

# 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, vehicle miles traveled (VMT) per capita reduction goals, use of Intelligent Transportation Systems (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. Current policy documents provide a good foundation to ensure a logical and efficient street network. The street network is also somewhat constrained in many areas by existing development, as well as by the McDowell Sonoran Preserve which incorporates approximately one-third of Scottsdale’s land area. 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 generated through the public process.

- ▶ 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.

Further description of these goals can be found in the Vision, Values, and Goals section of the *Transportation 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 Capital Improvements Plan (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 roadway 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 right-of-way (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. For complete policies review the Policy Element.

### 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 and community area plans, 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 to 55 percent non-single-occupant vehicles (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. Include roadway restriping that considers existing and forecasted motor vehicle traffic, existing pavement and lane widths, *A Policy on Geometric Design of Highways and Streets* (published by AASHTO), and desired bicycle accommodation. These restriping guidelines are intended to accommodate bicycle lanes on existing roadways, through optimized use of existing rights-of-way. (see Bicycle Element, Section 3.1)

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.

<b>Street type</b>	<b>Character</b>
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

**TABLE 4-1: Functional Classification Categories (continued)**

Street type	Character
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 given 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 optional trail.

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 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.

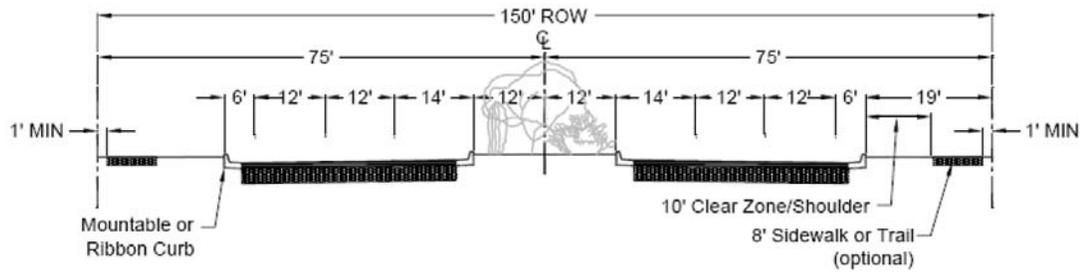
In October 2004, the City Council adopted a *General Plan* amendment to add Bell Road to the Buffered Roadway designation and add a third level of scenic roadway designation called “Desert Scenic Roadway.” Desert Scenic Roadways apply to the one-mile and half-mile roads within the City’s ESLO district (similar in area to the North area of the *Transportation Master Plan*) 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 Scottsdale’s roads (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.

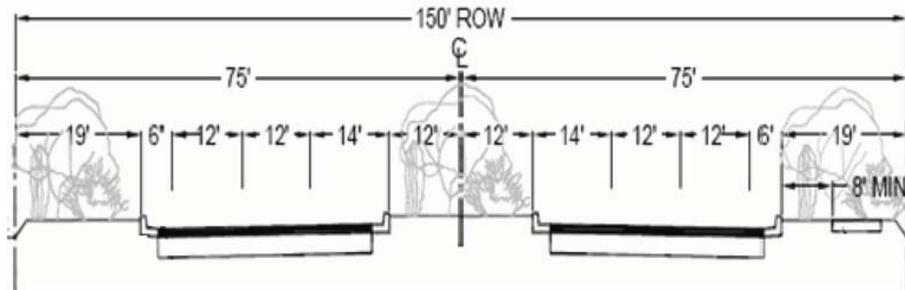
### 4.3 Existing Cross Sections

Figures 4-1 through 4-4 on the following pages are graphical representations of the current cross section for each street classification:

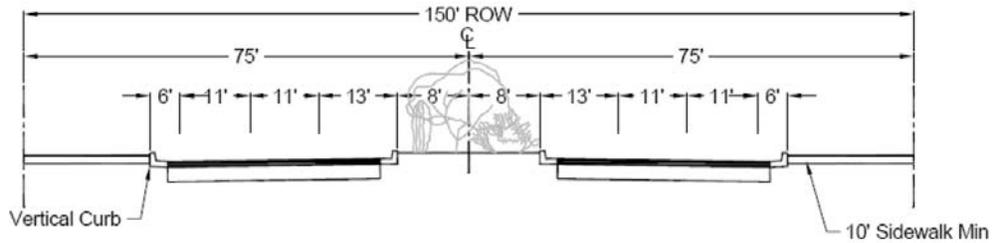
- ▶ Figure 4-1: Major Arterials
- ▶ Figure 4-2: Minor Arterials
- ▶ Figure 4-3: Major Collectors, and
- ▶ Figure 4-4: Minor Collectors



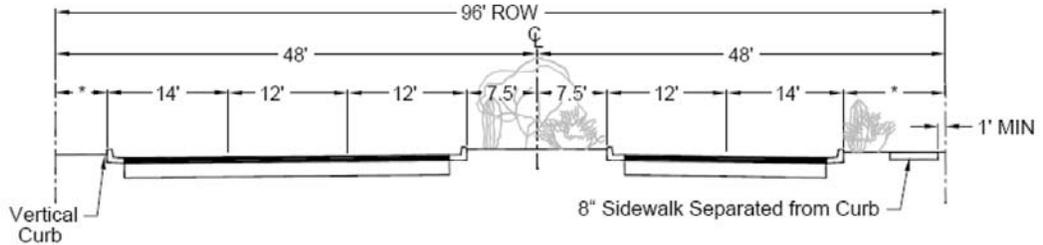
Rural Character



Suburban Character

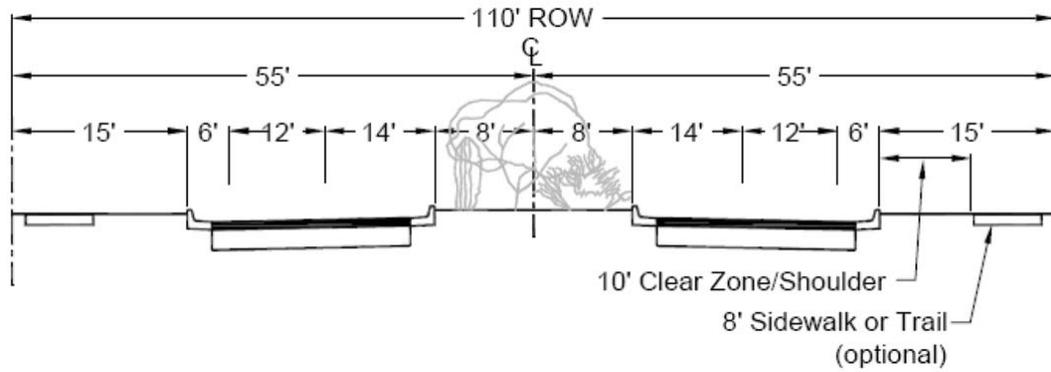


Urban Character

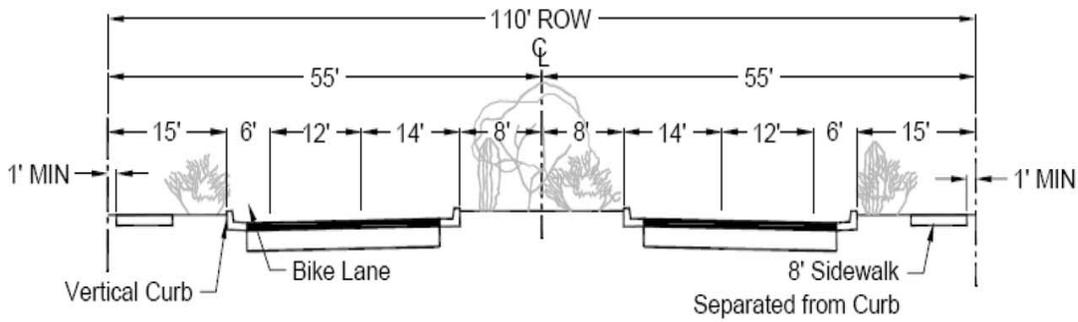


Couplet Streets

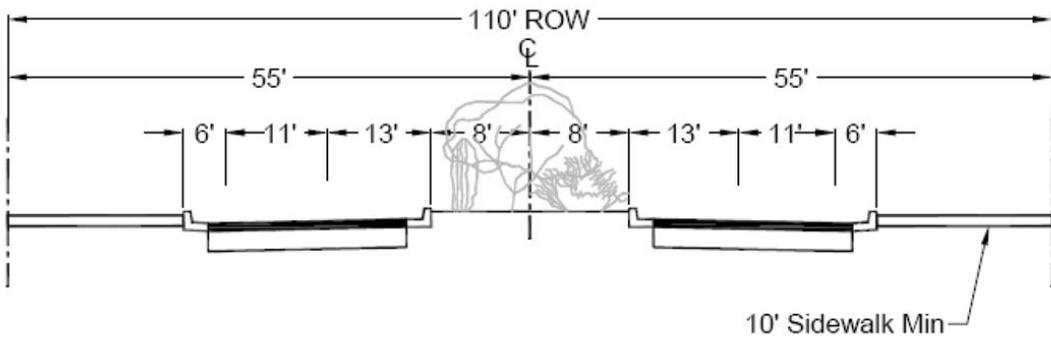
FIGURE 4-1: Major Arterial Typical Cross Sections



Rural/ESL Character

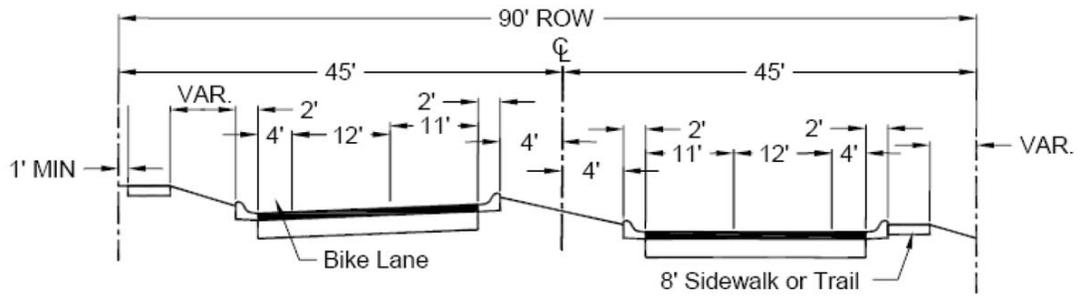


Suburban Character

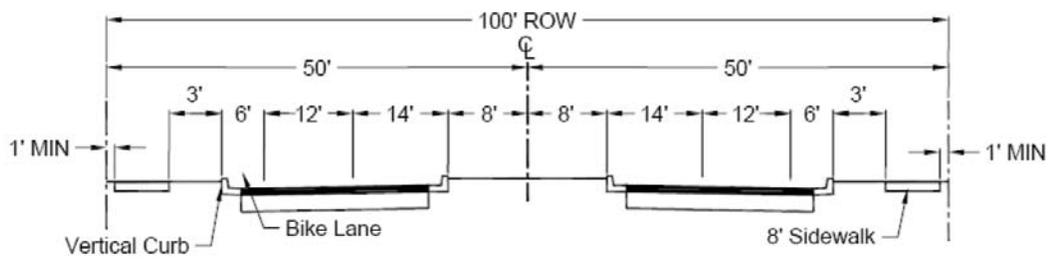


Urban Character

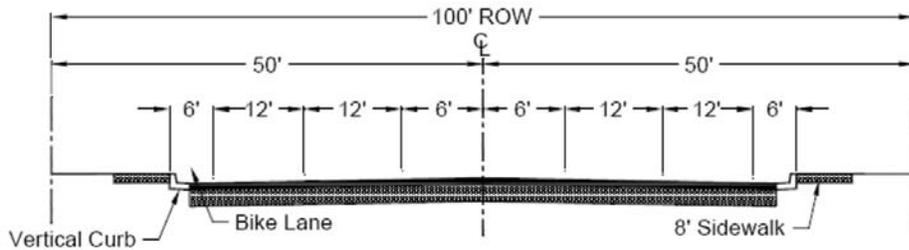
FIGURE 4-2: Minor Arterial Typical Cross Sections



Rural/ESL Character

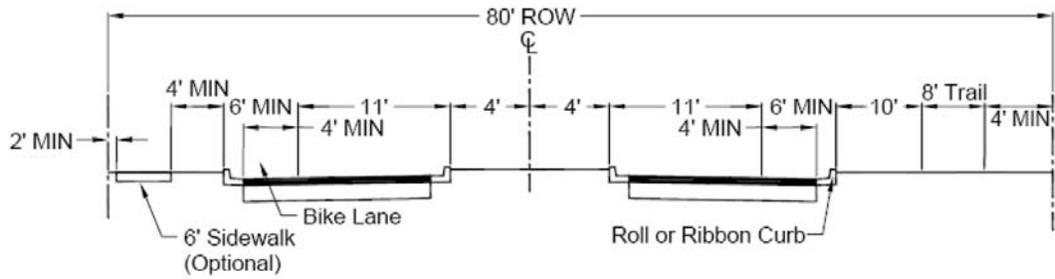


Suburban Character

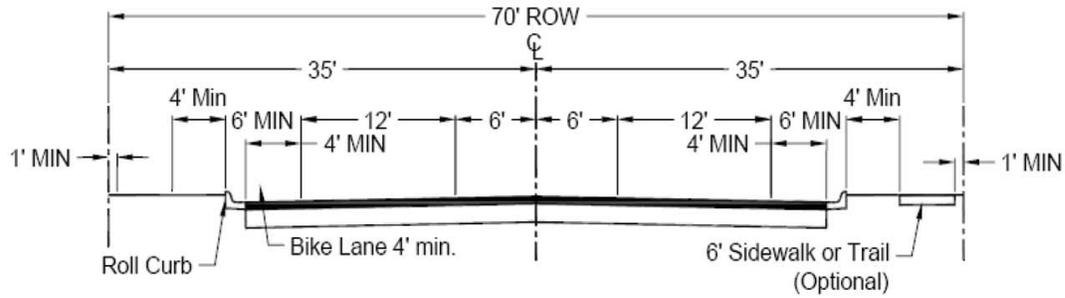


Urban Character

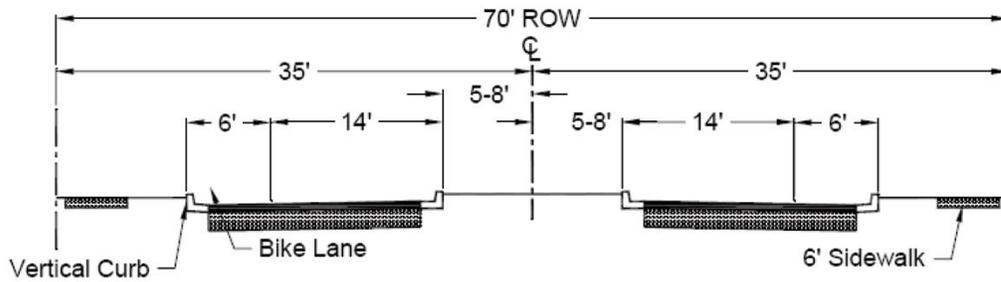
FIGURE 4-3: Major Collector Typical Cross Sections



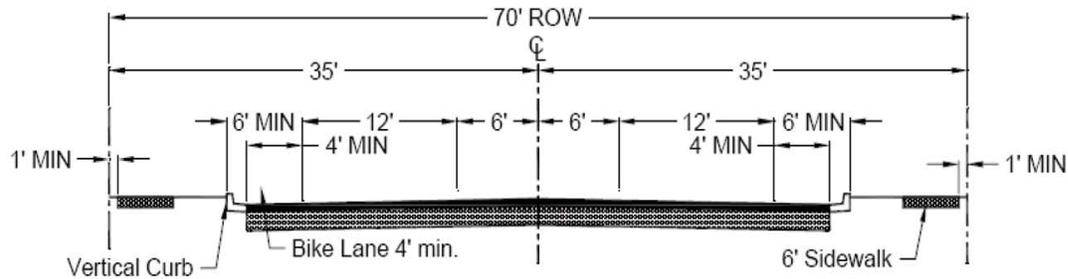
Rural/ESL Character with Trails



Rural/ESL Character



Suburban Character



Urban Character

FIGURE 4-4: Minor Collector Typical Cross Sections

## 5.0 RECOMMENDED STREET SYSTEM/FUNCTIONAL CLASSIFICATION

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

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.

Functional Classification Characteristics				
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 - 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, and 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* and *Design Standards and Policies Manual [DS&PM]*).
- ▶ 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.
- ▶ The Downtown Couplets are five-lane major arterials 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* and *DS&PM*).
- ▶ 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* and *DS&PM*).
- ▶ 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* and *DS&PM*).
- ▶ 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.

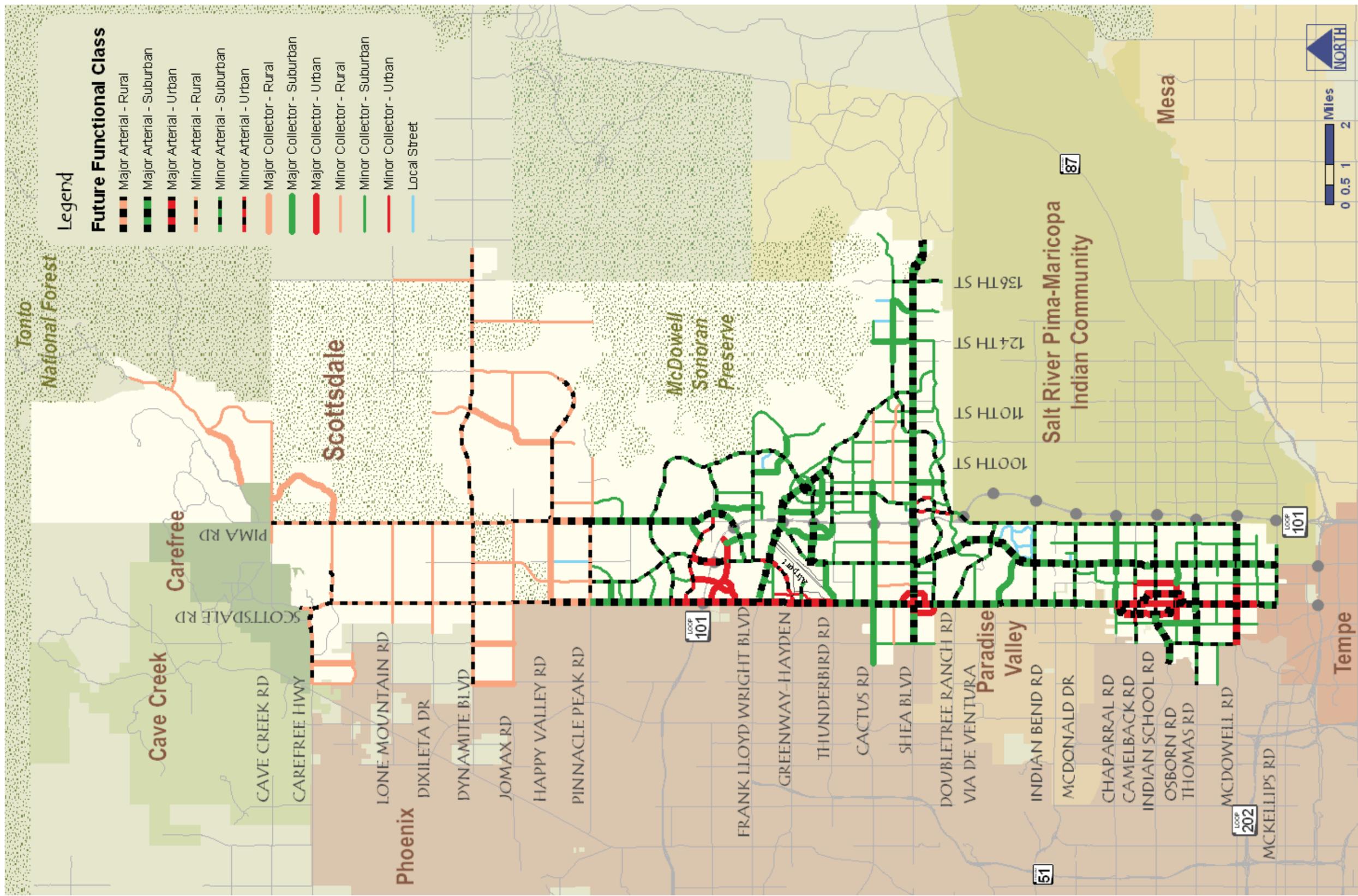


FIGURE 4-5: Recommended Street Functional Classification



## 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)

Intelligent transportation systems 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 are 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 Transportation Management Center (TMC). The Scottsdale 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, Arizona Department of Transportation (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 decrease 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 bus rapid transit (BRT) corridors programmed in the Regional Transportation Plan (RTP) funded through 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.<sup>3</sup> 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

<sup>3</sup> Arizona Revised Statutes Title 28, Section 28-703

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 *Manual on Uniform Traffic Control Devices* (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 policies and 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 less than 8,000 vehicles per lane per day using 2030 forecasted volumes.
- ▶ Target average daily volumes for four-lane collectors be less than 9,000 vehicles per lane per day using 2030 forecasted volumes.
- ▶ Target average daily volumes for four-lane arterials be less 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:
  1. Improve use of existing facilities through the efficient implementation of cost effective signing, striping, intersection control, and sight distance improvements.
  2. Improve access to, and amenities at, transit stops, if transit service is available, and review quality of the service.
  3. Upgrade pedestrian facilities.
  4. Upgrade bicycle facilities.
  5. Consider adding transit service, if not currently available.
  6. Install ITS equipment, if none existing, and integrate with transit service.
  7. Increase access management.
  8. Add right-turn deceleration lanes to commercial and/or multi-family driveways.
  9. Add turn lanes at intersections.
  10. 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 day per lane).

## 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 *Transportation 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 right of way management program (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**

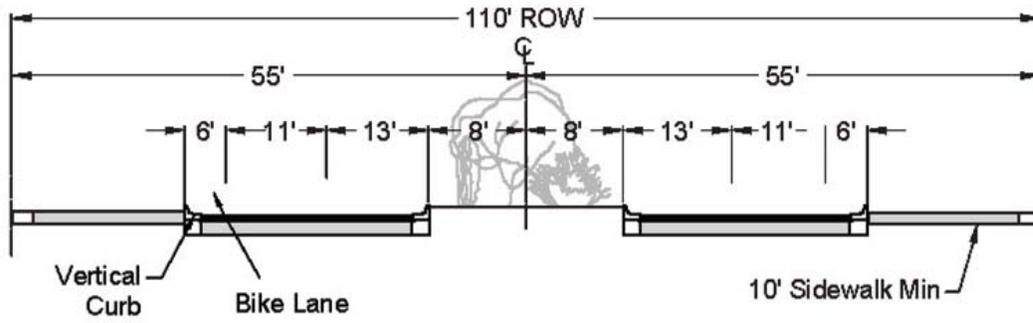
The *Transportation Master Plan* recognizes the need for a comprehensive review of traffic signal timing policies. The City has signal timing plans for all major roadways and intersections for varying times of day; these plans are subject to continuous review and update. At the *Transportation Master 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**

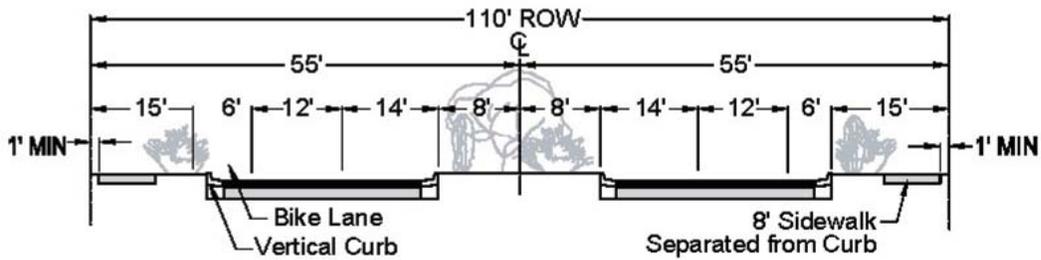
Local area infrastructure plans have been drafted for some areas of the City outside of master planned communities. The purpose of these plans is to guide local decisions for infrastructure improvement (streets, water, trails, etc.) and related development, and to help coordinate the efforts of various 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**

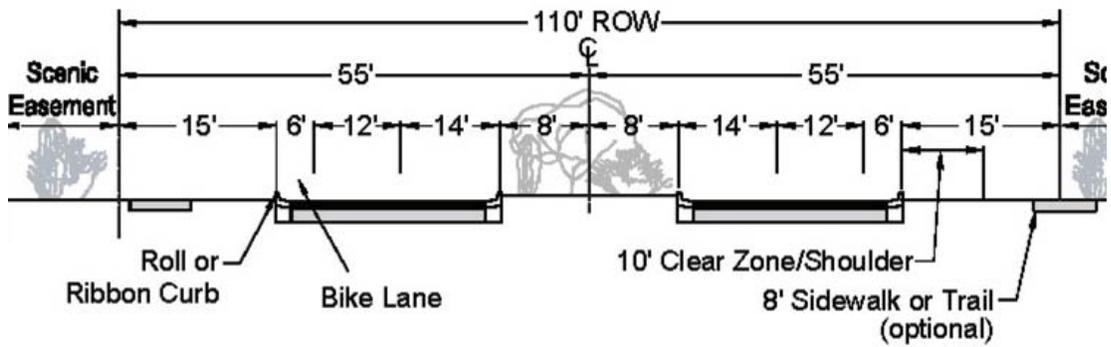
The City's DS&PM was updated in August 2007. The updates are consistent and compatible with the policy recommendations resulting from the *Transportation Master Plan*, that all streets be designed in context of adjacent land uses. Three representative samples of context-sensitive urban, suburban, and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



City of Scottsdale August 2007 DS&PM  
Urban Cross Section



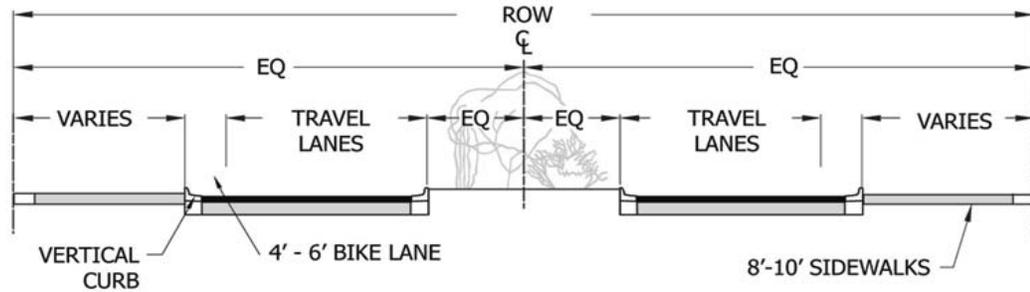
City of Scottsdale August 2007 DS&PM  
Suburban Cross Section



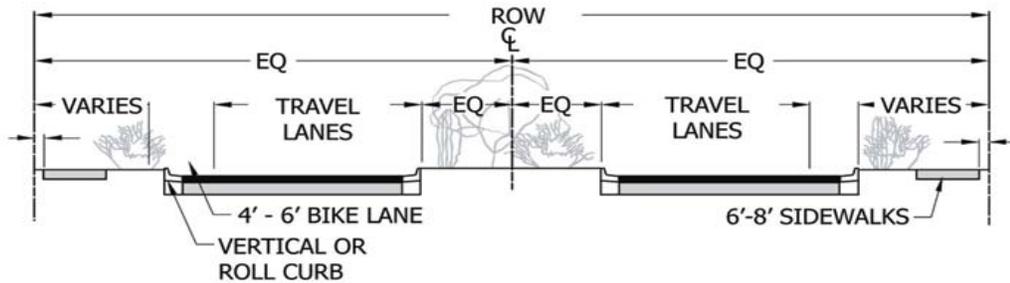
City of Scottsdale August 2007 DS&PM  
Rural Cross Section

FIGURE 4-6: 2007 Design Standards and Policies Manual Street Cross Sections

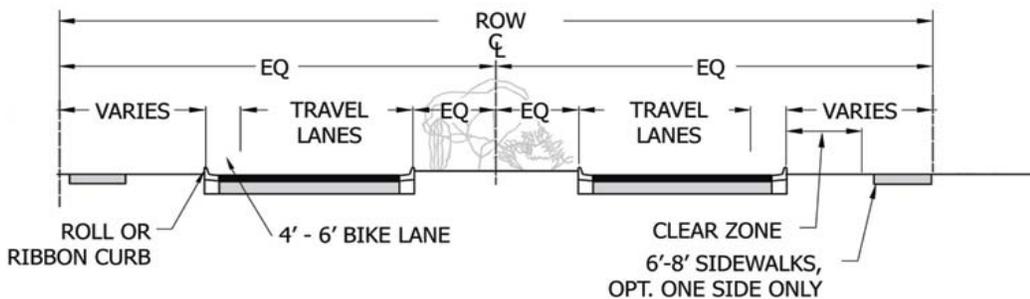
The following three sections represent generalized interpretations of three basic context-sensitive cross sections, developed by the *Transportation Master Plan* team, that are consistent with the updated DS&PM sections above. These *Transportation Master Plan* sections show a range of alternative applications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

FIGURE 4-7: Transportation Master Plan Interpretation Street Cross Section