIPS/ EXISTING CAPACITY
A	South of Thomas Road	64th Street	4	38,400	38,400	19,700	0.72
		68th Street	2	19,200	19,200	14,800	
		Scottsdale Road	6	57,600	57,600	57,400	
		Miller Road	2	19,200	19,200	14,600	
		Hayden Road	6	57,600	57,600	39,200	
		Pima Road	2	19,200	38,400	5,600	
B	North of Indian School Road	68th Street	2	19,200	38,400	17,900	0.54
		Goldwater Blvd	5	48,000	48,000	27,000	
		Scottsdale Road	4	38,400	38,400	19,400	
		Drinkwater Blvd	5	48,000	48,000	16,800	
		Miller Road	4	38,400	38,400	17,100	
		Hayden Road	6	57,600	57,600	39,800	
		Granite Reef Road	2	19,200	19,200	6,200	
		Pima Road	2	19,200	38,400	11,500	
C	North of Indian Bend Road	Scottsdale Road	6	57,600	57,600	10,000	0.51
		Hayden Road	6	57,600	57,600	44,700	
		Pima Road	2	19,200	38,400	13,600	
D	South of Doubletree Road	Scottsdale Road	6	57,600	57,600	24,600	0.62
		Hayden Road	6	57,600	57,600	45,100	
		Pima Road	2	19,200	38,400	13,600	
E	North of Cactus Road	Scottsdale Road	6	57,600	57,600	56,100	0.70
		Hayden Road	4	38,400	38,400	24,600	
		94th Street	4	38,400	57,600	16,500	
		96th Street	2	19,200	38,400	4,700	
		Frank Lloyd Wright Blvd	4	38,400	38,400	32,300	

TABLE 4: SCREENLINE ANALYSIS OF 2004 TRAFFIC VOLUMES							
SCREENLINE	CORRIDOR	CROSS STREET	EXISTING NUMBER OF LANES	EXISTING PERSON CAPACITY	POTENTIAL 2030 PERSON CAPACITY	2004 PERSON TRIPS	2004 TRIPS/ EXISTING CAPACITY
F	North of Central Arizona Project Canal	Scottsdale Road	6	57,600	57,600	47,400	0.81
		Hayden Road	4	38,400	38,400	31,200	
		Thompson Peak Pkwy	4	38,400	38,400	30,300	
G	South of Lone Mountain Road	Scottsdale Road	4	38,400	57,600	26,300	0.74
		Pima Road	2	19,200	38,400	16,500	
H	West of Scottsdale Road	Chaparral Road	2	19,200	38,400	3,800	0.53
		Camelback Road	6	57,600	57,600	20,300	
		Indian School Road	4	38,400	38,400	28,400	
		Osborn Road	4	38,400	38,400	7,600	
		Thomas Road	6	57,600	48,000	38,900	
		McDowell Road	6	57,600	57,600	43,500	
I	West of Pima Road	Indian Bend Road	4	38,400	38,400	26,200	0.80
		McDonald Road	4	38,400	38,400	25,400	
		Chaparral Road	4	38,400	38,400	31,700	
		Indian School Road	4	38,400	57,600	44,400	
		Thomas Road	4	38,400	38,400	35,200	
		McDowell Road	6	57,600	57,600	37,400	
J	West of Scottsdale Road	Cactus Road	4	38,400	38,400	35,100	0.92
		Shea Blvd	6	57,600	57,600	53,600	
K	East of Pima Road	Frank Lloyd Wright Blvd	6	57,600	57,600	57,100	0.73
		Raintree Drive	4	38,400	38,400	34,100	
		Thunderbird Road	4	38,400	38,400	10,000	
		Cactus Road	4	38,400	48,000	40,100	
		Shea Blvd	6	57,600	57,600	58,300	
		Mountain View Road	4	38,400	48,000	15,800	
		Via Linda	4	38,400	48,000	9,300	
L	West of 104th Street	Frank Lloyd Wright Blvd	4	38,400	38,400	30,600	0.74
		Cactus Road	2	19,200	38,400	8,100	
		Shea Blvd	6	57,600	57,600	55,800	
		Via Linda	4	38,400	38,400	19,400	

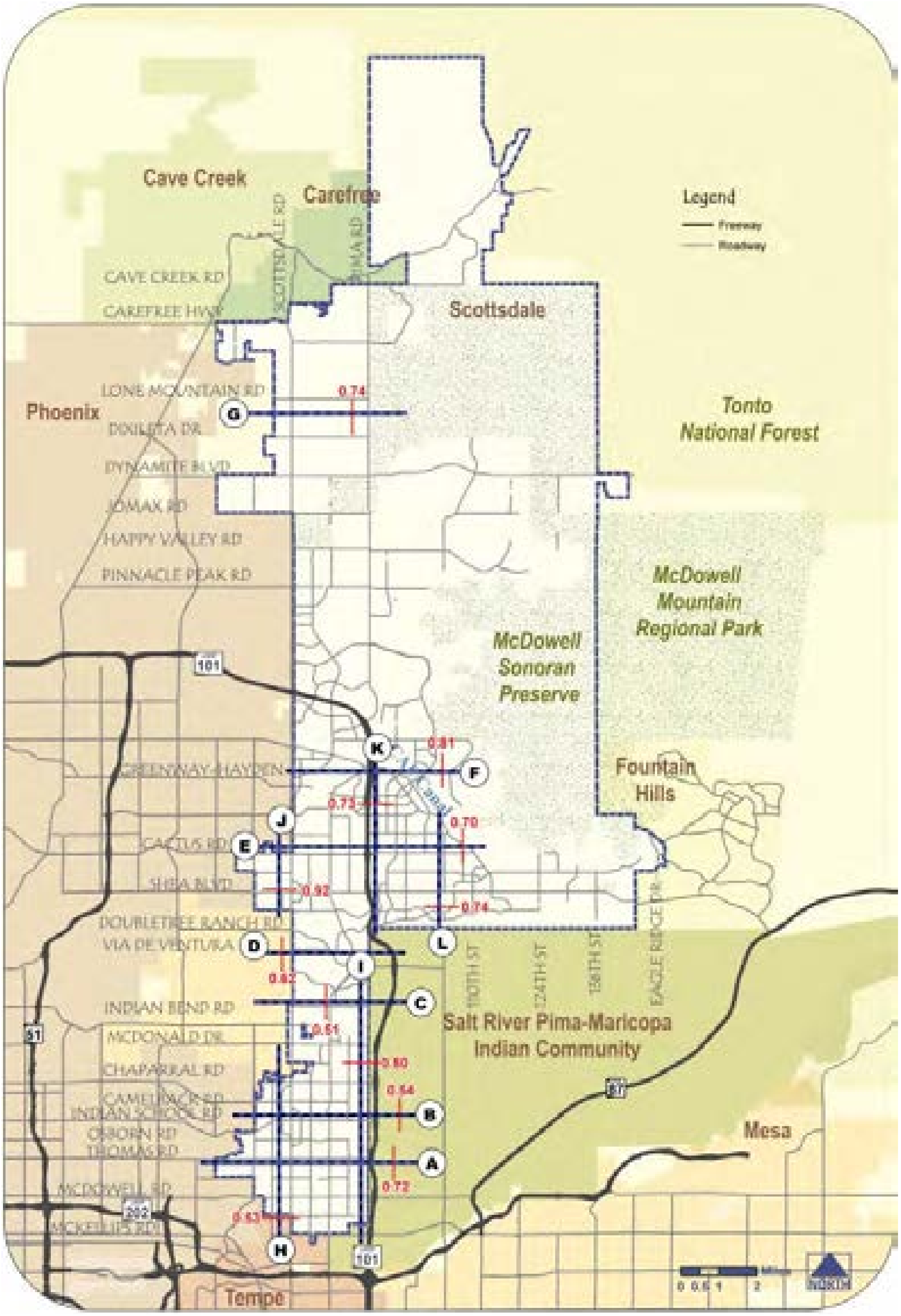


Figure 24: SCREENLINE ANALYSIS

Construction of Loop 101 has reduced traffic volumes on Scottsdale Road, Hayden Road, and Pima Road but they are gradually increasing and may eventually reach pre-freeway levels.

Today, Loop 101 carries over 136,000 vpd. Using the latest available regional travel forecasts[4], the volume on Loop 101 is expected to increase to 250,000 vpd by 2030, a volume at which, even with the planned additional lanes, the freeway will experience level of service (LOS) F for up to two hours during peak morning and afternoon periods. Level of service is a measurement of roadway congestion ranging from LOS A, least congested to LOS F , most congested. Further, with the projected developments in and around Scottsdale, including 40,000 new employees on the SRPMIC, 50,000 employees in the Scottsdale Airpark, One Scottsdale, and higher densities in downtown Scottsdale, the forecasted volumes on the regional and local transportation systems are expected to increase.

3.2.8 Proposition 400 Streets Projects within Scottsdale

Passed by voters in 2004, Proposition 400 continues the half-cent transportation sales tax for an additional 20 years funding transportation related projects in Maricopa County. Combined with state and federal transportation funds, Proposition 400 will create $17.6 billion for transportation projects throughout the region. The projects listed below are the Proposition 400-funded roadway projects for Scottsdale or the freeways serving Scottsdale. A total of $580.3 million (in 2002 dollars) in regional funds is programmed for Scottsdale freeways and arterial streets, with a 30 percent local match of $122.2 million required for the arterial street projects. Table 5, *Summary of Proposition 400 Projects*, shows the projects, their funded amounts and sources, and planned construction periods.

TABLE 5: SUMMARY OF PROPOSITION 400 PROJECTS

PROJECTS	REGIONAL FUNDS 2002 $ IN MILLIONS	LOCAL FUNDS 2002 $ IN MILLIONS	YEAR
FREEWAYS			
Pima / 64th Interchange	$23.0	$0.0	2007
Pima HOV Lanes - Princess to Loop 202	$73.4	$0.0	2007
Pima HOV Lanes - Scottsdale to Princess	$12.5	$0.0	2011
Red Mountain Travel Lanes - Rural to Loop 202	$37.2	$0.0	2012
Pima Travel Lanes - Shea to Loop 202	$90.7	$0.0	2014
Pima Travel Lanes - Scottsdale to Shea	$51.0	$0.0	2022
FREEWAY SUBTOTAL:	$287.8		

4 2004 MAG Traffic Model Simulation

TABLE 5: SUMMARY OF PROPOSITION 400 PROJECTS			
PROJECTS ARTERIAL ROADWAYS	REGIONAL FUNDS 2002 $ IN MILLIONS	LOCAL FUNDS 2002 $ IN MILLIONS	YEAR
Loop 101 North Frontage - Scottsdale to Princess	$21.3	$9.1	2006-2008
Loop 101 South Frontage - Hayden to Princess	$12.7	$5.5	2010
Pima Rd. - South City Limits to 90th (SRPMIC)	$28.2	$12.1	2010
Scottsdale Rd. - Thompson Peak to Happy Valley	$12.3	$5.3	2014-2015
Pima Rd. - Dear Valley to Happy Valley & Dynamite To Cave Creek (1st 4 lanes)	$76.4	$32.8	2011-2015
Carefree Highway - Cave Creek to Scottsdale	$8.6	$3.7	2016
Scottsdale Airport Runway Tunnel	$64.5	$27.6	2018
Scottsdale Rd. - Happy Valley to Carefree Highway	$26.1	$11.2	2018-2019
Pima Rd. - Happy Valley to Dynamite	$21.8	$9.3	2016-2018
Miller / Loop 101 Underpass	$12.9	$5.5	2020
Union Hills Dr. - Hayden to Pima	$12.5	$5.4	2022
Shea Blvd. - Loop 101 to SR 87	$21.3	$9.1	2024
ARTERIALS SUBTOTAL:	$318.7	$136.6	

3.2.9 Capital Improvement Projects

Capital improvement projects are physical construction projects. Transportation capital improvements that have been identified meet the City Council's goal of providing for the safe, efficient, and affordable movement of people and goods throughout the City and providing multi-modal options. They include airport, road, transit, bicycle, and pedestrian improvements. Major roadway and intersection projects planned for fiscal years 2006 through 2011 are outlined below.

Only 12 percent of the City's 2006-2011 Transportation CIP comes from regional funding. The remainder comes from the City's own 0.2 percent transportation sales tax, bond elections, grants, and developer contributions.

Scottsdale Road – Frank Lloyd Wright Boulevard to Thompson Peak Parkway

Improvements include widening to a six-lane major arterial cross-section with a landscaped median, turn lanes at Frank Lloyd Wright Boulevard, bicycle lanes, sidewalks, curbs and gutters, intelligent transportation system facilities, and pedestrian crossings at the CAP Canal.

Pima Road – Loop 101 to Pinnacle Peak Road

Enhancements include the following: widening Pima Road to six lanes with a landscaped median, turn lanes, grade-separated path crossings, bicycle lanes, sidewalks, curbs and gutters, intelligent transportation system facilities, and noise mitigation.

Thompson Peak Parkway – Bell Road to Union Hills Drive

Improvements include the completion of the four-lane parkway with a wide median, bicycle lanes, sidewalks, and trails.

Indian School Road – Drinkwater Boulevard to Pima Road

Indian School Road improvements include many new features such as: new turn lanes, bus bays, a landscaped median to maximize through capacity, relocated and widened sidewalks, additional on-street bicycle lanes, and improved storm drainage.

Camelback Road– 64th Street to 68th Street

This transportation plan completes the last section of Camelback Road. It includes a four lane roadway with medians / turn lanes, sidewalks, curbs and gutters, and improvement to traffic signals.

McDonald Drive – Scottsdale Road to 78th Street

The project consists of additional turn lane capacity at Scottsdale Road, Miller Road / Cattletrack Road, and 78th Street and enhanced pedestrian features between the Arizona Canal and Miller Road / Cattletrack Road, plus bicycle lanes.

Indian Bend Road – Scottsdale Road to Hayden Road

Indian Bend Road improvements include widening to a four-lane minor arterial standard with landscaped medians, turn lanes, bicycle lanes, curbs and gutters, new bridge crossing at Indian Bend Wash, sidewalk on the south side, and path on the north side.

Shea Boulevard Corridor

Shea Boulevard improvements include intersection enhancements, bus shelters, and the addition of turn lanes at 90th and 92nd Streets

Cactus Road – Loop 101 to Frank Lloyd Wright Boulevard

This project involves the widening to a four-lane major collector between Loop 101 and 96th Street, and a two-lane neighborhood collector between 96th Street and Frank Lloyd Wright Boulevard. Corridor improvements include bicycle lanes, sidewalks, a multi-use nonpaved trail, and a paved path.

Thunderbird Road – Scottsdale Road to Pima Road

Improvements include building the final two lanes of the four-lane major collector with bicycle lanes and sidewalks, adding turn lanes at Scottsdale and Hayden Roads, and re-aligning 73rd Street to the east.

Frank Lloyd Wright Boulevard – Scottsdale Road to Shea Boulevard

The purpose of this project is to construct a series of localized turn lane improvements and access control modifications including median modifications throughout the corridor. The project will also improve the Frank Lloyd Wright Boulevard and Via Linda intersection by constructing new turn lanes, bus bays and bus shelters, and installing intelligent transportation system features.

Bell Road – 94th Street to 98th Street

This project will construct the remaining two travel lanes, a landscaped median, bicycle lanes, sidewalk, and a new bridge wash crossing.

Freeway Frontage Road

The project includes frontage roads on the north and south sides of Loop 101. The frontage road on the south side of Loop 101 will run between Pima Road and Hayden Road while the frontage road on the north side will run from Pima Road to Scottsdale Road.

Pinnacle Peak Road – Miller Road to Pima Road

Improvements include widening to four lanes, landscaped medians, additional turn lanes and bicycle lanes. Pinnacle Peak Road from Scottsdale to Miller Road will be widened to four lanes by a private developer.

3.2.10 Traffic Management Program

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3.3 Transit

3.3.1 Introduction

Much like other communities in the Phoenix metropolitan area, the City of Scottsdale has experienced rapid population growth that continues transforming some portions of the community from a suburban to an urban environment. With this growth and increase in density come several challenges, including the ability to provide transit service that is integrated into a comprehensive multi-modal transportation system.

Forecasted growth and development, decreased land availability to construct new transportation corridors, and anticipated increases in transit-dependent populations make it evident that a variety of transportation strategies are needed to provide a system that effectively serves the residents of Scottsdale.

Route 81 in Scottsdale

3.3.2 Existing Plans and Policies

Scottsdale Transit Plan (2003)

Scottsdale Transit Plan (2003) provides policy guidance for the development and future improvements of the transit system. The transit plan presents a vision that sees Scottsdale residents, employees and visitors with a transit system of accessible mobility choices that support a diverse population, improved air quality, enhanced safety, cost effectiveness, multiple mobility modes, and integration with other valley transit systems.

Scottsdale 2006 Transit Plan Update

The *Scottsdale 2006 Transit Plan Update* recognizes that Scottsdale needs a complement of transportation strategies in order to provide residents with effective travel options. Increasing growth and development concurrent with decreasing land availability mean that transit options must be crafted that best match the travel demand with available resources. The *Scottsdale 2006 Transit Plan Update* looks at prioritizing transit improvements that are possible with Proposition 400 and calls for three significant actions in the Scottsdale Road corridor:

- Prioritize transit improvements from east-west bus routes from the Phoenix border to Scottsdale Road (short term);
- Develop and implement a form of high-capacity transit (HCT) along Scottsdale Road that ultimately connects downtown Scottsdale with other major activity centers (downtown Tempe / ASU Tempe, Skysong) and ultimately with the regional light rail transit system (mid-term); and
- Implement a form of HCT to connect with major activity centers north of downtown such as the resort corridor, Scottsdale Airpark, and One Scottsdale (long-term).

Transit service along Scottsdale Road serves as the backbone of the maturing Scottsdale transit system and, as such, must have improved service characteristics that will meet the increased needs of the corridor's activity centers, business districts, the university, and neighborhoods. These characteristics include:

- Optimized route structure;
- Increased service hours and frequency of service;

- Uniform and streamlined design (transit vehicles and stops); and
- Additional vehicle capacity.

3.3.3 Existing Bus Service

Existing transit service in the City of Scottsdale is characterized by fixed route bus service operating on the arterial grid system. Almost all of the bus routes in Scottsdale connect to other jurisdictions, and in most cases the service is contracted to an outside provider (see Table 6, *Scheduled Valley Metro Scottsdale Bus Routes*). The majority of transit service is focused on the southern half of the City, where the highest densities are located. Scottsdale's north / south configuration and unique geography create challenges for expanding transit service throughout the City.

The City of Scottsdale made substantial improvements to its local bus service in July 2006. Service and frequency improvements have been implemented on a number of its routes, including the Route 72 on Scottsdale Road which received funding through Proposition 400. In addition, the City implemented its first neighborhood circulator.

Existing fixed route bus service in the City of Scottsdale includes 12 local bus routes, three express bus routes, and two neighborhood circulators. In general, local bus routes operate from 5 a.m. to midnight (earlier on some routes) on weekdays, and 7 a.m. to 10:00 p.m. (earlier on some routes) on weekends.

TABLE 6: SCHEDULED VALLEY METRO SCOTTSDALE BUS ROUTES (07 / 06 Schedule)				
		HEADWAY		
ROUTE	NAME	WEEKDAY (PEAK / OFF-PEAK)	SATURDAY	SUNDAY
LOCAL BUS				
17	McDowell Road	30/30	30	30
Green	Thomas Road	20/30	30	30
41	Indian School Road	15/30	30	30
50	Camelback Road	15/60	30	60
66	68th Street	30/30	30	30
72	Scottsdale Road	15/30	30	30
76	Miller Road	30/30	30	60
81	Hayden Road	15/30	60	60
84	Granite Reef	60/60	60	60
106	Shea Boulevard	30/60	30	60
114	Via Linda	60/60	60	60
170	Bell Road	30/30	30	30
EXPRESS BUS				
510	Scottsdale	2 trips (peak direction)	N/a	n/a
512	Scottsdale	2 trips (peak direction)	n/a	n/a
532	Mesa	4 trips (peak direction)	n/a	n/a
NEIGHBORHOOD CIRCULATORS				
Trolley	Downtown Trolley	10	10	n/a
Trolley	Neighborhood Connector	20	20	20

3.3.4 Ridership

Ridership data for existing routes within the City of Scottsdale is available from Valley Metro / RPTA, which produces an Annual Ridership Report. According to this report, total boardings in Scottsdale for FY 2005-2006 were 1,890,631. This marks a 5 percent increase over the previous fiscal year (FY 2004-2005). Total revenue miles for FY 2005-2006 were 1,653,411 and boardings per mile were approximately 1.1. The routes with the highest annual ridership in Scottsdale are Routes 72, 81, 41, and the Green Line.

3.3.5 Paratransit

Paratransit service in the City of Scottsdale is provided by East Valley Dial-a-Ride. Service is provided to those with disabilities and seniors. The Americans with Disabilities

Act (ADA) requires that complementary paratransit service be provided in all areas with three-fourths of a mile of fixed route transit service. East Valley Dial-a-Ride provides ADA and Non-ADA service in Scottsdale every day (including holidays) from 4 a.m. to 1 a.m.

Cab Connection is an alternative to the Dial-a-Ride transportation service in Scottsdale. The program offers 20 vouchers per month per user. Vouchers are subsidized by the City at a rate of 80 percent up to a maximum of $10.00. Users of the cab connection must be disabled and 65 years of age or older.

3.3.6 Scottsdale Trolleys

To support the downtown and resort trade, Scottsdale offers free trolley service between the resorts and within the City's downtown. The trolley travels to the Main Street and Marshall Way Arts districts, Fifth Avenue shops, the Galleria and the Scottsdale Fashion Square. Figure 25, *Downtown Scottsdale Trolley Route*, provides a map of this service route. A neighborhood connector enhances the Downtown Route by connecting community services with the downtown (Figure 26, *Scottsdale Neighborhood Connector Routes*). A Resort Trolley and a shuttle service between the downtown and the Giants Stadium are also available on a seasonal basis. Since 2002, the total number of annual trolley boardings has increased 77 percent, from 42,456 in 2002 to 75,527 in 2005[5].

3.3.6.1 Downtown Scottsdale Trolley

The Downtown Scottsdale Trolley provides downtown Scottsdale patrons with a free ride to Scottsdale Fashion Square, the Fifth Avenue Shops, Marshall Way Arts District, Main Street Arts District, Old Town, and the Scottsdale Convention and Visitors' Bureau. The trolley service went to all-year in FY 2005-06, and to seven days in FY 2006-07. The trolley runs every ten minutes, seven days a week, from 11:00 a.m. until 9:00 p.m. There is no trolley service on New Year's Day, Memorial Day, July 4th, Labor Day, Thanksgiving, or Christmas.

5 Valley Metro

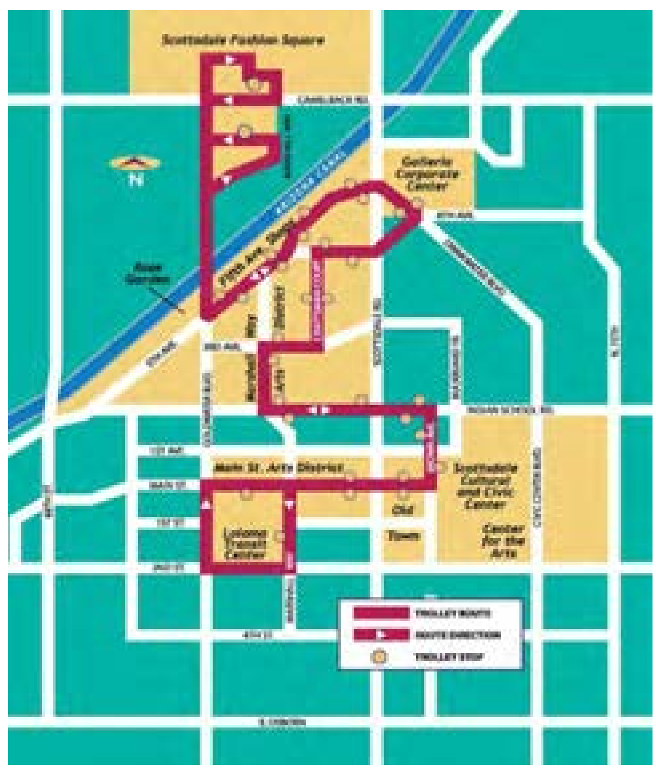


Figure 25: DOWNTOWN SCOTTSDALE TROLLEY ROUTE

3.3.6.2 Scottsdale Resort Trolley

The Scottsdale Resort Trolley, which is also free to ride, connects guests from 11 Scottsdale Resorts on three color-coded trolley routes to Scottsdale Fashion Square and downtown Scottsdale during winter months.

Participating resorts include:

- Camelback Inn;
- Chaparral Suites Resort;
- Doubletree Paradise Valley Resort;
- Gainey Suites Hotel;
- Hyatt Regency Scottsdale Resort and Spa and Gainey Ranch;
- Millennium Resort Scottsdale;
- The Phoenician;
- Renaissance Scottsdale Resort;
- Sanctuary on Camelback Mountain;
- Scottsdale Resort & Conference Center; and
- A JW Marriott Resort & Spa.

Figure 26: SCOTTSDALE NEIGHBORHOOD CONNECTOR ROUTES

3.3.6.3 Scottsdale Neighborhood Circulator

The Neighborhood Circulator is a free circulator service that began running in June 2006, and connects southern Scottsdale neighborhoods and activity centers. The trolley runs seven days per week from 6:30 a.m. to 9:00 p.m. every 20 minutes. It will pick up passengers and drop them off any place along the route where the trolley can be safely stopped.

3.3.7 Proposition 400

The projects listed below are the Proposition 400-planned transit projects for Scottsdale. A total of $219.3 million (in 2002 dollars) in regional funds is programmed for Scottsdale transit projects, regional operations, and capital investments. Table 7, *Proposition 200 Transit Projects Within Scottsdale*, summarizes Proposition 400 Transit Projects within Scottsdale, their funding source and amount and timing. Proposition 400 funding will allow the City to expand its local transit funding options.

TABLE 7: PROPOSITION 400 TRANSIT PROJECTS WITHIN SCOTTSDALE			
PROJECTS	REGIONAL FUNDS 2002 $ IN MILLIONS	LOCAL FUNDS 2002 $ IN MILLIONS	YEAR
TRANSIT			
Scottsdale Rd. (72)	$70.6	$0.0	2006-2025
North Loop 101 Connector	$2.2	$0.0	2007-2025
Camelback Rd. (50)	$8.8	$0.0	2012-2015
East Loop 101 Connector	$2.4	$0.0	2008-2025
Hayden Rd. (81)	$32.9	$0.0	2014-2025
Scottsdale Rd. Bus Rapid Transit	$8.3	$0.0	2013-2025
Shea Blvd. (106)	$7.6	$0.0	2014-2025
Pima Express (to Airpark P&R)	$2.3	$0.0	2012-2025
McDowell Rd. (17)	$16.6	$0.0	2014-2025
Bell / Frank Lloyd Wright (170)	$6.1	$0.0	2018-2025
Indian School (41)	$11.2	$0.0	2019-2025
Thomas Rd. (Green)	$7.7	$0.0	2019-2025
SR 51 Express (512)	$2.0	$0.0	2022-2025
REGIONAL OPERATIONS			
Dial-A-Ride ADA-only trips	$36.2	$0.0	2006-2025
Regional Services (Bus Books, route planning, Web site, marketing)	$7.3	$0.0	2006-2025
CAPITAL INVESTMENTS			
Bus Purchases	$13.5	$0.0	2006-2025
Shea / Loop 101 Park & Ride	$3.5	$0.0	2011-2015
Scottsdale Bus Rapid Transit right-of-way and infrastructure	$4.0	$0.0	2011-2015
Airpark Passenger Facility	$1.6	$0.0	2016-2020
TRANSIT SUBTOTAL:	$219.3	$0.0	

3.4 Pedestrian

3.4.1 Introduction

The Bicycle / Pedestrian Plan was adopted in January 1995. The Plan has been subsequently augmented through the establishment of pedestrian standards contained in the City's DSPM. These standards include extensive renovations and improvements to the Downtown Scottsdale pedestrian environment, improvements to signals and crosswalks, and support of Safe Routes to School programs.

3.4.2 Plans and Policies

Bicycle / Pedestrian Plan (January 1995)

This plan developed recommendations to improve facilities for bicycling and walking. The plan's recommendations are grouped into four areas: planning and implementation; design and standards; safety, education, and enforcement design; and economics. Four levels of implementation were identified within the plan, each with an associated cost. Most of the projects identified have been implemented.

MAG Pedestrian Area Policies and Design Guidelines (2005)

The Maricopa Association of Government (MAG) Pedestrian Area Policies and Design Guidelines were recently updated in 2005. This document includes information on pedestrian facilities and standards, appropriate to a range of pedestrian areas.

MAG Pedestrian Plan 2000

The MAG Pedestrian Plan 2000 includes a study of latent demand and roadside conditions (Figure 27, *Pedestrian Latent Demand Map*). The plan identifies downtown Scottsdale and the City's resort corridor as areas with some of the highest demand for pedestrian facilities in the region.

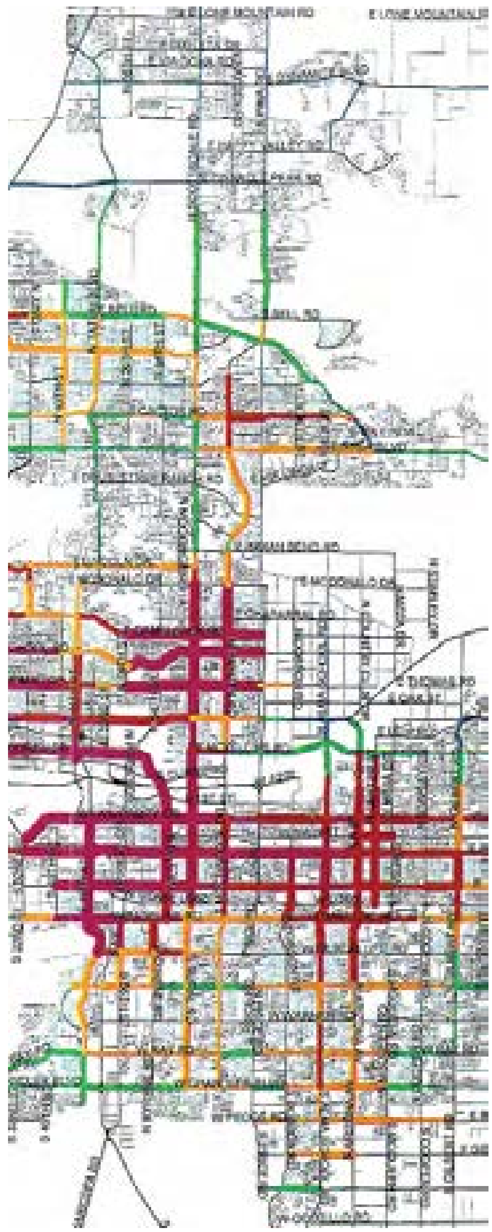


Figure 27: PEDESTRIAN LATENT DEMAND MAP
Areas in red and orange identify locations with the highest pedestrian demand.
Source: MAG Pedestrian Plan 2000

Downtown Pedestrian Mobility Study

The City is currently conducting a pedestrian mobility study that will contain recommendations to improve the pedestrian circulation within the downtown.

Scottsdale Road Streetscape Design (underway)

In 2005, the City initiated a streetscape project for Scottsdale Road. This project includes the redesign of the Scottsdale Road streetscape to make it more attractive and pedestrian-friendly.

Draft Guidelines for Sidewalk Cafés

Draft Guidelines are being prepared for sidewalk cafés to enhance the pedestrian experience by creating visual interest and encourage passersby to pause and explore the area on a more intimate scale. General requirements include:

- Ensuring that sidewalk café operations do not prohibit or limit free and unobstructed passage for pedestrians;
- Locating cafés where walkways are at least 10 feet wide;
- Not locating sidewalk cafés in areas where they obstruct sightlines at intersections or cause operational or safety issues on public rights-of-way;
- Keeping all operations, including serving of food and beverages, within the defined sidewalk café area and / or within any enclosure;
- Providing walkways that are at least six-feet wide; eight-foot sidewalks are desirable;
- Providing walkways that are clear of obstructions such as traffic signals or signs, bus stops, benches, newspaper stands, trash receptacles, tables and chairs, planters and landscaping, and similar items. Walkways should be free of utility covers, decorative pavers with joints, and other surface features that create a rough or uneven surface that may pose difficulties to persons using wheelchairs, canes or scooters;
- Using truncated domes or other devices to alert pedestrians with visual impairments of crossings or other changes in use of the sidewalk; and
- If a crosswalk is adjacent to the property with a sidewalk café, the crosswalk must intersect perpendicularly with the sidewalk / walkway minimum clear zone. Sidewalk curb ramps must be located at the center of the sidewalk and provide a level landing space.

3.4.3 Sidewalks and Curb Ramps

Sidewalks are typically provided on all arterial, collector and local streets. Some streets within the northern area of the City do not provide sidewalks or other pedestrian facilities. Scottsdale requires a minimum sidewalk width of six feet citywide and prefers an eight-foot sidewalk width in high use areas. The City's design guidelines recommend that new sidewalks be a minimum of five feet from the back of curb (eight feet in areas with high vehicular traffic volumes). The exception to this setback rule is when a sidewalk is adjacent to a bus stop or in more urbanized areas where wider (10 feet or more) back of curb sidewalks are allowed.

To enhance the connectivity and safety of the pedestrian environment, the DSPM encourages reducing the number of curb cuts for driveways and providing through-pedestrian access from cul-de-sacs and dead ends, across drainage easements and between commercial developments to destinations.

Recently, the City has taken substantial steps to improve curb ramp facilities. The DSPM requires curb ramps to be placed wherever a pedestrian access route crosses a sidewalk / street transition, at intersections, medians, alleys, and where pedestrian travel continues on the roadway once a public sidewalk ends.

Additionally, the City requires alterations in retrofit development areas to follow guidelines for new construction unless technically infeasible as determined by the Scottsdale Transportation Department.

While there is no information on current sidewalk and / or ramp conditions, the walking environment throughout the City should meet minimum updated American Association of Highway and Transportation Officials (AASHTO) standards. Areas of high existing and potential activity such as around schools, neighborhoods and community parks, Downtown, health care campuses, retail centers and commercial intersections may need more extensive facilities then those recommended in the AASHTO standards.

Finally, the City is working to improve pedestrian access and safety by requiring the use of directional ramps at all intersections. The DSPM requires that where physically feasible, directional ramps should be installed at all intersections. In locations without sufficient space to accommodate full directional ramp treatment, diagonal ramps with a minimum eight-foot width and four-foot landing are preferred.

3.4.4 Pedestrian-Vehicle Collisions

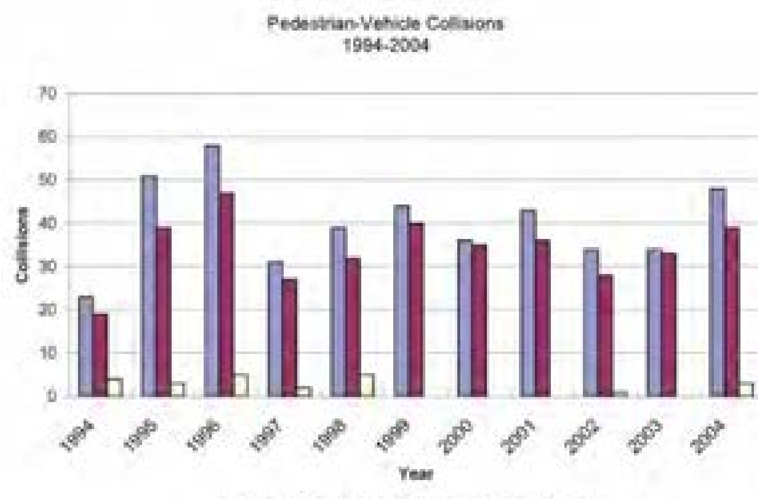


Figure 28: PEDESTRIAN VEHICLE COLLISIONS 1994-2004

The pedestrian-vehicle collision data presented is based on collision data obtained from the City of Scottsdale. Figure 28, *Pedestrian Vehicle Collisions 1994-2004*, illustrates the number of reported pedestrian-vehicle collisions from 1994 through 2004 divided into total collisions, injury collisions and fatal collisions. The lowest number of pedestrian-vehicle collisions occurred in 1994 with a total of 23 crashes, 19 of which resulted in injury and four resulted in fatalities. The highest number of pedestrian collisions occurred two years later with 58 total collisions, 47 of which were injury related and five fatalities. The majority of pedestrian-vehicle collisions resulted in injury.

3.5 Bicycle

3.5.1 Introduction

The City of Scottsdale has recently updated its bicycle map. Supporting the City's bicycle map are extensive bicycle facility guidelines included in the DSPM (2006). MAG is also developing a regional bicycle plan. The City's map, existing standards and policies and the regional plan will be the starting point for the development of an updated citywide bicycle plan to be completed as part of this Transportation Master Plan.

In May of 2005, Scottsdale was a first-time recipient of a silver level award by the League of American Bicyclists. This award recognizes municipalities that actively support cycling and encourages residents to use bicycles as an alternative mode, and for recreation.

3.5.2 Plans and Policies

Bicycle / Pedestrian Plan (January 1995)

This plan is described in the Pedestrian chapter of this report.

3.5.3 Routes / Paths / Facilities

Through the DSPM, the City implements a range of standards for on- and off-street bicycle facilities. The DSPM encourages on- and off-street bikeways (both types) on a one-half mile grid south of Shea Boulevard, a one-mile grid between Shea Boulevard and the CAP Canal, and on a two-mile grid north of the CAP Canal. Major arterials, minor arterials, major collectors, minor collectors, and certain special neighborhood and rural streets have typical cross-sections that include four-foot to six-foot bicycle lanes, depending on parking.

The City provides an on-line bicycle map. This map details multi-use paths and bicycle lanes .
Source: City of Scottsdale.

The City's zoning ordinance requires bicycle parking located at all businesses, except in the downtown, within 50 feet of the building entrance. The quantity of bicycle parking required is based on the number of vehicle spaces.

While older bicycle facilities may be eight feet wide, in accordance with the standards in place at the time they were constructed, new off-street bicycle facilities within the City are to be built as multi-use paths with a minimum width of 10 to 12 feet.

3.5.4 Bicycle-Vehicle Collisions

Scottsdale's bicycle facilities consist of over 95 miles of bicycle lanes and paved shoulders, and 61 miles of paths. These conditions, along with the weather, support bicycle mobility. The bicycle-vehicle collision data presented in Figure 29, *Bicycle-Vehicle Collisions 1994-2004*, is based on collision data obtained from the City of Scottsdale. Bicycle collisions in

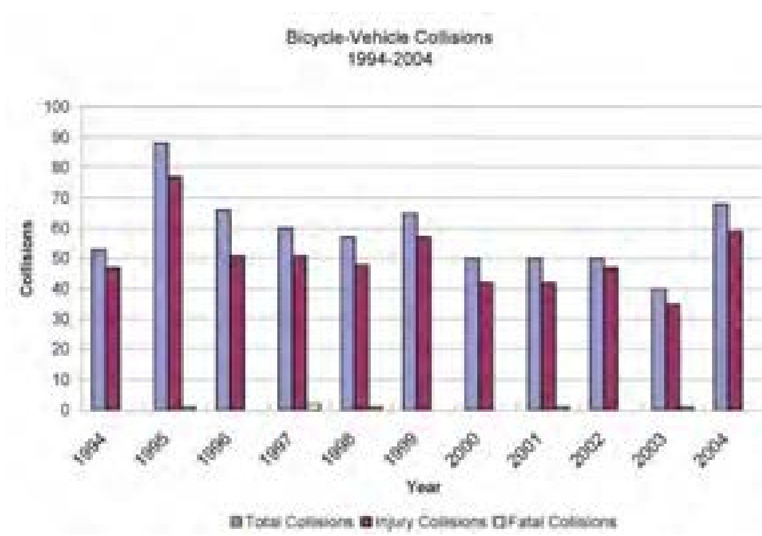


Figure 29: BICYCLE VEHICLE COLLISIONS 1994-2004

this context are impacts that occur with vehicles on Scottsdale's transportation system. (It should be noted that Scottsdale's bicycle-vehicle collision rate is consistent with nationwide statistics.)

The highest number of reported bicycle-vehicle collisions occurred in 1995 with 88 total collisions, 77 of which resulted in injury and one fatality. The lowest number of bicycle-vehicle collisions occurred in 2003 with 40 total collisions of which 35 resulted in injury and one fatality as seen in Figure 29.

3.6 Multi-use Trails and Facilities

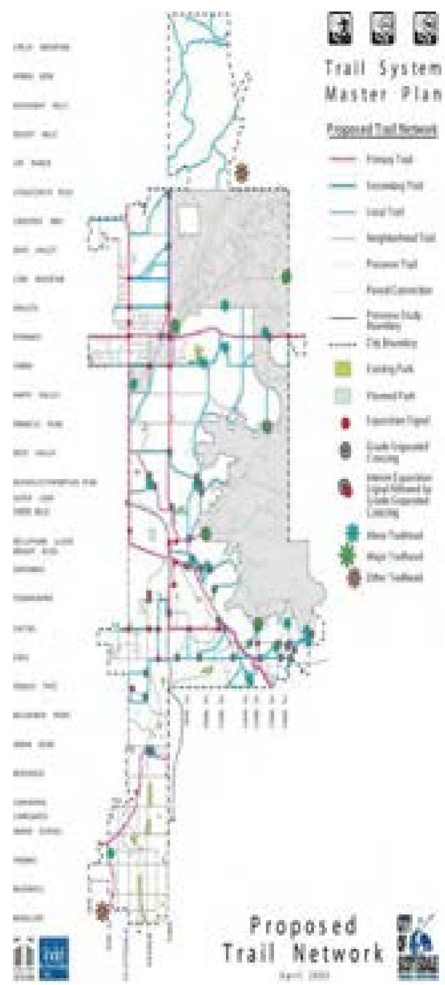
3.6.1 Introduction

Equestrians are a part of the City's history and will continue to be part of its future. Within north Scottsdale, several subdivisions include horse properties. The McDowell-Sonoran Preserve provides extensive opportunities for riding as do several designated trails throughout the City.

3.6.2 Plans and Policies

Scottsdale Trails Master Plan (2004)

In February 2004, the City adopted a Trails Master Plan. The Master Plan identifies 286 miles of primary, secondary, neighborhood, and local trails within the City. It proposes 22 equestrian trail crossings and two interim equestrian crossings (at grade crossings with an equestrian signal where a grade separated crossing is ultimately desired). Equestrian crossings are recommended to use asphalt alternative surfaces and user-activated signals. Of the 21 trailheads recommended in the plan, 16 are recommended to include horse trailer parking.



Scottsdale Trails Master Plan Map, Proposed Trail Network
Source: City of Scottsdale.

4 LAND USE – TRANSPORTATION CONNECTION

4.1 Introduction

This section describes current land use and development within the City and summarizes the variety of documents, plans, and policies that frame and support decisions affecting the relationship between transportation and land use. Most significant among these plans, policies, and documents is the Scottsdale *General Plan 2001*, the overriding, voter-approved document that guides land use transportation decisions. The Future in Focus public involvement process was the framework to solicit citizen input to guide the General Plan's development.

The *General Plan 2001* is supported by and implemented through other area plans and policies that include character area plans, neighborhood plans, local area master plans, streetscape plans, and specific transportation modal plans, and the zoning ordinance. Specific transportation modal plans are summarized in Chapter 3 of this report.

4.2 General Plan and Supporting Plans and Policies

4.2.1 General Plan 2001

The Scottsdale *General Plan 2001* is a set of goals, policies, and implementation strategies to guide future development. It serves as a "blueprint" for future City development. The 12 elements included in the Plan are: character and design; community involvement; public services and facilities; preservation and environmental planning; open space and recreation; land use; economic vitality; cost of development; neighborhoods; growth areas; housing; and community mobility. The *General Plan 2001* is based on the Scottsdale Visioning and CityShape 2020 processes and City Council goals. City voters ratified the *General Plan* in March, 2002. The *General Plan* states community values for the year 2025 that maintain Scottsdale will be a community that:

- Demonstrates its commitment to environmental, economic, and social sustainability and measures both the short- and long-term impacts of its decisions;
- Creates, revitalizes, and preserves neighborhoods that have

long-term viability, unique attributes and character, livability, connectivity to other neighborhoods in the community, and that fit together to form an exceptional wide quality of life;

- Facilitates human connection by anticipating and locating facilities and infrastructure that support interaction and by promoting policies that have a clear human orientation, value and benefit;
- Respects the environmental character of the City, by preserving desert and mountain lands through innovative measures to protect natural resources, water resources, wildlife habitat and migration routes, archaeological resources, scenic vistas, views and corridors, and enhance clear air;
- Builds on its cultural heritage, promotes historical and archaeological conservation areas, and identifies and promotes the arts and tourism respective of the unique desert environment;
- Coordinates transportation options with appropriate land uses to enable a decreased reliance on the automobile and more mobility choices;
- Maintains or improves its high aesthetic standards quality, public amenities, and transportation levels of service;
- Recognizes and embraces change, from being predominantly undeveloped to mostly built out, from a young town to a maturing City, from a bedroom community to a net importer of employees, and from a focus on a single economic engine to a diverse, balanced economy;
- Simultaneously acknowledges its past (preservation of historically significant sites and buildings will be important) and prepares for the future;
- Promotes growth that serves community needs, quality of life and community character; and
- Recognizes and embraces the diversity of the community by creating an environment that respects the human dignity of all without regard to race, religion, national origin, age, gender, sexual orientation, or physical attributes.

4.2.2 Mobility Element and Strategic Area Plans

The City of Scottsdale has developed Character and Strategic Area plans to emphasize context-sensitive design and planning throughout the City. This section describes the purpose and intent of these plans.

Character area planning resulted from the CityShape 2020 process as part of the three-level *General Plan* – citywide, character areas, and neighborhoods. Character Area Plans work to define, maintain or enhance a desired "character" for the area. "Character" can generally be thought of as the look or feel of a place - that which sets it apart from other areas. Character area planning addresses issues of design and character and involves more than looking at just the physical layout of development or the amount of open space to be provided.

Character areas cover geographical areas of different size and each has a common setting, land use pattern, or character of development that will lead to a logical character study.

Since the establishment of the character area planning process, two character area plans have been adopted by the Scottsdale City Council. The *Desert Foothills Character Area Plan* was adopted in July, 1999, and the *Dynamite Foothills Character Area Plan* was adopted in March, 2000 (Figure 30, *Character Area Plans*). The implementation of the *Desert Foothills Character Area Plan* included the establishment of a zoning overlay district that was applied to the Desert Foothills area in March, 2003.

Larger areas of study, called Strategic Planning Areas have also been established for the City. A strategic plan is an assessment of an area that identifies and documents programs already underway or under study, those areas that need to be focused on and / or accelerated, and provides a description of the timeframes for each of these focus areas. The emphasis is on implementation and short-term action. They can be "triggers" for identifying new City Capital Improvement Programs and evaluating existing CIPs for continued value. With direction from the City Council, strategic plans can help the City establish work priorities for areas of the community.

Desert Foothills Character Plan (1999)

Plan Summary – The Desert Foothills character area is approximately eight square miles, generally located between Dixileta Road to the north, Jomax Road to the south, the City's western boundary, and 96th Street to the east.

Three common goals have been identified and refined through the Desert Foothills planning and public outreach process. The essence of these goals is to balance the anticipated physical development in the area and the rural lifestyle of the residents with the sensitive lush upper Sonoran desert. The vision, goals and strategies set forth in this plan detail a logical direction to preserve the character of this unique region of the City. The goals of this plan are:

Goal 1 – Preserve the natural, visual qualities of the lush upper Sonoran Desert by using desert-sensitive building techniques that retain and blend with the natural desert character of the area.

Goal 2 – Promote connected areas of desert open space and trails through visual and functional linkages within and between local neighborhoods and a regional open space network.

Goal 3 – Identify and celebrate the rural desert character experienced in the Desert Foothills study area that will result in or maintain a unique desert community distinguished from other parts of Scottsdale and the metropolitan area.

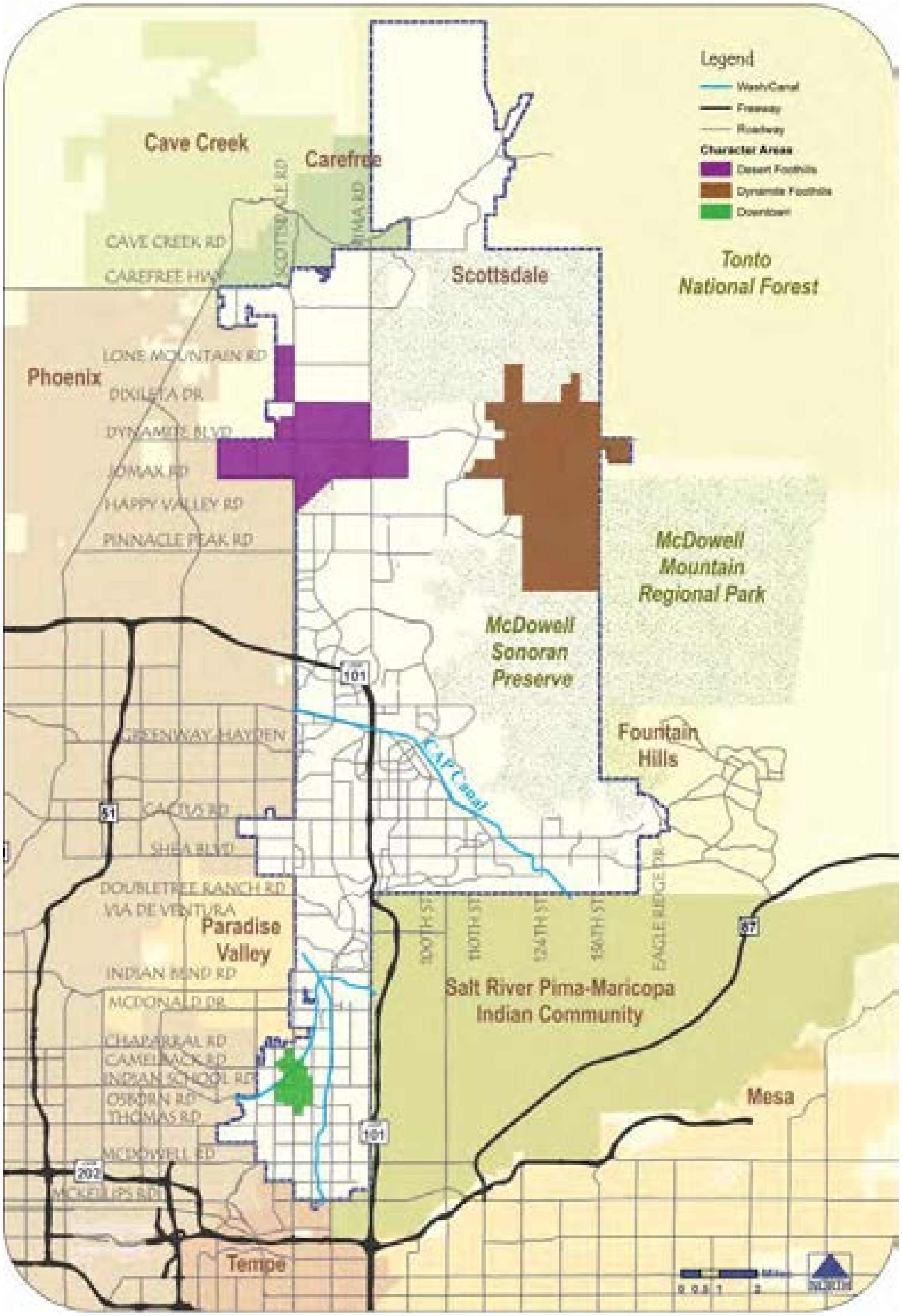


Figure 30: CHARACTER AREA PLANS

Dynamite Foothills Character Area Plan (2000)

Plan Summary – The Dynamite Foothills area is located in far northeast Scottsdale between the McDowell Mountains and the Lone Mountain Road alignment, and east of 112th Street to the City boundary at 136th Street. The area contains desert vistas, broad open spaces and an attractive desert environment. It is, for the most part, undeveloped, although, since the adoption of the plan, limited development has occurred. A portion of the area is included in the Recommended Study Boundary of the McDowell-Sonoran Preserve.

The Dynamite Foothills Area has a Rural Desert character, which is both a desert preservation and lifestyle issue. Individuals move into these areas to experience the openness of the natural desert setting and the rustic feel of the developed form. Residents currently living in these remote areas are generally willing to travel longer distances for services. This is part of the lifestyle issue, which needs to be balanced with air quality, infrastructure and development pattern issues that would encourage the provision of basic services close to residential areas in order to reduce travel distances, and to provide a better sense of community.

Through the character study process, three goals were established for the Dynamite Foothills character area:

Goal 1 – Preserve the existing rural desert character for the Dynamite Foothills which will result in a unique desert community distinguished from other parts of Scottsdale and the Valley.

Goal 2 – Recognize the topographic diversity of the Dynamite Foothills area and provide guidelines for balancing the relationship of different types of development to the unique environmental nature of the area.

Goal 3 – Promote open space in accordance with the CityShape 2020 Guiding Principles and the recommendations of the Desert Preservation Task Force, and support the efforts of the McDowell-Sonoran Preserve Commission to provide open space.

The Downtown Plan (2006)

Plan Summary – The Downtown Plan guides decision-making in the downtown area. The Downtown Plan applies to that area designated as Downtown Scottsdale. Generally, the area is bounded by Chaparral Road to the north, Earl Drive to the south, Miller road to the east, and 68th Street to the west. This plan establishes policies that allow downtown to be a highly functional mixed-use center with emphasis on specialty retail, office, cultural, restaurant, entertainment and residential uses. The Downtown Plan contains the following components: Summary; Land Use & Circulation Policy; and the Downtown Urban Design & Architectural Guidelines.

It also emphasizes management of design and redesign of the built environment with the understanding that downtown Scottsdale's small-town atmosphere and pedestrian scale are its strongest features.

4.2.3 Neighborhood Plans

Neighborhood planning is a strategic process that involves the community in the development and implementation of issue-based, action-oriented local plans that address neighborhoods' physical environment, land use, and infrastructure issues. Figure 31, *Neighborhood Plans*, shows the location of Neighborhood Plans.

Sundown Ranch Estates (2003)

Plan Summary – The plan is the result of two planning studies conducted in 1997 and 2003. The neighborhood is comprised of 105 acres with 80 homes, and is located in the area of Shea Boulevard and Hayden Road. The main focus of this study is to preserve the special qualities of this area as the neighborhood matures. Key points of the plan are to maintain the low density / rural character of the neighborhood, stabilize the neighborhood by opposing commercial development, mitigate speeding and cut-through traffic on Sundown Drive and maintain it as a narrow local street (no curbs, sidewalks or streetlights), preserve the Scottsdale Country Club and adjacent golf course, and mitigate traffic- related noises along Shea Boulevard.

Sherwood Heights (2003)

Plan Summary – The plan is a result of a six-month planning process initiated by area residents to guide the future of their neighborhood. It is comprised of 110 acres with 250 homes in south Scottsdale. The key components of this plan are: character and mountain view preservation; mitigating neighborhood traffic (speeding, cut-through); septic tank to sewer conversion; and burying power lines. In 2003, a zoning overlay district was created to restrict building heights and numbers of stories in the neighborhood.

Peaceful Valley (1992)

Plan Summary – The plan is a result of the neighborhood enhancement process initiated by residents who worked with the City to address issues and goals. Key points of this plan for the 141-home neighborhood located at Osborn and Miller roads are: the desire to improve neighborhood pride; preserve and enhance the existing lifestyle in the neighborhood; maintain and upgrade housing quality and value; and protecting the neighborhood from traffic impacts.

Figure 31: NEIGHBORHOOD PLANS

4.2.4 Local Area Master Plans

Local Area Master Plans (LAMPs) are working guides developed by interdepartmental City staff and are not formally adopted by the City Council. LAMPs are designed to assist City staff and property owners in ensuring that infrastructure and the City's service needs (rights-of-way, trails, streets, water or sewer lines) can be met in areas of the City with large numbers of smaller, individually owned properties. LAMP plans exist for the East Shea, Desert Foothills, and Dynamite Foothills areas (Figure 32, *Local Area Master Plans*). LAMPs will be updated to reflect infrastructure changes in these areas.

The following ten goals were established by City staff for LAMPs:

- Coordinate infrastructure so that projects are not planned independently of one another;
- Maintain a general network of streets and build only the streets that are needed to serve each parcel;
- Reduce concentrations of traffic on a limited street network and the need for individual parcels to directly access major streets in order to improve safety and capacity;
- Create a better neighborhood design that establishes a balance between accessibility and access control, also providing emergency access that meets City standards;
- Minimize street crossings of major washes in order to maintain the integrity of natural washes, minimize long term construction and maintenance costs, and allow for local trail access;
- Coordinate the location of utilities and public access improvements in order to reduce long term costs and minimize disruptions to neighborhoods;
- Allow trail use along streets;
- Provide predictability for City budgeting and maintenance programs;
- Provide consistency in decision-making across the City while also allowing for the ability to make informed site decisions that would alter the plans; and
- Increase the public's awareness of future neighborhood developments and activities.

4.2.5 Streetscape Guidelines

The purpose of the streetscape guidelines is to create a unified feel that will enhance roadway aesthetics, respect neighborhoods and provide opportunities for public art. Scottsdale's Scenic Corridors and Streetscape plans are described here and shown in Figure 33, *Streetscape Guidelines*.

Frank Lloyd Wright Streetscape Guidelines

Defined Area – Streetscape design and enhancement for Frank Lloyd Wright Boulevard.

Summary – The focus is to reflect Frank Lloyd Wright's design theory, "Inspired by

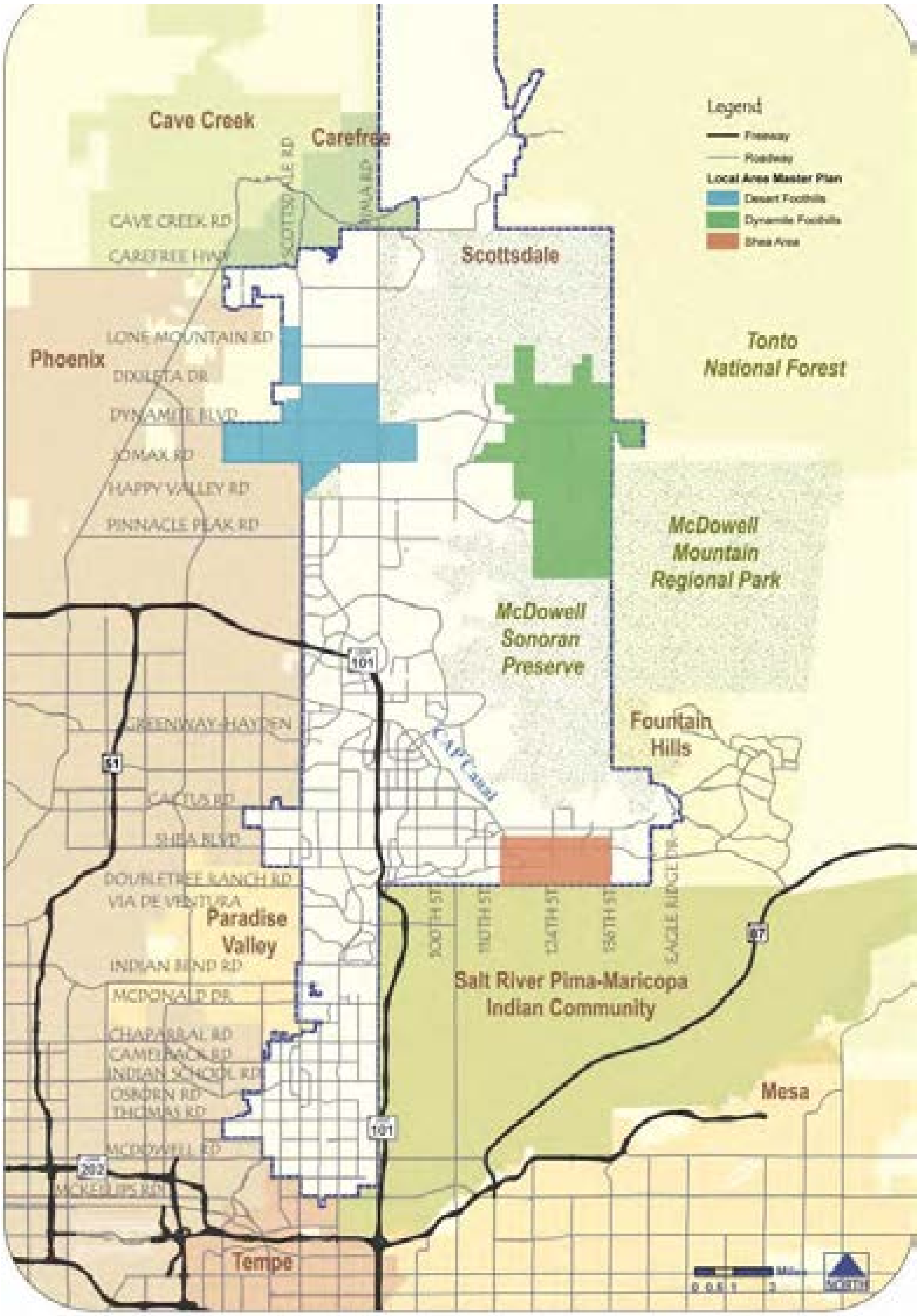


Figure 32: LOCAL AREA MASTER PLANS

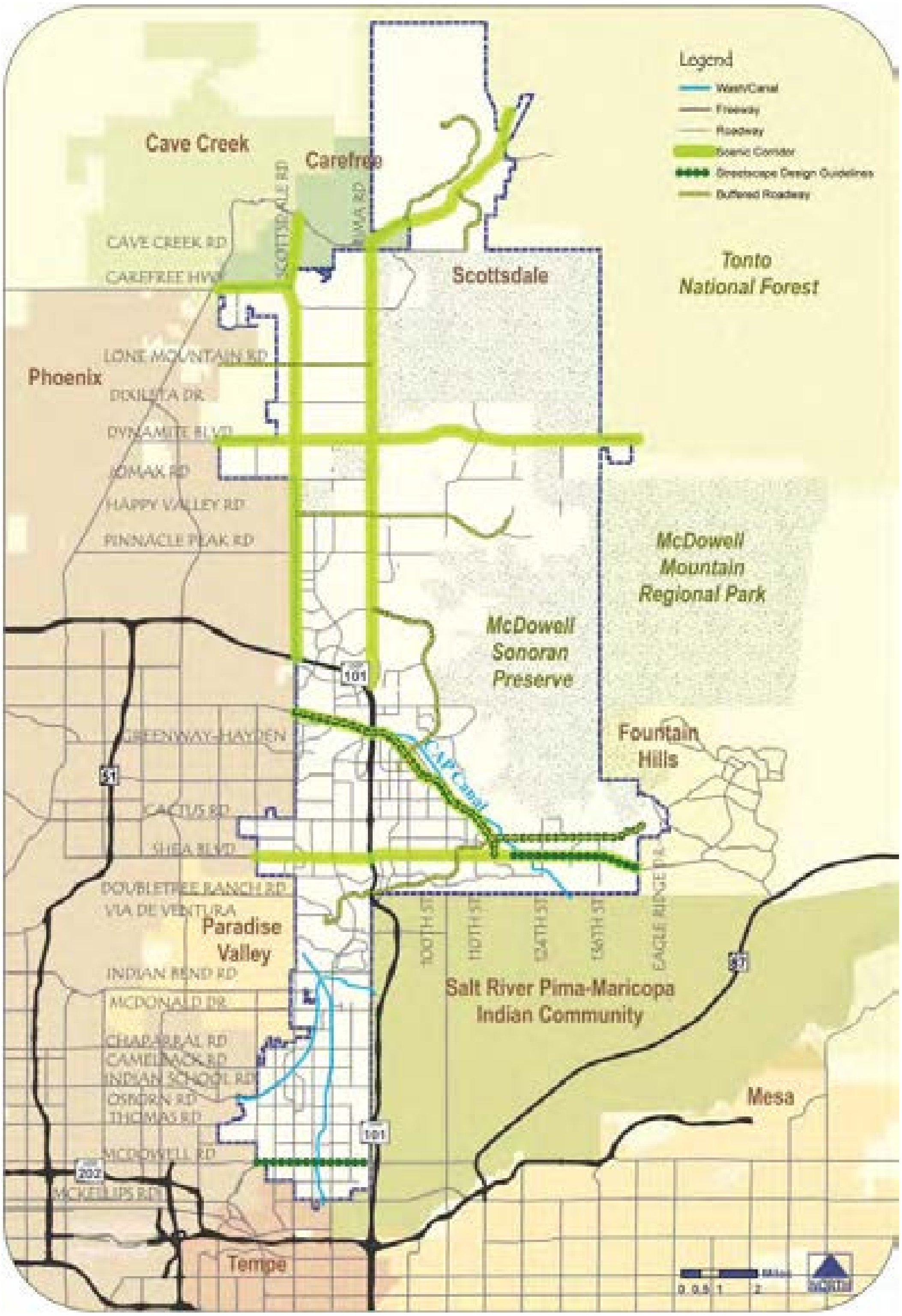


Figure 33: STREETSCAPE GUIDELINES

Nature," throughout the streetscape. Theme symbol, landscape theme and theme colors are an integral part of the guidelines.

Shea Boulevard Streetscape Guidelines

Defined Area – The guidelines apply to Shea Boulevard east of Frank Lloyd Wright Boulevard to 144th Street.

Summary – This policy is a follow up to the Shea Area Plan (1993). It covers specific design enhancement guidelines for landscape and hardscape along Shea Boulevard.

Via Linda Streetscape Guidelines.

Defined Area – Adopted in 1994, these design guidelines apply to Via Linda from the CAP to the 140th Street alignment.

Summary – The key points of these specific streetscape design guidelines are: a native desert landscape pallet; buffered set-backs; building heights; wall design; graphic symbols; and landscaped medians.

McDowell Corridor Improvements

Defined Area – The corridor is McDowell Road, 64th Street to Pima Road. This is a 2003 update of the original 1996 plan.

Summary – The ultimate goal is to achieve a distinctive streetscape character that reinforces the identity of south Scottsdale.

Scottsdale Road Streetscape – under development

Defined Area – Streetscape design guidelines and master plan for the entire 25-mile length of Scottsdale Road.

Summary – The purpose of the project is to create an identity and visual character for Scottsdale Road as a "signature" corridor.

Scenic Corridor Design Guidelines (2003)

The Scenic Corridor Design Guidelines are policies, standards, details, and concepts that are to be used to establish the health, safety, welfare, quality, and character of physical improvements approved by the Development Review Board in 2000 along roadways designated by the City of Scottsdale's *General Plan 2001.*

These policies create the basis for visual character within and along major roadways with a particular emphasis on retaining and displaying the native desert and the traditional southwest cultural heritage of the area.

Buffered roadways are also major roadways, but smaller in scale (usually minor arterials or major collectors). Buffered roadways do not have their own design guidelines, however the creation of design guidelines are planned for the future.

Within the City, scenic corridors include:

- Carefree Highway (west from Scottsdale Road to the City's western boundary, 2 miles);
- Cave Creek Road (northeast of Pima Road to the City's northeast boundary, 3½ miles);
- Dynamite Boulevard (east from 56th Street to the City's eastern boundary, 10½ miles);
- Pima Road (north of the Loop 101 to Cave Creek Road, 11 miles);
- Scottsdale Road (north from Frank Lloyd Wright to Carefree Highway, 11 miles); and
- Shea Boulevard (Pima Freeway east to the City's eastern boundary, 9 miles).

Within the City, buffered roadways include:

- Desert Mountain Parkway
- Frank Lloyd Wright Boulevard
- Happy Valley Road
- Lone Mountain Road (east of Pima)
- Thompson Peak Parkway
- Via Linda Road

Within the City, roadways under consideration with amendment:

- Bell Road (Buffered Roadway)
- Dixileta Road (Scenic Roadway)
- Jomax Road (Scenic Roadway)
- Lone Mountain Road (maintain as buffered)
- Thompson Peak Parkway (maintain as buffered)

4.2.6 Public Art Master Plan (2003)

The mission of the Scottsdale public art program is to make Scottsdale a desirable community in which to live, work and visit by integrating art and design projects throughout the City. This contributes to Scottsdale's unique character and enhances the City's image and identity. The goals of the Public Art Master Plan are:

- Ensure that Scottsdale remains a leader in providing art and cultural amenities for its residents and visitors, resulting in a community that is vital, sustainable and inspired;
- To provide art and design projects of the highest quality throughout the community

resulting in a “museum without walls” and making art accessible to all;

- To integrate the work and thinking of art into the planning and design of our built environment to make Scottsdale a better place to live, work and play;
- To further beautify Scottsdale’s natural environment through the incorporation of art and design projects of the highest quality that enliven, educate and inspire;
- To stimulate the local economy as a result of making Scottsdale a preferred destination for residents and businesses as well as a key center for culture, recreation, and tourism; and
- To build a legacy of art and culture to serve future generations.

4.3 Land Use

4.3.1 Overview

Scottsdale is best understood as a reflection of growth and development patterns dating from the 1950s through the present. With some exceptions, the City has grown from south to north, with relatively little leapfrog or hopscotch development. The resulting development pattern reflects the development trends and styles of each growth period. Today, these patterns define the broad character of southern, central and northern Scottsdale. Within each of these areas are neighborhoods and areas defined by the variety of area plans described above. The differences between development patterns in southern, central, and northern Scottsdale also provide opportunities for different approaches to transportation infrastructure and facilities.

Southern Scottsdale (Indian Bend Road to the City border with Tempe)

The development of southern Scottsdale’s local neighborhoods coincided with the post-war population boom in the Valley during the 1950s. The influx of new residents led to the development of low density subdivisions throughout the City that were characterized by single-family homes located on an organized grid network of streets. These subdivisions were often located in close proximity to large suburban employers, such as Motorola.

The predominant development type of this area is single-family ranch homes with neighborhood commercial areas located along the major streets that edge the neighborhoods. Portions of southern Scottsdale

ASU-Scottsdale Center for New Technology and Innovation (Skysong) site plan.

along McDowell, Hayden, Thomas and Chaparral roads are the location of patio / town home developments that remain today and house a significant portion of the City's senior population. Southern Scottsdale's pattern of separated residential and commercial uses is representative of auto-oriented development. However, the greater reliance on a grid-like street network has allowed for greater transit service coverage and helped to support the development of several north / south multi-use paths.

Southern Scottsdale, one of the City's most mature areas, is experiencing a redevelopment trend. New projects include the ASU-Scottsdale Center University Center for New Technology and Innovation, now known as Skysong, at Scottsdale and McDowell roads.

In the past decade, substantial revitalization and reinvestment in commercial and residential housing to multi-story condominium housing, hotel, and mixed-use projects has occurred in Downtown Scottsdale. The City's downtown ranks among a handful of employment cores that are the densest employment centers in the metropolitan area and is exceeded in density only by Scottsdale Airpark, parts of Phoenix, and downtown Tempe. Nearly $1 billion of public and private investment has resulted in approximately 2,000 new residential units incorporated into a diverse range of retail, governmental, cultural and other employment facilities.

The Scottsdale Waterfront will be comprised of 1.1 million square feet of office, commercial, and 336 housing units.

- **Retail** – Several of the downtown districts are known for their unique retail opportunities, many shown in Figure 34, Downtown Scottsdale Investment as of 2005. Scottsdale Fashion Square in the northwest quadrant of downtown has approximately 1.8 million square feet of gross floor space. The Fifth Avenue Shops and Boutiques, the Old Town District, and the Arts District provide upscale, antique and art gallery shopping opportunities. These areas are connected to the Scottsdale Waterfront. The Waterfront is a mixed use residential / retail project adding 1.1 million square feet of retail to the southwest corner of Camelback and Scottsdale Road. These unique retail opportunities are a large draw with the local tourism market as well as residents of Scottsdale and the larger metropolitan region.

Figure 34: DOWNTOWN SCOTTSDALE INVESTMENT AS OF 2005

- **Civic / Governmental** – The Civic Center Mall lies in the southeast quadrant of downtown and includes the Scottsdale City offices, the Scottsdale Public Library, cultural and museum space, open space, event gathering space and a small amphitheater. The Mall area is also bordered by community agencies, restaurants, night clubs and public parking.
- **Cultural / Entertainment** – The downtown includes museums such as the Center for the Arts, the Scottsdale Historical Museum and the Museum of Contemporary Art. In addition, the Scottsdale Stadium sits on the south side of downtown and hosts the San Francisco Giants during the Major League Baseball Spring Training Cactus League season. Downtown Scottsdale is also known for an active night life with dozens of night clubs, restaurants, and entertainment venues.
- **Medical** – Scottsdale Healthcare Osborn is located at the south end of downtown and operates as a renowned medical center within Maricopa County. This facility has a Level 1 Trauma Center, which was expanded in 2004, and is considered one of the busiest trauma centers in Arizona. Additionally, a surgery center was added in 2003 as a separate building and in 2005 the Hospital was designated as a Primary Stroke Center.

- The downtown also includes the Loloma Transit Station (Main Street and Marshall Way), which provides access to all local bus routes (see Table 7). The Scottsdale Trolley provides circulator shuttle service to the retail and business districts in downtown and one route provides service to nearby resort hotels located just north of downtown (see Section 3.3.7.1). Neighborhood Circulator service began June 4, 2006 (see Section 3.3.7.3).

Key destinations within southern Scottsdale include:

- Skysong – McDowell and Scottsdale Roads;
- General Dynamics – McDowell and Granite Reef Roads;
- Scottsdale Community College – Chaparral Road, east of Loop 202;
- Downtown Scottsdale / Scottsdale Civic Center / Waterfront / Scottsdale Fashion Square;
- Indian Bend Wash;
- El Dorado Park / Boys and Girls Club;
- Loloma Transit Center;
- Arcadia High School;
- Ingleside Middle School;
- Arcadia Neighborhood Learning Center;
- Hopi Elementary School;
- Tavan Elementary School; and
- Navajo Elementary School.

Central Scottsdale (Indian Bend North to Loop 101)

Central Scottsdale was primarily developed during the 1970s through 1990s. During this period, large scale developments and production housing responded to increasing population growth throughout the metropolitan area (Figure 35, *Central and Northern Scottsdale Growth Areas*). McCormick Ranch, Gainey Ranch, and Scottsdale Ranch are located in this area of the City and are among its first master planned communities. These projects include a variety of housing types arranged around corner shopping centers and commercial areas located at the intersection of main arterial streets such as McCormick Ranch Road, Via Linda, Gainey Ranch Road, and Hayden Road. Cul-de-sacs, curvilinear streets, internal path systems, and auto-oriented development were hallmarks of this development era.

Central Scottsdale also includes horse properties along Cactus Road and subdivisions constructed over the past two decades along Shea Boulevard, south of the McDowell Mountains. Most of the land uses along Shea Boulevard, between Hayden and Scottsdale roads, are commercial centers serving the central Scottsdale area. Scottsdale Healthcare Shea is a key employment and activity center.

Figure 35: CENTRAL AND NORTHERN SCOTTSDALE GROWTH AREAS

Key destinations within central Scottsdale include:

- Resort corridor (Scottsdale Road from Camelback Road to Via de Ventura)
- Scottsdale Airpark at Scottsdale Road and Frank Lloyd Wright Boulevard;
- Mayo Clinic (132nd Street and Shea Boulevard)

▶ Navajo Elementary School	▶ Desert Canyon Middle School
▶ Pueblo Elementary School	▶ Mountainside Middle School
▶ Cherokee Elementary School	▶ Mohave Middle School
▶ Cochise Elementary School	▶ Saguaro High School
▶ Mt. View Park	▶ Chaparral High School
▶ Sequoya Elementary School	▶ Desert Mountain High School
▶ Anasazi Elementary School	▶ Cheyenne Traditional School
▶ Aztec Elementary School	▶ Scottsdale Healthcare Shea
▶ Laguna Elementary School	▶ Mustang Library
▶ Scottsdale Ranch Park	▶ TPC Golf Course / Princess Resort
▶ Zuni Elementary School	▶ Cactus Park
▶ Cocopah Middle School	▶ CAP Basin Park

Northern Scottsdale

Northern Scottsdale includes the most recent master planned development types, as well as rural development that was annexed into the City. This area includes some of the most dramatic terrain and vegetation in Scottsdale. It is slightly higher in elevation than the southern portion of the City. Development in northern Scottsdale has focused on retaining the desert and mountain views and vegetation that sets this area apart from the other areas of the City and the metropolitan area. New development ranges from three to less than one unit per acre and offers extensive trails and paths within each project. Key development areas within northern Scottsdale include McDowell Mountain Ranch, DC Ranch, the Troon developments, the Boulders, Terravita, Bellasera, Desert Highlands, and Desert Mountain.

The predominant land use is single-family housing in gated communities focused around "town centers" or commercial areas. Older subdivisions are predominantly large lot, single-family developments often along dirt roads. Commercial development not designed as part of the "town center" is predominantly located at arterial intersections.

The extensive McDowell Sonoran Preserve and other environmentally protected areas serve as effective natural barriers to sprawling growth and demand in northern Scottsdale.

Key destinations within northern Scottsdale include:

- WestWorld
- One Scottsdale (planned)
- Scottsdale Road and Thompson Peak Parkway (planned location of Scottsdale Healthcare Hospital)
- McDowell Mountain Ranch Community Center
- Scottsdale and Pinnacle Peak Roads commercial centers
- Copper Ridge Schools (includes Math And Science Academy)
- Golf Courses at the Boulders, Troon North, Desert Highlands, Desert Mountain, and other Master Planned Communities
- McDowell Sonoran Preserve
- Pinnacle Peak Park & Trail
- Lost Dog Wash and Sunrise Trailheads
- El Pedregal Shopping Center

4.3.2 Land Use Distribution

When the City's open spaces, which include Indian Bend Wash, the McDowell Sonoran Preserve, and City parks, are excluded from land use calculations, residential development accounts for 47 percent of all land uses. Vacant land accounts for 44 percent of the City's land uses, and nine percent is developed as commercial / employment. Although this vacant land percentage appears high due to the 28,841 acres that are designated for the McDowell Sonoran Preserve, it should be noted that this does not imply availability of extensive developable vacant land. When the City's McDowell Sonoran Preserve (planned and current) is included, the Preserve accounts for 29 percent of the City's total land (36,400 acres). Developed residential uses account for 33 percent of the City's land. Vacant land is 31 percent and developed commercial / employment uses drop to seven percent of all City land use.

4.3.3 Employment

The location of employment centers is important to transportation planning. Providing regional connections that enable the City to be a net employment importer benefits the City's economy. Employment and home-to-work trips are a major contributor to peak period congestion. Based on the MAG 2000 population and employment projections, the total number of employees within the City will increase from approximately 153,000 in 2000 to 218,000 in 2030, or 42 percent. The largest increases in employment are projected in northern Scottsdale around Loop 101 and Scottsdale Road, where employment is expected to grow from approximately 16,800 in 2000 to over 52,000 in 2030 (more than a 200 percent increase). Within central Scottsdale, employment is anticipated to increase approximately 21 percent from approximately 86,600 to 100,400, much of it near the Scottsdale Airpark and along Scottsdale and Shea roads. In southern Scottsdale, projected employment increase for 2030 is approximately 11 percent, from approximately 49,700 to 55,167. The densest employment areas will be located in southern Scottsdale, where in 2030, the employment density is projected to be 6.75 persons per developed employment acre, up from 6.05 persons per developed employment acre in 2000. Conversely in northern Scottsdale, projected 2030 employment density is 0.97 persons per developed employment acre as opposed to 0.31 persons per developed employment acre.

Activity centers within the City also vary with regards to employment densities. The densest areas in 2000 were the Mayo Clinic facility at 14.57 persons per developed employment acre and the Shea Scottsdale Healthcare facility at 12.05 persons per developed acre. The Airpark employment density was 5.15 employees per developed acre.

4.3.4 Population

Population growth trends mirror those of employment. Northern Scottsdale's population is projected to increase 167 percent from approximately 30,700 people in 2000 to 82,200 people in 2030. Central Scottsdale's population is projected to increase 18 percent between 2000 and 2030 or from 107,600 to 127,600 people. Southern Scottsdale's population is projected to increase 12 percent from 64,400 to 72,100 people.

The most densely developed areas are currently projected to be southern Scottsdale, with a density in 2000 of 7.84 persons per developed residential acre increasing to 8.79 persons per developed residential acre in 2030. Central Scottsdale's density is also projected to increase from 3.48 persons per developed residential acre to 4.13 persons in 2030. Northern Scottsdale densities will change from 0.57 persons per developed residential acre in 2000 to a projected 1.52 persons per developed residential acre in 2030.

4.3.4.1 Age and Income

Compared to the region, the City is relatively wealthy and mature. As of 2005, the City's residents had a median household income over $50,000, as opposed to $46,111 countywide. The City's median age is 39.9 years, compared to the county's 33 years, according to the US Census 2005. The average household size in Scottsdale is smaller (2.18) than that of the United States (2.69).

5 EMERGENCY SERVICES

5.1 Introduction

Providing emergency fire and police access is one of the key functions of the transportation system. The City of Scottsdale maintains its own fire and police services.

5.2 Fire

The Scottsdale Fire Department is the newest fire department in Arizona. Scottsdale has thirteen fire stations (with more planned for the future) (see Figure 36, *Scottsdale Fire Stations)*, thirteen engine companies, three ladder companies, four brush trucks and, one hazardous material response vehicle.

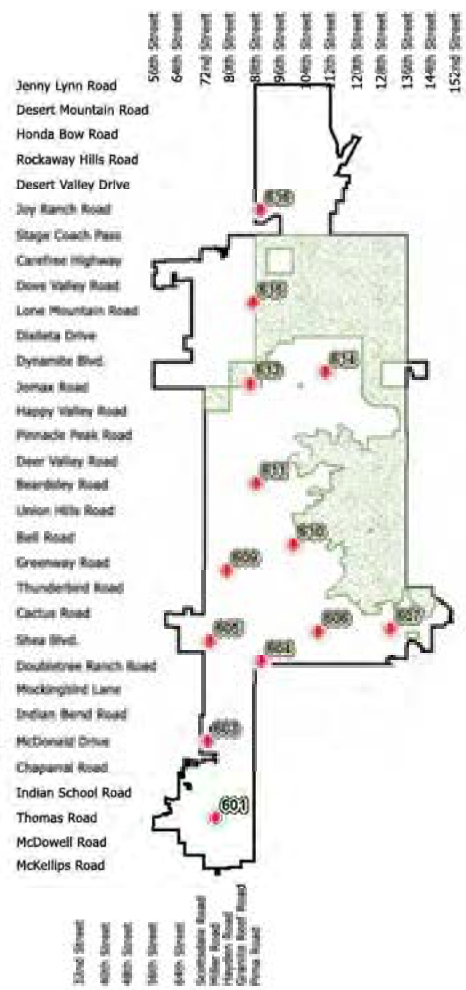


Figure 36: SCOTTSDALE FIRE STATIONS

Last year, Rural Metro, the City's fire service provider reported a total of 21,756 calls, including 826 fire calls, 13,302 medical calls and 3,011 service calls[6]. Response time is considered the most important measurement of a fire department's performance. Service level objective of four-minute response time standard, 80 percent of the time to all emergencies. Some improvements to meet this objective include the approval from City Council for a new downtown fire station on Indian School west of Miller Road and the addition of a new aerial ladder truck. Additionally, the Fire Department annually updates its Standards of Coverage to accommodate the needs of its citizens.

5.3 Police

The mission of the Scottsdale Police Department is:

> *"The Police Department, in partnership with the Citizens of Scottsdale, recognizes the changing needs of our community and law enforcement's role*

6 http://www.scottsdaleaz.gov/news/fire/about.asp. 8-06-2006

in addressing those needs. Furthermore, we pledge EXCELLENCE, INITIATIVE and INTEGRITY to enhance the quality of life throughout our City knowing those we serve deserve no less."

The City's Police Department includes 404 sworn police officers (including the Chief). The departments Annual Performance Report, on *Five-Year Strategic Plan*, FY2004–05 reported that it is 20 percent complete on staffing a traffic squad to address community needs in addition to the current traffic squad.

Scottsdale Police Department Traffic Enforcement Division includes the Vehicular Crimes Reconstruction Unit, Motor Unit, DUI Squad, Photo Enforcement, Parking Enforcement and the Special Events Unit. These six divisions respond to fatal collisions, traffic complaints, traffic violations, suspected intoxicated drivers. Additionally, they utilize preventative measures through directing traffic, using photo enforcement and policing Scottsdale's special events.

1.2.2 Establish an Additional Traffic Squad to address community needs.

Measure of Success	Initiation Date	Target Date	Responsibility
A traffic squad in addition to the current traffic squad will be staffed with a sergeant & officers & will be operational.	01/2005	01/2006	Lt. Frank O'Halloran

Summary of Annual Progress

- Completed site survey of the District 3 Detective area, which will house the new Motor Squad & new Park Unit.
- Completed procurement of majority of necessary officer duty equipment & office/computer equipment for additional Traffic Enforcement Squad.
- Completed order of 2 enforcement cars to be used by the DUI Squad upon the addition of the two budgeted officers.
- Completed necessary City purchasing documentation for procurement of additional Police Motorcycles for the Squad.

Year End Status

- Percent Complete: 20%
- Continuing into FY 2005/06
- On-Schedule

The Police Department Annual Performance Report on the Five-Year Strategic Plan documents its progress in establishing a traffic squad to address community needs.

6 SCHOOL BUS ROUTES

6.1 Introduction

The City of Scottsdale is served by the Cave Creek, Scottsdale, and Paradise Valley Unified School Districts, as well as several charter schools.

6.2 Scottsdale Unified School District[7]

The Scottsdale Unified School District includes 33 elementary and secondary schools and five high schools (Figure 37, *Scottsdale Unified School District*).

All of the schools within the Scottsdale Unified School District, with the exception of the Sierra Vista Alternative School, provide bus service. The Scottsdale Unified School District also sponsors Trip Reduction Programs for students and faculty and an after-hours or late bus program. These programs are coordinated through the individual schools. Bus service is not available during school holidays or summer break.

6.3 Cave Creek Unified School District[8]

The Sonoran Trails and Desert Arroyo Middle Schools are both located within the Cave Creek Unified School District (Figure 38, *Cave Creek Unified School District*). Both schools provide bus service within the City. Bus service is not available during school holidays or summer break.

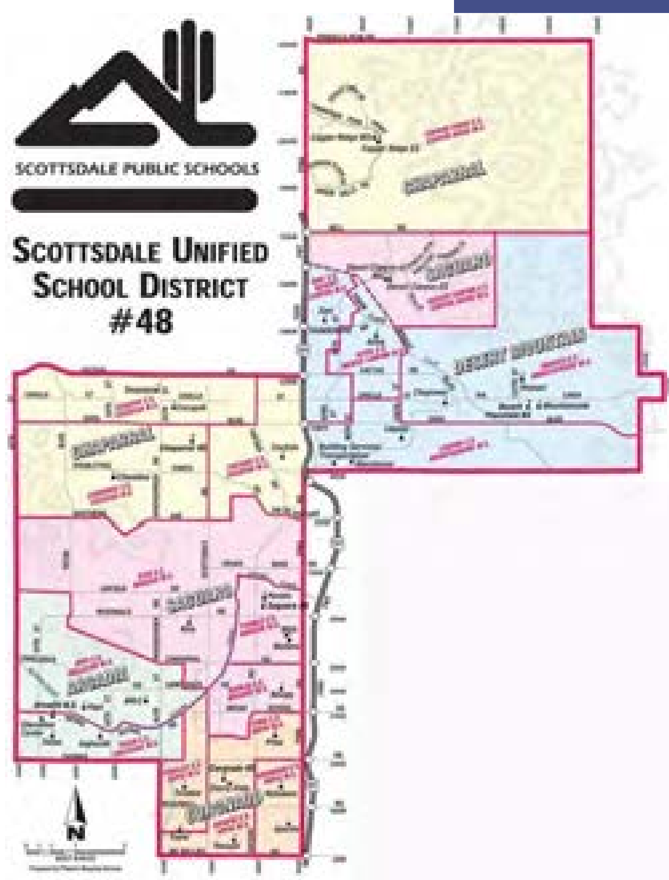


Figure 37: SCOTTSDALE UNIFIED SCHOOL DISTRICT

7 Black Mountain Elementary
8 Cactus Shadows High School

6.4 Paradise Valley Unified School District

The Paradise Valley School District includes Pinnacle Peak, Greyhawk, and Sonoran Sky elementary schools. It extends into Scottsdale east to Pima Road between Jomax and Cactus roads (Figure 39, *Paradise Valley Unified School District*).

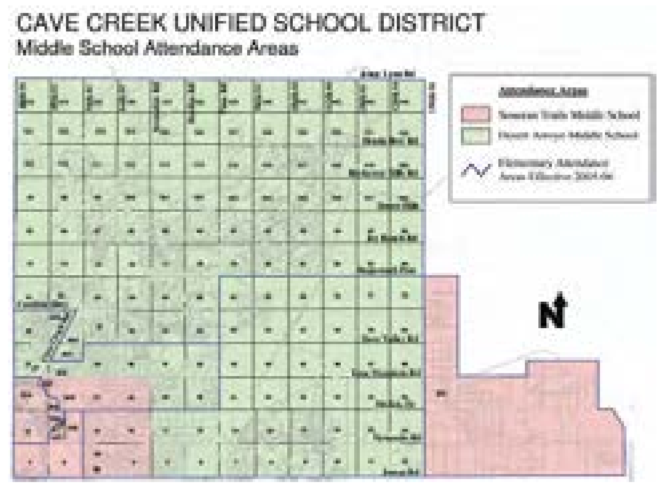


Figure 38: CAVE CREEK UNIFIED SCHOOL DISTRICT

6.5 Charter and Private Schools

A Charter School is a public school established by contract with a district Governing Board, the State Board of Education or the State Board for Charter Schools to provide learning that will improve pupil achievement. Charter and private schools vary in size. No statistics are available on the exact number or charter and private school students within the City. These schools operate in commercial, institutional and residential areas. Within Scottsdale, Charter schools include but are not limited to:

- Basis Scottsdale, 9128 E. San Salvador Drive;
- CASY Country Day, 7214 E. Jenan Drive;
- Classics and Four Arts Academy;
- EduPrenurship Student Center, 1201 North 85th Place;
- Freedom Academy, 15014 North 56th Street;
- Mission Montessori, 12990 East Shea Boulevard;
- Mission Montessori, 11050 North 96th Street;
- Montessori Academy, Scottsdale Campus; and
- Scottsdale Horizons Day School, 7425 East Culver.

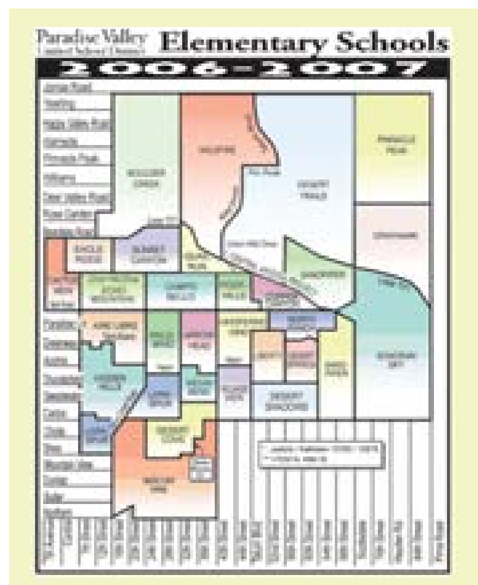


Figure 39: PARADISE VALLEY UNIFIED SCHOOL DISTRICT

7 INTELLIGENT TRANSPORTATION SYSTEMS

7.1 Existing Infrastructure

Scottsdale's Traffic Management Center (TMC) maintains the City's Intelligent Transportation System (ITS). The goal of ITS within Scottsdale is to improve safety, security and efficiency for the traveling public on the City's transportation system. ITS is composed of subsystems which include roadside control, roadside information, parking management, emergency response, transportation management, transit management and many others. The TMC operates from 6:00 a.m. to 6:00 p.m., Monday through Friday.

Analysis of traffic flow is conducted using a series of monitoring cameras and sensors strategically placed throughout the City, as shown in Figure 40, *PTZ Camera Locations*. Currently, the City has forty-three PTZ (Pan, Tilt and Zoom) cameras and five detection cameras. North-south movements through Scottsdale are difficult during rush hour because there are few continuous north-south routes. Hayden Road is timed for northbound traffic and Scottsdale Road is timed for southbound traffic to accommodate the morning traffic rush. During the evening rush, the traffic signals are reversed. In general, most east-west roads are timed for westbound traffic for morning rush hour and eastbound traffic for evening rush hour.

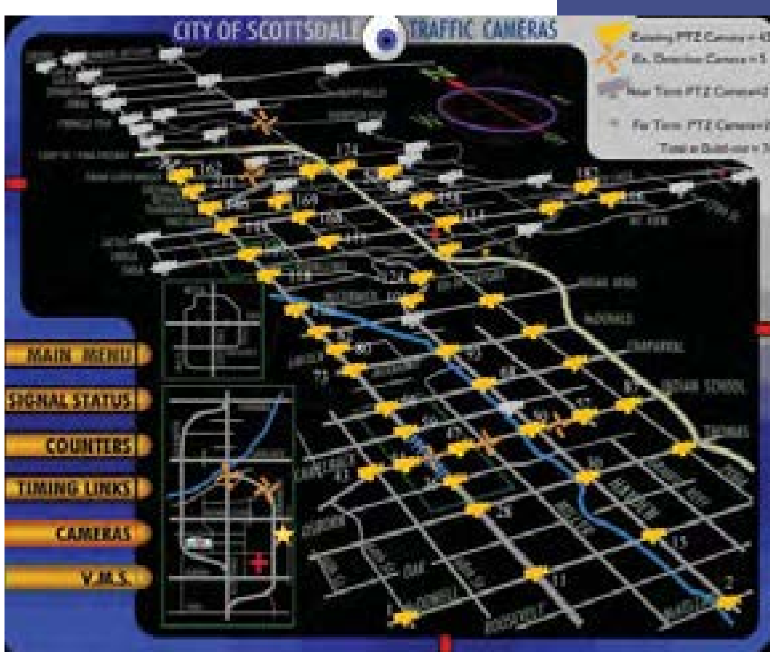


Figure 40: PTZ CAMERA LOCATIONS

Dynamic Message Signs (DMS) have versatile applications for traffic information dissemination, traffic and emergency management, and even public safety (i.e. Amber Alert). One of the primary uses of DMS is to provide drivers real-time traffic information warning of unstable traffic conditions allowing for informed travel decisions. Secondary uses include relaying information regarding special events such as sporting events and weather conditions. The City currently utilizes eight dynamic message signs (Figure 41, *Dynamic Message Sign Locations*).

Figure 41: DYNAMIC MESSAGE SIGN LOCATIONS

8 KEY PLANNING CONSIDERATIONS

8.1 Introduction

This chapter describes the main outreach efforts undertaken to understand key planning topics that Scottsdale residents, businesses, and staff feel should be addressed in the development of the Master Plan and the topics identified as a result of these efforts. In addition to stakeholder interviews, a citizen workshop, and a three-day charrette, meetings with City-staff, the City's Transportation Commission, a project web page with feedback form, a newsletter and feedback form, as well as several meetings with City entities and organizations contributed to the range of ideas and opinions about key planning topics that need to be addressed in the Master Plan.

8.2 Key Planning Topics

The key topics identified through the outreach process were organized into the areas of land use, mode, bicycle, pedestrian, roads, transit, equestrian and downtown, central, south and north Scottsdale.

8.2.1 Citywide

As discussed in Chapter 3 of this report, the opening of the Loop 101 freeway generated increased peak period traffic on east-west streets, particularly those that provide direct access to the freeway. In addition, new developments in the central Scottsdale vicinity have generated increased demand for east-west travel to access Loop 101. This demand trend for increased east-west travel is also evident through northern Scottsdale. For these reasons, responsive traffic management strategies are important to ensure sustained levels of service through 2030.

Affordable housing is important within the City, and the transportation system must support it. Currently, employees who live outside Scottsdale cannot easily use transit to get to work. Within the City, low wage workers face similar challenges.

8.2.2 Downtown / South Scottsdale

Throughout the public participation process, the following planning considerations pertaining to the City's downtown and southern area were:

- The role of Scottsdale Road (through-traffic or local traffic) and the couplets (bypass or local traffic) need to be clearly defined;
- If the downtown has paid parking, it may become less competitive than Scottsdale Fashion Square, which offers free parking;
- Some residents believe the parking ticket system is unfair because employees and business owners park at the three-hour meters and obviate customer parking along 5th, 6th, and Main Streets;
- Residents feel that on-street parking policies need to be revisited and free parking should be provided;
- Downtown planning needs to consider day time, night time, and seasonal parking;
- Alternative modes of transportation for the downtown area should be determined;
- Freeway traffic needs to be brought into the downtown;
- The Downtown Trolley represents an underused public transportation resource within the downtown. Approaches to enhance its use, and hence, efficiency, should be recommended;
- Density and transit are keys to the success of downtown, especially as the market for downtown living continues to grow and the need for transit increases; and
- Residents in north Scottsdale need a way to get downtown and downtown residents need a way to get to north Scottsdale.

8.2.3 Pedestrian / Bicycle

Scottsdale residents also see a strong need to enhance non-motorized travel throughout the City limits. For example, the plan needs to clearly define bicycle and pedestrian corridors that serve Scottsdale Community College, North Scottsdale, Downtown Scottsdale and both sides of the Loop 101 from Princess south to Raintree. Bicycle and pedestrian corridors should connect to Phoenix on street routes, provide a straight commuter route on Pima road and the downtown couplets, as well as include a bridge at Jackrabbit Road over the Central Arizona Project Canal, and provide an overpass along the Loop 101 at Cholla Street and Sweetwater Avenue.

To facilitate pedestrian and bicycle navigation throughout the City, Scottsdale residents also express a desire for the following:

- The City should develop a wayfinding system that includes information kiosks and maps with walk times between destinations listed;
- Mid-block crossings along the Arizona Canal at Camelback and Scottsdale Roads are needed;
- A solution is needed to the barrier problem along Indian School Road where high

traffic volume impedes pedestrian and bicycle movement in the area. However, citizens indicated that Indian Bend Wash, Miller, Granite Reef or Marshall Way would not be appropriate locations for these pedestrian solutions;

- Bicycle lanes should be put on both downtown couplets and on 74th Street from Wilshire to McDowell by Coronado High School;
- In some areas, multiuse paths are hidden by trees and walls, creating poor visibility conditions;
- Safety recommendations and facilities to protect cyclists and pedestrians from speeding vehicles (such as push button activators for bicyclists and wider sidewalks and bridge crossings) are needed in some areas;
- No parking in bicycle lanes needs to be strictly enforced; and
- Gated communities should allow inter-community foot traffic / bicycle traffic to provide non-motorized alternatives to roads with heavy vehicular traffic.

8.2.4 Scottsdale Airpark

Circulation around the Airpark, including east side to west side access, is important to its continued growth. Airport land use is changing from warehouse to office and commercial, which has caused an increase in on-street parking and is impacting circulation. Scottsdale residents offered the following recommendations for the Airpark:

- There is a need to review on-street parking policies
- The Airpark should be connected by transit to Skysong and other destinations throughout the City
- Because regional and City connections are important to Airpark employers, a park-and-ride service from the west valley serving the Airpark is suggested and bus service needs to be dependable, comfortable, and safe (something like Phoenix's Rapid Service)
- Accessibility to Airpark businesses and employers within the airpark is important
- Freeway access to the Airpark will become more congested when One Scottsdale is built and Phoenix builds up Desert Ridge. The impacts of these developments on Scottsdale roadways needs to be examined, and
- A shuttle from the park-and-ride on the Loop 101 could be located in the Airpark.

8.2.5 Equestrians and Multi-use Trails

Equestrian and multi-use trails contribute to the overall quality and character of life in Scottsdale and provide avenues of appreciation and celebration of Scottsdale's natural and cultural resources. Allowing people to access the desert close to home and feel close to nature is an attractive quality that some Scottsdale's residents want to preserve and enhance in the following ways:

- Equestrian crossing standards are needed;
- The City should consider combining path and trail facilities to maintain equestrian options wherever possible;

- Horse trailers need longer clearance intervals for stopping than automobiles.
- Equestrian / bicycle / pedestrian trails are currently discontinuous and need to be connected; and
- The equestrian option should be maintained where possible.

Not all residents, however, share these feeling regarding multi-use trails. Some feel that the horse is an image of Scottsdale's past, not its future. They voice concerns about spending tax dollars to build equestrian paths that only a few horse owners might only occasionally use.

8.2.6 North Area

A number of streets in the north area are classified as arterials and collectors, but carry low traffic volumes. Therefore, it may not be appropriate to build these streets to the currently adopted standards. Some residents want the speed limit on some streets increased, while others want it decreased. Noise is an increasingly important issue to residents, as is access to downtown. However, design and aesthetics remain very important to North Scottsdale residents, who also recognize that there are trade-offs regarding access and maintaining a rural environment.

8.2.7 Roadways

Enhancements are required throughout the City's roadways to facilitate more efficient access, not only within the City, but also between regional venues via Loop 101. Scottsdale residents recognize that these enhancements can contribute to the City's economic growth and vitality.

- Congestion relief is needed in the Cactus Road, Shea Boulevard, and Via Linda corridors;
- Options including using Miller Road, 64th Street, 68th Street, and Granite Reef Road should be considered to supplement existing City north-south capacity;
- Chaparral Road needs to be widened, narrowed, controlled and / or options such as connecting Camelback Road to Loop 101, and improving Indian School Road and Lincoln Drive need to be investigated.;
- Traffic operations at the Hayden Road and Frank Lloyd Wright Boulevard intersection need to be improved by moving it west or through other options; and
- Traffic operations in the Loop 101 / Pima Road area, including the Pima / Princess interchange, need to be improved to provide better access to major developments.

8.2.8 Transit

As referenced above in section 3.3.1, continued growth and development, diminishing available land for construction of new transportation corridors, and a projected increase in transit-dependent populations suggest the need for additional transportation choices.

The following are planning considerations to provide a more effective transit system for the residents of Scottsdale:

- Additional transit routes are needed and schedules should be improved;
- Transit vehicles should have signal preemption capabilities;
- Park-and-ride locations should be identified; and
- Local circulators in the Airpark, southern Scottsdale, and the Mayo Clinic areas are needed.