

# EL RIO



Avondale

BUCKEYE, AZ



## El Rio Design Guidelines and Planning Standards

A Guide for Land Management and Implementation of the El Rio Watercourse Master Plan



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# Executive Summary

*The vision of a restored Gila River serving as a catalyst for economic development in the Southwest Valley was born in 1999. Since then, that vision has flourished through the cooperative efforts of Maricopa County and the Cities of Avondale, Buckeye and Goodyear. The El Rio Design Guidelines and Planning Standards provide the county, the communities, and all interested parties, with guidelines to supplement the current development regulations. These guidelines help to create and maintain a focus on techniques that can increase awareness and appreciation of, as well as access to, the Gila River.*

## EL RIO



Avondale





## i.1 Introduction

The Gila River is one of the more important river corridors in Arizona. With its headwaters in the mountains of western New Mexico and its mouth at the Colorado River in Yuma, the Gila spans the entire width of central Arizona, covering nearly 650 miles, 570 of which are in Arizona. In total, the Gila River accepts drainage from an area of nearly 60,000 square miles, which is slightly more than half the land area of the state. (Source: University of Arizona Water Resources Research Center).

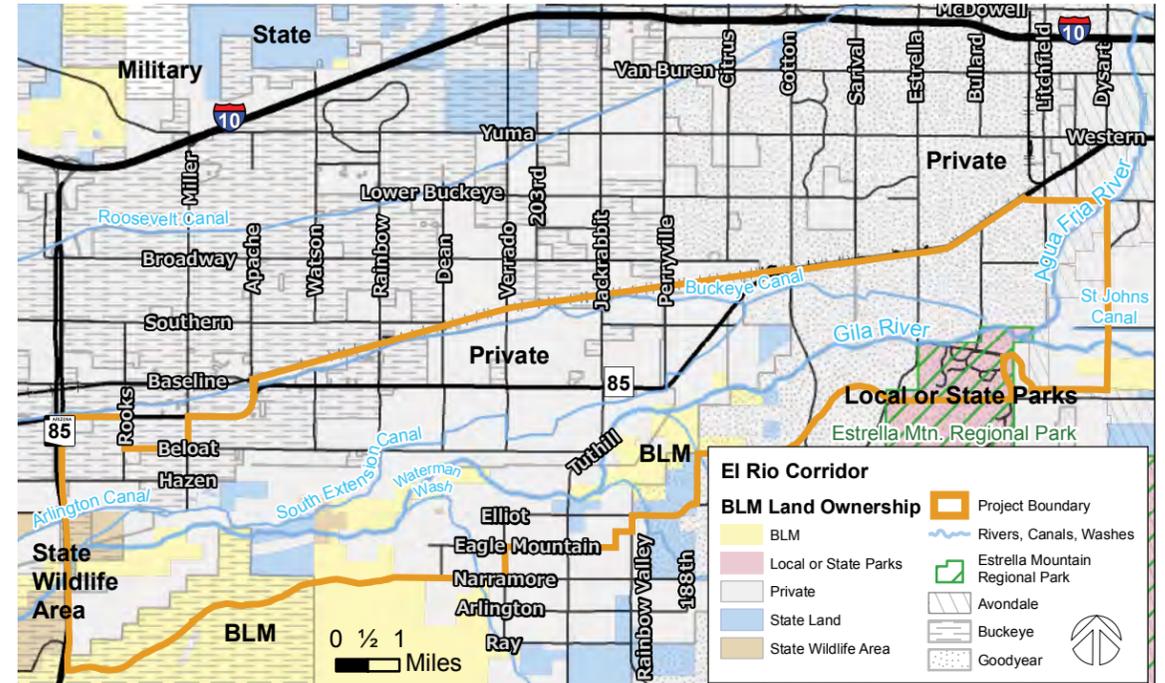


Source: K.Musser <http://www.eoearth.org/view/article/176074/bnrg>

## i.2 Area of Study

Located in the west Phoenix metropolitan area, the project area spans roughly 17.5 miles from the junction of the Agua Fria River on the east end to the State Route 85 bridge on the west end, and incorporating nearly 53 square miles as it crosses through the communities of Avondale, Buckeye and Goodyear and unincorporated areas of Maricopa County. This area is one of the fastest growing regions in the country, and will continue to experience significant growth pressures in the future. As such, the corridor has been the focus of several previous planning efforts. In 1999, the *El Rio Vision* document was developed and in 2002, the Flood Control District of Maricopa County (FCDMC) began work on the *El Rio Watercourse Master Plan (WCMP)*. Building on these previous planning efforts, the *El Rio Design Guidelines and Planning Standards* is intended to protect the corridor while integrating multi-use activities.

Understanding the challenge, these communities have looked to other positive examples where these competing goals have been managed successfully. These examples include: Scottsdale's Indian Bend Wash, East Maricopa Floodway, Tres Rios 91st Avenue Demonstration Wetlands Reclamation Project, Rio Salado Environmental Restoration Project, and Tempe Town Lake. Like the examples above, the public interface with the Gila River will address both structural and non-structural flood control alternatives for future development, recognizing the



importance of flood mitigation, the riparian habitat and the potential for economic growth and recreation.

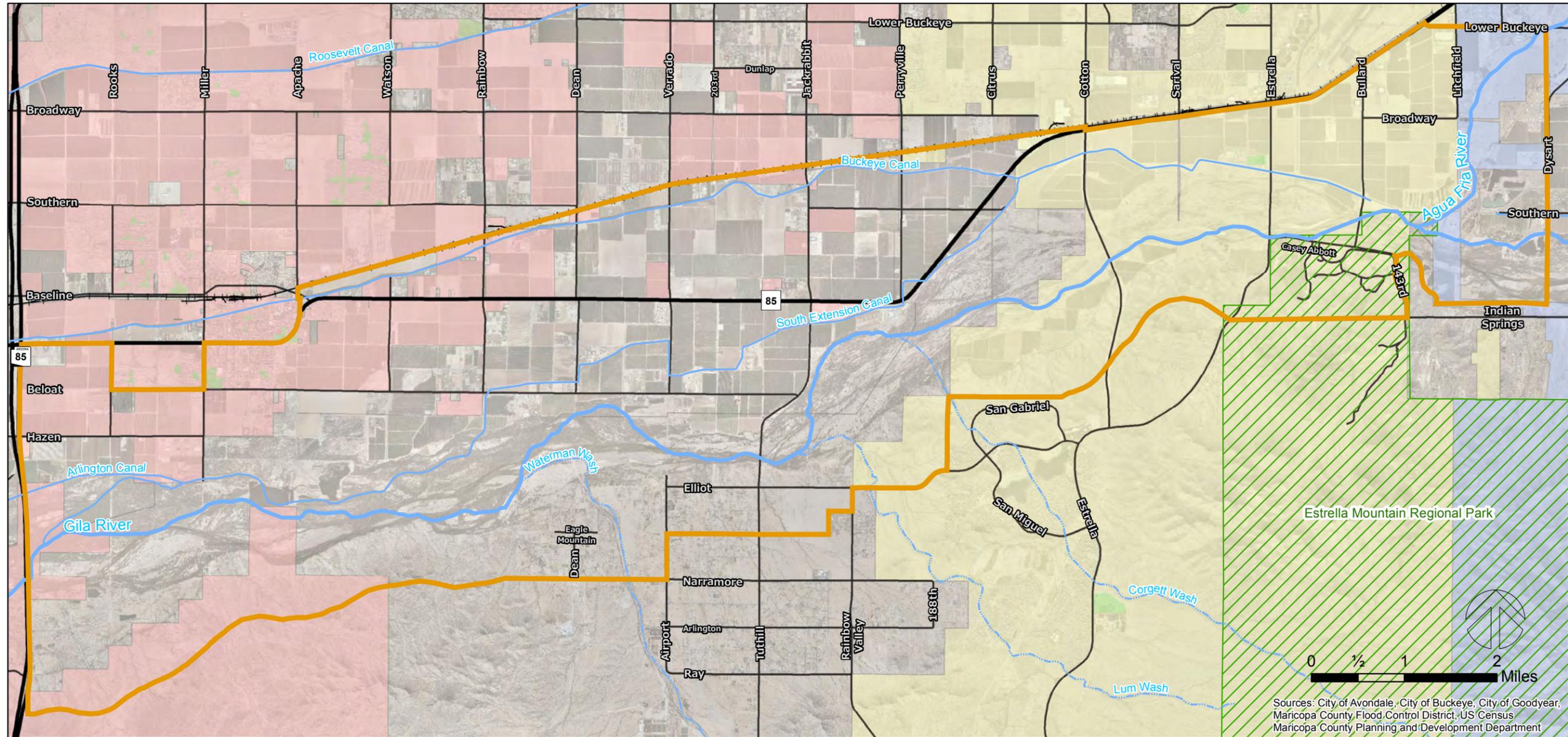
This document provides information about, and guidance on, the following:

1. Background of the project study area
2. Character and vision
3. Land use
4. Open spaces, paths, trails, and edge treatments
5. Planting habitats and transitional planting guidelines
6. Signage and wayfinding features

7. Overview of the economic development potential to the surrounding communities

8. Pilot projects - one in each city

The identified project area (see map above) includes a wide diversity of existing and planned land uses of the three municipalities and areas of unincorporated Maricopa County that border the project. This study supports that future development potential with an additional focus on how these developments, and the public, will interface with the Gila River.



Sources: City of Avondale, City of Buckeye, City of Goodyear, Maricopa County Flood Control District, US Census, Maricopa County Planning and Development Department



Date: 9/27/2015



**Legend**

- Project Boundary
- Canal
- Washes
- Rivers
- Estrella Mountain Regional Park
- Parks
- Railroad
- Arterial Streets
- Interstate Highway
- State Highway
- County Highway
- Interchange
- Ramp
- Avondale
- Buckeye
- Goodyear

**El Rio Design Guidelines and Planning Standards – Area Map**



## i.3 Purpose of Document

Design guidelines are meant to illustrate development options and solutions to developing in a floodplain, while maintaining access to the Gila River, improving the aesthetic quality of the river and its surrounding communities, increasing the availability of publicly accessible open space, and effectively utilizing planning efforts to maximize the potential of the surrounding area for development and economic growth. It is important to remember, though, that the guidelines represent conceptual ideas, not zoning regulations or development standards; they do not supersede but are meant to supplement the regulations in the local municipal codes of the surrounding Cities of Avondale, Buckeye and Goodyear, as well as Maricopa County standards.

The purposes of this document include:

1. Communicate the design qualities expected within the El Rio project area
2. Facilitate the fair and consistent application of design objectives throughout the El Rio project area
3. Protect investment within the El Rio project area by encouraging consistently high-quality development
4. Establish a positive interface with the river thereby integrating the river into the future development potential along this vitally important corridor
5. Promote pedestrian and other multi-modal connections to the river and thereby fostering an interconnected society
6. Promote the economic viability of this

area for future development

One of our overriding goals is that all development within the El Rio corridor will provide an interconnected, multi-modal system with a mix of uses and green spaces.

All development in the corridor will link to the El Rio Trail system and the river environment. This interconnected 'ribbon' of green will transform the El Rio corridor into a unified, cohesive setting where residents and visitors can reconnect with nature, pause and enjoy life, and where both natural and human ecosystems can flourish.

Historically, flooding in the El Rio corridor has played an important role in shaping the surrounding natural environment. Although floods occur infrequently in the area, the consequences can be very significant. Flooding can place lives at risk and result in extensive property damage. Therefore, managing the risk of flooding is an important part of contributing towards achieving an economically and environmentally sustainable destination.

As development continues to take shape in the area, it is important to understand this history and plan for future development that takes this history into consideration. Based on the level of flood risk, future development can provide site design and/or structural improvements to mitigate flood risk. The framework outlined in this document allows for all forms of future development in the corridor.

The *El Rio Design Guidelines and Planning Standards* document encourages future development at an appropriate scale to the level of flood risk and takes the following

objectives into consideration:

1. Minimize the potential impacts of flooding on human health and safety
2. Encourage development in locations with little or no risk from flooding
3. Allow development throughout the corridor, at a scale appropriate to the risk of flooding and mitigation measures
4. Recognize potential for changes in flood risk by considering future, funded local and regional flood improvements

No design or improvement can completely eliminate flood risk in the corridor. Therefore, managing the consequences of flooding is of paramount importance.



## i.4 Chapter Overview

Future development will be guided by these core objectives. Property owners, developers, designers, and contractors proposing new development within the El Rio project area should first determine their location relative to the established floodplain of the Gila River and review the development regulations required by each local jurisdiction. And finally, any development should consult these El Rio Design Guidelines and Planning Standards for further guidance with respect to the interface with the Gila River and specific site design considerations.

### Chapter 1 - Background

This section provides an overview of the previous reports that have been completed on the El Rio corridor and clarifies the history of the corridor. It also provides information on land ownership and land use within the project area.

### Chapter 2 - Character and Vision

This chapter provides a purpose for the continued efforts relative to the El Rio corridor. This chapter also expands previous efforts to identify and describe twelve (12) distinct character areas that can serve as a planning tool for development. Character Area Planning is the term given to an 'area-based' approach to land use planning. It is a technique that identifies and interprets the notable qualities and historic features that unite like neighborhoods and/or land areas. Recognizing these qualities and features gives the present day landscape a connection to the past while defining a way forward for future development.



The benefits of this approach are many:

1. It enables a community to identify and value its natural, built and social environments, thereby more effectively managing change.
2. It safeguards the natural and historic environment that contributes to an area's sense of place.
3. It enhances the quality places that are important to a community.
4. It is more flexible and business friendly than the conventional approach to planning by allowing design and context to moderate compatibility.

The chapter also builds upon the historic El Rio vision developed in 1999. The vision was articulated in five distinct theme objectives. They include the following:

1. Restore and maintain the natural functions with the river corridor (as a riparian habitat)
2. Focus on multi-use facilities and functions
3. Maintain, enhance or mitigate flood control elements
4. Focus on public/private partnerships
5. Link functional compatibility outside the riparian habitat limits

To build upon this vision this report expands the vision into multiple broad theming guidelines. The approach to applying the vision and theme to the physical elements of the project corridor has to be multifaceted and flexible but based upon, and reflective of, these broad principles.

### Chapter 3 - Land Development Guidelines

Because of the corridor's unique riparian setting, development in the corridor should take advantage of active and passive recreation opportunities while respecting the natural setting and being mindful of the inherent risk of flooding. Therefore, all development within the El Rio corridor will provide an interconnected, multi-modal system with a mix of uses and green spaces. The goal of this chapter is to assist in providing guidelines for all development in the project area at a scale appropriate to its proposed location and level of flood risk. All development in the corridor will

link to the El Rio Trail system and the river environment. This interconnected 'ribbon' of green will transform the El Rio corridor into a unified, cohesive setting where residents and visitors can reconnect with nature, pause and enjoy life, and where both natural and human ecosystems can flourish.

The El Rio Land Management and Implementation Guide is established in order to set consistent goals and policies for development, within the corridor and across jurisdictional boundaries. All development within the El Rio corridor should follow the approved General Plan of the applicable local jurisdiction in which the property is located. In addition, development will follow the guidelines in this document which provides a sustainable planning vision that respects the desert southwest environment and enhances and preserves the unique setting of the El Rio Corridor. This is accomplished through the establishment of two planning transects to guide development. The El Rio transects introduced in Chapter 3 are intended to guide future development with the corridor.

The intent of the transect guides is not to prescribe allowed uses, but instead illustrate how different densities and intensities of development should be integrated with each other while respecting and enhancing the unique El Rio environment. This approach allows the full range of land use types, densities and intensities, provided the appropriate mitigation is included with the development.

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## i.4 Chapter Overview

There are two (2) transect guides in the El Rio corridor plan; The Viewshed transect and The Flood Risk transect. The intent of the transects is to ensure that the density and intensity of development is appropriate as it approaches the Gila River and as to the level of flood risk. In utilizing the transect guides, proposed development will be reviewed as follows:

1. All property outside the floodplain and within the El Rio corridor should follow the Viewshed transect.
  - a. The Viewshed transect is sectioned into different categories based on the distance from the Gila River floodway.
  - b. In general, as development approaches the Gila River floodway, development should become less dense and intense.
  - c. Development of the property should follow the guidance of the appropriate Viewshed category (i.e., General Urban, Urban Center, etc.)
  - d. However, it is recognized that the Gila River is an attractive amenity; therefore, development adjacent to the floodway may consider more dense and intense development under the River Urban Core development option, provided a detailed development plan is submitted and approved by the applicable jurisdictional entities.

2. If the subject property is within a FEMA designated floodplain, then the development of the property should follow the Flood Risk transect.
  - a. The Flood Risk transect identifies the appropriate type and scale of development for properties within the El Rio Corridor that may be at risk for some level of flooding.
  - b. The Flood Risk transect is sectioned into different categories based on the depth of the base flood elevation. Development of the property should follow the guidance of the appropriate flood risk category (i.e., Regular Floodway, Natural Area, and Transitional Rural Area).
  - c. After determining the flood risk category, proposed development will refer to Table 3.1, The El Rio Corridor Land Use table, for guidance on density and intensity of development.

Where development is proposed within the corridor, suitable mitigation measures should be incorporated within the design to ensure that development is as safe as possible with minimal risk to life and minimal potential for property damage. However, it is important to recognize that design and improvements cannot eliminate flood risk completely. Therefore, where development is allowed, plans/measures must be in place to manage the consequences of flooding and, where necessary, long term maintenance of improvements must be

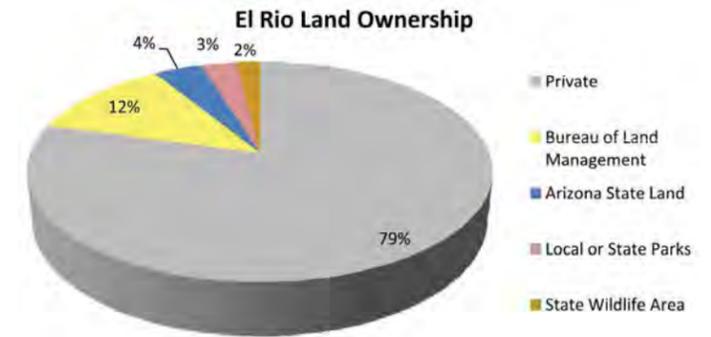
provided, and all proposed development on property identified as 'at-risk' of flooding, should identify and provide means for safe egress in the event of flooding.

### Chapter 4 - Open Spaces, Paths, Trails and Edge Treatments

The El Rio project corridor that is adjacent to and part of the Gila River has the rare opportunity of showcasing several unique ecosystems of the Sonoran Desert riverine system while offering the public an opportunity to experience and educate themselves about this vitally important ecosystem. The El Rio project corridor associated with the Gila River includes a beautiful, diverse natural environment. There are natural and man-made challenges to address, but this project offers the opportunity to showcase to the public, through a series of interconnected trails, overlooks and trailheads, the native riparian habitats that were historically associated with the Gila River ecosystem.

These guidelines are meant to provide a means to help in protecting natural and active open spaces associated with the El Rio corridor and provide some guidance in re-establishing these habitats in appropriate areas associated with the Gila River.

These guidelines identify opportunities for recreational uses along the Gila River and the El Rio corridor as some of the key objectives of the El Rio project. While other uses, including land use, zoning and economic development are



Ownership Type	Acreage
Private	26,866
Bureau of Land Management	4,046
Arizona State Land	1,338
Local or State Parks	996
State Wildlife Area	641
<b>Total</b>	<b>33,886</b>

## i.4 Chapter Overview

vitaly important, it was envisioned that recreational uses take precedence. The resulting proposed development of the El Rio Trail, trailheads and river access points, while providing links to the existing Maricopa and Sun Circle Trails and proposed parks and trails of adjacent municipalities, would provide valuable amenities to the residents of the West Valley. These guidelines provide the vision for an interconnected El Rio network of connected trails and pathways which will help to encourage public use through ease of access, convenience and safety. To maximize access, all facilities are planned as non-motorized, shared-use/multi-use.

These guidelines include the following:

1. Trail Goals
2. El Rio Trail Design Standards
3. River Access and Trailhead Guidelines
4. Underpass Standards at Roadways
5. Overlook Guidelines

The El Rio Design Guidelines and Planning Standards has an inherent connected series of open spaces based on the watercourse of the Gila River, its tributaries and canals. The land and watercourse interaction provides the opportunities for both the "land side" and "watercourse side" to capitalize upon the inherent assets of each, while meeting the vision and goals of El Rio. This interactive relationship is the "Edge". By defining and instituting The El Rio Design Guidelines and Planning Standards the long term economic viability

of the district will be enhanced.

The "Edge" is the boundary edge condition of the Open Spaces along the El Rio Watercourse that is defined by the floodway edge of the project and its natural embankment or, if applicable, any levee, or created and permitted flood containment structure that creates potential public "Edges" within the defined project corridor. The length of the edge, for a parcel, is the length of the shared boundary between private property and the floodway edge as shown in the Exhibits in Section 4. All property adjacent to

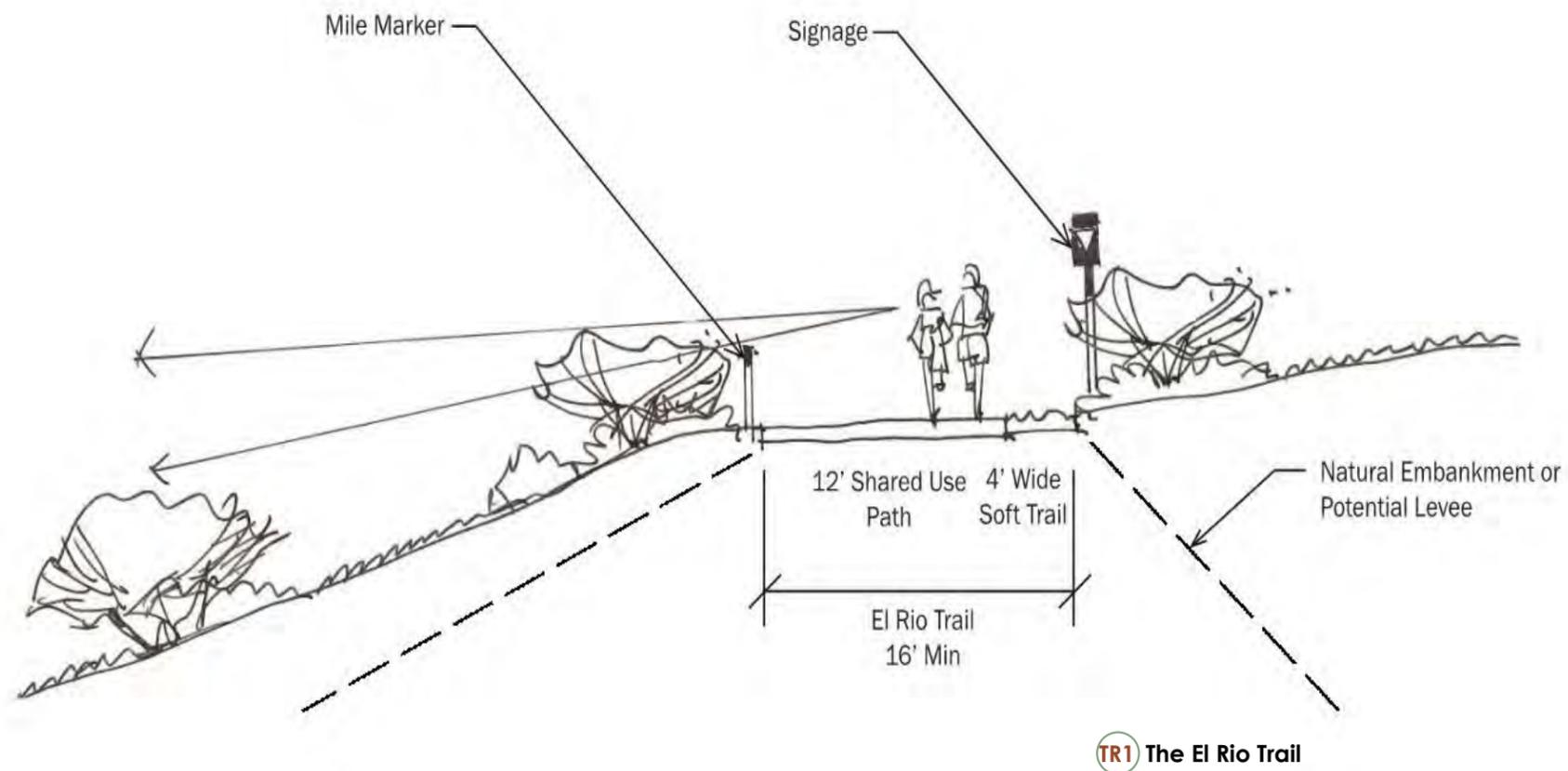
the edge boundary should be subject to "Edge" treatment guidelines establishing an El Rio identity that is both aesthetically pleasing and visually unified.

### Chapter 5 - Landscape Guidelines

The El Rio Design Guidelines and Planning Standards were developed to provide a diversity of plant material that can be used outside of the defined floodway to reinforce the low water use native planting habitats that are prevalent within and adjacent to the Gila River's riparian ecosystem. The landscape guidelines

were developed to provide the El Rio project area a unique native plant habitat and overall aesthetic that can transition from the riparian ecosystem to a more robust upland landscape.

These guidelines, and planning standards, have provided an opportunity to define the Gila River as a signature corridor within the communities of Avondale, Buckeye, Goodyear, and portions of unincorporated Maricopa County to serve as a calling card for the region and to establish the El Rio corridor as a catalyst for change. This effort can be highlighted in the El Rio corridor plant



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## i.4 Chapter Overview

palette selections for those areas outside of the established floodway. The El Rio corridor plant palette offers an opportunity to accentuate the natural beauty of the region while providing the diversity and flexibility of plant material selections that can transition from the native Gila River habitat to a more structured development aesthetic. The purpose of these guidelines is to document the design criteria for the development of a landscape aesthetic treatment for the El Rio corridor in a clear but flexible format.

The plant palettes provided within these guidelines would allow adjacent development to implement any of the plant habitats described within this document, all dependent upon specific site design issues and the proximity to, or availability of, water. These landscape guidelines were developed to provide the Cities of Avondale, Buckeye, Goodyear and areas of unincorporated Maricopa County with a diversity of plant palettes that are flexible and easily modified for implementation. It would be in the floodway fringe area where development potential exists and where the lower Sonoran and transitional plant palettes described in this section may be most applicable. However, the plant palettes provided would allow adjacent development to implement any of the plant habitats described within this document, all dependent upon specific site location, and the proximity to, or availability of, water.

The goal in establishing these plant habitats and associated palettes is to allow any streetscape, trailhead, trail



corridor, drainage corridor, or adjacent development associated with the El Rio project area the ability to blend and visually connect their specific design with that of the FCDMC El Rio Vegetation Management Plan for the Lower Gila River in Maricopa County, Arizona.

The result of establishing these flexible plant habitats as a platform base in the El Rio Design Guidelines and Planning Standards project results in establishing criteria and baselines for comparison to any planting designs in the project area. These guidelines could easily be modified and adopted beyond established rights-of-way and be used by surrounding development. The goal is to maintain an aesthetic experience for public and private developments that maintains a relationship to the El Rio Design Guidelines and Planning Standards and highlights the importance the Gila River holds to each city's, and unincorporated Maricopa County, development.

The Cities of Avondale, Buckeye, Goodyear and Maricopa County will encourage private development to execute this design theme when developing within the El Rio area. Utilizing elements of the El Rio design theme will reinforce a cohesive development aesthetic for the El Rio corridor. However, should adjacent private developments implement a different identity and character for their specific properties, the El Rio river corridor will sufficiently retain its own identity and visual character through the use of these plant palettes and landscape guidelines.

### Chapter 6 - Signage Guidelines

The signage guidelines outline conceptual directions for a signage package addressing the principal sign types of:

1. Orientation and navigation
2. Information/regulation
3. Identity
4. Education



The signage concepts have, in part, incorporated pertinent aspects of the recently adopted MAG Valley Path Brand & Wayfinding Signage Guidelines (Valley Path), so that there is a compatibility between the two and to ensure that the El Rio identity remains primary and Valley Path a sub-set within.

When implementing signs that are contained in the MAG Valley Path Brand & Wayfinding Signage Guidelines, all specifications within that document should be followed, modifying them only as outlined in these guidelines.

There are two (2) concepts for directional, identity and education elements. Concept selection for this signage use is at the discretion of the municipality in which the implementation will occur. It is recommended within these guidelines

# i.4 Chapter Overview

that where those ordinances govern this work, each municipality create an El Rio overlay or similar mechanism so that these concepts can be consistently applied over the entire project area.

## Chapter 7 - Economic Development

Economic development opportunities vary by community and will generally be guided by regional assets, adjacent land uses, existing and planned trails and recreational venues, and the specific community's vision. All three cities have existing, or planned, primary trailheads that connect to the river with its vast natural environment and variety of recreational experiences. Each community's vision for capturing economic development opportunities is discussed in this chapter.

The El Rio project corridor is truly a unique treasure in Maricopa County. This portion of the project corridor associated with the river provides habitat for wildlife but also affords a vast array of recreational opportunities not found in other parts of the

Valley, including the potential for boating, fishing, hunting, walking, hiking, bicycling, and horseback riding. This regional resource also offers wilderness areas for passive use, such as wildlife watching. All of these endeavors have the potential to serve as economic catalysts for the surrounding communities.

There have been numerous economic studies prepared by community leaders and planners to understand and document the value of trails, greenways, parks, open space, hunting, fishing and wildlife watching to the local economy. These studies have concluded that trails enhance the quality of life and help build strong economically vital communities. In addition to providing an amenity to residents, trails and linkages to outdoor recreation can also help foster the growth of business, enhance property values, and revitalize neighborhoods. The El Rio corridor provides the same economic engine and potential that has proven successful in other communities.

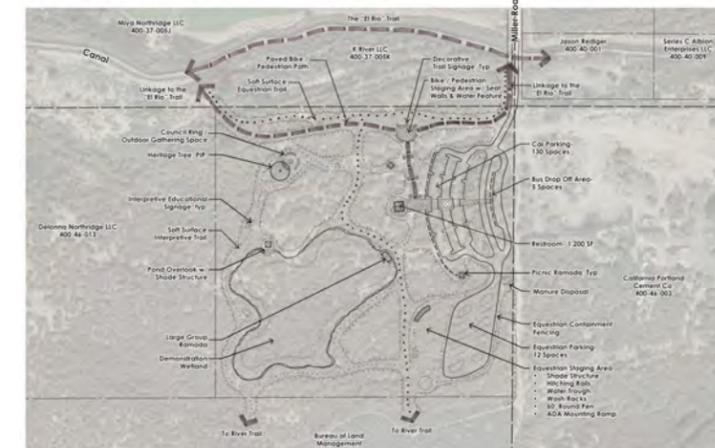
## Chapter 8 - Pilot Projects

These guidelines and planning standards include three pilot project sites: one in the City of Avondale, one in the City of Buckeye, and one in the City of Goodyear. They have been selected as pilot project trailheads along the El Rio corridor. The purpose of these pilot projects is to promote environmental education, provide passive human interaction and recreational access to the Gila River along the El Rio trail. Each site selected is unique and provides a wide variety of educational opportunities and both regional and local connectivity. These pilot projects directly connect to other recreational and natural resources in the area and are positioned to serve as templates for future project developments that will enhance the access and usability of this tremendous natural resource.

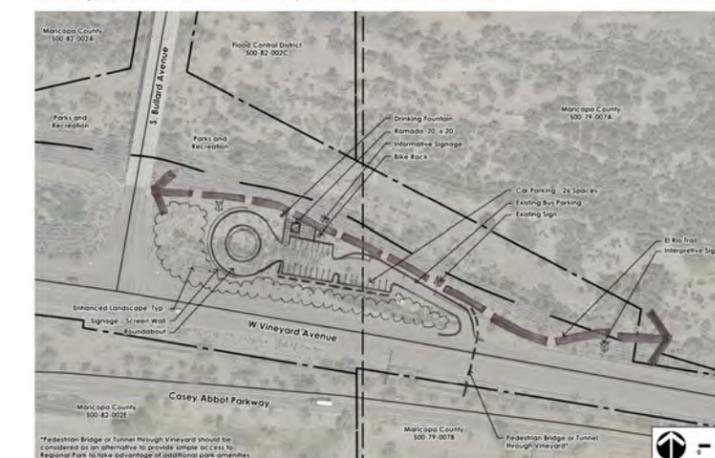
Avondale - Concept 1, Car and Equestrian Parking



Buckeye - Preferred Concept, "The Pond"



Goodyear - Preferred Concept, "Rio Vista Trailhead"



# Executive Summary



# Background

*The vision of a restored Gila River serving as a catalyst for economic development in the Southwest Valley was born in 1999. Since then, that vision has flourished through the cooperative efforts of Maricopa County and the Cities of Avondale, Buckeye and Goodyear. This partnership gave birth to the El Rio Watercourse Master Plan which serves as a blueprint for regional flood control, economic development, recreation and preservation along the Gila River.*

*El Rio, A Plan to Heal the River, 2013*





## 1.1 Introduction

The Gila River is one of the more important river corridors in Arizona. With its headwaters in the mountains of western New Mexico and its mouth at the Colorado River in Yuma, the Gila spans the entire width of central Arizona, covering nearly 650 miles, 570 of which are in Arizona. In total, the Gila River accepts drainage from an area of nearly 60,000 square miles, which is slightly more than half the land area of the state. (Source: University of Arizona Water Resources Research Center).



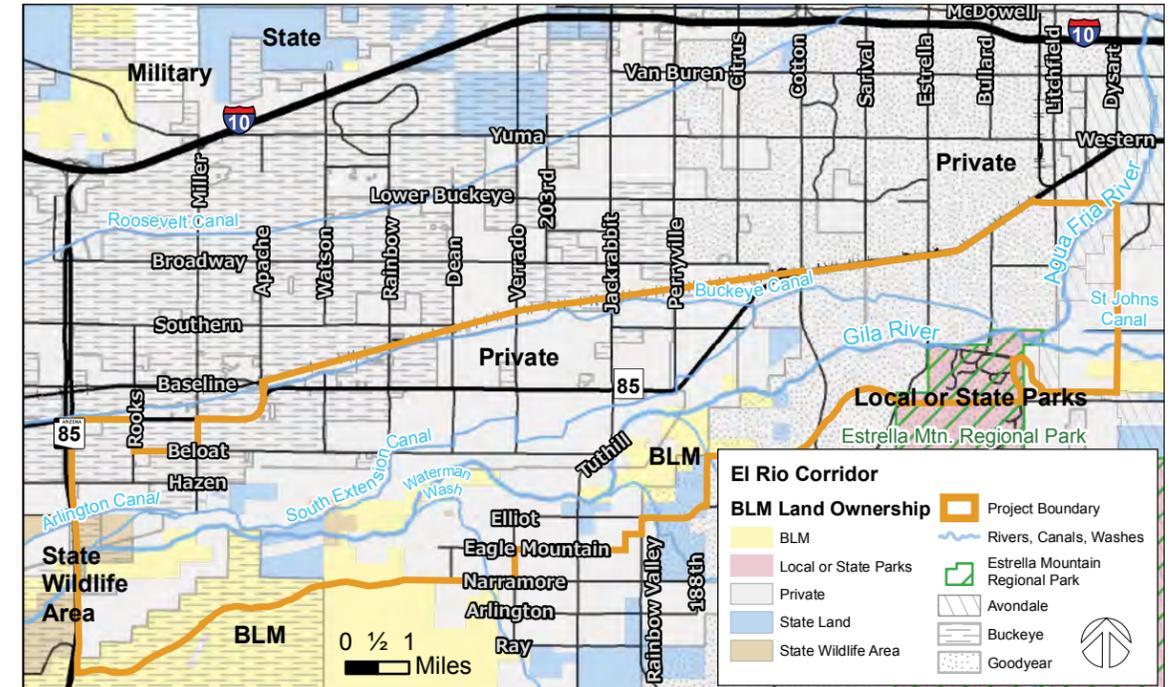
Source: K.Musser <http://www.eoearth.org/view/article/176074/bmg>

## 1.2 El Rio Corridor Area of Study

Located in the west Phoenix metropolitan area, the project area spans roughly 17.5 miles from the Gila River's junction with the Agua Fria River on the east end to the State Route 85 bridge on the west end, and incorporates nearly 53 square miles as it crosses through the communities of Avondale, Buckeye and Goodyear, along with unincorporated areas of Maricopa County.

This area is one of the fastest growing regions in the country and will continue to experience significant growth pressures in the future. As such, the corridor has been the focus of several previous planning efforts. In 1999, the *El Rio Vision* document was developed and in 2002, the Flood Control District of Maricopa County (FCDMC) began work on the *El Rio Watercourse Master Plan (WCMP)*. Building on these previous planning efforts, the *El Rio Design Guidelines and Planning Standards* are intended to protect the corridor while integrating multi-use activities.

Understanding the challenges, these communities have looked to other positive examples where these potentially competing goals have been managed successfully. These examples include Scottsdale's Indian Bend Wash, East Maricopa Floodway, Tres Rios 91st Avenue Demonstration Wetlands Reclamation Project, Rio Salado Environmental Restoration Project, and Tempe Town Lake. Like the examples above, the public interface with the Gila River will address both structural and non-structural flood control alternatives for future development, recognizing the importance of flood



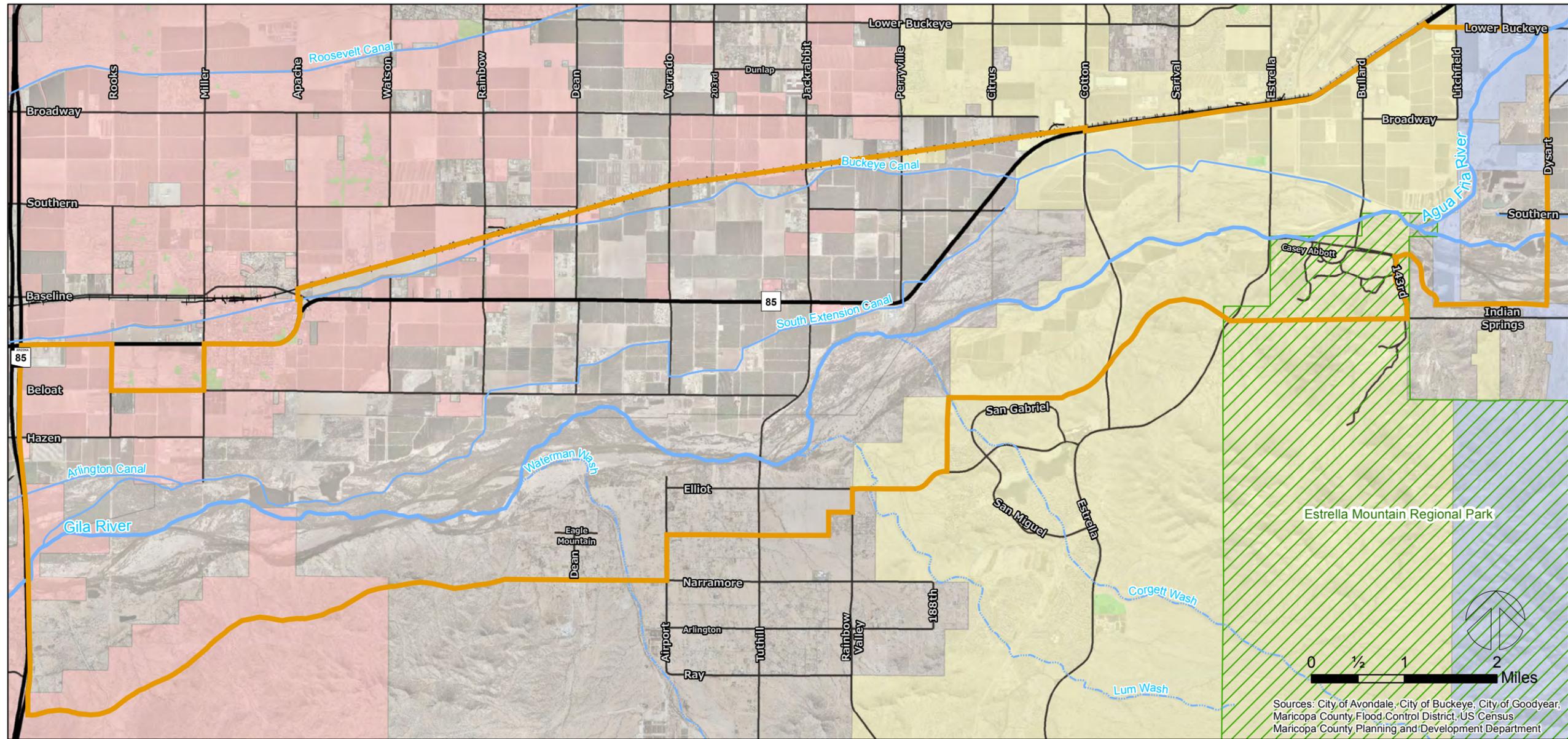
mitigation, the riparian habitat and the potential for economic growth and recreation. Accordingly, this document provides guidance on the following:

1. Land use design
2. Character area development
3. Edge treatments along the Gila River
4. Plant habitat and transitional planting guidelines
5. Signage and wayfinding features
6. Overview of the economic development potential to the surrounding communities
7. Conceptual designs for three pilot projects to provide access to the river

8. Pilot projects - one in each city

The identified project area (see map above) includes a wide diversity of existing and planned land uses of the three municipalities and areas of unincorporated Maricopa County that border the project. This study supports that future development potential with an additional focus on how these developments, and the public, will interface with the Gila River.

One of the primary objectives is the incorporation of these guidelines into the review process of any proposed development by the cities of Avondale, Goodyear, Buckeye and unincorporated Maricopa County, particularly with regard to requests for increased zoning entitlements.



Sources: City of Avondale, City of Buckeye, City of Goodyear, Maricopa County Flood Control District, US Census, Maricopa County Planning and Development Department

Date: 9/27/2015

**Legend**

Project Boundary	Canal	Estrella Mountain Regional Park	Railroad	Interstate Highway	Avondale
Washes	Parks	Arterial Streets	State Highway	Buckeye	Goodyear
Rivers		Interchange	County Highway	Ramp	

El Rio Design Guidelines and Planning Standards – Area Map



## 1.3 El Rio Corridor Recent Studies and History

In 1987, The Flood Control District of Maricopa County (FCDMC) recognized a convergence of past, present, and future demands coming together for this reach of the Gila River. Since then, the FCDMC has developed a vision, master plan and guidelines for future development in the El Rio corridor.

**1987 Creation of a 97-Mile Watercourse Master Plan.** FCDMC, in conjunction with more than 20 different municipalities, agencies, Native American communities, jurisdictions and other user groups initiated a Watercourse Master Plan for a 97-mile stretch of both the Salt and Gila River corridors from Granite Reef Dam to approximately Painted Rock Dam. The result of this effort was the development of a more focused and refined area of study along the Gila River.



**1999 El Rio Watercourse Master Plan Vision Multi-Agency Review and Response to Planning and Policy Opportunities on the Gila River.** FCDMC, in conjunction with the City of

Avondale, the Town of Buckeye and the City of Goodyear, along with the backing of other local municipalities, agencies, Native American communities, developers and environmental groups initiated the development of the El Rio Watercourse Master Plan Vision for the 17.5 mile stretch of the Gila River from the confluence of the Agua Fria River to the crossing of State Route 85. This effort resulted in the creation of the document "El Rio Vision Multi-Agency Review and Response to Planning and Policy Opportunities on the Gila River"



**2001 On-Call Archeological Investigation of El Rio Corridor.** FCDMC initiated an archeological assessment of a 17.5-mile stretch of the El Rio project corridor. This assessment was completed

in 2002 by Scientific Archeological Services of Phoenix resulting in the publication "A Cultural Resource Assessment of the El Rio Archeological Research Locale in West Central Maricopa County, Arizona".

### 2005/2006 The El Rio Watercourse Master Plan Landscape Management Guidelines.



FCDMC initiated a more detailed study of the

17.5-mile stretch of the El Rio project corridor through the commission of "Landscape Management Guidelines for the Watercourse Master Plan". This master planning effort was completed in 2006 by EDAW of Phoenix resulting in the publication *The El Rio Watercourse Master Plan Landscape Management Guidelines*.

### 2006 The El Rio Watercourse Master Plan.



FCDMC refined its understanding of the corridor through a more detailed study of the El Rio project corridor. This study was completed in 2006 by Stantec of Phoenix resulting

in the publication *El Rio Watercourse Master Plan* and provides the foundation for this document, the *El Rio Design Guidelines and Planning Standards*.

The primary goal of the *El Rio Watercourse Master Plan (WCMP)* was to provide flood protection while allowing for the long-term, multi-use function of the river corridor. The WCMP serves the public in the following ways:

1. Presents structural and non-structural alternatives to minimize potential flooding
2. Manages environmental restoration of salt cedar trees and the reintroduction of native species to the area, such as cottonwood and willow trees
3. Enhances water quality with the inclusion of wetlands and open flow channels
4. Integrates recreational facilities and trails along the Gila River through a multi-use facility
5. Incorporates educational opportunities with interpretive hiking trails and riparian educational centers
6. Highlights this economic asset that could become a regional and national destination

The plan was adopted formally by the City of Avondale, the City of Buckeye, the City of Goodyear and the Flood Control District of Maricopa County.



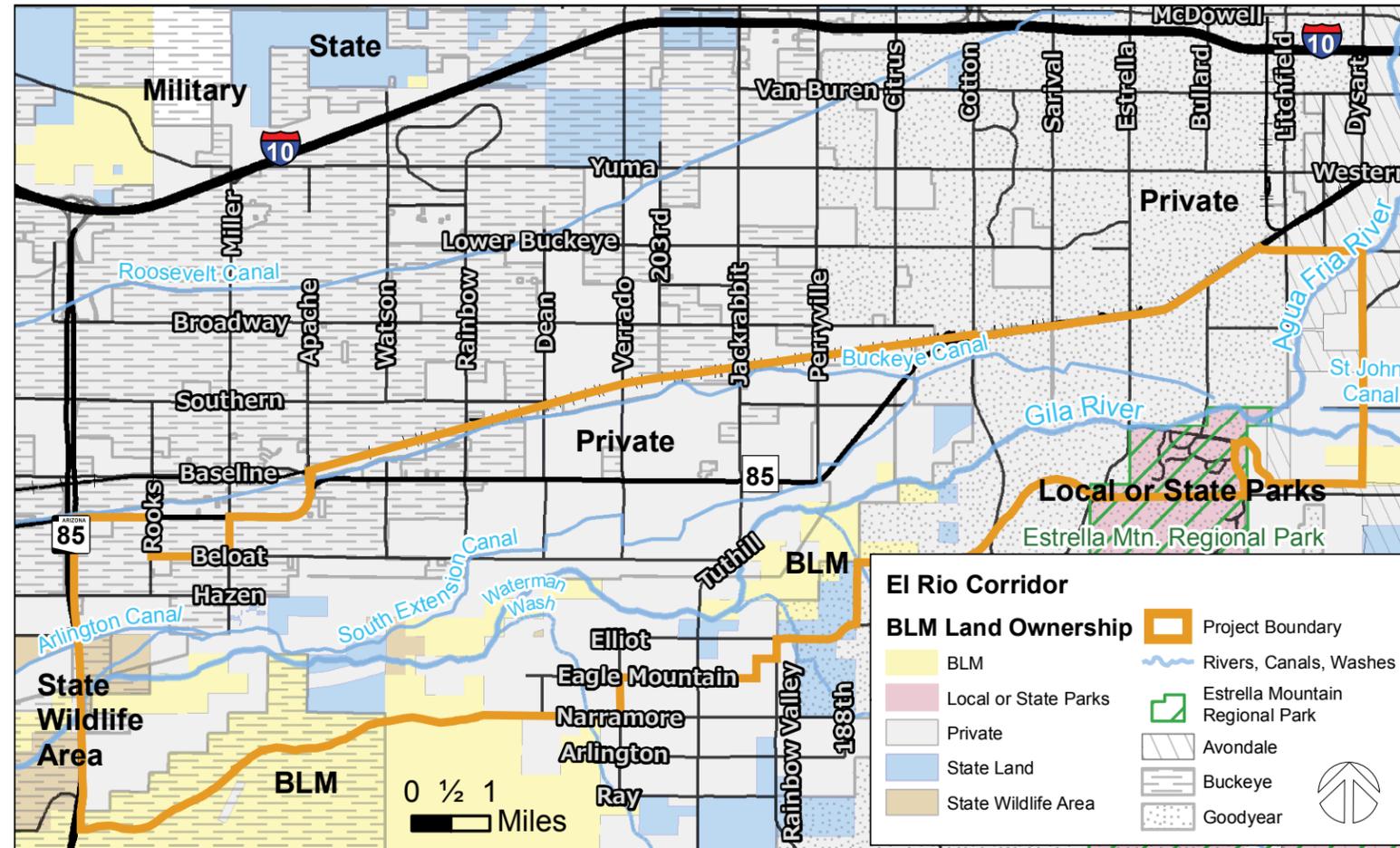
**2007 Execution of the Memorandum of Understanding.** A Memorandum of Understanding (MOU) to implement the *El Rio Watercourse Master Plan*

was adopted formally by the City of Avondale, the Town of Buckeye, the City of Goodyear and the Flood Control District of Maricopa County.

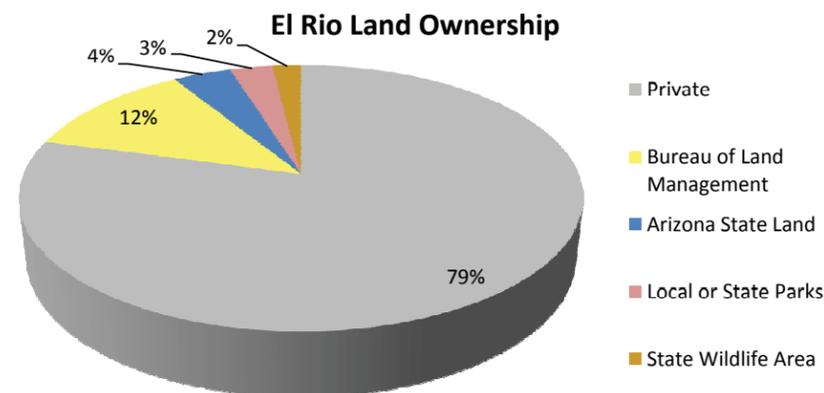
**2013 Adoption of the Intergovernmental Agreement.** An Intergovernmental Agreement (IGA) for the creation of consistent design guidelines and planning standards was formally adopted by the City of Avondale, the Town of Buckeye, the City of Goodyear and the Flood Control District of Maricopa County.

# 1.4 Land Ownership

Land ownership within the corridor is predominately privately held. The biggest government land owner in the corridor is the Bureau of Land Management (BLM), with 4,046 acres. The BLM land is concentrated in the western half of the corridor, roughly split between land in the riverbed and land along the south bank of the river in the Buckeye Hills. The Arizona State Land Department owns some land in the western half of the corridor as well as scattered land around the middle of the corridor, both in and along the edge of the river bed. The next largest governmental land ownership category falls into local or state parks, specifically, the Estrella Mountain Regional Park, found near the eastern end of the corridor in the riverbed. Finally, there are two smaller state wildlife areas on the western end of the corridor in the riverbed. The government held land in the floodway is given over to conservation uses and is undevelopable.



El Rio Land Ownership



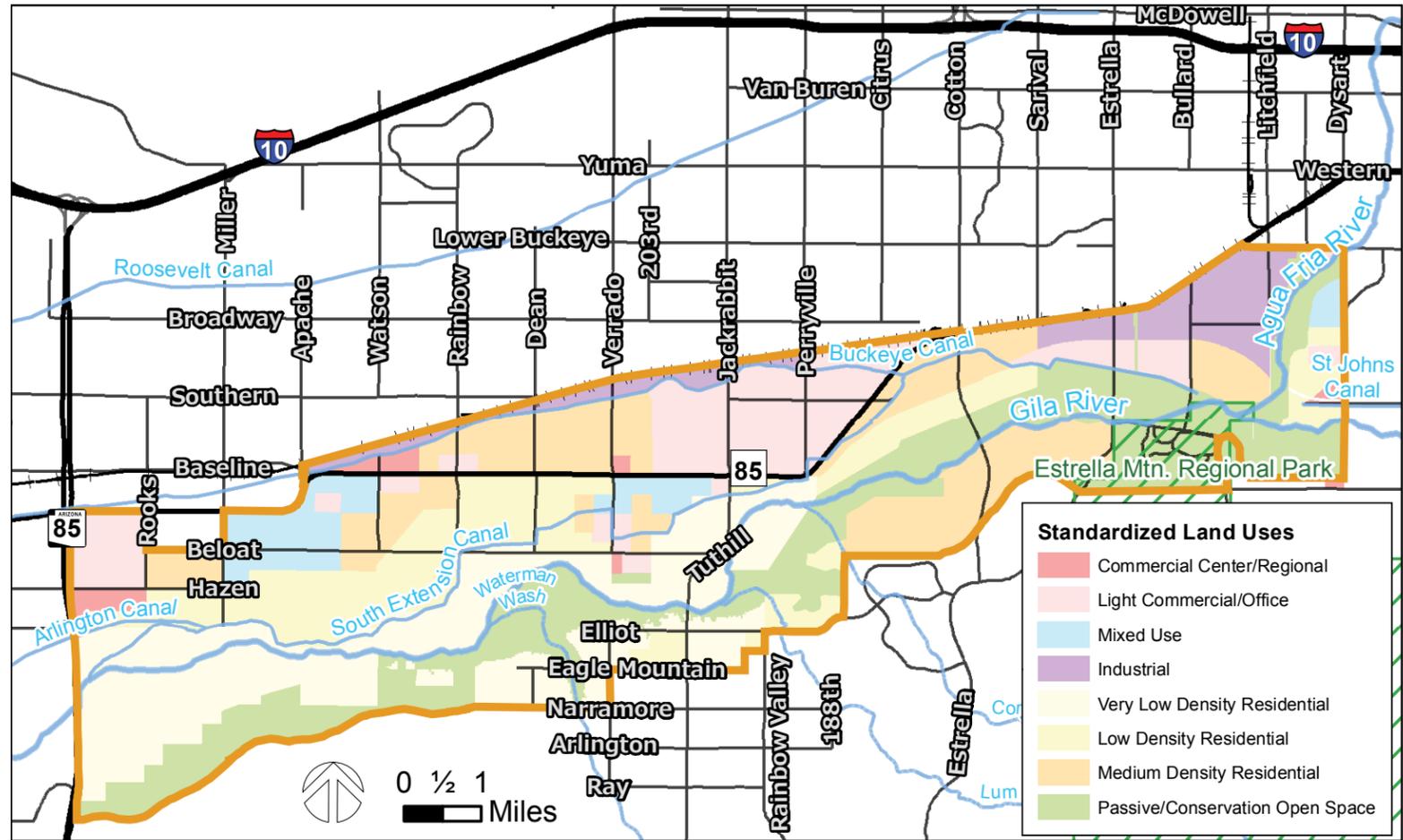
Ownership Type	Acreage
Private	26,866
Bureau of Land Management	4,046
Arizona State Land	1,338
Local or State Parks	996
State Wildlife Area	641
<b>Total</b>	<b>33,886</b>



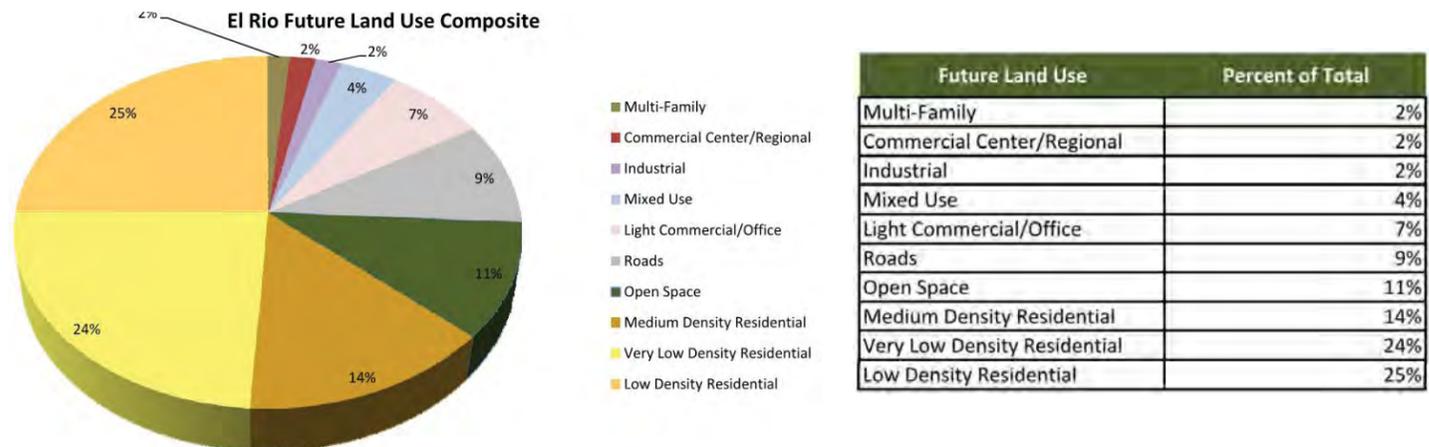


## 1.5 Composite Future Land Use Designations

The El Rio Design Guidelines and Planning Standards document does not propose future land use designations. Future land use designations are specifically approved and governed by each respective municipal jurisdiction. However, in order to gain an understanding of the communities' collective vision for future land use within the corridor, the project team developed a composite land use map in order to gain an understanding of planned future land uses. Referring to the table below, nearly one-half of the corridor is planned as low or very low density residential while 15% of the corridor is planned as non-residential or mixed use. The composite land use map is shown to the right.



El Rio Future Land Use Composite



# Character and Vision

*The El Rio corridor is characterized by a scenic and diverse southwestern desert riparian environment. The vision for the corridor is to leverage its remarkable resources in order to create a unique destination that is environmentally and economically sustainable.*





## 2.1 Purpose

The El Rio corridor is characterized by a scenic and diverse southwest desert riparian environment which contains significant natural, cultural and historical assets. Collectively, the participating jurisdictions believe that broad policy and development guidance through best practices can help retain and enhance these assets, while supporting development that is appropriate for its context.

### El Rio Watercourse Master Plan

The primary goal of the Flood Control District of Maricopa County (FCDMC) is to reduce the risks of flooding and minimize the impacts of floods on human health and safety, as well as to preserve and restore the natural beauty and benefits of the river corridor.

In 2006, Maricopa County, along with the City of Avondale, the Town of Buckeye and the City of Goodyear completed the "El Rio Watercourse Master Plan" (WCMP). The purpose of the WCMP was to examine the benefits, opportunities and impacts of flood control management in the study area and to recommend a preferred design alternative. This would provide a flood protection strategy that preserves the cultural and archaeological heritage of the river and enhances the long-term multi-use vision of the river corridor.

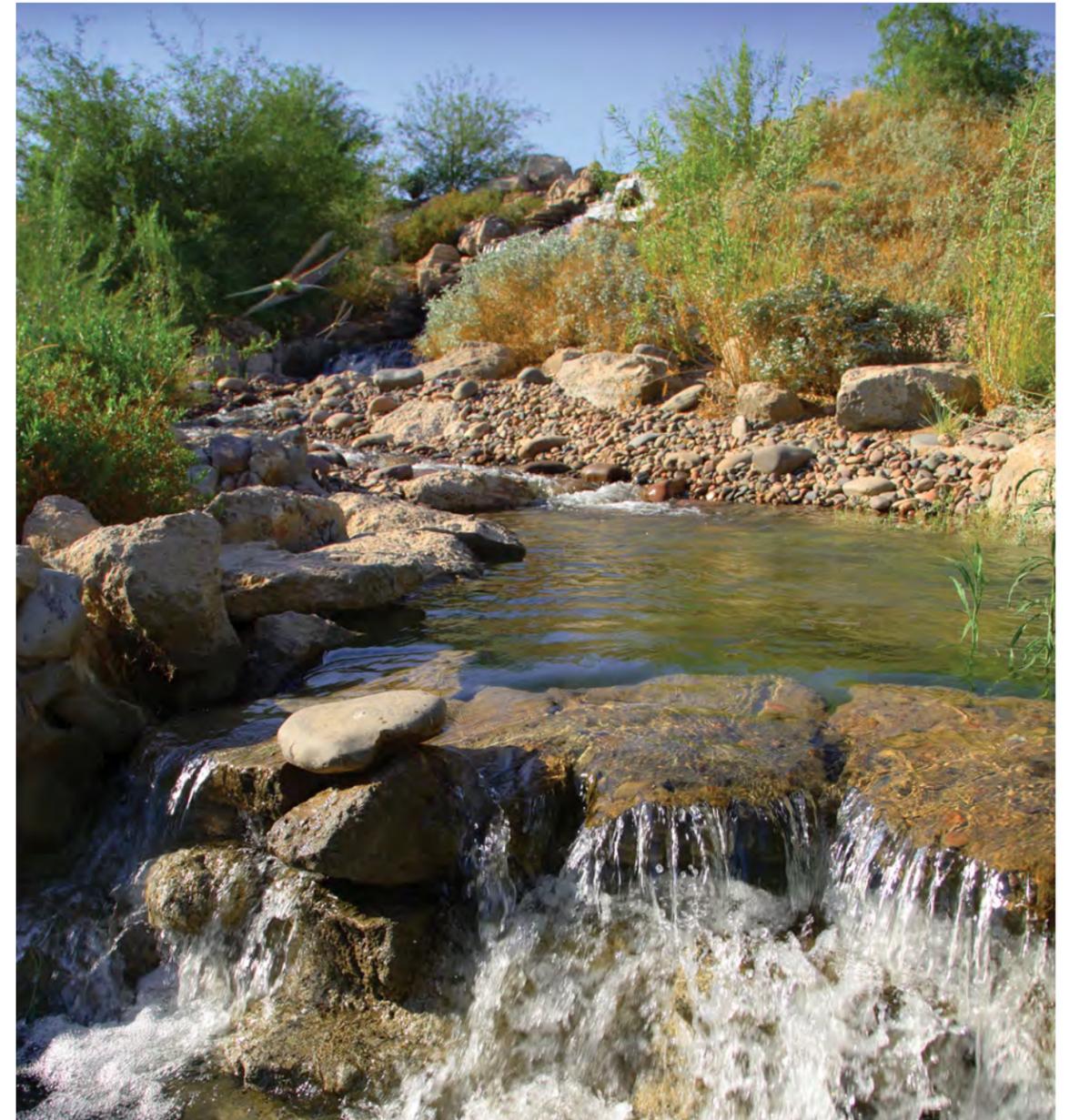
### El Rio Design Guidelines and Planning Standards

The *El Rio Design Guidelines and Planning Standards* is the next stage of implementation of the WCMP.

Understanding the primary goal of the District, the focus of this document is to identify land use design guidelines and planning standards that take into consideration both structural and non-structural flood control alternatives for future development.

In order to promote consistency in development within the corridor, the *El Rio Design Guidelines and Planning Standards* are intended to apply across the multi-jurisdictional boundaries of Maricopa County, the City of Avondale, the City of Buckeye and the City of Goodyear. The *El Rio Design Guidelines and Planning Standards* were developed to meet the following goals:

1. Reduce the risks of flooding, by maintaining proper conveyance and minimizing the potential impacts of flooding on human health and safety through safe, appropriate development
2. Restore and preserve the natural wash systems and constructed drainage features to provide a physical and visual connection with the Gila River and its associated wildlife habitat, thereby protecting and enhancing the quality, character and amenity value of the area and setting
3. Coordinate multi-jurisdictional planning and design of pathways, trails and land use that will focus on the proximity and access of the Gila River as an asset in development layout and site design. Promote the responsible development of the diverse land use categories



4. Demonstrate the value of, and commitment to, the corridor by identifying and promoting economic development opportunities that leverage public support
5. Initiate sponsored pilot projects within the corridor that provide physical access to the Gila River and foster a sense of public ownership
6. Build a sense of place by enhancing the natural, cultural and historic resources of the area while respecting the natural environment

## 2.2 Character Area Planning

### What is Character Area Planning?

Character Area Planning is the term given to an 'area-based' approach to land use planning. It is a technique that identifies and interprets the notable qualities and historic features that unite like neighborhoods and/or land areas. Recognizing these qualities and features gives the present day landscape a connection to the past while defining a way forward for future development.

Conventional land use planning looks first at the use, then defines where it should go and what it should look like. Character Area Planning first understands the inherent character of an area then describes the context in which a proposed use can be compatible with the area in which it is proposed. In short, Character Area Planning reveals the underlying setting within a place. That setting then sets the context in which residents prefer to see future development.

The benefits of this approach are many:

1. It enables a community to identify and value its natural, built and social environments, thereby more effectively managing change.
2. It safeguards the natural and historic environment which contributes to an area's sense of place.
3. It enhances the existing quality of those places that are important to a community.
4. It is more flexible and business friendly than the conventional approach to planning by allowing design and context to moderate compatibility.

### Why Use Character Area Planning?

Character Area Planning better assists a community in recognizing, retaining and replicating the values it considers meaningful and worth preserving. It offers a broader and more inclusive approach than those used for designation-based control. Because it is area-based, it can take into account all aspects of a place and thus provides a basis for an integrated approach to its planning and management.

Additionally, because it can be undertaken at different scales and in ever-greater detail at successive planning and design stages, it can flexibly guide both rural and urban development, from individual types of development through large growth area projects. Finally, because it is essentially about place, it can provide the basis for local planning that empowers communities to protect their desirable features.



### Character Area Determination

The corridor was reviewed to identify areas with distinct characteristics. It was apparent that there were many distinct areas but it was determined that 12 areas could be identified as sharing common features and/or characteristics. These formed the 12 Character Areas identified on the Character Area Map on the following page.

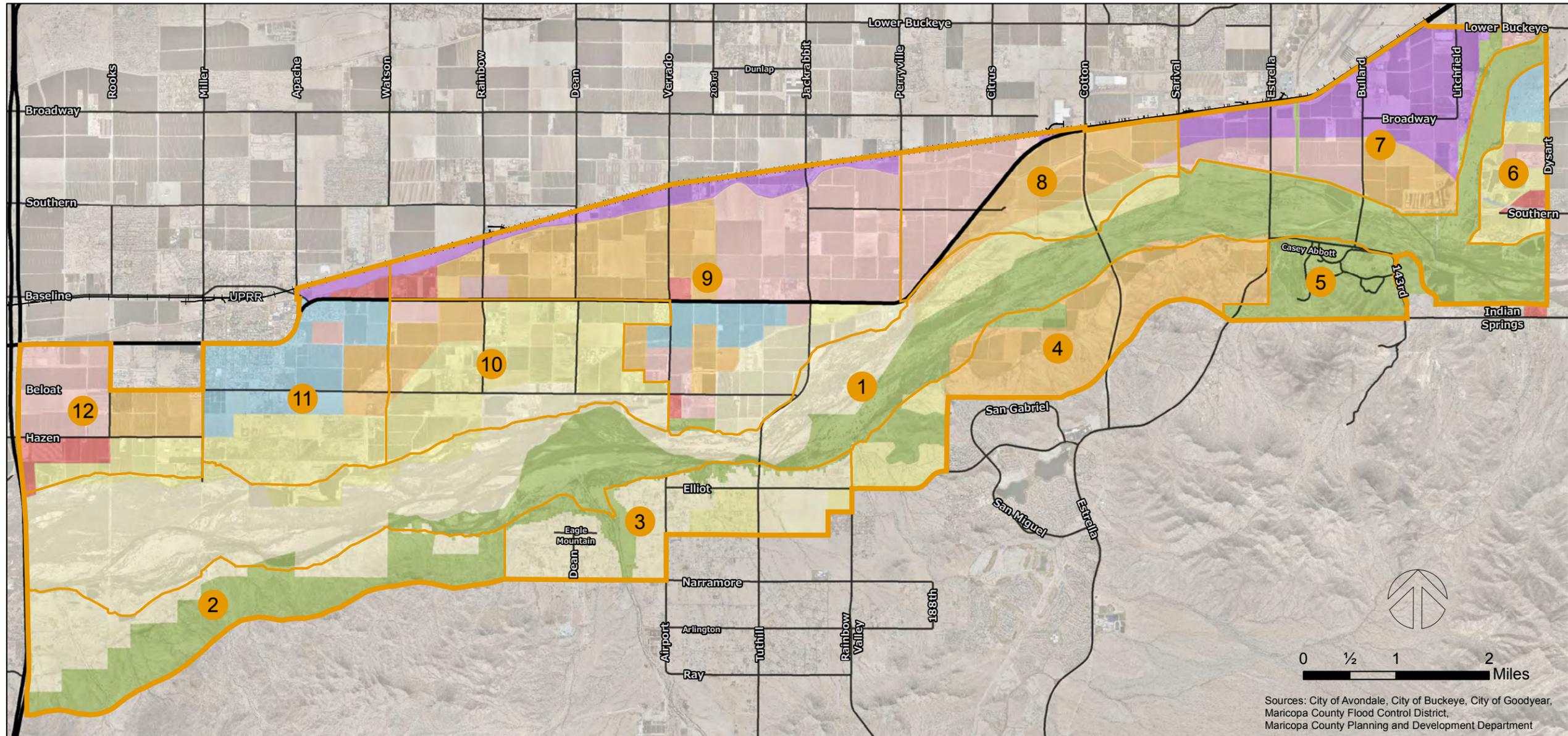
A character area description which best expressed the unifying features of the character area was then drafted. This description was based on a number of factors, including current land-use patterns, future planned land uses, surrounding community assets, natural and man-made

features, historical and cultural assets, topographical features and floodplain and floodway delineations.

The description for each of the 12 Character Areas will not restrict future densities or intensities, but will provide guidance to future development with the expectation that it will maintain and enhance the established character of the area.

## Character and Vision





Sources: City of Avondale, City of Buckeye, City of Goodyear, Maricopa County Flood Control District, Maricopa County Planning and Development Department

Date: 9/27/2015

### Legend

- Character Areas (with #s)
- Project Boundary
- Railroad (UPRR)
- Arterial Streets
- Highways

### Standardized Land Uses

- Commercial Center/Regional
- Light Commercial/Office
- Mixed Use
- Industrial
- Very Low Density Residential
- Low Density Residential
- Medium Density Residential
- Passive/Conservation Open Space

### Character Areas

1. High Value Habitat	7. El Rio East Employment Recreation Core
2. Scenic Rural Development and Open Space	8. Goodyear North Bank Development
3. Waterman Wash Rural Development and Recreation	9. Buckeye North Bank Development
4. King Ranch Development and Recreation	10. El Rio Historic Rural
5. Estrella	11. El Rio West Urban Core
6. Tres Rios Scenic Confluence	12. Buckeye Commerce Corridor

## El Rio Design Guidelines and Planning Standards – Character Areas Map

## 2.3 Character Area Descriptions

### 1 High Value Habitat

#### Location

The High Value Habitat Character Area is located in the City of Avondale, the City of Buckeye, the City of Goodyear and unincorporated areas of Maricopa County. It runs the full length of the 17.5-mile corridor from east to west and corresponds directly with the Agua Fria and Gila River floodways.

#### Key Resource Features:

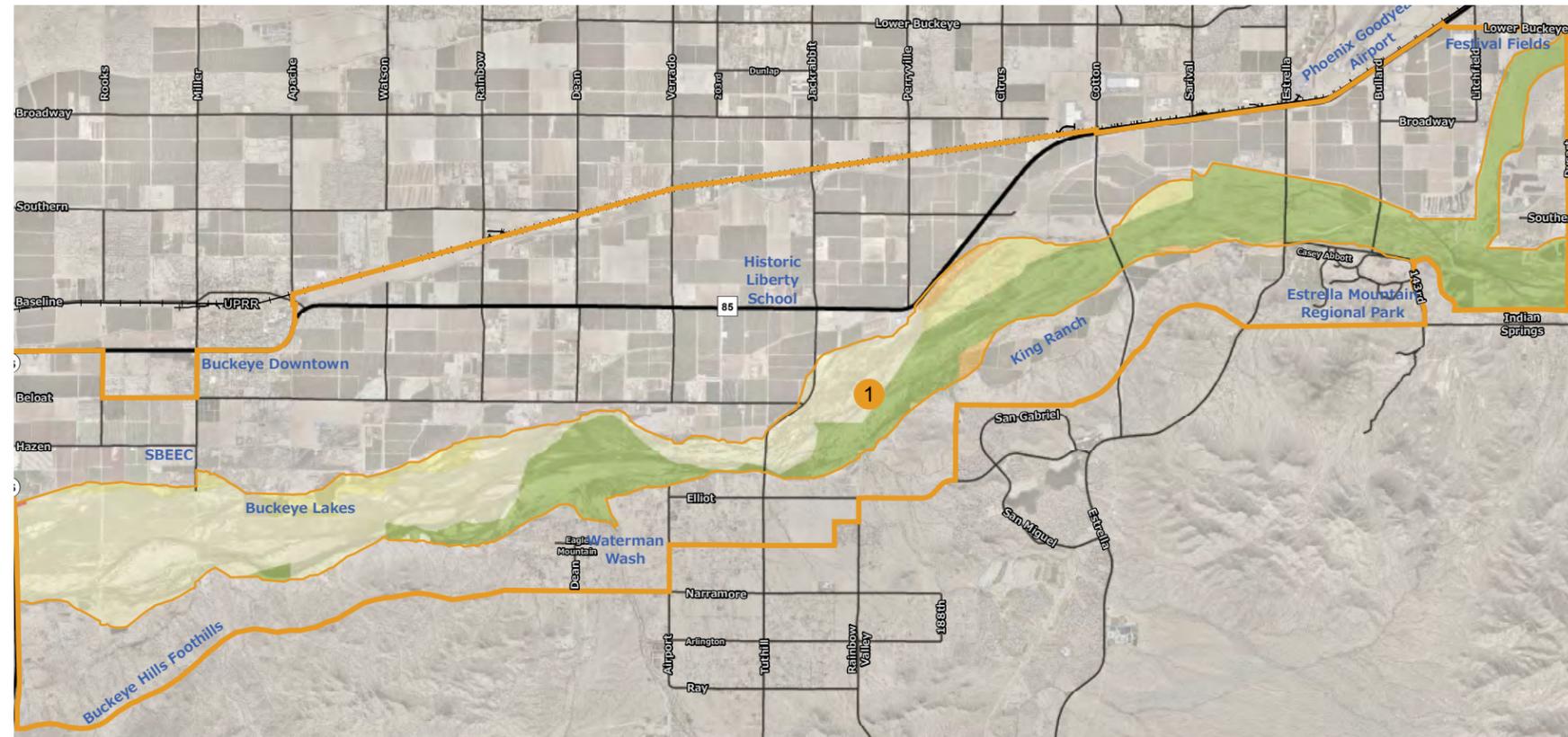
1. Habitat
2. Conservation
3. Recreation
4. Sand and Gravel
5. Scenic Views

#### Topography, Land Cover and Existing Land Use

The topography of the area consists primarily of rugged river bottom interspersed with flowing water. The land slopes lower to the west. There are large stands of trees fed by perennial water flow. The existing land use is part passive conservation open space and part very low density residential. Some sand and gravel mining operations have rights to operate in the area.

#### Future Land Use

The High Value Habitat Character Area is designated very low density residential and passive conservation open space. The entire character area is in the floodway, so development opportunities



are limited.

This character area is the floodway, therefore, new residential will be prohibitively difficult. New non-residential private development may include mining operations. New mining activity in the High Value Habitat Area, within municipal boundaries should:

1. Be sensitive to the surrounding environment and existing development
2. Include noise, dust, and glare mitigation
3. Provide a detailed restoration plan

#### Character Area Description

This character area consists of the Gila River, which, in the El Rio plan area, has a perennial water flow that is generated from reclaimed water, agriculture tail water, and from natural ground water. This flow has helped to develop a rich riparian ecosystem. The vegetation and perennial flow now supports high value habitat for wildlife which has the potential to provide significant economic value to the region through opportunities for outdoor recreation, nature-based specialty travel and wilderness experiences.



## Character and Vision





## 2 Scenic Rural Development and Open Space

### Location

The Scenic Rural Development and Open Space Character Area is located in the City of Buckeye and includes areas of unincorporated Maricopa County. The western edge follows the State Route (SR) 85 alignment. The eastern edge corresponds with the Rainbow Road alignment. It is bounded on the north by the Gila River and on the south by a line approximately one quarter mile from the river bank.

### Key Resource Features:

1. SR 85
2. Cultural Resources
3. Buckeye Hills Foothills
4. Scenic Views
5. Mining Lakes

### Topography, Land Cover and Existing Land Use

The topography of the area consists primarily of many small desert hills. The western end of the area flattens out on the north side. There are multiple small washes that intersect the area. There are some small agriculture uses and scattered large lot residential and ranch uses. Most of the area is undeveloped natural desert.

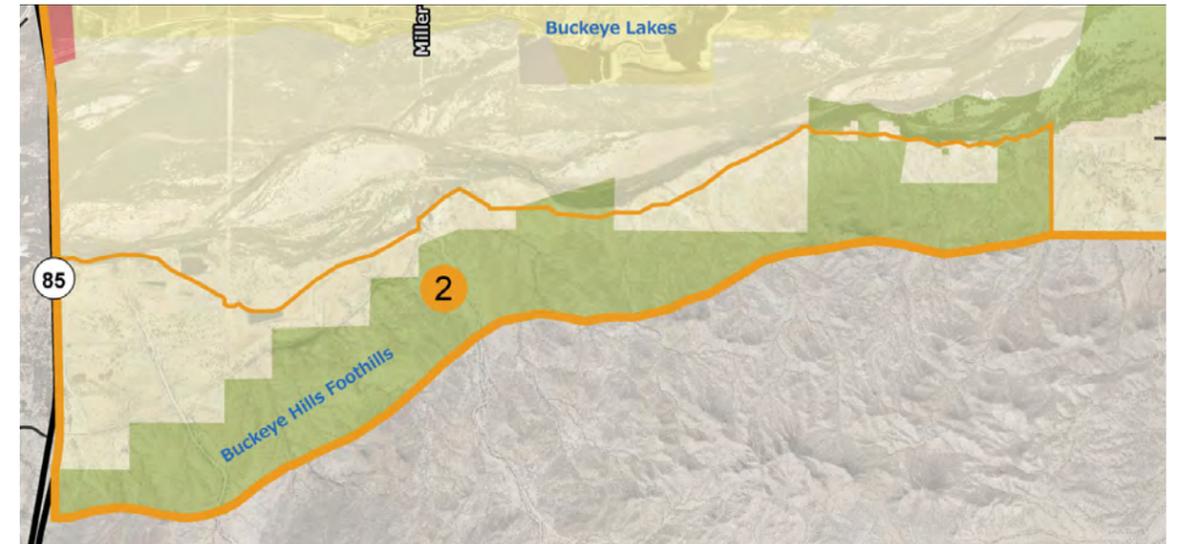
### Future Land Use

The Scenic Rural Development and Open Space Character Area is designated very low density residential and passive/conservation open space.

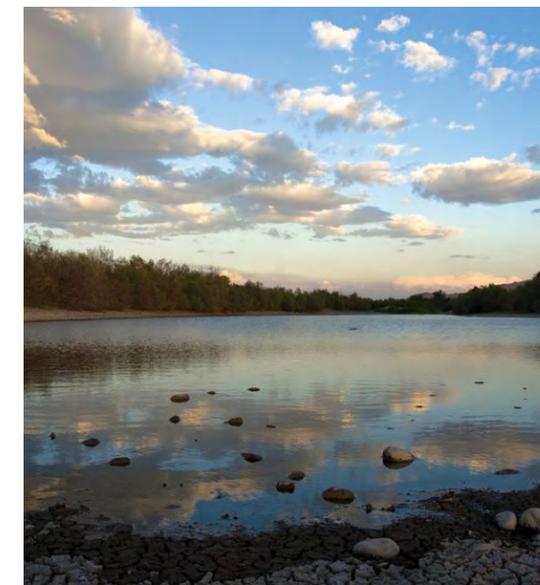
1. Development should consider the natural desert landscape in its architectural style, color, and materials.
2. Colors, materials forms and massing should reflect the natural foothills of the Sonoran Desert.
3. Building forms and sites should follow the terrain of the natural hillside and washes.
4. Balance between the buildings and the landscaping should substantially favor the landscaping. In general, open space and vegetation dominate. Rural uses such as horses, view fencing hedgerows along property boundaries, and generous setbacks from the street will visually contribute to the rural and estate character.
5. Lots should have well defined construction envelopes so that encroachment into natural areas is minimized.
6. Indigenous and rustic types of building materials are preferred in order to maintain a rural character.

### Character Area Description

This character area is rural with very low density/intensity development with expansive passive open space views of the Gila River Corridor to the north and the Buckeye Hills to the south. The area contains both ecological and archeological assets that merit protection. This character area benefits from the proximity of the diverse terrain of the



mountain foothills and river corridor and can naturally provide wildlife corridor linkages to the Gila River. Close proximity to SR 85 provides access to regional transportation corridors.



### 3 Waterman Wash

#### Location

The Waterman Wash Character Area is located in unincorporated Maricopa County. It is bounded on the north by the Gila River, the west by the Rainbow Road alignment, the east by Rainbow Valley Road and the south by Narramore Road.

#### Key Resource Features:

1. Waterman Wash
2. Recreation
3. Waterman Ranch
4. Mesquite Bosque

#### Topography, Land Cover and Existing Land Use

The topography of the area consists primarily of sandy, low flat land sloping northward to the south bank of the Gila River. Waterman wash dominates the area. Existing land uses consist of large lot, rural residential with agricultural and ranch type uses.

#### Future Land Use

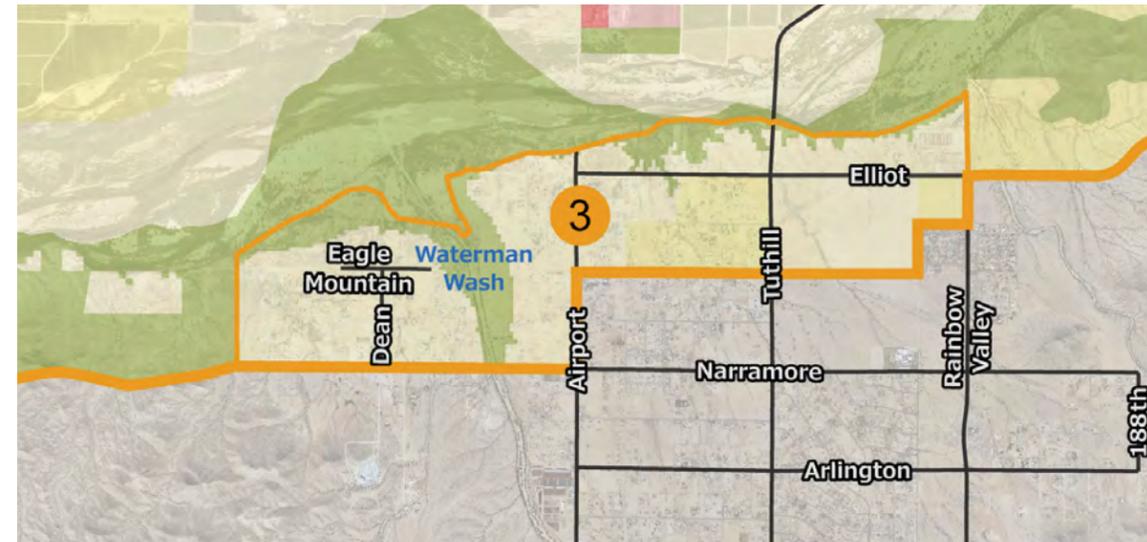
The Waterman Wash Character Area is designated low and very low density residential.

1. Development should consider the natural desert landscape in its architectural style, color and materials.
2. Colors, materials forms, and massing should reflect the natural foothills of the Sonoran Desert.

3. Building forms and sites should follow the terrain of the natural hillside and washes.
4. Balance between the buildings and the landscaping should substantially favor the landscaping. In general open space and vegetation dominate. Rural uses such as horses, view fencing hedgerows along property boundaries, and generous setbacks from the street will visually contribute to the rural and estate character.
5. Design should incorporate traditional Arizona ranch design and materials, blending with the desert and rural character.
6. Buildings should be sited to maintain openness and preserve view corridors.

#### Character Area Description

Waterman Wash is an ephemeral wash that drains several smaller desert washes in the area to the south of the Gila River and serves as a wildlife corridor for the area. The area is open rural desert with very low density/intensity rural, large lot residential development. This character area has a feeling of openness through the natural washes and large lot development.





## 4 King Ranch

### Location

The King Ranch Character Area is located in the City of Goodyear and includes areas of unincorporated Maricopa County. It is bounded on the north by the Gila River, the west by Rainbow Valley Road, the east by Estrella Parkway and the south by the Estrella Mountain Ranch master planned community.

### Key Resource Features:

1. King Ranch
2. Fertile Agricultural Land
3. Cotton Lane Bridge
4. State Land
5. Scenic Views
6. Estrella Foothills

### Topography, Land Cover and Existing Land Use

The topography of the area ranges from low flatland directly adjacent to the south bank of the Gila River to hilly terrain created by the foothills of the Estrella Mountains and several desert washes that dominate the southern portion of the area.

### Future Land Use

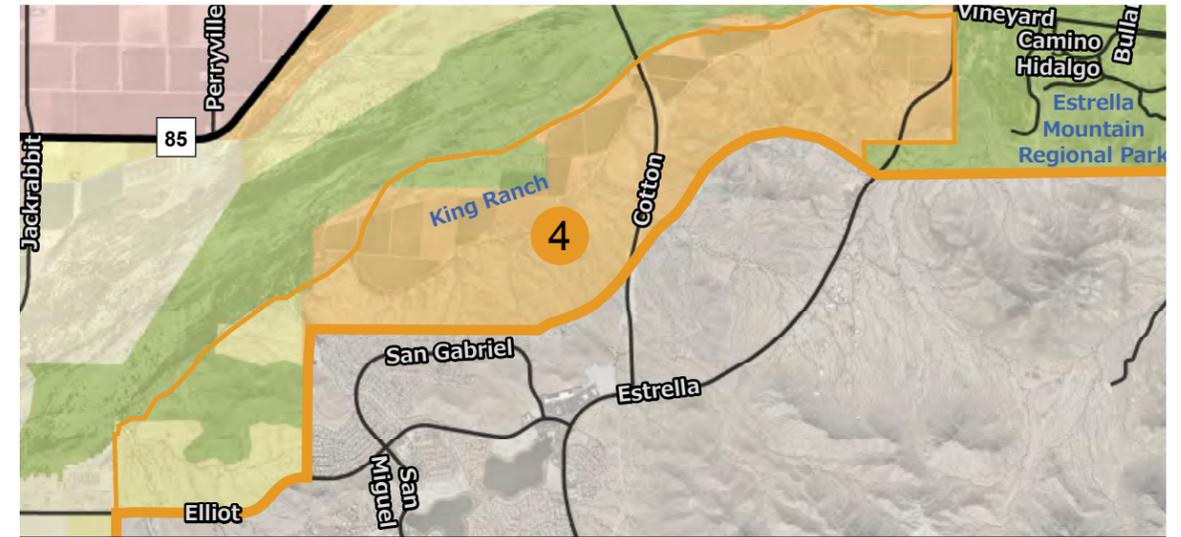
A large portion of the future land use is governed by the King Ranch PAD. The King Ranch PAD is designed as a master-planned community that encompasses approximately 1,860 acres directly adjacent to the south bank of the Gila River. The community plans approximately 4,250 units. This PAD is generally designated as medium density residential, with some

low density residential designated in the area's west end.

1. The man-made and open space elements of the community should be balanced.
2. Internal open space and external transitioning should be maximized to provide the necessary balance with the man-made elements.
3. Setbacks for and between buildings and along public ways should be more pronounced.
4. Solid fencing or walls should be partially limited, with the area adjacent to the community open space in a partial-view style of fencing.
5. Meandering shared-use trails along collector and arterial corridors which link to internal and external open space areas, paths and trails should be provided.
6. Development adjacent to arterial streets should maintain view corridors and where possible, provide re-vegetation with native plants and materials.
7. Drainage improvements should blend with the natural desert environment.

### Character Area Description

The King Ranch Character Area, situated below the foothills of the Estrella Mountains, has some of the most scenic vistas of the area and includes active farming uses and undisturbed desert. This area is principally made up of the King Ranch



Planned Area Development (PAD). The King Ranch property currently includes active farming operations along the Gila River with a large portion of the property currently within the 100-year floodplain. Abutting the agricultural land to the south are the foothills of the Estrella Mountains, which make up the southern boundary of King Ranch. Between the foothills and agricultural fields the property is fragmented with dry washes which are characteristic of the Sonoran Desert environment.



## 5 Estrella

### Location

Located in the City of Goodyear, the Estrella Character Area is bounded on the north by Vineyard Avenue and on the south by the Indian Springs Road alignment. The eastern boundary is 143rd Avenue and the western boundary is Estrella Parkway.

### Key Resource Features:

1. Estrella Mountain Regional Park
2. Estrella Mountain
3. Nature Center
4. Camping
5. Scenic Views
6. BOR/FCD Restoration/Demonstration Project
7. Rodeo Grounds

### Topography, Land Cover and Existing Land Use

The topography of the area includes the mountainous Sonoran Desert terrain of the Estrella Mountains. The area slopes to the north as it transitions to the rolling foothills of the Estrella Mountains, eventually leading to the south bank of the Gila River. The area is entirely within the Estrella Mountain Regional Park.

### Future Land Use

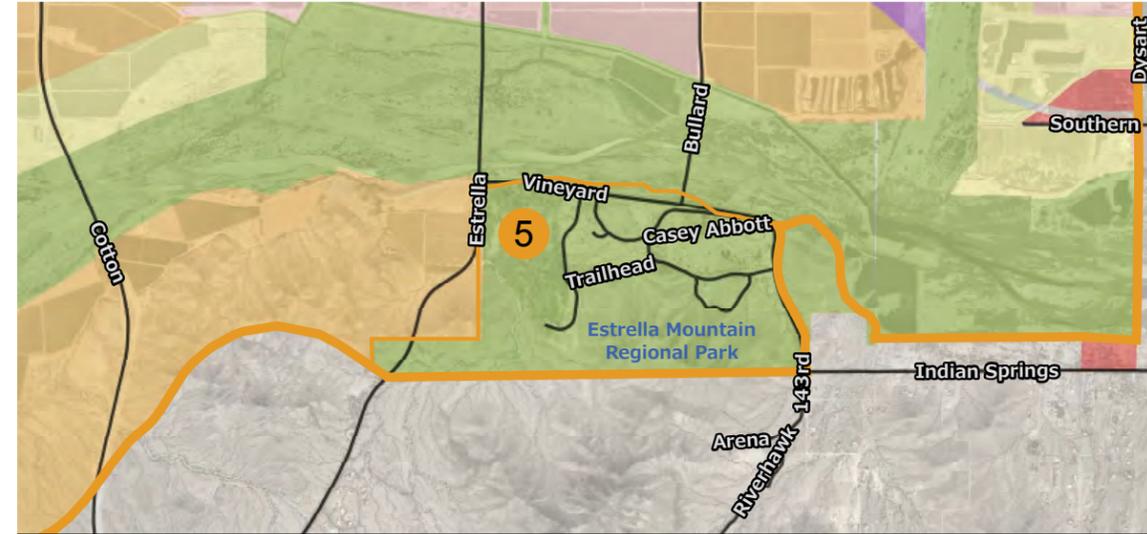
The future land use designation for the area is park and open space.

1. All property within this character area is public park space. New private development is not permitted.

2. New public development shall respect the natural elements and terrain.
3. New structures should incorporate the natural colors and materials of the surrounding area.

### Character Area Description

The Estrella Character Area is distinguished by the Estrella Mountain Regional Park which makes accessible the expansive beauty of the natural desert. The park encompasses nearly 20,000 acres and is the second largest park in the Maricopa County park system. The park includes the recent addition of a Nature Center, along with extensive active and passive recreation opportunities, including a 65-acre active turf park, and trails for mountain biking, hiking and horseback riding. The park also has playground equipment, volleyball areas, picnic areas with ramadas and an 18-hole golf course. The park includes a large wetland, or riparian, area. The majority of the park remains pristine desert.



## Character and Vision





## 6 Tres Rios Greenway

### Location

Located in the City of Avondale, the Tres Rios Greenway Character Area is bounded by Dysart Road on the east, the north bank of the Gila River on the south and the east bank of the Agua Fria River on the west and north.

### Key Resource Features:

1. Sun Circle and Maricopa Trails
2. Tres Rios
3. Sand and Gravel
4. Avondale WWTP
5. Habitat
6. Scenic Views

### Topography, Land Cover and Existing Land Use

The topography is generally flat with a gentle slope toward the Gila River to the south. The area has no natural desert vegetation or washes. Existing land uses primarily consist of a mix of agricultural and large lot rural residential development. The area includes the City of Avondale's Wastewater Treatment Facility approximately 1/4 -mile south of Broadway Road along the Dysart Road alignment. On its southern boundary, this character area is also impacted by the historic use of the river for sand and gravel production.

### Future Land Use

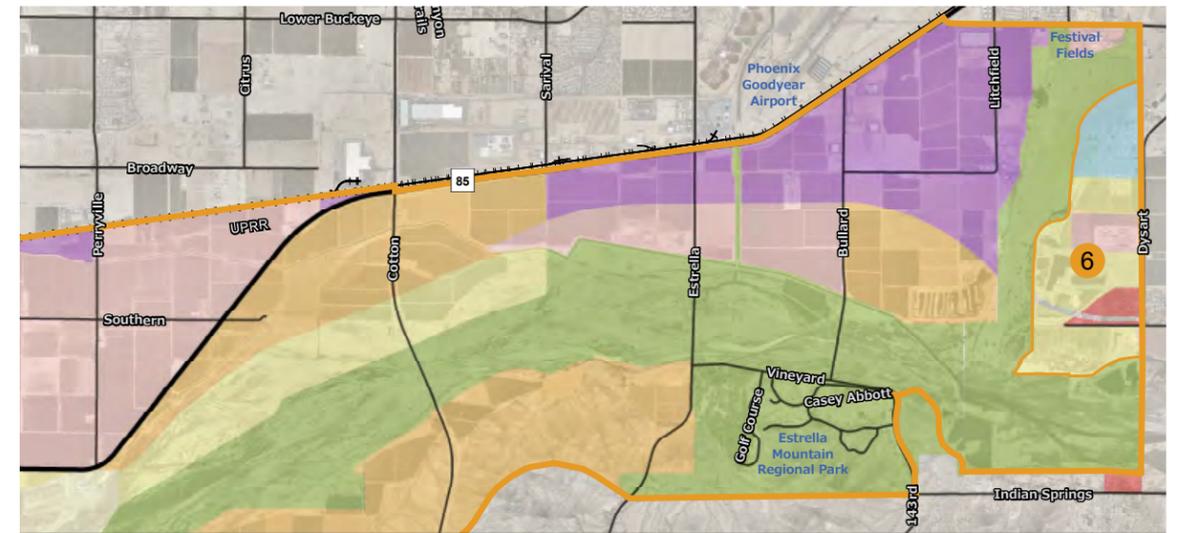
The future land use designations for the area include low density residential with some non-residential uses identified.

The Tres Rios Greenway Character Area is a low lying area that is impacted by flooding. Future development should take this into consideration and consider the many recreational opportunities along the Gila River corridor that could be located within this character area, such as hiking, wildlife viewing, camping, fishing, and interpretation or observation of geological, cultural, and ecological features.

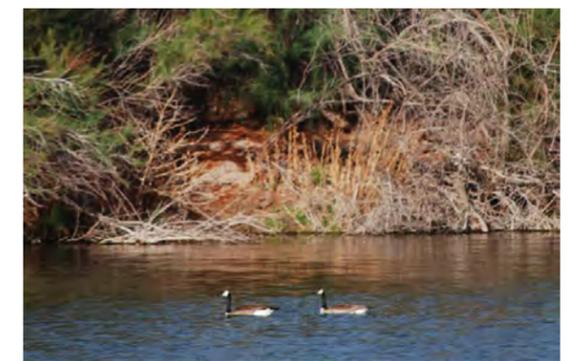
1. New development should be low density/intensity with finished floor elevations a minimum of 2 feet above the 100 year base flood elevation.
2. Development should maintain openness and public access to the river corridor.
3. Solid fencing or walls should be limited.
4. Development should provide opportunities for view corridors and public access.
5. Buildings should be sited to maintain openness and preserve view corridors.
6. Development should provide passive and active opportunities for interacting with the Gila River corridor.

### Character Area Description

The Tres Rios Greenway Character Area represents the west end of the Tres Rios project and the beginning of the El Rio project. The Tres Rios project, beginning to the east in Phoenix, is a constructed wetlands project. As a result of the project, the area now supports an abundance



of birds and other wildlife. The Tres Rios Nature Festival is held here every March to celebrate the natural environment. The area has varying development impacts, including active agricultural production, the City of Avondale's Wastewater Treatment Facility and low density, large lot rural residential to small lot manufactured housing. This area is also within the adopted Avondale "Tres Rios Greenway Specific Plan". The objectives of the Tres Rios Greenway Plan are to improve public amenities for trails, recreation, community meeting areas, as well as providing more favorable wildlife habitat where possible and appropriate, while maintaining the ability to safely contain flood waters when such events occur.



## 7 El Rio East Employment Core

### Location

Located in the City of Goodyear, the El Rio East Employment Core Character Area is generally bounded on the north by MC 85 and on the south by the Buckeye Canal. The eastern boundary is the west bank of the Agua Fria River and the western boundary is Sarival Road.

### Key Resource Features:

1. Avondale Festival Fields
2. Goodyear BMX Facility and Dog Park
3. Employment Core
4. Proximity to Airport and Rail
5. BID Canal
6. Bullard and Estrella Roadways
7. Bullard Wash
8. Goodyear WWTP
9. Cultural Resource

### Topography, Land Cover and Existing Land Use

The topography is generally flat with a gentle slope toward the Gila River to the south. The area is primarily in active agricultural production and associated uses, with virtually all natural desert vegetation and washes removed.

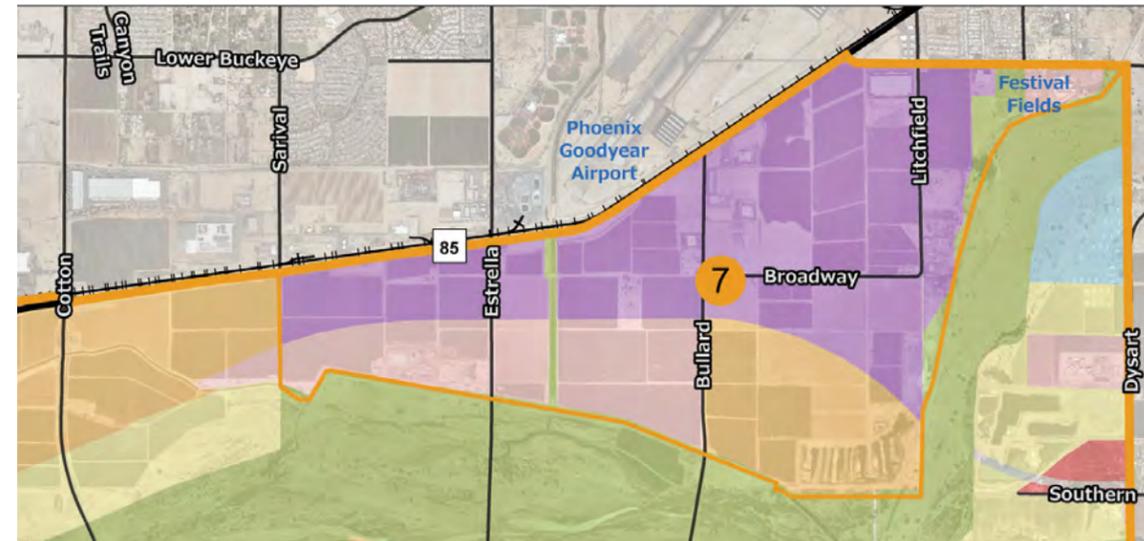
### Future Land Use

The future land use designations for the area include a mix of employment, commercial and medium density residential.

1. Development in this area should incorporate unique entry features within the major north-south and east-west arterial corridors which convey the unique qualities of El Rio Corridor.
2. Land uses in the El Rio East Employment Core should maintain and expand the land use diversity to provide a range of density and intensity of development.
3. Transitions between different densities/intensities should be incorporated through setbacks, buffers and stepping down densities/intensities where necessary.
4. Non-residential uses adjacent to the Phoenix Goodyear Airport should be prioritized.
5. Development adjacent to arterial streets should maintain view corridors.
6. Provide meandering shared-use trails along collector and arterial corridors which link to internal and external open space areas, paths and trails.

### Character Area Description

Anchored by the proximity of the Phoenix-Goodyear Airport to the north and an emerging cluster of aviation businesses, the El Rio East Employment Core is positioned to become a major employment hub of the southwest valley. This position is bolstered by the presence of several existing and planned arterial corridors such as MC85, Estrella Parkway, Litchfield



Road and Sarival Road. The area includes some existing employment uses, but its current use is predominately agricultural. The southern boundary of the area is the Buckeye Canal, which provides some protection from flooding from the Gila River.

## Character and Vision





## 8 Goodyear North Bank Development

### Location

The Goodyear North Bank Character Area, located in the City of Goodyear, is bounded on the south by the north bank of the Gila River, on the north by the alignment with both MC 85 and the railroad ROW, on the east by the Sarival alignment, and on the west by the Perryville alignment.

### Key Resource Features:

1. Cotton Lane Bridge
2. BID Canal
3. Sand and Gravel
4. Transmission Line Corridor
5. SR 30
6. Loop 303
7. 303 Drainage Corridor

### Topography, Land Cover and Existing Land Use

The topography of the area is generally flat, with a gentle slope towards the Gila River to the south as well as a gentle slope towards the west. The area is primarily in active agricultural production and associated uses, with virtually all natural desert vegetation and washes removed.

### Future Land Use

The future land use designations for the area include light commercial to the west of MC 85, medium density residential to the east of MC 85 and light density residential along the river's edge.

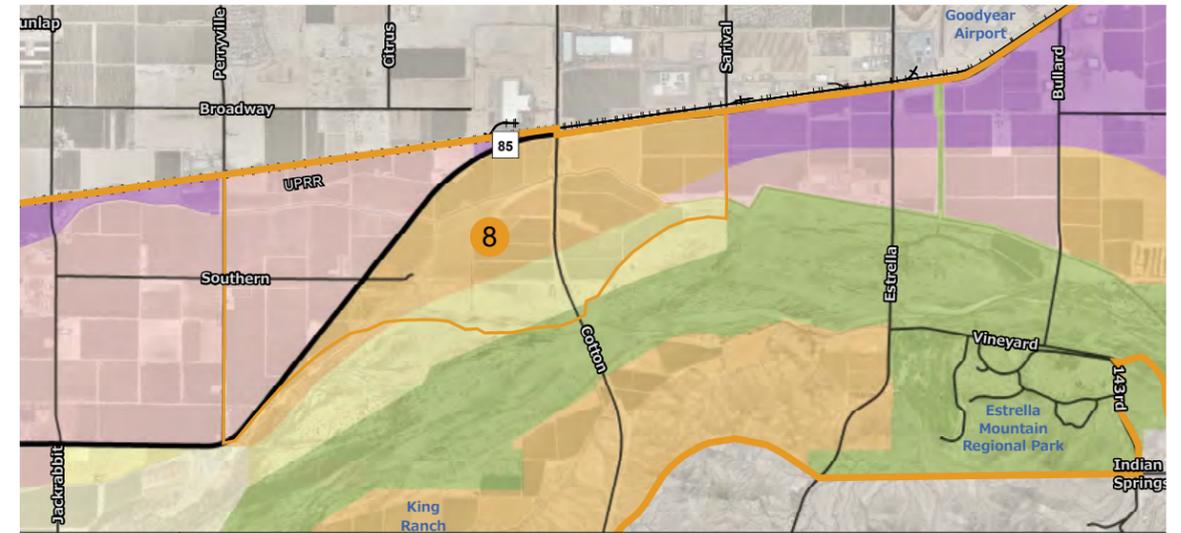
1. Development in this area should incorporate unique entry features within the major north-south and east-west

arterial corridors which convey the unique qualities of El Rio Corridor.

2. Provide meandering shared-use trails along collector and arterial corridors which link to internal and external open space areas, paths and trails.
3. Development adjacent to arterial streets should maintain view corridors and where possible, provide re-vegetation with native plants and materials.
4. Thoughtful and creative residential development that supports the employment and commercial core should be encouraged.
5. A neighborhood trail system that connects local neighborhoods with regional open space, paths and trails should be developed.

### Character Area Description

The Goodyear North Bank Character Area is primarily active agricultural production. The area is bisected by two major arterial roadways, Cotton Lane and MC 85. The lack of a levee or defined north bank of the Gila River places a portion of the area within the 100-year floodplain. The Cotton Lane bridge provides one of two primary connections between north and south Goodyear. The area is further impacted by the Buckeye Canal and the presence of a major electrical transmission line corridor. This character area may also be heavily impacted by the future Loop 303 and SR 30, system to system interchange. Developers of this area will need to take all the relevant impacts into consideration prior to development.



## 9 Buckeye North Bank Development

### Location

The Buckeye North Bank Development Character Area is located on the eastern border of the City of Buckeye adjacent to the City of Goodyear and south of the Union Pacific Railroad. Its northern boundary is the railroad ROW, its eastern boundary is the Perryville alignment, its western boundary moves from the Watson alignment east to the Verrado alignment and its southern boundary is MC 85 on the west end, and the Gila River north bank on the east end.

### Key Resource Features:

1. MC 85
2. Historic Liberty School
3. Cemetery
4. Proximity to Rail
5. Verrado Way (Access to I-10)
6. BID Canal
7. FCD Bank
8. Perryville
9. Future SR 30

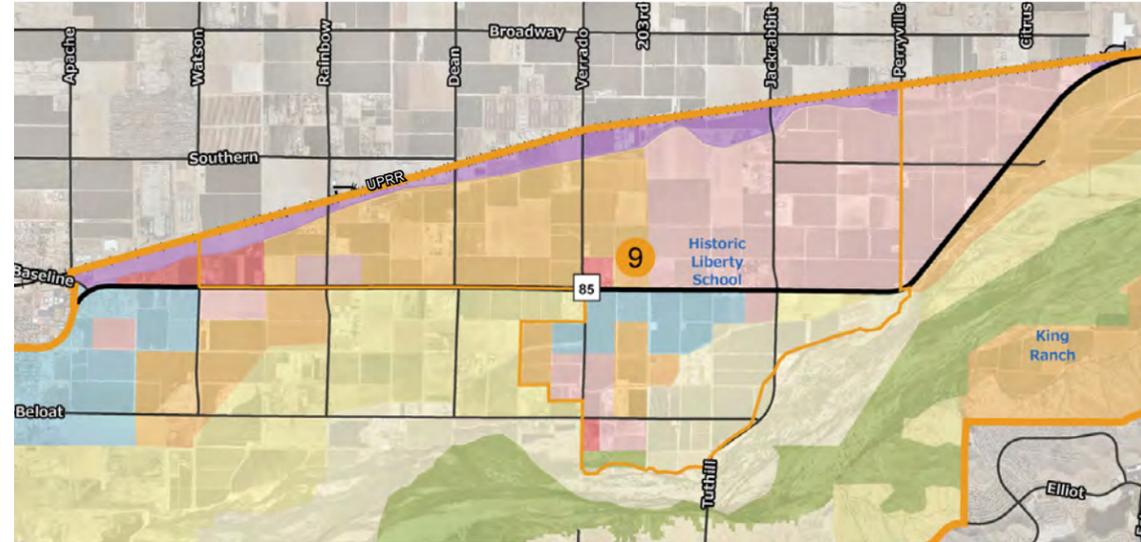
### Topography, Land Cover and Existing Land Use

The topography is flat land that gently slopes to the river to the south. Parts of the area are low enough to fall into the 100-year flood zone. The area is primarily in active agricultural production and associated uses, with virtually all natural desert vegetation and washes removed. There are also a few scattered low density residential uses throughout the area.

### Future Land Use

The Buckeye North Bank Development Character Area has been designated for several uses, including medium density residential in the west half, light commercial in the north east section, mixed uses in the southeast portion, and industrial along the rail line on the north side.

1. Development in this area should incorporate unique entry features within the major north-south and east-west arterial corridors which convey the unique qualities of El Rio Corridor.
2. Mixed-use commercial/residential development, where appropriate, based on flood risk, should be allowed.
3. Development of standards that improve the visual quality of commercial and mixed-use development and create a unified, distinctive, and attractive character along arterial streets should be established.
4. Contributing to the pedestrian environment with standards that integrate residential and non-residential uses should be encouraged.
5. Development adjacent to arterial streets should maintain view corridors and where possible, provide re-vegetation with native plants and materials.
6. A neighborhood trail system that connects local neighborhoods with regional open space, paths and trails should be developed.



### Character Area Description

The area has a great deal of potential for growth. It is mostly flat, with great access to the river, to MC 85, and to the railroad. It also has the potential to develop its own independent character. It is far enough from downtown Buckeye and downtown Goodyear to become an independent economic hub, while still being close enough to those areas for all residents to mutually benefit. However, it is also a potential flood risk area. The area has a lower elevation than all of the rest of the non-floodway land in the corridor, and

would be extremely likely to flood in a 100-year flooding event without further flood prevention measures. The potential economic growth that could happen here could far outweigh the cost of permanent flood prevention measures – if the area is utilized to its fullest potential. The risk of flooding may dissuade small-lot, leap frog development, however, a continuation of the low-density, rural development may be appropriate. Large scale development may be suitable with appropriate subdivision design and/or flood mitigation measures to address potential flooding of the area.

## Character and Vision





## 10 El Rio Historic Rural

### Location

The El Rio Historic Rural Character Area is located in the City of Buckeye. It is bounded on the west by Watson Road, on the east by Verrado, on the north by MC 85, and on the south by the Gila River.

### Key Resource Features:

1. Sand and Gravel
2. Cemetery
3. Lake

### Topography, Land Cover and Existing Land Use

The topography is mostly flat with a slope towards the south and southeast. Parts of the area are low enough to fall into the 100-year flood zone. The area is mostly agricultural, with some scattered low density residential. A South Extension Canal runs through the area from the east to the south.

### Future Land Use

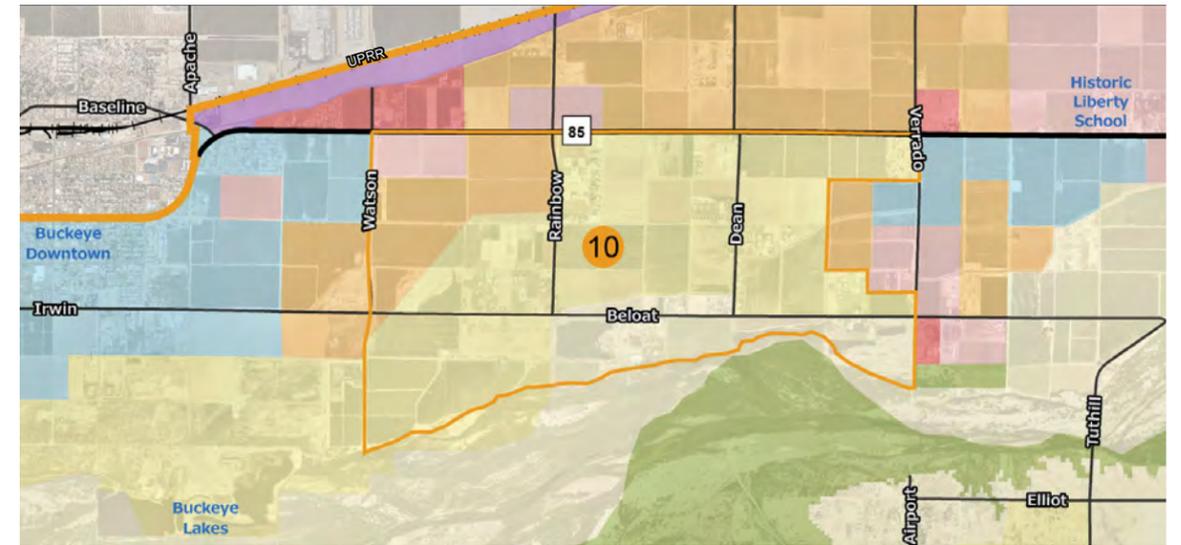
The area is designated for various residential uses increasing in density towards the northwest. A small amount of light commercial has been designated in the northwest corner.

1. Development in this area should incorporate unique entry features within the major north-south and east-west arterial corridors which convey the unique qualities of El Rio Corridor.
2. The character and scale of the established rural properties should be preserved.

3. Solid fencing or walls should be partially limited, with the area adjacent to the community open space in a partial-view style of fencing.
4. Rural uses such as horses, view fencing hedgerows along property boundaries, and generous setbacks from the street will visually contribute to the rural and estate character.
5. Design should incorporate traditional Arizona ranch design and materials blending with the desert and rural character.
6. Meandering shared-use trails along collector and arterial corridors which link to internal and external open space areas, paths and trails should be provided.

### Character Area Description

The El Rio Historic Rural Character Area is positioned between the employment and commercial focused areas to the east, and the historic downtown Buckeye area to the west. The El Rio Historic Rural Character Area is large lot irrigated rural farm and ranch land, reminiscent of the early days of ranching and farming in Maricopa County. The area comprises well-established farm landscapes with expansive views in all directions and particularly good views of the Buckeye Hills to the south. This area is well-positioned to be an attractive place to live. The close river access will promote active living, while the close proximity to regional retail and employment will promote a live, work, play lifestyle. The risk of flooding may dissuade



small-lot, leap frog development, however, a continuation of the low-density, rural development may be appropriate. Large scale development may be suitable with appropriate subdivision design and/or flood mitigation measures to address potential flooding of the area.

## 11 El Rio West Urban Core

### Location

The El Rio West Urban Core Character Area is located in the City of Buckeye and bounded on the west by Miller Road, on the east by Watson Road, on the south by the Gila River, and on the north by both the rail alignment and the MC 85 alignment.

### Key Resource Features:

1. Downtown Buckeye
2. Buckeye Lakes
3. Historic Resource
4. Buckeye WWTP
5. Arlington Canal
6. MC 85
7. Government Services
8. Fire Training Facility
9. Established Grid Pattern
10. Sand and Gravel

### Topography, Land Cover and Existing Land Use

The area is flat and slopes to the south towards the river. There are some areas in the southern half that are rugged terrain. The northwest corner is characterized by built out mixed uses, while most of the rest of the area is given over to agricultural uses and passive open space.

### Future Land Use

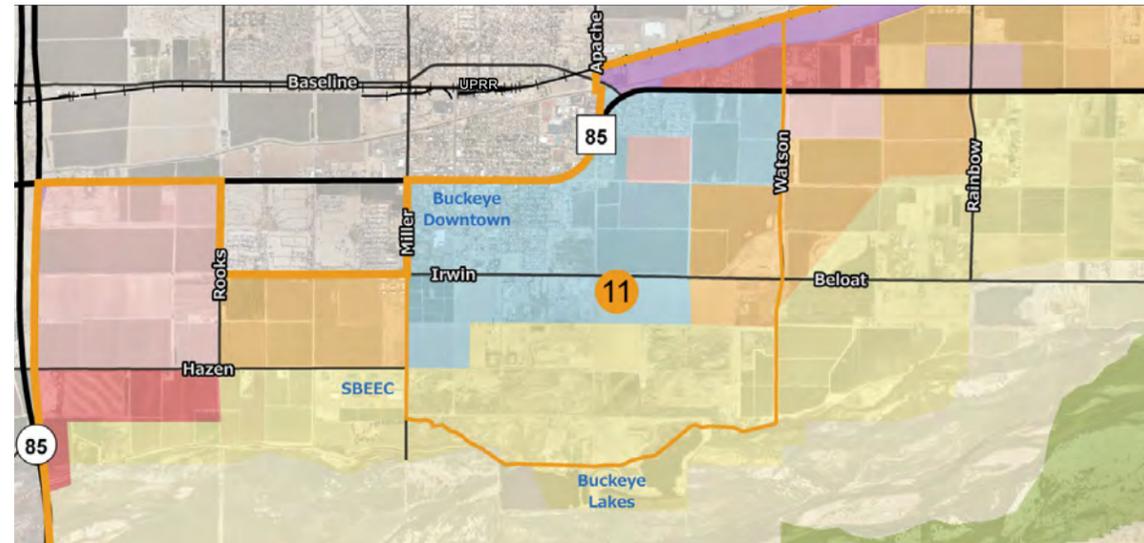
The area is designated as mixed use in the northern half, with some scattered commercial, light commercial, and medium density residential in the eastern portions. The northeast corner has industrial

uses along the rail line, while the southern side is proposed as low density residential.

1. Development in this area should incorporate unique entry features within the major north-south and east-west arterial corridors which convey the unique qualities of El Rio Corridor.
2. The El Rio West Urban Core should strive to maintain and enhance Buckeye's historic development pattern.
3. Quality urban design with an emphasis on small town historical character should be promoted.
4. Development should support, enhance and improve the economic viability of downtown Buckeye through a thoughtful mix of residential and non-residential uses.
5. Pedestrian and vehicular circulation should be improved to ensure a pedestrian friendly and safe environment.
6. Development of shaded outdoor spaces for the use and benefit of residents, employees, and visitors should be encouraged.
7. Development should provide neighborhood trails that connect local neighborhoods with regional open space, paths and trails within the Gila River corridor.

### Character Area Description

The El Rio West Urban Core Character Area is anchored on the north by downtown Buckeye and on the south by Buckeye



Lakes in the Gila River. Development in the area includes a mix of residential and non-residential development, as well as historic and non-historic properties. The east portion of the area is dominated by active agricultural production while the southern portion, adjacent to Buckeye Lakes, has sand and gravel mining operations. Directly west of this area, and part of Character Area 12, is the South Buckeye Equestrian and Events Center (SBEEC). The long-term plan for this area includes establishing connectivity from downtown to the Gila River and capitalizing on the SBEEC for local, regional and national events.



## Character and Vision





## 12 Buckeye Commerce Corridor

### Location

The Buckeye Commerce Corridor Character Area, situated next to the heart of downtown Buckeye, is bounded on the north by MC 85 and Beloit Road, on the west by SR 85, on the east by Miller Road, and on the south by the Gila River.

### Key Resource Features:

1. SR 85
2. MC 85
3. South Buckeye Equestrian and Events Center (SBEEC)
4. Arlington Canal

### Topography, Land Cover and Existing Land Use

The flat topography of the area slopes towards the south where it meets the river bank. The existing land uses are agricultural in nature with the exception of a few estate residential lots and one apartment complex in the northeast corner.

### Future Land Use

The future land use designations for the area are medium density residential in the northeast corner, light density residential along the river, light commercial in the northeast section, and regional commercial in the southwest corner.

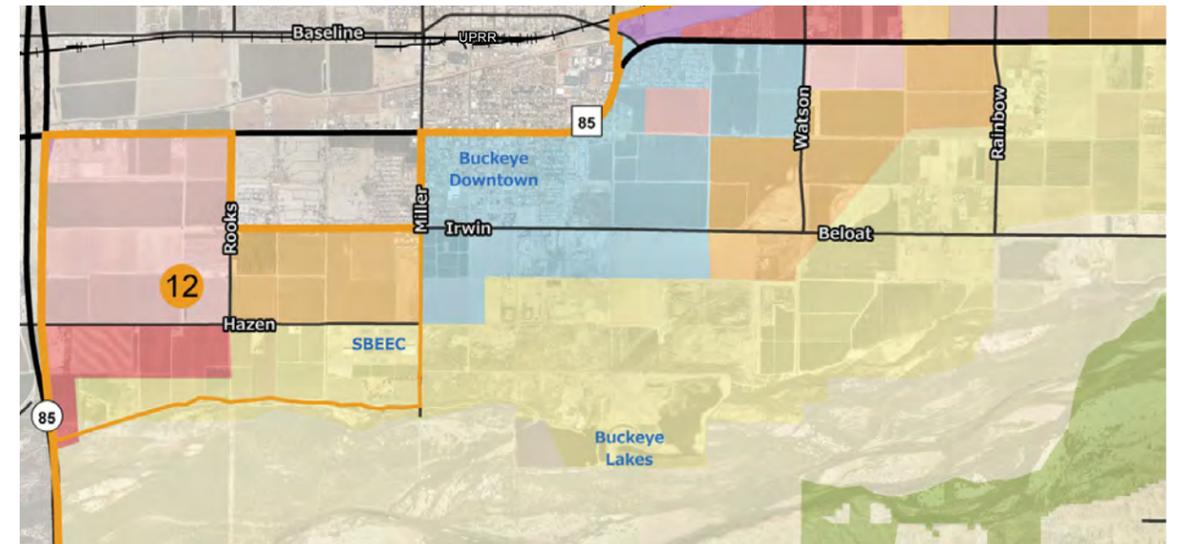
1. Development in this area should incorporate unique entry features within the major north-south and east-west arterial corridors which convey the unique qualities of the El Rio corridor.

2. Land uses in the Buckeye Commerce Corridor should leverage the presence of the SBEEC and provide supporting diverse land uses.
3. Transitions between different densities/intensities should be incorporated through setbacks, buffers and stepping down densities/intensities where necessary.
4. Non-residential uses adjacent to the major street arterials should be prioritized.
5. Development adjacent to arterial streets should maintain view corridors.
6. Meandering shared-use trails along collector and arterial corridors, linked to internal and external open space areas, paths and trails should be provided.

### Character Area Description

The Buckeye Commerce Corridor Character Area is predominately in active agricultural production, but it has direct access to SR 85 and MC 85, and lies within 1 to 2 miles of downtown Buckeye, giving it prime potential to be a regional commercial hub as well as a walkable, livable neighborhood that supports downtown Buckeye. The river bank is slightly higher here than in parts of the City of Buckeye further east, so the area lends itself to more advanced riverside developments. The northwest corner of the character area is developed as a mixed industrial/employment area.

The southeast corner of the area is the



site of the South Buckeye Equestrian and Events Center (SBEEC), a premier equestrian and events facility. It includes event venues, state-of-the-art boarding facilities, a veterinary hospital and a dining and entertainment establishment. The facility hosts local, regional and national events that attracts riders from throughout the country. Directly east of this character

area and part of Character Area 11 are the Buckeye Lakes in the Gila River. The long-term plan for this area includes establishing connectivity from downtown Buckeye to the SBEEC and to the Gila River, and capitalizing on the SBEEC for local, regional and national events.

## 2.4 El Rio Corridor Theme

The development of a “theme” for the El Rio Corridor should be based on the extensive research already completed within this corridor, including those areas surrounding it. The project corridor has been extensively studied, including an archeological report issued in 1868 that traced pre-historic activity in the corridor. Since those early stages of research, the project corridor has grown in complexity and importance as development pressures in the cities of Avondale, Buckeye and Goodyear encroach into the project corridor. The theme needs to build out of, and be an extension of, the work completed to date, including the most recent efforts described earlier.

### The El Rio Vision

The theme for this project needs to be related to the project vision. The vision for the project was established back in 1999 by a joint committee led by former Maricopa County Supervisor, Mary Rose Wilcox, along with the City of Avondale, the Town of Buckeye and the City of Goodyear, and the Flood Control District of Maricopa County. This task force, aided by multiple state, federal and local representatives and surrounding key stakeholders, developed a vision for the El Rio project corridor. The vision was articulated in five distinct theme objectives:

1. Restore and maintain the natural functions of the river corridor as a riparian habitat
2. Focus on multi-use facilities and functions
3. Maintain, enhance or mitigate flood control elements
4. Focus on public/private partnerships
5. Link functional compatibility outside the riparian habitat limits



## Character and Vision





## El Rio Theme Guidelines

The theme for El Rio should build from the previously completed studies and have a strong relationship to the corridor's natural surroundings and historical importance. The contextual site information of the El Rio project area is unique in that it presents multiple physiographic conditions in its natural setting. Landform variations include the rocky, mountainous slopes of the Estrella Mountains and Buckeye Hills south of the river, and flat alluvial plains north of the river. There are varied bed form conditions within the river channel that include multiple terrace formations and undulating sand and gravel bars interspersed with discontinuous low-flow channels and areas of open water. Vegetation conditions vary in direct response to the landform variations described above and are dictated by, and subject to, the availability of water within the project area. Hydric riparian or wetland conditions are seen immediately adjacent to any open water areas along low flow channels or sand and gravel excavation areas. Mesic vegetation, like mesquite bosques and salt cedar thickets, are seen on terraced areas where the water table does not lie at the surface. Extensive establishment of salt cedar groves throughout the project limits are an ongoing environmental and site design issue.

Because of these physical influences, the unique archeology and history of this area, coupled with the existing logo for El Rio, we believe that the theme for this project should be multifaceted. It should initiate from the colors, textures and fonts developed with the branding logo and the El Rio name, and wherever possible, include the following broad categories as theming guidelines.



**Recycle/Reuse** – Use both site-specific and manufactured recycled items in the project as site furnishings and construction materials that are illustrative of the river's history and use. This is the main principle that connects the entire project and should be applied to any restoration aspects of the project and public use facilities where it is cost effective and feasible.



**Accessibility** – Provide balanced, controlled, safe, and creative solutions for people of all ages and abilities without sacrificing the variety of experiences that a large, multiuse facility will present. Access will be balanced and controlled to ensure it does not negatively impact any planned environmental restoration aspects of the project.



**Local Materials** – Use indigenous materials and facilities to minimize maintenance challenges for the future and educate the public to the diverse materials and solutions that are both locally and regionally significant and available.



**Create Connections** – Promote the development of connections between different uses both within and outside the project. This connection should include the development and design of trail linkages to surrounding municipal and private developments, and open space areas.

Character and Vision



**Historical Interpretation** – Describe, interpret and honor the history of the river, its ancestral peoples, and the villages and cities that grew on its banks in every aspect of the project’s design and programming. Position the project as a national, regional, cultural, and recreational resource for the Cities of Avondale, Buckeye and Goodyear and potentially, the nation.



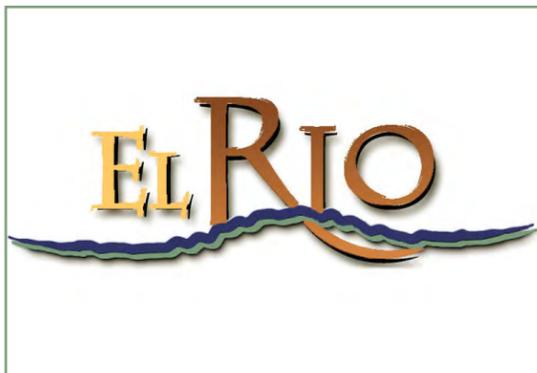
**Respect the Settings** – Enhance the river corridor so that it is compatible and consistent with its natural habitat and the overall project that is the nucleus of this endeavor. New development should respect the setting of the corridor by maintaining and enhancing viewsheds to the river corridor and mountain ranges.



**Create Discovery Zones** – Create spaces and areas along the river corridor to serve as discovery zones and destinations that invite and educate the visiting public in a positive and enlightened manner. These may be initiated with the pilot projects described in Section 8 of this report.



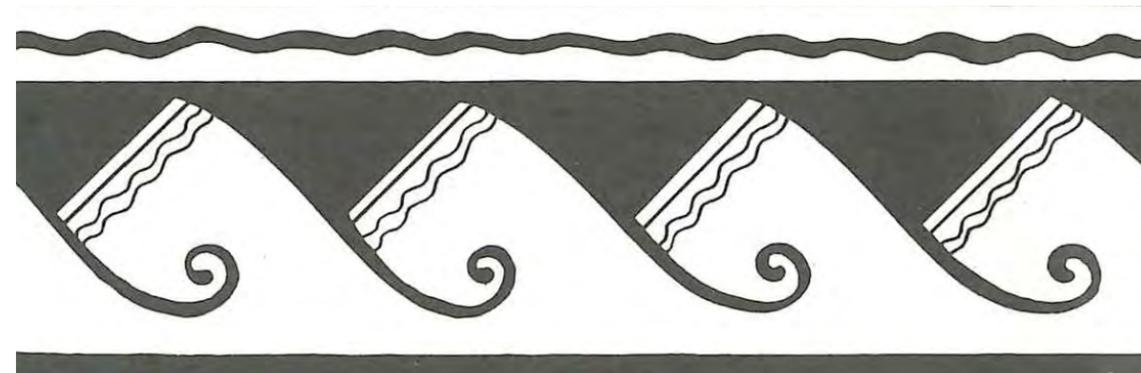
**Encourage Frequent and Year-Round Use** – Provide a cohesive mix of attractive, safe elements and spaces along the river that tell the story of the river cycle. This story includes the river’s relationship to the environment and the desert seasons, which will create a compelling user destination for birding, hiking and equestrian usage along with passive recreational endeavors.



**Build upon the colors within the existing El Rio Logo** – Use the colors found in the established El Rio logo of blue and rust as foundation colors and the green and yellow colors for accents in signage, site furnishings and other features and elements in the El Rio corridor.



**Linkages** – The theme for the El Rio corridor should extend beyond the actual river and create the opportunity to make linkages to both private development and public infrastructure through creative connections that reinforce the El Rio theme.



**The communities believe that every element associated with the El Rio project corridor needs to relate back to both the vision established in 1999 and the broad theming guidelines presented as part of this project. The approach to applying the vision and theme to the physical elements of the project corridor has to be multifaceted and flexible but based upon, and reflective, of these broad principles.**



# Land Development Guidelines

*All development within the El Rio corridor will provide an interconnected, multi-modal system with a mix of uses and green spaces. The goal of this planning document is to assist in providing guidelines for all development in the project area at a scale appropriate to its proposed location and level of flood risk. All development in the corridor will link to the El Rio Trail system and the river environment. This interconnected 'ribbon' of green will transform the El Rio corridor into a unified, cohesive setting where residents and visitors can reconnect with nature, and can pause and enjoy life. El Rio will be that special place where both natural and human ecosystems flourish.*





## 3.1 Background

Historically, flooding in the El Rio corridor has played an important role in shaping the surrounding natural environment. Although floods occur relatively infrequently in the area, the consequences can be very significant. Flooding can place lives at risk and result in extensive property damage, therefore, managing the risk of flooding is an important consideration in the development of an economically and environmentally sustainable destination.

As development continues to take shape in the area, it is important to understand this history and plan for future development that takes this history into consideration. Based on the level of flood risk, future development can provide site design and/or structural improvements to mitigate flood risk. The framework outlined in this chapter allows for future development in the corridor.

## 3.2 Development Objectives

The El Rio Design Guidelines and Planning Standards document encourages future development at an appropriate scale to the level of flood risk and takes the following objectives into consideration:

1. Minimize the potential impacts of flooding on human health and safety.
2. Encourage development in locations with little or no risk from flooding.
3. Allow development throughout the corridor, at a scale appropriate to the risk of flooding and mitigation measures.
4. Recognize potential for changes in flood risk by considering future, funded local and regional flood improvements.

No design or improvement can completely eliminate flood risk in the corridor; therefore,

managing the consequences of flooding is of paramount importance.

## 3.3 Implementation

Future development will be guided by the El Rio transect guides. There are two (2) transect guides in the El Rio corridor plan, the Viewshed transect and the Flood Risk transect. The Viewshed transect is intended as the overarching guide for land management and design and applies to all property in the El Rio corridor. The intent of the Viewshed transect is to ensure that the density and intensity of development is appropriate as it relates to the approach to the Gila River and the view of the southern mountain ranges and hills.

The Flood Risk transect covers any property, or portion thereof, that is within a FEMA designated floodplain. The intent of the Flood Risk transect is to ensure that the appropriate density and intensity of development is located and designed in a safe manner as it relates to the floodplain and flood depths. This transect could be further enhanced through the use of agricultural conservation easements, which would preserve farmland along the river. These guidelines recognize that agricultural land use remains a vitally important aspect of the community lifestyle while also benefiting wildlife.

In utilizing the transect guides, proposed development should be reviewed as follows:

1. If property is in the floodplain, it should follow the Flood Risk transect.
2. The Flood Risk transect is sectioned into different categories based on the depth of the base flood elevation. Development of the property should follow the guidance of the appropriate flood risk category (i.e., Regular Floodway, Natural Area, and Transitional Rural Area).
3. After determining the flood risk category, proposed development will refer to Table 3-1, El Rio Corridor Land Use, for guidance

- on density and intensity of development.
4. If property is not in the floodplain, it should follow the Viewshed transect.
5. The Viewshed transect is sectioned into different categories based on the distance from the Regular Floodway. Development of the property should follow the guidance of the appropriate Viewshed category (i.e., River Development Option 1 or 2, General Urban or Urban Center).
6. If the subject property is within a FEMA designated floodplain, then the development of the property should follow the Flood Risk transect.

Table 3-1, El Rio Corridor Land Use, sorts development into four categories: Highly Vulnerable, More Vulnerable, Vulnerable, and Low Vulnerability. In general, use vulnerability is based on the type, density and/or intensity of development in relation to:

1. The depth of the base flood elevation
2. The consequences of flooding on human health and safety

3. The extent of potential property damage
- Vulnerability of development is based on the presence and level of concentration of people, infrastructure and/or buildings. Higher concentration of people, infrastructure and/or buildings results in higher vulnerability due to the potential costs to life and property in the event of a natural or man-made disaster. Also, higher concentrations require a higher level of disaster preparedness and mitigation in order to reduce the risk to life and property.

Development in any vulnerability category should consider mitigation measures in order to manage the potential consequences of flooding. Consequences of flooding can be managed by reducing the density/intensity of development since it naturally reduces the concentration of people, infrastructure and/or buildings. Therefore, less dense/intense development is, by definition, less vulnerable. Consequences of flooding may also be marginally reduced through local site design mitigation measures or more widely reduced through the construction of regional flood facilities.

Vulnerability	Use Type Descriptions		Permitted Development			
	Residential Uses	Non-Residential Uses	Flood Risk Transect			Viewshed
			Regular Floodway	Natural Area	Transitional Rural Area	
<b>Highly Vulnerable</b>	Residential densities in excess of 4.01 du/ac	All Buildings for Retail and Service Uses, such as, but not limited to, Lodging, Meeting Hall, Hospital, Religious Institution, School, Group Living, Day Care, Restaurants, Indoor Entertainment.	X	X	P <sub>2</sub>	P
<b>More Vulnerable</b>	Residential densities from 2.01 to 4.0 du/ac	All Buildings for Industrial, Retail and Service Uses in excess of 20,000 square feet.	X	P <sub>2</sub>	P <sub>1</sub>	P
<b>Vulnerable</b>	Residential from 0 to 2 du/ac	All Buildings for Industrial, Retail and Service Uses in excess of 10,000 square feet and Outdoor Entertainment.	X	P <sub>1</sub>	P	P
<b>Low Vulnerability</b>	Residential densities up to 1 du/ac	Agricultural, Parks and Open Space, Mining	P <sub>2</sub>	P	P	P

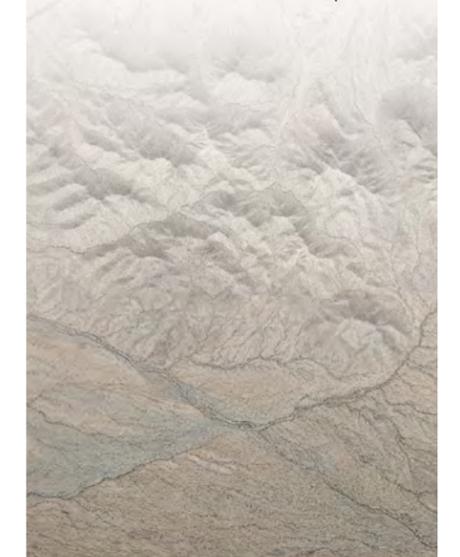
X = Not Permitted  
P = Permitted with no restrictions  
P<sub>1</sub> = Permitted with note on final approved site plan and/or subdivision plat indicating flood risk.  
P<sub>2</sub> = Permitted with a) Note on final approved site plan and/or subdivision plat indicating flood risk, and b) site design and/or structural mitigation measures.  
**Note:** All Development should be in accordance with Maricopa County flood regulations and / or the applicable local jurisdictional flood regulations.

# Land Use

All development within the El Rio corridor is intended to be guided by a sustainable planning vision that respects the desert southwest environment, and enhances and preserves the unique setting of the El Rio corridor. The following El Rio transects will guide future development within the corridor.

The intent of the transect guides is not to prescribe allowed uses, nor modify or amend approved local jurisdictional General Plan land use designations but instead illustrate how different densities and intensities of development should be integrated with each other, while respecting and enhancing the unique El Rio environment.

In general, this approach allows the full range of land use types, densities and intensities, provided the appropriate mitigation is included with the development.

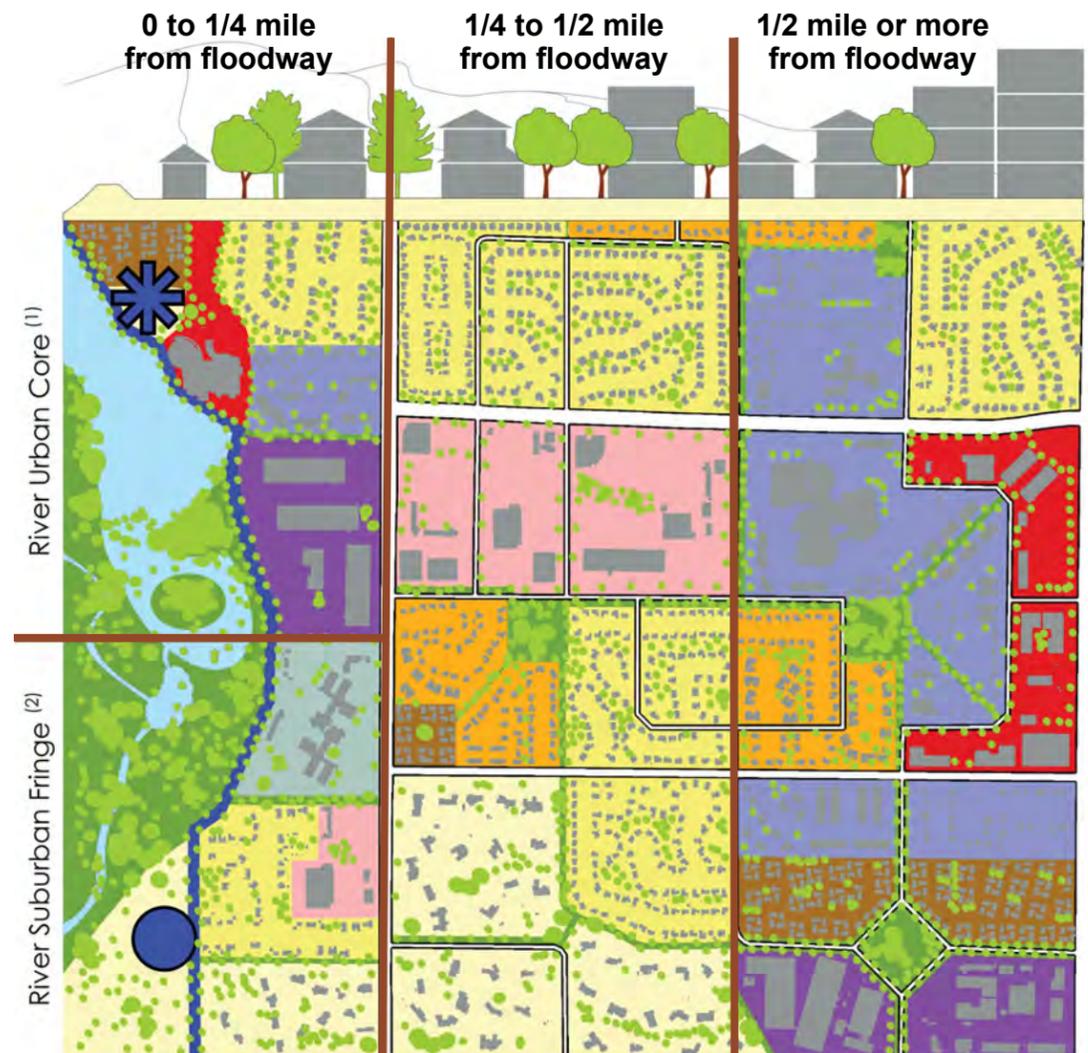


Regular Floodway    Natural Area    Transitional Rural Area    Areas Outside the Floodplain (refer to Viewshed transect)

**Flood Risk\***

- Legend**
- Land Uses**
- Open Space
  - Very Low Density Residential
  - Low Density Residential
  - Light Commercial/Office
  - Agriculture
- Other Features**
- Foliage
  - El Rio Trail
  - River Access Trailhead
  - T1E Trailhead
  - Roads
  - Water

\*-Finished floors of a permitted building should be elevated a minimum of two (2) feet above the 100-year base flood elevation.  
 -Smaller lots may be permitted provided clustering techniques are utilized and overall project density does not exceed permitted general plan density.  
 -All development should comply with FEMA Rules.



River Urban Core (1)    River Suburban Fringe (2)    River Development Options (1)(2)    General Urban    Urban Center

**Viewshed**

- Legend**
- Land Uses**
- Open Space
  - Civic
  - Commercial Center/Regional
  - Light Commercial/Office
  - Mixed Use
  - Employment
  - Very Low Density Residential
  - Low Density Residential
  - Medium Density Residential
  - Multi-Family
  - Foliage
  - El Rio Trail
  - River Access Trailhead
  - T1E Trailhead
  - Roads
  - Water

(1) River Urban Core development permitted with detailed development plan  
 (2) River Suburban Fringe development permitted by right

## El Rio Land Use Transect Guides





## 3.4 Design and Land Management Goals

### Goal 1

Preserve the scenic vistas while enhancing the natural riparian environment with development that is responsible and respectful of its setting, in order to establish the corridor as a unique regional and national destination.

#### Policies

1. In low and very low density/intensity development, infrastructure should enhance the character of the corridor by minimizing street widths using alternatives to asphalt roads, utilizing ribbon curbs, minimal street lighting and trails/path system rather than a sidewalk network.
2. In medium to high density/intensity development, infrastructure should enhance the character by utilizing street alignments and site design to take advantage of sightlines to the Gila River corridor and the mountain ranges and hills to the south.
3. Use site planning techniques that minimize the visual impact of development along north/south arterial corridors.
4. Transition development adjacent to the floodway by using appropriate setbacks, building scale, building massing and open space.

### Goal 2

Recognize the potential for inundation and provide guidelines for development that balances the density and intensity of development as it relates to the potential for, and intensity of, flooding.

#### Policies

1. Cluster development may be considered in flood risk areas. Clustering is any general approach which results in a more compact arrangement of buildings and creates larger tracts of connected open spaces.
2. Cluster development should provide a range of housing types and an approach to maintaining areas in their natural state. Net density and character of clustered areas should not exceed the approved General Plan of the applicable local jurisdiction.
3. Finished floors of any permitted building should be elevated a minimum of two (2) feet above the 100 year base flood elevation.
4. Uses such as golf courses, low intensity resorts and non-commercial equestrian centers should have minimal visual impact and preserve the natural setting.

### Goal 3

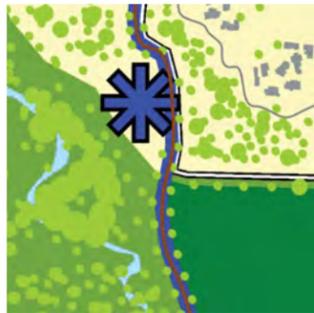
Encourage an integrated approach to land development that promotes interconnected public access to open space and that results in integrated diverse uses, densities and intensities.

#### Policies

1. Development should provide multiple access points to open space. Open space areas should be accessible through residential neighborhoods.
2. Residential uses should use site planning, open space, building massing and construction techniques which preserve the natural setting.
3. Non-residential uses should be similar in character to the surrounding residential development.
4. Open space, pedestrian paths and trails are encouraged throughout all development projects.
5. The perimeter of projects should be designed to promote a sense of arrival and integrate the natural setting of the El Rio corridor.
6. To ensure open space connections and the feeling of openness throughout the corridor, development should utilize open space to transition from development to development and should minimize the use of subdivision walls to separate different subdivisions.
7. Designate and sign appropriate public access to all bike/pedestrian paths and trails.
8. All bike/pedestrian paths/trails should connect to the El Rio trail

9. Use open space conservation areas to preserve the natural setting through the following methods:
10. Provide visual open space amenities along and near streets and use natural open space between developments and roadways to minimize the impact on views.
11. Encourage the use of natural area open space in site planning and subdivision design to ensure an overall openness.
12. Encourage natural area open spaces that can be used and enjoyed by all residents and connect to open areas outside the development.
13. Provide building setbacks that are staggered and not in a straight line.
14. Preserve and protect the unique open spaces, along with archaeological and historical sites.
15. Encourage large continuous use of open space.
16. Restrict access to sensitive habitats.
17. Active open space areas should incorporate the unique natural setting of the El Rio corridor, emphasizing the unique river environment, through site and architectural design.
18. Turf should be limited to active recreation areas, open play spaces and areas of high public use.

### 3.5 Flood Risk Transect



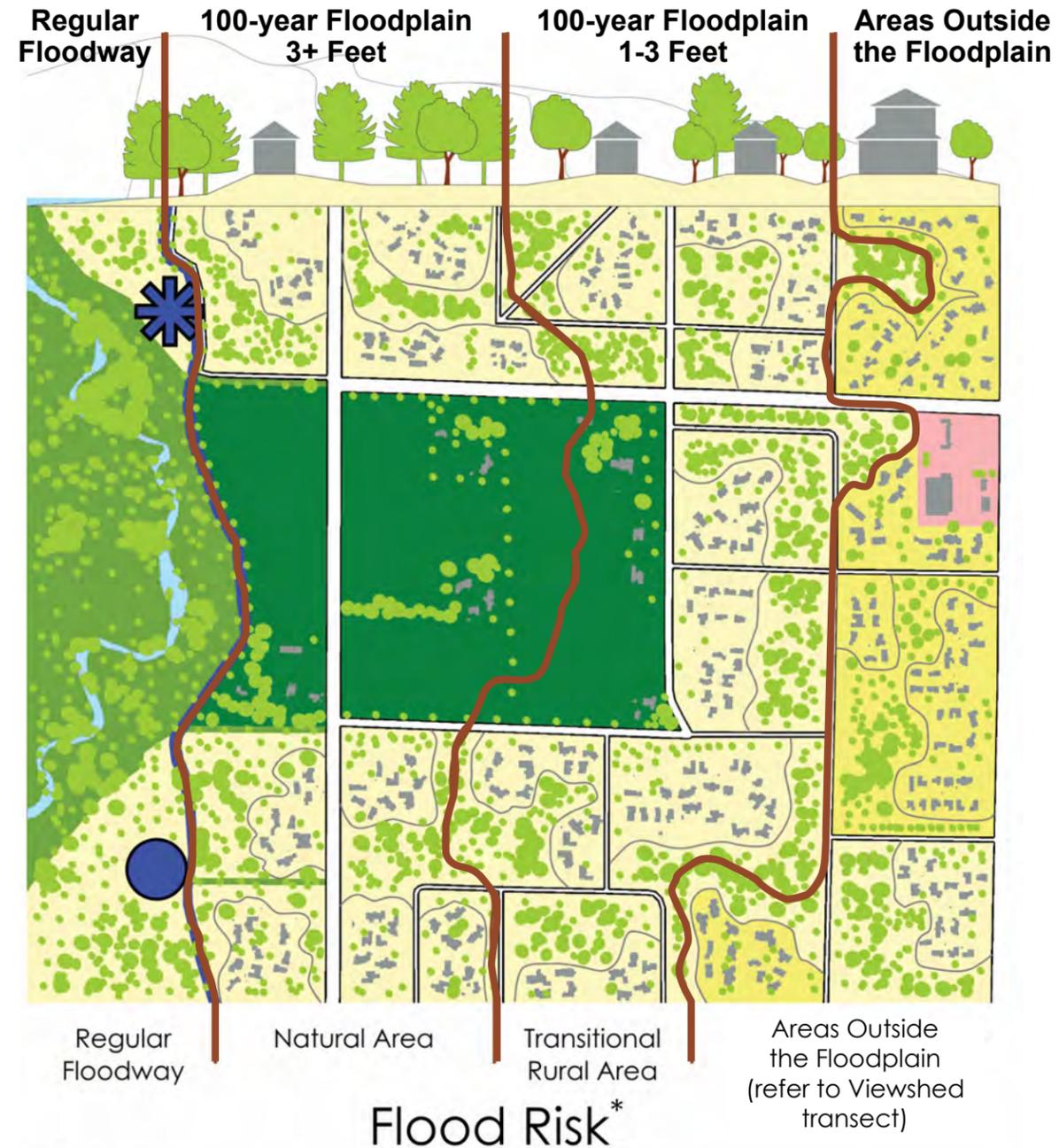
The Flood Risk transect identifies the appropriate type and scale of development for properties within the El Rio corridor that may be at risk for some level of flooding.

Where development is proposed, suitable mitigation measures should be incorporated within the design to ensure that development is as safe as possible and there is minimal risk to life and minimal potential for property damage. However, it is important to recognize that design and improvements cannot eliminate flood risk completely. Therefore, where development is allowed, plans/measures must be in place to manage the consequences of flooding and, where necessary, long-term maintenance of improvements must be provided. All proposed development on property identified as 'at-risk' of flooding should identify and provide means for safe egress in the event of flooding.

The table below is used to guide the density and intensity of development based on which flood risk category the development is located (i.e. Regular Floodway, Natural Area, or Transitional Rural Area).

Vulnerability	Use Type Descriptions		Permitted Development			Viewshed
	Residential Uses	Non-Residential Uses	Flood Risk Transect			
			Regular Floodway	Natural Area	Transitional Rural Area	
<b>Highly Vulnerable</b>	Residential densities in excess of 4.01 du/ac	All Buildings for Retail and Service Uses, such as, but not limited to, Lodging, Meeting Hall, Hospital, Religious Institution, School, Group Living, Day Care, Restaurants, Indoor Entertainment.	X	X	P <sub>2</sub>	P
<b>More Vulnerable</b>	Residential densities from 2.01 to 4.0 du/ac	All Buildings for Industrial, Retail and Service Uses in excess of 20,000 square feet.	X	P <sub>2</sub>	P <sub>1</sub>	P
<b>Vulnerable</b>	Residential from 0 to 2 du/ac	All Buildings for Industrial, Retail and Service Uses in excess of 10,000 square feet and Outdoor Entertainment.	X	P <sub>1</sub>	P	P
<b>Low Vulnerability</b>	Residential densities up to 1 du/ac	Agricultural, Parks and Open Space, Mining	P <sub>2</sub>	P	P	P

X = Not Permitted  
P = Permitted with no restrictions  
P<sub>1</sub> = Permitted with note on final approved site plan and/or subdivision plat indicating flood risk.  
P<sub>2</sub> = Permitted with a) Note on final approved site plan and/or subdivision plat indicating flood risk, and b) site design and/or structural mitigation measures.  
**Note:** All Development should be in accordance with Maricopa County flood regulations and / or the applicable local jurisdictional flood regulations.



**Legend**

**Land Uses**

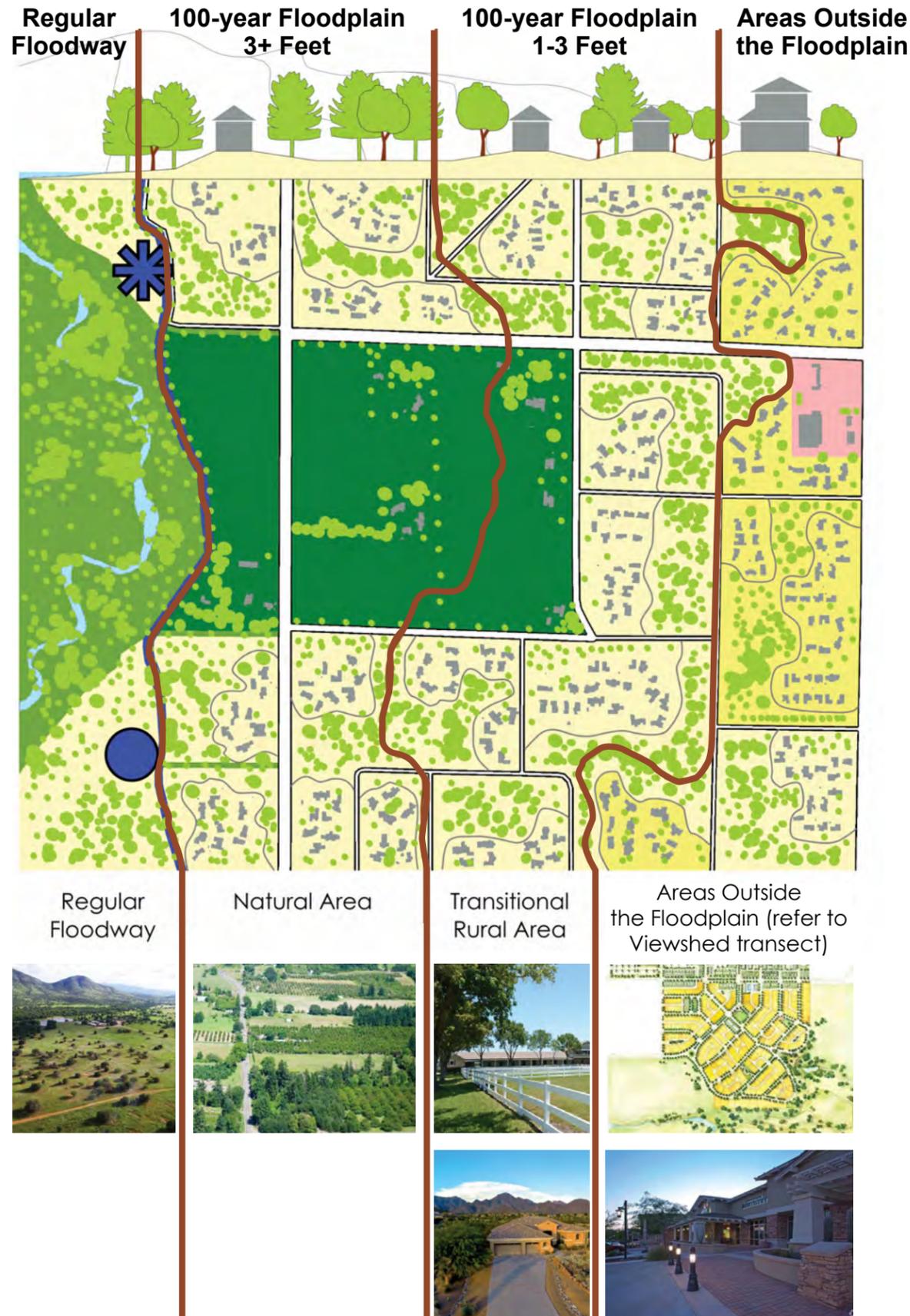
- Open Space
- Very Low Density Residential
- Low Density Residential
- Light Commercial/Office
- Agriculture

**Other Symbols**

- Foliage
- El Rio Trail
- River Access Trailhead
- TIE Trailhead
- Roads
- Water

\*-Finished floors of an permitted building should be elevated a minimum of two (2) feet above the 100-year base flood elevation.  
- Smaller lots may be permitted provided clustering techniques are utilized and overall project density does not exceed permitted general plan density.  
- All development should comply with FEMA Rules.





## Regular Floodway



### Area Location

The Regular Floodway describes land located in the FEMA designated floodway.

### Allowed Land Uses

One dwelling unit per acre or less, agricultural uses, open space, and permitted mining operations.

### Area Description

This area is defined as the Gila River floodway and contains a perennial water flow that is supplied by reclaimed water, agriculture tailwater and groundwater. The

area consists of expansive open space areas that include salt cedar thickets, mesquite bosques, marsh lands and cottonwood/willow corridors. The area also includes some sand and gravel mining operations. The predominately natural condition of this area supports a varied wildlife habitat and passive recreation opportunities.

### Character Areas

The High Value Habitat character area is the Regular Floodway.

## Natural Area



### Area Location

The Natural Area describes those areas that are within the floodplain with a flood depth of 3+ feet.

### Allowed Land Uses

Very low density residential and agricultural uses are permitted within the Natural Areas. However, development is discouraged in Natural Areas, that is in excess of the allowable floor area ratio (FAR) of the underlying base zoning district of the governing jurisdiction.

### Area Description

These types of areas are in the floodplain, therefore, finished floors of any permitted building will need to be elevated a minimum of two feet above the 100-year

base flood elevation. Expected typical uses in the natural area are active and passive open space uses, particularly trails and trailheads. These are encouraged to help connect the “Edge” areas (see Section 4) with the rest of the El Rio corridor. Opportunities may exist for the preservation of natural resources in these types of areas.

Areas designated as Natural Areas (or open space) should be limited from new development, with the exception of projects, like trails, that are designed to preserve or accentuate their natural resources.

### Character Areas

A portion of all character areas falls into this category.

## Transitional Rural Area



### Area Location

The Transitional Rural Area describes those areas within the floodplain with a flood depth of 1-3 feet.

### Allowed Land Uses

Low density residential and agricultural uses are permitted within Transitional Rural Areas.

### Area Description

These types of areas are at risk of flooding. Finished floors of any permitted building will need to be elevated a minimum of two feet above the 100-year base flood elevation. Expected typical developments will be single stand-alone houses, clustered very low-density housing, agricultural and related agricultural industry uses. Active and passive open space uses, particularly trails and trailheads, are encouraged to help connect this area with the rest of the El Rio corridor.

Most of the natural desert scape has already been turned over to agricultural uses in the Transitional Rural Areas of the El Rio corridor, therefore, developers who utilize clustering techniques are encouraged to fill in the non-elevated areas of their developments with native plants, identified elsewhere in this document, in order to help unify this concept area with the rest of the El Rio corridor.

### Character Areas

Parts of Buckeye North Bank Development, Parts of Waterman Wash Rural Development and Recreation Area, Scenic Rural Development and Open Space constitute this category.

## Land Use





## 3.6 Viewshed Transect

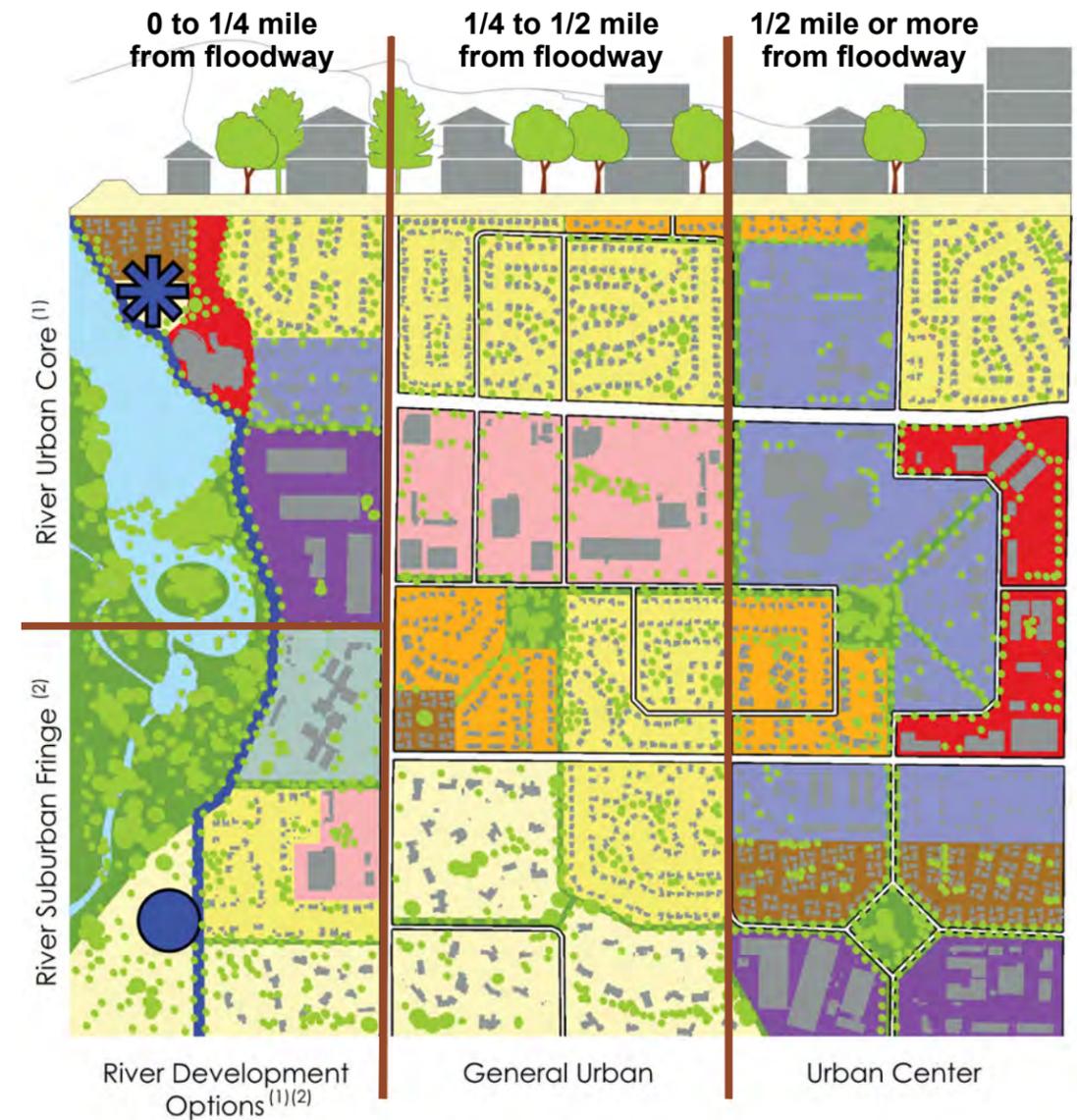
All development within the El Rio corridor should follow the approved General Plan of the applicable local jurisdiction in which the property is located. In addition, property within the El Rio corridor should follow the *El Rio Design Guidelines and Planning Standards* document.

The *El Rio Design Guidelines and Planning Standards* document is established in order to set a consistent set of goals and policies for development, within the corridor, across jurisdictional boundaries. When considering development, all property "Outside the floodplain" should comply with the Viewshed transect.

The Viewshed transect identifies the appropriate type and scale of development for properties within the El Rio corridor as it relates to the distance of a property to the Gila River floodway. The Viewshed transect is sectioned into different categories based on the distance from the Regular Floodway. Development of the property should follow the guidance of the appropriate Viewshed category

(i.e., River Development Option 1 or 2, General Urban or Urban Center). In general, as development approaches the Gila River floodway, development should become less dense and intense. However, it is recognized that the Gila River is an attractive amenity, therefore, more dense and intense development adjacent to the floodway may be considered under the River Urban Core development option, provided a detailed development plan is submitted and approved by the applicable jurisdictional entities.

Because of the corridor's unique riparian setting, development in the corridor should take advantage of both active and passive recreational opportunities while respecting the natural setting and being mindful of the inherent risk of flooding. To that end, the goals and policies on the following page have been established.



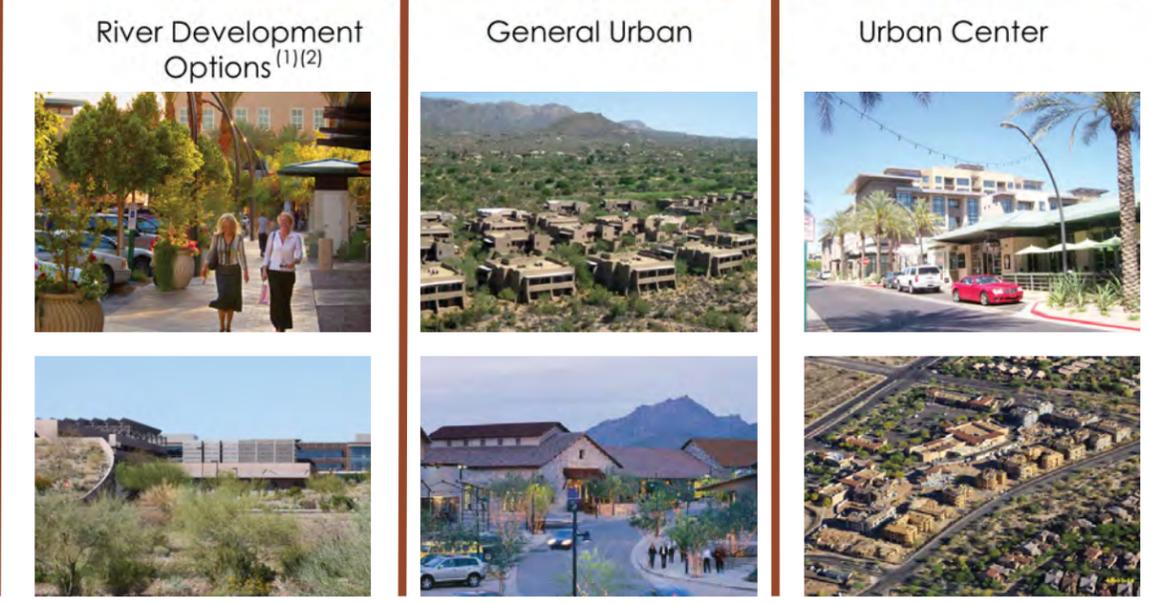
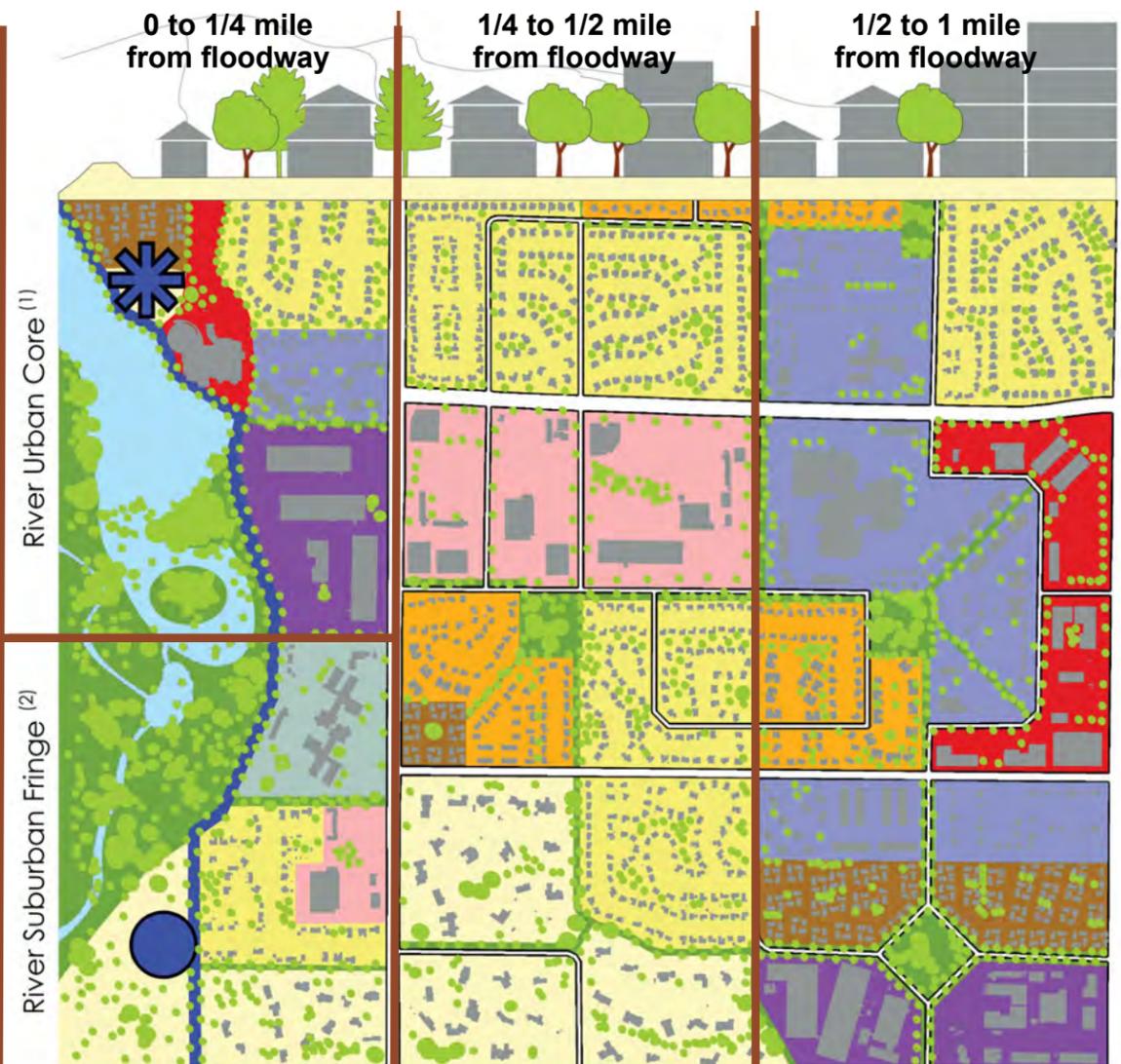
### Viewshed

#### Legend

- |                            |                              |                        |
|----------------------------|------------------------------|------------------------|
| Land Uses                  |                              |                        |
| Open Space                 | Employment                   | Foliage                |
| Civic                      | Very Low Density Residential | El Rio Trail           |
| Commercial Center/Regional | Low Density Residential      | River Access Trailhead |
| Light Commercial/Office    | Medium Density Residential   | T1E Trailhead          |
| Mixed Use                  | Multi-Family                 | Roads                  |
|                            |                              | Water                  |

(1) River Urban Core development permitted with detailed development plan

(2) River Suburban Fringe development permitted by right



### River Development Options

**Area Location**  
 These areas are adjacent to the Gila River floodway. If property is located in a FEMA designated floodplain, the property should follow the Flood Risk transect guide. The River Development Options describes those areas that are outside the floodplain and also adjacent to the river.

**Area Description**  
 The River Development Options includes two development type options, Option 1, the River Urban Core and Option 2, the River Suburban Fringe. Properties in this location have direct access to the unique riparian habitat of the Gila River. Properties in this area also enjoy views of the natural river setting and expansive views of the mountain ranges and hills to the south. Active and passive open space uses, particularly trails and trailheads, are

encouraged to help connect these edge areas with the rest of the El Rio corridor. Opportunities may exist for the preservation and utilization of natural resources in these types of areas, which developers are encouraged to protect. These areas, when developed, should become showpieces for the region.

**Character Areas**  
 Parts of El Rio Historic Rural, Goodyear North Bank Development Area, Buckeye Commerce Center, El Rio West Urban Core, Tres Rios Scenic Confluence, King Ranch Development and Recreation, El Rio East Employment Core create this space. If further flood risk mitigation factors are employed, the Buckeye North Bank Development and the El Rio Historic Rural areas could both fall into this category.

#### River Urban Core



**Allowed Land Uses**  
 River Urban Core - higher impact densities like employment, multi family, and regional commercial uses, are permitted with detailed development plans approved by the applicable jurisdictional entities.

#### River Suburban Fringe



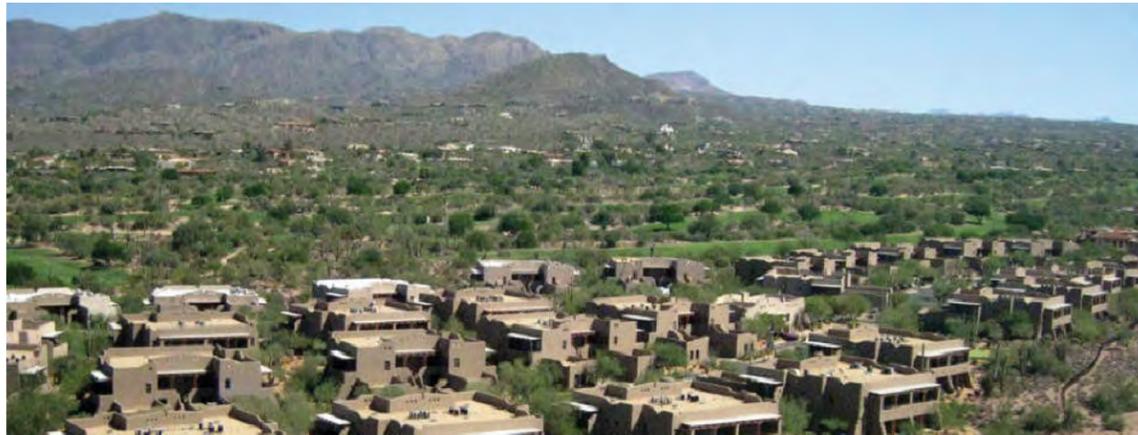
**Allowed Land Uses**  
 River Suburban Fringe - low impact densities, like very low density residential, low density residential, and light commercial uses are permitted.

### Land Use





## General Urban



### Area Location

The General Urban area describes those areas that are within one-quarter of a mile to one-half mile (1/4 to 1/2-mile) from the Gila River floodway and removed from the floodplain.

### Allowed Land Uses

The General Urban category is a transition area that should serve as a visual and spatial buffer between the properties adjacent to the river floodway and the more dense and intense Urban Center properties over 1/2-mile from the river floodway. Development within this area will incorporate a blend of both rural and suburban development and will achieve a balance between the built and natural environments. Natural open spaces will be incorporated with development in order to create an interconnected network of green spaces and bike and pedestrian paths and trails.

Properties falling in the General Urban category will provide a range of residential densities and housing types. Development will also include limited light commercial and/or office opportunities intended to complement the traditional neighborhoods by providing local convenience services. As part of zoning approvals, development within this concept area will also provide a consistent set of standards to guide

the physical development and the visual quality of the proposed development. Proposed residential and non-residential uses should conform to the current approved General Plan for the underlying jurisdiction in which the development is proposed.

### Area Description

The General Urban Center category includes all properties 1/4 to 1/2-mile from the river floodway and removed from the floodplain. The topography north of the river is generally flat with a slope to the Gila River. The area north of the river is primarily in active agricultural production. The topography south of the river ranges from low flatland directly adjacent to the south bank of the Gila River to hilly terrain created by the foothills of the Estrella Mountains and several desert washes that dominate the southern portion of the area. A large portion of the land in the General Urban category is in a FEMA designated floodplain.

### Character Areas

The General Urban category begins 1/4-mile away from the floodway and portions of all character areas, with the exception of the floodway itself, (High Value Habitat) fall in the General Urban category.

## Urban Center



### Area Location

The Urban Center area describes those areas that are 1/2-mile or greater from the Gila River floodway and removed from the floodplain.

### Allowed Land Uses

The Urban Center area is intended for the highest density and intensity of uses in the corridor. Development will provide a diversity of uses at a variety of scales with the intent of providing a vibrant urban mixed use environment or "lifestyle centers" to serve the larger region. Development will integrate a range of residential densities and housing types with a diverse architectural palette. Development will also include a full range of intensity of uses for commercial, office and employment. As part of zoning approvals, development within this concept area will also provide a consistent set of standards to guide the physical development and the visual quality of the proposed development.

### Area Description

The Urban Center category includes all properties 1/2-mile or further from the river floodway. The topography north of the river is generally flat with a gentle slope toward the Gila River to the south. The area is primarily in active agricultural production and associated uses, with

virtually all natural desert vegetation and washes removed. The topography south of the river ranges from low flatland directly adjacent to the south bank of the Gila River to hilly terrain created by the foothills of the Estrella Mountains along with several desert washes that dominate the southern portion of the area. Portions of the Urban Center category are currently in a FEMA designated floodplain.

### Character Areas

The Urban Center category begins 1/2-mile away from the floodway and portions of all character areas, with the exception of the floodway itself, (High Value Habitat) fall in the Urban Center category.

# Open Spaces, Paths, Trails and Edge Treatments

*The El Rio project corridor that is adjacent to, and part of, the Gila River, has the rare opportunity of showcasing several unique ecosystems of the Sonoran Desert riverine system while offering the public an opportunity to experience and educate themselves about this vitally important ecosystem. The El Rio project corridor associated with the Gila River includes a beautiful, diverse natural environment. There are natural and man-made challenges to be addressed, but this project offers the opportunity to showcase to the public, through a series of interconnected trails, overlooks and trailheads, the riparian habitats that were historically associated with the Gila River ecosystem.*

## EL RIO



Avondale





## 4.1 Natural and Active Open Space

The passage of time has brought many changes to the Gila River and to all rivers in the southwest. It is very different from the free-flowing rivers that traditionally provided the basis of life in the desert southwest. The growth and development of Avondale, Buckeye and Goodyear, and the unincorporated areas of Maricopa County, have also brought changes to the river. The river still serves the needs of the people, but the environment that defined the river has been destroyed or eliminated over the past 100 years. The most profound changes have been the placement of upstream dams to divert water for crop irrigation, control of cyclical flooding, and creation of a power source for the local inhabitants. These changes have severely limited the hydrology and the related natural wildlife community.

The current nature of the river has created a geographic and visual division and the El Rio project will start the process of repairing this division. This will be accomplished through a variety of means, including the preservation of natural open space that displays the characteristics and habitats common to a Sonoran Desert river system while maintaining flow conveyance. The potential to recreate natural ecosystems within the active river and along its banks is great. This can be accomplished through the selective and ongoing removal of invasive species and replacement, where appropriate, with cobble strands, saltbush flats, native mesquite, cottonwood and willow habitats. Surrounding development can then easily transition from this environment. There also exist great opportunities to identify active open space linkages and river access points that foster and create an interconnected series of nodes for public interaction and interface

with this unique and beneficial river environment and ecosystem. These and other aspects defined within this project, along with previous studies, will be the threads that help to initiate the process of repairing this vitally important ecosystem.

The natural river environment represented in the Gila River is a system that includes a succession of types of materials, from the more xeric Sonoran palo verde and mesquite bosque habitats, to wetland, as the transitional areas between terrestrial lands and the river aquatic systems. Wetlands support plant species adapted to wet conditions, and wetlands soils develop particular characteristics caused by floodings or saturations. Wetlands may also be supported by high groundwater levels rather than bordering on a water body which is common in the El Rio corridor. Common wetland types include marshes, swamps, bogs and wet meadows. Wetlands offer opportunities to explore nature, provide habitat for animals, improve water quality, and reduce flooding and erosion. The corridor is punctuated by sand and gravel operations that have left open bodies of water as a part of their excavation operations that, when left undisturbed, slowly show signs of reverting into wetland based habitats based on vegetative cover. This provides an excellent opportunity for partnering with active sand and gravel operations in the development of portions of the river as demonstration wetlands for educational purposes and habitat restoration.

The protection, where viable, and reintroduction, where feasible, of these distinct and unique Sonoran Desert ecosystems should all be interwoven into the El Rio project.

The development of the El Rio Trail system, with its series of proposed trailheads, overlooks, and linkages to other public and potential private facilities located along the corridor, will initiate this transformation.

A primary objective will be the promotion of passive recreation within and along this river environment through trails and educational areas (overlooks, trailheads,

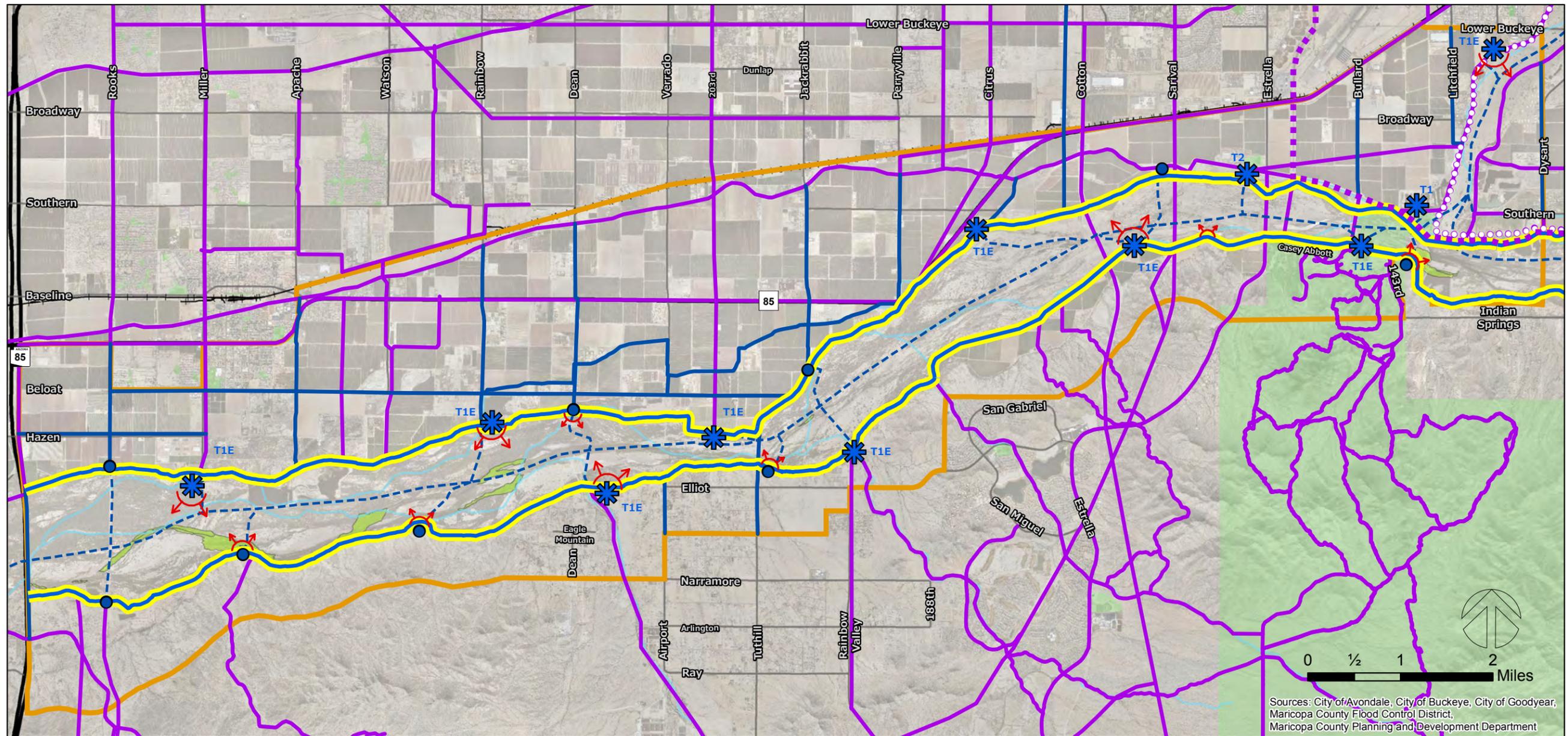
pilot projects) strategically located to avoid identified high quality and sensitive habitats. These facilities are programmed to be developed in sync with the surrounding communities' overall trail and river access plans and recreation plans.



## 4.2 Path, Trail, and Trailhead Design

Identifying opportunities for recreational uses along the Gila River and the El Rio corridor is one of the key objectives of the El Rio project. While other uses, including land use, zoning, and economic development are vitally important, it was envisioned that recreational uses, such as development of the El Rio Trail that links to existing and proposed parks and trails, would provide a valuable amenity to the residents of the West Valley. The trails and shared use pathways would connect communities to the river, and provide unique opportunities to showcase the corridor's cultural history and diversity of habitats. The El Rio Path and Trail System includes paths and trails that provide both regional (Maricopa Trail

and Sun Circle Trail) and local connections. Having a comprehensive network of paved paths and unpaved trails within the El Rio corridor accommodates the broadest section of users. The El Rio network of connected trails and pathways will help to encourage public use through ease of access, convenience and safety. To maximize access, all facilities are planned as non-motorized, shared-use/multi-use. Having both shared-use/multi-use paved paths and unpaved trails enables users to select the facility most appropriate to their abilities and desires. For instance, commuter bicyclists prefer paved surfaces, while equestrians and many joggers prefer unpaved surfaces.



Sources: City of Avondale, City of Buckeye, City of Goodyear, Maricopa County Flood Control District, Maricopa County Planning and Development Department

Avondale  
BUCKEYE, AZ  
CITY OF GOODYEAR  
MARICOPA COUNTY  
Date: 8/10/2015  
Matrix DESIGN GROUP

**Legend**

- El Rio Vista Overlook
- El Rio Trail Head (T1, T1E, T2)
- El Rio River Access
- Recommended El Rio Trail
- Recommended El Rio River Trail
- Recommended Municipal Path or Trail
- Existing or Planned Municipal Path or Trail
- Maricopa Trail
- Sun Circle Trail
- Project Boundary
- Rivers and Major Streams
- High Value Habitat
- Parks
- Railroad
- Arterial Streets
- Interstate Highway
- State Highway
- County Highway
- Interchange
- Ramp

Exhibit 4-1

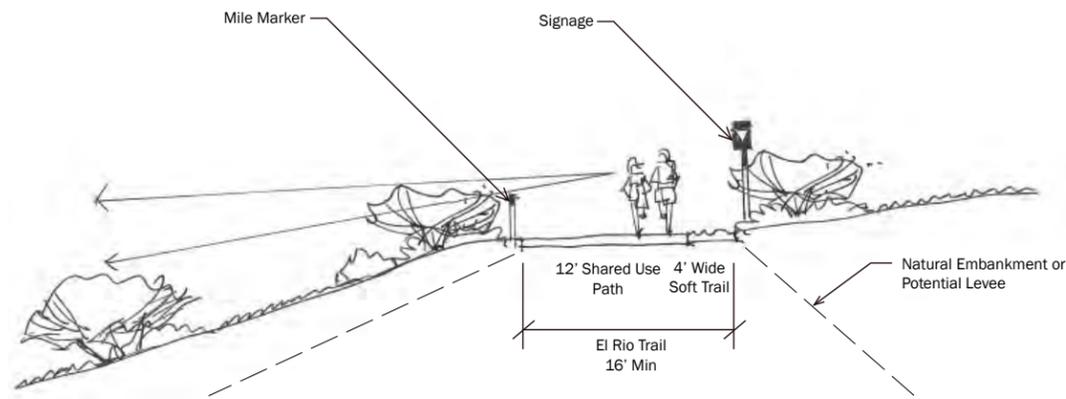
El Rio Watercourse Planning Standards - Trails, Trailheads and Overlooks Map



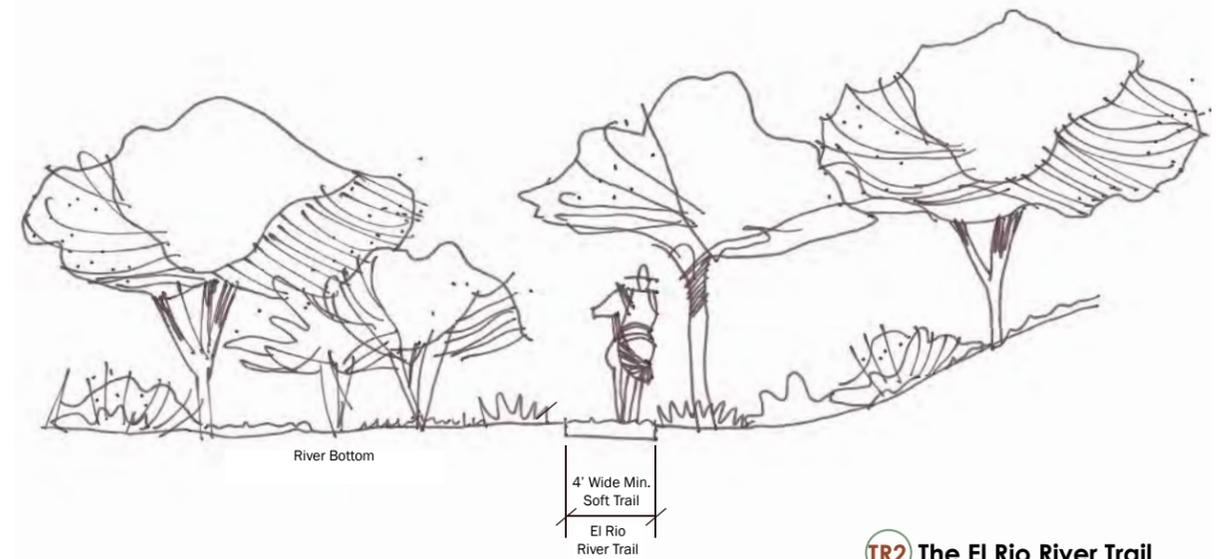
## Trail Goals

There are a number of existing and planned recreational facilities that are in close proximity to the El Rio project corridor and the Gila River. These facilities range from community parks and golf courses to trails and equestrian areas. Several additional recreational amenities are included in the El Rio plan. Some of the goals for this plan are to:

1. Complement the flood control and other functions with multiple-use recreational features
2. Connect open space and recreational resources in and around the river
3. Create opportunities for activity while minimizing impacts to the corridor's unique landscape and habitat
4. Provide access to the river for residents, hikers, bikers, and equestrians
5. Identify ways that the El Rio recreational trail system could be used as a symbolic bridge to the surrounding communities celebrating the history and the future that this corridor and project area can bring to the Cities of Avondale, Buckeye, Goodyear and the unincorporated areas of Maricopa County.
6. Create landscape treatments that reinforce the diverse native river habitats which then transition to private development. Compliance with US Army Corps of Engineers levee landscape treatments must be considered where applicable. Landscape planting and vegetation management must provide aesthetic and environmental benefits without compromising the reliability of levees, floodwalls, embankment dams and any appurtenant structures.
7. Aggressively implement river access and trail development through linkages that support the recreation plans of the surrounding communities of Avondale, Buckeye Goodyear and the unincorporated areas of Maricopa County adjacent to the project area.
8. Include "Edge" treatments as guidelines for private development linkages that will contribute to the overall strength and connectivity of the corridor.
9. Trail routing that avoids high quality and sensitive habitats as identified by federal, state and local agencies.



TR1 The El Rio Trail



TR2 The El Rio River Trail

## The El Rio Trail

The El Rio Trail provides many opportunities to showcase the river and adjacent landscape, allows for multiple recreational activities, and at the same time integrates these with valuable flood control management strategies. Recommendations for the recreational elements of the El Rio project include:

### El Rio Trail

El Rio Trail (see illustration TR1) is programmed to be a continuous paved shared use path that maintains a 12'-0" width. The paved path would be an improved surface for bicyclists, walkers, joggers, and skaters. Immediately

adjacent to the primary El Rio Trail is a 4'-0" wide soft surface trail that could be used by equestrians, hikers or mountain bikers. The El Rio Trail is programmed to link into the surrounding jurisdictional trail networks of the Cities of Avondale, Buckeye, Goodyear and the unincorporated areas of Maricopa County.

### El Rio River Trail

El Rio River Trail (see illustration TR2) would be in the actual river channel, programmed to be a natural earthen path with a minimum 4'-0" width and primarily for use by equestrians, mountain bikers, hikers and naturalists.

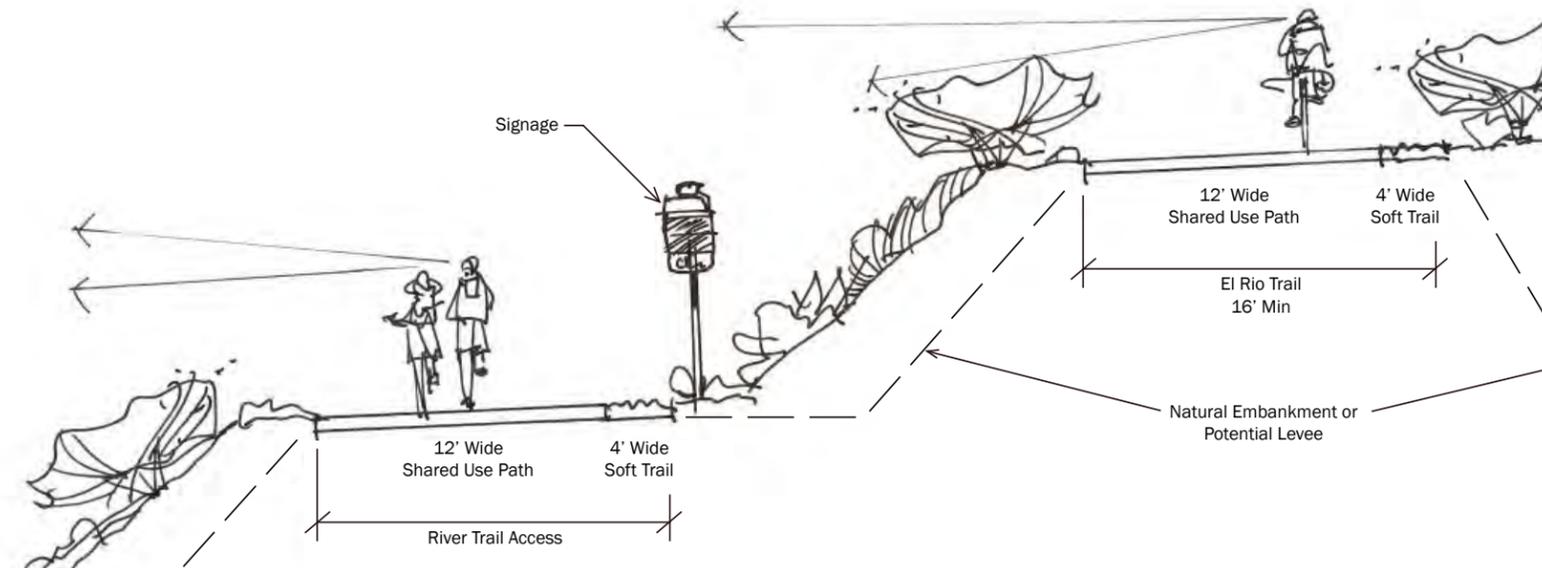
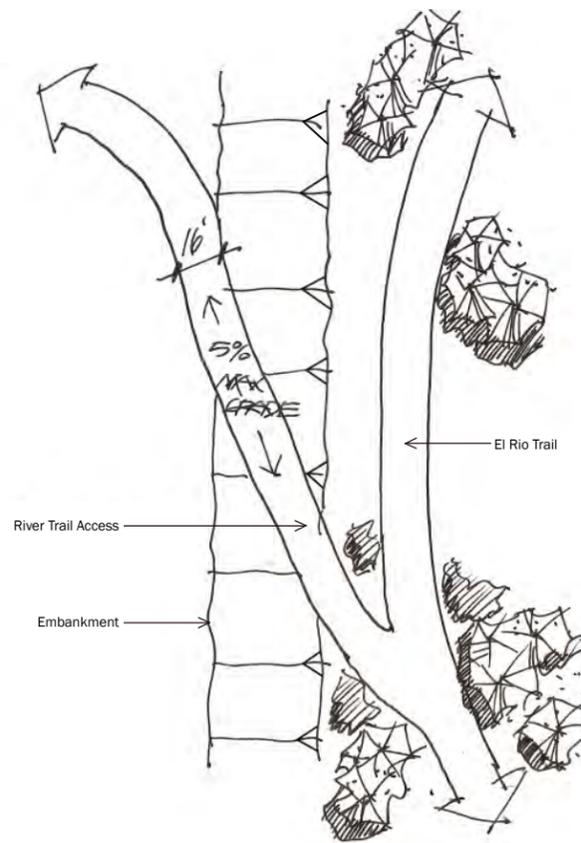
### River Access and Trailheads

River access and trailhead nodes are proposed at several locations along the river corridor to link the local jurisdictions' planned trails and pathways and to serve as access points to the river.

1. River access nodes are a series of access points from the upper bank El Rio Trail down to the river bed level El Rio Trail. These access nodes also serve as maintenance and emergency vehicle access for river operations (see Table 4-1).
2. Public trailhead designs shall provide, at a minimum, automobile and non-vehicular access to shared use biking and hiking paths and access to the river corridor. If designated, the trailhead may need to accommodate equine use including equestrian trailer access and parking (see Table 4-1).

Table 4-1 El Rio Trailhead and Access Points		
Trailhead (T1)	Approximately 10 Acres	60-100 parking spaces, benches, drinking water, lighting, shade structure, picnic ramada, bike racks, trash receptacles and wayfinding signage
Trailhead with Equestrian Amenities (TIE)	Approximately 15 Or More Acres	150-200 Standard parking spaces plus 10-15 equestrian spaces on natural surface material in addition to benches, drinking water, restroom, lighting, shade structure, picnic ramadas, bike racks, wayfinding and interpretive signage, ADA mounting ramp or platform, manure disposal area, one round pen, one wash rack and hitching rails.
Trailhead (T2)	Approximately 5 Acres	10-30 parking spaces, benches, drinking water, restroom, lighting, shade structure, picnic ramada, bike racks, trash receptacles and wayfinding signage
El Rio River Access Node	Approximately 1 Acre	Benches, drinking water, lighting, shade structure, bike racks and wayfinding signage
El Rio Overlook	Approximately 1-2 Acres	No parking. These are meant for foot or bicycle traffic access (unless associated with one of the trailhead locations), but should include benches, shade structure, and interpretive signage

### Open Spaces, Paths, Trails and Edge Treatments



TR3 PLAN - Trail at Embankment / River Trail Access Ramp

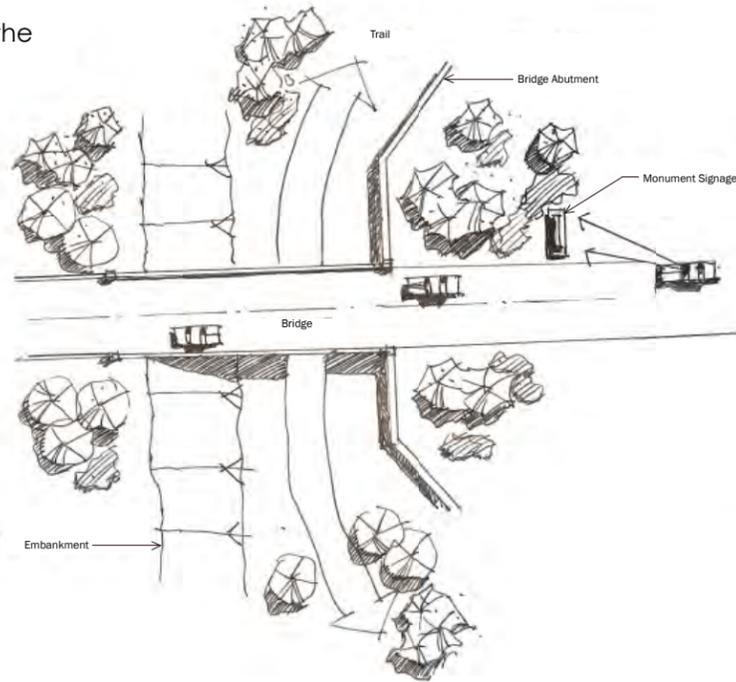
SECTION - Trail at Embankment / River Trail Access Ramp



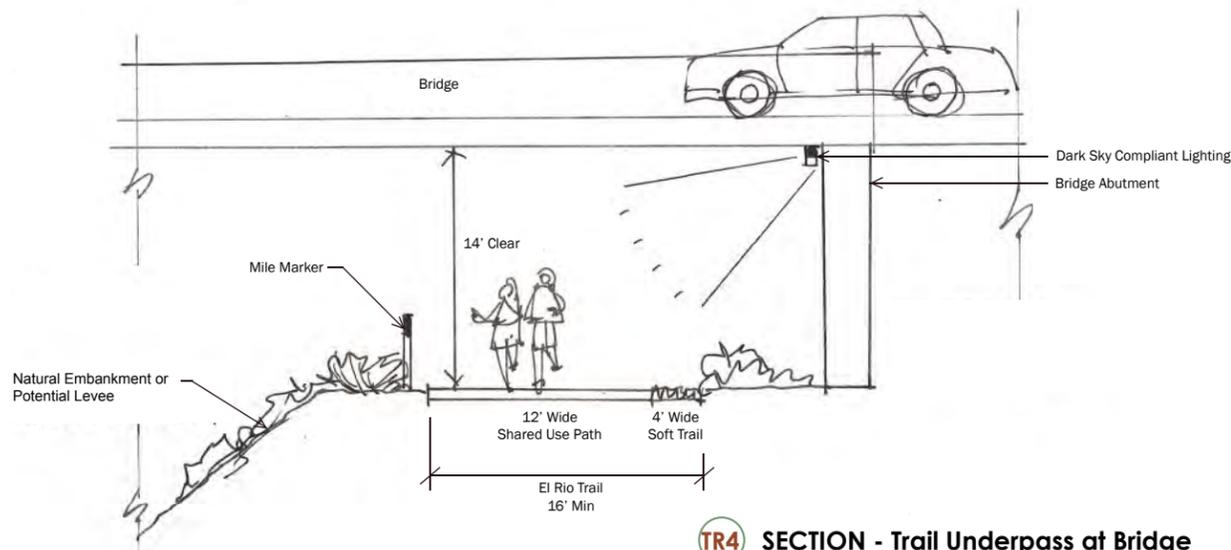
## Network Underpasses

The interconnectivity of the El Rio Trail system will be one of its primary goals. This interconnectivity includes linkages to the surrounding communities' bike and trail systems as well as ensuring that the El Rio Trail is accommodated unimpeded under any bridge structures that may intersect the Gila River and the El Rio Trail.

The goal will be to Implement links to the network of multi-use trails and street network. This includes bike lanes and shared use pathways located along or intersecting the corridor, and those identified by the local jurisdictions. In addition, where any street crosses or intersects the El Rio corridor, the El Rio Trail should be accommodated in an underpass treatment to separate trail users from street traffic (see Illustration TR4). These underpasses should be lighted for safety and security measures. Any lighting should be designed to be the most energy efficient and in compliance with any dark sky ordinance guidelines (see Illustration TR4).



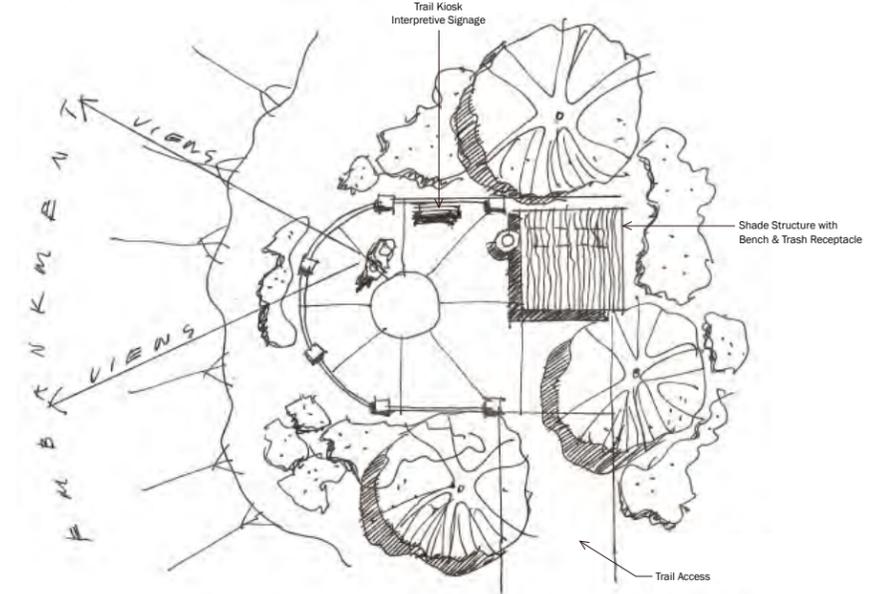
**TR4 PLAN - Trail Underpass at Bridge**



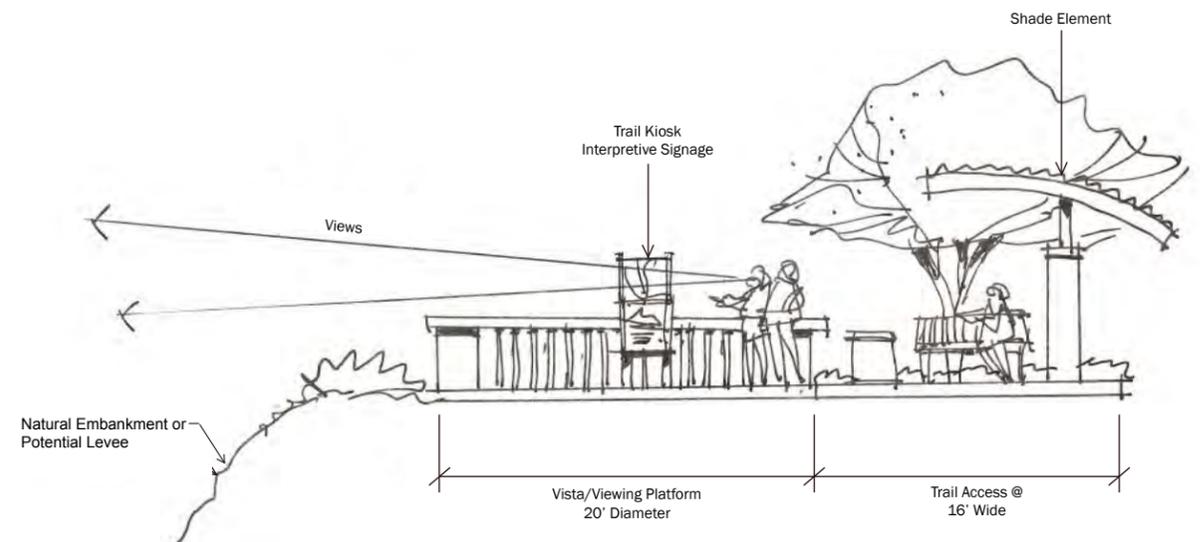
**TR4 SECTION - Trail Underpass at Bridge**

## Overlooks

Recreational facilities shall serve as anchor points to link trails, and then serve a dual purpose as a park or an interpretive site with overlooks. Wonderful opportunities exist to link to Estrella Mountain Regional Park, Festival Fields Park, Tres Rios, and other planned and existing regional and local recreational areas and create hubs for the El Rio Trail (see Illustration TR5).



**TR5 PLAN - Vista Overlook**



**TR5 SECTION - Vista Overlook**

## 4.3 Edge Treatment Design Considerations



The El Rio Design Guidelines and Planning Standards embraces an existing, connected series of open spaces based on the watercourses of the Gila River, its tributaries and canals. The land and watercourse interactions provide the opportunities for both the “land side” and “water course” to capitalize upon the inherent assets of each, while meeting the vision and goals of El Rio. This interactive relationship is defined by the phrase, the “Edge”. By defining and instituting the development standards these El Rio Design Guidelines and Planning Standards, both the quality of life and long term economic viability of the area will be enhanced. The implementation of the El Rio goals and vision establishes a positive and mutually beneficial relationship in the district and along this “Edge”.

### The El Rio Vision:

*Restore the river, retain heritage landscape*

*character, focusing on multiple use linked to the surrounding communities through public – private partnerships while enhancing public safety with flood control measures.*

### Goals:

1. Restore and maintain the natural function within the river corridor as riparian habitat
2. Focus on multi-use facilities and functions
3. Maintain and enhance flood control elements or mitigate any undesirable aspects
4. Focus on public – private partnerships
5. Link functional compatibility outside the habitat limits

The “Edge” treatment as part of these El Rio Design Guidelines and Planning Standards, sets forth guidelines for minimum

standards of percentage of open edge treatments, setbacks, public pedestrian/ bicycle/equestrian access, open views and adjacent uses. The following terms and definitions, tables and illustrations, establish performance guidelines, within the El Rio Design Guidelines and Planning Standards within and part of the Cities of Avondale, Buckeye and Goodyear, along with the unincorporated portions of Maricopa County identified earlier in this report. These standards are supplemental to the existing municipalities’ General Plans, Zoning Codes and Development Policies.

### The “Edge”

The “Edge” is the development boundary condition of the open spaces along the El Rio watercourse that is defined by the floodway edge of the project and its natural embankment or, if applicable, any levee, or created and permitted flood containment structure that creates potential public “Edges” within the defined project corridor. The length of the “Edge”, for a parcel, is the length of the shared

boundary between private property and the floodway edge as shown in Exhibit 4-2 on the following page. All property adjacent to the “Edge” should be subject to “Edge” treatment guidelines explained herein.

### “Edge” Treatment Guidelines

The performance guidelines define both the quantity and quality of the “Edge”.

### Open Edge Treatment

Where development occurs along the “Edge” there is a 60/40 ratio guideline, of 60% minimum functionally open to 40% non- open. To meet the 60% open “Edge” performance guidelines ,various treatments may be utilized per this document. Within the 60% open “Edge” there is a subset performance guideline with a 30/70 min/ max treatment performance ratio which defines the type of edge treatments that can be utilized (See Table 4-2).

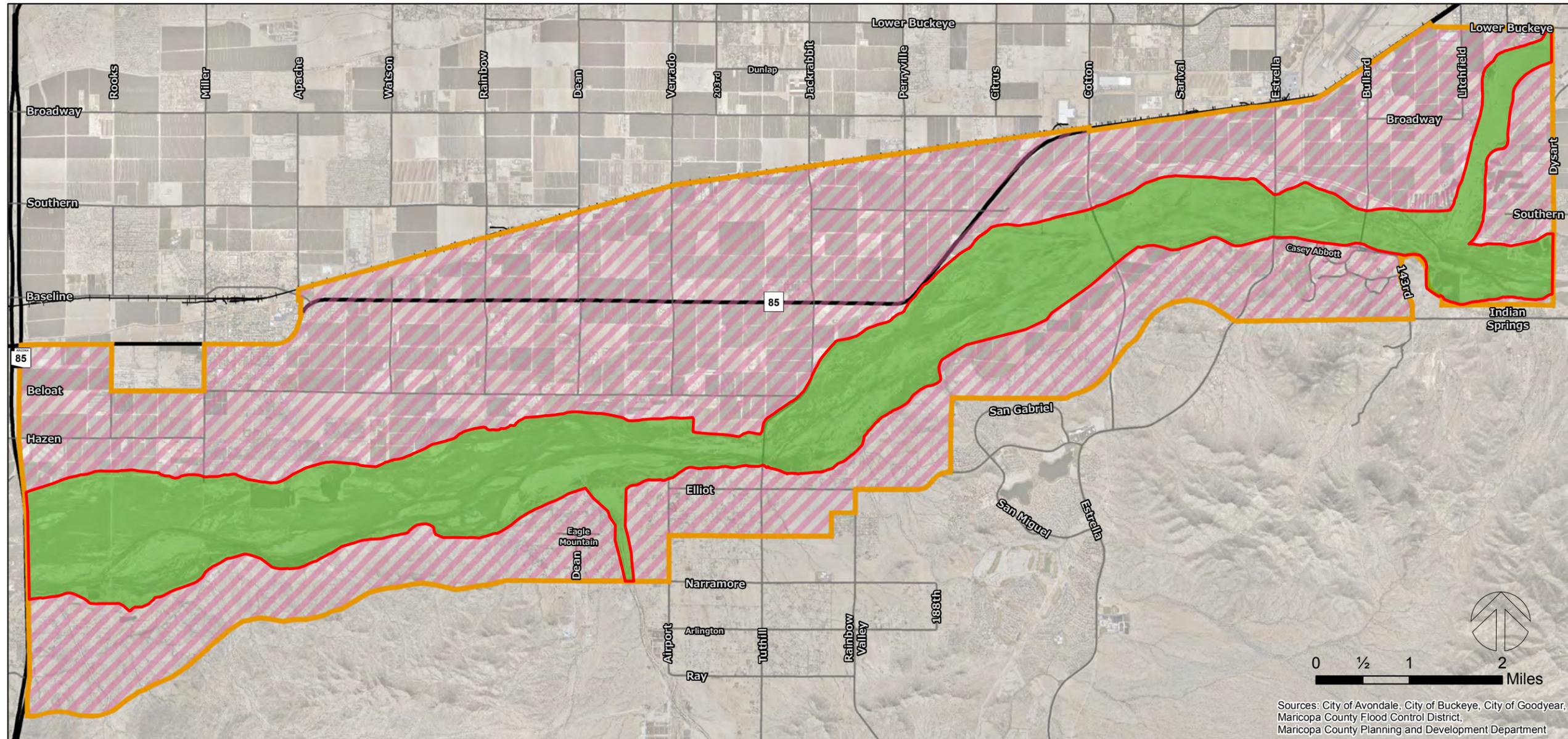
**Table 4-2:**  
Open Edge Treatment Performance Guidelines to Achieve 60% Functionally Open Edge

Minimum 30% (at the open edge)
Single loaded public street or single loaded private street with public access easement (non-gated)
Public park
Paseo
Municipal facilities such as fire and police stations, community center, or library are recommended to “front” onto the river with storage and parking placed away from the river edge.
Private undisturbed open space
Private improved open space

Maximum 70% (at the open edge)
Public school
Shared parking as approved by the City
Public street T-intersection
Public street cul-de-sac
Retention or detention basin graded to blend
Creative option
Single loaded gated private street
Gated private street cul-de-sac
Gated private street T-intersection
Parkway

## Open Spaces, Paths, Trails and Edge Treatments





Sources: City of Avondale, City of Buckeye, City of Goodyear, Maricopa County Flood Control District, Maricopa County Planning and Development Department



Date: 8/17/2015



- Legend**
- The "Edge"
  - El Rio Watercourse and Tributaries
  - Adjacent Development
  - Project Boundary
  - Railroad
  - Arterial Streets
  - Interstate Highway
  - State Highway
  - County Highway
  - Interchange
  - Ramp

Exhibit 4-2

## El Rio Watercourse Planning Standards - "Edge" Treatment Areas Map

## Minimum Edge Treatments

### Non-Open Edge Treatment

A maximum of 40% of the "Edge" can be private development and is not subject to open edge treatment.

Minimum edge treatments include all areas at the "Edge" including the 40% non-open edge.

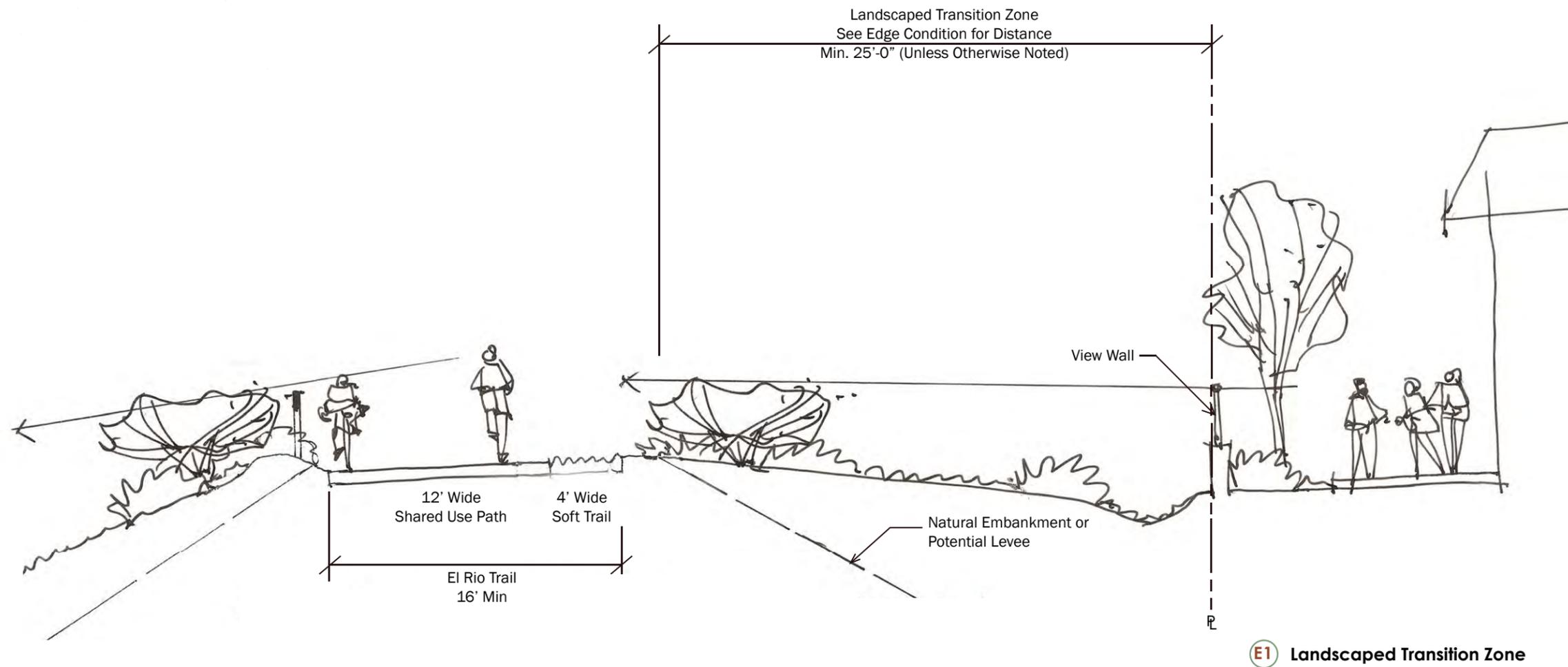
### Landscaped Transition Zone

The building, landscape and/or levee setback zone which provides aesthetically pleasing landscaped areas will help to soften the adjacent development and transition the El Rio open space native landscape to the adjacent development landscape (see Illustration E1).

The recommendation of these guidelines

is the creation of a landscaped transition zone that is a minimum of 25'-0" in width from the El Rio Trail "Edge" to any proposed development with the exception to this width allowed at areas with less than one foot of grade differential or at a patio edge. This area allows the municipality to work hand in hand with the surrounding development to create an agreement on the landscape treatment and maintenance of this area. The 25'-0"

landscaped transition zone allows for a grade transition from development landscape to the more native and desert ecosystem planting design that is to be associated with the El Rio Trail system.



## Open Spaces, Paths, Trails and Edge Treatments



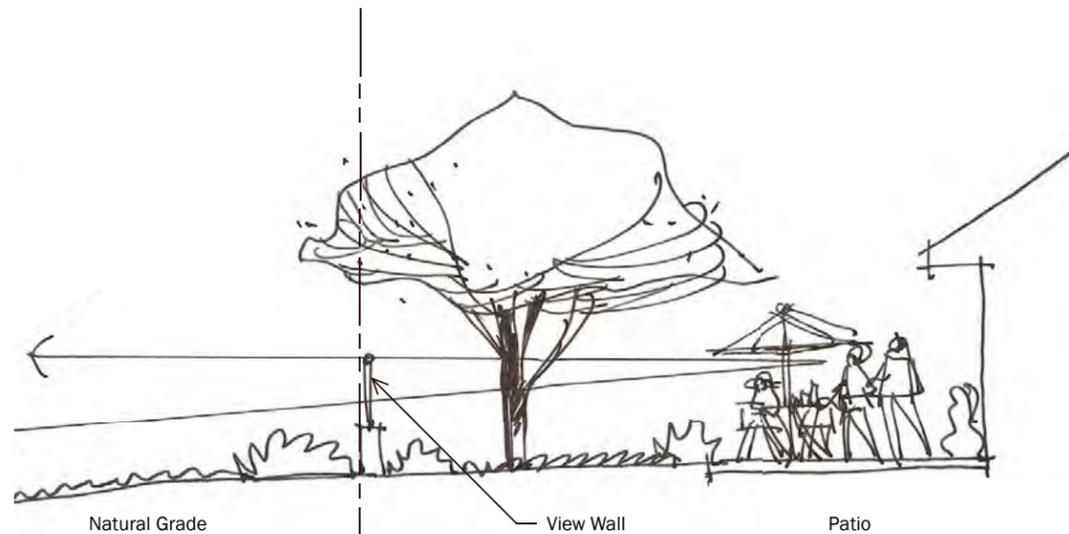


## View Walls

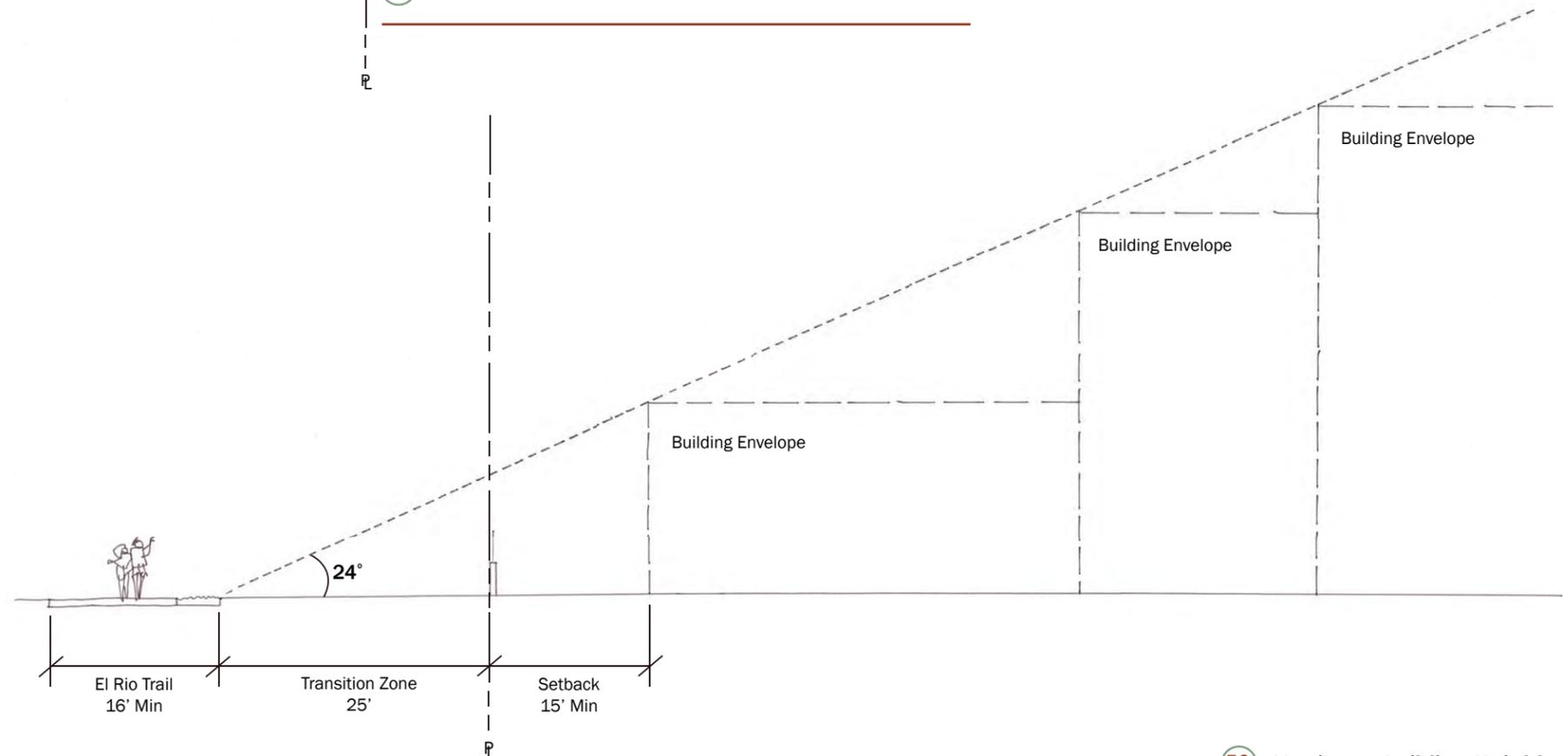
Open fencing at residential and commercial uses will create a spacious feeling, encourage surveillance, and discourage graffiti and vandalism to the wall and adjacent property. Such structures should be view type fences with a minimum 2'-0" CMU base and a 2'-0" picket style open view fence on top. Recommended minimums; Residential Low: 2'/2', Residential High: 3'/3', Commercial: 2'/2', Parking: 2'/2'. Solid walls are not allowed, for though they visually screen loading and storage areas, the creation of such areas is to be avoided in development adjacent to the El Rio corridor. Adjacent development should not place these incompatible uses adjacent to the "Edge" (see Illustration E2). The style and architectural feel of any view wall should be in accordance with local jurisdictional guidelines. View wall locations will be dependent upon the transition zones, but should never be closer than twenty-five feet (25'-0") from the edge of the El Rio Trail, with the exception to this width allowed at areas with less than one foot of grade differential or at a patio edge.

## Maximum Building Height

The maximum allowed building height adjacent to the "Edge" shall be at the discretion of the jurisdiction, however the recommended heights should be as shown in Illustration E3.



**E2 View Walls**



**E3 Maximum Building Height**

### Open Edge Treatment Options

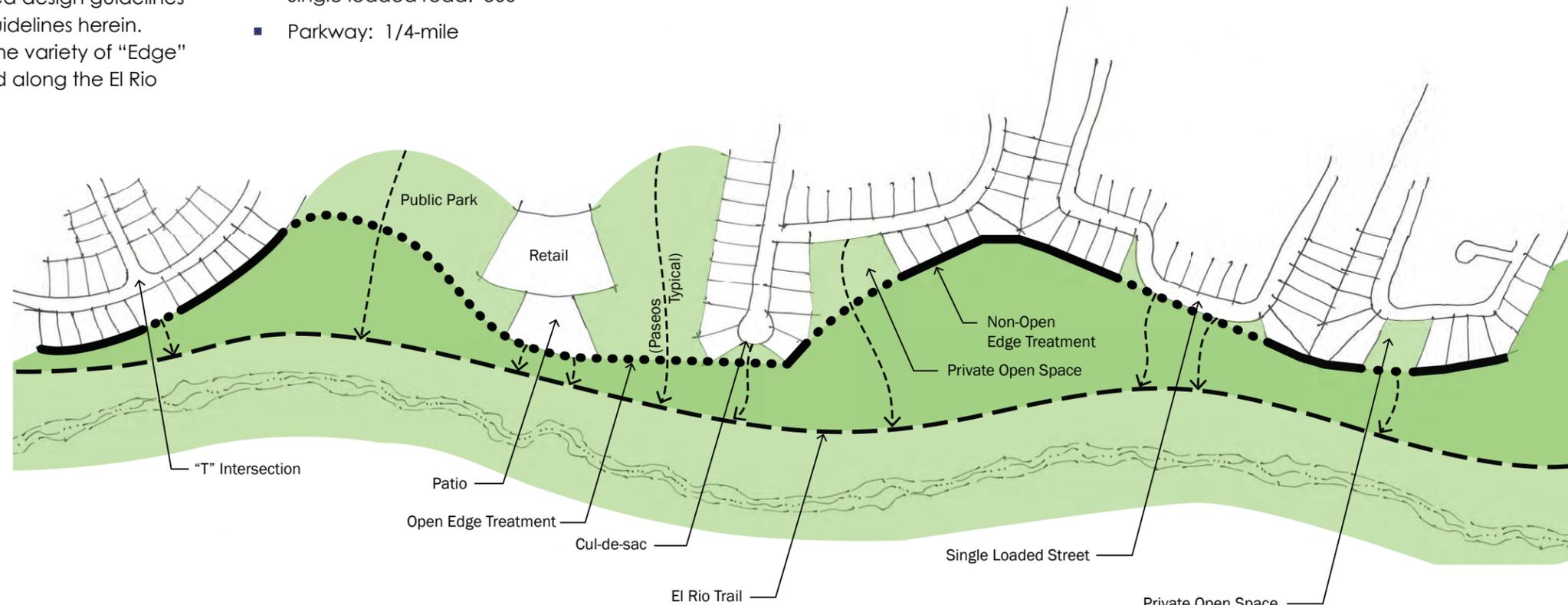
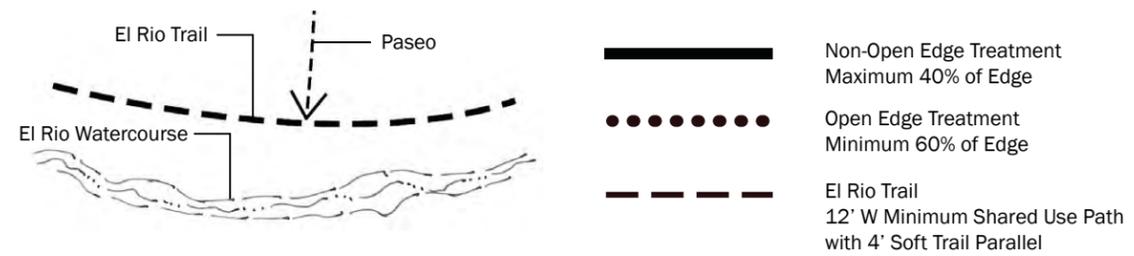
The following treatments, uses and streets are acceptable and part of the 60% guideline for open edge treatments. Approved open edge treatments which are open spaces such as public/private open space, parks, patios, retention, etc., should count both as open edge treatment and as part of a development's recommended open space, per the zoning district, where the open edge treatment is on private land within a public easement. Where an open edge treatment is constructed by a developer on adjacent public land, it should count as open edge treatment only. Each municipality may consider more restricted design guidelines but no less than the guidelines herein. Illustration E4 depicts the variety of "Edge" treatments anticipated along the El Rio

corridor.

### Paseo

A paseo is a public access way (shared use path or sidewalk) which shall be placed along or perpendicular to the El Rio open space to provide connectivity and public access between the open space and adjacent development. The maximum distance between paseos connecting back into the adjacent development is:

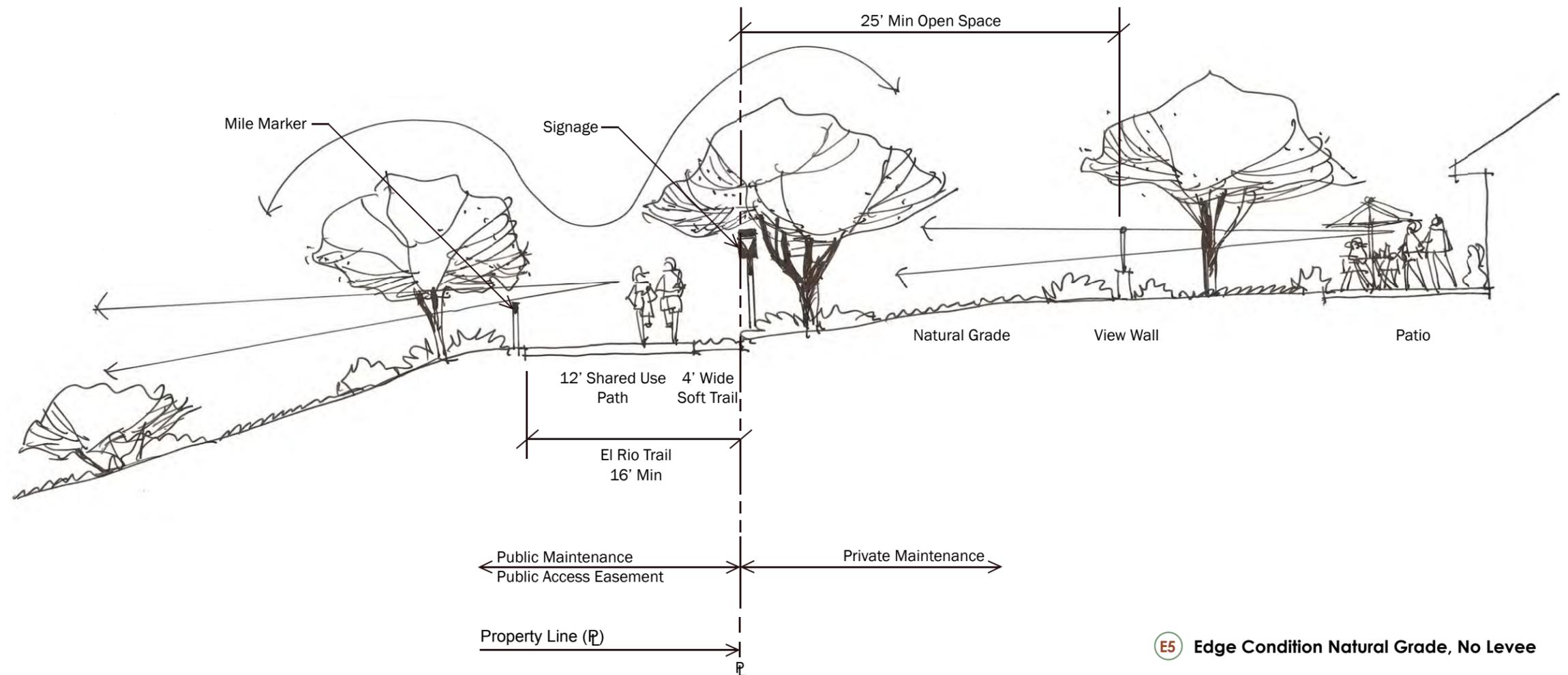
- Adjacent developed use: 500'
- Shared Parking: 300'
- Public School: 1/4-mile maximum, but must have one connection to river
- Single loaded road: 500'
- Parkway: 1/4-mile



**E4** Open Edge Treatment

## Open Spaces, Paths, Trails and Edge Treatments





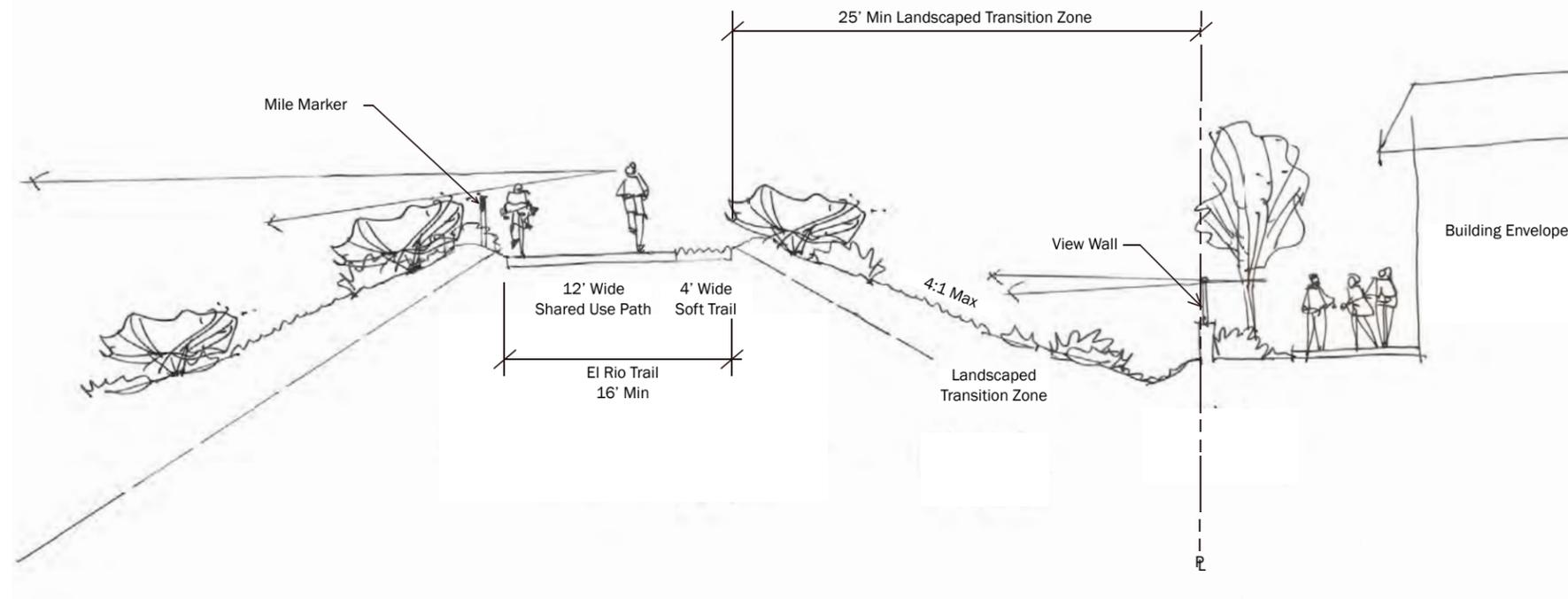
**E5** Edge Condition Natural Grade, No Levee

### Edge Condition Natural Grade

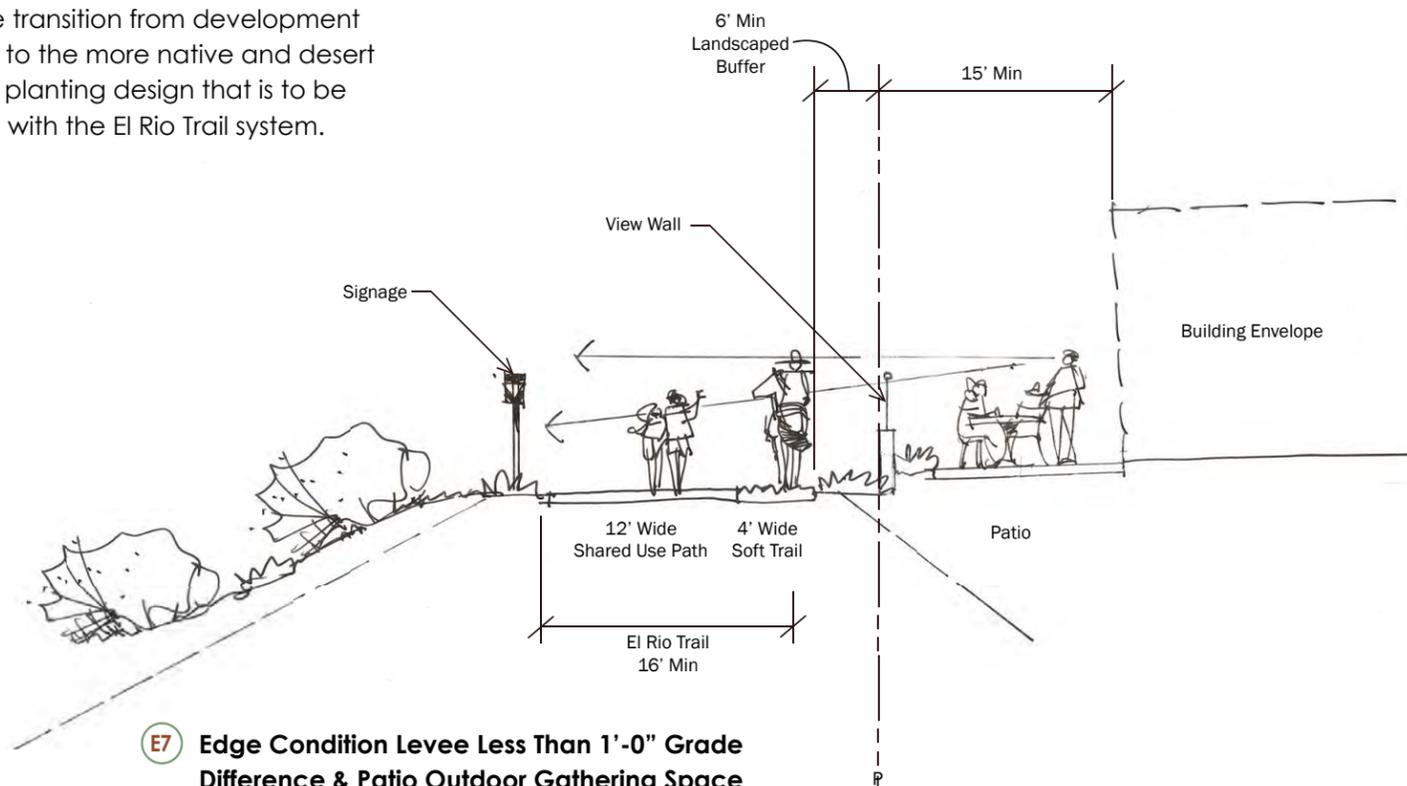
In instances where the "Edge" occurs adjacent to any natural grade of the river's defined edge or embankment (non structural edge/floodway) the El Rio Trail is programmed to be along this edge as shown in Illustration E5. This location may allow the El Rio Trail to be inundated during high flows if the natural edge of the river is not sufficient to contain the flows and/or event. The recommendation of these guidelines is that there should be a 25'-0" minimum landscaped transition zone from the El Rio Trail edge to any proposed development. This area allows the municipality to work hand in hand with the surrounding development to create an agreement on the landscape treatment and maintenance of this area. The 25'-0" landscaped transition zone allows for a transition from development landscape to the more native and desert ecosystem planting design that is to be associated with the El Rio Trail system.

### Edge Condition Levee with Greater Than 1'-0" Grade Difference

In instances where the "Edge" occurs adjacent to a structural levee, the El Rio Trail is programmed to be along this "Edge" as shown in Illustration E6. This treatment applies only when the grade differential between the El Rio Trail elevation is greater (higher) than the surrounding development by more than one foot (1'-0"). The recommendation of these guidelines is that there should be a 25'-0" minimum landscaped transition zone from the El Rio Trail edge to any proposed development. This area allows the municipality to work hand in hand with the surrounding development to create an agreement on the landscape treatment and maintenance of this area. The 25'-0" minimum landscaped transition zone allows for a grade transition from development landscape to the more native and desert ecosystem planting design that is to be associated with the El Rio Trail system.



**E6 Edge Condition Levee Greater Than 1'-0" Grade Difference**



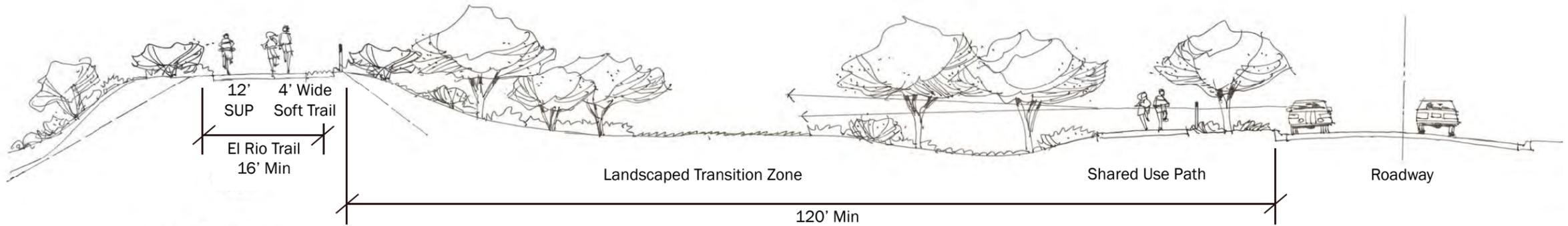
**E7 Edge Condition Levee Less Than 1'-0" Grade Difference & Patio Outdoor Gathering Space**

### Edge Condition Levee with Less Than 1'-0" Grade Difference

In instances where the "Edge" occurs adjacent to a structural levee, the El Rio Trail is programmed to be along this edge as shown in Illustration E7. This treatment applies only when the grade differential between the El Rio Trail elevation is within 1'-0" of the surrounding development. The recommendation of these guidelines is that there should be a minimum of 6'-0" landscape buffer zone from the El Rio Trail edge to any proposed development. This area allows the municipality to work hand in hand with the surrounding development to create an agreement on the landscape treatment and maintenance of this area. The 6'-0" landscape zone allows for a grade transition from development landscape to the more native and desert ecosystem planting design that is to be associated with the El Rio Trail system.

Open Spaces,  
Paths, Trails  
and Edge  
Treatments





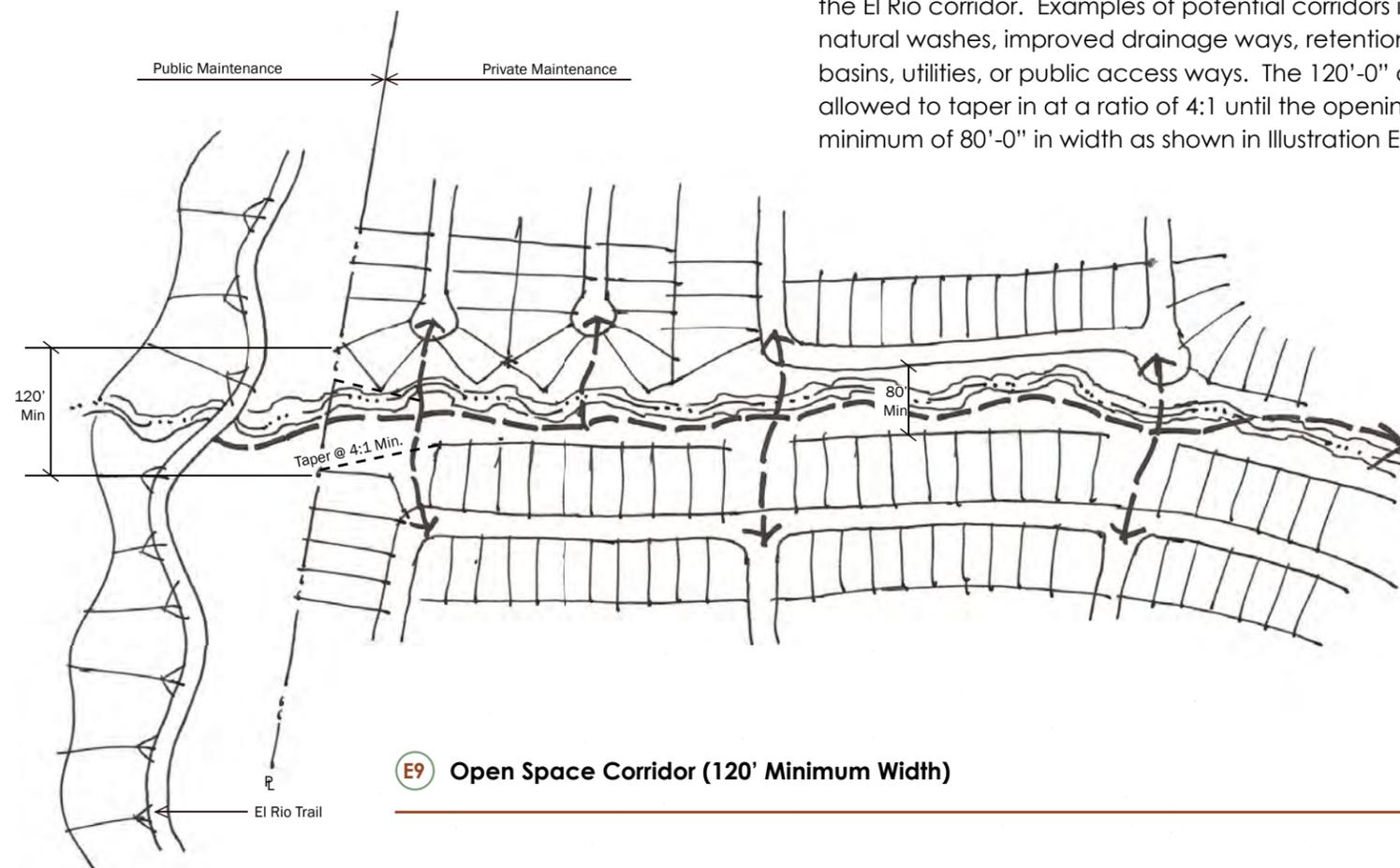
**E8** Edge Condition Along a Parkway

## Edge Condition Along a Parkway

In instances where the “Edge” occurs adjacent or parallel to a roadway corridor with a shared use path corridor the El Rio Trail is programmed to be along this edge as shown in Illustration E8. This treatment applies only when the El Rio Trail is parallel to or adjacent to a roadway corridor. The recommendation of these guidelines is that there should be a minimum of 120’-0” landscape setback from the El Rio Trail edge to any proposed back of curb location. This area allows the municipality to work hand in hand with the surrounding development to create an agreement on the landscape treatment and maintenance of this area. The 120’-0” landscape zone allows for a wide variety of landscape treatments including the incorporation of several Low Impact Development (LID) techniques and to serve as the transition from streetscape to the more native and desert ecosystem planting design that is to be associated with the El Rio Trail system.

## Open Space Corridor

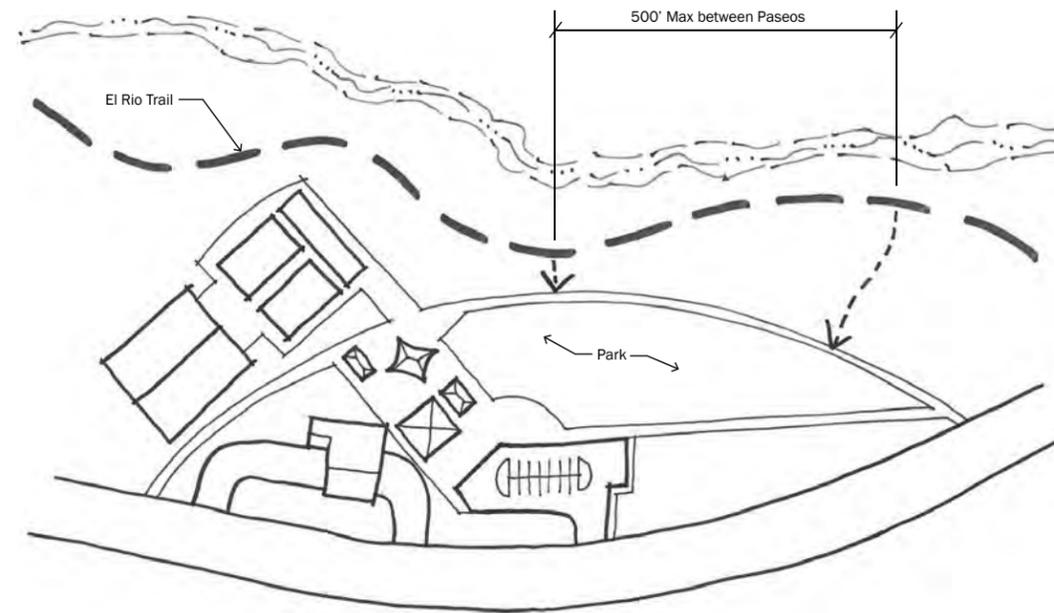
A public access way connection should be a minimum of 120’ wide at the El Rio corridor. Examples of potential corridors include open space, natural washes, improved drainage ways, retention or detention basins, utilities, or public access ways. The 120’-0” opening will be allowed to taper in at a ratio of 4:1 until the opening area maintains a minimum of 80’-0” in width as shown in Illustration E14.



**E9** Open Space Corridor (120' Minimum Width)

**Public Park**

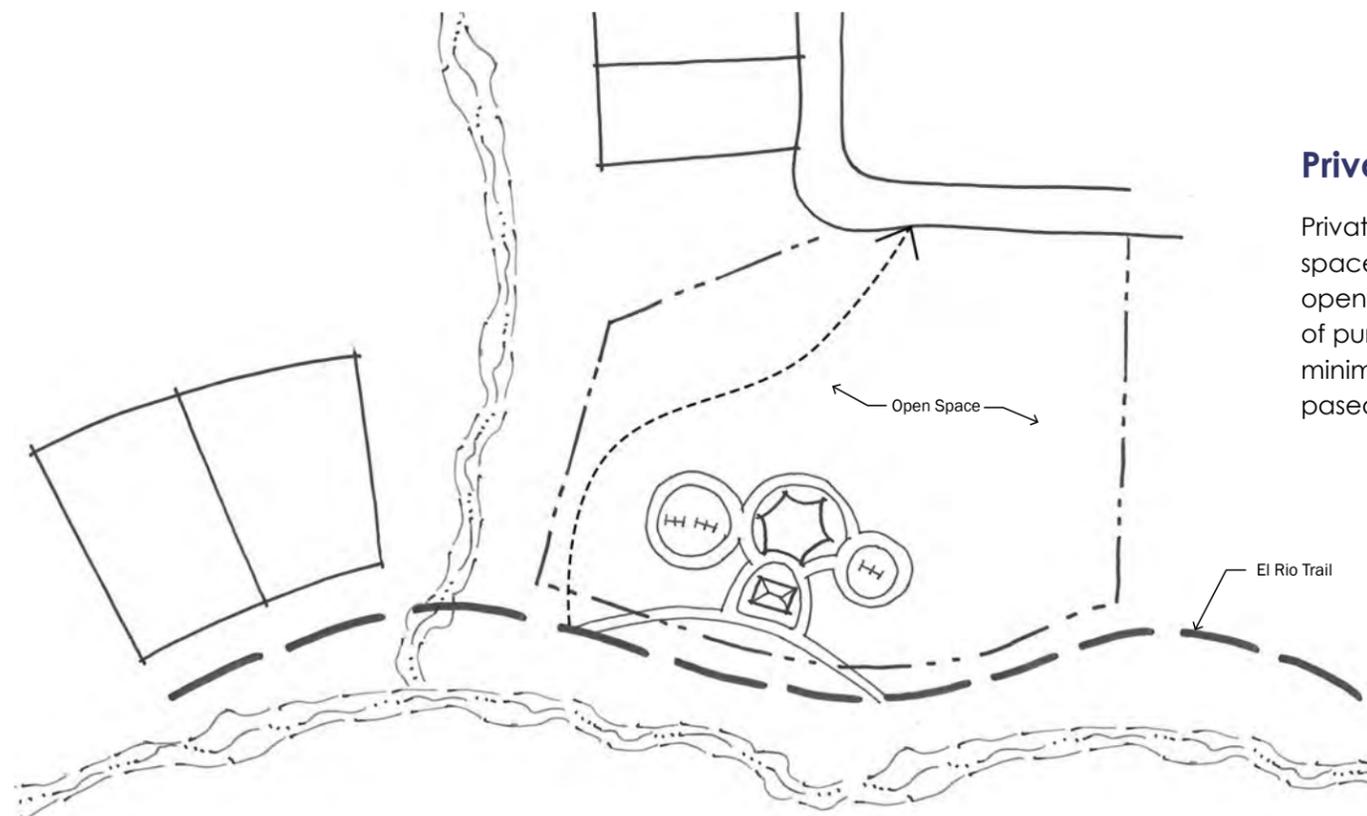
A public park, whether natural or improved, which provides physical and visual access to the El Rio Open Space for the public shall maintain at a minimum one paseo connection to the El Rio open space and a maximum spacing of 500'-0" between linkages as shown in Illustration E10.



**E10 Public Park**

**Private Improved Open Space/Park**

Private improved open space located between the El Rio open space and an adjacent street should provide linkages to the El Rio open space. The private improved open space may serve a variety of purposes, such as parks and retention, but should maintain at a minimum one physical paseo connection and a maximum spacing of paseos at 500'-0" between linkages as shown in Illustration E11.



**E11 Private Improved Open Space with Public Access**

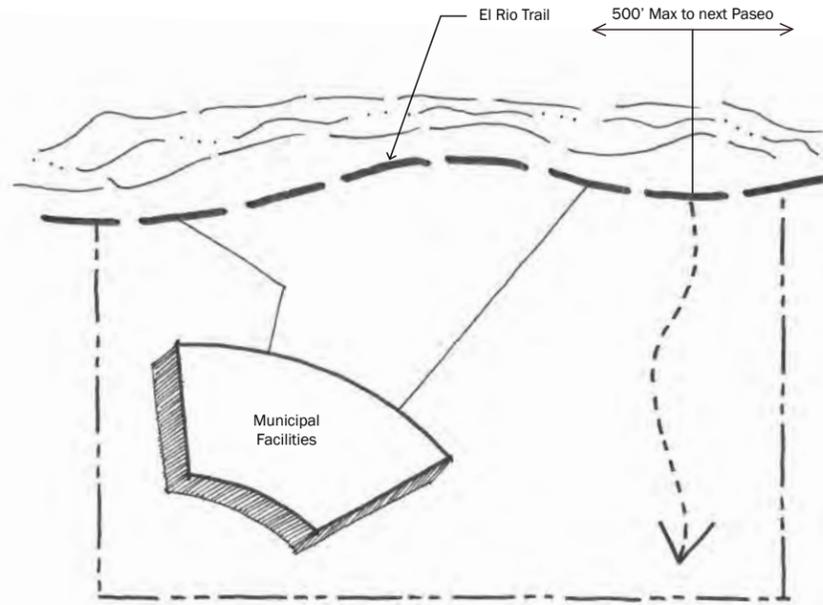
Open Spaces,  
Paths, Trails  
and Edge  
Treatments



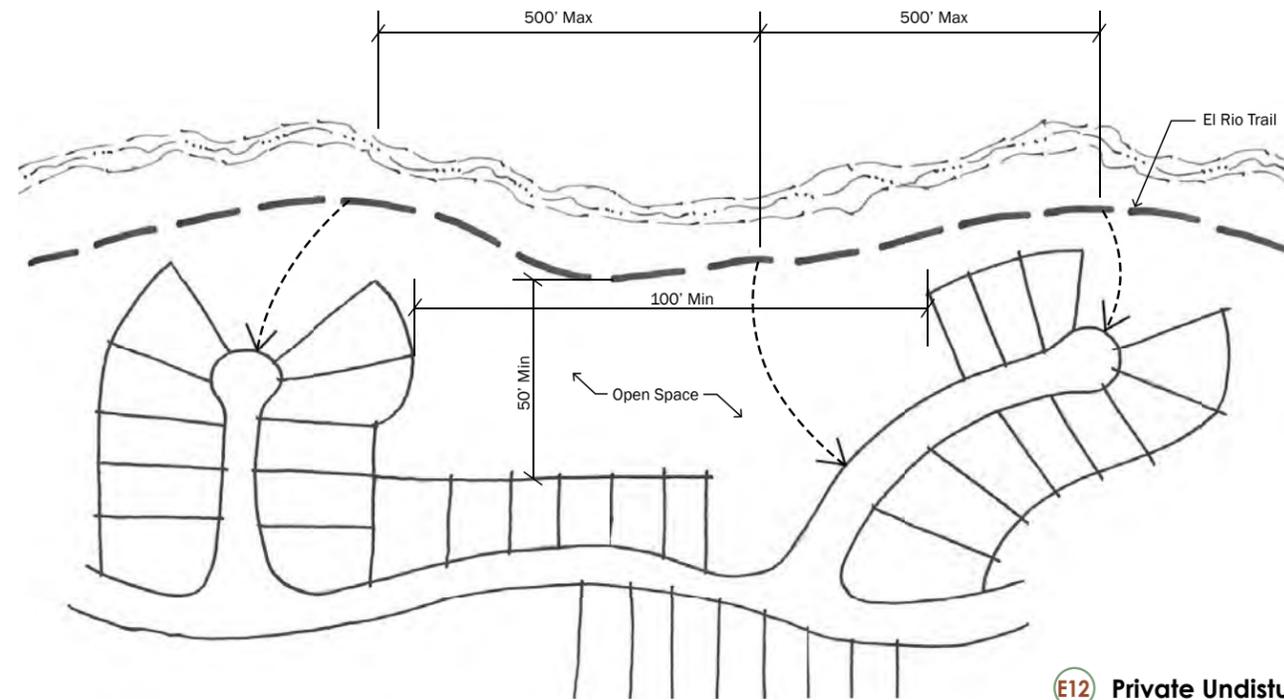


## Municipal Facilities

Municipal facilities, such as fire stations, police stations, community centers or libraries shall be designed to provide physical and visual access to the El Rio open space for the public. At police and fire stations, the goal will be to make those facilities front to the river to facilitate the open public frontage while the recommended secure lots and associated walled facilities can be placed opposite of the public frontage as shown in Illustration E13.



**E13** Municipal Facilities



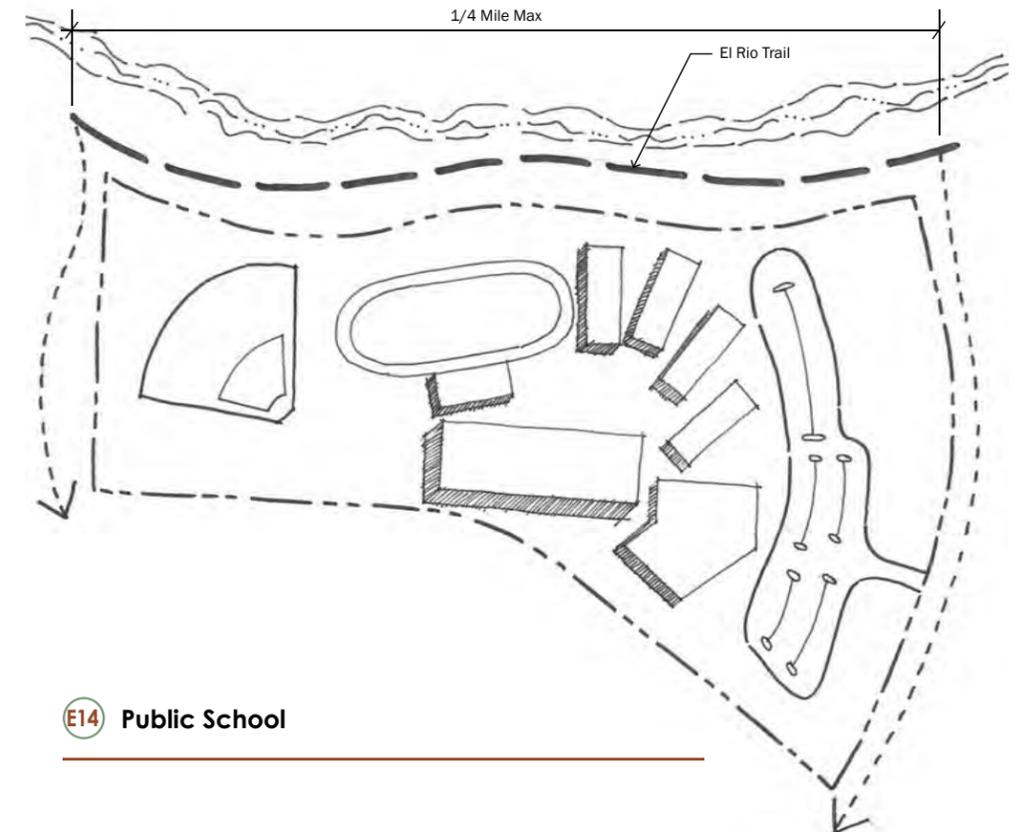
**E12** Private Undisturbed Open Space with Public Access

## Private Undisturbed Open Space

Private undisturbed open space located between the El Rio open space and an adjacent street should provide linkages to El Rio open space. Private undisturbed open spaces should provide a connection to the El Rio public open space as shown in Illustration E12.

## Public Schools

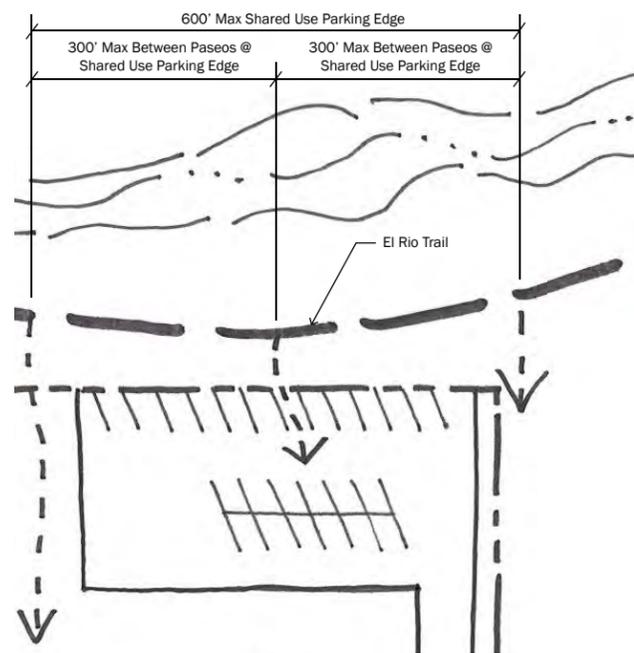
Public schools shall provide visual access to the El Rio open space for the public, and shall be designed to also provide physical access to the open space for the public at their campus edges but never less than 1/4-mile in distance apart as shown in Illustration E14.



**E14** Public School

### Shared Parking

Shared parking, as approved by the city, may count towards an open edge treatment if it is shared public parking. Shared public parking provides a public benefit, but is subject to a joint use agreement developed with the city. The maximum allowed "Edge" distance that would be counted as open edge is 600'. This maximum is to assist in creating a varied edge condition. Pedestrian access at a shared parking lot should have access to the El Rio Trail at 300' maximum to encourage public use and connectivity as shown in Illustration E15.



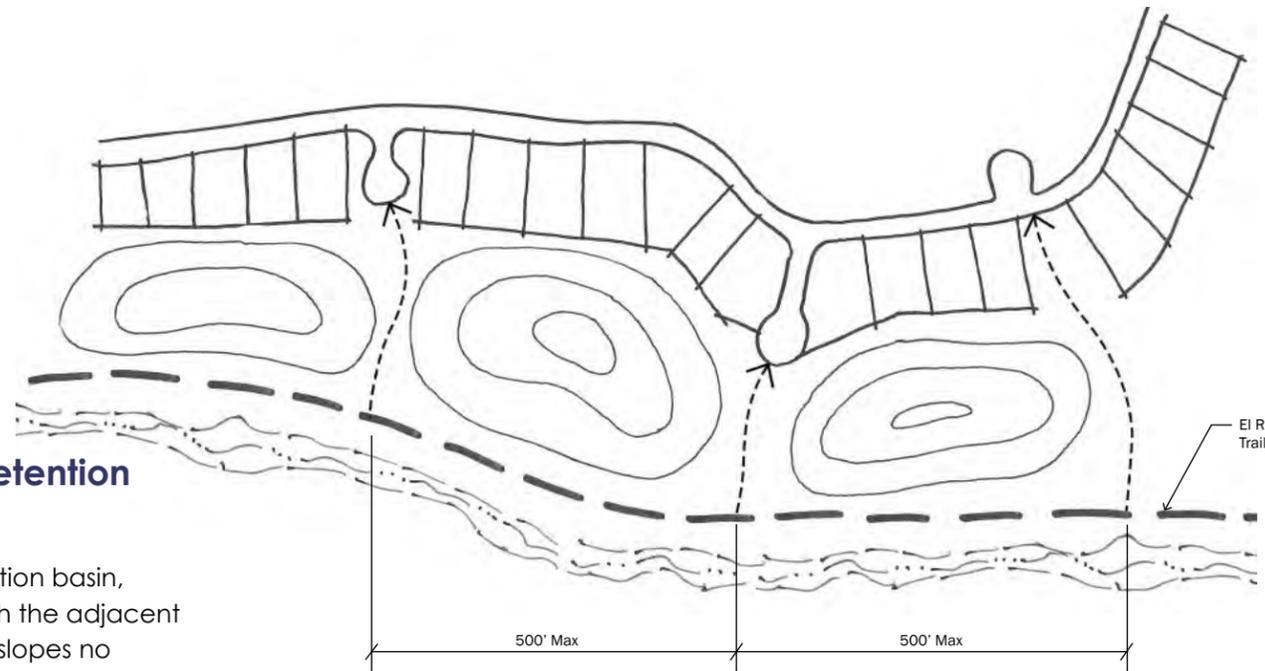
**E15 Shared Parking as Approved by the city (600' Max. Edge, 300' Max. Distance Between Access Ways)**

### Retention or Detention Basin

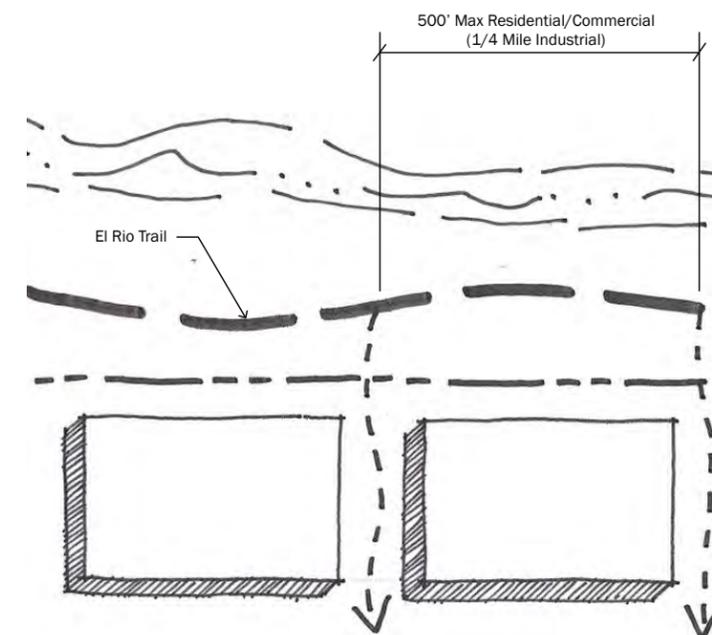
A retention or detention basin, graded to blend with the adjacent terrain, with varying slopes no greater than 4:1, should be designed to provide a physical and visual opening to the El Rio open space, as well as serving drainage functions. The basin landscape treatments should allow for a landscape transition from development landscape to the more native and desert ecosystem planting design that is to be associated with the El Rio Trail system. The proposed connections associated with any retention detention landuse is shown on Illustration E16.

### Public Building Frontage

The face of a building fronting the El Rio open space "Edge" which has 60% windows and public access doorways will count towards a portion of the open space guidelines. This category would also include any open building shade structure fronting the El Rio open space "Edge" that is located over the main front doorways of the adjacent business which is open to the public. Paseos to the El Rio corridor associated with these public building frontages located in and associated with industrial areas shall not exceed 1/4-mile while all other developments should not exceed 500'-0" as shown in Illustration E17.



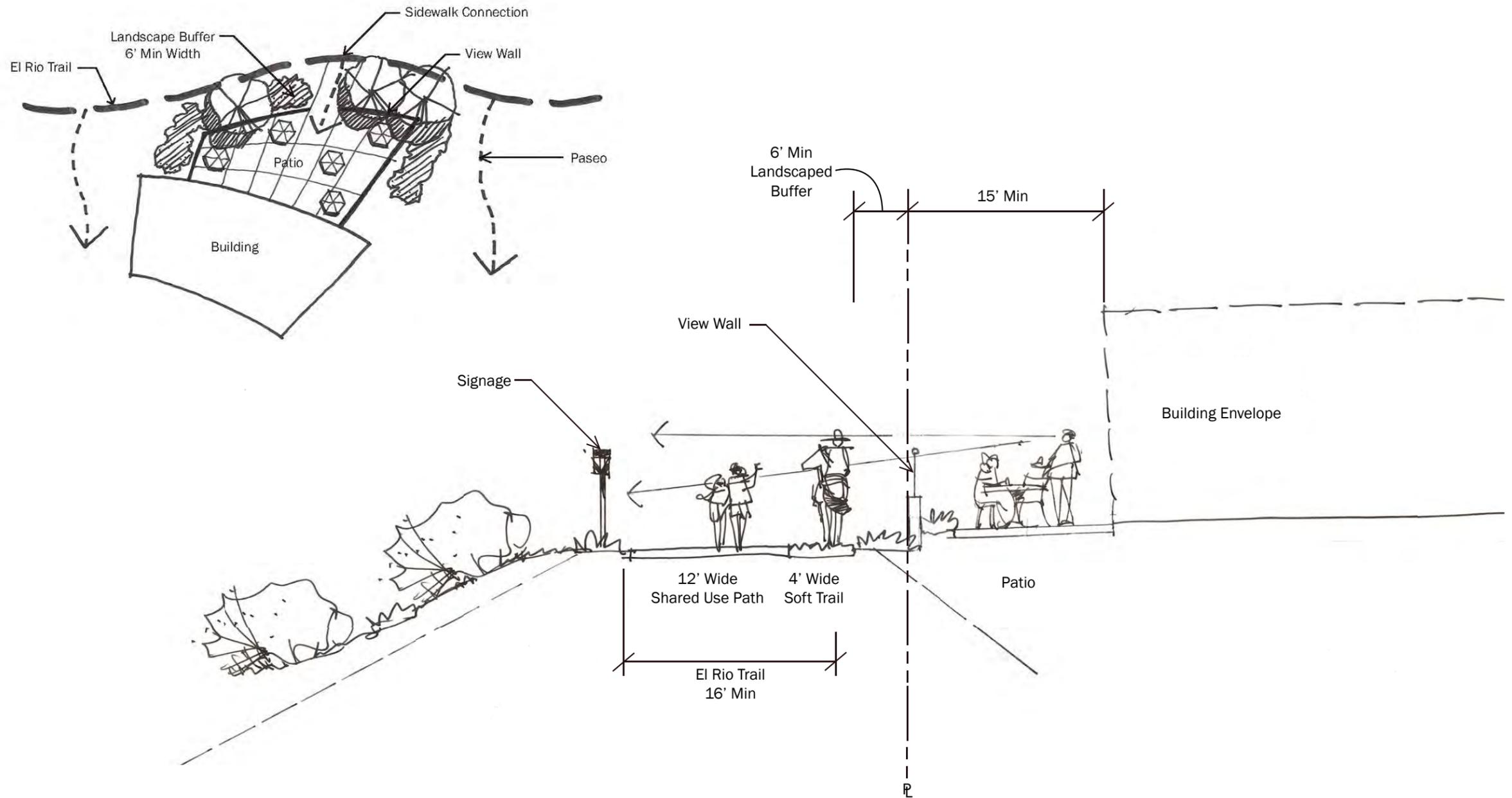
**E16 Retention or Detention Basin Graded to Blend with Public Access Every 500' Maximum**



**E17 Public Building Frontage**

Open Spaces,  
Paths, Trails  
and Edge  
Treatments





**E18** Patio / Outdoor Gathering Space

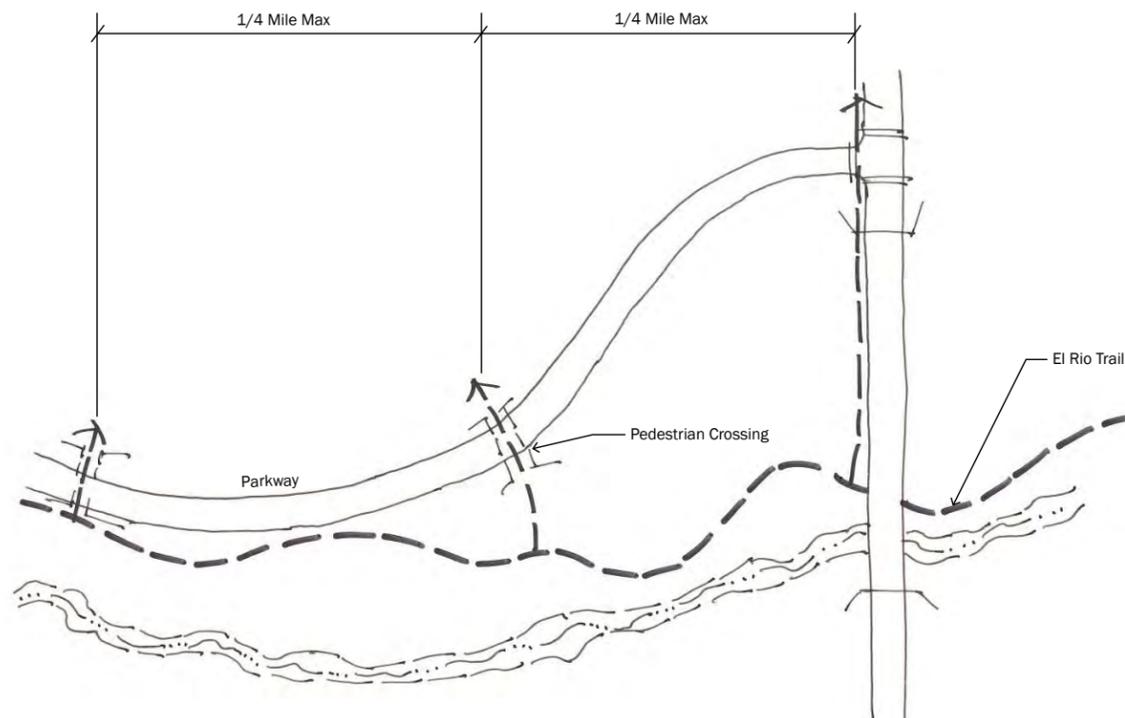
## Patio Outdoor Gathering Space

Outdoor spaces such as restaurant or bar outdoor dining areas, shopping area public plazas, etc. which have public physical and visual access to the El Rio open space "Edge" are highly encouraged and would count towards the recommended open space. The landscape buffer and public use areas associated with these uses should be maintained at a minimum of 6'-0" from the property line. Building setbacks should be a minimum of 15'-0" from any established property line as shown in Illustration E18.

## Public Streets as Open Edge Treatment Options

### Parkway

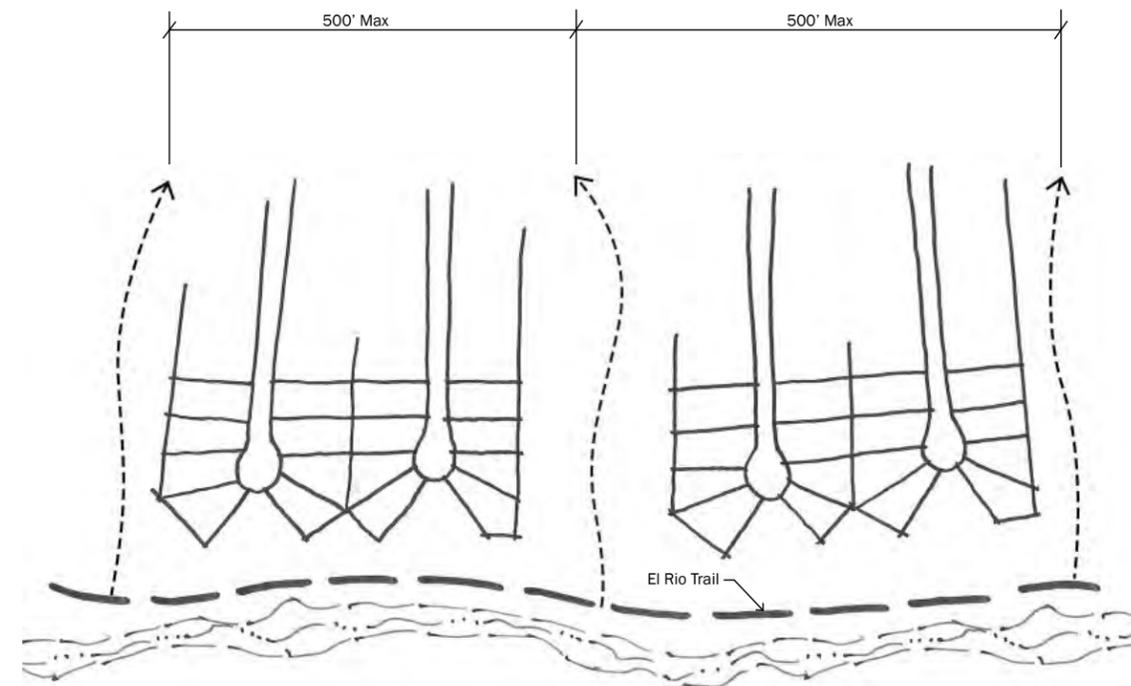
Any single loaded regional (major collector, arterial, and highway) public roadway which is parallel to the "Edge" and allows public physical and visual access to the El Rio Open Space shall count as part of the Open Edge treatment. Physical connections of these public roadways shall be separated from the travel way through the use of an underpass and or overpass as shown in Illustration E19.



**E19 Parkway (Public Access Way)**

### Gated Private Streets

When there are gated private developments adjacent to the El Rio corridor paseos should be provided at a maximum spacing of 500'-0" as shown in Illustration E20.



**E20 Gated Private Streets (500' Max. Edge, 500' Max. Distance Between Public Access Ways)**

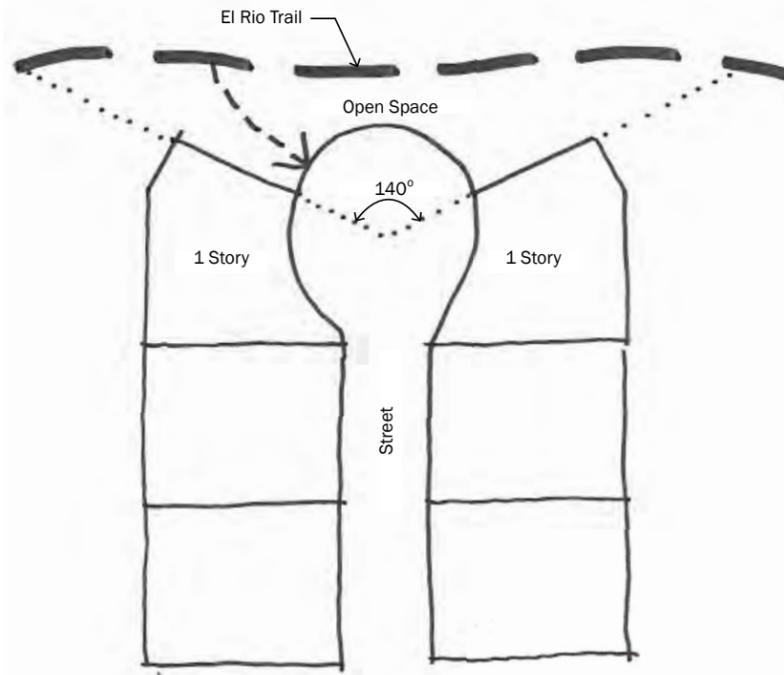
## Open Spaces, Paths, Trails and Edge Treatments





## Cul-de-Sac

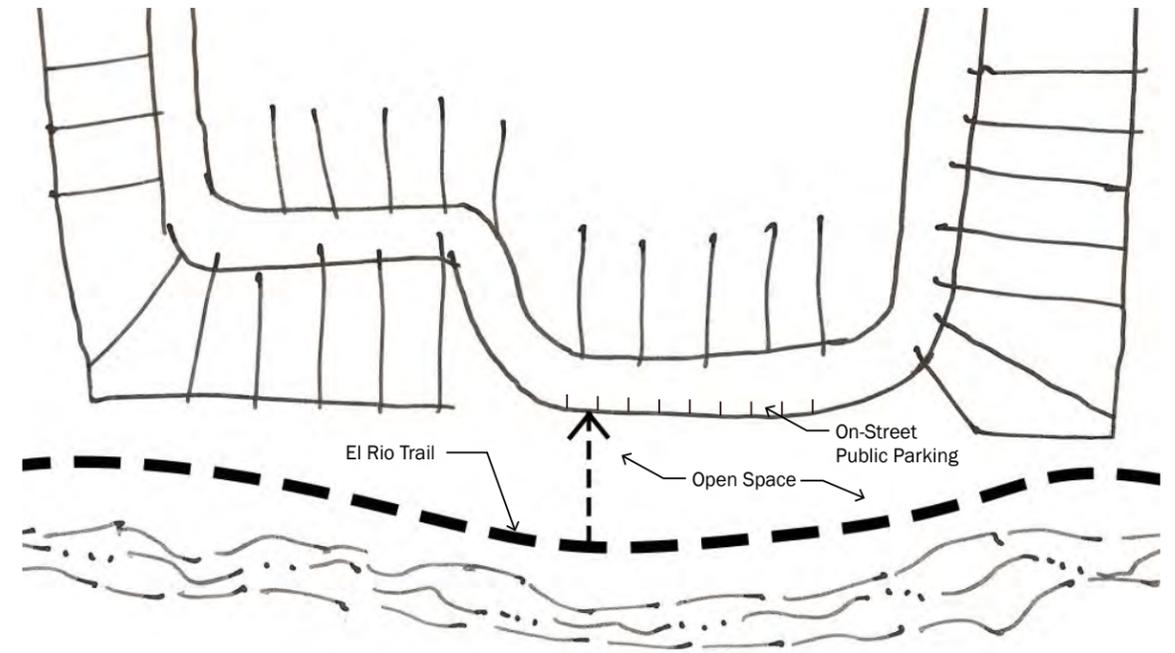
When a cul-de-sac, within adjacent development, abuts the El Rio "Edge", the design should provide a public visual and physical open access to the El Rio open space. The minimum width of the cul-de-sac connecting open area, should be defined, by a line running along the public or private open space edge intersecting the two rays of a one hundred forty degree angle measured from the center of the cul-de-sac, as shown in Illustration E21.



**E21 Private & Public Street Cul-De-Sac**

## Single Loaded Street

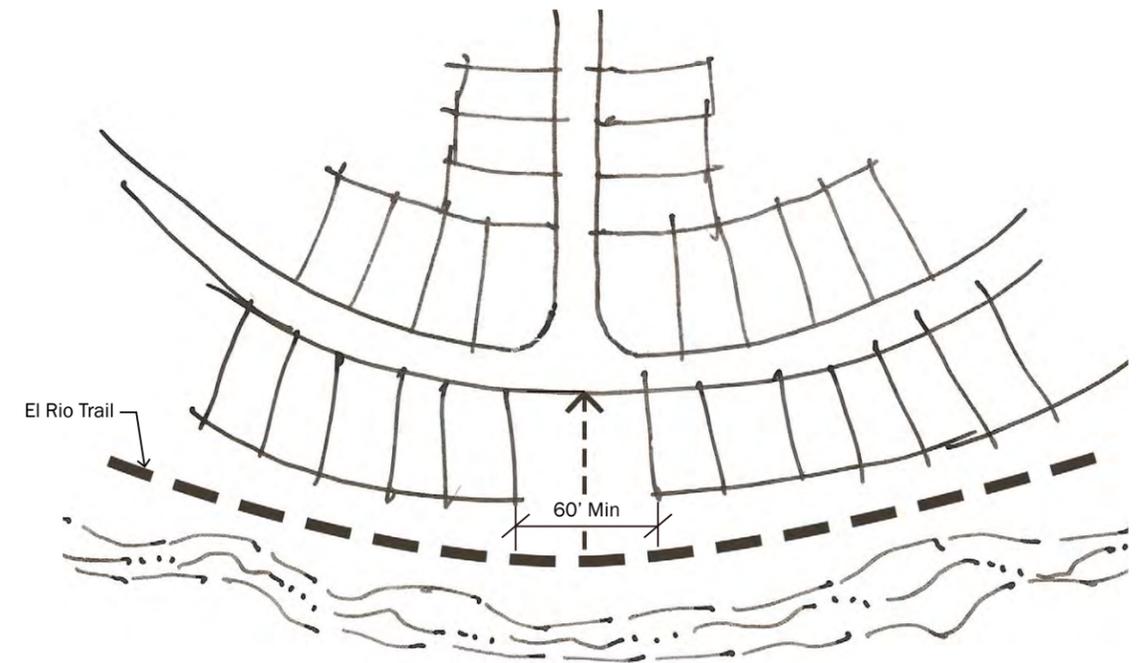
Single-loaded streets that run parallel to the El Rio corridor shall allow public physical and visual access to the El Rio open space as shown in Illustration E22.



**E22 Single-Loaded Public Street Or Single-Loaded Private Street with Public Access Easement (Non-Gated)**

## Street at "T" Intersections

Where a street enters a "T" intersection such that an open area aligning with the perpendicular street is maintained as undisturbed open space between the cross street and the El Rio open space, that area shall be considered open edge treatment, with a sixty feet minimum width open area provided. A "T" intersection provides physical and visual access for the public to the open space from the developed side of the "Edge" as shown in Illustration E23.



**E23 Public and Private Street "T" Intersection**

# Landscape Guidelines

*The El Rio landscape guidelines were developed to provide suggestions showcasing the diversity of plant material that can be used to reinforce the low water use native planting habitats that are prevalent within, and adjacent to, the Gila River's riparian ecosystem. The landscape guidelines were developed to provide the El Rio project area a unique native plant habitat and overall aesthetic that offers appropriate transitions from the riparian ecosystem to a more robust upland landscape.*

## EL RIO



Avondale





## 5.1 El Rio Corridor Plant Palettes

The El Rio Design Guidelines and Planning Standards has provided an opportunity to define the Gila River as a signature corridor within the communities of Avondale, Buckeye, Goodyear and unincorporated areas of Maricopa County. The development of these guidelines will help to reinforce this place as a calling card for the region and to establish the El Rio corridor as a catalyst for change. This effort can be reflected in the El Rio corridor plant palette selections. The El Rio corridor plant palette offers an opportunity to accentuate the natural beauty of the region while providing the diversity and flexibility of plant material selections that can transition from the native Gila River habitat to a more structured development aesthetic.

The cities of Avondale, Goodyear, Buckeye and unincorporated Maricopa County recognize that the landscape has a direct correlation to the wildlife that is dependent on a healthy river ecosystem. The purpose of these guidelines is to provide a conceptual framework for a landscape aesthetic treatment specific to the El Rio area that would enhance the corridor while also providing the diversity of planting that will benefit native and migrating wildlife.

There are high quality and sensitive habitats within the project area, which will be identified as part of the FCDMC El Rio Vegetation Management Plan for the Lower Gila River in Maricopa County, Arizona and the City of Buckeye's In-lieu fee program.

Illustration P1 shows the typical watercourse floodplain / floodway section that graphically depicts the areas where the plant habitats described within these guidelines would have the greatest potential to flourish. It would be in the floodway fringe area where development potential exists and where the lower Sonoran and transitional plant palettes described later in this section may be most applicable. However the plant palettes provided herein would allow adjacent development to implement any of the plant habitats described within this document, all dependent upon specific site location, and the proximity to, or availability of, water.

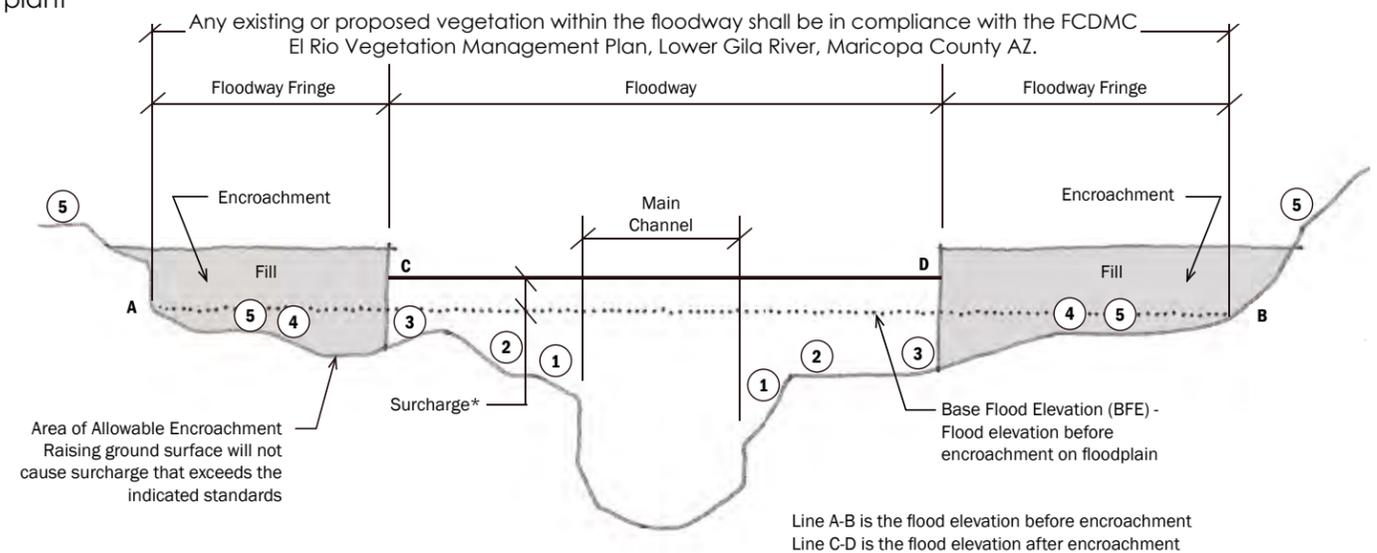
These landscape guidelines were developed to provide the Cities of Avondale, Buckeye, Goodyear, and areas of unincorporated Maricopa County with a diversity of plant palettes that are flexible and easily modified for implementation. The goal in establishing these plant

habitats and associated palettes is to allow any streetscape, trailhead, trail corridor, drainage corridor, or adjacent development associated with the El Rio project area the ability to blend and visually connect their specific design with that of the FCDMC El Rio Vegetation Management Plan for the Lower Gila River in Maricopa County, Arizona.

The result of establishing these flexible plant habitats as a framework creates a baseline for comparison to any planting designs within the project area. These guidelines can easily be modified and adopted beyond established rights-of-way and used for any surrounding development. The goal is to maintain a common aesthetic experience for public and private developments that maintains a relationship to the El Rio Design Guidelines and Planning Standards and highlights the importance of the Gila River to each city's and Maricopa County development.

The Cities of Avondale, Buckeye, Goodyear and unincorporated areas of Maricopa County will encourage private development to incorporate these design themes within the El Rio area. Utilizing elements of the El Rio design theme will reinforce the cohesive development aesthetic for the El Rio corridor while also providing vitally important wildlife habitats. However, should adjacent private developments implement a different identity and character for their specific properties, the El Rio river corridor will sufficiently retain its own identity and visual character through the use of these plant palettes and landscape guidelines.

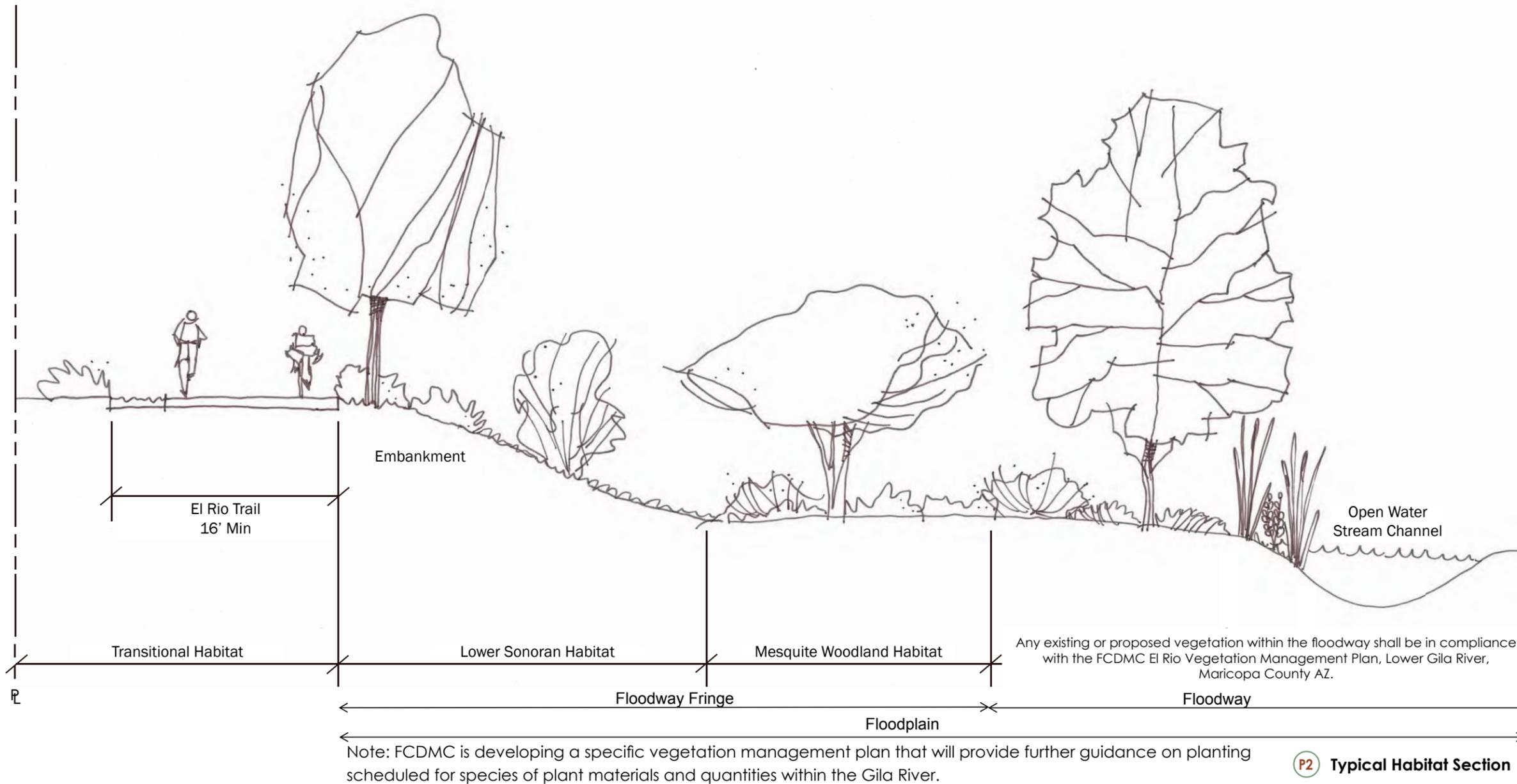
- ① Wetland Habitat
- ② Cottonwood Willow Habitat
- ③ Mesquite Woodland Habitat
- ④ Lower Sonoran Habitat
- ⑤ Transitional Habitat



**P1 Typical Watercourse Floodplain / Floodway Section**

\*Surcharge not to exceed 1.0' (FEMA requirement) or lesser height if specified by community

Landscape Guidelines



The illustration P2 depicts typical plant habitat zones associated with a Sonoran Desert river environment. The development and implementation of the habitat types shown is dependent upon location and design intent and will be dictated by the FCDMC El Rio Vegetation

Management Plan, for the Lower Gila River, in Maricopa County. It is provided as a conceptual idea that could be utilized as part of a river restoration project. It is also provided as a template for any publicly accessible wetland or river ecosystem demonstration projects that may be

implemented within the project area. These habitats and their respective plant species and densities are described later in this document but would be done fully recognizing the influence of the FCDMC El Rio Vegetation Management Plan, for the Lower Gila River, in Maricopa County.





## Wetland Habitat

Wetland planting habitats depicted in this report should be used in either public and/or private developments that want to try and capitalize on existing or developed open water areas within the floodway fringe of the El Rio Design Guidelines and Planning Standards area. This habitat will showcase the beauty and diversity of a wetland habitat. The implementation of this habitat could be part of a landscape that is focused on rehabilitation, repurposing of a former sand and gravel operation within the floodway fringe area, or showcasing a wetland habitat as a key element of a private development landscape.

Wetland plantings are dependent upon water surface levels being available and maintained. The normal maximum water surface elevation in a wetland area can be assumed to be 0 feet (relative elevation). Water level controls may need to be installed that are connected to a pump station or other water level control device. The pump will turn on when the water drops to a relative elevation of -1 feet and will automatically turn off when the water rises to 0 feet. The wetland communities will occur at elevations below 0 feet, which will correspond with a hydroperiod of continuously saturated to continuously inundated. The cottonwood/willow habitat (discussed later in this report) will begin at 0 ft and will extend upward in elevation

in areas above the continuous saturation zone.

The wetland communities should consist of a mosaic of vegetated shallow marsh, deep marsh, submerged/floating zone, and open water areas. The floodway fringe wetland planting areas should be configured to leave access points for maintenance activities and the application of vector control measures. This blend of wetland features should be designed to balance habitat value, water consumption, vector control, and operation and maintenance requirements. There should be the ability to raise and lower the water level in each pond or wetland to aid in plant establishment and vector control. It is understood that the project area has a high existing groundwater table that will make draining these ponds difficult. The specific wetland communities are discussed in greater detail on the following pages for use in any floodway fringe area as the floodway treatments would be controlled by the FCDMC El Rio Vegetation Management Plan, for Lower Gila River, in Maricopa County.

**Shallow Marsh and Deep Marsh Zones**

Vegetation communities in riparian areas are typically found growing on alluvial features that roughly parallel the river channel, or in disturbed landscapes, on or around open pockets of water. Two wetland plant communities – shallow marsh and deep marsh – could be established on and around existing open water areas in the floodway fringe portions of the project area. The shallow marsh vegetation zone will be established from 0 to -1 feet in relative elevation, where 0 feet is the normal maximum water surface elevation. The hydrologic regime in the shallow marsh should be continuously saturated to shallowly inundated up to a depth of 1 foot. The deep marsh vegetation zone should be established in the relative elevation range of -1 to -2.5 feet. The hydrologic regime in the deep marsh should be continuous inundation with water depths extending from the ground surface to 2 feet in depth.

Both the shallow marsh and deep marsh zones should be planted with a variety of native emergent and riparian species to provide structure and function to the wetland, provide some improvement in water quality, provide wildlife habitat and provide enhanced aesthetics. These proposed plant species are listed in Table 5-1. Multiple species of bulrush will be the target plant species in the permanently inundated areas; however, cattails will likely encroach and may eventually dominate in shallow persistent waters unless active control measures are implemented.

Emergent marsh zones should be strategically sized and located in the wetland basins to reduce the potential for mosquito breeding. For example, the emergent marsh zone edge should be accessible for larvicide and/or herbicide applications if required, and should be bordered by sufficiently deep water to maintain communities of larval eating fish.

**Submerged Floating Zones**

The submerged/floating zone should be established in the relative elevation range of -2 to -3 feet and will be continuously inundated with water at depths of 1.5 to 3.5 feet. The submerged floating zone will serve to diversify wetland habitat, provide a dry-season refuge for fish and other aquatic fauna, convey high flows with minimal frictional losses, and increase residence time for ancillary water quality improvement. Most of the submerged/floating zone should be planted with submerged plants and floating plants, however, the upper reaches of this zone should be planted with giant bulrush – an emergent wetland plant. Giant bulrush should initially be established in water depths that are relatively shallow (i.e., <1 feet), however, once established will flourish and expand to deeper waters. The planting list for this zone is noted on Table 5-1.

Table 5-1 represents a preliminary list of proposed plant species by zone. This list has been compiled from the planting plans developed for the Rio Salado and Tres Rios projects and reflects the results of a qualitative field-assessment of successful

Table 5-1 Proposed Plant Species by Zone	
Botanical Name	Common Name
<b>Shallow Marsh</b>	
Sagittaria latifolia	Broadleaf arrowhead
Schoenoplectus acutus	Hardstem bulrush
Schoenoplectus americanus	Three-square bulrush
Veronica anagallis-aquatica	Water speedwell
<b>Deep Marsh</b>	
Sagittaria latifolia	Broadleaf arrowhead
Schoenoplectus acutus	Hardstem bulrush
Schoenoplectus californicus	Giant bulrush
<b>Submerged/Floating Zone</b>	
Schoenoplectus californicus	Giant bulrush
Hydrocotyl verticillata	Whirled marsh pennywort
Ceratophyllum demersum	Coontail
Potamogeton nodosus	Long leaf pondweed

plantings at these two related projects.

Emergent plantings in the shallow marsh and deep marsh will be dominated by bulrush (Schoenoplectus sp.) but will also include other species such as arrowhead (Sagittaria latifolia.) and water speedwell (Veronica anagallis-aquatica). Emergent zone propagules should be installed at an average density of about 4,000 plants per acre (approximately 3 feet on center).

The submerged/floating vegetation zone should be designed as a combination of vegetation and open water zone. This zone will be planted with mat-forming vegetation, emergent species that are tolerant of deeper water, and submerged aquatic species. The planted species

should be installed at an average density of about 4,000 plants per acre (approximately 3 feet on center), whereas propagules of the floating plants will be distributed in the open water.





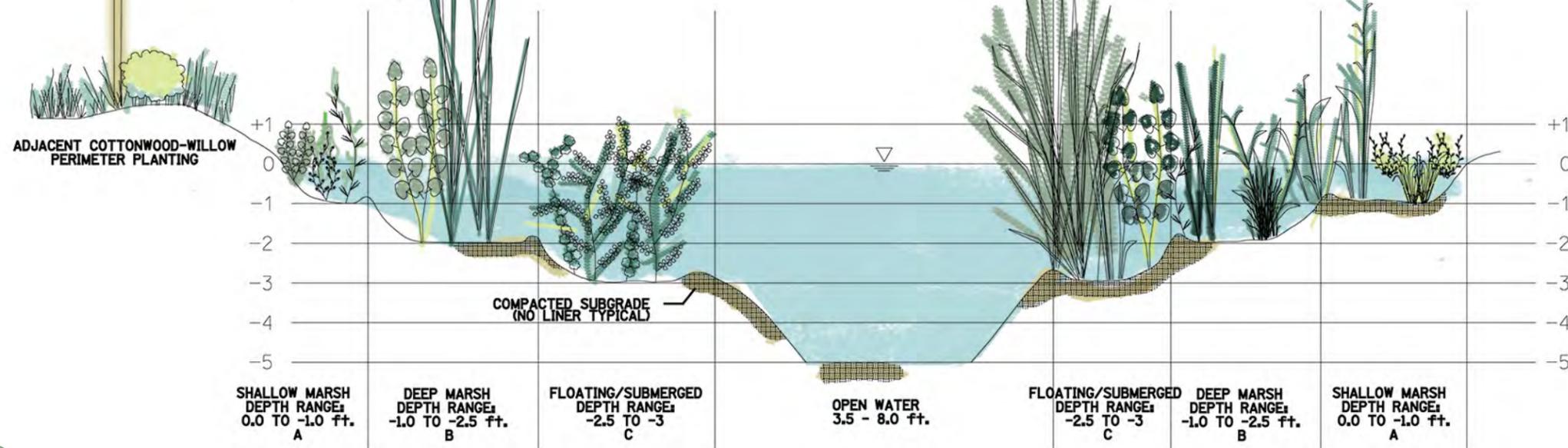
Wetland Plant Legend (see note below)

PATTERN TYPE	PLANT TYPE	SELECTED SPECIES AND SCIENTIFIC NAME
	WETLAND MARSH: EMERGENT & SPREADING PLANTS	
A	SHALLOW MARSH DEPTH RANGE: 0.0 TO -1.0 ft.	SCIRPUS AMERICANUS, SCIRPUS ACUTUS, SAGITTARIA GREGGII, SAGITTARIA LATIFOLIA, ALISMA TRIVIALE
B	DEEP MARSH DEPTH RANGE: -1.0 TO -2.5 ft.	SCIRPUS CALIFORNICUS, SCIRPUS VALIDUS
C	FLOATING/SUBMERGED DEPTH RANGE: -2.5 TO -3	HYDROCOTYLE SP., LUDWEGIA PALUSTRIS, POLYGONUM HYDROPIPEROIDES, POTOMOGETON SP., RORIPPA NASTURTIUM-AQUATICUM, VERONICA SP.
	OPEN WATER: DEEP ZONE	



P3 Plan View of Conceptual Wetland Planting Plan

Note: Any existing or proposed vegetation within the floodway shall be in compliance with the FCDMC El Rio Vegetation Management Plan, Lower Gila River, Maricopa County AZ.



P4 Wetland Habitat Typical Section

Typical wetland planting section for floodway fringe areas. Any existing or proposed vegetation within the floodway shall be in compliance with the FCDMC El Rio Vegetation Management Plan, Lower Gila River, Maricopa County AZ.

## Cottonwood/Willow Habitat

The cottonwood/willow habitat plant palette can provide a habitat that serves as a transition between a wetland habitat and a more xeric habitat. As with the wetland habitat, the cottonwood/willow plant palette allows both public and private development to capitalize on existing or developed open water areas within the designated floodway fringe areas of the El Rio Design Guidelines and Planning Standards area. This habitat can serve as a transition from a wetland open water habitat to a more forested tree canopy habitat. The implementation of this habitat could be part of a floodway fringe landscape that is focused on the rehabilitation and/or repurposing of a former sand and gravel operation, or showcasing a cottonwood/willow habitat as a key element of a development. The need for a higher groundwater table and the ability to recreate a “flood” of an area of cottonwood/willow to assist with regeneration and establishment of these two main species may limit the use of this



habitat within a private development area. However, the plant palette beyond the main species of cottonwood and willow provides plant diversity that can be utilized in creating a transitional plant palette for both public and private developments in the floodway fringe areas.

The cottonwood/willow habitat can serve as a transitional habitat from the wetland aquatic zones to the drier mesquite woodlands and as a link between wetlands. As the name implies, dominant canopy species include cottonwoods (*Populus fremontii*) and willows (*Salix goddingii* and *S. exigua*). Other important canopy species include ash (*Fraxinus velutina*) and elderberry (*Sambucus mexicana*) in mesic areas and mesquite (*P. velutina* and *P. pubescens*) in drier areas. Cottonwood/willow habitats within the project corridor and any water conveyance channel would use water from existing groundwater and potential storm water flows conveyed by a series of created rills and other methods fed by the wetland ponds or reservoirs. Reshaping the ground surface around the existing open water areas can provide an area for interconnected small channels that would create a wetted perimeter of soils that will aid in the establishment and continued growth of cottonwood and willow plantings. This aspect will also help create saturated groundwater conditions conducive to long term growth and survivability.

The succession of cottonwood/willow habitat should have an initial, low vegetation stage consisting of 0 to 7 years of growth following planting, followed by a medium height stage of 7 to 14 years, and



a mature stage lasting from 20 to 100 years.

These trees can be planted both from containers and as pole plantings. Pole plantings are done at a higher density than would be found in nature, but will allow for a natural progression of habitat development as stronger plants mature and dominate the area. Willows and cottonwoods have been used extensively for riparian restoration projects because they are easily established. Poles or cuttings can be obtained from commercial nurseries or from native stands located near the project site.

Commercial sources for cottonwood and willow cuttings are also available on a seasonal basis. If the plant stock comes from a commercial supplier, the supplier needs to ensure that the plant materials are from a local ecotype and/or were gathered or had their origins from within the same watershed or been hybridized and have proven attributes that allow them to survive and flourish in the lower Sonoran Desert habitat frequented by prolonged drought and heat with a water source that tends to be highly saline.



## COTTONWOOD/WILLOW HABITAT TREE SCHEDULE

BOTANICAL NAME	COMMON NAME	QUANTITY PER ACRE
BACCHARIS SALICIFOLIA	SEEP WILLOW	97
FRAXINUS VELUTINA	VELVET ASH	5
POPULUS FREEMONTII	COTTONWOOD	18
PROSOPIS PUBESCENS	SCREWBEAN MESQUITE	11
PROSOPIS VELUTINA	VELVET MESQUITE	22
SALIX GOODINGII	GOODING'S WILLOW	37
SAMBUCUS MEXICANA	ELDERBERRY	18

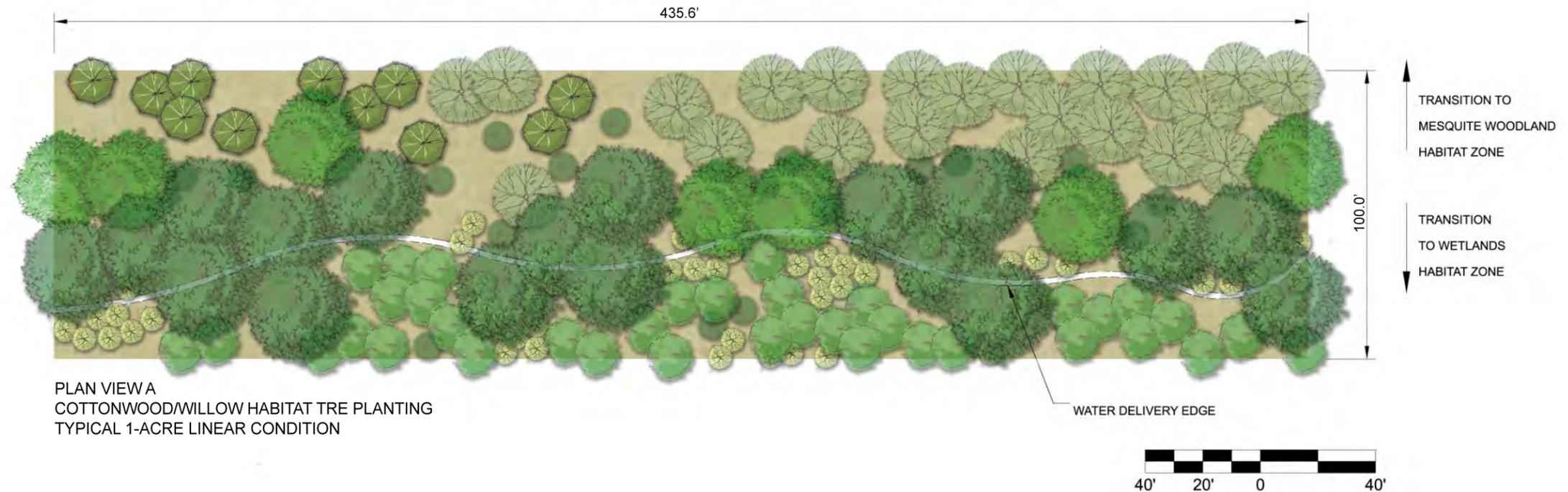
## SHRUB SCHEDULE (SHRUB SYMBOLS NOT SHOWN)

BOTANICAL NAME	COMMON NAME
ATRIPLEX CANESCENS	FOUR WING SALTBRUSH
CELTIS RETICULATA	NET-LEAF HACKBERRY
HYMENOCLEA MONOXYRA	BURROBUSH
HYMENOCLEA SALSOTA	BURROBUSH
PLUCHEA SERICEA	ARROWWEED
SALIX EXIGUA	SANDBAR WILLOW

THE COTTONWOOD/WILLOW HABITAT TREE PLANTING MODULE DEPICTED ON THIS LAYOUT REPRESENTS A TYPICAL ONE-ACRE TREE DENSITY OF A LINEAR COTTONWOOD/WILLOW HABITAT ZONE. THIS MODULE SCENARIO SHOWS A TRANSITION FROM A WETLANDS HABITAT ZONE TO A MESQUITE WOODLANDS HABITAT ZONE. IN A NON-TRANSITIONAL AREA, THE MESQUITE TREE QUANTITIES WOULD BE REPLACED BY COTTONWOOD TREES. GOODING'S WILLOW AND SEEP WILLOW WOULD ALSO OCCUR IN GREATER DENSITY IN A NON-TRANSITIONAL COTTONWOOD/WILLOW AREA.

## FORBS/GRASSES SCHEDULE (FORBS/GRASSES SYMBOLS NOT SHOWN- SHALL BE INCLUDED AS A SEED MIX)

BOTANICAL NAME	COMMON NAME	BOTANICAL NAME	COMMON NAME	BOTANICAL NAME	COMMON NAME	BOTANICAL NAME	COMMON NAME
AMBROSIA AMBROSIOIDES	CANYON RAGWEED	CLEMATIS DRUMMONDII	VIRGIN'S BOWER	HORDEUM ARIZONICUM	ARIZONA BARLEY	MUHLENBERGIA RIGENS	DEER GRASS
AMSINCKIA TESSELLATA	FIDDLE-NECK	CYPERUS ODORATUS	SEDGE	JUNCUS BUFONIUS	RUSH	PHRAGMITES COMMUNIS	REED
ANEMOPSIS CALIFORNICA	YERBA MANSA	DATURA WRIGHTII	DATURA	LOTUS HUMISTRATUS	DEERVETCH	PLATYSTEMON CALIFORNICUS	CREAM-CUPS
ARISTIDA ADSCENSIONIS	SIX-WEEK THREE AWN	DISTICHLIS SPICATA	SALT GRASS	LOTUS SALSUGINOSUS	DEERVETCH	SPOROBOLUS AIROIDES	ALKALI SACATON
ARISTIDA PURPUREA	PURPLE THREE AWN	ELYMUS GLAUCUS	WILD-RYE	MARAH GILENSIS	VINE (WILD) CUCUMBER		
BROMUS ARIZONICUS	ARIZONA BROME	FILAGO SPECIES	FILAGO	MIMULUS GUTTATUS	YELLOW MONKEYFLOWER		
CLEOME LUTEA	SPIDER-FLOWER	GNAPHALIUM PALUSTRE	CUDWEED	MIMULUS PILOSUS	MONKEYFLOWER		



PLAN VIEW A  
COTTONWOOD/WILLOW HABITAT TRE PLANTING  
TYPICAL 1-ACRE LINEAR CONDITION

Typical cottonwood/willow planting plan for floodway fringe areas. Any existing or proposed vegetation within the floodway shall be in compliance with the FCDMC El Rio Vegetation Management Plan, Lower Gila River, Maricopa County AZ.

## Mesquite Woodland Habitat

The mesquite woodland habitat plant palette can provide a floodway fringe habitat that serves as a transition between the cottonwood/ willow habitat and a more xeric habitat. This habitat and its associated species harbors a diversity of very xeric type plantings. It offers the opportunity to serve as a common planting theme for those areas that transition to a more water intensive landscape treatment. As with wetland and cottonwood/ willow, this plant habitat implementation could occur or be part of a floodway fringe landscape that is focused on the transition areas between the El Rio trail system and adjacent development. The broad spreading mesquite species and the thorny nature of this planting palette may limit the use of this habitat within a private development area to those areas of viewing and transition rather than active use. However, the plant palette provides plant diversity that can be utilized in creating a transitional plant palette for both public and private developments as there may be transition zones between the El Rio Trail corridor and public or private development where this habitat could thrive. The mesquite woodland habitat (bosques) were once quite common in the desert southwest as the primary woody cover on the upper floodplains of the river valleys and across the desert floors. This woodland was reduced in

coverage by agriculture and by the harvesting of wood products, primarily fuelwood. Mesquite seedlings and saplings can be planted to restore the majority of the sites to woodlands. These woodlands protect the soil, provide habitat for birds, especially doves, and the mesquite pods provide food for many native animals. It is noteworthy that, historically, these pods were used by native peoples in their diets. The long term goal should be to establish sustainable mesquite woodlands to serve as wildlife habitat. These bosques, consisting primarily of mesquite trees, also include a diverse understory of vegetation that provides habitat for a wide variety of species.



## Landscape Guidelines





## MESQUITE WOODLAND TREE SCHEDULE

BOTANICAL NAME	COMMON NAME	QUANTITY PER ACRE
BACCHARIS SALICIFOLIA	SEEP WILLOW	90
PARKINSONIA FLORIDUM	BLUE PALO VERDE	7
CHILOPSIS LINEARIS	DESERT WILLOW	7
POPULUS FREEMONTII	COTTONWOOD	4
PROSOPIS PUBESCENS	SCREWBEAN MESQUITE	18
PROSOPIS VELUTINA	VELVET MESQUITE	32
PROSOPIS GLANDULOSA VAR. TORREYANA	HONEY MESQUITE	31
SAMBUCUS MEXICANA	ELDERBERRY	11

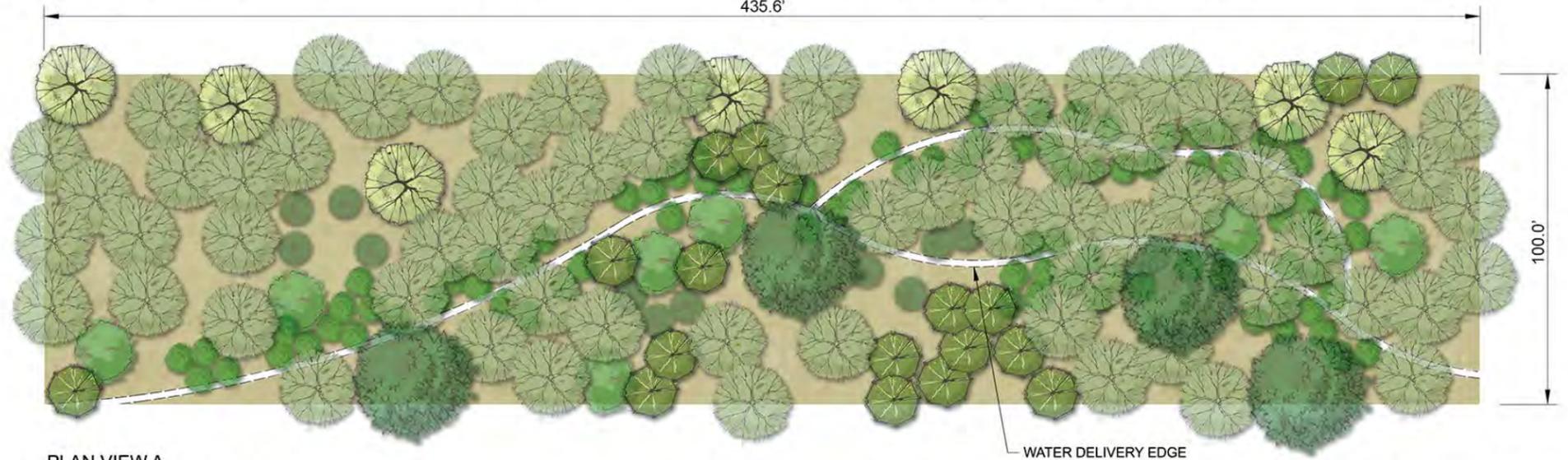
## SHRUB SCHEDULE (SHRUB SYMBOLS NOT SHOWN)

BOTANICAL NAME	COMMON NAME	BOTANICAL NAME	COMMON NAME
ACACIA CONSTRICTA	WHITETHORN ACACIA	HYMENOCLEA SALSOTA	BURROBUSH
ACACIA GREGGII	CATCLAW ACACIA	HYPTIS EMORYI	DESERT LAVENDER
ATRIPLEX CANESCENS	FOUR-WING SALTBU	LYCUIM SPECIES	DESERT THORN
ATRIPLEX LENTIFORMIS	QUAILBUSH	LYCUIM FREMONTII	WOLFBERRY
CELTIS PALLIDA	DESERT HACKBERRY	PULCHEA SERICEA	ARROWWEED
CELTIS RETICULATA	NET-LEAF HACKBERRY	SPHAERALCEA AMBIGUA	DESERT MALLOW
ENCELIA FARINOSA	BRITTLEBUSH	TRIXIS CALIFORNICA	TRIXIS
HYMENOCLEA MONOXYRA	BURROBUSH	ZIZYPHUS OBTUSIFOLIA	GRAYTHORN

THE MESQUITE WOODLAND TREE PLANTING MODULE DEPICTED ON THIS LAYOUT REPRESENTS A TYPICAL ONE-ACRE TREE DENSITY OF A LINEAR MESQUITE WOODLAND ZONE. THIS MODULE SCENARIO SHOWS A MIXTURE OF MESQUITE TYPES - BOTH VELVET MESQUITE AND SCREWBEAN MESQUITES. IN A STANDARD HABITAT ZONE, HOWEVER, ONE MESQUITE WILL EXIST AS A MORE DOMINANT MESQUITE TYPE, DEPENDING ON THE SITE-SPECIFIC CONDITIONS OF A GIVEN AREA.

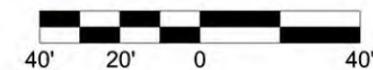
## FORBS/GRASSES SCHEDULE (FORBS/GRASSES SYMBOLS NOT SHOWN- SHALL BE INCLUDED AS A SEED MIX)

BOTANICAL NAME	COMMON NAME	BOTANICAL NAME	COMMON NAME	BOTANICAL NAME	COMMON NAME	BOTANICAL NAME	COMMON NAME
ABRONIA VILOSA	SAND VERBENA	CLEMATIS DRUMMONDII	VIRGIN'S BOWER	JUNCUS BUFONIUS	RUSH	PANICUM OBTUSIFOLIUM	CURLY MESQUITE
ARISTIDA ADSCENSIONIS	SIX-WEEK THREE AWN	DATURA WRIGHTII	DATURA	LEPIDIUM THURBERI	PEPPERGRASS	PENSTEMON PARRYI	PARRY'S PENSTEMON
AMARANTHUS PALMERI	CARELESS WEED	DISTICHLIS SPICATA	SALT GRASS	LOTUS HUMISTRATUS	DEERVETCH	PHACELIA SPECIES	WILD HELIOTROPE
AMSINCKIA TESSELLATA	FIDDLE-NECK	EMMENANTHE PENDULIFLORA	WHISPERING BELLS	LOTUS SALSUGINOSUS	DEERVETCH	PLEURAPHIS RIGIDA	BIG GALLET
ARISTOLOCHIA WATSONI	INDIAN-ROOT	ERIOGONUM INFLATUM	DESERT TRUMPET	LUPINUS ARIZONICUS	LUPINE	POA BIGELOVII	BLUEGRASS
BAILEYA MULTIRADIATA	DESERT MARIGOLD	ERIONEURON PULCHELLUM	FLUFF GRASS	MUHLENBERGIA MICROSPERMA	ANNUAL MUHLY	PSILOTROPHE COOPERI	PAPER FLOWER
BOUTELOUA CURTIPENDULA	SIDE-OAT GRAMA	ESCHSCHOLZIA MEXICANA	MEXICAN POPPY	MUHLENBERGIA PORTERI	DEERGRASS	SALVIA COLUMBARIAE	CHIA
BOUTELOUA GRACILIS	BLUE-GRAMA	FESTUCA ARIZONICA	FESCUE	OENOTHERA DELTOIDES	EVENING PRIMROSE	SENECIO LEMMONII	GROUNDSEL
BROMUS ARIZONICUS	ARIZONA BROME	FESTUCA PACIFICA	FESCUE	OPUNTIA SPINOSIOR	CANE CHOLLA	SPOROBOLUS AIROIDES	ALKALI SACATON
CAMMISONIA SPECIES	SUNCUPS	FILAGO SPECIES	FILAGO	OPUNTIA ENGELMANNII	ENGLEMANN'S PRICKLY PEAR	VERBESINA ENCELOIDES	COWPEN DAISY
CHAENACTIS SPECIES	PINCUSHION	GEREA CANESCENS	DESERT SUNFLOWER	ORTHOCAARPUS PURPURASCENS	OWL'S CLOVER		



PLAN VIEW A  
MESQUITE WOODLAND TREE PLANTING  
TYPICAL 1-ACRE LINEAR CONDITION

Typical mesquite woodland planting plan for floodway fringe areas. Any existing or proposed vegetation within the floodway shall be in compliance with the FCDMC El Rio Vegetation Management Plan, Lower Gila River, Maricopa County AZ.



### Lower Sonoran Habitat

The lower Sonoran habitat plant palette is very much related to the mesquite woodland habitat and completes the transition in a floodway fringe habitat from wettest to the more xeric habitat. This habitat and its associated species provide a diversity of very xeric type plantings. It offers the opportunity to serve as a common planting theme for those floodway fringe areas where a dryer more desert approach is applicable. As with the other habitats presented, this plant habitat implementation could occur as part of a landscape that is focused on some of the transition areas between the El Rio Trail system and adjacent development. The color of the palo verde and ironwood species and the thorny nature of this planting palette may limit the use of this habitat within a private development area to those areas of viewing and transition rather than active use. However, the plant palette provides plant diversity that can be utilized in a streetscape, creating a transitional plant palette for both public and private developments as there may be transition zones between the El Rio Trail corridor and public or private development where this habitat could thrive.

The inclusion of the lower Sonoran plant habitat represents a part of the Great American Desert of western North America, extending from the northern part of the United States deep into Mexico, a nearly continuous continental arid region separated from the Pacific Ocean and the Gulf of Mexico except in the states of Sonora and Baja California in northwestern



Mexico. This region contains over 3000 different plant species. We have taken the phrase lower Sonoran to define the habitat that is often characteristically found just beyond the mesquite woodland and bosque habitats and tends to be a drier, more xeric condition. The planting concept for any lower Sonoran planting in a floodway fringe area would be characterized by palo verde and mesquite species with the occasional punctuation of a desert ironwood. The shrub and understory planting that should be placed by a seed mix within this habitat have a very wide variety of plants that would thrive in these more xeric conditions.



## Landscape Guidelines





## LOWER SONORAN TREE SCHEDULE

BOTANICAL NAME	COMMON NAME	QUANTITY PER ACRE
PARKINSONIA FLORIDUM	BLUE PALO VERDE	7
PARKINSONIA MICROPHYLLUM	LITTLE LEAF PALO VERDE	11
OLNEYA TESOTA	IRONWOOD	7
PROSOPIS PUBESCENS	SCREWBEAN MESQUITE	11
PROSOPIS VELUTINA	VELVET MESQUITE	7

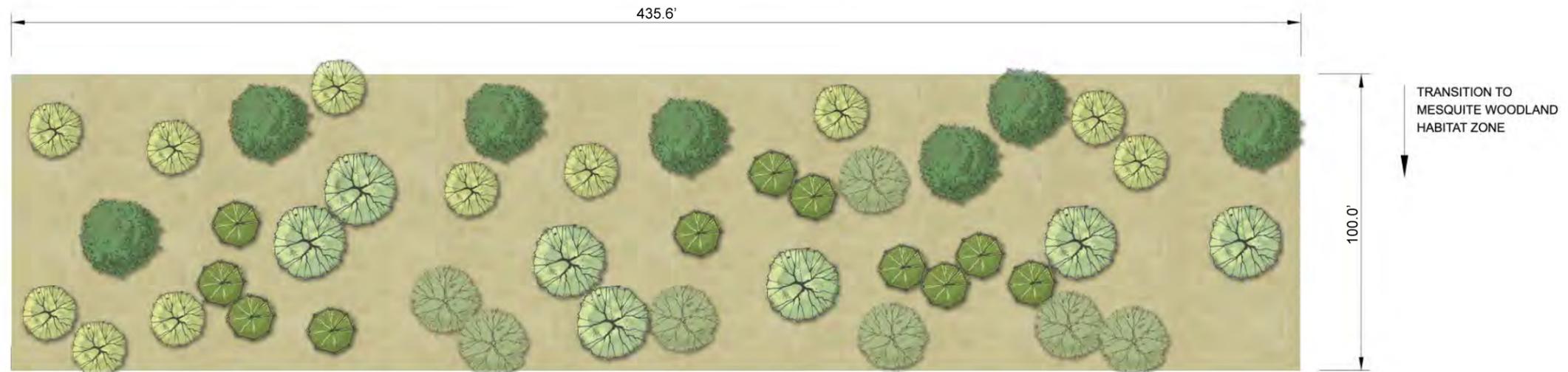
## SHRUB SCHEDULE (SHRUB SYMBOLS NOT SHOWN)

BOTANICAL NAME	COMMON NAME	BOTANICAL NAME	COMMON NAME	BOTANICAL NAME	COMMON NAME
ACACIA CONSTRICTA	WHITETHORN ACACIA	FOQUIERIA SPLENDENS	OCOTILLO	OPUNTIA ENGELMANNII	ENGELMANN'S PRICKLY PEAR
ACACIA GREGGII	CATCLAW ACACIA	JUSTICIA CALIFORNICA	CHUPAROSA	OPUNTIA FULGIDA	CHAIN-FRUIT CHOLLA
AGAVE CHRYSACANTHA	GOLDEN FLOWER AGAVE	LARREA TRIDENTATA	CREOSOTE	OPUNTIA LEPTOCAULIS	DESERT CHRISTMAS CACTUS
AMBROSIA DUMOSA	WHITE BURSAGE	LOTUS RIGIDUS	DESERT ROCK PEA	SIMMONDSIA CHINENSIS	JOJOBA
ATRIPLEX CANESCENS	FOUR-WING SALTBUUSH	LYCIUM EXSERTUM	DESERT THORN	SPHAERALCEA AMBIGUA	GLOBEMALLOW
ATRIPLEX LENTIFORMIS	QUAILBUSH	MIRABILIS BIGLOVII	FOUR-O-CLOCK	TRIXIS CALIFORNICA	TRIXIS
CALLIANDRA ERIOPHYLLA	NATIVE FAIRY DUSTER	OPUNTIA ACANTHOCARPA	BUCKHORN CHOLLA	VIGUIERA PARISHII	GOLDENEYE
SENNA COVESII	DESERT CASSIA	OPUNTIA BASILARIS	BEAVERTAIL CACTUS	YUCCA BACCATA	BANANA YUCCA
CELTIS PALLIDA	DESERT HACKBERRY	OPUNTIA BIGLOVII	TEDDY BEAR CHOLLA	ZIZYPHUS OBTUSIFOLIA	LOTEBUSH
ENCELIA FARINOSA	BRITTLEBUSH	OPUNTIA CHLOROTICA	PANCAKE PEAR		

## FORBS/GRASSES SCHEDULE (FORBS/GRASSES SYMBOLS NOT SHOWN- SHALL BE INCLUDED AS A SEED MIX)

BOTANICAL NAME	COMMON NAME	BOTANICAL NAME	COMMON NAME	BOTANICAL NAME	COMMON NAME
ACACIA CONSTRICTA	WHITETHORN ACACIA	ENCELIA FARINOSA	BRITTLEBUSH	SIMMONDSIA CHINENSIS	JOJOBA
ACACIA GREGGII	CATCLAW ACACIA	LARREA TRIDENTATA	CREOSOTE	SPHAERALCEA AMBIGUA	DESERT MALLOW
AMBROSIA DUMOSA	BURSAGE	LYCIUM EXSERTUM	DESERT THORN	ZIZYPHUS OBTUSIFOLIA	LOTEBUSH
ATRIPLEX CANESCENS	FOUR-WING SALTBUUSH	OLNEYA TESOTA	IRONWOOD		
ATRIPLEX LENTIFORMIS	QUAILBUSH	OPUNTIA ACANTHOCARPA	BUCKHORN CHOLLA		
BOUPELLOUA CURTIPENDULA	SIDE-OAT GRAMA	OPUNTIA BASILARIS	BEAVERTAIL CACTUS		
CALLIANDRA ERIOPHYLLA	FAIRY DUSTER	OPUNTIA ENGELMANNII	ENGELMANN'S PRICKLY PEAR		
SENNA COVESII	DESERT CASSIA	PHACELIA CREMULATA	WILD HELIOTROPE		
CELTIS PALLIDA	DESERT HACKBERRY	PROSOPIS PUBESCENS	SCREWBEAN MESQUITE		
PARKINSONIA FLORIDUM	BLUE PALO VERDE	PROSOPIS VELUTINA	VELVET MESQUITE		

THE LOWER SONORAN TREE PLANTING MODULE DEPICTED ON THIS LAYOUT REPRESENTS A TYPICAL ONE-ACRE TREE DENSITY OF A LINEAR UPPER SONORAN ZONE.



PLAN VIEW A  
LOWER SONORAN TREE PLANTING  
TYPICAL 1-ACRE LINEAR CONDITION

**Typical lower sonoran planting plan for floodway fringe areas. Any existing or proposed vegetation within the floodway shall be in compliance with the FCDMC El Rio Vegetation Management Plan, Lower Gila River, Maricopa County AZ.**





**Transition Zone Habitat**

The floodway fringe transition zone planting design offers a great deal of flexibility when evaluating its use adjacent to existing or proposed private development. The transition zone planting layout has been created to facilitate the gradual transition from either public or private development areas that may have had a focus on a higher water use, less native plant palette, to the more xeric and native river corridor planting design associated with the Gila River. The floodway fringe transition zone plant materials are shown to include a mixture of both native and non-native low water use species. The guidelines were developed to allow the use of more non-native, but desert adapted, plantings closer to any adjacent development, and as a transition to the more native desert El Rio Trail plant palette. Moving away from both the private development "Edge" and the El Rio Trail, the planting will begin to reflect a species change to more of a lower Sonoran native desert plant palette.





## TRANSITION ZONE TREE SCHEDULE

BOTANICAL NAME	COMMON NAME	QUANTITY PER ACRE
CHILOPSIS LINEARIS	DESERT WILLOW	5
DAHLBERGIA SISSOO*	INDIAN ROSEWOOD	11*
PROSOPIS HYBRID	THORNLESS MESQUITE	6
PROSOPIS VELUTINA	VELVET MESQUITE	3
PARKINSONIA X 'DESERT MUSEUM'	DESERT MUSEUM PALO VERDE	7
OLNEYA TESOTA	IRONWOOD	3
X CHITALPA TASHKENTENSIS	CHITALPA	4

\*Use of this tree species near concrete slabs may require the use of root intrusion barrier

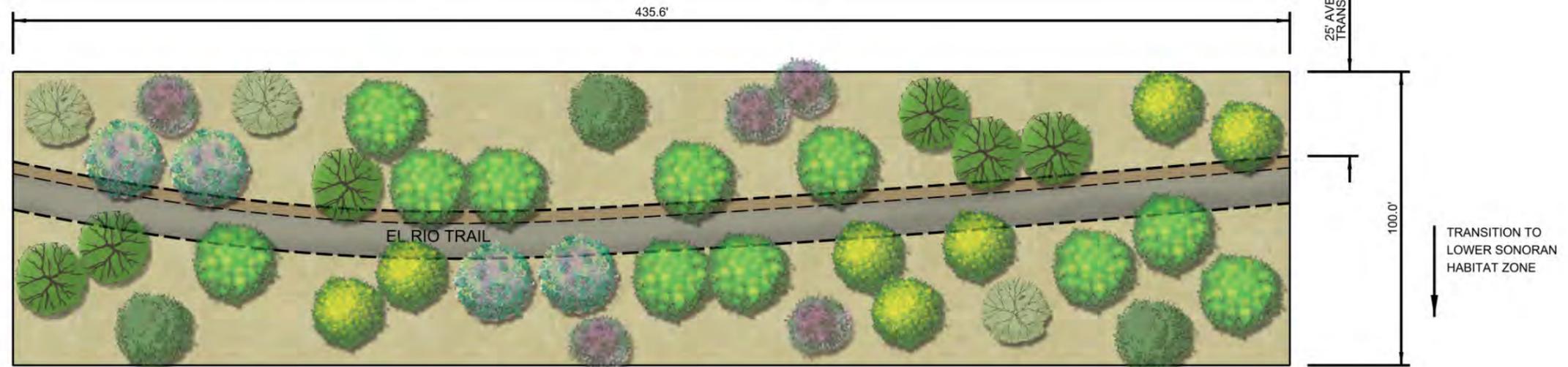
## SHRUB & ACCENT SCHEDULE (SHRUB/ACCENT SYMBOLS NOT SHOWN)

BOTANICAL NAME	COMMON NAME	BOTANICAL NAME	COMMON NAME	BOTANICAL NAME	COMMON NAME
AGAVE SP.	AGAVE	FOUQUIERIA SPLENDENS	OCOTILLO	TECOMA SP.	TECOMA SPECIES
ASCLEPIAS SUBULATA	DESERT MILKWEED	JUSTICIA CALIFORNICA	CHUPAROSA	YUCCA SP.	YUCCA
BAILEYA MULTIRADIATA	DESERT MARIGOLD	LARREA TRIDENTATA	CREOSOTE		
BOUGAINVILLEA VAR.	BUSH BOUGAINVILLEA	LEUCOPHYLLUM SP.	TEXAS SAGE		
BOUTELOUA GRACILIS	BLUE GRAMMA GRASS	MUHLENBERGIA SP.	GRASS SPECIES		
CALLIANDRA ERIOPHYLLA	PINK FAIRY DUSTER	OPUNTIA ACANTHOCARPA	BUCKHORN CHOLLA		
DASYLIRION LONGISSIMUM	MEXICAN GRASS TREE	OPUNTIA ENGELMANNII	ENGELMANN'S PRICKLY PEAR		
DASYLIRION WHEELERI	DESERT SPOON	PENSTEMON PARRYI	PENSTEMON		
DODONEA VISCOSA	HOPBUSH	SIMMONDSIA CHINENSIS	JOJOBA		
ENCELIA FARINOSA	BRITTLEBUSH	SPHAERALCEA AMBIGUA	GLOBEMALLOW		

## GROUNDCOVER SCHEDULE (GROUNDCOVER SYMBOLS NOT SHOWN)

BOTANICAL NAME	COMMON NAME
ACACIA REDOLENS	PROSTRATE ACACIA
CONVOLVULUS CNEORUM	BUSH MORNING GLORY
DALEA GREGGII	TRAILING INDIGO
HYMENOXYLS ACAULIS	ANGELITA DAISY
LANTANA MONTEVIDENSIS	TRAILING LANTANA
LANTANA SP. 'NEW GOLD'	NEW GOLD LANTANA
OENOTHERA BERLANDIERI	MEXICAN EVENING PRIMROSE
ROSMARINUS OFFICINALIS PROSTRATUS	PROSTRATE ROSEMARY
WEDELIA TEXANA DEVIL'S RIVER	ZEXMENIA
WEDELIA TRILOBATA	YELLOW DOT

THE TRANSITION ZONE TREE PLANTING OFFERS A GREAT DEAL OF FLEXIBILITY FOR ADJACENT DEVELOPMENT. THE TRANSITION ZONE PLANTING LAYOUT IS TO FACILITATE THE GRADUAL TRANSITION FROM PRIVATE DEVELOPMENT LANDSCAPE TO THE MORE XERIC AND NATIVE RIVER CORRIDOR PLANTING. THE SCENARIO SHOWN INCLUDES A MIXTURE OF BOTH NATIVE AND NON NATIVE SPECIES WITH A HEAVIER EMPHASIS ON THE NON NATIVE SPECIES CLOSER TO THE EL RIO TRAIL AND THE ADJACENT PRIVATE DEVELOPMENT. MOVING AWAY FROM THE PRIVATE DEVELOPMENT EDGE AND THE TRAIL THE TRANSITION ZONE PLANTING WOULD REFLECT A SPECIES CHANGE TO MORE OF THE LOWER SONORAN NATIVE NATURALIZED HABITAT ZONE.



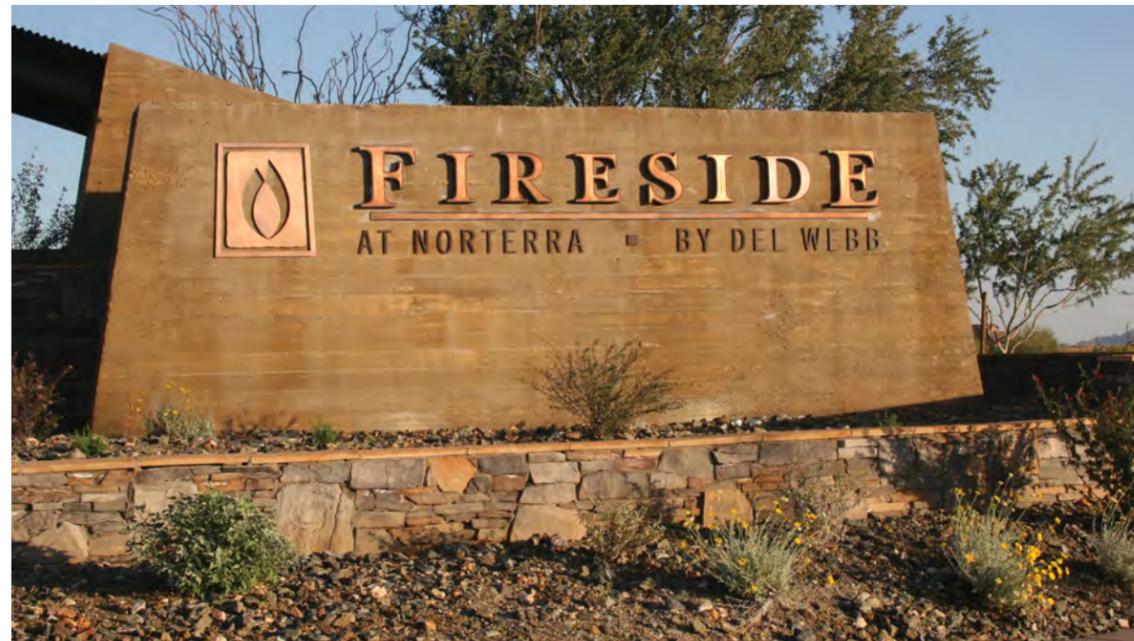
PLAN VIEW A  
TRANSITION ZONE TREE PLANTING  
TYPICAL 1-ACRE LINEAR CONDITION

Typical transitional zone tree planting plan for floodway fringe areas. Any existing or proposed vegetation within the floodway shall be in compliance with the FCDMC El Rio Vegetation Management Plan, Lower Gila River, Maricopa County AZ.

## Beyond the Planting Palettes

The aesthetic for the El Rio plan includes the use of native plant materials as transitional design features to the more traditional private development design. This aspect of the El Rio Design Guidelines and Planning Standards should be fine-tuned by each public entity reviewing any proposal considering designs at a detailed level of creativity and evaluated on a case-by-case basis. This would be the arena that would include selecting colors, materials, and textures that will complement and work with the more native plant palette that defines El Rio. The aesthetics also help to define and give substance to the style complementing the objects that make up the design theme as depicted in the signage and graphics described within this report. The elements most often found in association with a streetscape and or in the areas transitioning between private development and the El Rio Trail may include the following elements.

**View Walls** – These can be used between the El Rio Trail and the “Edge” as defined earlier in this section. Walls can also be incorporated into medians and streetscape designs to provide vertical separation between traffic lanes. Walls can provide a variety of unique vertical surfaces that can help to accentuate the overall El Rio aesthetic and theme. In addition, walls can be used as artistic elements in the landscape that can be accentuated at night though the use of energy efficient lighting systems. The walls should capitalize on the aesthetic vocabulary established



in the signage section of this report accentuating the use of unfinished board and batten concrete walls along with river run rock as accent features in, and associated with, any wall. Utilizing a wall in a median will require close scrutiny by the reviewing agency on the overall width of any median and visibility triangles so that a wall can be safely included in a design. The use of walls in a streetscape right-of-way is encouraged to support and supplement the overall aesthetic and El Rio theme but will be dependent upon the setting and location of the streetscape and any city requirements. Any walls associated with El Rio can provide low screening, block undesirable views, or provide visual interest where there may be the tendency for monotonous uniformity. The walls for El Rio could include but not be limited to their use as:

1. Subdivision walls

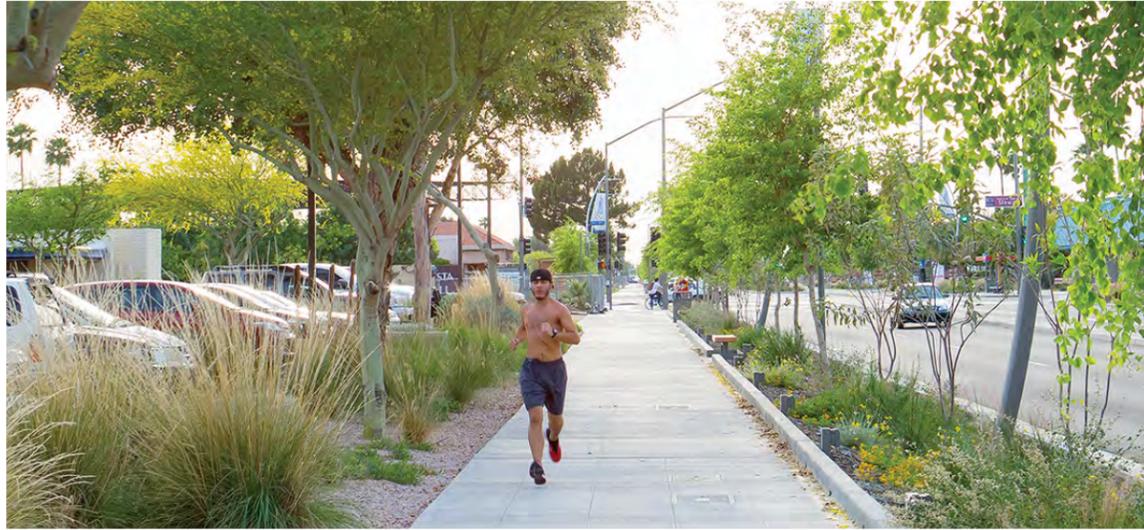
2. Intersection Enhancement
3. Screening of utilities and service equipment areas
4. Enhance areas of pedestrian activity
5. Combine with seating or act as seat walls
6. Separate and/or protect sidewalks from lanes of traffic
7. Vertical surfaces along the right-of-way that could be opportunities for business identification or residential signage
8. Walls next to seating or pedestrian activity areas that become posting areas for local news and area events
9. Commercial/Retail entries
10. Subdivision signs
11. Public facility entrances



**Architectural sculpture elements** – The El Rio theme, as described earlier in this report, is built upon respecting the unique archeological record and history of this area while respecting the branding and logo previously completed. The use and introduction of any architectural and or sculptural elements should build from the theme and only be allowed and concentrated in areas of heavy use and visual prominence. These areas include, but are not limited to: intersections, trailheads, public seating areas, bridge crossings of the Gila River, and city identified gateways. They can be incorporated into streetscape amenities, like bus stops, or become stand-alone focal points for public art displays, but should have an aesthetic that is in keeping with the theme and signage standards developed within this report. Any artistic expressions, either integrated into the streetscape elements or as individual artist's creations, can enrich the experience of

## Landscape Guidelines





public spaces and can mark or signal El Rio as a unique and special environment.

**Streetscape and Median Planting** – The development of streetscape and median plantings to complement either public right-of-way or private development will be dependent upon the classification of the street and the overall width and dimension of any associated right-of-way and median area. In general, if there are landscape areas and medians within the El Rio Design Guidelines and Planning Standards, they should complement and reflect the importance of water storage and conveyance in every aspect of their design. This can be achieved by making adjacent landscape areas and medians recessed below adjacent sidewalk and pavement grades. The use of bioretention, bioinfiltration cells, and working with the roadway design team to incorporate curb inlets into the landscape areas including the median to serve as first flush water capture, are all critical elements that can demonstrate the importance of water in our desert environment. The depth and extent of these bioswales and first-flush basins in a landscape area or median will depend on the street designation of each

respective city, the right-of-way available and the median width. The medians and landscape areas should display a planting palette that emphasizes the desert and low water use adapted selections that are shown in the earlier plant palettes. The densities of these plantings would be dictated by available area, but would emphasize, as a minimum target, 80% native/low water use adapted plantings done en masse, with 20% allowed for specialty plantings to accentuate entries, intersections of importance or other specialty areas designated or allowed by the local municipality.

As guiding principles associated with any street work in the El Rio Design Guidelines and Planning Standards the street designs should embrace the principles and concepts of “Complete Streets”, “Green Streets” and “Low Impact Development (LID)”. Information on these concepts and principles of design is vast, and growing rapidly, but as a starting point, information on these approaches can be found at the following web sites:

<http://nacto.org/usdg/>



<http://www.smartgrowthamerica.org/complete-streets>

<http://www.mesaaz.gov/home/showdocument?id=12724>

**Gateways** – There are numerous areas and points of interest that would allow for the creation of a gateway statement in helping to create a sense of place and entry to the El Rio area. These potential gateway areas include river bridges and intersections as two of the best opportunities to celebrate the area and the unique environment that is El Rio. If a particular intersection is chosen by a municipality to serve as an El Rio gateway statement, the entire interchange (all four corners) shall be included. The significance of the gateway treatment at the selected intersection should include the use of El Rio themed elements as described in this project. It should be reflected in every element including but not limited to: pavement design, crosswalks, signage, walls, public art, landforms, seating,



planting design and lighting. The gateways are meant to be large presentations that signify the importance of the area and clarify the linkage to the El Rio corridor.

**Ground Plane Treatments** - The ground plane materials used throughout the El Rio area help to define the area's overall look and feel. The ground plane treatment in all locations associated with the El Rio area should be a "Desert Pavement" material of native stone. Desert pavement is a feature consisting of closely packed clasts (rock fragments) of varying sizes, lying in a layer displaying different tones relative to the desert varnish layer that has accumulated on the exposed surface of the naturally occurring rock. Desert pavement shall be native, local, desert granite stone at the size shown below and color specified by each local municipality. However, earth tones of deep browns and deep reds are suggested in keeping with the colors from the surrounding mountain ranges and theme of the El Rio Design Guidelines and Planning Standards. The desert pavement

shall be from a single source, free from coating, clay, caliche or organic matter. A five pound (5lb) sample of material of

Desert Pavement	
Sieve	%Ret.
4"	1
3"	14
2"	11
1-1/2"	20
1-1/4"	19
1"	21
3/4"	27
1/2"	30
3/8"	35
1/4"	41
#4	49
#8	57
#10	11
#16	14
#30	15
#40	17
#50	18.5
#100	21
#200	26

desert pavement shall be provided for approval by each respective city before initiating any installation. The size/gradation is meant to mimic the native desert pavement of the surrounding undisturbed desert and should at a minimum consist of the following gradation:

**Amenities** - The amenities associated with the El Rio corridor and the associated linkages out into the surrounding communities include, but are not limited to: benches, lighting, trash receptacles, and bike racks. Such resources provide functional convenience for all users. And, though serving a functional purpose, these amenities offer the opportunity to integrate art and icon elements into the design, and to select shape, finish, and visual accents that will showcase links to the overall theme and reinforce the design theme through their structural elements, materials and colors. The El Rio themes, as stated earlier in this document, need to

build upon and grow out of the theming guidelines. Each city will have to interpret these theming guidelines to determine how it will be applied and what El Rio material vocabulary would best reflect each city's El Rio aesthetic.

*The landscape design guidelines that have been presented were developed to be non-regulative, but have been provided to describe the design philosophy for planting and site amenities within, and associated with, the El Rio Design Guidelines and Planning Standards. These landscape guidelines, along with their supporting graphics, were developed to illustrate the importance of the El Rio goals, themes and design philosophy. All design elements, landscape decisions and site amenities should be clearly connected to, and reflective of, the El Rio Design Guidelines and Planning Standards.*



# Signage Guidelines

*Effective communication with the public requires a clear, concise delivery of an understandable message through a certain medium.*

*One of the best mediums for conveying messages is through signage. A comprehensive sign program should foster understanding of a place by implementation of a thorough and complete system of navigation and orientation, outline behavioral expectations and safety guidelines, incorporate learning opportunities, and offer a positive image and identity to serve both visitors and all entities involved in the management of the area.*

*The El Rio Signage Guidelines have been developed to form a cohesive system that unifies the project area as it promotes the assets of this unique corridor while creating an appealing and intuitive delivery of information. These guidelines serve as a technical resource for key stakeholders (Cities of Avondale, Buckeye, Goodyear and Maricopa County) and their respective planning divisions as they develop strategies for design and implementation of signage within the El Rio project area.*

*One of the primary goals of these guidelines is the reinforcement of the El Rio identity along with the outline of parameters for signage uniformity and consistency throughout the project area. The document provides guidance for identity implementation, elements for wayfinding and orientation, general sign messaging possibilities, and sign placement parameters. It should be referred to when implementing signage within the project area for internal road and pathways and when replacing or retrofitting signs along existing transportation corridors that link with the Gila River and the project area.*





## 6.1 -Introduction

The following pages outline conceptual directions for a signage package addressing the principal sign types of:

1. Orientation and navigation
2. Information/regulation
3. Identity
4. Education

The concepts have, in part, incorporated pertinent aspects of the MAG Valley Path Brand & Wayfinding Signage Guidelines (Valley Path), so that there is a compatibility between the two, and to ensure that the El Rio identity remains primary and Valley Path a sub-set within.

When implementing signs that are contained in the MAG Valley Path Brand & Wayfinding Signage Guidelines, all specifications within that document should be followed, modifying them only as outlined.

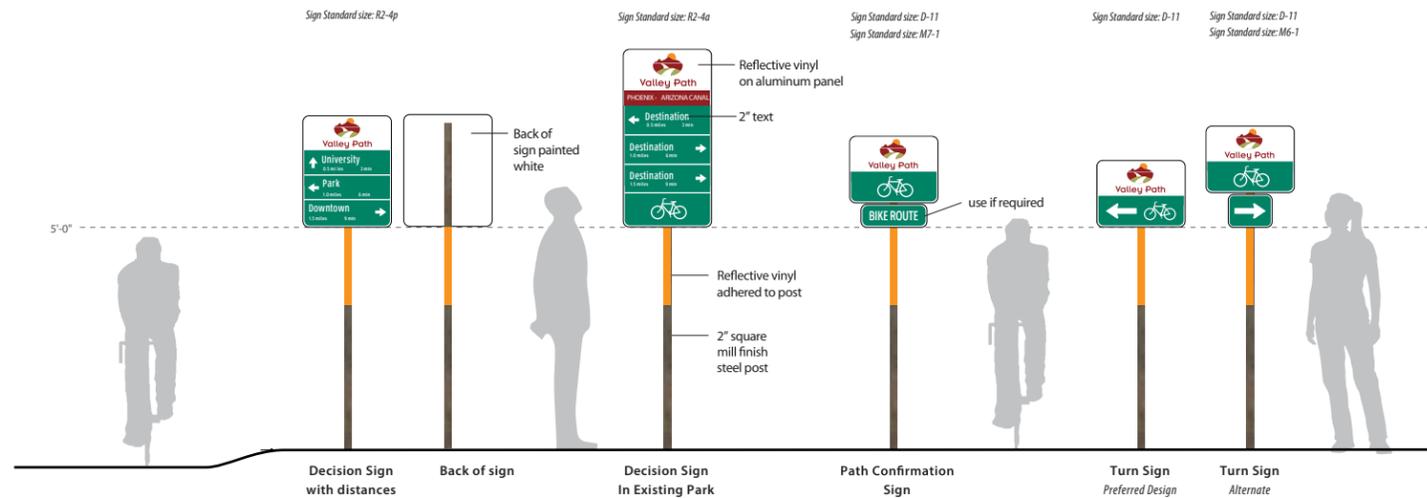
There are 2 concepts for directional, identity and education elements. Concept selection is at the discretion of the municipality in which the implementation will occur.

Since signage ordinances for the included municipalities vary greatly in their allowances and are not wholly reconcilable, it is recommended that where those ordinances govern this work, each municipality create an El Rio overlay or similar mechanism so that these concepts can be consistently applied over the entire project area.





El Rio logo



Valley Path Brand & Wayfinding Signage Guidelines as per MAG



Existing Identity Element  
@ Cotton Lane Bridge



Existing Educational Installation  
@ Bullard and Vineyard

## 6.2 - Design Criteria

Guiding factors in the development of the signage concepts have been:

1. EL RIO logo
2. Utilizing Valley Path standards (with modifications) for navigation and orientation elements
3. Developing distinct El Rio identity and education elements that are compatible with, and complimentary to, Valley Path standards
4. Utilizing materials and processes compatible with public, exterior uses
5. Using existing elements in developing material and color palette
6. Incorporating, where possible, the intangible of "transparency" as a connection to the open space and view standards outlined in Section 4 Open Spaces, Paths, Trails and Edge Treatments
7. Any necessary modifications in the following concepts should take into account these factors.

Note:  
The illustration of identities/logos in the following pages is a conceptual representation for general size and location, only. Each jurisdiction should refine application as per their graphic standards as they are at the time of implementation.

## Signage Guidelines



## 6.3 - Color and Material Palette



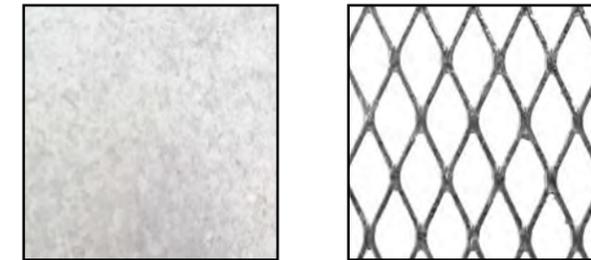
**Foundation**



**Accent**



**Galvanized Sheet, Stock, Shapes and Expanded Steel**



very durable, repairable finish  
readily available  
provides great contrast to logo/color palette

<p><b>Integral Graphic Panel (CHPL, Direct Embed or equal)</b></p>	<p><b>Standard and Custom-size Aluminum Panels with Reflective Vinyl Overlay and UV Graffiti Vinyl Overlamine</b></p>	<p><b>Board-formed Concrete</b></p>	<p><b>Rebar Framework with River Rock Fill</b></p>	<p><b>Exposed Aggritage</b></p>
<p>very durable readily available</p>	<p>very durable readily available ties to established elements</p>	<p>very durable rustic, natural appearance</p>	<p>very durable ties to established elements</p>	<p>very durable ties to established elements lower cost than river rock veneer</p>

The foundation materials outlined on this page have been chosen for their durability in an exterior, public environment as well as their reasonable cost and availability.

Vandalism or graffiti on graphic panels and galvanized/concrete materials can be removed or mitigated by appropriate mechanical or chemical means.

The addition of an anti-graffiti coating can also be employed in particularly vulnerable areas and to painted surfaces (most typically intended for application of project and municipality logos).

## 6.4 - Navigation Elements

The following descriptions have been taken from Valley Path and modified as appropriate.

### Decision Sign

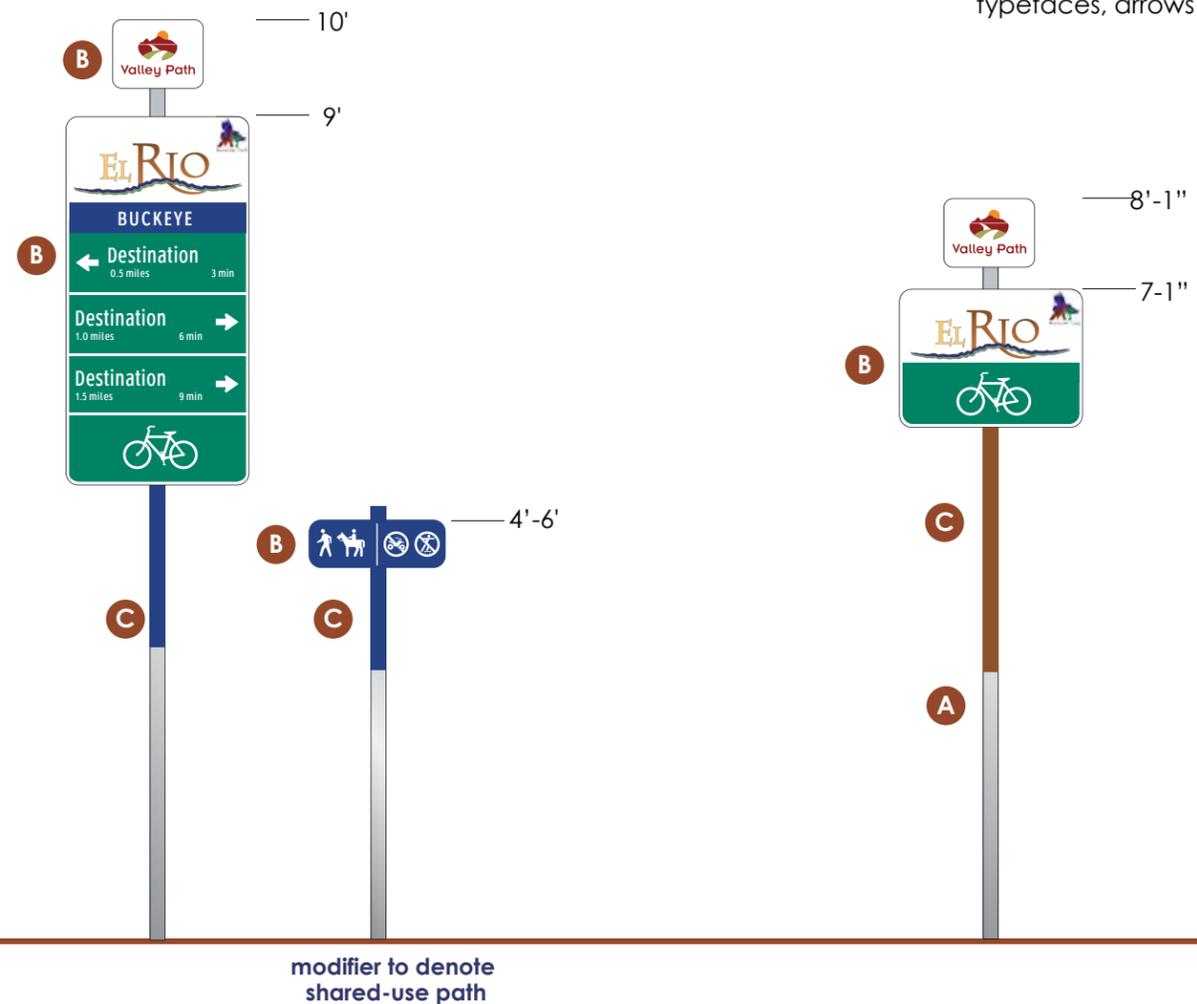
This is a decision sign in an established park or trail area and should be located at decision points.

This is a MUTCD-compliant sign type, using MUTCD approved typefaces, arrows and icons.

### Bicycle Path Confirmation

This is a path confirmation sign and should be located at points along the bicycle path to assure cyclists they are on the correct route. This is a MUTCD-compliant sign type, using MUTCD approved typefaces, arrows and icons.

These sign types have been developed specifically for bicyclists. Since all of the trails within El Rio will be shared use, it makes sense to utilize this sign type for all modes of travel along trails.



Valley Path standard Decision Sign modified for El Rio

Valley Path standard Bicycle Path Confirmation Sign modified for El Rio

scale 1/2" = 1'-0"

modifier to denote shared-use path





## Navigation and Regulatory Elements

The following mile marker description has been taken from Valley Path guidelines, modified as appropriate.

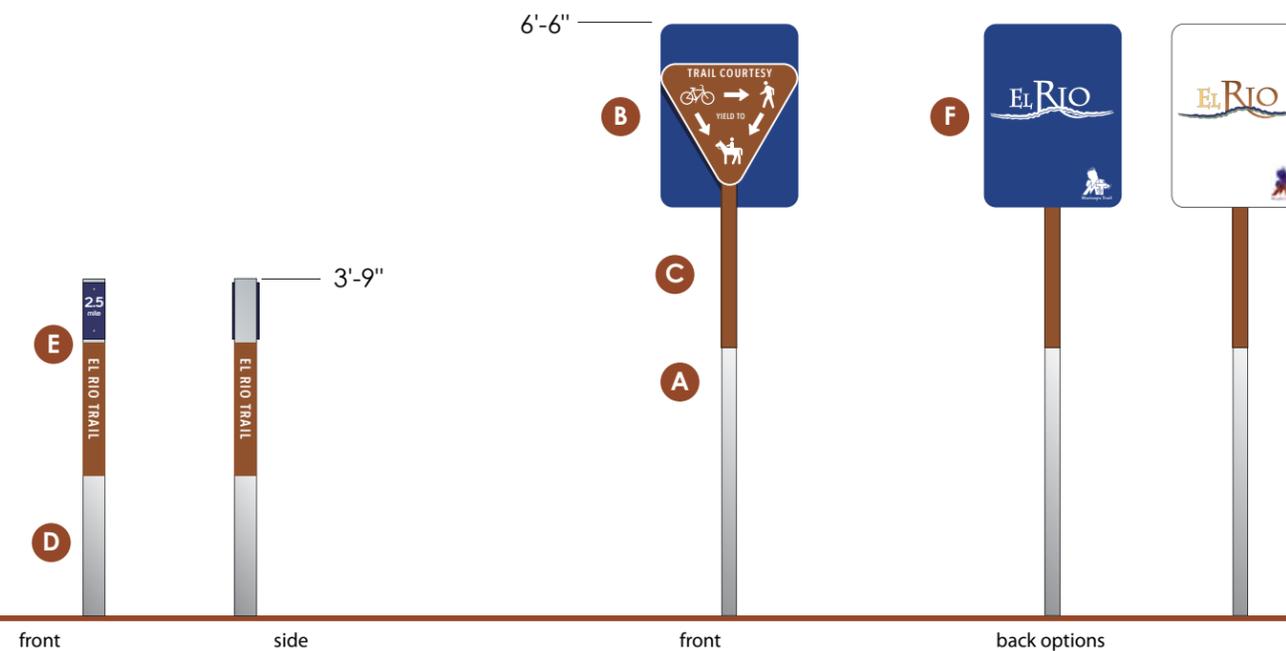
### Mile Marker

This is an informational sign for all path users and may be located at 1/4-mile increments along each trail.

### Regulatory

These signs supply the framework for information regulating behavior expectations. They can be standards (stop, yield, merge, etc.) as well as any specific directives particular to El Rio - i.e. "please stay on path". Material specifications in conformance to Valley Path.

- A** 2" square unfinished aluminum tubing (if installed in river bottom, flexible post such as "carsonite" to be used to mitigate flood damage.)
- B** standard aluminum panel with reflective vinyls and graphics - mechanically attached to aluminum tubing. back of panel is painted white.
- C** 2" wide applied reflective vinyl strip
- D** 3" square galvanized steel tube
- E** painted aluminum panels with reflective white vinyl text mechanically attached to steel tube.
- F** standard aluminum backer panel with reflective vinyl and graphics.



Valley Path standard modified for El Rio

Regulatory signs based on Valley Path standards

Standard kiosk specifications have been taken from Valley Path guidelines, with some modifications.

- A** mill finish architectural angle mechanically attached to i-beam.
- B** 1/4" thick integral graphic panels- both sides or one side only, mechanically attached to expanded metal or together through screen.
- C** graphic panels mechanically attached to side of i-beam/tubing
- D** 3x6 galvanized steel post
- E** galvanized expanded metal panel, mechanically attached to architectural angles or channel, top and bottom edges capped.
- F** 2" square galvanized steel tubing post
- G** galvanized steel panel, mechanically attached to posts
- H** painted and/or applied vinyl aluminum panels, mechanically attached to expanded metal.
- J** applied reflective vinyl/arrows

## Navigation and Orientation Elements

### Trail Kiosk

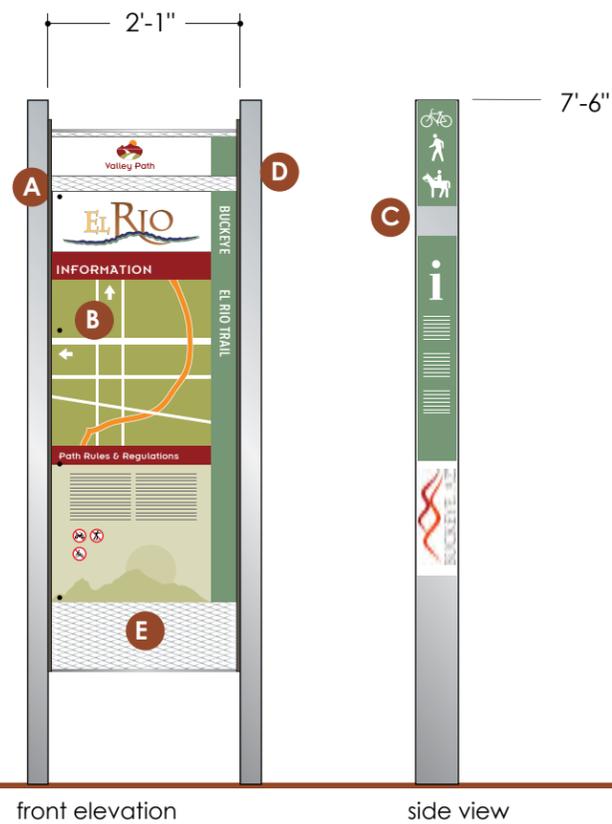
This is a double-sided informational sign for all trail/path users, located at entry/access points.

It can contain items such as trail maps, rules and regulations, points of interest, etc.

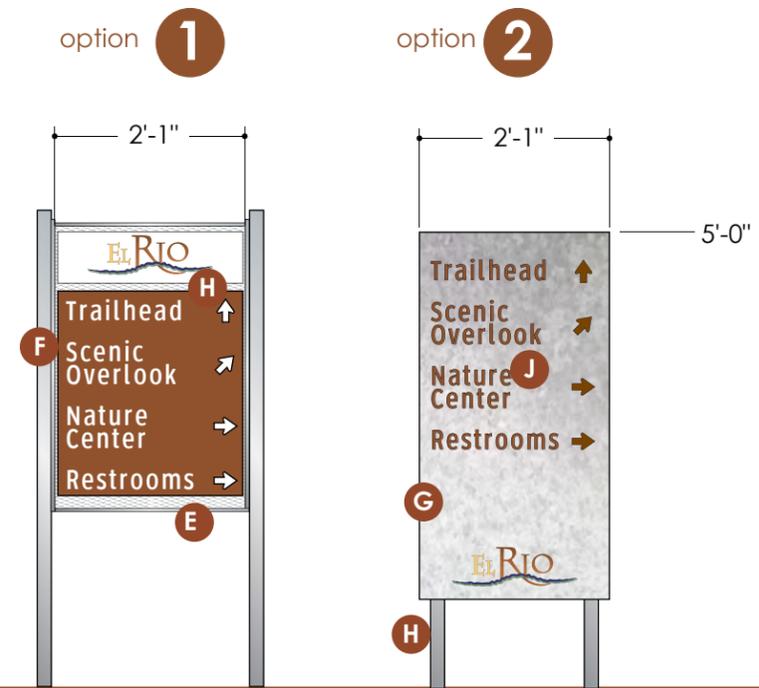
### Directional

These signs provide direction for those areas outside of designated pathways/trails, but within the project area. They are intended for both pedestrians and vehicular traffic. Vehicular applications are for parking areas and access roads of low mph and not for public roadways.

They can be single or double-sided.



Valley Path standard trail kiosk modified for El Rio



Vehicular/Pedestrian Amenity directional within project boundaries

## Signage Guidelines



## 6.5 - Identity Concept A



### Primary Project Identity

These are intended for installation at major vehicular access points to project or along significant edges.

The addition of a destination marker provides an identity for both the project and major amenities within.

Vertical and horizontal configuration options accommodate varying visual requirements and space available conditions.

### Secondary Project Identity

These are intended for installation at secondary vehicular and/or pedestrian access points. The destination marker panel is integral to concept, but can be either activated or left blank.



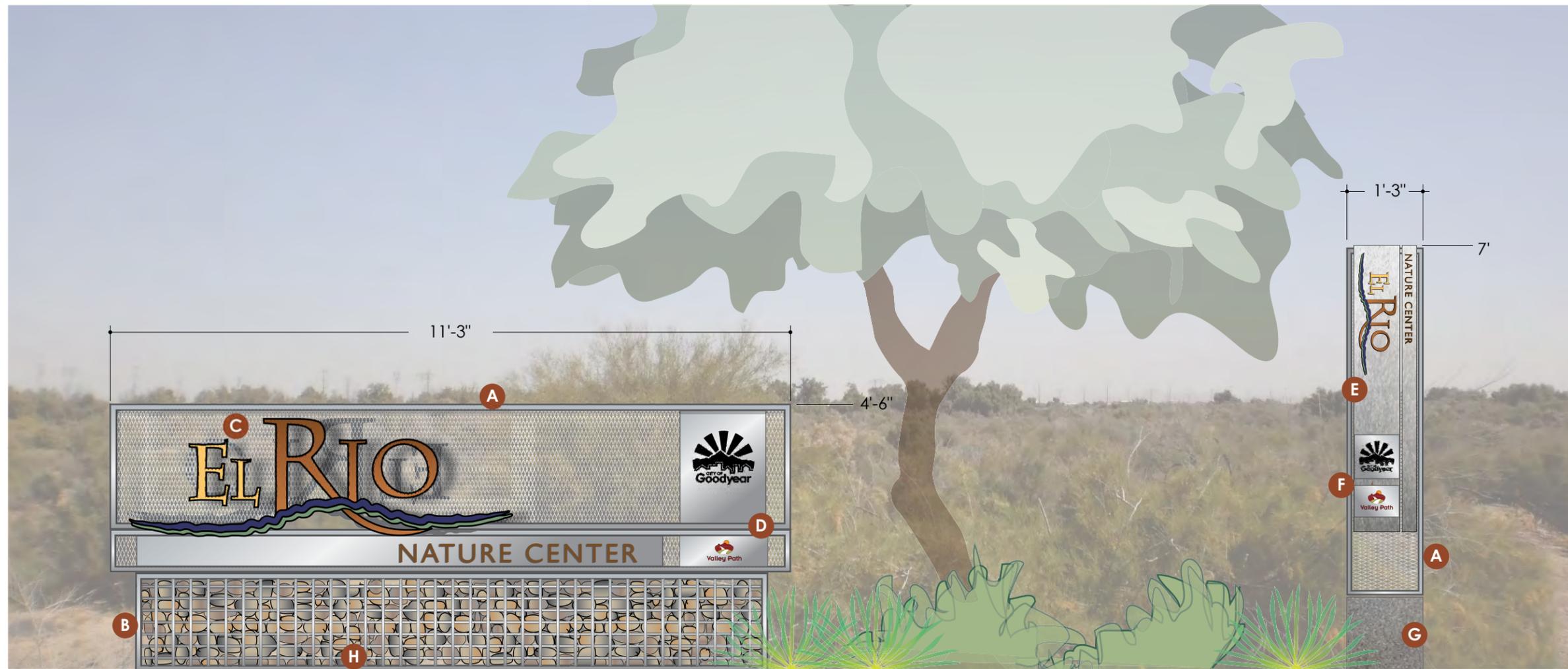
approximate scale - 1/2" = 1'-0"

Primary Project Identity  
vertical configuration

Primary Project Identity  
with destination marker

Signage Guidelines

- A galvanized framework with expanded metal inset.
- B rebar/angle framework base with river rock fill.
- C painted FCO letters/logo mechanically attached to expanded metal inset.
- D municipal and "Valley Path" logo panels mechanically attached to expanded metal inset
- E galvanized metal panels, breakformed over top of framework.
- F municipal and "Valley Path" logo panels mechanically attached to galvanized panel.
- G exposed aggregate concrete base
- H external lighting washes front and back faces



approximate scale - 1/2" = 1'-0"

**Primary Project Identity  
horizontal configuration  
with destination marker**

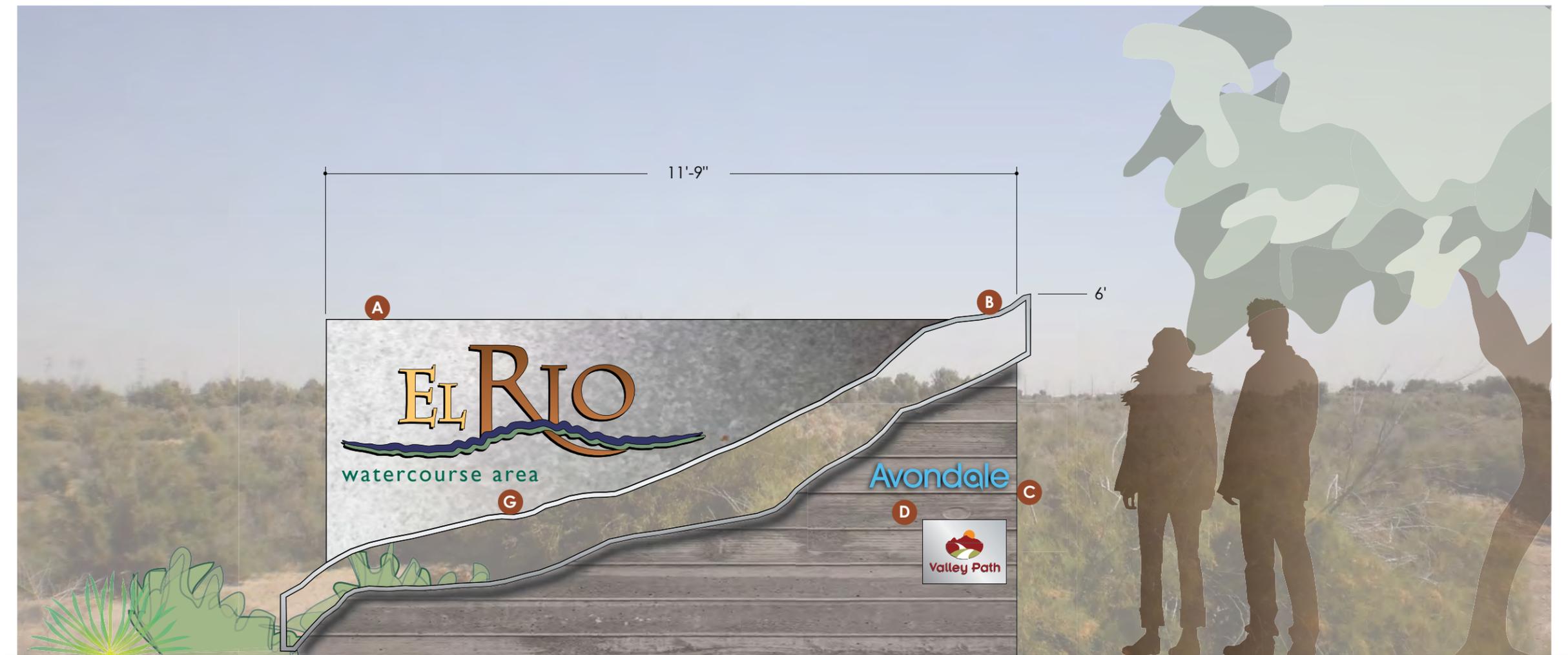
**Secondary Project Identity**

## Identity Concept B

see descriptions on sheet 6.8  
section 6.5 - Identity Concept A



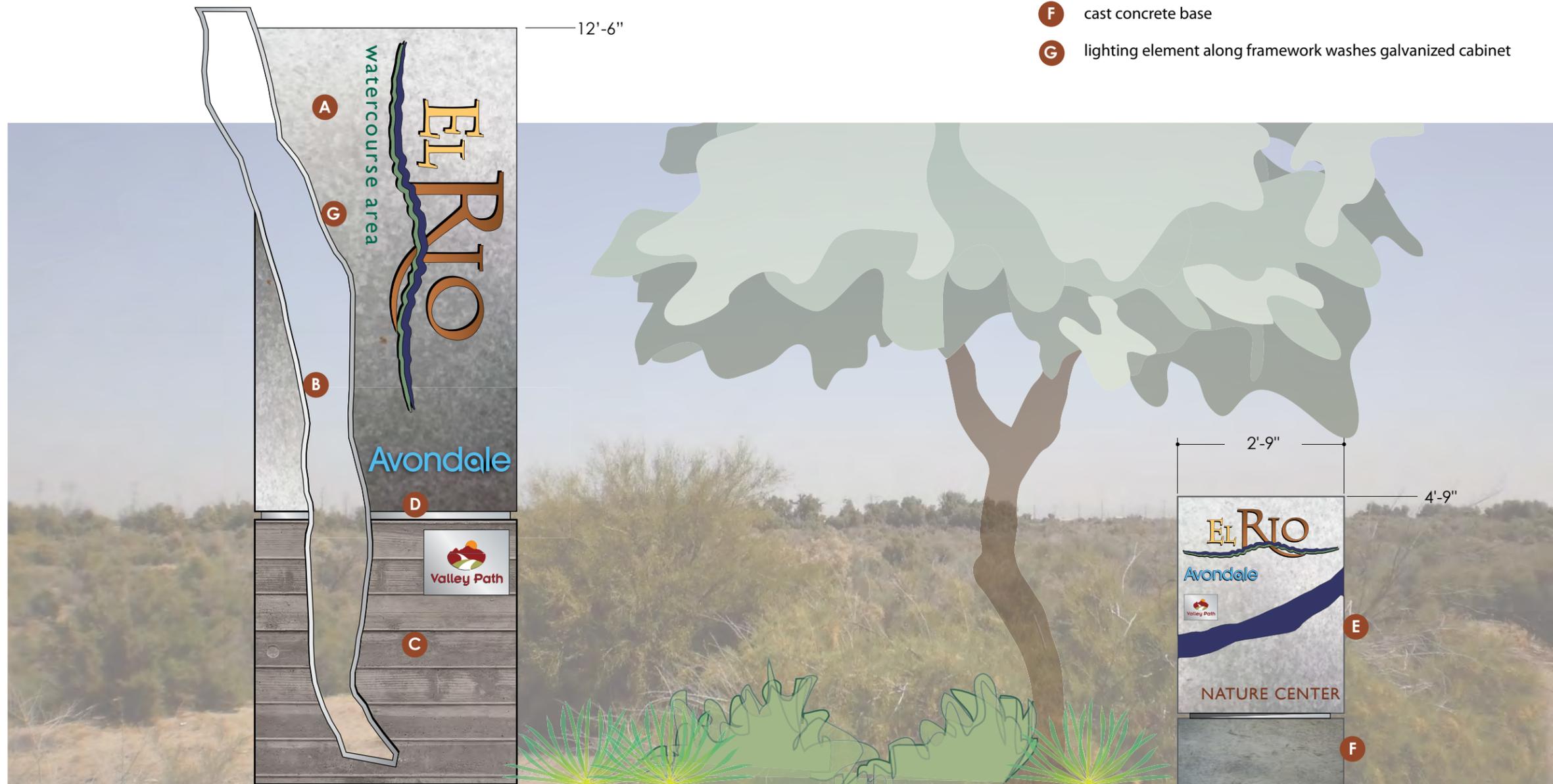
alternate with translucent fiberglass "river" panel



Primary Project Identity  
horizontal configuration

Signage Guidelines

- A** galvanized cabinet with dimensional "EL RIO" FCO identity overlay secured to face
- B** open "river" galvanized structural steel framework
- C** board-formed concrete base
- D** FCO municipal logo and "Valley Path" logo panel secured to concrete face
- E** galvanized sign cabinet face - logo and "river" are cut out and backed with color panels.
- F** cast concrete base
- G** lighting element along framework washes galvanized cabinet



approximate scale - 1/2" = 1'-0"

**Primary Project Identity  
vertical configuration**

**Secondary Project Identity**



## 6.6 - Educational Concept A

All elements are intended as single units that can be set alone or in a grouping, configured in various geometries. This approach allows for application to a wide range of conditions.

### Primary Element

The framework/expanded metal configuration allows for application of multiple and varied size interpretive panels. The unit can be 4 sided (all equal dims.) or 2 sided (narrow side dim.) and is intended to be installed at major points of interest where there is sufficient space for gathering.

### Secondary Element

Utilizing the same framework as the primary element, this element is intended to be installed at secondary points of interest where gathering space is limited or where the displayed information is minimal.

### Panoramic Element

Utilizing the same framework as the primary element, this element is intended to be installed at overlook points - either as a stand alone unit or attached to site railings.

### Botanical Marker

This element is used to identify pertinent plant material or other individual, dispersed elements of interest and applies to both Educational Concepts.

- A** galvanized framework with expanded metal inset
- B** rebar/angle framework base with river rock fill
- C** integral graphic interpretive panels attached to expanded metal/framework
- D** galvanized post
- E** panoramic graphic panels set at an angle for best visibility
- F** overhead shade element - galvanized framework with translucent fiberglass panel inset
- G** space allocation for incorporation of link/information access - either URL, QR code, brochure holder or similar
- H** galvanized post fabricated at an angle with mechanically attached, etched stainless steel text panel



- A** galvanized framework with woven metal strap inset. straps have mounting holes on 2" centers
- B** board-formed concrete base
- C** integral graphic interpretive panels attached to metal straps
- D** galvanized post
- E** panoramic panels set at an angle for best visibility
- F** overhead shade element with translucent fiberglass panel inset, solar panels for overhead lighting
- G** water capture trough/ runnel to adjacent plant material
- H** space allocation for incorporation of link/information access - either URL, QR code, brochure holder or similar

## Educational Concept B

### Primary Element

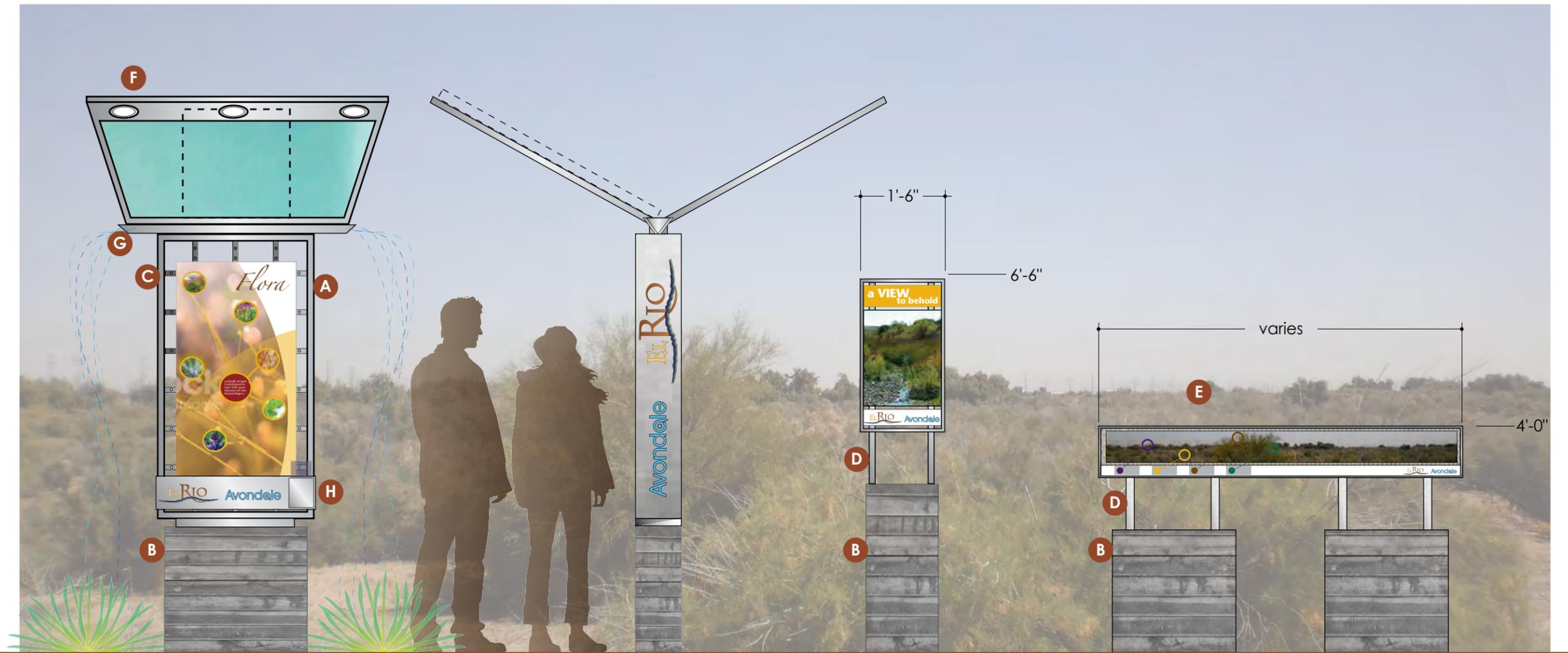
The framework/woven strap configuration allows for the application of multiple and varied size interpretive panels. The unit is double sided and is intended to be installed at major points of interest where there is sufficient space for gathering.

### Secondary Element

Utilizing the same framework as the primary element, this element is intended to be installed at secondary points of interest where gathering space is limited or where the displayed information is minimal.

### Panoramic Element

Utilizing the same framework as the primary element, this element is intended to be installed at overlook points - either as a stand alone unit or attached to site railings.



approximate scale 1/2" = 1'-0" front elevation

side elevation

can be rail mounted as shown in Concept A

Primary Educational Element

Secondary Educational Element

Panoramic Educational Element





minimum 5' from edge of expected mature tree canopy



vertical identity elements

adjacent shrub or groundcovers to have a mature height no greater than base



at the time of installation, adjacent plant material canopy to clear the top of horizontal elements by at least 2'

2' min.



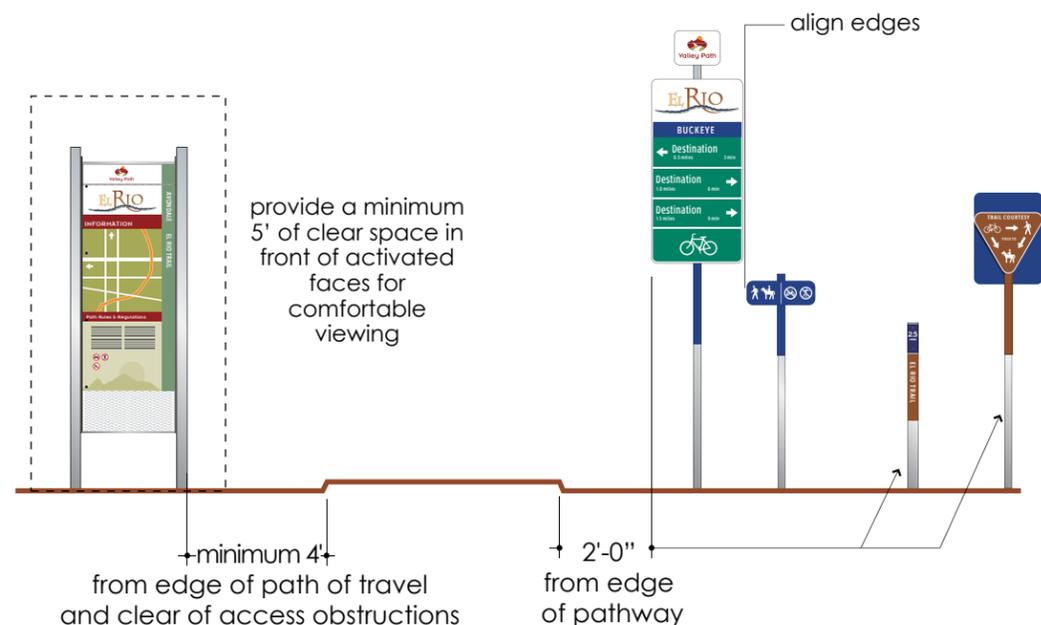
horizontal identity elements

plant material or other obstructions to be kept clear of sightlines from path or roadway to sign for a distance appropriate to useful viewing

2' from edge of road or pathway



limit planting in front of horizontal elements to low groundcover



provide a minimum 5' of clear space in front of activated faces for comfortable viewing

minimum 4' from edge of path of travel and clear of access obstructions

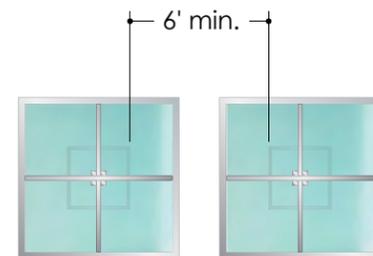
2'-0" from edge of pathway

align edges

plant material or other obstructions to be kept clear of sightlines from pathway to sign faces for a distance appropriate to useful viewing

trail kiosk/ educational elements

pathway direction/information/regulatory elements



plan view

provide a minimum 6' clearance between grouped elements or adjacent obstructions for comfortable circulation and viewing

education elements

# Economic Development

*Economic development opportunities vary by community and will generally be guided by regional assets, adjacent land uses, existing and planned trails and recreational venues, and the specific community's vision. All three cities have existing, or planned, primary trailheads that connect to the river, with its vast natural environment and its rich variety of recreational experiences. Each community's vision for capturing economic development opportunities is discussed in this chapter.*

*The El Rio project corridor is truly a unique treasure in Maricopa County. This portion of the project corridor associated with the river provides habitat for wildlife and also affords a vast array of recreational opportunities not found in other parts of the Valley, including the potential for: boating, fishing, hunting, walking, hiking, bicycling, and horseback riding. This regional resource also offers wilderness areas for passive uses, such as wildlife watching. All of these opportunities have the potential to serve as economic catalysts for the surrounding communities.*




Avondale BUCKEYE, AZ





## 7.1 Background and Assessment

The El Rio project corridor covers a stretch of approximately 17.5 miles of the Gila River running through Avondale, Buckeye, Goodyear and unincorporated areas of Maricopa County in the southwestern valley. This river corridor is composed of, primarily, a loose network of unmaintained trails and off road vehicle tracks that provide access to hikers, bikers, campers, boaters, fishermen, bird watchers and other recreationists.<sup>1</sup> Currently, there are limited developed recreational amenities and public facilities, such as parking, water and bathrooms.

General land use plans and existing trail networks for each community were reviewed to determine the current land use adjacent to the El Rio corridor. Within the City of Buckeye and unincorporated Maricopa County, open space and low density residential are the dominant land use types; mixed use, residential, and open space are the dominant land use types in the City of Goodyear; and the land uses in the City of Avondale include open space and low-density residential.<sup>2</sup>

Planned within proximity of the El Rio corridor, is the future State Route 30 (SR30), which is intended to be a reliever for Interstate 10. SR30 spans about 14 miles, connecting the new Loop 303 to the Loop 202, and passes through the Cities of Avondale and Goodyear. Its most southern proposed alignment provides the greatest access to the El Rio corridor, however, construction of SR30 is not anticipated until 2026, and then only if funding becomes

available.

Transportation projects, such as SR30, affect economic development by increasing efficiency, which can boost productivity, reduce transportation costs, and improve industry's access to customers, resources and the labor force. They can also improve access to parklands and wilderness areas, which then draw in visitors to partake in hiking, boating, hunting, fishing and wildlife watching. One example of a major transportation project is the Price Road Corridor in Chandler, which stretches into Tempe. This corridor facilitates access among employment hubs and serves as an anchor to major shopping centers on each end; Tempe Marketplace on the north and Chandler Fashion Square on the south. The Price Road Corridor has been underway for the last 50 years, but it wasn't until there was a density of population that stimulated recreational, cultural, office, industrial and retail development. In short, transportation projects enable economic growth and development, but do not cause them.



### Avondale

Of the three communities, Avondale has the smallest portion of the El Rio project corridor within its jurisdiction. The city would like to brand the El Rio portion of the project corridor associated with the Gila River as an outdoor recreational hub within their community by invigorating the river with active recreational activities. This vision includes a series of small lakes for fishing, kayaking and canoeing. Festival Fields is the city's pilot project and is located south of Lower Buckeye Road adjacent to the Agua Fria River and is a part of the El Rio project corridor. The Avondale pilot project is located on the north bank of the Agua Fria River and currently provides ball fields for planned sporting events and ramadas for picnicking. This location is easily accessible by vehicle and bicycle, and includes potential linkages to linear trails for hiking and equestrian uses, as well as connecting to Maricopa County's Sun Circle Trail and the Maricopa Trail. A second phase of Festival Fields is planned by the City of Avondale and will include

the expansion of the ballparks and ramadas. Given that existing parking for residents and visitors is available at Festival Fields and PIR, the city is able to stage large events, festivals and activities that attract large groups of people.

The Buckeye Water Conservation Drainage District (BWCCD), which has land holdings within Avondale, has discussed a variety of concepts relating to active outdoor recreation. These concepts include mechanized water skiing, adventure rope courses, zip lines, motocross and BMX facilities and white water rafting. These types of activities could be staged on BWCCD land within the El Rio project corridor. Fees could be generated through concessions, users of the facilities and sponsorships.

In addition to the El Rio project, Avondale has connectivity to the Tres Rios project, which is located immediately to the east of the confluence of the Agua Fria and Gila Rivers, and offers primitive hiking and equestrian trails. The city's desire is to create a trailhead at the historical base meridian marker where there is an opportunity to create access for hunting and future water sports. Presently there is only one bridged crossing of the Gila River immediately east of the terminus of the El Rio project corridor at Avondale Boulevard. El Mirage Road, immediately east of the project corridor, is a low water crossing and is subject to closure during flow events.

<sup>1</sup> "El Rio Watercourse Master Plan Overview."

<sup>2</sup> Ibid, p6

## Economic Development



### Goodyear

The city's plans are long term and very much dependent upon two proposed residential development projects: Lakin Property, located north of the river and east and west of Cotton Lane, and King Ranch which is located south of the river, also east and west of Cotton Lane. These developments include commercial land uses within proximity to the El Rio project corridor. These could be instrumental in attracting a wide variety of businesses, including those that provide services to residents and visitors, as well as those businesses that want the ambiance of being adjacent to the river. The "Edge" treatments, described earlier, would allow a direct connection to all users and types of businesses to the recreational elements that are programmed to be an integral part of this river ecosystem.

The city's vision of the El Rio project corridor associated with the river edge interface is for passive recreation, which includes hiking, cycling, and bird watching. The connection of trails is a policy objective outlined in the city's recently adopted "Parks, Recreation, Trails and Open Space

Master Plan," whereby city trails connect to the El Rio project corridor and to Estrella Mountain Regional Park trails. Presently, accessing the trails and river is very limited, as there are few transportation linkages. The city, however, does have three bridged crossings, including Bullard Avenue, Estrella Parkway and the recently completed Cotton Lane, which has a series of viewing platforms that extend out over the river and have made an El Rio statement with current bridge signage.

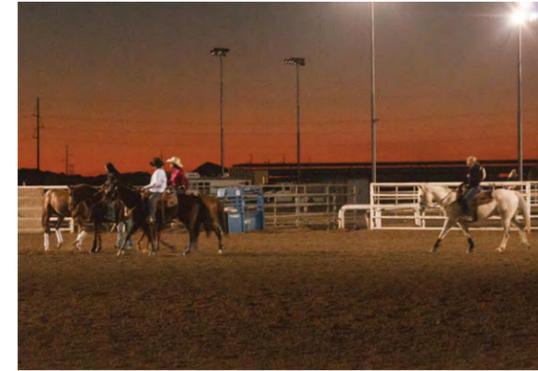
The Goodyear pilot project, which is located southwest of Bullard and Vineyard Avenues, is a proposed trailhead development that would provide trail and river access for hiking, automobile parking and equestrian trail amenities. This trailhead not only connects to the El Rio project corridor, but also to the city's Bullard Wash Trail via the BWCDD canal bank.

### Buckeye

The City of Buckeye has very large aspirations for leveraging the El Rio project corridor into a wide variety of economic development projects. In addition to linear parks and trails along the river banks, they are planning for a series of lakes through the remediation of sand and gravel pits within the river corridor. Also under consideration is the extension of the Buckeye Canal south into downtown to create a river walk, similar to the iconic San Antonio River Walk, which would include boating and water features. The proposed plan is for that canal experience to branch off and connect to the El Rio river trail and river ecosystem. Trail development, ecosystem restoration and environmental education, similar to the Rio Salado Project in Phoenix is also proposed to be of high importance to the City of Buckeye.

The type of development envisioned along the river's edge includes retail, office, high density residential, education and healthcare. The medical component would have a strong focus on health and wellness and would tie nicely into outdoor recreation. Creating a winter destination for a variety of Olympic training venues, such as kayaking, associated with the City of Buckeye lake projects, will lend itself to hotel and conference center development, and could serve as a catalyst for the attraction of a wider variety of land uses, including universities and educational campuses.

Current access to trailheads and the river on the north bank is limited to dirt roads. The newly constructed Cotton Lane Bridge



incorporates a series of viewing platforms that extend out from the bridge over the river for habitat and wildlife viewing, and this crossing includes existing El Rio monumentation signage at each end of the bridge. In the future, a bridged crossing at Watson Road is envisioned that would connect the north and south banks and include viewing platforms. These El Rio Design Guidelines and Planning Standards indicate several new trailhead and river access nodes within the City of Buckeye that could help to build upon the city's current vision for an active and economically viable river corridor.

The Buckeye pilot project is a 40 acre parcel located west of Miller Road and south of the Canal. To the north of the pilot project is the South Buckeye Equestrian and Events Center, which includes state of the art boarding facilities, portable stalls, lighted arenas, and a RV Park. The city's pilot project envisions connectivity to the Equestrian Center, as well as new and existing trailheads for hiking and equestrian uses. It will also contain vehicle parking, an equestrian staging area, scenic overlook and picnic areas.





## 7.2 Economic Benefits

Over the years there have been numerous economic studies prepared by community leaders and planners to understand and document the value of trails, greenways, parks, open space, hunting, fishing and wildlife watching to the local economy. These studies have concluded that trails enhance the quality of life and build strong economically vital communities. In addition to providing an amenity to residents, trails and linkages to outdoor recreation can also help foster the growth of business, enhance property values, and revitalize neighborhoods. Outdoor activities such as hunting, fishing and wildlife watching attract residents and non-residents to the area to partake in these activities and they will often purchase equipment and spend money on food and lodging at areas that offer these unique experiences.

Another benefit that has been documented is the economic value of physical activity. People who live in walkable neighborhoods, or who can easily access open space, trails and bike paths, are more likely to be physically active and less likely to be overweight and



obese, thereby reducing healthcare costs. This also holds true for adolescents. In a national study, it was found that youth with access to multiple recreation facilities are more physically active and have a greater chance of reducing/preventing childhood obesity.<sup>3</sup>

Providing recreational opportunities and facilitating economic development comes with a cost. When evaluating the return on investment, many regions with river recreational corridors generate revenue from staged activities and special events as a way to cover the capital cost and expense of facility maintenance. Examples of the type of activities that generate income include: staged river walks and runs, flotillas on the river, music festivals, craft fairs, and classes, to mention a few. Business opportunities also exist for concessions, including food service, the rental of equipment (boats, paddleboards, etc) and equestrian trail rides. Other opportunities include agricultural leases within a greenway. Generating revenue and documenting the economic benefit can be multi-faceted. The return on investment could include the tax increment generated from the increase in property values, the retail sales tax from tourism spending, and the direct fees earned from concession contracts and registration fees from special events and classes.

This research has shown that a growing number of communities are using a "trail town" model, which places trails as the centerpiece of a tourism based strategy for community revitalization. The results show that these

communities are experiencing significant positive economic impacts. The trail town approach not only fosters cycling and hiking, but also provides the opportunity to link these trails to local businesses and downtowns.

Key findings of the economic impact research include the following:

**Trails** - The economic impact of visitor and tourism expenditures resulting from connecting communities and trails has proven to be long lasting and have ongoing positive effects.

1. The number one amenity that potential homeowners cite when they are looking to move into a new community is a trail system (National Association for Home Builders).
2. Trails have proven to be a catalyst for revitalizing neighborhoods by spurring development of new housing and businesses that can take advantage of the location adjacent to the trail.<sup>4</sup>
3. Bicycle tourism, a growing segment of the tourist market, has become an economic development vehicle for communities that have businesses connected to trails and trail use.
4. A study in Nebraska found that for every \$1 spent on trails, there was almost \$3 in savings in direct medical costs.<sup>5</sup>
5. In San Jose, California, Cisco Systems touts the trails as a competitive advantage for attracting and retaining employees and reducing healthcare costs.

**Open Space and Property Values** - Several studies demonstrate that open space can provide a wide range of benefits to residents and local governments.

1. Open spaces can lead to higher property tax revenues for local governments by increasing the value of nearby homes. In Austin, Texas increased property values associated with a greenway were estimated to result in \$13.6 million of new property tax revenue, and in Dallas, Texas developers report that there is a 25 percent premium for properties adjacent to the Katy Trail.<sup>6</sup>
2. Trails are providing a valuable amenity and translate into increased housing values. This was documented in a study on property values in Indianapolis, Indiana which found that proximity to a greenway has a statistically significant positive effect on property values to the tune of \$140 million.
3. Impact of the Phoenix Mountains and South Mountain preserves on residential property values in Phoenix finds that homes closer to the preserve (up to 1/2-mile) were higher in value, which supports the findings of similar studies for other regions. Further, the factors that influence the impact on adjacent developed lands include the shape, size and character of the open space preserve along with the type of activities in the preserve.
4. The positive effect of access to natural open space on property values depends upon the proximity/adjacency of private properties to

<sup>3</sup> Gordon-Larsen P, Nelson M, Page P, et al. "Inequality in the Built Environment Underlies Key Health Disparities in Physical Activity and Obesity." *Pediatrics*, February 2006.

<sup>4</sup> Rails to Trails Conservancy, "Trails and Economic Development," August 2007.

<sup>5</sup> Active Living Research, "The Economic Benefits of Open Space, Recreation Facilities and Walkable Community Design." Research Synthesis, May 2010.



the open space. The economic value of open space and natural areas was greater for higher density urban areas than rural areas, where it was concluded that in rural areas there is already a relatively large amount of undeveloped land (both public and private) thereby diminishing the price premium associated with living close to a public open space.<sup>7</sup>

5. Rio Salado Master Plan in Phoenix, Arizona, examined a number of benefits that came from the development of the Rio Salado. One area examined was the effect on property values. The report concluded that property values of land rescued from floodplain will increase 4 to 5 times and the value of land adjacent to water will also increase substantially.<sup>8</sup>

**Events** - The programming of activities and events positively impacts tourism and generates revenue for the region.

1. Nearly 5 million people have attended a special event at Tempe Town Lake since it opened. These events have

generated \$166 million in total return on investment, with most of these events raising money for local charities. Events have included Fantasy of Lights Boat Parade, Fourth of July celebration, concerts, races, etc. In addition, classes are offered in rowing, beach yoga and stand up paddle boarding. Boat rental and storage and park rentals also generate income.

2. Major events staged within Pennsylvania's Lackawanna Heritage Trail contribute to the \$31.3 million in economic impact and \$2 million in tax revenue generated. Special events that are staged include an annual bike tour, half and full marathons and clean-up events.

**Wildlife Watching** - Nationwide there is an avid and growing wildlife watching population. Activities include observing, feeding and photographing.

1. According to a study by the U.S. Fish and Wildlife Service, Arizona has a birding participation rate of 18 percent, slightly below the national average of

20 percent.<sup>9</sup> Total spent by residents and nonresidents on wildlife watching in Arizona during 2011 was \$936 million. These expenditures include food and lodging, transportation, equipment rental, and purchases of wildlife watching equipment.<sup>10</sup>

2. The total economic impact of wildlife watching in Maricopa County by both residents and non-residents is \$644 million. Of this, \$381 million is from retail sales generating \$42 million in state and local tax revenue.<sup>11</sup>

**Development Activity** - The correlation between river recreational corridors and urban development can be significant.

1. Tempe Town Lake in Tempe, Arizona, has a variety of existing residential and commercial development valued at \$356 million. In the works is another estimated \$241 million in development projects. More than 1,000 people currently live at Town Lake, and with the completion of other residential projects there will be more on the way. Town Lake merchants and hotel sales revenues total more than \$753 million since 1999, which translates into significant sales tax revenue for the City of Tempe.<sup>12</sup>
2. The Rio Salado Master Plan, Phoenix, Arizona, evaluated the economic impact of the plan on the district and on the region. They concluded that the predominant development type attracted to this public amenity would be residential. In areas where there

is existing commercial development, additional commercial development is likely to follow, creating jobs both during the construction stage and the ongoing operations. The growth in permanent jobs is estimated at 74,000 and the supply of new housing units would increase by 16,000. The annual amount of property tax revenues due to the rescue of land from the existing floodplain is \$37 million.<sup>13</sup>

3. The Bayou Greenways 2020 initiative in Houston, Texas, is a seven year program to connect linear parks for 150 miles along nine bayous within the city limits. Redevelopment has been propelled by public/private partnerships and voter and philanthropic support. Underway along the Bayou is an 18-story, 250,000 square foot office building, a 7-story, 22 unit condo project and a planned 40-story mixed use residential and retail high rise building. The Bayou project has awakened the economic development potential of the city.

There exists conclusive evidence that by consciously linking trails and businesses, and by providing new desirable housing choices within proximity and connected to trails, communities around the country are building vital, economically stable neighborhoods. The economic benefits of trails can play an important role in policy makers' decisions about zoning, restrictions on land uses, government purchase of lands for parks and investments in similar initiatives that include trail linkages in the decision process.

<sup>7</sup> Active Living Research. "The Economic Benefits of Open Space, Recreation Facilities and Walkable Community Design. Research Synthesis, May 2010.

<sup>8</sup> Rio Salado Development District. "Rio Salado Master Plan, January 1985."

<sup>9</sup> U.S. Fish and Wildlife Service. "Birding in the United States: A Demographic and Economic Analysis," Addendum to the 2011 National Survey of Fishing, Hunting and Wildlife-Associated Recreation.

<sup>10</sup> U.S. Fish and Wildlife Service. "2011 National Survey of Fishing, Hunting and Wildlife Associated Recreation-Arizona."

<sup>11</sup> Tucson Audubon Society. "Economic Contributions of Wildlife Viewing to the Arizona Economy: A County Level Analysis, 2013." Southwick Associates and Arizona Game & Fish Department.

<sup>12</sup> City of Tempe. "Tempe Town Lake by the Numbers, 2012"

<sup>13</sup> Rio Salado Development District. "Rio Salado Master Plan, January 1985."

## Economic Development





## 7.3 Economic Development Opportunities

An examination of other river parks and trails in the U.S. was conducted to learn innovative and effective approaches to river and trail-based economic development. Many cities, such as: Denver, Colorado; Tempe, Arizona; San José, California; and Dallas, Texas, are aggressively transforming their underutilized floodways into active recreational amenities, and in so doing, are enhancing the quality of life and furthering their economic prosperity. To gain an understanding of what recreational amenities and activities are being programmed, and help identify economic opportunities that other cities are experiencing, research was conducted on five river and trail systems around the country, which may have some applicability to the El Rio project corridor. The five river systems evaluated for this analysis include:

1. **Guadalupe River Park and Bay Ridge Trail** – This urban trail along the Guadalupe River within the City of San Jose, California offers an abundance of recreational, educational and quality of life amenities. Staged events draw upwards of 150,000 people a year. The Guadalupe River Park connects to a much larger trail system called the Bay Ridge Trail within the San Francisco Bay Area.
2. **James M. Cobb River, Colorado River State Park** – This river trail project in Western Colorado links together a series of five lakes that provide a variety of recreational and nature opportunities for residents and visitors to experience.

3. **The Lackawanna River Heritage Trail** – This Pennsylvania multi-purpose trail system connects 30 communities. In addition to recreational opportunities, a primary objective is fostering economic development within the communities by activating the trails with public art, annual festivals, team training and numerous races and competitive events, thereby encouraging destination tourism.
4. **Tempe Town Lake** – The City of Tempe, Arizona developed an urban lake that was channelized, which resulted in reclaiming several hundred acres of land for commercial and office development. Recreational amenities include a beach park which is used year-round to stage outdoor activities.
5. **Trinity River Project** – This massive public works project for the cities of Dallas and Fort Worth, Texas provides flood protection, recreation, environmental restoration, economic development and major transportation components.

The following river system case studies are applicable to the El Rio Design Guidelines and Planning Standards in that they illustrate a wide variety of recreational and real estate opportunities, as well as the economic and quality of life Impacts they have on their surrounding areas. Some of these projects have been in existence for decades, while others are relatively new. All of them are considered “works in progress” and endeavor to take advantage of evolving consumer desires and market position.

Management of these river facilities is critical to ensure that the millions of dollars spent on planning and capital investment are sustained. Maintenance of the river corridor and administrative tasks, such as strategic planning and marketing, are ongoing activities of the fiduciary agency

or non-profit organization. For multi-jurisdictional river corridors, the creation of a single entity to maintain, plan, market, fund-raise and forge public-private partnerships has been the administrative approach taken.



### Guadalupe River Park and Bay Ridge Trail

#### *San José and the Bay Area in California*

#### BACKGROUND

Guadalupe River Park is a 253 acre three-mile stretch of parkland that runs along the banks of the Guadalupe River in the heart of downtown San José, California. This three-mile stretch is composed of 2.3 miles of trails and includes a series of seven sister city plazas, playground areas, water

features and public art. There are in total 27 various exhibits and plazas to educate the multitude of visitors about the city's history, the river's natural environment along with information on flood protection measures.

The *San José Business Journal* identifies the Guadalupe River Trail as one of the city's top attractions. San José annually hosts 10 major events along the Guadalupe River Trail. These popular events each draw up to 150,000 attendees. Bike Valet Parking is offered by the Silicon Valley Bicycle Coalition at the San José Blues Festival and

Music in the Park. Connections to other paths and transportation hubs as well as a future BART station, encourage use of the River Walk by commuters. In addition, the River Walk ties into the Countywide Trails Master Plan system and serves as a link in the larger regional trail system, the Bay Area Ridge Trail.

The Bay Area Ridge Trail, which currently consists of 350 miles, traverses a multitude of jurisdictions along the ridgelines overlooking the San Francisco Bay. The Bay Ridge Trail is a multi-use trail for hikers, runners, cyclists and equestrians. Its focus is on active outdoor recreation and communing with nature and offers geocaching opportunities and activities and outings for families and children. The Bay Area Ridge Trail Council formed a corporate partnership with REI, who is helping to promote the active engagement of kids and families, whether it be hiking, cycling or camping.

The first segment of the Ridge Trail was dedicated in 1989 and involved a collaborative effort on the part of countless public, private and community partners and advocates. Today oversight is conducted by the Bay Area Ridge Trail Council, whose mission is to create a continuous 550+ mile trail. When complete, the Ridge Trail will connect over 75 parks and open spaces. This continuous, long-distance, trail is also creating a protected greenbelt corridor for habitat and wildlife.

### MANAGEMENT

In 1992, the Bay Area Ridge Trail Council became an independent 501(c)(3) nonprofit organization. The Council continues to collaborate with countless public, private and community partners and advocates in all nine Bay Area

counties to create more miles of Ridge Trail. The council is responsible for planning, acquiring, designing, building, caring for and promoting the Ridge Trail and have been doing so for the past 26 years.

## James M. Robb Colorado River State Park (String of Pearls)

### Colorado

#### BACKGROUND

The James M. Robb Colorado River State Park links a series of parks via a 35 mile trail system along the river corridor, which is referred to as a "String of Pearls." This trail system is used for hiking, walking, and cycling. Each section of the String offers various activities.

**Fruita Section** – This portion is open year-round for camping and day use, including boating, fishing, picnicking and seasonal bird watching. Amenities include parking, restrooms, showers and recreational vehicle dump stations.

**Connected Lakes** - Connected Lakes provides a network of trails that traverse a series of ponds. Visitors find a wide variety of recreational opportunities, including fishing, picnicking, hiking and bird watching. Amenities include:

1. River launch site for boaters and rafters
2. Several handicapped accessible fishing piers/structures
3. Picnic shelters
4. Fishing - warm water only
5. Boating - electric motors only in ponds



**Colorado River Pear Park** - The numerous small lakes in the Pear Park trail section provide critical habitat for endangered fish. These lakes were created in partnership with gravel extraction. There are opportunities for hiking and wildlife observation, but boating, rafting and fishing are prohibited. Vegetative management is ongoing on the shoreline of most lakes. Amenities include drinking water, restrooms and wildlife watching areas.

**Corn Lake** – This day-use-only park provides a launching site for boaters and rafters enjoying the Colorado River. A 0.9-mile trail follows the lakeshore. The trail provides access to both the Colorado River and Corn Lake for fishing and is used by hikers and bicyclists. The park also offers picnic sites and restrooms for physically challenged visitors. Corn Lake offers both warm and cold water fishing and picnic shelters. The park is stocked with trout each spring and fall. Amenities include boat ramp access, parking, picnic area,

restrooms, trailhead and fishing. The area has both paved and unpaved trails.

**Island Acres Section** - The Island Acres section is open year-round for camping and day-use activities. The day-use area closes at 10:00 p.m. The park is enjoyed by Grand Valley residents and out-of-state visitors as a convenient and attractive place to fish, camp, picnic and/or hike along the Colorado River or near any of the lakes in the park. Amenities include recreational vehicle electrical hookups, picnic areas, parking, restrooms, showers, swimming beaches, tent camping and access to numerous unpaved trails.

#### MANAGEMENT

The two agencies, Colorado State Parks and Division of Wildlife, merged in 2012. Oversight of the James M. Cobb Colorado State Park is now managed by the merged organization Colorado Parks and Wildlife.

## Economic Development





## The Lackawanna River Heritage Trail

*Pennsylvania*

### BACKGROUND

The Lackawanna River Heritage Trail (LRHT) is part of a multi-purpose trail system that follows the Lackawanna River through 30 communities in Pennsylvania. When completed, it will span 70 miles, with 40 of these miles running along the Lackawanna River. The trail begins at the confluence of the Lackawanna and Susquehanna rivers in Pittston, southwest of Scranton. LRHT is a linear, interpretive path which connects to the river and promotes health, wellness, recreation, socialization, alternative transportation, conservation of natural resources, and economic development. The multi-surface section connecting Scranton to Taylor has become a popular destination, attracting visitors to stone carvings, symbols, and sculptures that interpret Native American heritage. The last 6.1 miles of the Inaugural Scranton Half Marathon were run along the LRHT,

exposing participants from 23 states to the beauty of the newest section of the trail in Scranton.

Activities and programs staged in 2014 included a family fun day with music and performances, a bike tour, birdwalks/fishing and concerts on the trail. One of the new projects is a community partnership between Keystone College, Keystone Iron Works, the County Department of Arts, and the Lackawanna Heritage Valley who collaborated to install large iron sculptures by noted artists at sites along the trail. The program, known as "Confluence: Art on the Trails," was funded by the National Endowment for the Arts allowing artists to transform portions of the trail into outdoor galleries of iron sculptures. In addition, a myriad of organizations and school groups have begun to use the LRHT for events, fundraisers and as a training ground for athletic teams. These events, with their use of the LRHT facilities, drive sales for the hospitality industry as well as for many local retail shops and businesses.

An economic impact analysis of the Lackawanna Heritage River Trail system

was conducted in 2009 and is currently being updated. The study's initial findings concluded that, overall, there is a \$31.3 million annual economic impact to the region, with visitor and tourism expenditures being the primary source of economic benefits at \$27 million. Given that more miles of trails have opened since 2009, they are expecting the new analysis to show a greater economic impact on the surrounding areas.

### MANAGEMENT

The Lackawanna River Heritage Trail (LRHT) is managed by Lackawanna Heritage Valley Authority, a municipal authority of Lackawanna County. The Lackawanna Heritage Valley Authority was established in 1991 and LRHT became the first State Heritage Park in Pennsylvania. In 2000, it was designated as a National Heritage Area by the U.S. Congress in recognition of the region's unique contribution to the American experience. One of the Authority's goals is to enhance the economic vitality of the communities in the Lackawanna Valley.



## Tempe Town Lake

*Tempe, Arizona*

### BACKGROUND

In March of 1989, the Tempe City Council adopted the Rio Salado Master Plan, which was the culmination of 20 years of environmental land planning and studies to create the Tempe Town Lake. This 2.5 mile stretch of lake passes through the City of

Tempe just north of Tempe Butte. To create the lake, channelization of the Salt River was conducted and completed in 1996. This resulted in the recovery of 843 acres of developable land from the floodplain. The channelization was funded by the Arizona Department of Transportation (ADOT) and Flood Control District of Maricopa County (FCDMC).

Today, Tempe Town Lake provides walking, jogging and cycling on concrete paths on

each side of the lake, while also featuring public art at select locations. Recreational amenities include the Tempe Beach Park that accommodates volleyball, a splash playground and an amphitheater that can accommodate 5,000 people, in addition to boating, sailing and fishing. The Tempe Center for the Arts anchors the western boundary of the lake. Furthermore, there are annual events and activities staged at Tempe Town Lake that attract hundreds of thousands of people to the City of Tempe. Besides the creation of recreational amenities, the Tempe Town Lake has spawned substantial private mixed use development, including class A office towers and several condominium projects. Future plans also include a hotel. Its proximity and connectivity to major transportation facilities such as the Sky Harbor International Airport, the light rail, Loop 202 and Loop 101 highways are key economic development strengths of this location.

Tempe Town Lake has emerged as a top destination that has created jobs and stimulated the economy for the City of Tempe and the broader region. Since its creation, the estimated economic impact of Tempe Town Lake is \$500 million and has attracted upwards of 2.7 million people. Today more than 5,000 people work at the various businesses surrounding the lake.

### MANAGEMENT

The City of Tempe is responsible for the management and maintenance of Tempe Town Lake.



## Trinity River Project

*Dallas and Fort Worth Texas*

### BACKGROUND

#### Dallas

The Trinity River Corridor Project covers 20 miles, or approximately 10,000 acres, along the Trinity River, which runs through Dallas, Texas. It is an enormous public works and economic development project that provides flood protection, recreation, environmental restoration, economic development and major transportation components. Work has been underway on this corridor continuously since the Dallas City Council approved the "Trinity River Corridor Project Balanced Vision Plan" in 2003.

It is envisioned that the Trinity River of the future will feature iconic bridges, soccer

fields, parks, lakes, promenades and trails for hiking and biking. It is intended to become the focus of sustainable development and an attraction to people seeking alternatives to conventional suburban living. This 2,000 acre regional park will knit together scattered recreational facilities into one system. In short, it is believed that this project will become a catalyst for urban development in Dallas, Texas for decades to come.

In terms of economic development, city leaders and stakeholders identified development districts to spur new interest along the corridor. At locations with enhanced access to recreation and transportation, new large-scale development is being encouraged. Larger scale development will be required to support the cost of infrastructure such as levee stabilization and sump relocation. Throughout the corridor, they anticipate

that these public investments should lead to revitalization and redevelopment, which support existing communities and create new business and mixed use areas. The type of development called for within these districts includes infill within existing neighborhoods along with residential, office and retail development.

#### Fort Worth

The 2003 Trinity River Vision Master Plan was adopted by the Tarrant Regional Water District, Streams and Valleys, Inc., the City of Fort Worth, and Tarrant County, Texas. The Trinity River Vision was incorporated into the City of Fort Worth's Comprehensive Plan. Many projects have been implemented since its adoption, including: trail extensions, new trailheads, trail amenities, additional low water dams, new low water crossings, pedestrian bridges and private developments oriented to the Trinity Greenbelt.

The Trinity River Master Plan was designed to provide flood protection, recreation, scenic beauty and accessibility to the public. The plan focuses on eight segments of the Trinity River and its tributaries: Clear Fork North, Clear Fork South, Marine Creek, Sycamore Creek, West Fork East, West Fork West, and the central city area now called Panther Island. Projects that are underway include the following:

#### Panther Island / Central City

This project will create an urban waterfront community north of Ft. Worth, Texas. Public dollars are currently being spent on environmental cleanup, flood protection and infrastructure improvements, including new bridges and new or improved trails. Panther Island will include 800 acres of mixed use development consisting of

## Economic Development





10,000 square feet of commercial space and 10,000 mixed income households. Overall the development will include boating, a river walk and canals, dining and entertainment, a town lake with boardwalks and higher education. This development is anticipated to generate more than \$600 million in economic development activity in its first decade.

### Gateway Park Master Plan

A component of Central City is revitalization of the 1,000 acre Gateway Park, which will become the largest urban-programmed park in the area. The plan includes major restoration of the park's ecosystem, provides a multitude of diverse and recreational amenities while providing necessary flood storage. Park improvements will include practice and competition soccer fields, baseball/softball fields, covered basketball courts, boat launch, trails, and picnic areas, dog park, amphitheater and river education center, mountain bike trails and mountain bike course. It is anticipated that the plans will spur positive economic development.

### MANAGEMENT

There are several organizations responsible for the various aspects of planning and development, environmental and transportation components of the Trinity River Corridor Project. These partners include the City of Dallas, the North Texas Tollway Authority, the U.S. Army Corp of Engineers and the Texas Department of Transportation. Other non-profit partners are raising money to help implement the plan. In Fort Worth, Texas, the Trinity River Vision Authority (TRVA) was created as the organization responsible for the implementation of the Trinity River Vision.



## 7.4 Recommendations

**T**rails and river parks play a central role in economic development and have proven to be an important community amenity. All across the country, well-designed trails and open space are helping to shape urban growth, contribute to neighborhood revitalization and enhance property values. As mentioned earlier, all cities are keen on the El Rio Trail and its connectivity to their own trails and Maricopa County's trails system. Placing trails as centerpieces of a tourism based approach has shown, in other markets, to invigorate economic development.

Opportunities for private residential and commercial development exist along the river edge in Buckeye, Goodyear and unincorporated areas of Maricopa County. This type of development takes on a more urban form and has the potential of spurring investment along the corridor due to its access to recreation and unique desert riverine environment.

Based on research conducted on other river trails/parks in the country, combined with input from the three cities, and Maricopa County there are several ideas to explore that could enhance economic development and recreational potential of the El Rio project corridor and help to

establish it as a top tourist destination in the southwest valley.

**Identify unique recreational districts –** Given the length and diversity of the river, there is an inimitable opportunity to leverage each city's, and Maricopa County's, vision on how to best utilize the recreational asset of the El Rio corridor. Like other recreational river corridors noted in this report, consideration may be given to dividing the El Rio into recreational districts that offer a distinct variety of active and passive outdoor activities and amenities, such as areas for trails for hiking, cycling and equestrian uses, active sports and recreation, areas for hunting and fishing,

and other areas for nature recreation such as wildlife watching. These unique districts could then be independently branded and marketed, much like the individual lakes in the String of Pearls along the James M. Cobb River in Colorado.

**Provide the widest range of recreational opportunities** – Offering playing fields for active sports, wilderness recreational uses such as canoeing and kayaking, and bird-watching, and trails for hiking, and equestrian areas for all ages and abilities invites many to get involved. Improving the recreational experience for canoeists by creating waterways that exhibit increased velocity sections interspersed with slower pools encourages participation. Divisions could be created in the channel flow regime that would allow for smaller whitewater features to be created and managed for recreational uses. Including canoe launches that allow for a variety of trip lengths and experiences on and in the river corridor depending upon interest and skill level will engage many community members. Ensuring that any El Rio trails will connect to the larger trail systems in the area creates a myriad of possibilities.

**Activate the trails and parks** – Use is encouraged by providing a rich diversity of environmental education, including interpretive exhibits, nature observation areas and self-guided trails that include wetlands, and riparian zones. These should



include environmental exhibits that support other nature oriented activities such as birding and ecotourism. The placement of public art at key locations that promotes or depicts the remnants of the heritage, history and culture of the El Rio project corridor should be considered. Regularly staging events and activities that draw people, such as family fun days with music and performances, fun runs, bike tours, birdwalks/fishing and concerts on the trail will result in sustained use. As an example, Lackawanna Heritage Valley Authority conducted a half-marathon event on a section of trail that attracted people from 23 states.

**Engage children and families** – Connecting youth to the outdoors is the focus of recent studies that suggests that a very real “nature-deficit” disorder contributes to a diminished use of the senses, attention difficulties, conditions of obesity and higher rates of emotional and physical illnesses. Research also suggests that this nature deficit weakens ecological literacy and stewardship of the natural world. These problems are linked more broadly to what health care experts call the “epidemic of inactivity,” as well as to a devaluing of independent play. This project can benefit from the Bay Area Ridge Trail Council who formed a corporate partnership with REI. Jointly, they are helping to promote the active engagement of kids and families, whether it be hiking, cycling or camping.



This project can capitalize on the research and resources provided by REI, Children and Nature Network, Pathways to Nature for Kids, U.S. Fish and Wildlife, and others, to create viable programs.

#### **Form partnerships with stakeholders**

– Implementation of the El Rio Design Guidelines and Planning Standards will depend upon the active participation of partners, including national and local public agencies and a wide spectrum of non-profit groups and environmental organizations. In addition, seeking the support of the private sector and foundations for funding and or sponsorships, including philanthropy, is essential to a successful project. Specific, targeted, fundraising events should also be explored.

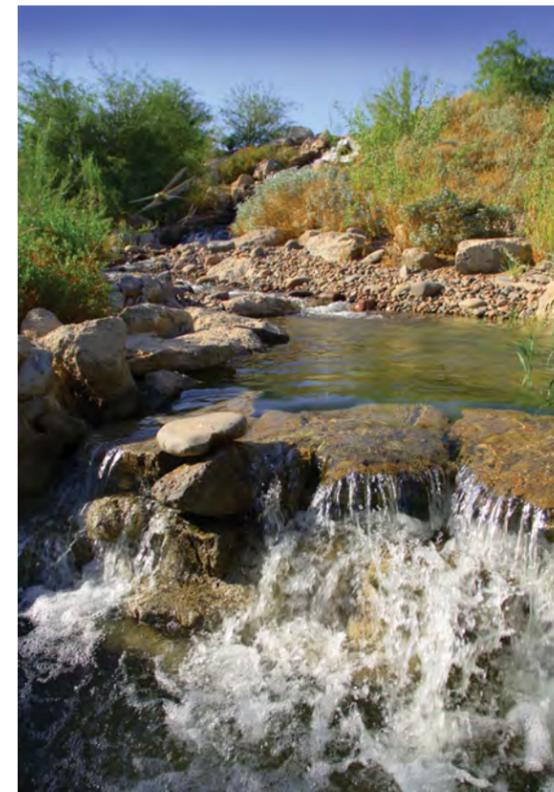
**Market the El Rio Corridor** - Encouraging organizations and businesses to use sections of the El Rio trail for events, such as run/walks, races, group bike rides, trail and river cleanups, geocaching, and other activities, benefits everyone. The events engage the community and invite participation. A website devoted to the El Rio Trail that includes the vision and history, along with visitor information, such as downloadable map(s) and a calendar of events and activities, is a basic requirement in any marketing plan.

These ideas, individually or collectively, will help achieve the overarching goals



outlined under the El Rio Design Guidelines and Planning Standards. This includes transforming El Rio into an economic engine by becoming a tourist destination and a regional attraction in the west valley, and by stimulating the attraction of private investment that fosters economic development.

**Maintain the El Rio Corridor** - The Flood Control District of Maricopa County is preparing the El Rio Vegetation Management Plan for the Lower Gila River. The plan will provide planting guidelines for the floodway and will also provide recommendations for the removal of Tamarisk (saltcedar), which may have a direct and positive effect on the economic viability of the overall area by potentially reducing flood risk in the area and opening the river to recreational uses.



## Economic Development



# Pilot Projects

*Three sites, one in the City of Avondale, one in the City of Buckeye and one in the City of Goodyear, have been selected as pilot project trailheads along the El Rio corridor. The primary purposes of these pilot projects are to promote environmental education and provide passive human interaction and recreational access to the Gila River along the El Rio Trail. The sites selected are uniquely positioned to provide a wide variety of opportunities for education, as well as providing regional and local connectivity. These pilot projects directly connect to other recreational and natural resources in the area and are positioned to serve as templates for future project developments that will enhance the access and usability of this tremendous natural resource.*



Avondale



# EL RIO



The pilot projects were selected for this effort by each of the public entities involved with the overall project. The pilot projects were designed to provide examples of possible linkages to the Gila River and the El Rio corridor. They are meant to serve as examples that showcase how public open space can be programmed to provide opportunities for economic revitalization and how private development can build off of public investment. Most importantly, these projects provide safe public access to the Gila River and the paths, trails and linkages to the wide variety of open space and recreational activities that the project area and the region offer.

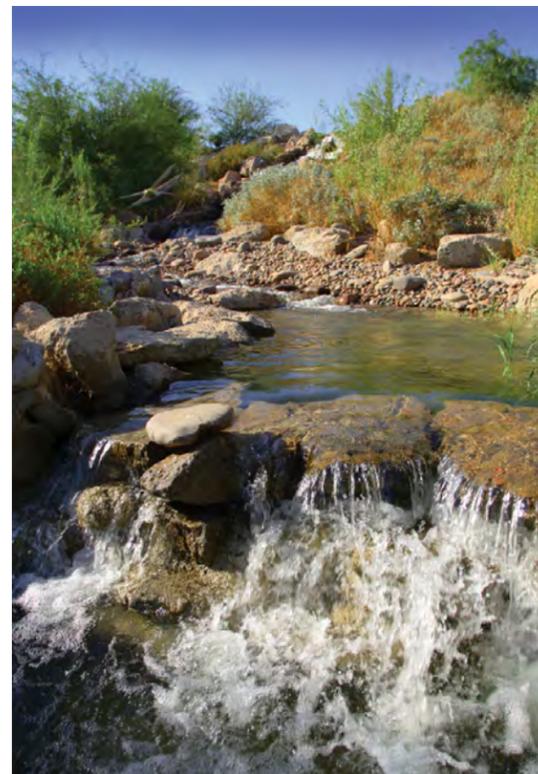
The pilot projects and construction of the El Rio Trail will ultimately open the El Rio area for responsible activities, including access to the Gila River and increasing visitation and visibility, which deters many of the negative and illegal activities (target shooting, wildcat trails created by OHV) that have been an issue. The cities of Avondale, Goodyear, Buckeye and unincorporated Maricopa County, will work with both public and private institutions and local law enforcement agencies to continue to provide and coordinate distribution of educational materials to the public with information on the sensitive riparian species and habitats and the allowable recreation uses in and adjacent to the Gila River.

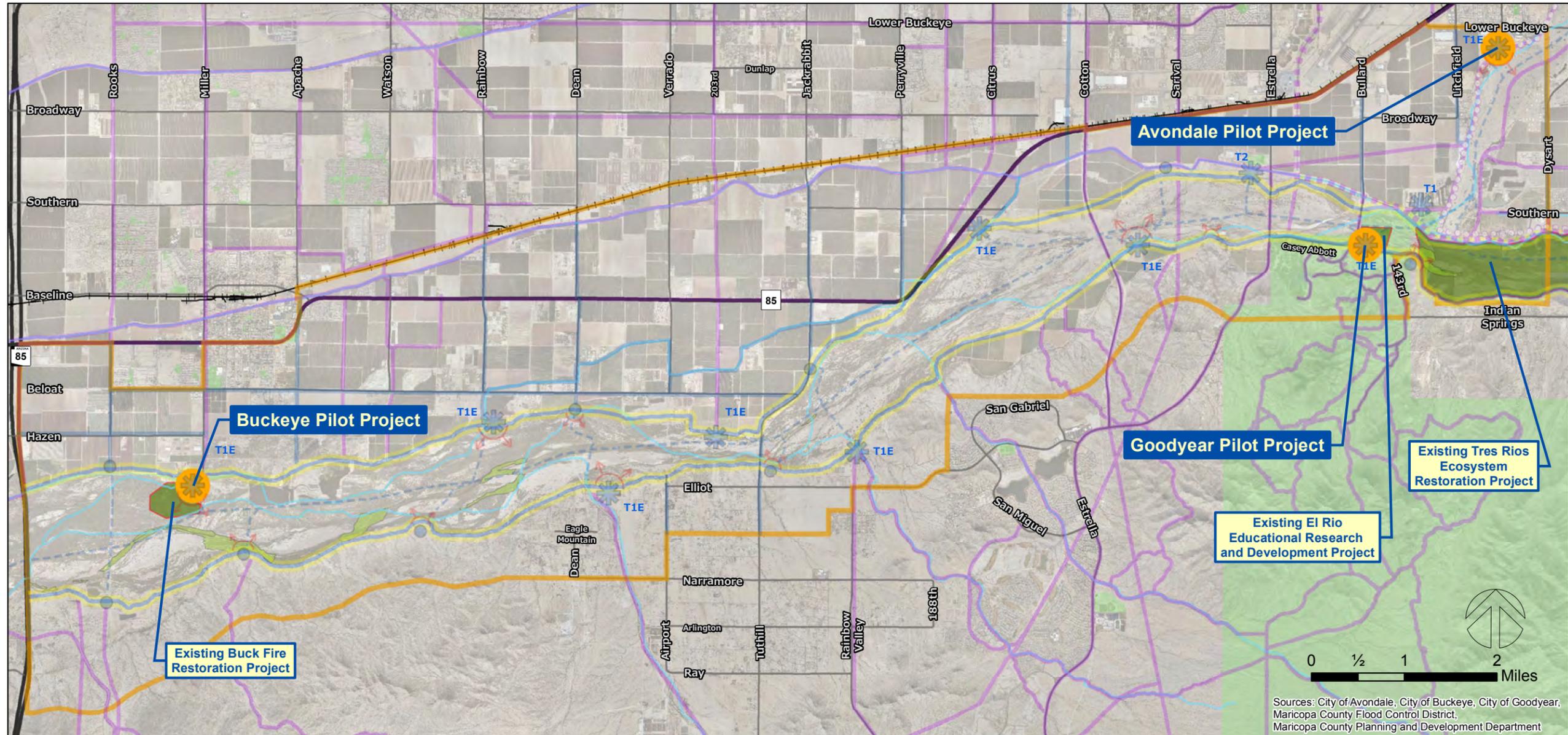
These pilot projects have the potential to demonstrate to the public a wide variety of planning and implementation practices involved with an ecosystem restoration effort. The pilot projects can demonstrate how they provide a focus on a wide variety of issues. These issues may include, but not be limited to: improving water quality, creating an environment for pollution prevention, reestablishing vital wildlife habitats, demonstrating salt cedar eradication and control and educating

the public on environmental concerns. The projects will also encourage both active and passive recreation activities such as: bird watching, fishing, hiking, trail bike riding and equestrian pursuits.

These pilot projects will result in increased coordination and cooperation between the respective Cities, the Flood Control District of Maricopa County, the US Army Corps of Engineers, US Fish and Wildlife Service, Arizona Game and Fish and other public and private agencies and key stakeholders with respect to establishing these pilot projects as a baseline for all future efforts.

These pilot project developments seek to showcase and help foster a better understanding by the public of the importance of the El Rio project area. They will also provide intrinsic links and benefits to the public's health, the economic sustainability of the overall area and, ultimately, to long term community vitality.





Sources: City of Avondale, City of Buckeye, City of Goodyear, Maricopa County Flood Control District, Maricopa County Planning and Development Department

Avondale  
BUCKEYE, AZ  
CITY OF GOODYEAR  
MARICOPA COUNTY  
Date: 8/11/2015  
Matrix DESIGN GROUP

- Legend**
- El Rio Vista Overlook
  - El Rio Trail Head (T1, T1E, T2)
  - El Rio River Access
  - Pilot Project
  - Recommended El Rio Trail
  - Recommended El Rio River Trail
  - Recommended Municipal Path or Trail
  - Existing or Planned Municipal Path or Trail
  - Maricopa Trail
  - Sun Circle Trail
  - Project Boundary
  - Rivers and Major Streams
  - High Value Habitat
  - Parks
  - Existing Habitat Restoration and Demonstration Projects\*
  - Railroad
  - Arterial Streets
  - Interstate Highway
  - State Highway
  - County Highway
  - Interchange
  - Ramp

\*Please note that at this scale the limits shown are not accurate but just meant to give an indication that there have been restoration efforts in each general area

El Rio Pilot Projects Key Map



## 8.1 City of Buckeye Preferred Concept “The Pond”

### Existing Conditions

The Buckeye pilot project will be located on 40 acres of land at the south end of Miller Road about a half mile south of Hazen Road. The property is currently covered with dense vegetation of mostly Atriplex (saltbush), Tamarix (salt cedar) and a few populus trees (cottonwoods). The site is located within the Gila River floodway and does not have any existing development occurring on the site. There is some evidence of off-road vehicular activities and illegal trash dumping on the site. Land surrounding the site is private property on three sides and it is adjacent to a Bureau of Land Management owned parcel to the south.

Approximately 300-feet north of the site, the planned El Rio Trail will parallel the top of the Buckeye Irrigation District's irrigation canal. Planned secondary trails will run along the river to the south of the site. The South Buckeye Equestrian and Event Center and the River Ridge Veterinary Hospital are located at the southwest corner of Miller Road and Hazen Road just to the north of this site.

### Goals

The proposed Buckeye trailhead development will have an equestrian emphasis but will also include amenities for pedestrians and bicyclists. Additionally, strong riparian flora and fauna educational elements will be incorporated into the overall master plan for the site.



### Access

Access to the site is from the existing Miller Road alignment, which comes in from the north. The access road is confined to the eastern edge of the site and will provide access to a 130 car parking lot, a bus drop-off/ parking area with space for five buses, and an equestrian parking lot for up to twelve horse trailers.

### Bicycle and Pedestrian Amenities

A pedestrian boulevard will connect the bus drop-off area, parking lot, and the 1,200 s.f. restroom building. The pedestrian boulevard will mark the beginning of the bicycle and pedestrian connection to the El Rio Trail with a twelve-foot wide paved multi-use pathway which will include decorative trail signage marking the way to the bicycle and pedestrian staging area. The bicycle and pedestrian staging area is envisioned to have seat walls, drinking fountains, and a small water feature to mark the first decision

## Pilot Projects



point along the bicycle and pedestrian connection to the El Rio Trail.

From the bicycle and pedestrian staging area, the pathway will split into two pathways connecting to the El Rio Trail. The east pathway will run along the Miller Road right-of-way alignment up to the El Rio Trail. The west pathway will cut across private property at the northwest corner of the site to connect to the El Rio Trail aligning with the irrigation canal that dips to the south. An access easement or right-of-way will need to be secured from the private land owner to make this western pathway connection. Several picnic ramadas near the parking lot will provide opportunities to rest, gather with friends and/or enjoy a picnic outing.

### Equestrian Amenities

Adjacent to the equestrian trailer parking area will be a large open equestrian staging area. The staging area will have a shade structure, hitching rails, water troughs, wash racks, a manure disposal area, a 60-foot round pen and an ADA mounting ramp. Both the equestrian parking and staging area will have an equestrian friendly surface such as compacted dirt or gravel. A soft surface equestrian trail will run north from the staging area to the north property line where it will split and follow the bicycle and pedestrian connector path to the El Rio Trail. It will also flow south to the secondary trail along the river.

### Education Amenities

A network of soft surface pathways will meander through the site and connect the pedestrian and equestrian staging areas with the educational components programmed for the site. A seven-acre demonstration wetland with a shaded overlook structure and a large group picnic ramada are to be located in the southwest quadrant of the site. A perimeter trail will provide access to additional viewing areas and educational amenities. A series of five interpretive kiosks are planned along the pathway network to provide interactive and educational information about the area's environmental history and significance. In the shadow of one of the existing "heritage cottonwood trees" located on site, a council ring\outdoor educational and gathering space will provide opportunities for groups to gather to learn about the site and discuss their experiences.

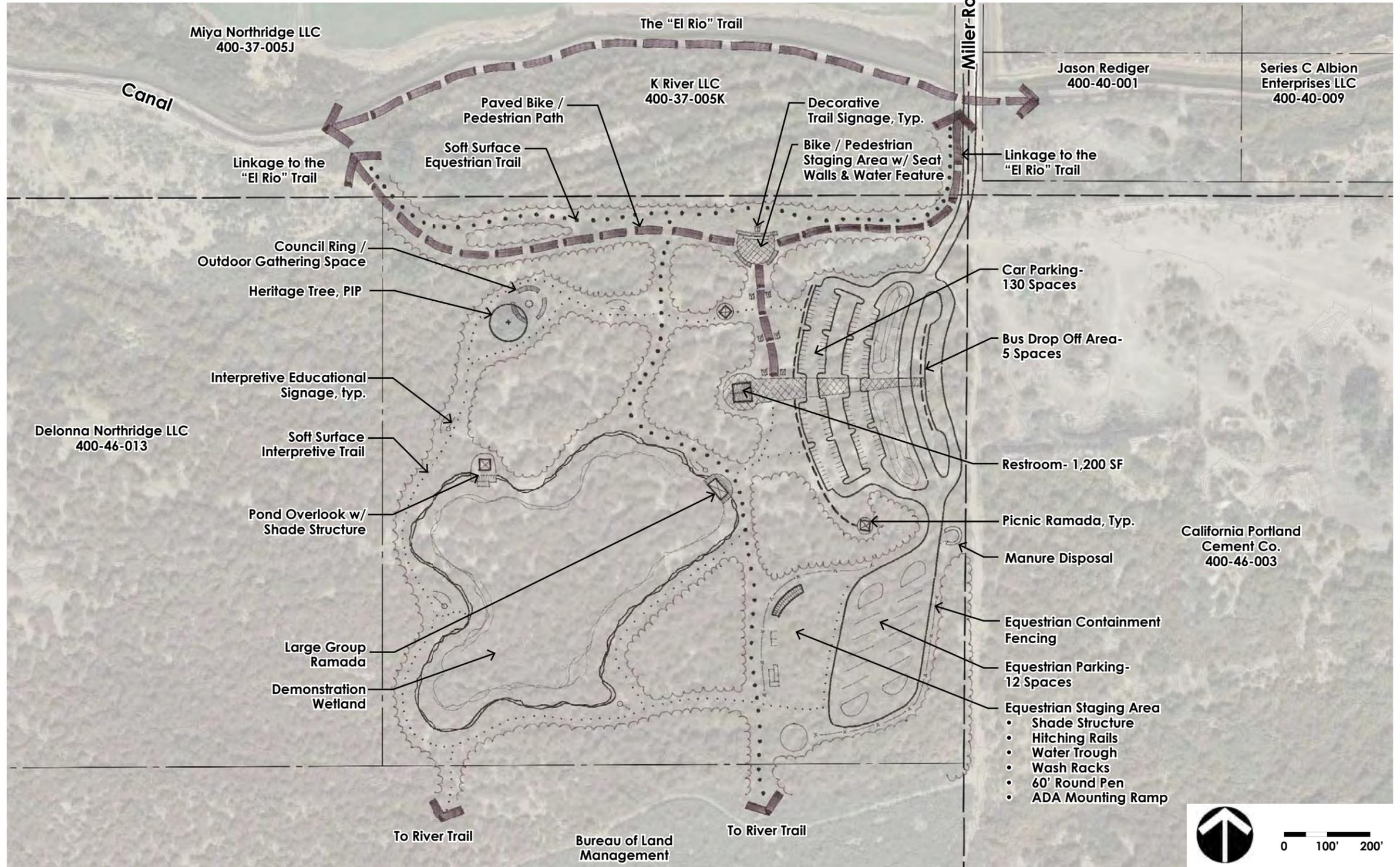


### Vegetation

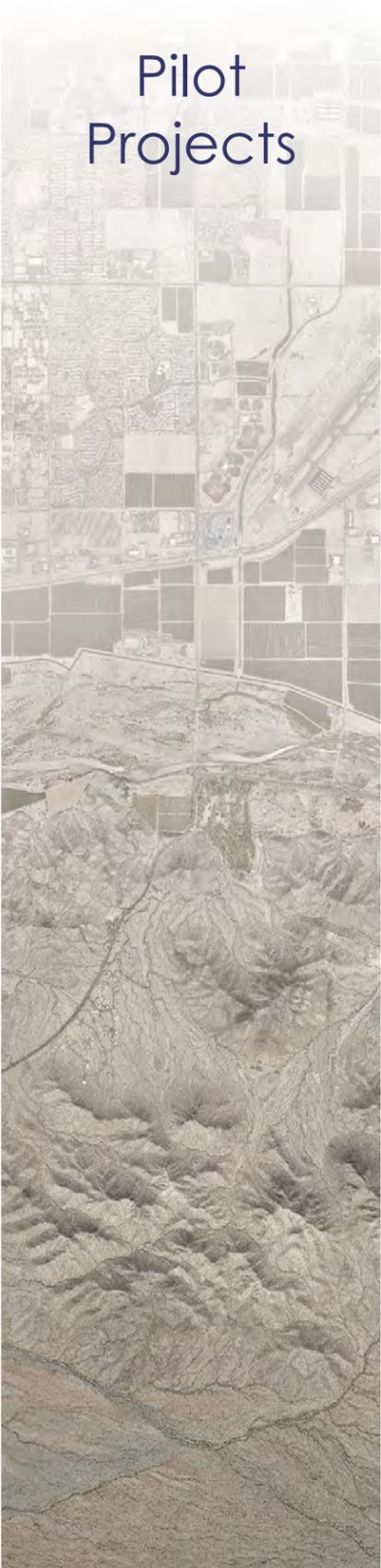
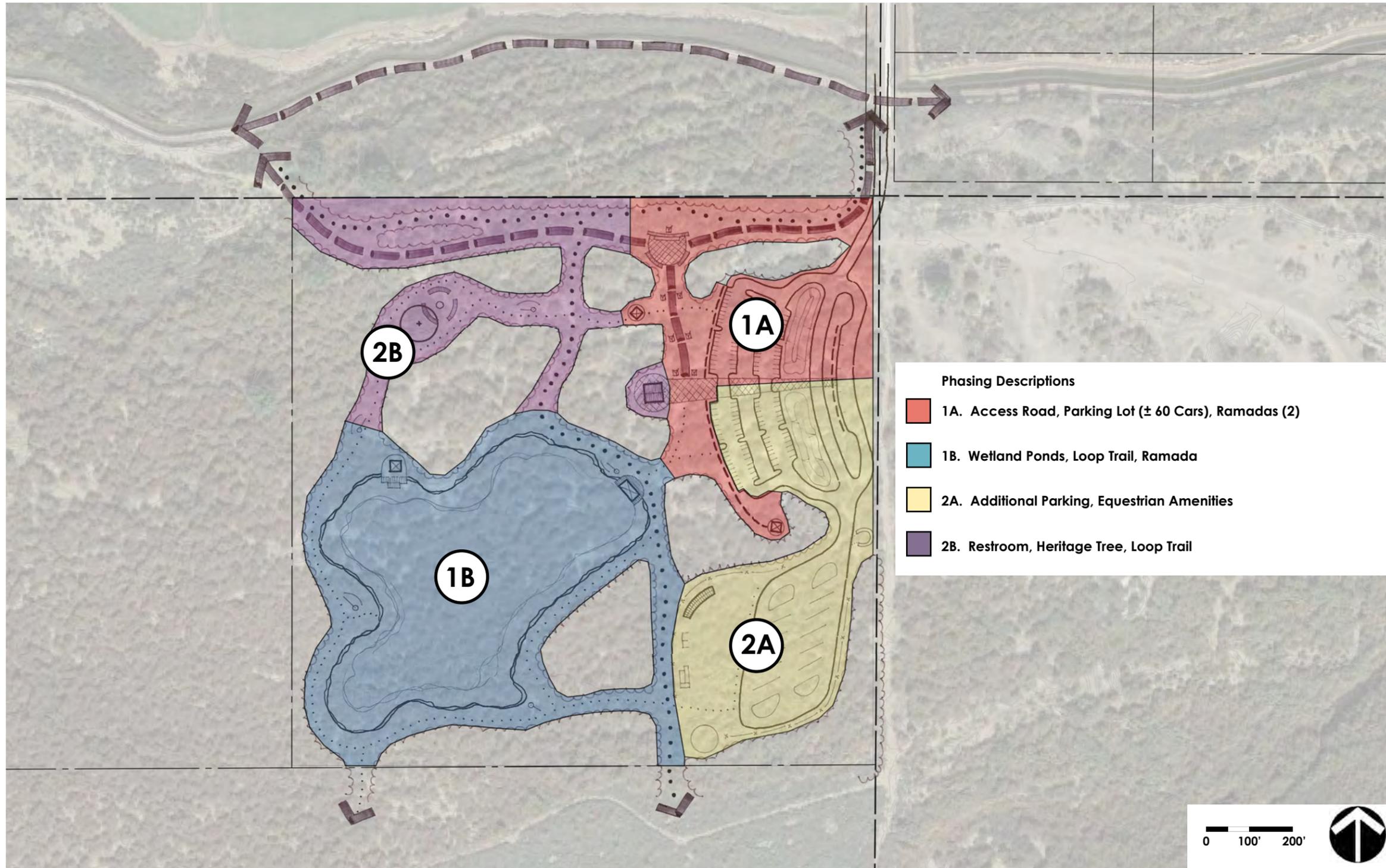
A development goal for the project is to minimize disturbance to the existing site. The utilization of the existing mature vegetation to frame view corridors to the mountains to the south and to screen adjacent uses from each other, has been incorporated into the master plan. Removing the invasive salt cedars and replacing them with plantings of native species would benefit both the environmental health of the site and the educational amenities. The Flood Control District of Maricopa County, in conjunction with the Bureau of Land Management Arizona State office, shared their restoration efforts following the Buck Fire in the Gila River to provide a template for these potential restoration efforts. This demonstration project holds great promise, and will be a solid template for restoring this site's native river ecosystem.



## Buckeye - Preferred Concept, "The Pond"



# Buckeye - Preferred Concept, Phasing Diagram





<b>Buckeye Site Preferred Concept</b>					
Item	Description	Unit	Qty.*	Unit Cost	Extended Amount
1A	Access Road & Parking Lot (Including Utilities), Ramadas (2)	AC	5.5	\$250,000.00	\$ 1,375,000.00
1B	Wetland Ponds (liners, pumps, filters, etc.), Loop Trail, Ramada	AC	11.7	\$370,000.00	\$ 4,329,000.00
2A	Equestrian Staging & Trailer Parking Lot	AC	6.2	\$150,000.00	\$ 930,000.00
2B	Restroom, Heritage Tree, Loop Trail	AC	4.7	\$150,000.00	\$ 705,000.00
30% Contingency (Design, Survey, Environmental Clearance, Geotechnical, Miscellaneous)					\$ 2,201,700.00
<b>Total</b>					<b>\$ 9,540,700.00</b>

\* Quantities from Master Plan Concepts Rounded to Nearest 1/10 Acre

## 8.2 City of Avondale Preferred Concept (Car and Equestrian Parking)

### Existing Conditions

The Avondale pilot project will be located within the City of Avondale's Festival Fields Park at Lower Buckeye Road and the Agua Fria River. The development of a trailhead will be incorporated into the western half of the park that is currently slated for phase 2 development. An existing hard bank levee runs along the south side of the park and protects it from most of the adjacent Agua Fria river flows. The existing levee does not protect the site from all flows as there is a Zone A floodplain behind the existing levee. The land on the far southwest corner of the site is currently unprotected from any levee and would be within the immediate Agua Fria floodway. The El Rio Trail is planned to run along the top of the existing flood control levee and then transition down into the river at the end of the existing levee.

The undeveloped portions of the park are largely devoid of vegetation, except within the existing drainage area north of the levee, which has some low desert scrub and trees. Land surrounding the site is private property on the west, park development on the north and east and the Agua Fria River to the south.

This site offers a great opportunity for access to the El Rio Trail system as well as to the Sun Circle and Maricopa Trail system along the Agua Fria River. This site has the opportunity to serve as a major hub for connectivity to the regional trail systems and as an access point to two of Arizona's vitally important river corridors.

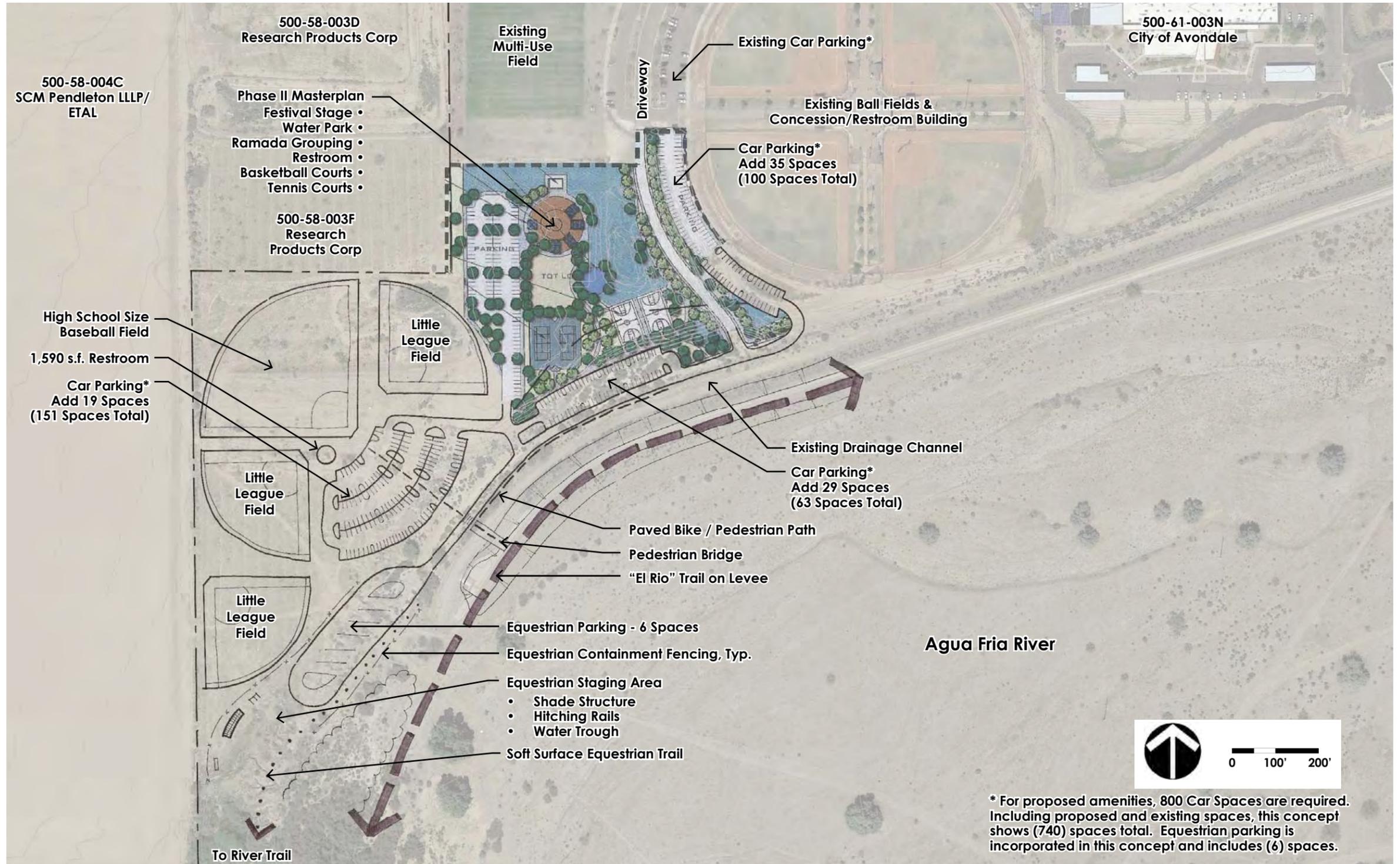


### Pilot Projects





## Avondale - Concept 1, Car and Equestrian Parking

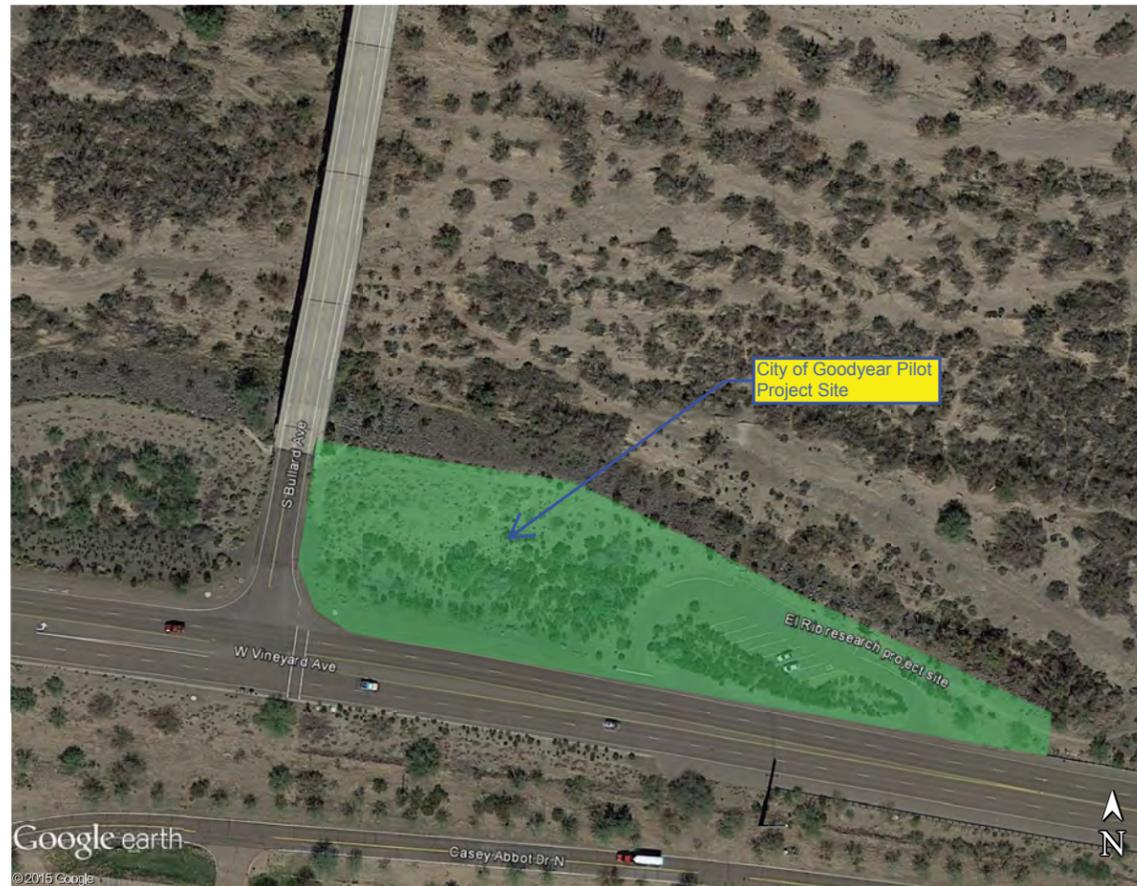


### 8.3 City of Goodyear Preferred Concept (Rio Vista Trailhead)

#### Existing Conditions

The Goodyear pilot project will be located within Estrella Mountain Regional Park, a Maricopa County park, at Vineyard Avenue. The development of this pilot project will be incorporated into the existing Flood Control District of Maricopa County demonstration project located east of Bullard Avenue. An existing levee runs along the north side of the site keeping most of the area out of the Gila River floodway. The El Rio Trail is planned to run along the top of the flood control levee and then transition down into the river until such time as flood control measures are implemented in this area. The demonstration site and its associated parking lot and informational kiosk will be reviewed relative to expanding the site to accommodate the City of Goodyear's trailhead desires.

The site has the potential to demonstrate a variety of river biomes from the wetland river open water areas within the Gila River through cottonwood/willow habitat transitioning through mesquite woodland to lower Sonoran near the parking area. The demonstration of these biomes as an educational opportunity is unique to this site. This site offers a great opportunity for access to the El Rio Trail system as well as the potential to connect on the northern banks of the Gila River and connect to the Sun Circle and Maricopa Trail systems. This site has the opportunity to serve as a major hub for connectivity to the regional trail systems and as an access point to two of Arizona's vitally important river corridors.

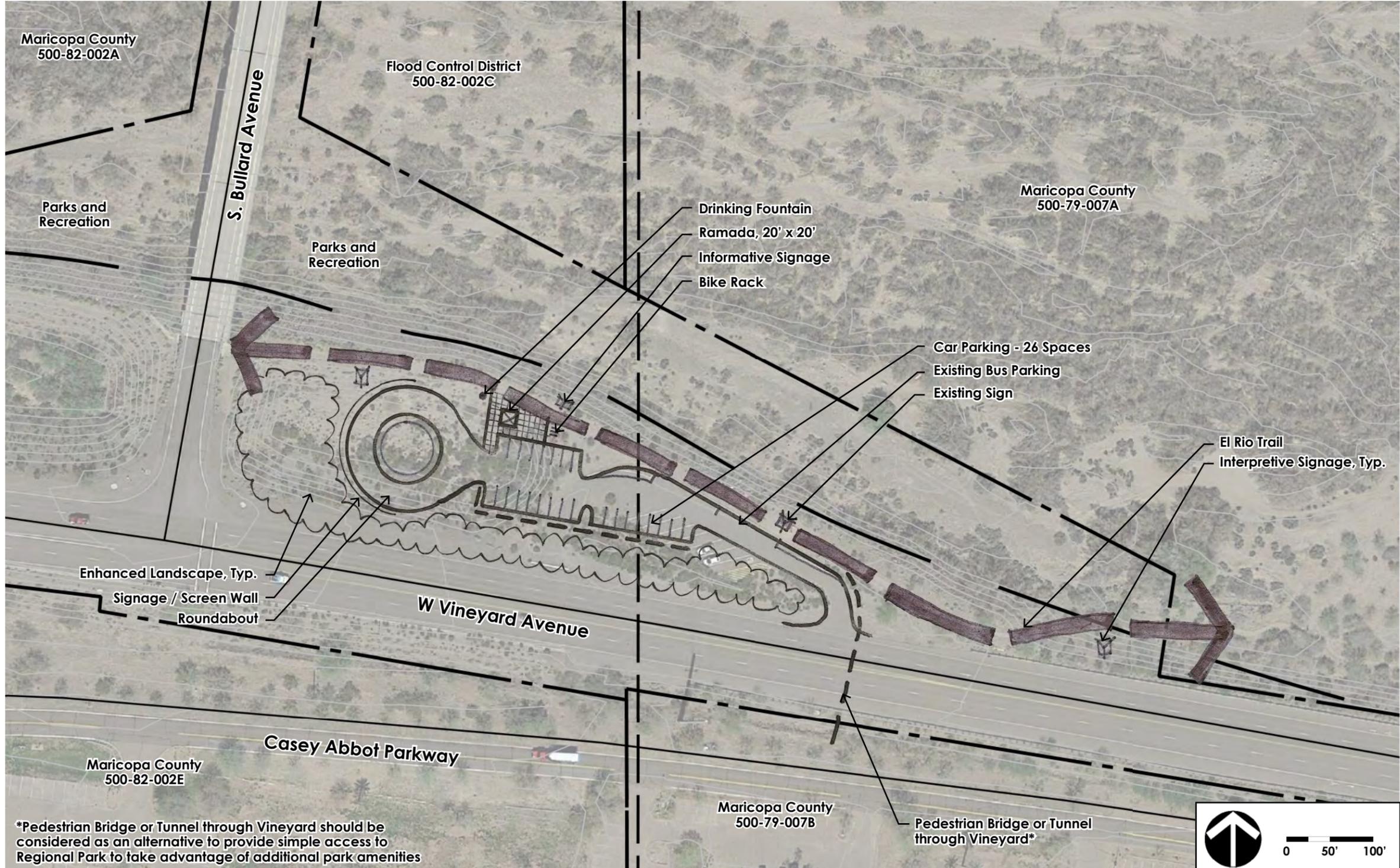


#### Pilot Projects

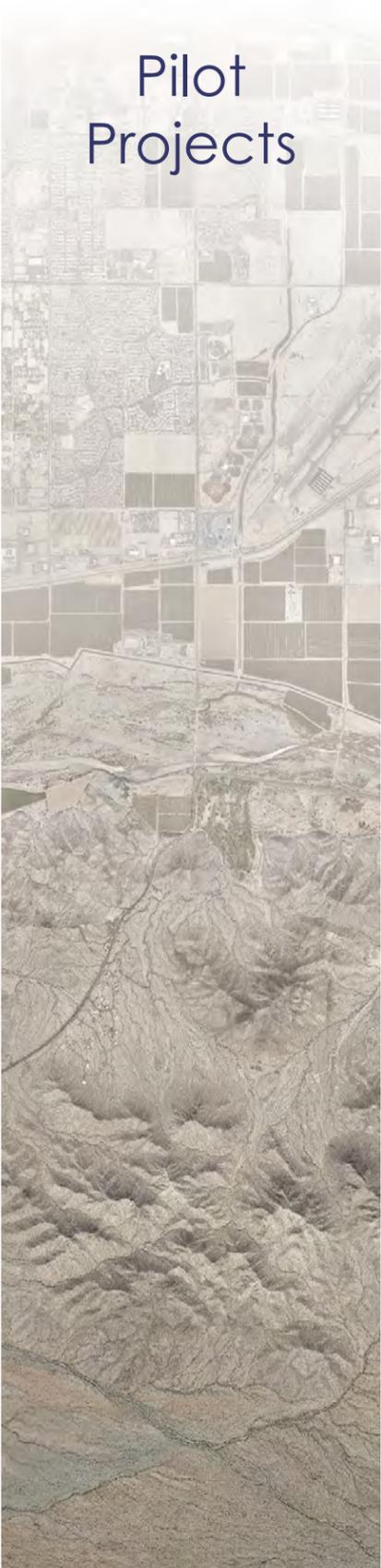
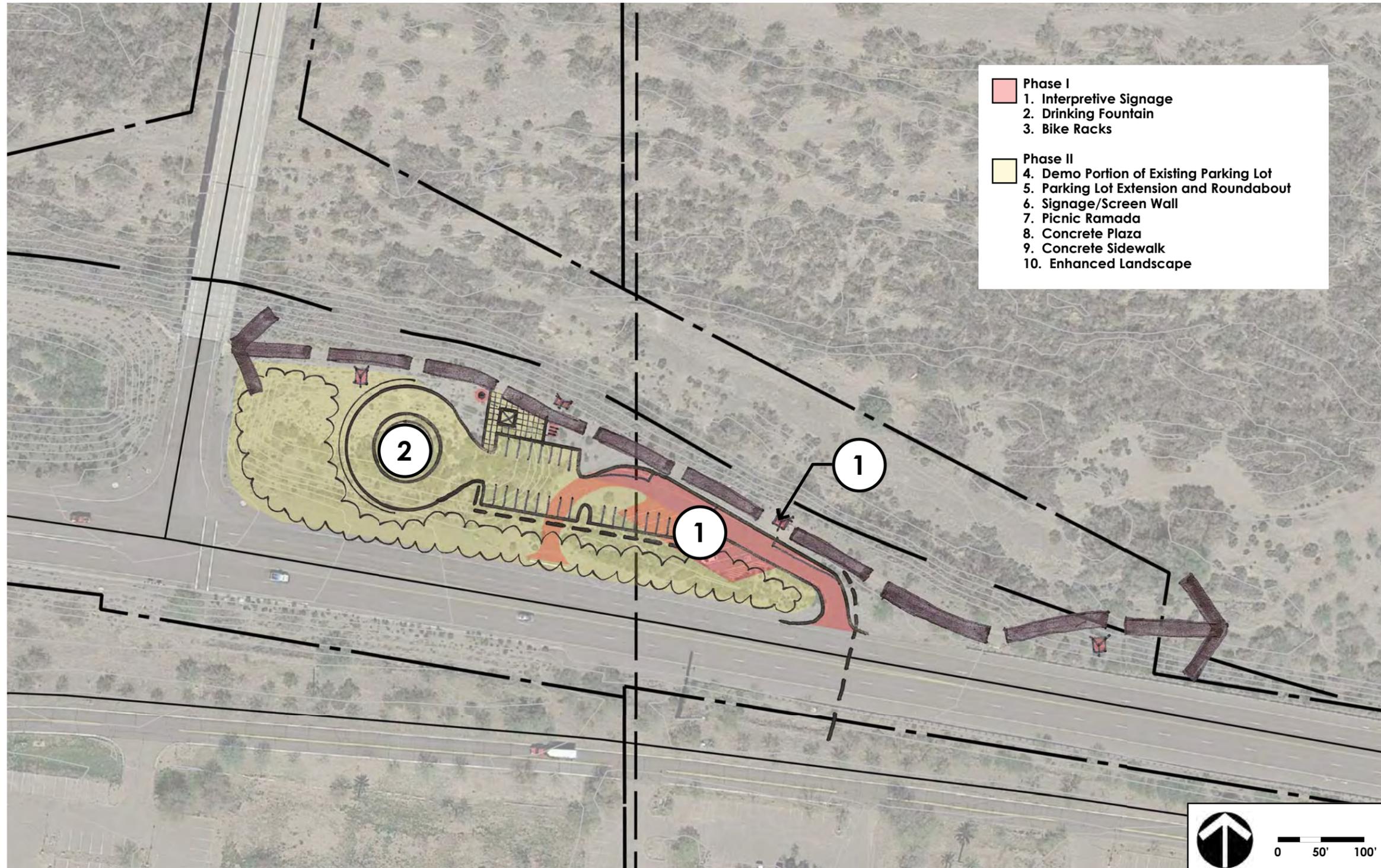




## Goodyear - Preferred Concept, "Rio Vista Trailhead"



# Goodyear - Preferred Concept, Phasing Diagram





Goodyear Site Preferred Concept					
Item	Description	Unit	Qty.*	Unit Cost	Extended Amount
<b>Phase I</b>					
1.00	Interpretive Signage	EA	3.0	\$3,000.00	\$ 9,000.00
2.00	Drinking Fountain	EA	1.0	\$5,000.00	\$ 5,000.00
3.00	Bike Racks	EA	3.0	\$500.00	\$ 1,500.00
30% Contingency (Design, Survey, Environmental Clearance, Geotechnical, Miscellaneous)					\$ 4,650.00
<b>Phase I Total</b>					<b>\$ 20,150.00</b>
<small>* Quantities from Master Plan Concepts Rounded to Nearest 1/10 Acre</small>					
<b>Phase II</b>					
4.00	Demo Portion of Existing Parking Lot	SF	4,600.0	\$11.00	\$ 50,600.00
5.00	Parking Lot Extension and Roundabout	SY	2,218.0	\$30.00	\$ 66,540.00
6.00	Signage / Screen Wall	LF	200.0	\$ 250.00	\$ 50,000.00
7.00	Picnic Ramada (20' x 20')	EA	1.0	\$30,000.00	\$ 30,000.00
8.00	Concrete Plaza	SF	2,120.0	\$8.00	\$ 16,960.00
9.00	Concrete Sidewalk	SF	2,280.0	\$5.00	\$ 11,400.00
10.00	Enhanced Landscape	SF	20,700.0	\$1.50	\$ 31,050.00
30% Contingency (Design, Survey, Environmental Clearance, Geotechnical, Miscellaneous)					\$ 76,965.00
<b>Phase II Total</b>					<b>\$ 333,515.00</b>
<small>* Quantities from Master Plan Concepts Rounded to Nearest 1/10 Acre</small>					
<b>Phase I &amp; II Total</b>					<b>\$ 353,665.00</b>