



Cave Creek | Carefree

# Transportation Framework Study

Working Paper No. 5  
Policies and Standards





# Working Paper No. 5

## Policies and Standards

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## I. INTRODUCTION

### A. Purpose of the Study

The purpose of the Cave Creek/Carefree Transportation Framework Study (TFS) is to develop a comprehensive master plan that will guide transportation development in the communities of Cave Creek and Carefree. As a framework document, this study is intended to serve as a coordinated reference for addressing existing and anticipated transportation issues within and amongst each community, with a particular emphasis placed on local and regional bicycle/pedestrian linkages and special event traffic and parking management.

### B. Purpose of this Working Paper

This Working Paper 5 – Policies and Standards presents a review of existing Town, County, region and national policies and standards relative to this study effort. It also suggests possible modifications or new policies or standards that could apply in Cave Creek and/or Carefree.

### C. Study Goals and Objectives

The Project Team completed public and stakeholder outreach through focus groups, three online surveys, special event intercept surveys, and three public meetings. These efforts and coordination with the Town staffs provided input for key desired improvements and actions as they relate to transportation in the project area.

The Project Team developed the following Goals from the extensive outreach:

**Goal: Provide transportation improvements that will enhance or preserve and not detract from the natural and social character of the area.**

**Goal: Promote a balanced transportation system that provides adequate capacity for and convenient access to vehicle, transit, bicycle/pedestrian, and equestrian travel modes within the study area.**

**Goal: Support the development of transportation related projects that encourage tourism and promote economic prosperity in the study area**

**Goal: Support transportation projects that are fiscally responsible and preserve existing infrastructure**

**Goal: Improve the safety of the transportation system for all travel modes in the study area.**

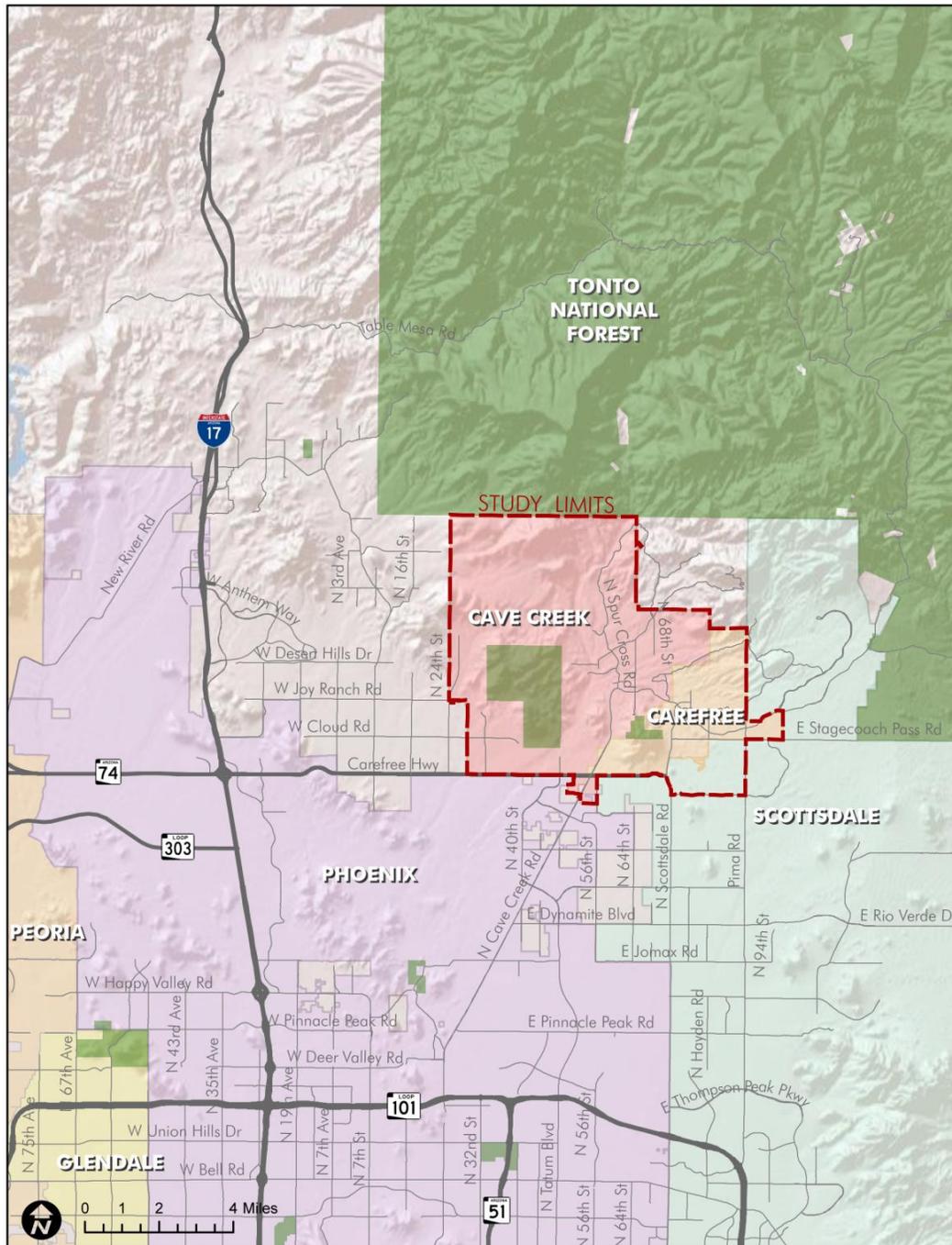




## D. Study Area Overview

The study area for the Cave Creek/Carefree Transportation Framework Study predominantly includes the Municipal Planning Areas (which also align with the Town Limits) for the communities of Cave Creek and Carefree. The study area is generally bounded by the Tonto National Forest boundary on the north, Pima Road on the east, Carefree Highway on the south and 24th Street on the west, but also includes a portion of Scottsdale lying east of Scottsdale Road and north of Westland Road and west of Pima Road. The Study Area is depicted in *Figure 1* below.

Figure 1: Study Area



Source: ASLD





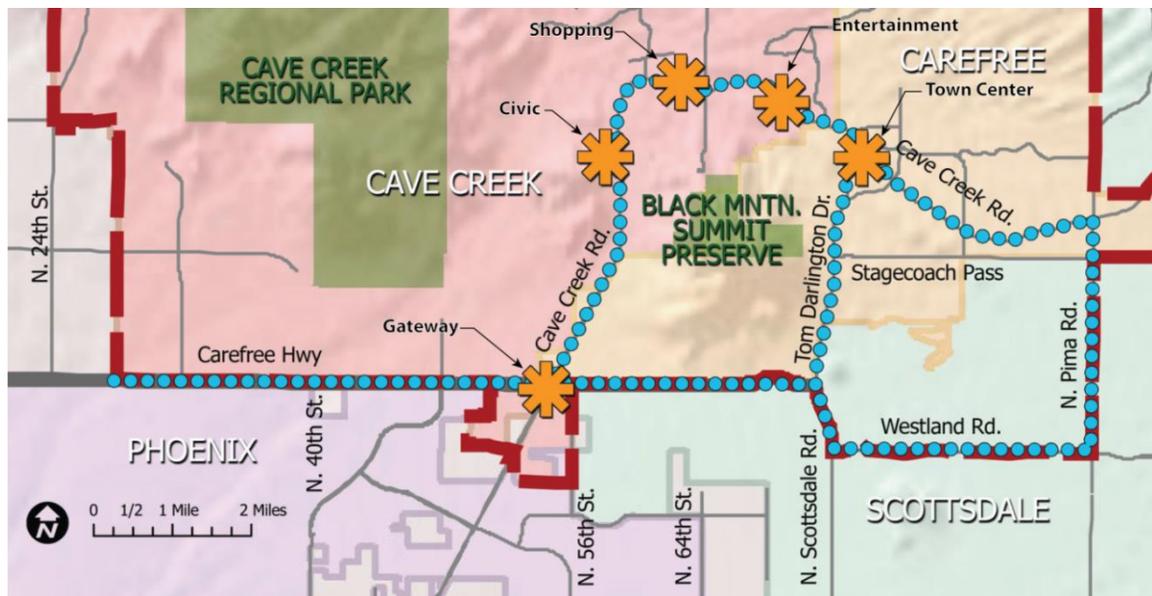
## II. REVIEW OF RECOMMENDATIONS

### A. Nodes

The overarching recommendation for Nodes and Corridors is to create a sense of place at locations of more intense urban activity. The activity nodes will be pedestrian and bicycle friendly and accommodate equestrian uses appropriate in a complete street, context sensitive environment. There are five activity nodes in the study area:

- The Cave Creek “Entertainment District” between Viola Lane and Vermeersch Road
- The Cave Creek “Shopping District” between Spur Cross Road and School House Road
- The Cave Creek “Civic District” between Hohokam Place and Skyline Drive
- The Carefree “Town Center District” between Tom Darlington Dr/Bloody Basin Rd and Cave Creek Rd/Bloody Basin Rd
- The “Gateway District” at the intersection of Carefree Highway and Cave Creek Road

Figure 2: Nodes and Corridors



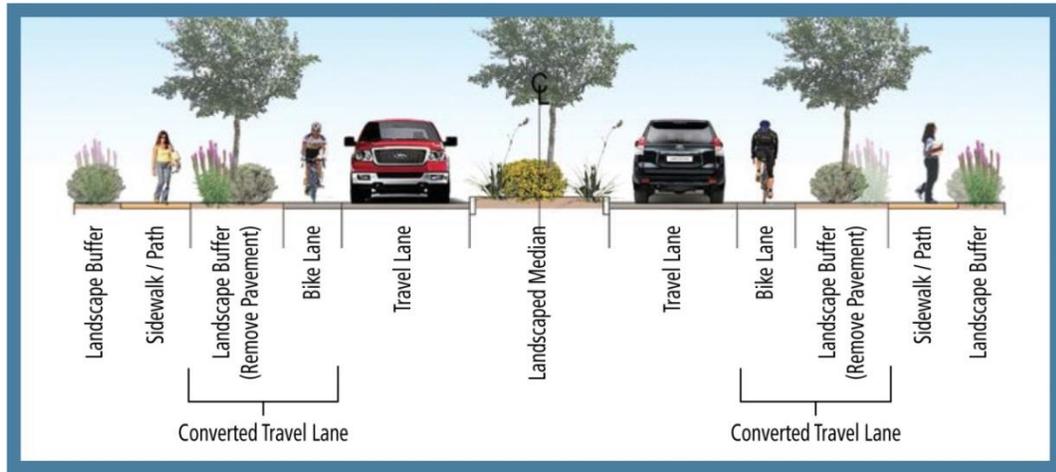
**LEGEND**

- - - Study Area     
 ●●●●● Primary Corridor     
 ★ Primary Activity Node

The nodes include a road diet providing one lane in each direction with a bike lane and sidewalks, an entry feature to provide a sense of arrival including a transition to one travel lane and entry monumentation, additional pedestrian and bicycle amenities and more business parking to promote parking once and walking around.



Figure 3: Typical Activity Node Cross Section in Cave Creek

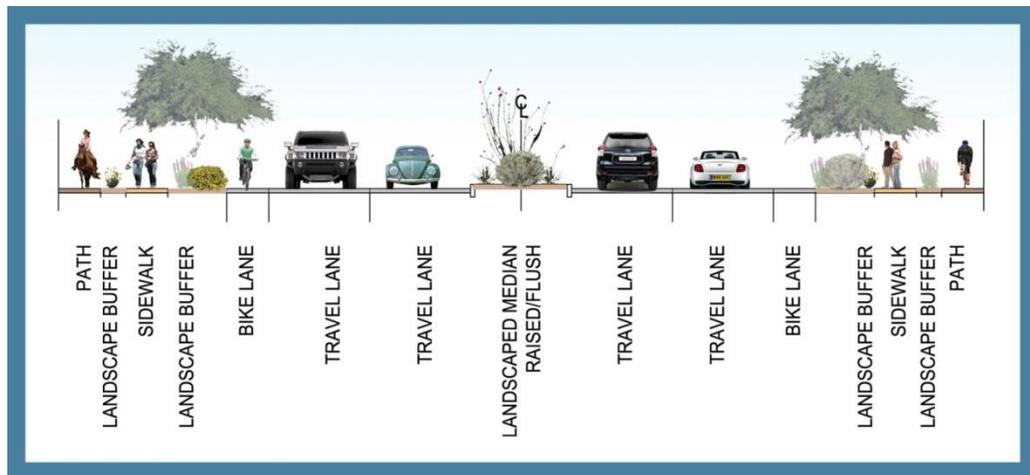


The Gateway District activity node is slightly different in its character and recommendations. A combination of sidewalks, bike lanes, sharrow lanes and multi-use paths with pedestrian crosswalks will enhance non-vehicular connectivity and safety in this vicinity of concentrated student activity in a high speed, high volume vehicular environment. A grade separation like a pedestrian underpass might be appropriate in the future at the Cave Creek Road/Carefree Highway intersection which is the busiest in the study area.

## B. Corridors

Cave Creek Road, Tom Darlington Drive, Pima Road, Carefree Highway and Westland Road are the corridors that connect the activity nodes and will consist of two travel lanes per direction, bike lanes and sidewalks, raised and/or landscaped medians, optional shared use paths and additional pedestrian crosswalks, pedestrian signals and traffic signals where needed. Limited corridor locations require three travel lanes per direction to satisfy 2035 traffic demand: Carefree Highway west of Cave Creek Road, Cave Creek Road south of Carefree Highway, Pima Road north of Hawksnest Road and Cave Creek Road east of Pima Road.

Figure 4: Typical Corridor Cross Section: Cave Creek Road from Carefree Highway to Civic Node





## C. Traffic

Six intersections that are currently unsignalized are expected to meet traffic signal warrants in 2035. Many are coincident with activity node entry points and should be considered for roundabouts. The locations meeting warrants are the intersections of Cave Creek Road at Tom Darlington Drive, Cave Creek Road at Spur Cross Road, Cave Creek Road at School House Road and Cave Creek Road at Pima Road. Other intersections expected to meet warrants include Carefree Highway at 32<sup>nd</sup> Street and Tom Darlington Drive at Stagecoach Pass Road. The road diet of one travel lane per direction in the activity nodes will perform at acceptable levels of service.

## D. Special Event Traffic and Parking

A series of recommendations to enhance the current service include refined manual traffic control procedures for periodic clearing of traffic queues, additional access to Cave Creek remote parking, continued development of the Cave Creek by-pass route, additional event parking, improved shoulder parking in Carefree, enhanced parking wayfinding signage and web page guidance, a “Park Once” strategy, sufficiently lit sidewalk and path accessibility, shuttle service for major Cave Creek events, and priority carpool parking for larger events.

## E. Transit

Transit recommendations include continued funding for Foothills Caring Corps for services to seniors and persons with disabilities along with support for their donation and driver recruitment campaigns. The Towns should pursue a transit study to better define needs and demand and encourage a consortium of stakeholders to develop a seasonal shuttle to connect local resorts with local businesses and possible linkage to public transportation in northern Phoenix and Scottsdale.



## F. Bicycle Tourism



The Towns, in their efforts to enhance their status as a bicycle tourism destination, should evaluate existing cycling assets, continue to foster a welcoming and vibrant bicycling environment including bike races and adventure events, create and publicize bike linkages and tourism corridors and pursue grants for bicycle amenities.



### III. EXISTING POLICIES AND STANDARDS

#### *Existing policies and standards:*

The existing transportation design policies and standards for the Town of Cave Creek and the Town of Carefree are framed by local adopted guidelines, regional standards for Maricopa County, and national criteria. The local documents provide text on the sensitivity of the rural character and preservation of the natural environment. The regional and national documents do not provide a level of importance to these key project area concerns.

#### *Comparison of current local, county, and state documents:*

In comparison of existing policies and standards, a review of current design criteria has been analysed with the following results:

#### A. Town of Cave Creek

##### *Town of Cave Creek – General Plan (2005)*

The Town of Cave Creek has adopted design criteria within the General Plan. Circulation elements are described within this document starting on page 40. This chapter of the document describes the Town goals and objectives for transportation needs within the community. The lack of bike lanes, continuous sidewalks, trails, and equestrian circulation is noted as a concern within this document. The Town has expressed goals of maintaining the rural character and natural landscape within its community areas. Improvements to provide facilities for pedestrian, bike, and equestrian circulation are growth goals. A focus on multi-purpose non-vehicular circulation and connectivity to adjacent recreational areas is expressed in this Plan as a goal and objective. Additional parking facilities that are at or below grade are encouraged.

##### *Town of Cave Creek – Town Core Plan Update (2012)*

The Town Core Plan was revised in 2012 to identify the commercial district areas of the Town Core and the Carefree Highway areas. This update also addresses significant bikeway and pedestrian design goals.

##### *Town of Cave Creek – Technical Design Guidelines for Landscaping*

As part of the Technical Design Guidelines for the Town of Cave Creek, a section is dedicated to address landscape improvements within public areas. This document was reviewed as part of a complete streets approach to designing roadway facilities. This approach evaluates not only roadway from curb to curb (or edge of pavement to edge of pavement), but also behind the curb conditions from right of way to right of way. This section describes character and design criteria for medians and buffer areas adjacent to bicycle and pedestrian facilities. The following bullet points are noted:

- Landscaping should screen parking facilities and utilities
- Landscaping should retain the natural character along roadways
- Use and protect native plant species
- 1 tree per 40 foot of landscaping along street frontage with a 24 inch box size minimum and a 8 foot separation from edge of road
- A 5 foot meandering path is a minimum requirement
- Medians less than 4 foot wide shall have no plants
- No landscape mounding within medians





### *Town of Cave Creek – Technical Design Guidelines for Trails*

As part of the Technical Design Guidelines for the Town of Cave Creek, a section is dedicated to address trail design within public areas. The goal of this guide is to develop an interconnecting, non-paved network for recreation and transportation. Within this section, a bike lane is defined as a 5.5 foot wide lane separated by a painted pavement stripe. Pathways are defined to include on street bikeways and equestrian use. Design criteria is provided for six trail types and crossing conditions (over / under/ and at-grade). A trails master plan is also provided within this guide.

### *Town of Cave Creek – Technical Design Guidelines for Transportation*

The purpose of the Town's technical transportation guidelines is to establish a minimum set of guidelines for design of roadways in the jurisdiction of the Town of Cave Creek. The intent is to assist the designer/user of these guidelines, but not to substitute for professional judgment and competency.

Design criteria for several items are specified in these transportation guidelines and will guide the future design of bicycle lane projects along Cave Creek Road. These items include lane width, pavement cross section, shoulders, cut/fill slopes, sight distance, driveway type, driveway spacing and right-of-way. Cave Creek has defined 2 multi-modal categories of circulation. The first is a Pedestrian Way and the second is a Shared Use Primary Community Trail. Pedestrian Ways are public walkways for connectionist to area destinations. The Trail is a public facility with natural tread as a shared environment for hikers, equestrians, and bicycles.

Within this document, the Town of Cave Creek describes that standard specifications and details have been adopted per the MAG Uniform Standard Specifications and Details, as well as the MCDOT supplements.

### *Town of Cave Creek – Sustainability Action Plan (2009)*

The Town of Cave Creek has adopted a green design approach to its community and had an established sustainability action plan. This plan gives direction on developing for low impact on the environment and promoting the use of natural systems and green building materials and techniques. For the design of a bicycle corridor and a main street pedestrian district, the following bullet points are noted:

- Infrastructure is a collaborative responsibility of the local government and the community.
- Energy conservation, green building, water conservation and management, habitat protection, pollution prevention, air quality, and reduction of the carbon footprint are described as key elements of sustainability.
- Promote energy sources that are renewable
- Optimize building efficiency to maximize natural ecosystems and construction practices. This includes protection of the natural elements, low impact building materials, water harvesting, and preserving dark sky conditions.
- Update the Town Core Plan to reinforce the role of achieving a more compact, pedestrian friendly environment.
- Require landscape materials that are native and drought-tolerant.
- Develop water conserving bio-swales.
- Encourage flood control projects that are multi-purpose and create habitat and habitat connectivity.
- Reduce the city heat island effect.
- Promote the use of non-auto travel modes.
- Support the completion of a bike lane system.
- Encourage transit-oriented developments that address transportation options.





## B. Town of Carefree

### *Town of Carefree – Zoning Ordinance (2010)*

The Town of Cave Creek has adopted design criteria within the community zoning ordinance. Parking criteria is identified within Article VII (7) of this document. Landscaping, including sight visibility policies, is identified within Article IX (9) at Section 9.13.

### *Town of Carefree – General Plan 2030 (2012)*

The Town of Carefree has adopted design criteria within the General Plan for 2030. Circulation elements are described within chapter 4 of this document. Specific criteria and goals are established within this chapter that include connectivity to the Regional Transportation System, Existing Town streets evaluation, description of goals-objectives-policies, and design standards focused on traffic, pedestrian, and bicycle environments. This document also addresses off-road elements for Open Space under chapter 5 of this document. A proposed implementation approach is described under chapter 11 of this document.

The circulation element describes growth improvements to Carefree Highway and Pima Road as part of the regional transportation system to provide better access to the loop 101 and I-17 freeways; both are located 10 miles away from the town.

Pedestrian / Hiking / Bicycle trails are described within chapter 4 and indicates a history of partnering with the Desert Foothills Land Trust (local non-profit organization) in the development and management of trails. Informal trails exist within area wash corridors and along arterial, collector, and local streets. Pedestrian crossings and circulation is described as features of the Town Center area. Under the Goals and Objectives of the General Plan, Carefree states that it will utilize nationally recognized studies, policies and guidelines that are prepared and supported by MAG – Maricopa Association of Governments. A long range plan for developing biking and hiking trails and paths is a key goal for Carefree. Arterial roadways are the biking primary circulation corridors proposed. Design standards for multi-use paths will be based upon MAG standards.

## C. Maricopa Association of Governments

### *MAG Pedestrian Policies and Design Guidelines (2005)*

The MAG document is intended to provide a source of information and design guidance to support walking as an alternative transportation mode by providing a policy to make all pedestrian areas and facilities safe, comfortable, and a destination for people who use them. All though there are specific design guidelines listed in this document not every guideline can be met due to the constraints mentioned in the Introduction. It is the projects intent to use this document as a resource, specifically page 47 of this document, and provide a “safe” ADA complaint facility throughout the entire project.

### *MAG Pedestrian Plan (2000)*

The MAG document describes several goals and objectives that describe best practices on developing safe pedestrian environments in the MAG region. This document promotes pedestrian facilities development and encourages walkability as a mode of transit. The goals include providing networks that create safe on and off street linkages. The Plan uses a “Latent Demand” model for forecasting need of pedestrian linkages for circulation and recreation.





### *MAG Complete Streets Design Guide (2011)*

The MAG document is a resource for ensuring that facilities for bicycles, pedestrians and transit are recognized as integral to a properly designed and functioning street. It is the projects intent to utilize a few of the technique examples to help obtain what MAG considers “Complete Street Design”, as described on page 40 of this document. The techniques to be utilized for this project are as follows: provide a dedicated pedestrian facility (Technique 1), provide pedestrian refuges when signal timing cannot be adjusted to safe levels for pedestrians (Technique 2) and provide dedicated bicycle path along Cave Creek (Technique 4).

### *MAG Regional Off-Street System Plan (2001)*

The MAG document reveals a region-wide system of off-street paths/trails for non-motorized transportation. Although it is not proposed for the project due to right of way constraints, there are a few locations along the project corridor as defined on the “Potential Corridors Map” which could allow off-street path/trail connections but would require the Towns to purchase land for from existing owners and require wash improvements to allow a traversable path. This option could be expensive but could be considered in the development stages if more funding would become available.

## **D. Maricopa County Department of Transportation**

### *MCDOT Roadway Design Manual (12/28/11)*

The purpose of the MCDOT Roadway Design Manual is to standardize roadway design elements where necessary for consistency and to ensure, as far as is practical, that minimum requirements are met for safety, welfare, convenience, pleasant appearance, environmental sensitivity and economical maintenance. The standards outlined in this manual are intended to assist the professional engineer’s competent work but not to substitute for it.

### *MCDOT Traffic Sign Manual (undated)*

This manual contains illustrations of signs approved for use on the Maricopa County Highway and Road System. All signs are to be in conformance to the MUTCD.

### *MCDOT Pavement Marking Manual (7/8/05)*

The purpose of the MCDOT Pavement Marking Manual is to illustrate pavement markings approved for use on the Maricopa County Highway and Road System with the intent of establishing standard details for use by County personnel and contractors when laying out pavement markings or preparing engineering plans. All pavement markings are to be in conformance to the MUTCD.

## **E. National Policies and Standards**

### *Americans with Disabilities Act (ADA) Standards for Accessible Design (2010)*

The Standards for ADA Design was revised in 2010 and made to be in compliance in March of 2012. The previous version was dated 1991. This reference provides minimum standards for providing access to public areas for Americans with disabilities. It describes distances, measurements, and grades to meet the health, safety, and welfare needs of physically challenged people.





### *Manual on Uniform Traffic Control Devices (“MUTCD”, 2009 Edition) and Arizona Supplement to the 2009 MUTCD (1/12)*

The MUTCD is an industry reference issued by the Federal Highway Administration to specify the national standards by which traffic signs, road surface markings, and signals are designed, installed, and used. These specifications include the shapes, colors, and fonts used in road markings and signs, to which all traffic control devices must generally conform in the United States. State agencies are able to develop their own sets of standards in substantial conformance to the federal MUTCD to supplant or supplement it. In early 2012, Arizona adopted a supplement to the 2009 Federal MUTCD. Part 9 of the MUTCD is an entire chapter devoted to Traffic Control for Bicycle Facilities, including Shared-Use Paths.

### *American Association of State Highway and Transportation Officials (AASHTO) Roadside Design Guide (6th Edition, 2011)*

This reference is commonly known in the transportation industry as the AASHTO “Green Book”. The purpose of the Green Book is to provide guidance on the functional design of roads and highways including the layout of intersections, horizontal curves and vertical curves by recommending ranges of values for critical dimensions.

### *AASHTO A Policy on Geometric Design of Highways and Streets, 6th Edition (2011)*

This reference provides guidance on acceptable sight distance for vehicles traveling along a roadway based on the width of the road and the speed of the vehicle.

### *AASHTO Guide for the Development of Bicycle Facilities (1999)*

The American Association of State Highway and Transportation Officials (AASHTO) Guide for the Development of Bicycle Facilities is a reference manual that addresses issues and clarifies elements needed to make bicycling a viable transportation alternative for recreation or mode of transit.

## **F. Discrepant Policies and Gaps**

As a result of the comparison of local, regional, and national policies, no significant disparity of policies is found. A minor deficiency in design policies relating to rural character needs and in sensitivity to the natural environment and landscape exists at the regional and national levels. Some of the design features proposed under the Nodes and Corridors concept do not exist within current policies.

The Town of Carefree includes in the General Plan 2030 goals and objectives, but does not identify how those goals will be implemented and when. The General Plan does not document what those facilities look like or what how they are to be constructed.

The Town of Cave Creek has a dedicated Technical Design Guideline for Trails, Landscaping, and Transportation. These documents summarize policy and design requirements. They include performance standards and minimums for design, but do not include construction details. The transportation document does include several typical cross-sections and exhibits for illustrating concepts. The General Plan includes a circulation element that describes and identifies the roadway categories within the Town of Cave Creek. This General Plan identifies a lack of public parking spaces. The General Plan includes goals and objectives, but does not identify how those goals will be implemented and when. The General Plan does not document what those facilities look like or what how they are to be constructed.





## IV. MODIFICATIONS OR NEW POLICIES AND STANDARDS

Because different entities maintain the transportation systems within the area, different policies and design standards are anticipated to meet the fiscal and operational needs of each community. Each Town has a desire to maintain an independent identity reflective of each communities brand or image. Both communities share a passion for the natural environment and desert character that sets these Towns apart from other municipalities in the valley. Some of these shared ideals can be developed into a common design policy for bicycle (on and off road networks), pedestrian (hard and soft path circulation), and multi-modal (including equestrian) design.

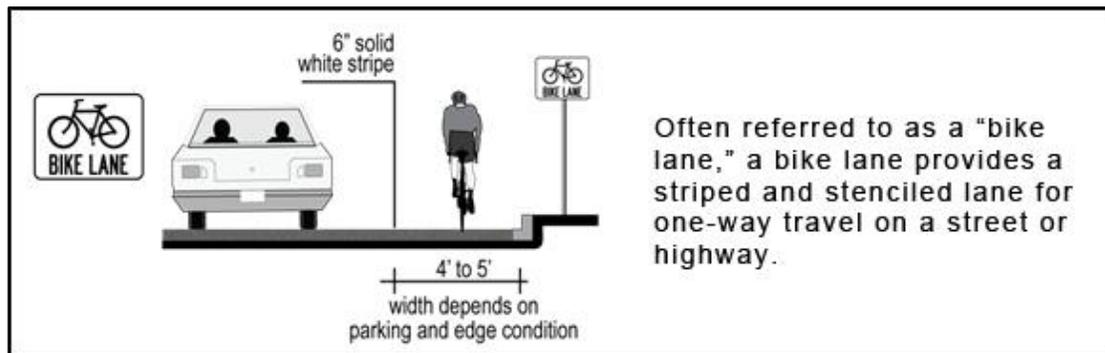
Amendments to the General Plan and Zoning Ordinances of each community are recommended to include bicycle parking requirements for future developments. Requirements for community circulation connections should also be added to Ordinances as part of future development.

An overall program for design and maintenance of these facilities needs to be developed. A uniform guideline for multi-modal infrastructure design and maintenance is recommended to achieve a consistent environment within the region. Within this guideline, differences in specific design details can remain intact for the Town of Cave Creek and the Town of Carefree. This document package should include a narrative on the goals and design context for the following features. A standard detail should also be developed for each of these design elements for each community as a supplement to any adopted MAG Standards. Separate details may be prepared for each community if there are differences in the design materials or finishes. Special provisions may also be prepared to supplement each detail as part of a design standards manual. When possible, an existing standard should be kept, or shown as a modification of that standard.

### *Bike Lanes*

Bike lanes provide a dedicated portion of the roadway designated by striping, signing, and pavement markings for one-way bike travel. Can be buffered; see below. Some bicycle maps will identify grade and corresponding traffic volumes along bike lanes to convey to cyclists the potential level of difficulty or stress associated with riding those bike lanes. Six-foot, concrete bike lanes (five-foot minimum) are preferred for Cave Creek and Carefree.

Typical Bike Lane Cross-section



### *Bike Route/Sharrows*

A preferred travel route for bicyclists, on which a separate lane or path is either not feasible or not desirable. The rightmost lane of a bicycle route is shared by bicyclists and cars. The route is marked with signs and can also be marked with sharrows. Sharrows (Shared Lane Marking) are defined in the Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD) (2009 Edition).

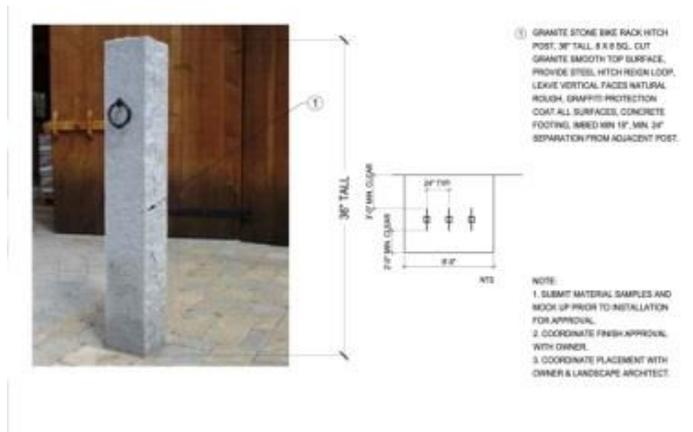


Typical Bike Route Cross-section



*Bike staging and destination facilities (site amenities)*

Staging areas for bike users should occur at locations where parking is available and where connections to paths and trails are nearby. Staging can occur within nodes, at interface points along corridors, or at convergence points of transportation and recreation networks. Facilities for these staging areas should meet the needs of the user groups and have a scale of amenities proportionate to the scale of parking available for users. Site amenities for these areas are to include bike racks and possibly bike lockers for commercial destinations for potential commuters. Seating opportunities, shade (organic or inorganic), and wayfinding signage are essential to staging and destination facilities. When possible, drinking fountains, lighting, and power charging stations are preferred. All amenities are required to be ADA compliant with site amenity design and placement.



*Bike Trails*

Trails for off road network design are defined in the local Cave Creek Design standards and in regional MAG standards. All trail design must comply with the AASHTO Guide for the Development of Bicycle Facilities (2012 or current). Trail markings and signage design is to be consistent with MUTCD - Manual on Uniform Traffic Control Devices criteria.





As part of the Technical Design Guidelines for the Town of Cave Creek, a section is dedicated to address trail design within public areas. The goal of this guide is to develop an interconnecting, non-paved network for recreation and transportation. Within this section, a bike lane is defined as a 5.5 foot wide lane separated by a painted pavement stripe. Pathways are defined to include on street bikeways and equestrian use. Design criteria is provided for six trail types and crossing conditions (over / under/ and at-grade). A trails master plan

is also provided within this guide. It is recommended for Carefree to develop and adopt a similar Guideline and a Master Plan of future trails networks that connect to regional systems.

The MAG Regional Off-Street System Plan (2001) includes recommendations for creating non-motorized paths and trails and should be used as a reference for the development of facilities and infrastructure. New linkages and connections within the study area must consider context sensitive solutions by using materials that are complementary to the local environment. Reuse of existing materials and salvaging of native plants should also be considered for new trail development.

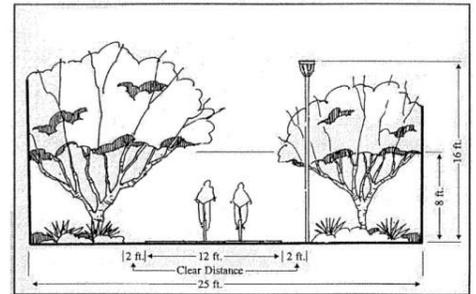
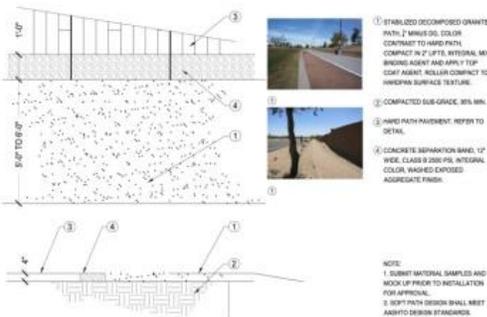


Figure 7-11: Recommended Path/Trail Section, Provided by the Tempe Multi-Use Path System Detailed Plan.

### *Pedestrian Connectors and Walks (Hard and Soft surfaces)*

Non-motorized circulation within the study area requires ADA compliant paths to provide connectivity to destinations and offer an alternate mode of transit for short distance trips. Connectors and Walks may include both hard (permanent pavements) and soft (aggregate or structured soils) material paths. Path locations, user types, and character of land use will support where the hard and soft materials are most appropriate.

Connectors are multi-purpose paths that serve several user types such as recreational, pedestrian, off-roadway cyclists, equestrian, and non-motorized wheeled traffic. These facilities are typically located in a more rural / less dense population area. Connectors provide linkages between destination areas. Site amenities and furnishings are infrequent within connector corridors, and are limited to trailheads, node interface areas, or at destinations. These facilities can be hard or soft materials or a combination of both. Width of connectors is between 8-16 feet and can offer parallel networks of paths for different users.



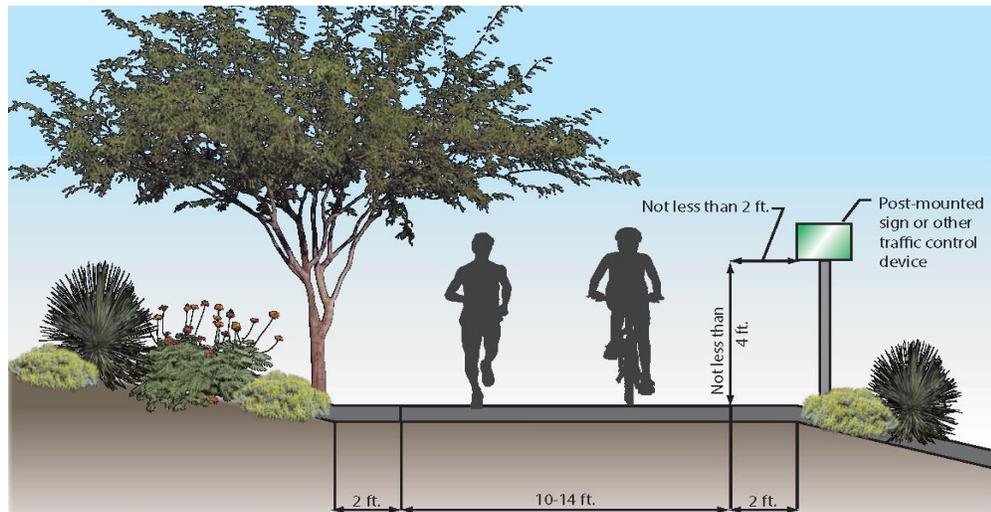
Walks are primarily pedestrian only and serve to circulate within destination areas. Walks are found in areas of denser activity and commercial zones or nodes. These facilities are generally all hard path materials, but offer more site amenities and furnishings than Connectors.



### Shared Use Paths

Shared use paths provide for bicycle travel on a paved right-of-way completely separated from a street or highway and are often planned along uninterrupted linear rights-of-way, such as rivers, channels, and rail rights-of-way. A shared use path may be used by cyclists, pedestrians, skaters, wheelchair users, joggers, and other non-motorized users. Compliance with the Americans with Disabilities Act (ADA) is required for shared use paths since they are accessible by pedestrians. Ten feet is the minimally accepted width for a paved, two-directional shared use path but widths typically vary from 10-feet to 14-feet depending on the mix and volumes of path users. Eight-foot wide is the minimum acceptable with a 4-foot landscaped buffer.

Typical Shared Use Path



### Pedestrian comfort nodes and destination facilities (site amenities)

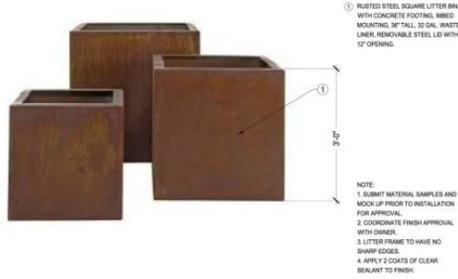
Comfort nodes are unique to the site conditions in which they are located and the space available to locate facilities within. Comfort nodes should be limited to locations within Node districts and be spaced at a ¼ mile or 10 minute walk spacing. The MAG Policies and Design Guidelines (2005) offer a source of information and design guidance to support walking as an alternative transportation mode by providing a policy to make all pedestrian areas and facilities safe, comfortable, and a destination for people who use them. MAG also offers a Pedestrian Plan (2000) that identifies a source of information and design guidance to support walking as an alternative transportation mode by providing a policy to make all pedestrian areas and facilities safe, comfortable, and a destination for people who use them. Although there are specific design guidelines listed in this document, not every guideline can be achieved due to site constraints.



- 1 GRANITE STONE BENCH CUT  
 GRANITE: SMOOTH TOP SURFACE,  
 NOTCH 2" DEEP, 3/4" FOR  
 SKATEBOARD DETERRENT. LEAVE  
 VERTICAL FACES NATURAL ROUGH,  
 GRANITE PROTECTION COAT ALL  
 SURFACES, 12" LENGTH.

NOTE:  
 1. SUBMIT MATERIAL SAMPLES AND  
 MOCK UP PRIOR TO INSTALLATION  
 FOR APPROVAL.  
 2. COORDINATE FINISH APPROVAL  
 WITH OWNER.  
 3. COORDINATE PLACEMENT WITH  
 OWNER & LANDSCAPE ARCHITECT.





Node composition should include shade as the highest priority to provide user comfort and encourage activity. Nodes should also provide amenities for staging, orientation, and temporary relief from the elements. This includes seating opportunities, site furnishings for litter/recycle, bicycle storage and securing, safety lighting, safety crash rated bollards, enhanced pavements, and when water is available, drinking fountains.

### Crosswalks

Crosswalk markings provide guidance to pedestrians who are crossing roadways by delineating paths to and within signalized intersections. In conjunction with signs and other measures, crosswalk markings help to alert road users of a designated pedestrian crossing point across roadways at locations that are not controlled by traffic control signals or STOP or YIELD signs. At non-intersection locations, crosswalk markings legally establish the crosswalk. For approaching vehicles, appropriate pedestrian/bicycle crossing warning signage such as MUTCD W-11-2, W-11-15 or W-11-15P for vehicle approaches at intersections should be considered. Examples of typical signing and pavement markings are shown below.

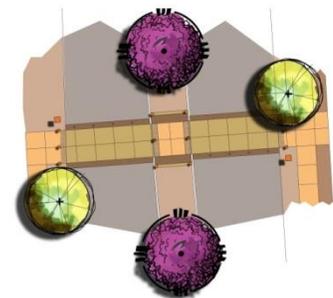
#### Typical Pedestrian Crossing Signing & Marking



Source: MUTCD

### Mid-Block Crossings

Crossings for at-grade locations within the study area are recommended to include a standard configuration so that users are familiar with these features. Further study is necessary to identify specific locations through traffic planning and analysis. Consistent features of crossings should include specialty pavement for crosswalks, imbedded (lighted) flashers for driver awareness, roadside signage, mid-road refuge areas, and when warranted, activation signals.





### Wayfinding Signage and Features

Wayfinding elements can be as obvious as monument, destination-arrival, directional, or area map signs. Wayfinding elements can be as subdued as consistent material finishes, imbedded information in pavements and features, or patterns within site materials. A recommended signage package for wayfinding elements, both obvious and subdued, should include context sensitive material choices that complement the character of the region. Weathered and natural materials are an appropriate material finish. Signage within the roadway must meet the sight visibility requirements of both Cave Creek and Carefree. Signage must also be compliant with MUTCD standards. Due to limited lighting and dark sky sensitivity of the area, lighting for signage is essential.

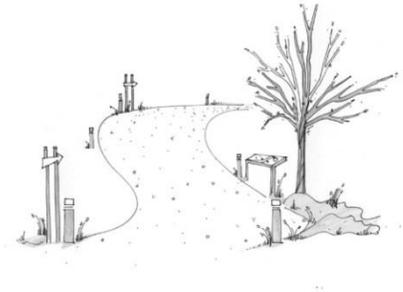


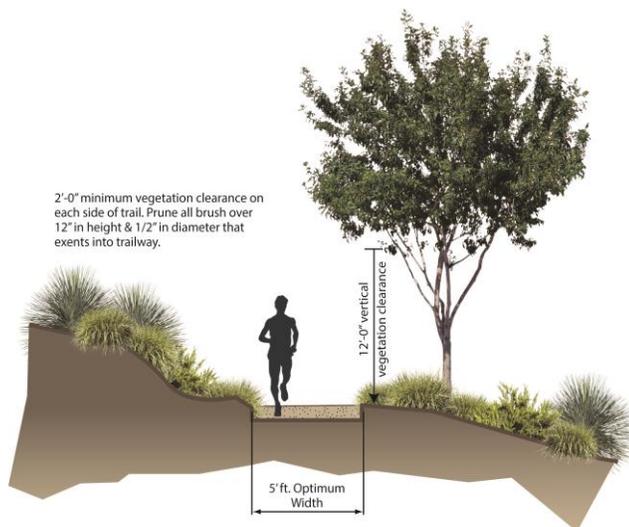
Figure 1-6: A User-Friendly Path/Trail.

### Trails

Multipurpose trails are off-road trails, typically unpaved that are intended for use by pedestrians, bicyclists or equestrian users. Multipurpose trails typically are set back from formal roadway facilities and often utilize natural and manmade features such as washes, rivers or utility corridors for recreational use. The Anza Trail is an example of a multipurpose trail in Rio Rico. There is no “one size fits all” approach when designing multipurpose trails as their design is highly influenced by local conditions including topography, physical impediments, and availability of right-of-way or easements.



### Typical Multipurpose Trail

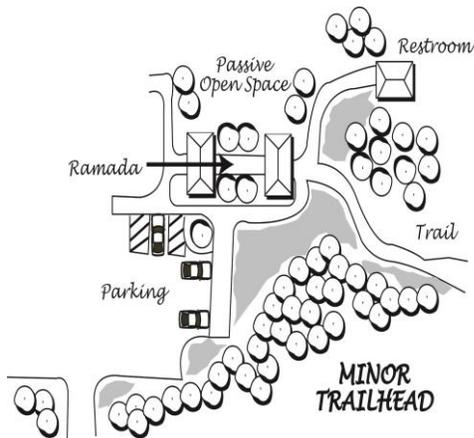




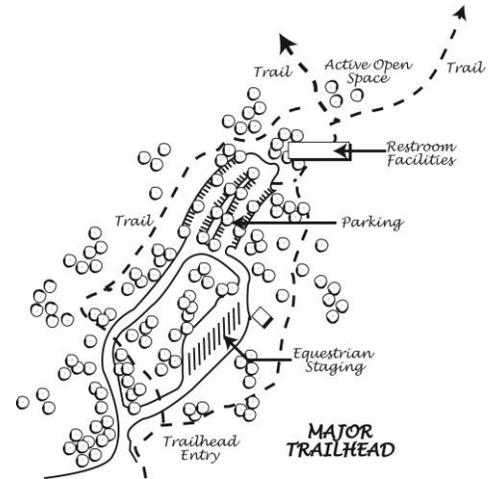
## Trailheads

Trailheads are staging areas at the point at which a path, usually intended primarily or solely for walking/hiking and/or equestrian traffic, begins. While there is no universal set of trailhead design standards, there are typically two trailhead types: major and minor.

Major trailheads are larger in size, located at significant destination points and often designed to accommodate equestrian users. Minor trailheads are typically located in connection with another community facility such as a park or community center that serve as a staging area to an adjacent trail or may serve as a standalone staging area to a popular trail destination.



Sample Minor Trailhead Design



Sample Major Trailhead Design

## Trail and/or equestrian staging and destination features (site amenities)

Typical amenities often associated with a major trailhead design include:

- Equestrian parking (gravel or decomposed granite surfacing) to accommodate large trailers and queuing space. The preferred parking space dimension is 15' wide by 70' long.
- Equestrian parking area design should allow the equestrian user the opportunity to enter and leave the trailhead (pull-through) without having to back-up or reverse the trailers.
- Standard parking (30-100 spaces)
- Ordinary mounting blocks, stumps or stones
- Drinking water source/water trough (for horses)
- Tether area
- Concrete bunker for manure disposal
- Picnic tables (2-4)
- Ramadas (2-4)
- Restrooms
- Separate parking and staging areas for non-equestrian users
- Garbage containers (2-3)
- Bench seating (2-3)
- Kiosk with trailing maps and interpretive information
- Trail signage clearly marked
- Dusk-to-dawn lighting



Features commonly associated with a minor trailhead include:

- Standard parking (10-30 spaces)
- Drinking water source
- Picnic tables (1-2)
- Ramadas (1-2)
- Restrooms
- Garbage containers (1-2)
- Bench seating (1-2)
- Kiosk with trailing maps and interpretive information
- Trail signage clearly marked
- Dusk-to-dawn lighting

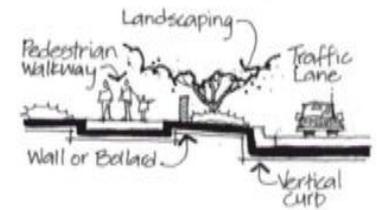
### Landscape Buffers

Buffers provide several benefits to the transportation environment. Landscape buffers within corridors offer separation between motorized traffic and non-motorized traffic. This separation distance is recommended to be a minimum of 5 feet from pavement to pavement. Landscaping can offer a benefit as a vegetation barrier for safety, a sound barrier, and as a comfort measure for non-motorized users. Landscape materials also reduce the urban heat island generated by roadway pavements. Landscape buffers also offer visual screening from residential neighborhoods, and enrich vistas and view corridors found within this project area’s native environments.

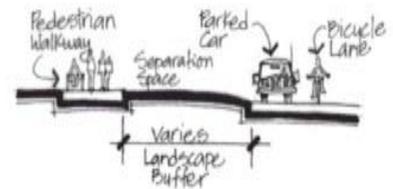
Buffers of 5 feet width or more can sustain native trees to promote shade, screen development, and offer organic safety barriers. Buffers should include a mix of local native trees, accents, shrubs, cacti, and groundcovers. Density of plantings and spacing is intended to blend with the adjacent native environment. In developed areas, this mix should follow current development standards adopted by the Towns of Cave Creek and Carefree.

### Safety features (lighting and barriers)

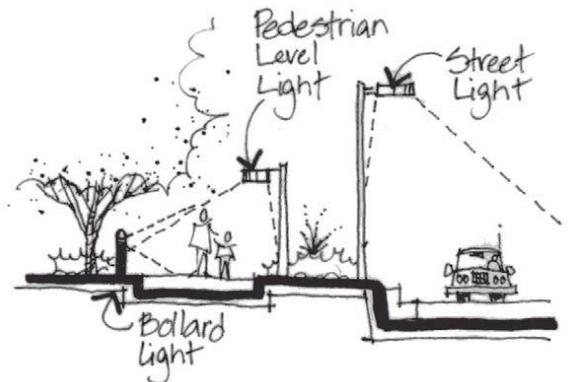
Pedestrian level lighting can be provided by bollard lights or by 10-foot to 15-poles (street lights are approximately 35-foot tall). A minimum of 1 footcandle from grade to 5 feet above the walking surface is typical between sunset and sunrise at intersections, crosswalks and other potential conflict points.



Types of vertical separation.



Types of horizontal separation.

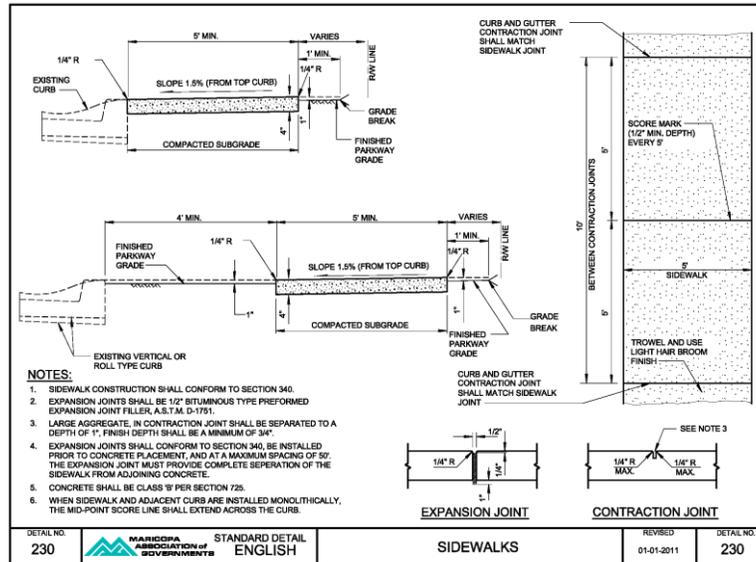


Source: MAG Pedestrian Policies Design Guidelines



## Sidewalks

Sidewalks generally provide the greatest degree of comfort for pedestrians when pedestrian use is found is close proximity to a roadway facility. Generally, sidewalks are preferred in residential communities with an average lot size of 12,000 square feet or smaller. The population densities and vehicle trips generated in higher density subdivisions warrant the application of sidewalks to safely segregate the pedestrian from vehicular traffic. MAG Standard Detail 230 calls for a 5-foot sidewalk width, however in areas where heavy pedestrian activity is anticipated, a six foot width is preferred. The minimum acceptable width of sidewalk for short distances is four feet.



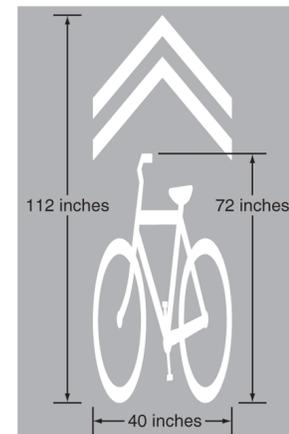
MAG Std. Detail 230

## Signage

All signage must comply with the current edition of the Manual on Uniform Traffic Control Devices (MUTCD). The minimum number of signs adequate to communicate the intended message is desirable in order to prevent information overload. Examples of bicycle signage are shown below.



Typical Bike Route Pavement Marking



Source: MUTCD