EL PASO & SOUTHWESTERN GREENWAY

MASTER PLAN

Regional Transportation Authority

SOUTH TUCSON

THE PUEBLO WITHIN A CITY

EL PASO & southwestern Greenway

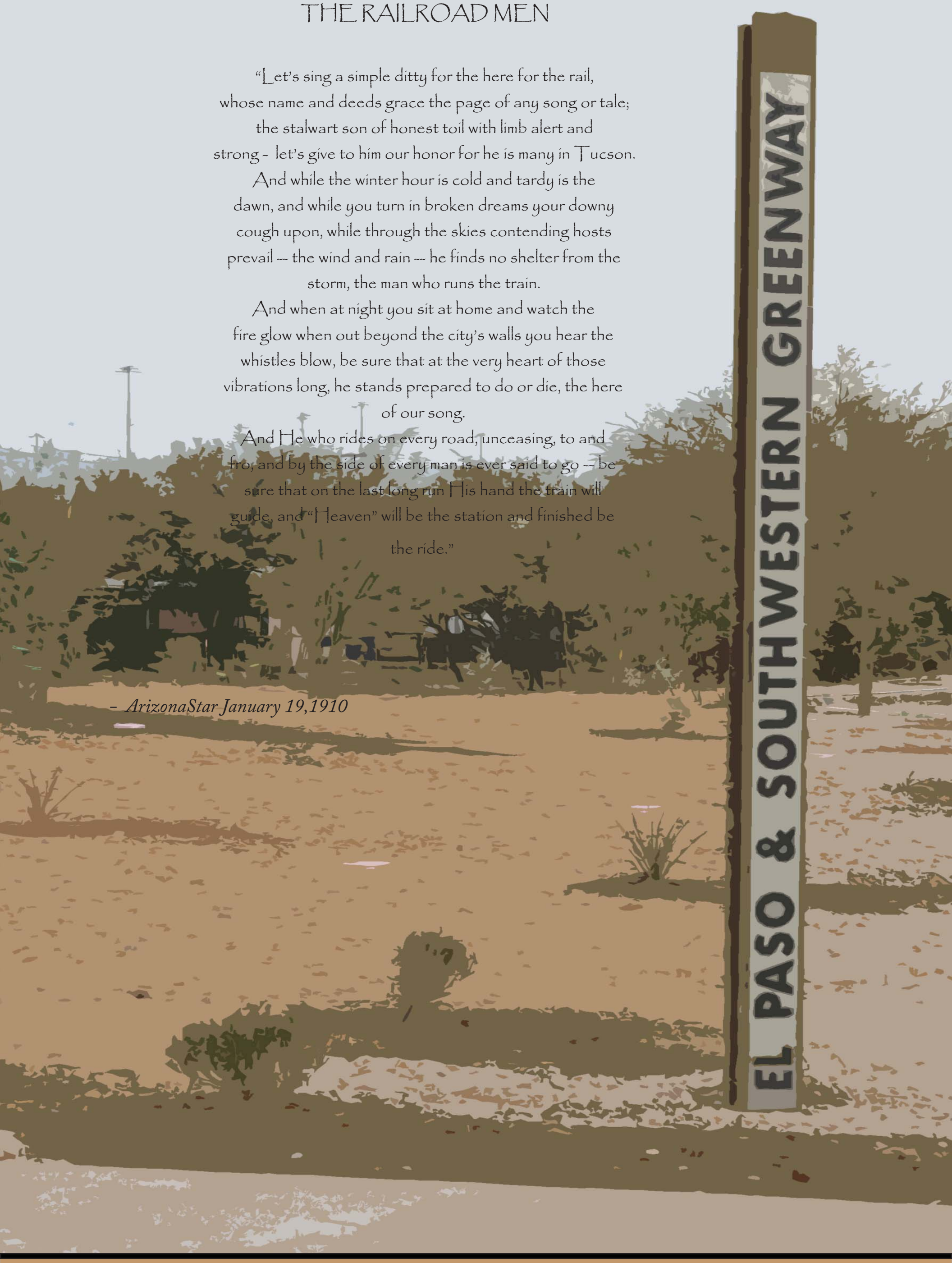
THE SEAL OF PIMA COUNTY ARIZONA

CITY OF FOUNDED 1775 TUCSON

THE RAILROAD MEN

"Let's sing a simple ditty for the here for the rail,
whose name and deeds grace the page of any song or tale;
the stalwart son of honest toil with limb alert and
strong - let's give to him our honor for he is many in Tucson.
And while the winter hour is cold and tardy is the
dawn, and while you turn in broken dreams your downy
cough upon, while through the skies contending hosts
prevail -- the wind and rain -- he finds no shelter from the
storm, the man who runs the train.
And when at night you sit at home and watch the
fire glow when out beyond the city's walls you hear the
whistles blow, be sure that at the very heart of those
vibrations long, he stands prepared to do or die, the here
of our song.
And He who rides on every road, unceasing, to and
fro, and by the side of every man is ever said to go -- be
sure that on the last long run His hand the train will
guide, and "Heaven" will be the station and finished be
the ride."

- *ArizonaStar January 19,1910*



EL PASO & SOUTHWESTERN GREENWAY

MASTER PLAN

Prepared for:

City of Tucson Department of Transportation

Prepared by:

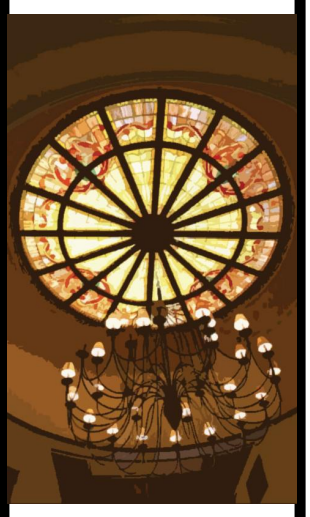
Kimley-Horn
and Associates, Inc.

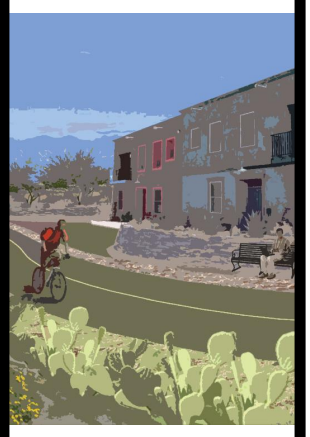
May 2012

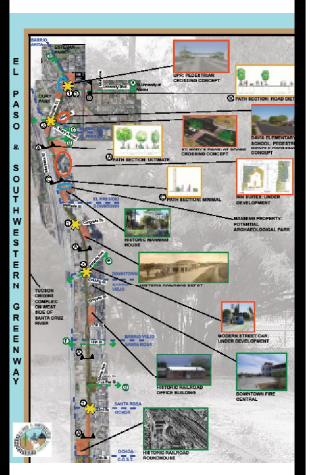
"True enjoyment comes from activity of the mind and exercise of the body; the two are united."

- Alexander Von Humboldt, 1769-1859

Chapter Icon	Chapter Title	Page Number







ACKNOWLEDGEMENTS

Technical Advisory Committee

TOM THIVENER, Project Manager, City of Tucson DOT

ANDY MCGOVERN	City of Tucson DOT
DAPHNE MADISON	Greenway Coalition
DIANA RHOADES	City of Tucson Ward 1
GABE THUM	Regional Transportation Authority
GARY WITTWER	City of Tucson DOT
HOWARD DUTT	City of Tucson Parks & Recreation
IRENE OGATA	City of Tucson
JENNIFER DONOFRIO	City of Tucson Environmental Planning
JESSIE SANDERS	City of Tucson DOT
JIM DEGROOD	Regional Transportation Authority
JIM GLOCK	City of Tucson DOT
JIM ROSSI	City of Tucson Real Estate
Jim STOYANOFF	City of Tucson Real Estate
JOEL GASTELUM	City of South Tucson
JONATHAN MABRY	City of Tucson Historic Preservation
JULIE PARIZEK	City of Tucson Parks & Recreation
LINDA ANDERSON-MCKEE	Urban Trails Coalition
MARIA GAYOSSO	City of Tucson
MARK MAYER	Pima County BOS District 5
MELISSA ANTOL	City of Tucson DOT
MICK JENSEN	City of South Tucson
PAT QUINN	Tucson Fire
PEG WEBER	City of Tucson Parks & Recreation
ROBERTO VILLASENOR	Tucson Police Department
STEVE ANDERSON	Pima County Natural Resources, Parks & Recreation
STEVE CULBERTSON	Tucson Police Department

Pima County Board of Supervisors

City of Tucson and City of South Tucson Council Members

Design Team

Kimley-Horn and Associates, Inc.
Wood Patel & Associates, Inc.
Greenways Inc./ ALTA Planning + Design
The Drachman Institute
Structural Grace, Inc.
Gordley Design Group, Inc.
Monrad Engineering, Inc.
Compusult, Inc.
Terracon

OVERVIEW

"If the greenway movement can help us get back a bit of honest natural beauty and ***our heritage of historic place****, we shall owe it much."*

- Charles Little, 1990

INTRODUCTION

A **Greenway** is a vegetated corridor that interconnects community assets; whether neighborhoods, a downtown, a university, sites of historical significance, parks or other community features; and allows a more unencumbered access due to the restriction to motorized traffic.

The El Paso & Southwestern Greenway is located in the City of Tucson and City of South Tucson, Pima County, in southern Arizona. The vision for this project has evolved over many years from when it was first noted in the original Eastern Pima County Trail System Master Plan adopted in 1989. Preliminary planning began with individual neighborhood outreach in 2003 by Pima County Natural Resources, Parks and Recreation and the City of Tucson. After much field work and community outreach, the first general concept was presented to the Tucson community by the University of Arizona's Drachman Institute in 2005. A thorough analysis of the Greenway corridor was completed in 2009, resulting in the El Paso & Southwestern Greenway Site Analysis Report. This El Paso & Southwestern Greenway Master Plan document has been prepared to provide a foundation for design and guide the path to actual development.

Many documents comprise the Greenway Master Plan. This report includes an illustrated graphic of the 6-mile alignment starting on page 41. The full-sized illustrated exhibit is available at the City of Tucson Transportation Department. The El Paso & Southwestern Greenway Master Plan Design Guidelines are included after the Master Plan graphic. The volume of support data used to produce this report necessitated the use of a separate 8 1/2" by 11" format Appendix. Those documents will be referenced within this report in the appropriate location.

The El Paso & Southwestern Greenway (Greenway) is envisioned in several planning documents to create a continuous, accessible, low-stress, non-motorized transportation corridor that connects with other corridors to create a network that bicyclists and pedestrians can utilize for their transportation and recreation needs.

The 6-mile alignment of the Greenway follows 3 miles of the abandoned El Paso & Southwestern (EP&SW) Railroad alignment through several of Tucson's oldest neighborhoods and through downtown Tucson. It provides a linkage to the University of Arizona, passes through the City of South Tucson and ends at the Ajo Detention Basin/ Kino Sports Park near Interstate-10 and Kino Boulevard. Development will proceed in phases, as funding is available and land acquisitions are completed.

As with any vision for future development, over time there will be subtle and significant influences that will create changes, whether in ownership, land form, design code revisions or community will. This Master Plan is subject to influences the future may bring; therefore, as each phase is developed, detailed design evaluations will be required to bring the concept, as shown in the Master Plan, to the community's future requirements.

VISION

The EP&SW Greenway will provide an active transportation corridor that weaves together local neighborhood history and the railroad. It will invite the greater Tucson community to enter through a number of linkages and explore a piece of their history that they may have not known before. The Greenway will accommodate the accessibility, safety, and comfort needs of a variety of non-motorized users, and protect and enhance the corridor's available natural resources. In order to support the future viability of the Greenway, sustainable design principles and long-term maintenance philosophies will be incorporated into the Project.

The intrinsic sustainable value of the Greenway is the promotion of alternative travel modes through smooth continuity of passages and linkages allowing increased alternative mode commuter traffic and decreased vehicular usage. Other sustainable initiatives are discussed in the Design Guidelines.

There will be opportunities to increase mobility as well as promote healthy active and passive recreation. Once completed, the Greenway will become a beneficial community development catalyst. A reflection of a strong trend throughout the nation, greenways become the seed for community improvements of all kinds. The foundation for improvement stems from public outreach during the design process creating anticipation of improved conditions, realization of those improvements once construction is complete and instinctual protection of the benefit received due to increased community pride. This pride will translate into improved management of existing properties and potential development of abandoned or neglected parcels.

During the Master Planning process, many of the goals of the City of Tucson, the City of South Tucson, Pima County, the general Tucson community and the design team were clearly understood as ideal solutions. These solutions are dependent on many future issues, including financing, governing goals and community desires. The development of the EP&SW Greenway into the future will be explored in this document. A complex design study, this Master Plan presents the future development of the El Paso & Southwestern Greenway both in reasonable and ideal conditions.

The Official Logo of the El Paso & Southwestern Greenway

PLANNING PROCESS

History

Participants in the development of the El Paso & Southwestern Greenway have come from several communities and entities including the City of Tucson, the City of South Tucson, Pima County, the greater Tucson Metropolitan community, Pima Association of Governments, the Regional Transportation Authority (RTA), the University of Arizona's Drachman Institute, City and County parks departments, specific adjacent neighborhoods, and individual community members. With few reservations, those in the Tucson community who have been actively involved believe that the EP&SW Greenway will be a great benefit to Tucson. The evolution of the Greenway follows:

• In 2003, an active community member of the Barrio Viejo neighborhood approached Pima County Natural Resources, Parks and Recreation and asked if the corridor could be developed as an amenity for her neighborhood. County Parks was very interested and discussed the alternative with the City of Tucson Department of Transportation. The road to the Greenway's realization had begun.

• In 2005 the Drachman Institute at the University of Arizona developed a preliminary concept plan as part of the EP&SW Greenway project. Public and municipal input resulted in objectives that included connectivity of surrounding neighborhoods, recreation, reflection of local/ regional identity and character, and celebration of local history.

• In 2006 Pima County voters approved $3.26 million as part of the Regional Transportation Authority Plan (RTA) to fund the Master Plan design of the 6-mile EP&SW Greenway project.

• In 2006 the City of Tucson was awarded a Federal Transportation Enhancement (TE) Grant for construction of a segment from Cushing Street on the north to 22nd Street. The north limit was later shifted south to Simpson Street due to the Tucson Fire Central Station #1 project.

• In 2006 the City of Tucson, in conjunction with The Tucson Fire Department, initiated design of the downtown Fire Central project. Included in that scope was the first 800' of the Greenway project from Cushing Street to Simpson Street. Public input was solicited through community meetings. Construction of Fire Central and the prototype Greenway was completed in 2009.

• In 2007 the consulting team headed by SAGE Landscape Architecture & Environmental (SAGE), was selected to provide a Site Analysis and Master Plan of the 6-mile EP&SW Greenway study area, as well as provide the design services for the El Paso & Southwestern Greenway- Simpson Street to 22nd Street project (Simpson Greenway). In 2010 SAGE merged with Kimley-Horn and Associates. The same design team will complete the Simpson Greenway Project Assessment and 15% construction documents, as well as this document, the El Paso & Southwestern Greenway Master Plan.

• In 2007, the privately funded 'The Bridges' Master Planned Community committed to building just over one mile of the EP&SW Greenway, from Park Avenue to Kino Boulevard. They also provided easements within their western property allowing connectivity from the Nogales Spur to Park Avenue.

• In early 2008, the private developer of Inn Suites included the EP&SW Greenway in their Site Plan in anticipation of the hotel's expansion. This expansion has not moved forward.

• On December 17, 2008 the first of two Open Houses was conducted to introduce the EP&SW Greenway and solicit community input and ideas. This Open House was directed towards neighborhoods from University Boulevard to 22nd Street. Support documentation of these earlier Open Houses can be found in the El Paso & Southwestern Greenway Site Analysis.

• On February 24, 2009 the second Open House was conducted for neighborhoods from 22nd Street to the Ajo Detention Basin.

• In 2009 the City of Tucson's consultant team completed the El Paso & Southwestern Greenway Site Analysis.

• In mid 2010, continued development of the Greenway into the Master Plan phase of the project began using the original design team.

• In August 2010 the Technical Advisory Committee (TAC) met to kick-off the Greenway Master Plan phase. a site visit was conducted to assess field conditions.

• In October 2010, members from the design team from the Drachman Institute conducted several small community outreach events through existing meeting formats, as well as "Cafecito" gatherings in the City of South Tucson.

• In 2011 a Cultural Resources Survey of the El Paso & Southwestern Greenway was completed by Allison Cohen Diehl of Desert Archeology.

• On January 6, 2011 the TAC reconvened to comment on the initial alignment of the Master Plan.

• In January 2011, three Open Houses were conducted to update the public on the Greenway's progress. The outreach was broken into the three general areas; the northern project, central and southeast project areas.

• On March 2, 2011 members of the design team presented information to the West Ochoa Neighborhood Association.

• On April 20, 2011, members of the design team presented the alignment to the Barrio Anita Neighborhood Association.

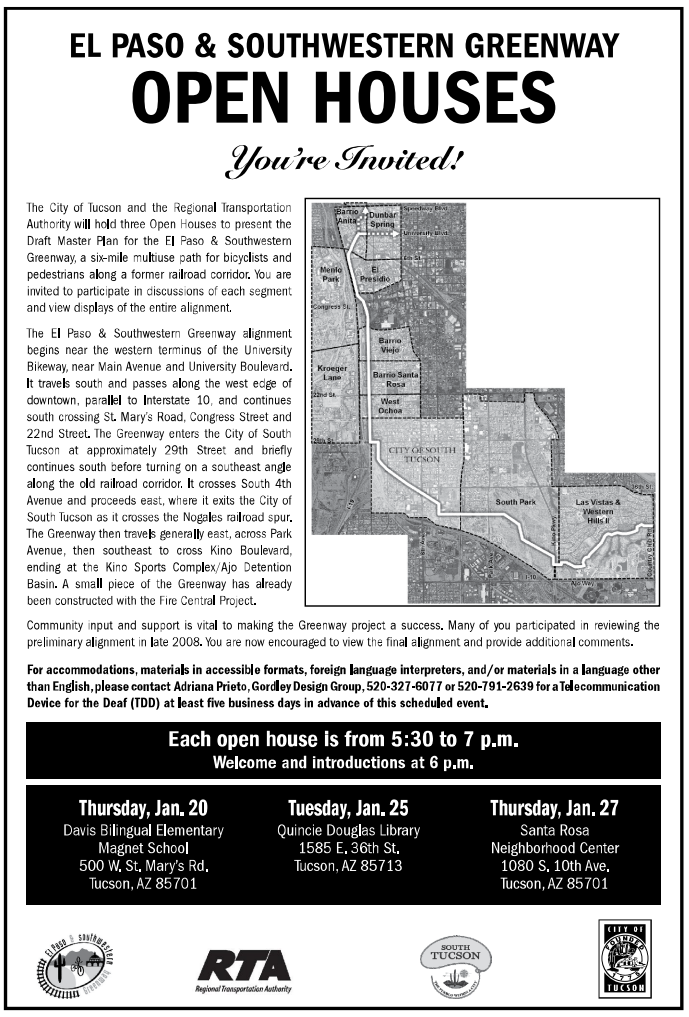
• In June 2011, key team members conducted a planning session with the City of South Tucson planners and City Manager.

• This document, the El Paso & Southwestern Greenway Master Plan, was completed in October 2011.

• In 2011 and on-going, the University of Arizona College of Architecture and Landscape Architecture Historic Resource Documentation and Interpretation service learning class prepared a multiple property National

Register nomination for the historic railroad-related resources along the Greenway. The nomination will be submitted to the Historic Sites Review Committee of the Arizona State Historic Preservation Office for review and recommendation to the National Register, sometime within the next year.

Open House Process



EL PASO & SOUTHWESTERN GREENWAY

OPEN HOUSES

You're Invited!

The City of Tucson and the Regional Transportation Authority will hold three Open Houses to present the Draft Master Plan for the El Paso & Southwestern Greenway, a six-mile multiuse path for bicyclists and pedestrians along a former railroad corridor. You are invited to participate in discussions of each segment and view displays of the entire alignment.

The El Paso & Southwestern Greenway alignment begins near the western terminus of the University Bikeway, near Main Avenue and University Boulevard. It travels south and passes along the west edge of downtown, parallel to Interstate 10, and continues south crossing St. Mary's Road, Congress Street and 22nd Street. The Greenway enters the City of South Tucson at approximately 29th Street and briefly continues south before turning on a southeast angle along the old railroad corridor. It crosses South 4th Avenue and proceeds east, where it exits the City of South Tucson as it crosses the Nogales railroad spur. The Greenway then travels generally east, across Park Avenue, then southeast to cross Kino Boulevard, ending at the Kino Sports Complex/Ajo Detention Basin. A small piece of the Greenway has already been constructed with the Fire Central Project.

Community input and support is vital to making the Greenway project a success. Many of you participated in reviewing the preliminary alignment in late 2008. You are now encouraged to view the final alignment and provide additional comments.

For accommodations, materials in accessible formats, foreign language interpreters, and/or materials in a language other than English, please contact Adriana Prieto, Gordley Design Group, 520-327-6077 or 520-791-2639 for a Telecommunication Device for the Deaf (TDD) at least five business days in advance of this scheduled event.

Each open house is from 5:30 to 7 p.m.
Welcome and introductions at 6 p.m.

Thursday, Jan. 20	Tuesday, Jan. 25	Thursday, Jan. 27
Davis Bilingual Elementary Magnet School	Quincie Douglas Library	Santa Rosa Neighborhood Center
500 W. St. Mary's Rd.	1585 E. 36th St.	1080 S. 10th Ave.
Tucson, AZ 85701	Tucson, AZ 85713	Tucson, AZ 85701

RTA Regional Transportation Authority

SOUTH TUCSON

CITY OF TUCSON

Open House Invitation

Overview

Community outreach has been an important component of the Greenway Master Plan process. Outreach was conducted during the Site Analysis Phase and continued during the Master Plan Phase. During the Master Plan Phase, the Greenway alignment was divided into three sections- northern, central, and southeastern. Full documentation of the Open Houses can be found in the Open House Report in Appendix A, a separate document to this report.

The three Open Houses were held at locations as central to the sections as possible, based on available facilities as follows:

North
Thursday, Jan. 20, 2011
Davis Bilingual Elementary Magnet School

Southeastern
Tuesday, Jan. 25, 2011
Quincie Douglas Library

Central
Thursday, Jan. 27, 2011
Santa Rosa Neighborhood Center

Over a period from January 3, 2011 to January 27, 2011 numerous notifications by a variety of methods were provided:

• Government official notification e-mail

• Postcard invitations announcing all three Open Houses were mailed to approximately 11,100 residents and businesses within a two-mile radius of the project area

• 15-second radio advertisements announcing Jan. 20, 25 and 27 open houses

• Invitation posted to the project website

• 10-second radio advertisements announcing Jan. 20, 25 and 27 open houses

• Newspaper advertisement in The Tucson Weekly periodical

• News release sent to local media

• Newspaper advertisement in La Estrella periodical

• 15-second radio advertisements announcing Jan. 25 and 27 open houses

• 15-second radio advertisements announcing Jan. 27 open house

Meeting Purpose and Format

The purpose of the Open Houses was to present the Draft Master Plan for the El Paso & Southwestern Greenway and to gather comments during the planning process. The meetings started in an Open House format, followed by a brief presentation. Tom Thivener, Project Manager, City of Tucson Department of Transportation, opened up each presentation by welcoming attendees to the meeting and recognizing government officials in attendance. Sandy Bolduc, Project Manager, Kimley-Horn, followed by introducing the project team and providing an overview of the project. Rebeca Field, Kimley-Horn, Lead Designer, conducted an interactive activity. She guided attendees from north to south, through the proposed El Paso & Southwestern Greenway alignment, as shown on a large project map. Attendees were encouraged to write comments or requests on the project map to be documented in the Master Plan. Afterward, attendees were invited to visit information stations to view displays and question team members. The stations were set up as follows:

Resident Commenting on Alignment Map

Central Open House Destination Boards

- Station 1 – Alignment Map

- Station 2 – Destination Chart

- Station 3 – Neighborhood Display Boards
  Dunbar Spring / Barrio Anita
  El Presidio / Downtown Tucson
  Barrio Viejo / Barrio Santa Rosa
  West Ochoa / City of South Tucson
  South Park / Las Vistas
  Western Hills II

- Station 4 – Historic Resources Display Boards
  Overpass Concepts

- Station 5 – Benefits Display Boards
  Development Benefits
  Safety Benefits
  Health Benefits

- Station 6 – Comment Forms

Resulting Input

The Destination Chart provided the opportunity for attendees to specify the top three destinations along the Greenway they would most likely travel to by placing dots next to the listed names of destinations. This was designed to give the team insight on which areas of the Greenway would need the most priority. The top three destinations choices were Downtown Tucson, the University of Arizona and BICAS (Bicycle Inter-Community Art and Salvage) located near Downtown.

The community responded to the Greenway presentation with suggestions for improvements as well as appreciation for the benefits they saw. They highly approved the separation of multi-modal traffic from vehicular traffic. They appreciated the interest in making major street and railroad crossings safe, but disagreed on how to accomplish that. Some agreed with overpasses and some preferred signalized crossings. They had a general concern for safety issues such as strangers being in their neighborhoods, but liked that lighting would make the Greenway more comfortable to use. They acknowledged access to other community linkages was considered, but wanted to be sure all linkages would be addressed. They responded positively to the recreational quality the Greenway would bring to their lives and the resulting health benefits. They were concerned about where the money for construction would come from. Greater detail of the community response can be found in the Open House Report, Appendix A.

Overview of Alignment with Residents

Review of Project Material During Open House

Attendees were also encouraged to complete comment forms and visit the project website at www.dot.tucsonaz.gov/elpaso. Overall, the attendees expressed strong support for the project.

Team Attendance

The following team members were present at the Open Houses:

- City of Tucson: Tom Thivener
- City of South Tucson: Joel Gastelum, Mick Jensen
- Drachman Institute, University of Arizona: Katie Gannon, Yenniffer Perry
- Gordley Design Group: Lucy Amparano, Melissa Anguiz, Adriana Prieto
- Kimley-Horn and Associates: Sandy Bolduc, Rebeca Field
- Structural Grace, Inc.: Claudia Perchinelli, Dave Dobler, Francina Sosa
- Wood Patel & Associates: Pat Marum, Jesse Schultz

Public Attendance

- Davis Bilingual Elementary School
  Public attendance: 36
  Comment forms received: 13

- Quincie Douglas Library
  Public attendance: 6
  Comment forms received: 1

- Santa Rosa Neighborhood Center
  Public attendance: 18
  Comment forms received: 7

Materials (in English and Spanish)

- Agenda
- Comment form
- Project fact sheet
- Drainage fact sheet
- Safety fact sheet
- Sign-in sheet

Outreach to the City of South Tucson

The City of South Tucson (COST) has been a critical partner in the El Paso & Southwestern Greenway Master Plan process. Over one mile of Greenway falls within its limits. Due to the importance of this segment and its central location, pointed outreach specific to COST was strategized. During the Open House process, all three Open House mailings were sent out to the entire City of South Tucson.

The Drachman Institute, Greenway Design Team members and outreach arm of the University of Arizona, was directed to place a strong emphasis on coordinating with the City of South Tucson in their Master Plan scope. They assisted COST with a Federal Transportation Enhancement Grant application and also supported COST efforts with a small grant for stabilization of the Auction House with a new roof. The Drachman Institute conducted small-scale outreach including "Cafecito" gatherings at several locations including COST schools to reach a broader audience in an informal venue.

City of South Tucson Community Outreach

Several outreach events were held with residents of the City of South Tucson to attain community input on the design of the El Paso & Southwestern Greenway. Each event was conducted at a unique venue, using a variety of methods to gain input, including surveys, focus group discussions, a field trip, and other exercises. Information received from the community directly influenced the planning and design of the El Paso & Southwestern Greenway through South Tucson. Further documentation of the Cafecito outreach is found in Appendix B: City of South Tucson Cafecito Report.

Outreach Summary

VENUE	DATE	PARTICIPANTS	METHODS
National Night Out	Tuesday 8/3/10 5-8pm	15 South Tucson residents, various ages	- booth: one-on-one discussion - boards: route & history - survey: 9 questions, 15 respondents
John C. Valenzuela Youth Center & EP&SW Greenway site	Thursday 9/23/10 5:30-8pm	7 middle school students	- site visit/night walk - round table discussion - survey: 13 questions, 7 respondents
John C. Valenzuela Youth Center	Friday 9/24/10 2-4pm	18 elementary school students (3rd - 5th grade)	- round table discussion - route mapping exercise - drawing exercise
Mission View Elementary School	Friday 11/19/10 8:30-10:30am	15 parents of elementary-aged children	- Cafecito: informal presentation & discussion - survey: 10 questions, 15 respondents

Summary Findings

- Few City of South Tucson residents had heard of the El Paso & Southwestern Greenway project, though most are familiar with the raised bed/ alignment that run through the community between South 6th and 10th Avenues.

- The majority of residents currently walk or bike within the community.

- Traffic speed was cited as a concern when walking or biking by nearly all respondents (7 of 7 youth respondents and 12 of 15 parent respondents).

- 13 of 15 parents at Mission View Elementary School identified stray dogs as their biggest concern when outside.

- Homeless people and strangers walking through the community were frequently cited by both youth and parents as a safety concern.

- Youth suggested several features along the Greenway, including graffiti walls as privacy screens in areas where backyards directly abut the Greenway. Seating areas and night lighting were also requested.

- Though outside the scope of the greenway project, most children and several youth mentioned a desire for a public swimming pool within the community.

- Parents and community members identified trees, walking paths and sidewalks, benches and drinking fountains as improvements they would most like to see.

- Facilities most favored by residents and parents included playgrounds, a community garden, a swimming pool, and exercise circuits.

- All youth indicated an interest in bicycling, including bike clubs and bike repair classes.

- Trees and shade were identified as an important amenity that encourage walking and outdoor activity.

Survey Results from John Valenzuela Youth Center

John Valenzuela Youth Center Visit with Elementary Students

Design Implications

The EP&SW Greenway crosses diagonally through the City Of South Tucson, providing access to and from many of the City's streets. Four major access points to the EP&SW Greenway are suggested: 4th Avenue, 6th Avenue, 8th Avenue, and 10th Avenue. A Gateway City Plaza is suggested as a central gathering area for the community and visual focal point along the busy 6th Avenue commercial corridor. The main commercial space is located between Taqueria Pico de Gallo and Discount Tire.

The character of the neighborhood and the activities and customs of survey respondents suggested creating a linear park along the alignment. Respondents suggested a design suitable for small daily gatherings rather than a strict focus on transportation usages such as walking, biking, or roller blading. Ideas included "placitas" with seating, trees and vegetation, and where spatial dimensions permit, play areas for different age groups. Survey results highlighted the importance of night lighting to extend the use of the EP&SW Greenway beyond daylight hours, especially in the summer, when the desert weather is more suitable for walking, biking or jogging.

Respondents suggested that small exercise stations of various types could be located along the Greenway in places with spatial constraints. Areas with more available space could contain larger exercise stations that could host small-group activities such as dancing or yoga classes. A community garden was cited as a popular amenity. Bike racks are suggested, at the minimum, on all main entries and main gathering areas. At minimum one restroom station and two water fountains should be located along the Greenway between 10th and 6th Avenues.

Features Kids Would Like to See Along the Greenway

Implementation Plan

Based on the community outreach and coordination with the COST staff, the Drachman Institute also produced the following implementation guidance for the City of South Tucson to aid the implementation of the EP&SW Greenway into their community. Ideally, the entire Greenway in the COST will be developed at once, and due to the close proximity, the segment of the Greenway next to West Ochoa neighborhood is also included with the COST. If phasing is required, two phases will work well. This internal phasing is predicated on the ease of managing local conditions.

Phase 1: 25 ½ Street to 6th Avenue with the addition of West Ochoa. In August of 2010, the City of South Tucson in conjunction with the City of Tucson, and with the aid of the Drachman Institute, applied for Round 18 of the FHWA Transportation Enhancement Grants. Although they were not awarded the grant, the general consensus is that the further development of the EP&SW Greenway Master Plan Report will provide substantial support toward an award in Round 19. The project area is listed as a future Pima County Bond project as well. Acquisition of the UPRR land is a critical step to this phase. The challenge of this phase is passage along 29th Street.

Phase 2: 6th Avenue to the Nogales Spur. There are challenges in this segment. The at-grade crossing at 6th Avenue will require a detailed Traffic analysis, passage along Vail Road will require revamping of existing traffic and parking patterns, and the land necessary to access the Nogales Spur is now under private ownership and an easement or acquisition will be needed. The Nogales Spur overpass is part of this phase.

The events to prepare for the Greenway construction should be initiated in the following order due to the length of time each step takes. They may overlap during the implementation process.

Step 1: Property Acquisition

In order to build the Greenway, the first critical step is acquisition of rights-of-way. The South Tucson portion of the six-mile alignment has been identified as the phase most likely to be implemented next, largely because South Tucson, as a municipality, has access to funding from the Regional Transportation Authority, Federal Transportation Enhancement grants, and the Environmental Protection Agency. See chart next page for "Likely Sources of Funding" matrix for further detail. Additionally, there are two adjacent parcels owned by Chevron that should be targeted for acquisition. These parcels could expand into local pocket parks and would greatly complement the recreational features of the Greenway.

Step 2: Environmental & Cultural Assessments

There is a possibility that portions of the alignment may have some contamination as a result of historical uses. This issue must be assessed and if present, remediated. Funding from the EPA Brownfields Program may be available for assessment and remediation.

Step 3: Design & Engineering – Construction Documents

Several sources of funding can be used for the design and engineering portion of the project. A combination of sources may be most appropriate. The alignment through South Tucson includes several design challenges. There are five critical roadway crossings located at 29th Street, 10th Avenue, 8th Avenue, 6th Avenue and 4th Avenue, as well as the historical bridge retrofit near 11th Avenue. The raised railroad bed beginning east of 11th Avenue to just west of 6th Avenue creates additional challenges to the goal of ADA accessibility and access to and from adjacent neighborhoods.

Step 4: Construction

If need be, construction can be completed in "sub-phases" within the main phases. For example the main asphalt pathway can be installed first and auxiliary paths could be added later. Surrounding pocket parks can be completed using a mix of other grant funding and various community partnerships. Portions of construction that are paid for with federal dollars tend to be more expensive and take longer. This is because federal dollars require wages and details that are generally more costly than other funding sources. Smaller localized projects along the Greenway may be easier to achieve and can be completed more quickly.

For the last three years the construction-bidding environment has been highly competitive due to the regional and national economic downturn. If this bidding environment continues, and the project moves forward in good time, the cost of building the Greenway could be lower than initially anticipated.

Step 5: Maintenance

The operation and maintenance of the Greenway is perhaps the most challenging piece for the City of South Tucson to finance. Some ideas for raising funds to maintain the Greenway include:

• Charge programming fees

• Charge peddlers license fees to allow local vendors to sell goods and services along the greenway route, especially in the vicinity of 6th Avenue. Raspados, paletas, pico de gallo, taqueria vendors, etc. would help bring the community into the park and provide a lively social environment for the community.

• Develop partnerships with local users or agencies to clean and maintain portions of the Greenway in exchange for recognition, an extension of the Adopt-a-Park program.

Partnerships With Local Youth will Assist in Incorporating the Greenway into the Community

South Tucson Implementation Strategy - Possible & Likely Sources of Funding

Source	Federal Pima County/ South Tucson	Federal/ADOT (SAFETEA-LU)	Federal/ADOT	Regional MPO - RTA	Pima County	Various
Program	**EPA Brownfields**	**Transportation Enhancement** to $750,000	**Safe Routes to School** to $400,000	**RTA** $325,000 Annually for Greenway related Uses.	**Pima County Reinvestment Bonds** –Up to $3 Million when Bond approved.	**Other Grants**
Property Acquisition		Yes		Yes		
Assessment/ Remediation	Yes					
Design		Yes	Yes	Yes	Yes	
Construction		Yes	Yes	Yes	Yes	Yes*
Maintenance						

* There are a variety of funding sources for project components such as park-lets, equipment and furniture, community art projects, vegetation, solar lighting.

PROJECT CONTEXT

A trail is not a route from here to there. It is ***a place to reconnect.***

- Robert Searns, 2001

PURPOSE & HISTORY

The purpose of any community improvement is to enhance the local population's health and safety, provide spaces for education and interaction, and to improve the condition of the subject and/ or bordering properties. This improvement will also provide cyclists safe commutes and recreation access to many Tucson destinations. Many portions of the current EP&SW Greenway alignment are, or are found adjacent to abandoned, ignored and blighted industrial and commercial properties.

In its current condition, the railroad corridor is a series of missed opportunities. The blighted environment can easily be transformed into a tree-canopied passage for people biking and walking, providing physical and descriptive linkages to explore the adjacent communities and their rich histories. The abandoned tracks, which will be retained wherever possible, as well as the beautiful historic structures along the route, are opportunities for describing the history of the EP&SW Railroad. A small weedy property is an opportunity for a local tot lot in a neighborhood that has no playgrounds. The segment behind some homes is a chance for a child to walk to grandma's house without crossing a major roadway. On the adjacent private land, there could be a cozy coffee shop for parents to visit together after their kids go to school. Perhaps there could be a bicycle repair shop where young friends can learn about maintaining their "Vehicles to Discovery." There could even be a small stage with lighting and power for a local mariachi band to perform just next to the new pathway.

Renderings of how the El Paso & Southwestern Greenway can be improved to facilitate walking and biking.

OPPORTUNITIES & CHALLENGES

Opportunities along a corridor such as the El Paso & Southwestern Greenway are endless. Challenges can be overcome by employing careful research, planning, and communication with the community. The following Opportunities and Challenges will be fully detailed for each segment of the EP&SW Greenway in the Master Plan Alignment Descriptions that follow this section.

Community History and Outreach

In addition to the historical buildings and bridge structure that will be highlighted in the alignment reviews, it will be important to preserve and/or mitigate other cultural and historical resources along the Greenway alignment. Resource assessment reports are available in Tucson's Arizona Historical Society, located near the University of Arizona campus. Some of those assets include archaeological remains, rail remnants, certain view sheds, and the alignment itself.

Wherever you find community activities, there is an opportunity to reach out to express and share local historical and cultural understanding. In it's day, during the early 1900's, the EP&SW Railroad provided a significant source of prosperity and pride to the Tucson community. Beautiful buildings of historic value are found along the alignment: the EP&SW Railroad Depot, where ladies in feathery hats and men in coattails and gloves boarded the train to Douglas; the Roundhouse, where the massive diesel engines were repaired and refurbished; the Auction House, where Long Horns were off-loaded and sold to the highest bidding rancher. These are stories worth sharing.

Some of Tucson's original neighborhoods are also located along the northern and western portions of the alignment. The fading stories are numerous and of value to our community. Saturday night baseball games between local rivalries were not to be missed at Oury Park in Barrio Anita. The railroad brought the circus with its elephants, giraffes and tents for an amazing family event right downtown. In Barrio Viejo, within walking distance of the alignment, is El Tiradito, a shrine dedicated to the broken hearts of a love triangle. The Greenway travels through the heart of the one-mile square City of South Tucson, incorporated by the local Anglo businessmen who had a fierce desire to avoid business license fees and control from the City of Tucson. Reference Dave Devine's "The Struggle by Survival" for more detail. Wonderful dining and musical venues abound. The question is: "how do you bring the community to the Greenway?"

The Greenway will Run Through the El Presidio Historic District, One of the Oldest Inhabited Sites in the U.S.

Linkages and Wayfinding

Drawing the community into the El Paso & Southwestern Greenway will be easy due to the proximity of numerous existing and proposed linkages which include bikeways, bus routes and the imminent implementation of Tucson's Modern Street Car that will intersect the Greenway at Granada Avenue on the south edge of Downtown.

Providing parking lots/ trail heads will allow visitors from other parts of the Tucson area to spend more time on the Greenway itself. Signage, identified as a critical design requirement, will be the key to identifying access points and pulling these visitors, some who may work or live nearby, into the Greenway itself. Signage along the Greenway will also be critical to allow for wayfinding and to highlight significant features within the area.

Inclusion of the Greenway into visitor brochures, as well as local publications will also be important. But it is the creation of **Destination Nodes** that will provide the reason to keep returning.

Destination Nodes

The secret to creating an environment that encourages visitors and the community to explore, engage in and then fully embrace its value is to provide numerous opportunities for discovery. Destination Nodes will provide that encouragement. These nodes may encompass existing historic or natural features, but may also include adjacent, undeveloped parcels suitable for a small park, historic interpretation or a local artist's sculpture. These nodes can be of any size and shape, as long as there is an intrinsic quality of interest, mystery or value.

• An example of a Destination Node found along the Reedy River Falls Park in Greenville, South Carolina is an area so nicely designed and situated that hundreds of couples have had their weddings performed there.

• A potential Node along the Greenway alignment is the EP&SW Depot on Congress Street. Features that community members discussed included a down to earth restaurant, whimsical retail or a museum. The exterior could be redesigned to include the depot platform and park-like gardens as seen on historic aerials and photos. The State Historic Preservation Office requires the preservation in place of the tracks that run alongside the depot, further enhancing the interpretation of the depot's history.

• Another idea that has initial support from the Arizona Department of Transportation (ADOT) is development of the ADOT detention basin near 28th Street. Park improvements are acceptable as long as the function of the basins is not compromised. Improvements could include small sports or multi-use fields, a dog park, a walking/ exercise circuit, a bicycle skills park or skate park. A dynamic opportunity exists for the surrounding neighborhoods that are sorely lacking in park facilities.

Once revealed, several of the elements along the Greenway alignment that will draw the curious include:

• Any of the historic buildings previously mentioned

• The historic railroad bridge just wide enough for one train to cross

• Significant spans of existing tracks including a rail switch that diverted the train's direction

• Views of the downtown Tucson skyline

• Fire Central Station #1 with its public museum and gazebo set in a small park setting.

• A distant arch that signifies access to the Barrio Santa Rosa Neighborhood Center.

These features and the locations that provide opportunities for new Destination Nodes will be fully detailed in the Master Plan Alignment Descriptions.

Physical Comfort and Safety

There are important challenges when developing in an area that historically has been neglected. The community shies away from spaces that are uninviting, barren and visited by unfamiliar people. When these spaces are developed, there is still a negative image to be overcome. Projects around our nation, also developed in blighted and feared areas, have allowed abandoned areas to be taken back into the hearts of the community. Proper improvements dispel these negative characteristics, invite positive activities and help develop a sense of pride, ownership, and guardianship. Basic comfort and safety features of the El Paso & Southwestern Greenway Master Plan design include:

• A divided urban pathway to separate slow and fast modes of alternative travel, each to their own path.

• The separation from vehicular traffic encouraging safe commuter cycling

• Passages and nodes with canopy shade for climate control

• Vegetation selected or pruned to allow proper visual access

Potential Destination Node: San Cosme Park at Fire Central

Landscaping and Seating Areas Adjacent to a Multi-Use Path in Tucson

• Benches and drinking fountains for rest and refreshment

• Comfort stations in select areas

• Lighting in areas prioritized for evening events

• Odor abatement where sewer manholes are poorly sealed

The tremendous explosion of alternative transportation in recent years has resulted in more research into the interface between alternate mode methods and vehicular traffic, as well as the conflicts that arise between alternate modes themselves. There is an on-going evolution of bicycle safety requirements through pathway signage and safety guidelines. A summary of requirements is found in the Summary of Design Guidelines, as well as the Traffic Report in Appendix C.

Community Health & Physical Activity Environments

Healthy communities offer a variety of viable transportation modes to all their citizens. The most vulnerable members of our society who do not have access to cars, including the elderly, youth, and low-income individuals, will benefit the most. Greenways provide low stress bicycle routes for riders who may not feel confident riding in bike lanes on busy roads. It is beneficial for communities to provide a variety of safe public spaces to serve people of different ages and abilities. The Greenway is an ideal setting to create a variety of nodes to serve a multitude of users. Greenways tend to be popular because they serve as both recreation and transportation facilities.

Sustainability

The goal for every community project is to remain a beautiful and comfortable safe haven well into the future. By designing the EP&SW Greenway to meet the community's needs, community ownership and responsibility are instilled. By designing the Greenway to promote its use by adjacent property owners, whether business or hospitality, broader community buy-in and support may be attained. By designing the Greenway to be as self-sufficient as possible, future maintenance costs are minimized, allowing community funds to be directed toward critical safety or upkeep issues.

Cultural & Environmental Issues

Cultural resources on the surface of the Greenway most likely will be residuals of a recent historic past rather than from the distant Native American. Unlike waterways that provided a survival base for our earliest inhabitants, this corridor had an economic basis fed by the railroad expansion initiated by the east coast Industrial Revolution of the late 1800's.

The El Paso & Southwestern Greenway Site Analysis report maps the locations of known contaminated sites along the Greenway. Further investigation will be required during detailed design to determine the status and extent of these sites, as well as determine if others exist. Contaminated sites along the alignment may have resulted from historical railroad uses such as fuel storage, engine yards, etc. These risks will be assessed in the environmental clearance phase of the project and if present, may need remediation. There may be funds available under the EPA Brownfields Program for this purpose.

There are a number of billboards situated within or immediately adjacent to the EP&SW Greenway that compromise viewsheds and the ground level design quality of the greenway experience.

Past Railroad Use Creates Potential Environmental Issues that Must be Addressed During Design

Limited or Non-Existant Vegetation in Portions of the Project Suggest Potential Soil Contamination

THE MASTER PLAN

"To make a greenway... is to make a community."

- Charles Little, 1990

SUMMARY OF DESIGN GUIDELINES

The Master Plan El Paso & Southwestern Greenway Design Guidelines are included at the end of this report. The Guidelines are divided into two bodies of reference: the first is Mandatory Design Requirements; the second is Recommended Design Guidelines. Implementation of the Design Guidelines may occur by several means:

City-Owned Properties

• Provide the Design Guidelines as a requirement for design teams to comply with.

• During the design process, provide individualized public outreach to Neighborhood Associations to generate support that will eventually influence interfacing property owners.

Interfacing properties

• Conduct presentations of specific greenway projects across the nation to groups of developers or community members to generate understanding of a greenway's benefits.

• Negotiate with individual landowners by showing benefits to development as well as the community.

• Include provisions for the Greenway as a condition of rezoning.

ALIGNMENT DESCRIPTION

This section includes a detailed description of the ideal recommendations for each segment of the El Paso & Southwestern Greenway, described as if walking along it upon its completion. In general, specific examples of the following characteristics will be expressed within each segment as is appropriate. Many of these characteristics overlap into more than one category. Certain characteristics will lend themselves as a focal point for a Destination Node. The Nodes are a key element that will attract the public to this Greenway.

Neighborhoods along the Greenway have a certain **Uniqueness**, distinctly separating each one from other sections of the Greenway. The earlier Tucson neighborhoods found in the northern portion of the project and through the City of South Tucson have numerous special histories or characteristics. Barrio Anita has a strong association with early baseball games, a tremendously popular community event, for years held at Oury Park. The City of South Tucson has several popular Mexican restaurants located adjacent to the Greenway. There may be physical characteristics, such as a distant view of A Mountain or a specimen tree that could easily be emphasized with site-specific design of a Destination Node.

Throughout the Greenway alignment there are **Historic Linkages** to various eras in Tucson's history. Some are tangible, as the numerous historic buildings noted along the alignment. The EP&SW Depot and the well-preserved associated railroad tracks that run from Congress Street to Cushing Street, provide a broad context for the heart of this alignment's history. Some linkages, such as the El Tiradito shrine in Barrio Viejo, delve into the heart of Tucson's earlier settlers. This shrine is not adjacent to the Greenway but may be referenced with historic interpretation and way-finding displays to broaden the Greenway's expression of local features. This signage will educate and create interest in Tucson's history.

One goal of the Greenway is to increase the **Physical Linkages** to complete connections to the Urban Loop, the alternate-mode pathway system Tucson is developing. Connections to the numerous City of Tucson Bikeways and Bike Routes that promote efficient commutes are also critical. These include the 3rd Street/University Bike Boulevard and 18th Street Bike Route. The foundation for some future linkages has been established. "The Bridges" development has dedicated an easement following the Nogales Spur south to the Julian Wash, a key spine route of the Urban Loop. A unique linkage will occur when the Modern Street Car is completed at Granada. The Greenway will also connect to several established Bike Boulevards to create a greater alternative transportation network. Existing Bike Boulevards include University Boulevard which connects to the University of Arizona, 18th Street which connects to the Santa Cruz River Path and 8th Avenue which connects to the Liberty Bike Boulevard on the south side of Tucson.

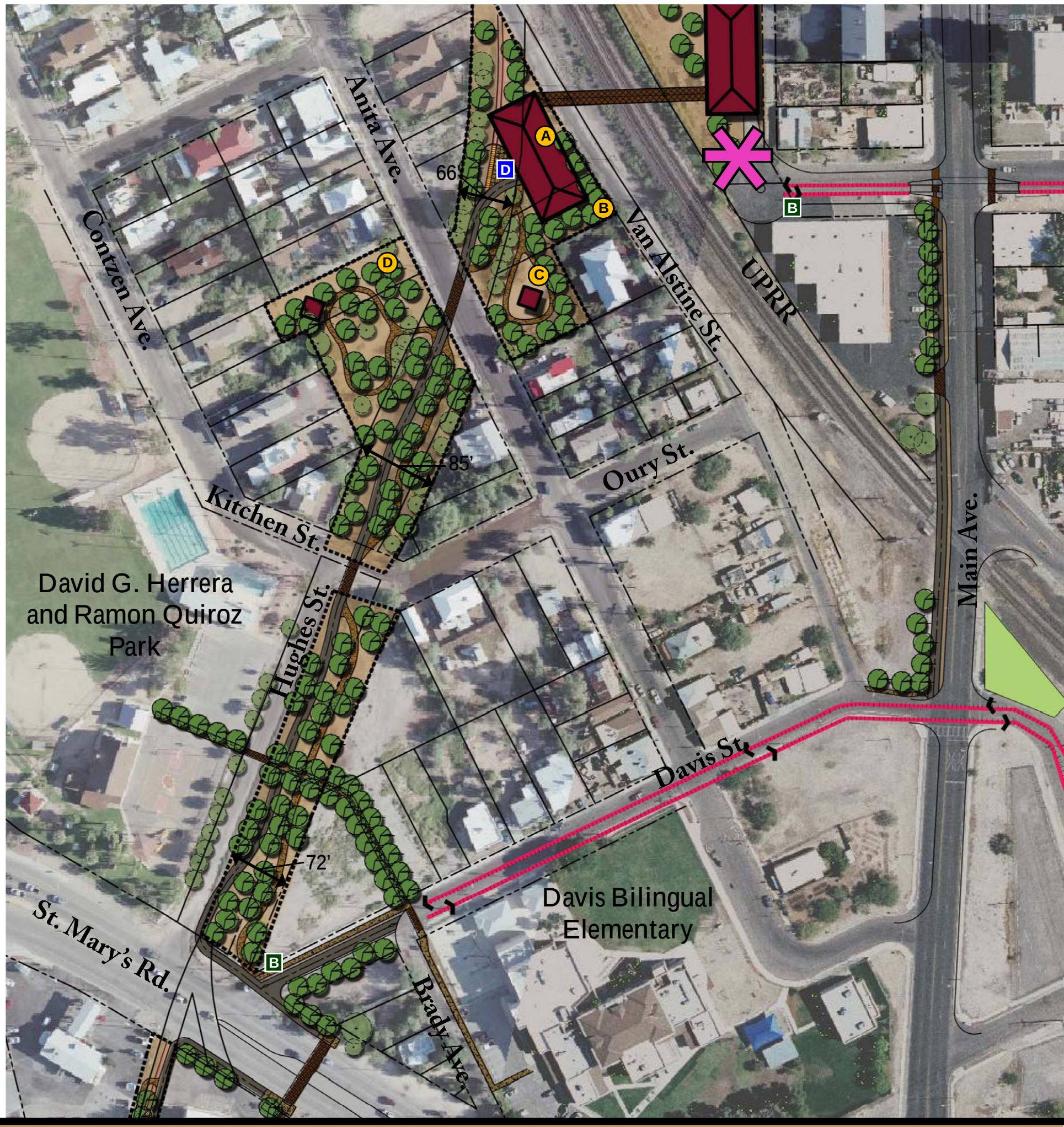
The EP&SW Greenway alignment is sprinkled with **Opportunities and Challenges**. The opportunities will be translated into community assets. The challenges, such as environmental issues or negative views, will be transformed into positive resources. The entire alignment is an opportunity for physical activity and exploration into new areas of town. One challenge will be creating a greenway with such an exciting variety of destinations and features that the entire community will be eager to visit and participate.

THE NORTH NEIGHBORHOODS: UNIVERSITY BOULEVARD TO ST. MARY'S ROAD (*PHASE 3a*)

The El Paso & Southwestern Greenway officially begins near the intersection of University Boulevard and Main Avenue. The interface with University Boulevard offers a strong connection to the University of Arizona campus through the use of the established University Bike Boulevard. The surrounding eclectic neighborhood provides the opportunity for integrating a number of unique themes to the area, such as the historic African-American heritage of the neighborhood, community artwork, the use of native Sonoran Desert plants, and the incorporation of innovative and sustainable design practices. There is also the potential to connect to Estevan Park and nearby neighborhoods to the north as shown on the Master Plan Exhibit on page 41.

As the Greenway begins its journey west it faces the immediate obstacle of the Union Pacific Railroad (UPRR). This active line separates the beginning of the Greenway from the historic El Paso & Southwestern Railroad (EP&SW) alignment which the Greenway will follow. The options explored to cross the UPRR include an at-grade crossing at the University Boulevard alignment, an overhead crossing at the University Boulevard alignment, or an at-grade crossing at the existing Main Avenue intersection with the tracks. Refer to Appendices C: Traffic Report and D: Structure Concept Memo for additional discussion regarding the crossing options.

The at-grade Main Avenue crossing requires the use of a portion of Main Avenue from University to Davis Street as a shared use path. This option provides a solution for moving the Greenway forward



regardless of whether overpass negotiations with the UPRR are successful. The proposed 5th Street Bike Boulevard with connection to Davis Street provides a strong connection east to the planned pedestrian enhancements that are part of the Tucson Downtown Links project. Westbound Davis Street intersects the historic EP&SW alignment.

If the overpass is approved, just west of the UPRR

Sketch of Proposed UPRR Pedestrian Overpass

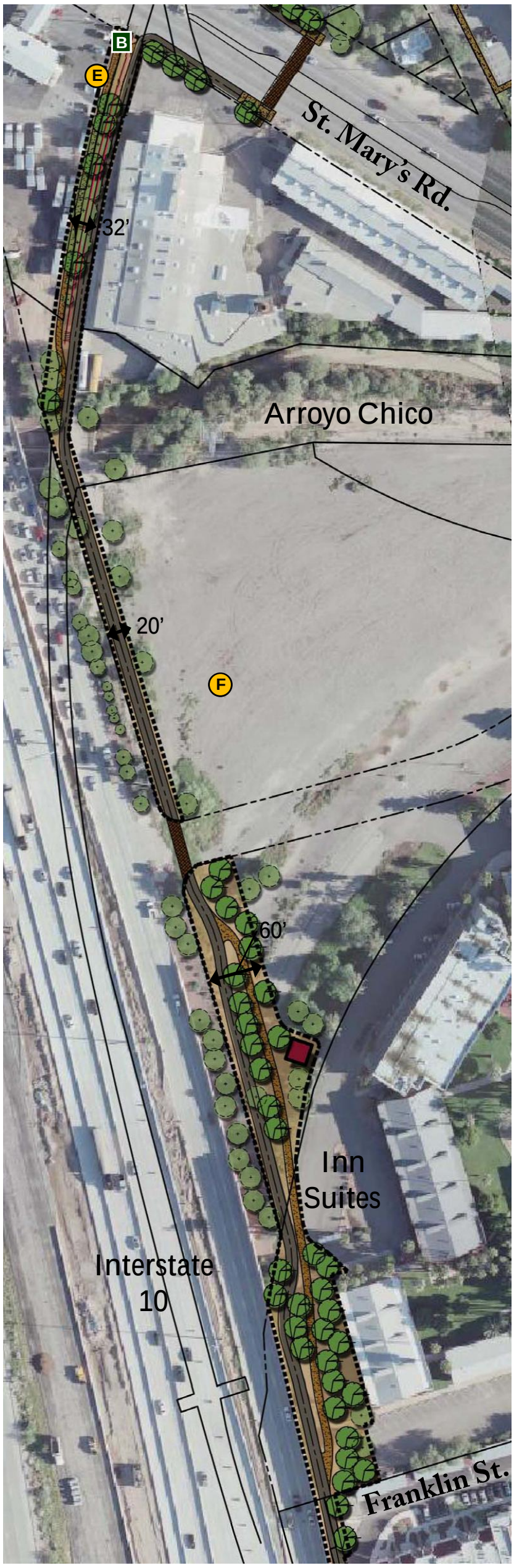
tracks at the University Boulevard alignment, the Greenway immediately meets the historic EP&SW alignment and crosses into the historic Barrio Anita Neighborhood. This notable juncture is marked with an interpretive railroad plaza that incorporates refurbished railroad tracks into a small display area. The plaza features seating opportunities, a drinking fountain, bike racks, native plantings and other amenities to mark the 'beginning' of the Greenway and promote user comfort. The surrounding neighborhood can also be featured in the plaza by incorporating themes such as the importance of community, the strong Mexican heritage of the area, and the importance of baseball in conjunction with nearby David G. Herrera and Ramon Quiroz Park. The area also features two ramadas and a divided urban pathway which consists of a 12' wide asphalt path and an 8' wide soft walking path.

As the Greenway crosses Contzen Avenue it parallels the eastern edge of David G. Herrera and Ramon Quiroz Park which offers a swimming pool, covered basketball courts, sand volleyball courts, a ramada, ball fields and a small community center for area residents. The Greenway provides a direct link to this amenity and also provides a link east towards the Davis Bilingual Elementary School. This important connection will provide a safe route for children to walk to school while benefitting from outdoor exercise. The crossing at Davis Street is recommended to consist of a speed table marked with distinctive pavement to alert bicyclists and the occasional motorist of a pedestrian crossing.

The second major crossing that the Greenway encounters on its journey south along the historic EP&SW alignment is the crossing of St. Mary's Road. This busy arterial street features high volume vehicular traffic and is in fairly close proximity to Interstate 10. Coordination efforts have been successful with the Tucson Downtown Links project to incorporate a TOUCAN, a signalized bicycle/pedestrian crossing at this location for the Greenway. Refer to Appendix C for additional discussion regarding the crossing configuration. The Downtown Links project also recommends the closure of Davis Street just west of Davis Bilingual Elementary to discourage vehicular traffic and encourage non-motorized access to the south through the use of a 12' wide asphalt path and an 8' wide soft path.

Phase 3a will have three at-grade intersections at Anita Avenue, Kitchen Street and St. Mary's. These streets convey storm runoff west and north; therefore, crossings should be constructed at or near existing ground elevations in order to minimize ponding against the path surfaces. Existing drainage patterns must be maintained. Depressed landscaping areas will be utilized for storm water harvesting where feasible. There are no channel crossings or storm drain improvements within this phase.

Planned Improvements to St. Mary's Road (Image Courtesy of the Tucson Downtown Links Project)



Legend

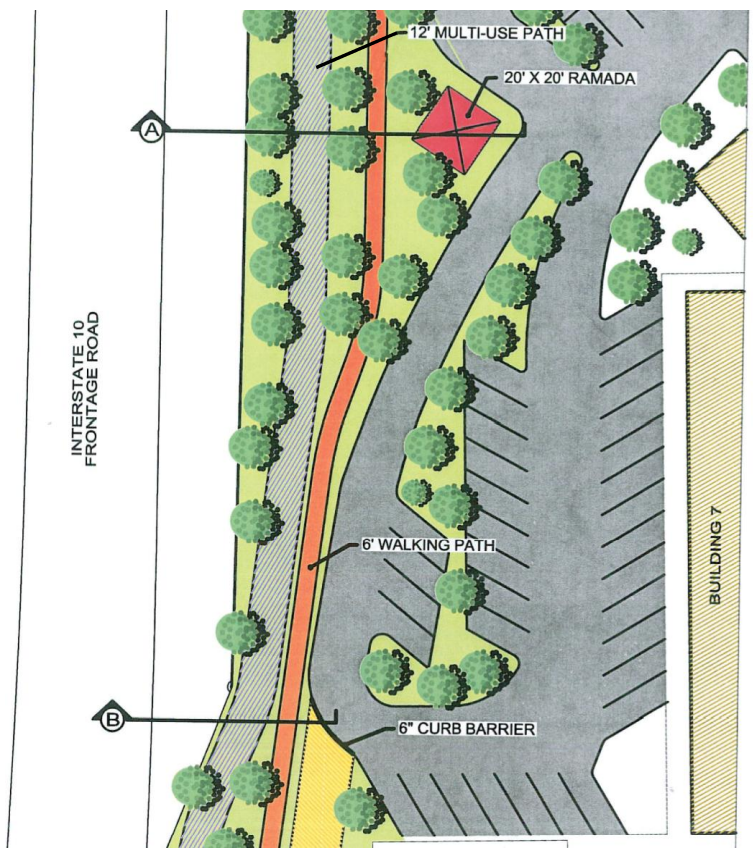
- **B** **Bike Rack**
- **A** **Property of Interest**
  - (Refer to Chart on Page 35)

N

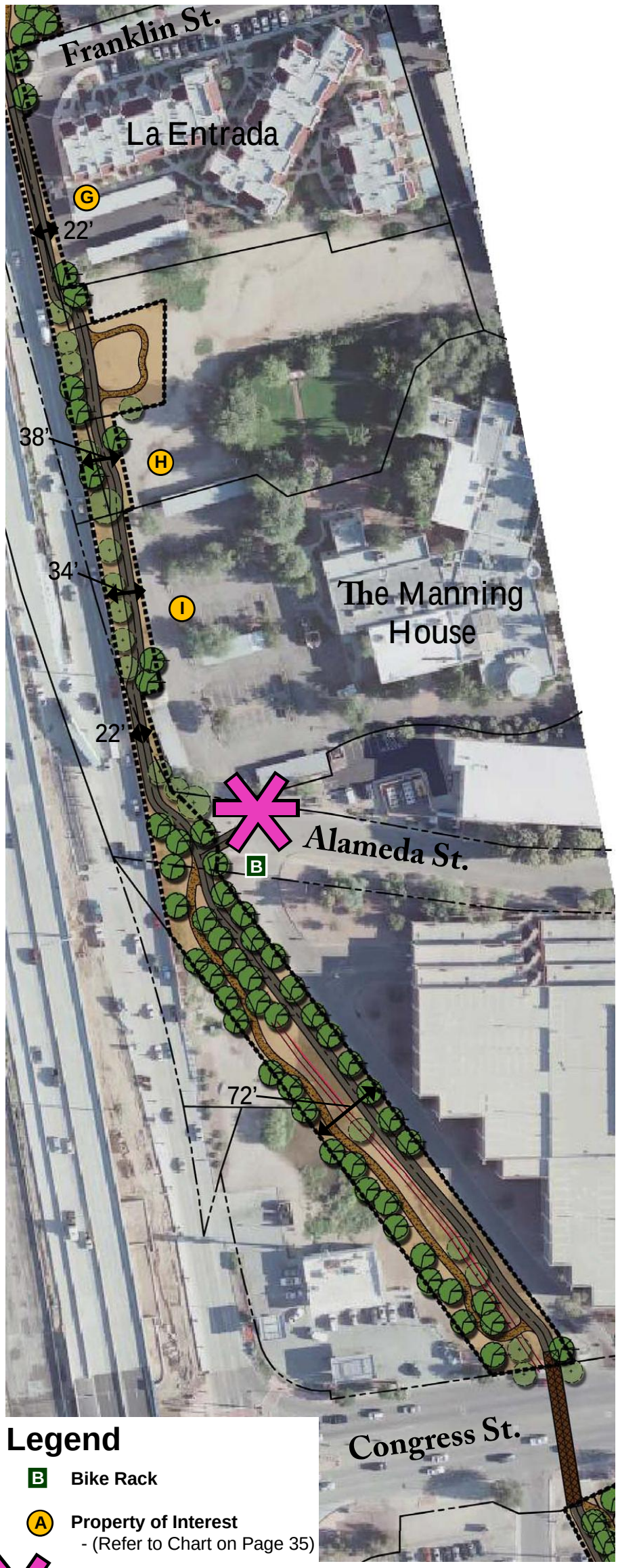
THE NORTH NEIGHBORHOODS: ST. MARY'S ROAD TO FRANKLIN STREET ALIGNMENT (*PHASE 5*)

Continuing south across St. Mary's Road, the available right-of-way narrows to 20' in width west of the adjacent private development. It is recommended that the western edge of the Greenway right-of-way be expanded into the adjacent parcel by approximately 12' to allow for the preservation of historic railroad tracks and several large shade trees, and the implementation of both an 8' wide soft path and a 12' wide asphalt path. The remnant tracks that appear in this area are invaluable in depicting the origins of the Greenway alignment. This area also marks the transition into the El Presidio Neighborhood from Barrio Anita north of St. Mary's Road. Themes that might be incorporated into artwork in this segment include the railroad, the Hohokam culture that was once prevalent along the nearby Santa Cruz River, El Presidio San Agustín del Tucson or the community's strong Spanish-Mexican heritage.

Arroyo Chico is currently under review for classification as a City of Tucson "WASH" designated water course. The "WASH" Ordinance has specific criteria governing the channel, banks, and area within fifty (50) feet of the top of bank. The Greenway alignment crosses over the Arroyo Chico using an existing box culvert structure that is sufficiently wide to carry both the asphalt and soft pathways. The paths will be constructed at grade to maintain existing drainage patterns when possible. Arroyo Chico is planned to ultimately contain its own system of pathways that will connect the Greenway to eastern portions of Tucson. The first parcel south of Arroyo Chico is privately owned and currently vacant. Plans to develop the parcel include a 20' wide easement adjacent to I-10 to accommodate the Greenway. This would allow a 12' wide asphalt path next to an 8' wide soft path to preserve continuity through the area. Immediately south is the Inn Suites property. As part of an agreement with the City of Tucson, Inn Suites is constructing approximately 675' of the Greenway alignment along the western edge of their property. Planned enhancements include supplemental plantings, an asphalt path, a soft path and a ramada for gathering.



Conceptual Plan of Greenway at Inn Suites (Graphic Prepared by WLB Group, 2008)



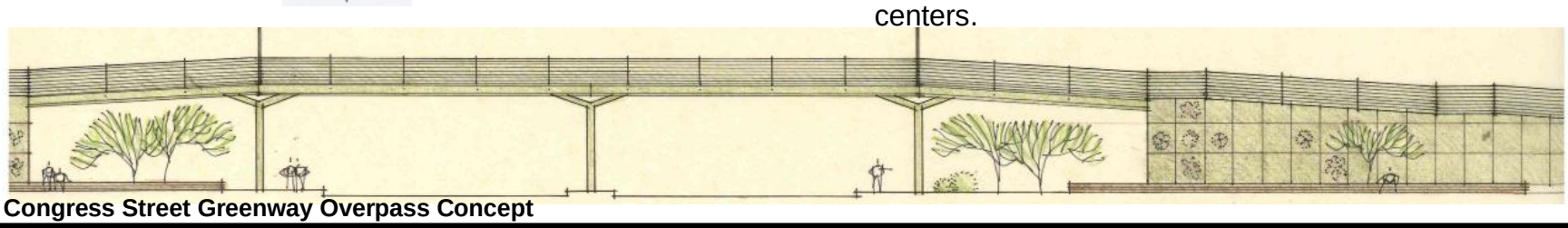
THE NORTH NEIGHBORHOODS: FRANKLIN STREET ALIGNMENT TO CONGRESS STREET (*PHASE 5*)

South of Franklin Street, the Greenway encounters alignment restrictions adjacent to the La Entrada apartment complex, which occupies the entire parcel up to the Interstate 10 frontage. It is recommended that a minimum 12' wide area running along the western edge of the parcel be dedicated to the construction of a single 12' wide asphalt path to allow for continuous movement to the downtown area and beyond. This configuration would impact an unpaved area that is currently used for overflow parking but would not have an effect on existing structures or pavement. An additional 10' of right-of-way is recommended for acquisition within the Arizona Department of Transportation (ADOT) frontage along Interstate 10 between the current parking area and the existing sound wall to allow for a planting buffer. The pathway will pass by two existing drainage inlets and will need to be elevated approximately 0.5' as it passes by the sound wall to limit localized ponding on the path surface.

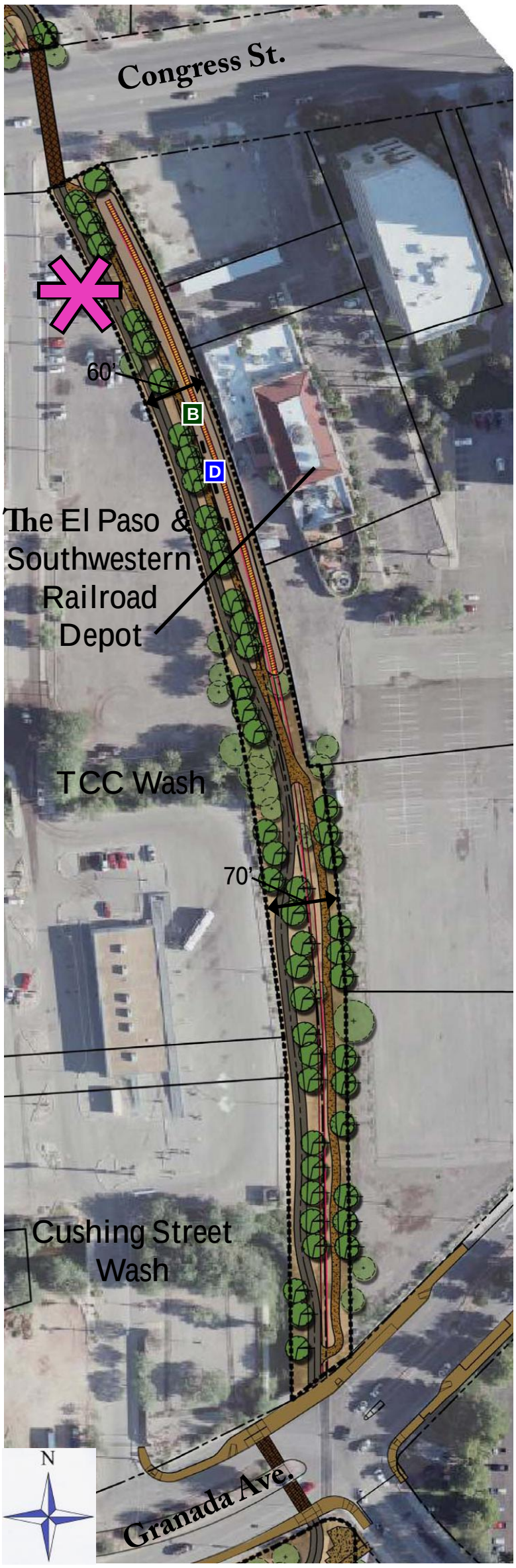
As the Greenway continues south, it is recommended that a single 12' wide asphalt path be partially constructed within the ADOT right-of-way south of La Entrada and that additional area be acquired within the historic Manning House property. An approximately 24' wide easement within the vacant property north of the Manning House would be required, in addition to the ADOT right-of-way, to enable the preservation of existing native trees and the creation of a 12' asphalt path. The City of Tucson currently owns a small parcel within this vacant property containing the remains of the old Leon House. An 8' wide soft path is shown through the area to offer opportunities for interpretive signage and discovery.

Spatial restrictions continue directly west of the Manning House. It is recommended that the westernmost strip of parking for the Manning House be converted into a 12' wide asphalt path to maintain continuity for the Greenway. The existing storage structure can be maintained by placing the 12' path mostly on ADOT right-of-way.

At Alameda Street, the Greenway crosses out of the El Presidio Neighborhood and into Downtown Tucson. Alameda Street offers a convenient east/west connection to the Greenway from Downtown. The Downtown area provides the opportunity for multiple connections to tourist destinations such as the Tucson Museum of Art and smaller galleries providing the potential to showcase Tucson artwork. Ample City right-of-way exists to create a 12' wide asphalt path, an 8' wide soft path with room for native plantings, and preservation of the existing tracks. A pedestrian overpass is recommended for the crossing of Congress Street that could ultimately service both the Greenway and the State parking structure. See Appendices C & D for additional information. It will be essential to connect Greenway users to the north and south sides of Congress Street and to the east/west sidewalks along Congress Street which lead to civic and cultural centers.



Congress Street Greenway Overpass Concept



THE NORTH NEIGHBORHOODS: CONGRESS STREET TO GRANADA AVENUE (*PHASE 3b*)

As the Greenway continues south across Congress Street it is met by the historic El Paso & Southwestern Railroad Depot to the east. Completed in 1913, the Depot features classical architectural elements including a 30' high rotunda, limestone columns and a stained glass dome. It is considered a symbol of the wealth and extravagance of Arizona's copper industry and has been listed on the National Register of Historic Places. Although its use as a railroad depot ended after the closure of the El Paso & Southwestern Railroad in 1924, the structure has persisted as one of the single-most important relics of Tucson's railroad history. The Depot is currently under private ownership and stands vacant with a large block wall separating the original tracks from the Depot itself.

The Greenway is located west of the block wall within City of Tucson right-of-way and can support a divided urban pathway consisting of a 12' wide asphalt path and an 8' wide soft path, seating opportunities and interpretive signage depicting the significance of the Depot. The existing tracks within this segment of the Greenway must be preserved in place to provide historic context to the Depot and surrounding area. It is recommended that the tracks be uncovered and refurbished to reveal the two lines that ran past the passenger loading dock. There is also the potential to create a public-private partnership to better link the railroad tracks with the Depot by removing the wall and allowing the Depot to function as a stopping point along the Greenway. Open House guests suggested a museum or a restaurant would be welcome additions.

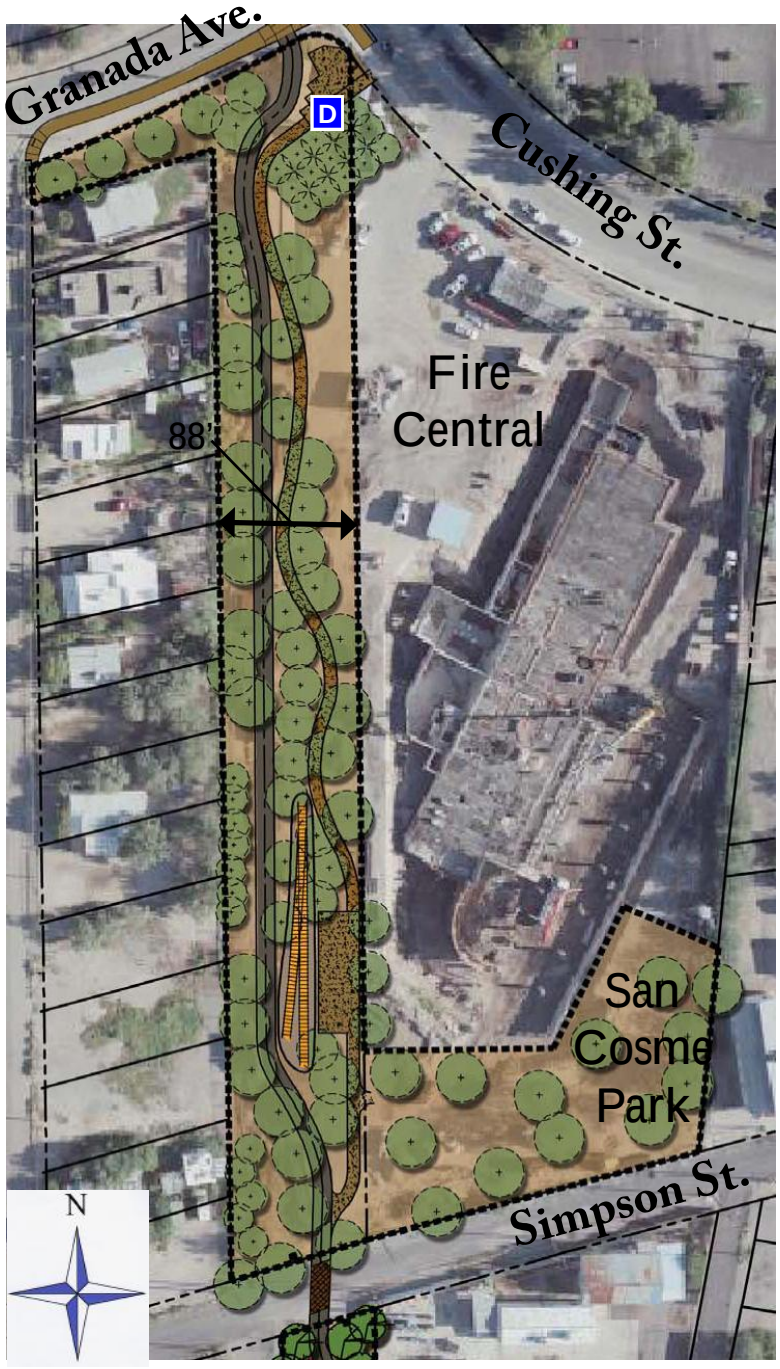
Continuing south, the divided urban pathway system winds through existing vegetation while preserving the existing tracks. The pathway system will cross the Tucson Convention Center (TCC) Wash channel and will be adjacent to the Cushing Street Wash channel for approximately 150 lf. The pathway system will utilize existing concrete structures to negotiate over or next to these washes. At-grade pathway construction will preserve the existing drainage patterns.

As the Greenway reaches Granada Avenue it intersects with the planned route for the Tucson Modern Street Car. As Granada turns west it becomes Cushing St. The Cushing Street Bridge project, currently under construction, will provide access to the Santa Cruz River Park, a critical access to Tucson's Urban Loop. A 12' wide paved area directs southbound Greenway users west along the north side of Granada Avenue towards a signalized crossing known as a "Cross Bike" consisting of a 6' wide crosswalk and two 4' wide 'Portland Green' bike lanes. The crossing is directly aligned with the existing asphalt pathway that is a part of the Fire Central Greenway project. Refer to Appendix C for additional crossing information.

Legend

Trailhead **D** **Drinking Fountain** **B** **Bike Rack**

The El Paso & Southwestern Railroad Depot (AHS #PAN26756)



THE NORTH NEIGHBORHOODS: FIRE CENTRAL, GRANADA AVENUE TO SIMPSON STREET (*COMPLETED*)

The Tucson Fire Central Station #1 Greenway, south of Granada Avenue to Simpson Street, marks the first completed segment of the El Paso & Southwestern Railroad Greenway. Completed in 2009, the Fire Central Greenway features a 12' wide asphalt path, an 8' wide stabilized decomposed granite path, native plantings and two interpretive plaza areas paying tribute to the railroad and the surrounding Barrio Viejo neighborhood.

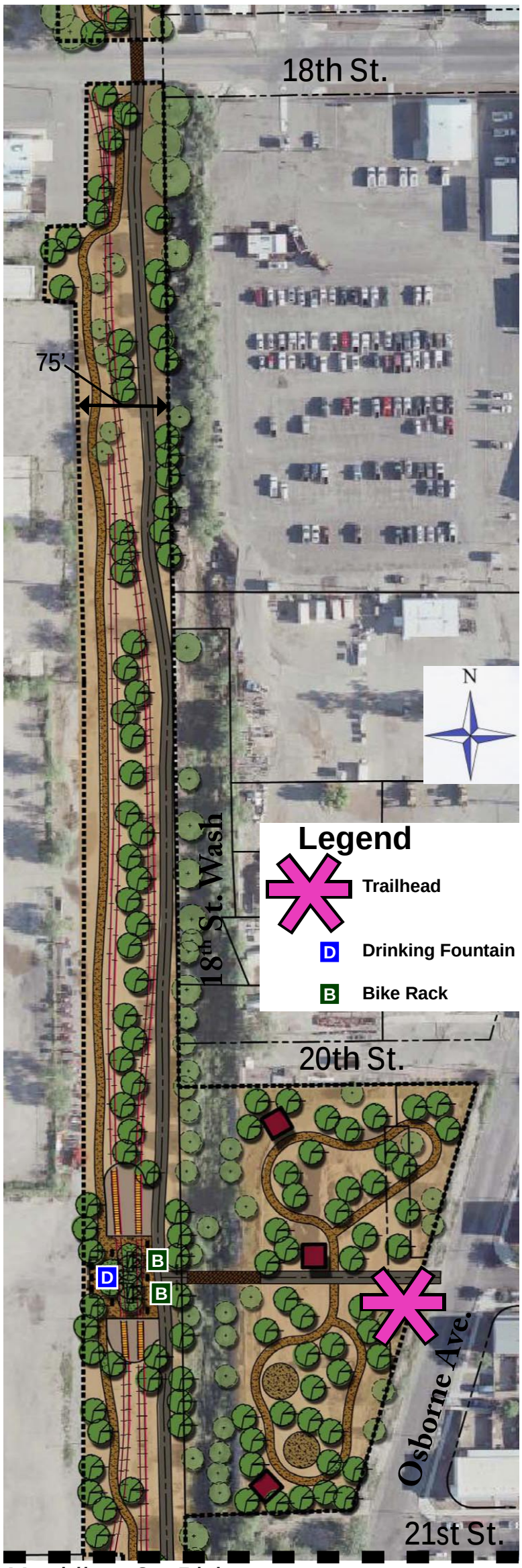
The Fire Central Greenway provides a direct connection to San Cosme Park, which was designed for the Barrio Viejo residents and includes a colorful mural, a kiosk for community events, lawn areas and vibrant plantings. As the first phase of the Greenway, the Fire Central segment provides a template for the remainder of the project in terms of hardscape materials, planting types, site amenities and signage. An at-grade pedestrian crossing marked with decorative stamped asphalt is recommended for Simpson Street to provide a connection South.

Interpretive Railroad Plaza at Fire Central

THE NORTH NEIGHBORHOODS: SIMPSON STREET TO 18TH STREET (*PHASE 1*)

The portion of the project south of Simpson Street to 22nd Street is funded through a 2006 Federal Transportation Enhancement (TE) Grant for construction. The Greenway continues to feature a divided urban pathway system consisting of a 12' wide asphalt path and an 8' wide soft path. The ample right-of-way width allows for the preservation of the existing tracks and vegetation. Features accentuating the surrounding historic Barrio Viejo neighborhood might include interpretive signage describing the significance of the Carillo Gardens or El Tiradito. Bright colors and flowers in addition to the influential Mexican heritage of the area may also play a role in distinguishing this portion of the Greenway.

The Greenway features several opportunities for exploration beyond the scope of the TE Grant including the existing Railroad Yard Office (1912-1913), and potential for a small pocket park with a ramada that can be enjoyed by the local residents. As the Greenway arrives at 18th Street, a stamped asphalt crossing will calm traffic along 18th Street. In addition, 18th Street is a planned Bicycle Boulevard with an existing connection to the Santa Cruz River Path.



Matchline - See Right

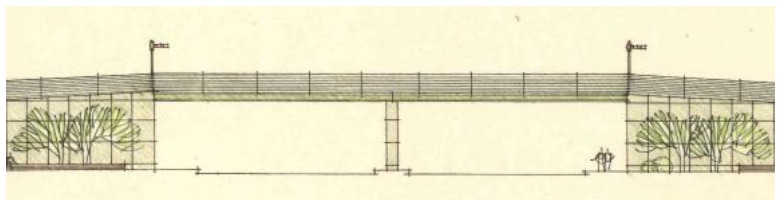
View Towards Santa Rosa Neighborhood Center

THE NORTH NEIGHBORHOODS: 18TH STREET TO 22ND STREET (*PHASE 1*)

After crossing 18th Street, the Greenway continues to enjoy a wide right-of-way as part of the TE Grant project as it enters into Barrio Santa Rosa. The divided urban pathway system continues, winding around existing vegetation and highlighting the remnant tracks. Opportunities for showcasing Santa Rosa's unique character include incorporating themes such as hope and cultural diversity into interpretive signage and bright, colorful tilework.

An opportunity to connect the Greenway to the heart of the Santa Rosa community presents itself south of 20th Street. A proposed small plaza featuring refurbished railroad tracks, seating, public artwork, two gateway arches, and interpretive signage is situated to visually connect with the iconic arch that marks the entrance to the Santa Rosa community center to the east along the La Paz Street alignment. While not within the current scope of the TE Grant, a bike/pedestrian bridge across the 18th Street Wash would enable users to access the Santa Rosa neighborhood. Improvements which may impact the 18th Street Wash may require an Environmental Resource Review (E.R.R.) due to its status and peak flow rate. A park on the east side of the wash with ramadas, paths and play areas could benefit the surrounding community. This property is currently owned by the City of Tucson's DOT.

The Greenway faces a significant crossing obstacle as it approaches 22nd Street. An underpass was not considered feasible due to extensive drainage being conveyed under 22nd Street through an existing culvert. High traffic volumes result in a dangerous at-grade crossing option. A pedestrian overpass is recommended as part of the future 22nd Street improvements to allow for safe passage to the south. Refer to Appendices C & D for additional discussion regarding this option.



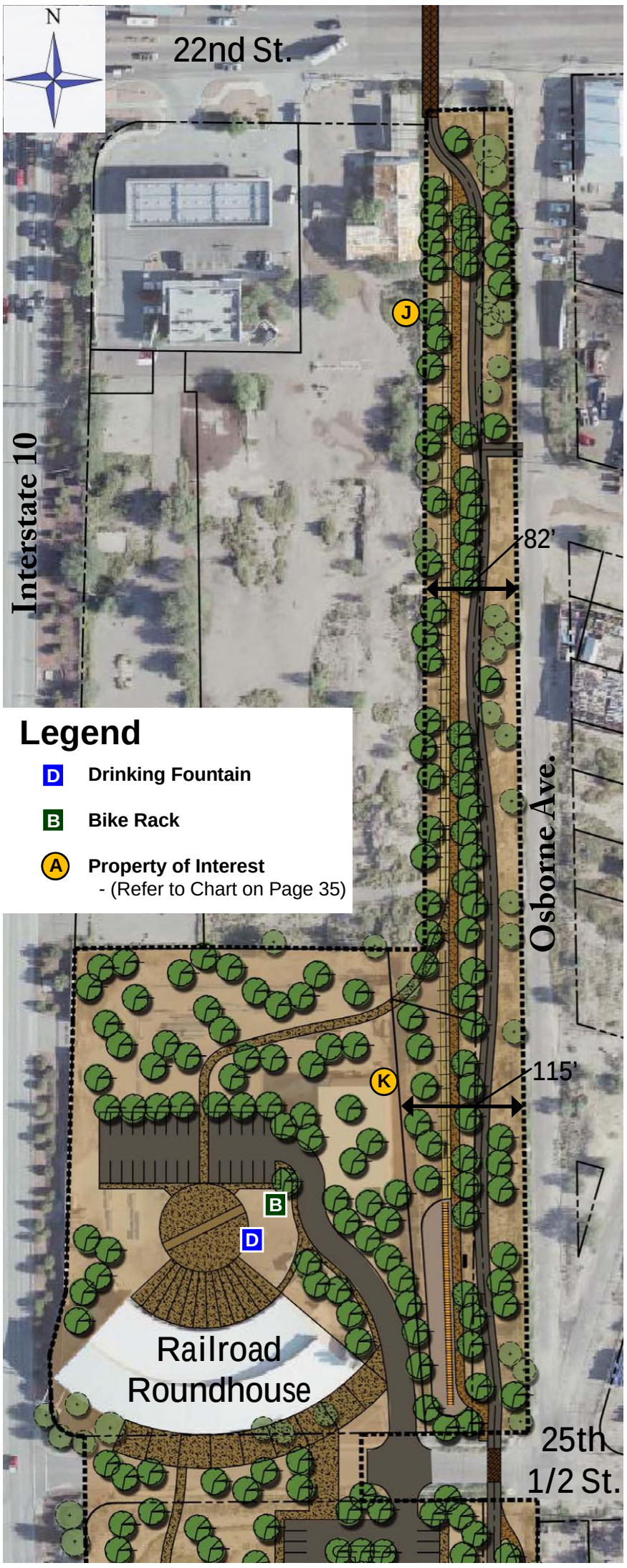
22nd Street Greenway Overpass Concept

Matchline - See Left

THE NORTH NEIGHBORHOODS: 22ND STREET TO 25TH 1/2 STREET (*PHASE 2c*)

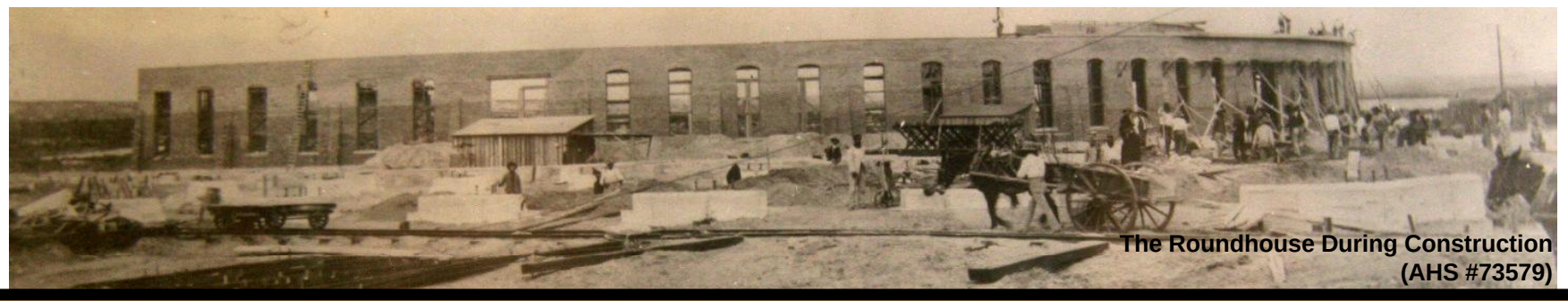
The Greenway encounters right-of-way restrictions south of 22nd Street as it parallels Osborne Avenue and enters into the West Ochoa Neighborhood. This neighborhood is included in the South Tucson phases due to its proximity and short length. The available space within the Osborne Avenue right-of-way for the Greenway is roughly 20' wide at its narrowest point and contains overhead power lines. It is recommended that a 50' wide easement and billboard lease rights be acquired from the adjacent, mostly vacant property to the west to allow for the pedestrian overpass landing. The project must avoid the drainage culvert and create a comfortable divided urban pathway system. This would also allow for the preservation of remnant tracks that appear to be buried in this area in addition to the preservation of several native shade trees. A portion of this phase will be located on the west bank of the 18th Street Wash channel and is planned to be elevated approximately 2' to raise the path surfaces above the 100-year water surface elevation. Themes borrowed from the surrounding neighborhood such as the Tohono O'Odham culture and the importance of religion and education may be infused within the Greenway through artwork or interpretive signage.

As the Greenway continues south it enters into a rectilinear parcel owned by the City of Tucson's Department of Transportation. The ample space in this area allows the opportunity for a pedestrian node featuring refurbished railroad tracks, a drinking fountain, seating opportunities and other site amenities. The node is directly east of the vacant Railroad Roundhouse, which was constructed in 1912 and offers many interpretive opportunities. The expansive curved brick structure was designed to service up to 11 engines for the EP&SW and is one of the largest concrete structures of its time. The Roundhouse was recently under private ownership, but is now available for purchase. The City of Tucson should consider acquiring this piece of Tucson's railroad history for functional as well as aesthetic reasons.



The Roundhouse in Operation (AHS #73582)

The Roundhouse has the potential to become a number of attractions for the community, such as a transit museum, a service station for Tucson's Modern Street Car or a gallery featuring local artists. It is recommended that a new parking area be constructed to service the Roundhouse plaza spaces developed to encourage public activities to take place here. It is also recommended that 25th 1/2 Street be closed prior to its intersection with Interstate 10 to reduce traffic volumes at the Greenway crossing, and to provide for a seamless connection to South Tucson and a future community park.



The Roundhouse During Construction (AHS #73579)

THE CITY OF SOUTH TUCSON: 25TH 1/2 STREET TO 29TH STREET (*PHASE 2a*)

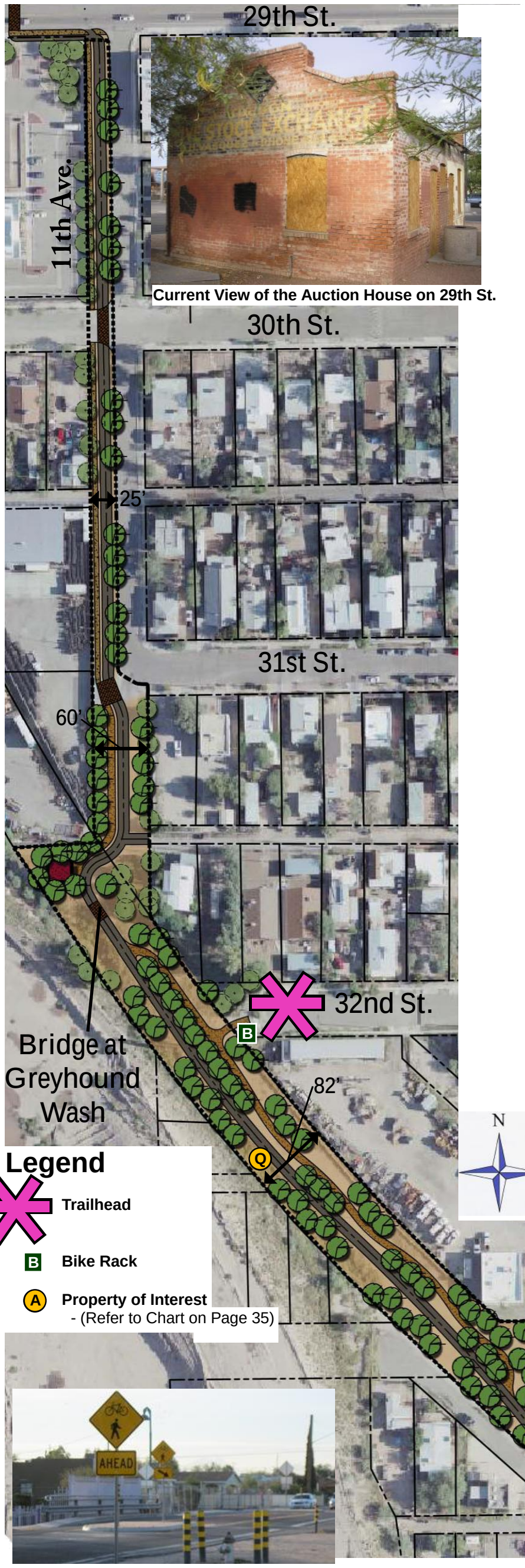
Continuing south across 25th 1/2 Street, the Greenway alignment runs just west of the boundary between the City of South Tucson (COST) and the City of Tucson. While technically not crossing into the COST until 29th Street, this portion of the Greenway will be considered an amenity for their community. Results from outreach conducted by the Drachman Institute, summarized on page 4 and detailed in Appendix B: City of South Tucson Cafecito Report are included in this alignment description.

The divided urban pathway system consisting of a 12' wide asphalt path and an 8' wide soft path will be located within a vacant strip of land under public ownership along the Osborne Avenue alignment south of 25th 1/2 Street. The path system will also cross two street alignments, two alleys, and a driveway which may require erosion protection as those travel lanes convey stormwater westward towards the Greenway alignment. Depressed landscaping will be used for storm water harvesting and the paths will be constructed at-grade to preserve the existing drainage patterns.

Two vacant parcels to the west coupled with a large detention area owned by the Arizona Department of Transportation (ADOT) offer the potential for the development of a 10.7 acre community park along the Greenway. ADOT would return the land to the City of Tucson in a reversion with the understanding the function of the detention basin would not be compromised. The City's residents expressed interest in playground areas for different age groups, a community garden, a swimming pool, and exercise circuits. A maintenance building and restrooms will be necessary for a park of this size. These could be incorporated into the Roundhouse, depending on its future use. Other amenities such as a dog park, bicycle skills/BMX park, skate park or outdoor amphitheater should be discussed with the surrounding community and included dependent on interest, and spatial allowances.

A community link is provided within an unnamed drainage easement south of 27th Street to connect to South Tucson and the surrounding residential areas. An 8' wide paved path is shown to accommodate temporary flooding and to facilitate pedestrian movement through the area. The existing trees should be preserved in place and supplemented with additional native plantings.

Upon reaching 29th Street, the Greenway alignment heads east within a portion of La Frontera's property and utilizes the 29th Street right-of-way to carry it past the historic Livestock Auction House. The Auction House is all that remains of the Tucson Livestock Exchange, which occupied seven acres along the railroad tracks, at the gateway to South Tucson. It may be one of the few buildings within the COST that is eligible for listing on the National Historic Register and provides the opportunity for interpretive signage and adaptive re-use depending on the needs of the surrounding community. The location of a HAWK or TOUCAN signal crossing at 29th Street will require a detailed traffic analysis but will guide users further south to continue along the Greenway. Refer to Appendix C: Traffic Report for additional crossing information.



Current View of the Auction House on 29th St.

THE CITY OF SOUTH TUCSON: 29TH STREET TO 10TH AVENUE (*PHASE 2a*)

After crossing 29th Street, the Greenway travels east along the south side of the road. This area of the Greenway is also very complex and will require extensive traffic analysis and design evaluation. The goal is to utilize the existing 6’ sidewalk and include a 12’ wide asphalt pathway within the 29th Street right-of-way to accommodate Greenway users. The existing bike lane may be incorporated.

The Greenway then heads south along 11th Avenue and features a 12’ wide asphalt path in addition to an existing 5’ wide sidewalk. It is recommended that 11th Avenue be narrowed to an 18’ north-bound lane bordered by a raised shoulder. Adjacent to the drive lane will be a 5’ landscape buffer, followed by a 12’ asphalt path, an additional 3’ landscape buffer and finally the existing 5’ sidewalk.

It should be noted that the Greenway through this portion of the project from 29th Street to the south end of 11th Avenue is a deviation from the historic EP&SW alignment due to significant ownership restrictions along the original alignment. This does provide the opportunity to incorporate the Auction House, which is an important asset to the COST community, into the Greenway.

At the south end of 11th Avenue, the sidewalk merges with the asphalt path to create a single route south, avoiding an access alley to the east and providing a planting buffer to the west. The Greenway merges with the original EP&SW alignment and requires the acquisition of abandoned railroad right-of-way from the Union Pacific Railroad (UPRR). Negotiations are currently underway between UPRR and the City of South Tucson.

A small pedestrian node is shown at the north end of the UPRR right-of-way with a ramada to allow users to rest and learn about the narrow bridge structure which they are about to cross. Built in 1911, the 14’ wide by 24’ long bridge was used by the EP&SW to cross the Greyhound Wash and is considered a historic asset along the Greenway. Its narrow width supports a single 12’ wide asphalt path and will require the addition of protective guardrails. Approximately 600 lf of the Greenway path system will parallel the west side of the Greyhound Wash, which conveys incoming east flows northwesterly under the railroad bridge. A smaller wash that collects flows originating between I-10 and the raised railbed parallels the west side of Greenway alignment.

The ample width of the former railroad right-of-way allows the development of a divided urban pathway system south of the bridge. Many of the suggestions that Drachman received from the City’s residents focus from here to the south. A pedestrian connection is provided to the adjacent residents off the 32nd Street cul-de-sac. A stamped asphalt crossing at 10th Avenue with advance warning signage similar to the crossing used at the Julian Wash is recommended due to relatively low traffic volumes in the area. The residents indicated this as a key access point to the Greenway. Mid-street refuges increase the crossing’s safety. Each such access point should be equipped with bike racks.

Example Greenway Crossing with Refuge of 10th Ave. at the Julian Wash Greenway.

THE CITY OF SOUTH TUCSON: 10TH AVENUE TO 8TH AVENUE (*PHASE 2a*)

As the Greenway continues east across 10th Avenue it follows the original 1911 raised railbed alignment through the heart of the COST. The raised berm alignment depicts the high quality railroad construction and engineering practices of its time and is considered a historic railroad asset to the community. A divided urban pathway system consisting of a 12' wide asphalt path and an 8' wide soft path takes Greenway users through the surrounding residential area, offering expansive mountain views back towards the west. A billboard at the southeast corner of the Greenway and 10th Avenue, however, affects these views. By locating the asphalt path on top of the berm, and the soft path at the base of the berm, the user can enjoy a variety of experiences while having ample opportunities to rest or connect to the neighborhood.

A gathering node is located at the junction of a small alleyway off of 9th Avenue. The residents emphasized the idea of shaded placitas allowing small, informal daily gatherings with the potential for artwork and signage to depict the history of the COST. Themes might incorporate the importance of community, independence, Mexican heritage, the Spanish language and Native American culture. A small section of tracks is also indicated between two 6' lanes of the asphalt pathway to reinforce the railroad concept and remind visitors how the alignment was once used. It is unknown whether tracks still exist in this location and further investigation should be done to determine their condition.

Historic Raised Alignment and View Towards 'A' Mountain

East of 9th Avenue the Greenway offers two 8' soft paths on either side of the berm, in addition to the asphalt path on top of the berm, creating a series of walking loops. There is ample space for gathering nodes that might contain picnic tables, play equipment, exercise equipment, gardens or other amenities as decided by the neighborhood. The effective outdoor area of Capilla San Antonio church might be expanded to include these paths and potentially a play node to enhance its parishioner's experience.

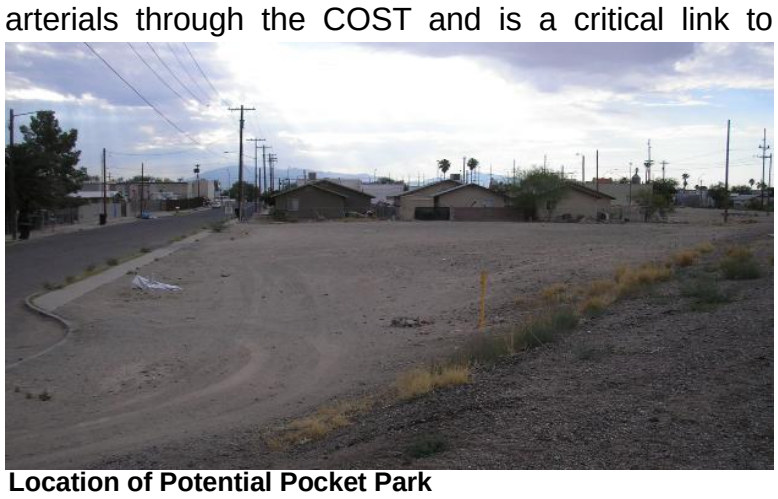
As the Greenway approaches 8th Avenue, a critical access point residents noted, the side paths gradually ramp back up the berm to merge with the asphalt path. 8th Avenue is a planned Bike Boulevard with connections to several nearby schools. A decorative stamped asphalt crossing is recommended for the Greenway crossing at this location.

THE CITY OF SOUTH TUCSON: 8TH AVENUE TO 6TH AVENUE (*PHASE 2a*)

Continuing southeast of 8th Avenue, the divided urban pathway system takes full advantage of the available UPRR right-of-way and incorporates numerous shade trees and other native plantings between the pathways. Two vacant parcels south of 35th Street and west of 7th Avenue provide the opportunity for a neighborhood pocket park with areas for picnicking, play structures, seating, a restroom and walking paths. It could also be the location of a basketball court or other community amenity depending on neighborhood interest. A small ramada and drinking fountain is located in the smaller of the two open areas and is the perfect spot to sit and enjoy some lunch or the company of friends and family.

As the Greenway approaches 7th Avenue, the raised alignment continues through the intersection of 7th Avenue and 36th Street. Here two important neighborhood connections are made through the use of side paths to residential areas to the north and south of the raised alignment. Progressing east, the Greenway has two potential routes to tackle the challenging 6th Avenue crossing. 6th Avenue is one of two major arterials through the COST and is a critical link to the Greenway. It is regarded as home to numerous restaurants and the City's Municipal Complex. The historic EP&SW alignment would take users southeast along the UPRR easement, which would enable the development of a divided urban pathway system and a gathering area at 6th Avenue. Community input suggested that this area become a central gathering space, a Gateway City Plaza. This space is considered a key visual focal point along the west side of the busy 6th Avenue commercial corridor. The plaza could potentially feature area artwork and serve as a gateway monument to the Greenway for the COST. It is also directly south of a local restaurant which is consistently regarded as one of the best restaurants in South Tucson. However, the historic intersection to 6th Avenue would necessitate a mid-block signalized crossing, such as a Pelican crossing, which would require further feasibility studies.

The second option for crossing 6th Avenue would take users along the 36th Street right-of-way and would require narrowing 36th Street between 7th Avenue and 6th Avenue to 18'. This segment of 36th Street currently serves as a secondary access lane to area businesses and is a primary access lane to one residence. The existing 5' sidewalk can be used for pedestrian access and a 10' asphalt path can be created for bicyclists. This option directs users to an existing signal at 6th Avenue and would provide for a safe crossing using existing infrastructure. There is also the potential to include the historic alignment segment as part of this option, having the area developed as a short linear park space with a terminus at 6th Avenue.



Location of Potential Pocket Park

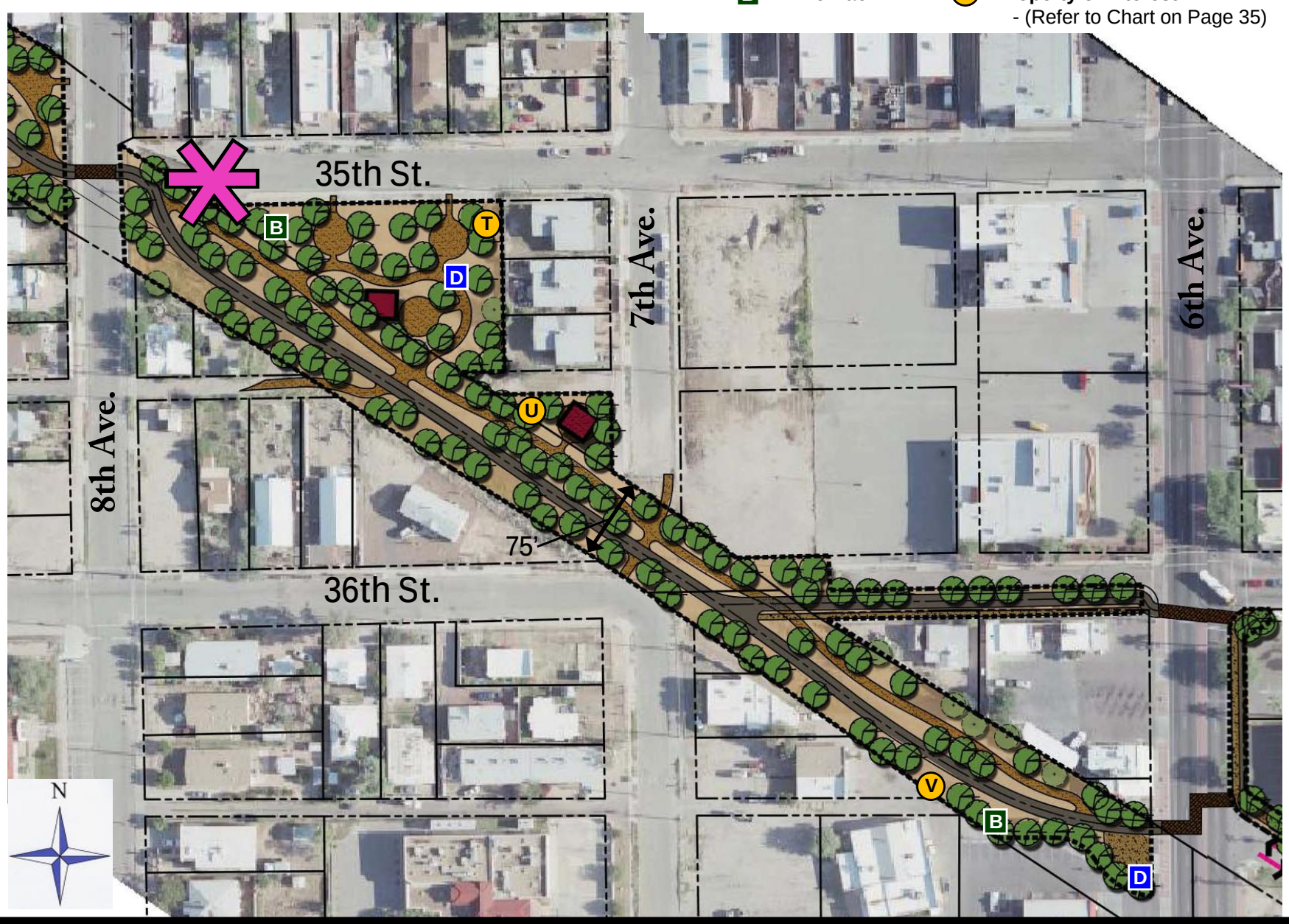
Legend

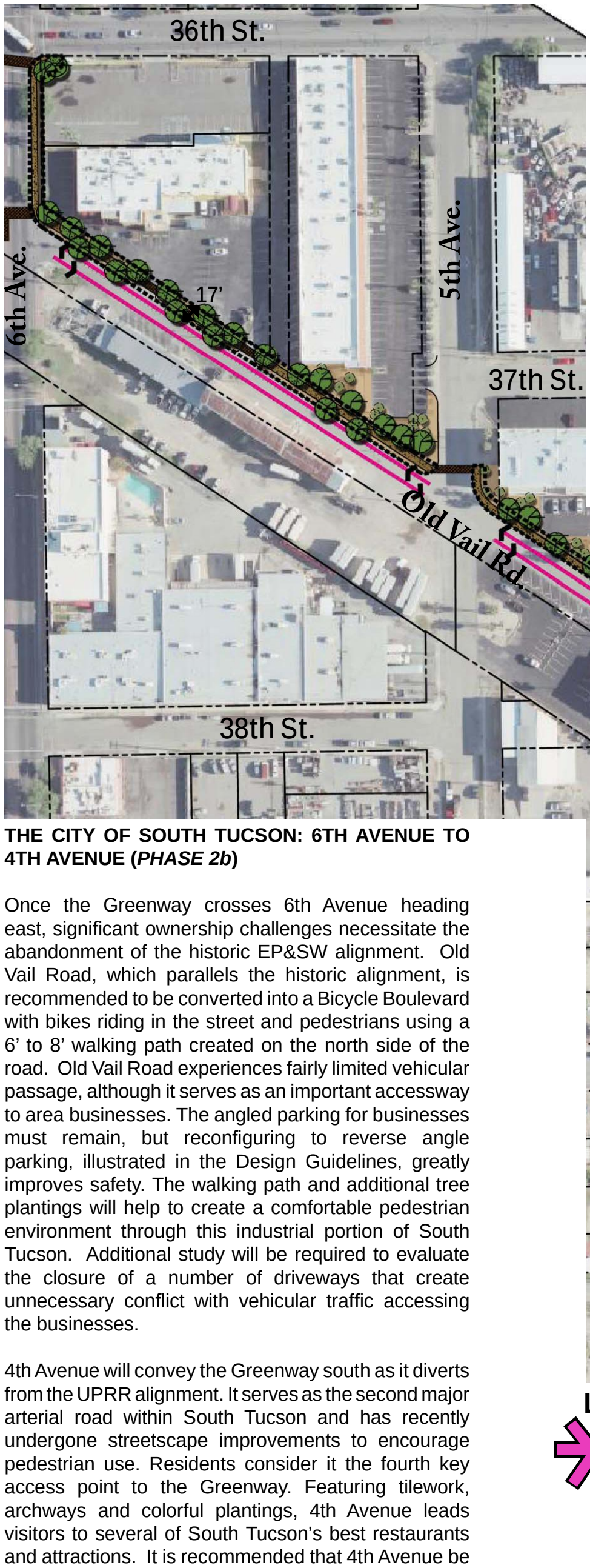
Trailhead

D **Drinking Fountain**

B **Bike Rack**

A **Property of Interest**
- (Refer to Chart on Page 35)



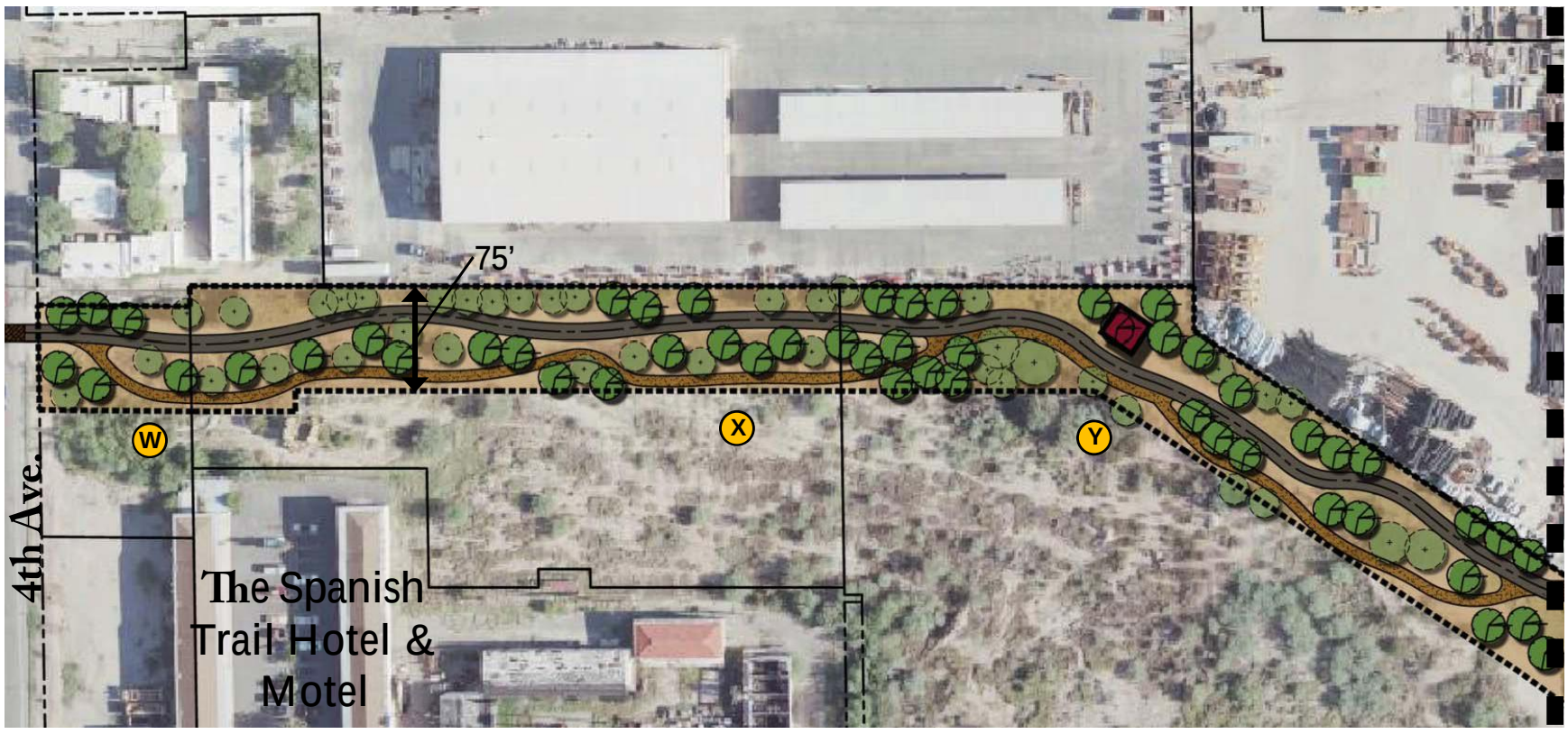


4th Ave Streetscape Improvements

THE CITY OF SOUTH TUCSON: 6TH AVENUE TO 4TH AVENUE (*PHASE 2b*)

Once the Greenway crosses 6th Avenue heading east, significant ownership challenges necessitate the abandonment of the historic EP&SW alignment. Old Vail Road, which parallels the historic alignment, is recommended to be converted into a Bicycle Boulevard with bikes riding in the street and pedestrians using a 6' to 8' walking path created on the north side of the road. Old Vail Road experiences fairly limited vehicular passage, although it serves as an important accessway to area businesses. The angled parking for businesses must remain, but reconfiguring to reverse angle parking, illustrated in the Design Guidelines, greatly improves safety. The walking path and additional tree plantings will help to create a comfortable pedestrian environment through this industrial portion of South Tucson. Additional study will be required to evaluate the closure of a number of driveways that create unnecessary conflict with vehicular traffic accessing the businesses.

4th Avenue will convey the Greenway south as it diverts from the UPRR alignment. It serves as the second major arterial road within South Tucson and has recently undergone streetscape improvements to encourage pedestrian use. Residents consider it the fourth key access point to the Greenway. Featuring tilework, archways and colorful plantings, 4th Avenue leads visitors to several of South Tucson's best restaurants and attractions. It is recommended that 4th Avenue be narrowed to a 3-lane cross section using the western lane to accommodate the 12' asphalt path. The new path can be raised to the adjacent landscape level and curbed for separation from traffic. The existing decorative sidewalk and landscaping can remain in-place and enhance the Greenway corridor leading south. An at-grade crossing with a mid-street refuge allows for safe passage to the east.



THE CITY OF SOUTH TUCSON: 4TH AVENUE TO THE NOGALES RAILROAD SPUR (*PHASE 2b*)

The Greenway continues its deviation from the historic alignment as it leaves 4th Avenue and heads east. The vacant area through which the Greenway passes, is currently a portion of The Spanish Trail Hotel & Motel property. During its peak in the 1960's and 1970's, the Spanish Trail was a popular haven for the rich and famous while they worked at the Old Tucson movie studio. The grounds once featured a lagoon, golf course, running track, cactus garden and an Olympic-size swimming pool. Today little remains of the Spanish Trail's glamorous past and the historic buildings stand in various stages of ruin or disrepair. The property is currently multi-family rental housing.

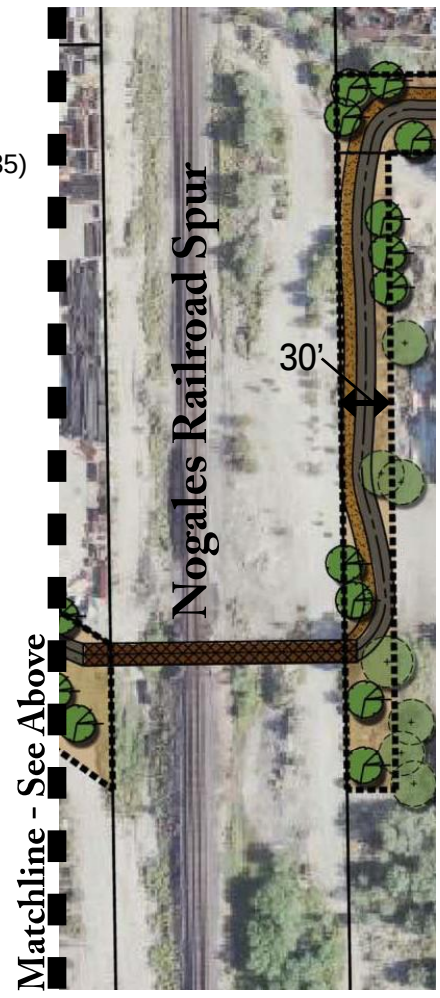
It is recommended that a 75' wide easement on the north side of the Spanish Trail property be acquired for the creation of a divided urban pathway system consisting of a 12' wide asphalt path and an 8' wide soft path. The area contains a significant amount of existing vegetation that should be preserved-in-place wherever possible. The Spanish Trail Hotel & Motel presents an opportunity to display interpretive signage indicating the history of the site and to tell the story of some of Tucson's most famous visitors. There is also the potential to refurbish the property into a functioning hotel, a collection of shops or an apartment complex.

An alternate alignment would follow the abandoned EP&SW alignment which now falls within the Borderland Construction property north of the Spanish Trail property. Although Borderland's operation is active along both sides of the abandoned alignment, as time progresses they may be willing to discuss incorporation of this amenity.

The Spanish Trail Hotel & Motel

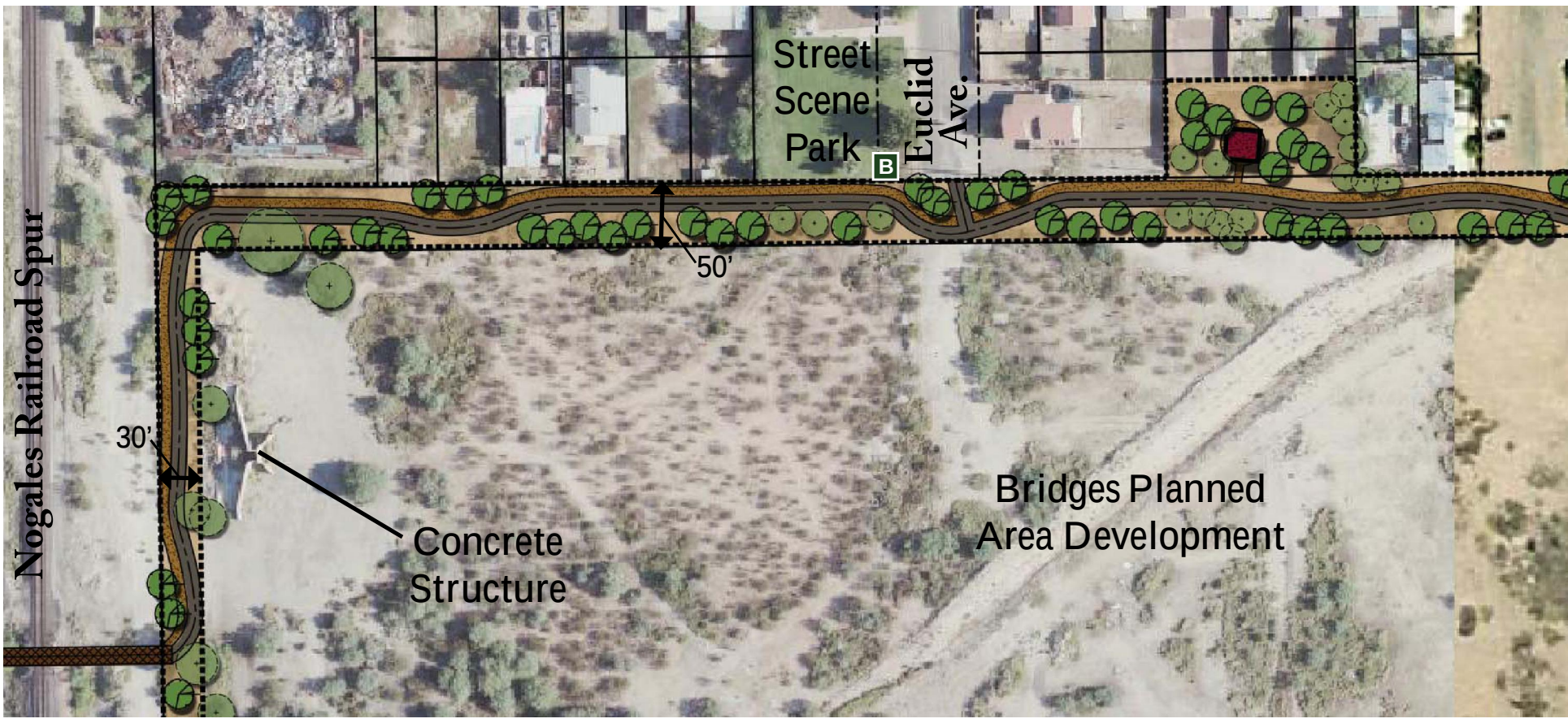
Legend

A **Property of Interest**
- (Refer to Chart on Page 35)



A ramada is located to the west of the Greenway's junction with the UPRR's Nogales Railroad Spur to provide a location for users to rest, grab a drink of water and learn about the 'end' of the EP&SW line. The EP&SW was sold to Southern Pacific in 1924 and by the end of that year all traffic was diverted to the Southern Pacific railroad. Prior to its closing, the Nogales Railroad Spur and the EP & SW intersected to provide access into Tucson and to Arizona's southern communities.

Today the Nogales Railroad Spur continues to be in active use by UPRR. Despite its elevated alignment in relation to the Greenway, a bike/pedestrian overpass is recommended to completely span the entire Union Pacific right-of-way and to avoid conflicts with the significant drainage running through the area. Between 4th Avenue and the Nogales Railroad Spur the path system will parallel a wash and is planned to be split and elevated in order to channelize the flows conveyed within that wash. Refer to Appendices C & D for additional information regarding the crossing configuration.



THE EAST NEIGHBORHOODS: THE NOGALES RAILROAD SPUR TO PARK AVENUE (*PHASE 4*)

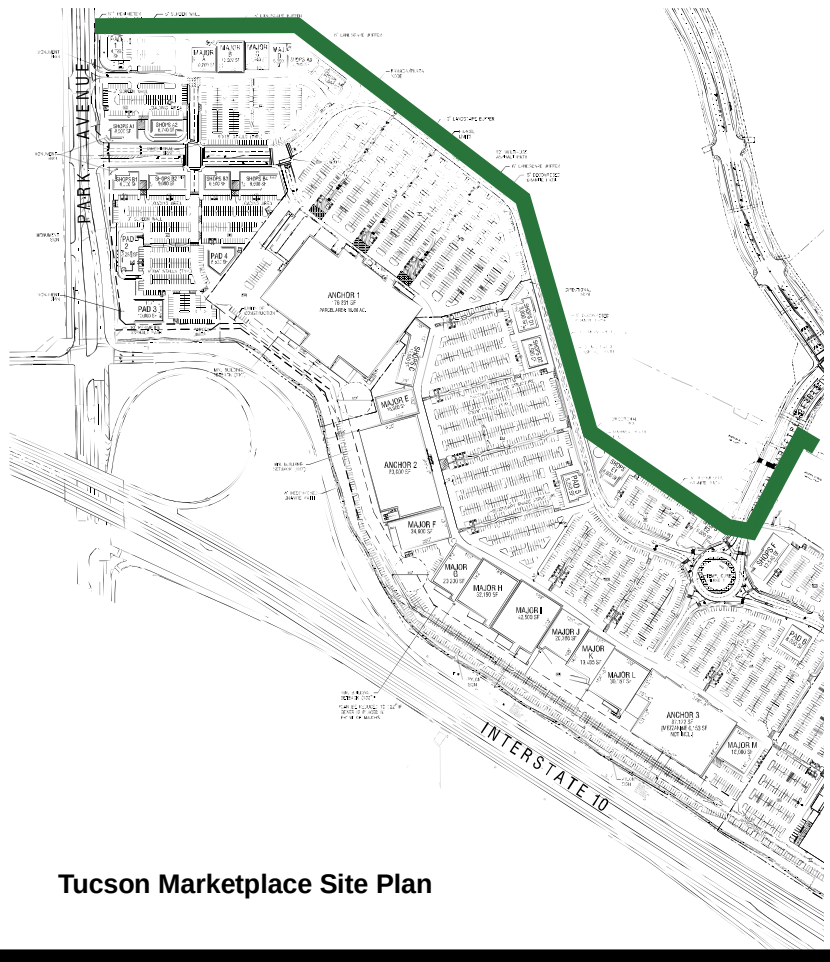
After crossing the Nogales Railroad Spur, the Greenway leaves the COST and enters the City of Tucson’s South Park neighborhood. Here the neighborhood’s strong African-American heritage and community spirit can be expressed in artwork or interpretive signage along the planned Greenway alignment. Design elements to consider include the ‘Wave’ which signifies the movement of people, the ‘Fractured Heart’ which is indicative of heartache and healing, and the ‘Tapestry’ which signifies the multi-cultural influence in the area.

The Greenway heads north within a 30’ easement dedicated by the Bridges Planned Area Development (PAD). The Bridges is a 350-acre master-planned mixed-use development featuring commercial, retail, office, residential, and recreational areas. The Bridges project spans both east and west of Park Avenue, with the western portion planned for medium density residential uses. The Greenway system in this area consists of a 12’ wide asphalt path and an 8’ wide soft path, located immediately adjacent, in an effort to preserve existing vegetation within the fairly narrow easement. Refer to Appendix E: The Bridges Agreement Memo for additional information. A concrete structure just east of the Greenway alignment holds potential for becoming a canvas for community artwork or a pedestrian node opportunity. Future pathways can be constructed that take users south along the easement towards Interstate 10 so that they can complete a critical link to the Julian Wash Linear Park, roughly one-half mile south.

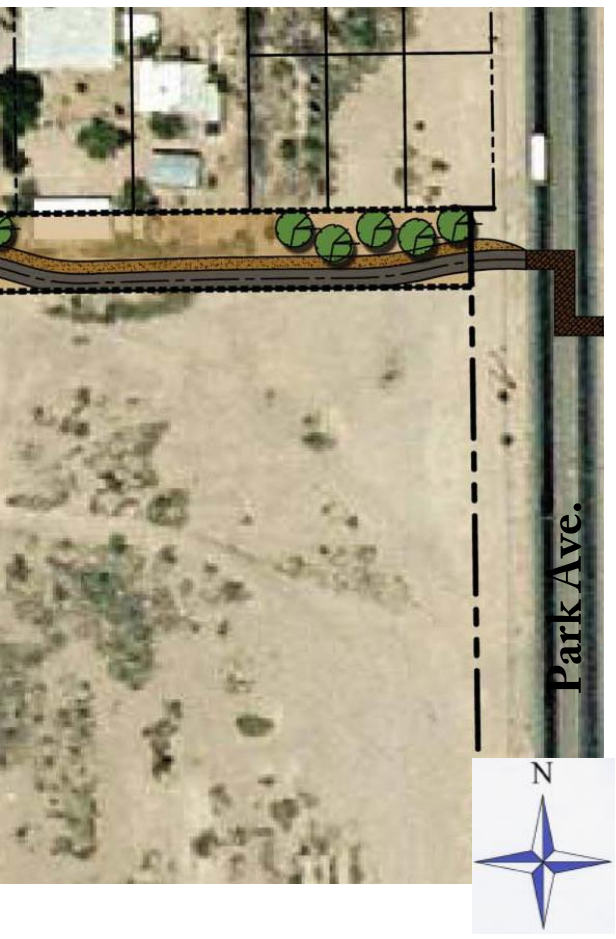
As the Greenway reaches the north end of the 30’ easement, it turns east utilizing a 50’ dedicated easement provided by the Bridges Planned Area Development. The dual path system winds through existing vegetation to connect users to Euclid Avenue which is a planned Bike Boulevard. It is adjacent to Street Scene Park which contains a lawn area, shade trees and a play structure. A City of Tucson well site further east provides an opportunity for some additional plantings and a ramada for community use. A PELICAN signal is planned for the Park Avenue crossing to enable users to safely travel east into the Tucson Marketplace site.

THE EAST NEIGHBORHOODS: TUCSON MARKETPLACE, PARK AVENUE TO DUVALL VISTA (*BY OTHERS*) - “BRIDGES”

East of Park Avenue the Greenway becomes a part of the Tucson Marketplace development (the Bridges) that is currently in design and construction. The Tucson Marketplace is also a part of the PAD and features a Costco, and other retail anchors, to draw customers to the site. The divided urban pathway Greenway system will continue along the north side of the Tucson Marketplace project area (shown in green on the diagram below). The Greenway system will consist of a 12’ wide asphalt path and an 8’ wide soft path separated by a narrow landscape buffer. A vehicular bridge with bicycle lanes and sidewalks allow users to safely cross the Greyhound Wash at Tucson Marketplace Boulevard.



Tucson Marketplace Site Plan



Legend

B **Bike Rack**

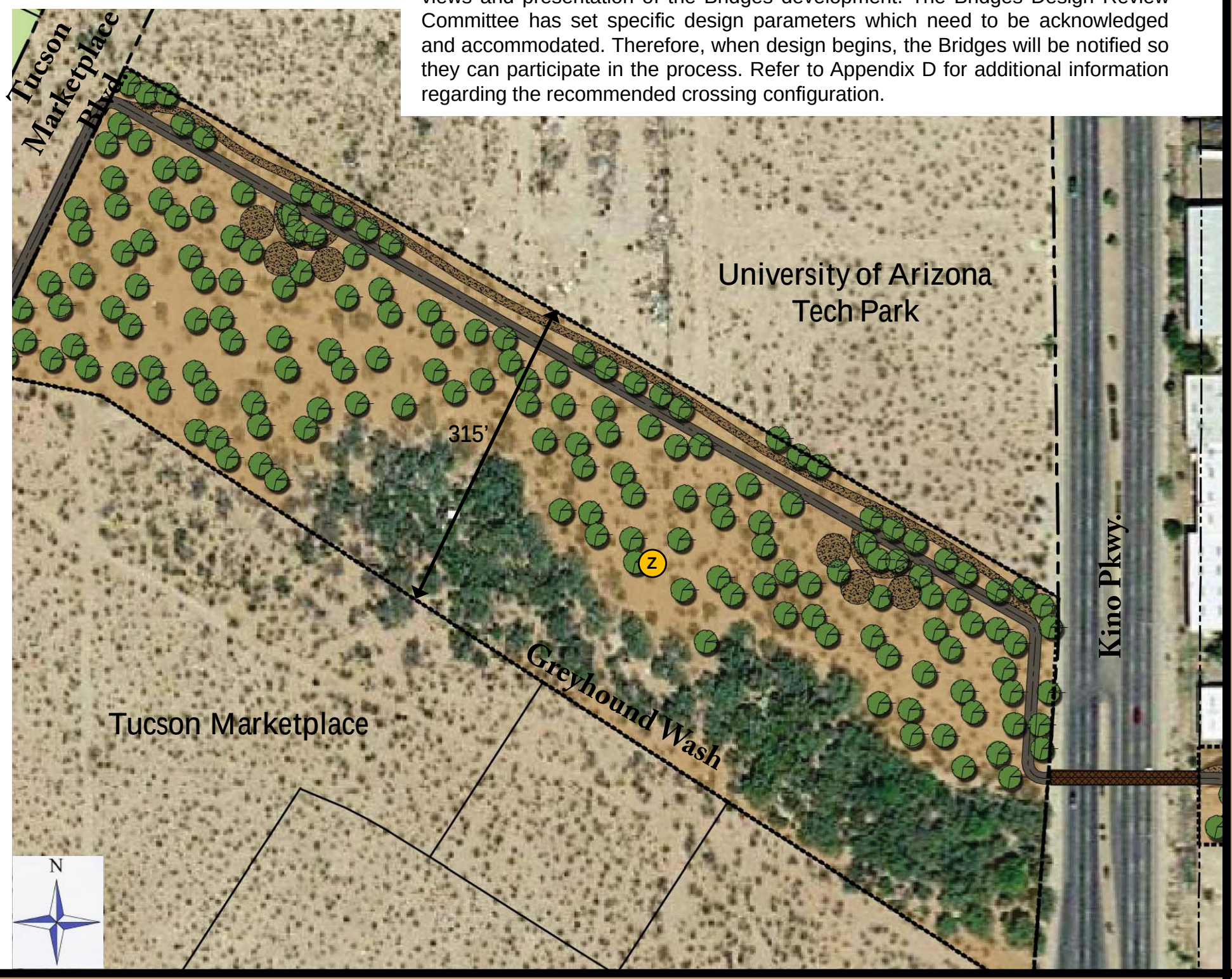
A **Property of Interest**
- (Refer to Chart on Page 35)

THE EAST NEIGHBORHOODS: DUVALL VISTA TO KINO PARKWAY(*PHASE 4*)

Although the Tucson Marketplace includes the design of a 12’ wide paved path on the north side of the property (south side of Greyhound Wash) terminating at Kino Parkway, it is recommended that a second system of paths be constructed on the north side of the Greyhound Wash as part of the Greenway project. This alignment would require passage of the Greenway across the Tucson Marketplace Boulevard (TMB) bridge to the north side of the Greyhound Wash. The alignment would then divert off of TMB onto the Pima County Flood Control District parcel. The Greenway team met with the Bridges representative to discuss whether this interface could work and be beneficial to both projects. The Bridges agreed to accommodate the Greenway on the TMB bridge. The improvements to ramp down to the County parcel’s grade will be provided by the Greenway. The Bridges noted that the PAD requirements include management of the native plants on the County parcel. Due to the many facets of this interface, it is required that the Bridges Design Review Committee be notified, and participate in the development of, any Greenway design adjacent to their property.

The Greenway has the potential to transform the nearly 9 acre Pima County parcel into a linear park complete with a divided urban pathway system, native plantings and ample picnic and gathering areas. This segment is shown elevated approximately 3 ft to keep the path surfaces above the Greyhound Wash water surface elevation. An alternative is to allow the pathway to meander near the wash and place any structures and amenities out of the water surface elevation. There is also an opportunity to interpret the history of the greater site which was the location of the ‘Tucson Downtown Airport’ in the early to mid part of the 20th Century. The airfield was utilized as a regional airport until the late 1970’s.

As the Greenway approaches Kino Parkway, a pedestrian/bike overpass is recommended to carry users safely east across this busy arterial roadway while avoiding significant drainage in the area. This overpass also directly affects the views and presentation of the Bridges development. The Bridges Design Review Committee has set specific design parameters which need to be acknowledged and accommodated. Therefore, when design begins, the Bridges will be notified so they can participate in the process. Refer to Appendix D for additional information regarding the recommended crossing configuration.



THE EAST NEIGHBORHOODS: KINO PARKWAY TO AJO DETENTION BASIN (*PHASE 4*)

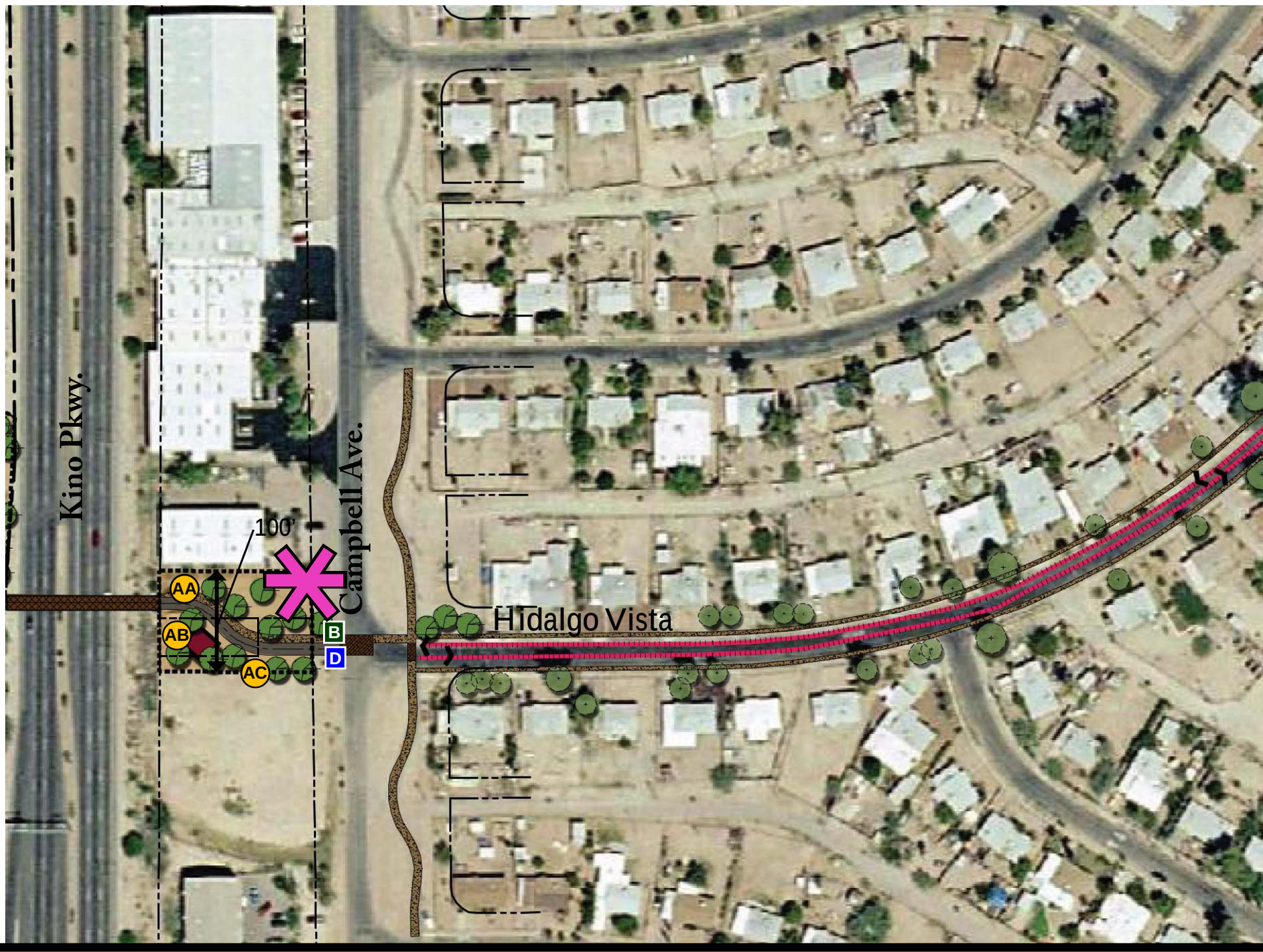
After crossing Kino Parkway, the Greenway must pass through vacant privately owned parcels to continue on its eastward path towards the Ajo Detention Basin. It is recommended the parcels be acquired for the Greenway. The area has the potential to become a small pocket park with shade trees and a ramada for residents east of Kino Parkway to enjoy. Here the path system will be at grade in order to preserve existing drainage patterns.

Campbell Avenue, also a planned Bike Boulevard, features an existing asphalt path and linkage to the north. Campbell marks the western boundary of the Western Hills II neighborhood which is a tight-knit community of residents bordering the larger Las Vistas neighborhood. Themes gathered from these neighborhoods, such as recreation, riparian sanctuaries, music and culture can be displayed in artwork or interpretive signage along the Greenway alignment. The area has historically struggled with high crime rates and illegal dumping although recent efforts by the community have resulted in increased neighborhood awareness, streetscape enhancements, and traffic calming measures.

A stamped asphalt crossing would allow users to travel past Campbell Avenue to the east, and marks the transition to Hidalgo Vista, a potential Bike Boulevard. Pedestrian Greenway users will be able to utilize the existing 4' wide sidewalks on either side of Hidalgo Vista, and the recently installed streetscape improvements, to travel east while bicyclists will ride in the road. At Naco Vista, an 8' wide sidewalk for pedestrians, in conjunction with the existing low-volume roadway for bicyclists, will carry users towards the Ajo Detention Basin. The Naco Vista sidewalks could ultimately be widened and upgraded to carry both bicyclists and pedestrians. Naco Vista provides convenient access to the recently completed Hidalgo Park which features two soccer fields, two ramadas, a restroom, parking area and a clubhouse. A basketball court is planned for the park as well.

Another alignment worth studying takes the Greenway further south along the east side of Campbell Avenue and then east along the south edge of the housing development. There is the potential to share the north edge of the Pima County Juvenile Detention Facility, but discussions must be initiated during the detailed design phase. This area would require substantial beautification lighting and abatement of potentially aggressive dogs that live adjacent to the alley.

The Greenway merges with an existing multi-use trail at the Ajo Detention Basin southeast of Hidalgo Park and marks the official end of the project. The approximately 120 acre Ajo Detention Basin was constructed in 1966 along the Tucson Diversion Channel as a flood control element. Since that time, a number of recreational and ecological features have been constructed in the area, including Sam Lena Park, the Kino Sports Complex and James Thomas Park. Included in the Greenway design is an asphalt path to close the gap between James Thomas Park and the Ajo Detention Basin



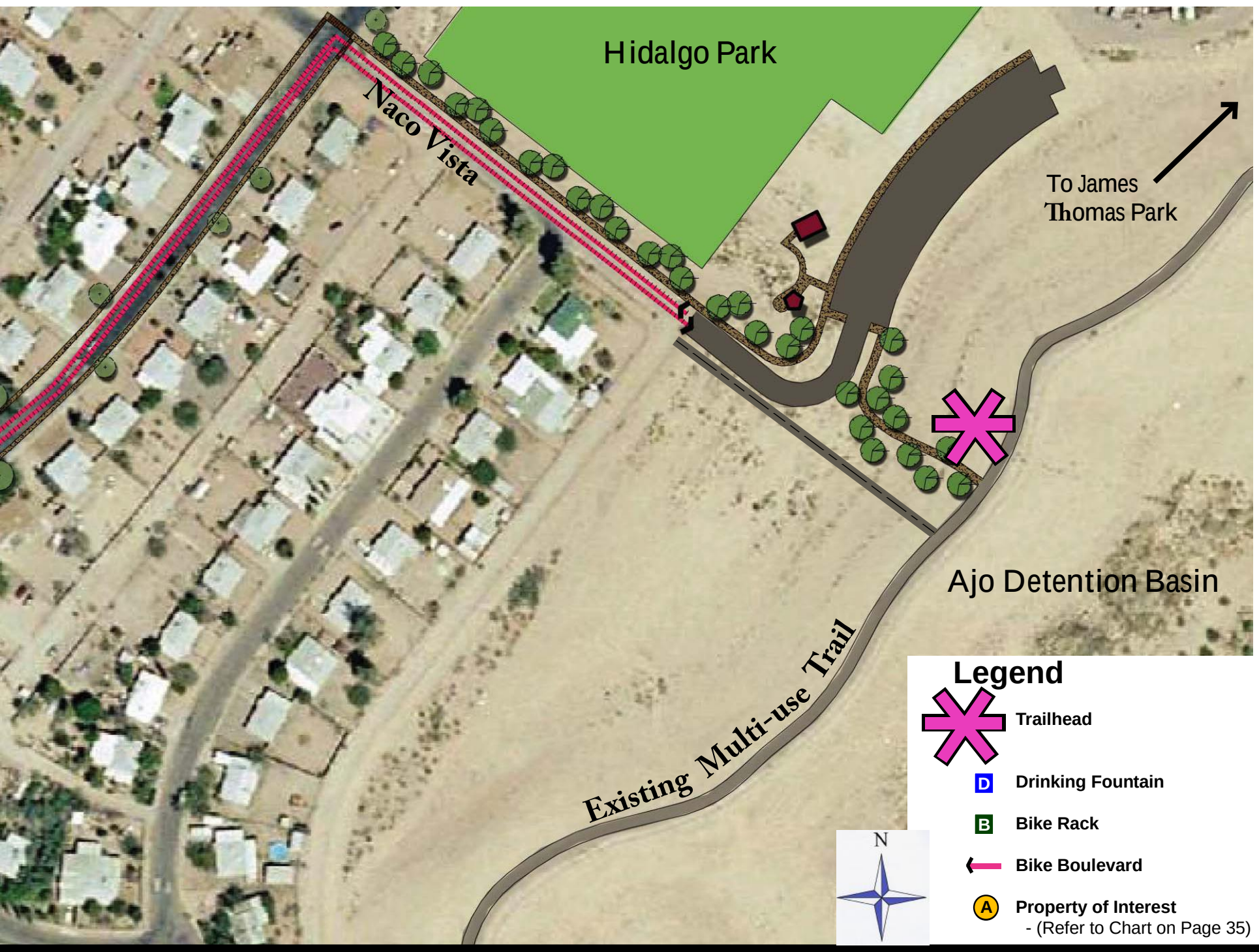
path. Refer to the Master Plan Exhibit on page 43 for additional information on the proposed connection to James Thomas Park.

By 2002, the Ajo Detention Basin had been modified to include 50 acres of wetlands, including freshwater marsh riparian habitat, 12 acres of wildlife and open water areas, and 38 acres of mesquite bosque with ephemeral grassland. The existing multi-use trail provides the opportunity to create a direct access for trail users to the adjacent park and riparian systems. Amenities at James Thomas Park and Sam Lena Park include ramadas, restrooms, grills, lighted tennis courts, lighted basketball courts, lighted softball fields, permanent soccer fields, playgrounds, walking tracks, and a disc golf course. The Kino Sports Complex features an 11,000 seat stadium, baseball fields, soccer fields, and youth softball fields.

James Thomas Park

Existing Multi-use Trail Surrounding the Ajo Detention Basin

The Ajo Detention Basin



THE FUTURE

*"Greenways are **'the paths to the future'** as they link people to the outdoors. They meet an ever growing need, a need to leave the hectic city (if only for a moment) and to experience earth beneath your feet and fresh air in your lungs–to feel life and to feel alive."*

- Victoria Logue, 1995

STRATEGIES

This section of the Master Plan takes looks at the reality of developing the El Paso & Southwestern Greenway to completion. There are numerous dynamic aspects of the Tucson community that must come together to allow each segment of the Greenway to progress. Each aspect under review is subject to significant changes as time advances, and the assumptions made now may be obsolete by the time a future segment moves toward development or construction.

• The project team under the guidance of the City of Tucson, has looked at the necessary **phasing** of such a large project, and has determined the logical sequence of construction based on many factors. A Phased Statement of Probable Cost for the elements proposed at this time is found in the Appendix F. All costs shown in the individual phases are based on current market conditions without escalation. Each phase shows direct costs for subcontractors and adds markups associated with a General Contractor or Construction Manager managing the project. All labor rates are non-Davis Bacon wages (non-prevailing wage). All play equipment or furnishings and ball field equipment is excluded. No “soft” costs (design fees, land acquisition costs, construction administration, construction contingency, etc.) are included.

• If there are private properties that directly block the continuity of the Greenway, an easement must be negotiated or **acquisition** of the property must occur before the Greenway can be constructed. The list of properties that are of interest to the continuity of the Greenway, through either easement or acquisition, are shown in the detail descriptions below.

• If disjunct pieces of the alignment do reach completion, a priority may be placed on a missing Linkage that has remained unbuilt, in order to create a larger continuous piece of the Greenway.

• The EP&SW Greenway has the potential to encourage **economic opportunities**. Anticipation of the Greenway’s construction may move completion of some projects forward. After a segment of the Greenway is constructed, it may become a catalyst for a variety of business opportunities. A thorough report of development opportunities is included in Appendix G: Development White Paper.

• One of the most crucial factors for development is funding. At the time of this document’s completion, funding sources were diminishing. **Funding opportunities** at the time of the *EP&SW Master Plan* report printing are found in Appendix H: Funding White Paper.

• The benefits of developing the EP&SW Greenway can be fully realized under one condition- continued **maintenance**. Provisions for the Greenway’s longevity must be included within the initial design program.

Further detail of each of these important strategies follows below. Additional documentation may be provided in the El Paso & Southwestern Greenway Appendices which are included as a separate document to this Master Plan report. All of these will be affected by future community support for the project. Regardless of the future, this Master Plan document provides clear guidance toward the development of the EP&SW Greenway, a community asset that will provide benefits in many ways for years to come.

Phasing

The Phasing Map on page 34 shows the logical sequence of development of the El Paso & Southwestern Greenway based upon current community conditions. The summaries below touch on the issues that exist. These issues are described in detail under the Alignment Descriptions.

Phase 1: To date, the Simpson Street to 22nd Street Greenway has reached 15% design through a Transportation Enhancement Grant. Although the 15% design was initiated during the development of this Master Plan, most of the Mandatory Design Requirements have been included. As the design is completed, adherence to the final EP&SW Greenway Design Guidelines will be required.

Phase 2: This phase encompasses the City of South Tucson (COST) as well as the West Ochoa neighborhood due to their physical proximity and identification with COST. COST is excited about the possible economic and health benefits of the EP&SW Greenway, and City leaders are supporting steps toward implementation. Ideally, all three sub-phases listed should be developed together.

Phase 2a: COST from 25 ½ Street to 6th Avenue. In August of 2010, the City of South Tucson in conjunction with the City of Tucson and the Regional Transportation Authority (RTA), and with the aid of the Drachman Institute, applied for Round 18 of the FHWA Transportation Enhancement Grants. Although they were not awarded the grant, the general consensus is that the further development of the EP&SW Greenway Master Plan Report will provide substantial support toward an award in Round 19. The RTA is supportive, and the project area is listed as a future Pima County Bond project as well. Acquisition of the UPRR land is a critical step to this phase.

Phase 2b: COST from 6th Avenue to Nogales Spur. There are a few challenges in this segment but it would complete the COST section of the Greenway. The at-grade crossing at 6th Avenue will require a detailed Traffic analysis; passage along Vail Road will require revamping of existing traffic and parking patterns; the land necessary to access the Nogales Spur crossing is now under private ownership and an easement or acquisition will be needed. The Nogales Railroad Spur overpass is part of this phase.

Phase 2c: West Ochoa Neighborhood from 25 ½ Street to 22nd Street. With the development of COST’s Phase 2a and 2b, this small segment becomes a barrier to the Greenway’s continuity. West Ochoa would best be included in the 2b phase of COST, although the inclusion of the 22nd Street overpass may necessitate separation. Completion of this segment of Phase 2 will provide completion of over two miles of the EP&SW Greenway, from Fire Central at Granada Avenue to the Nogales Railroad Spur.

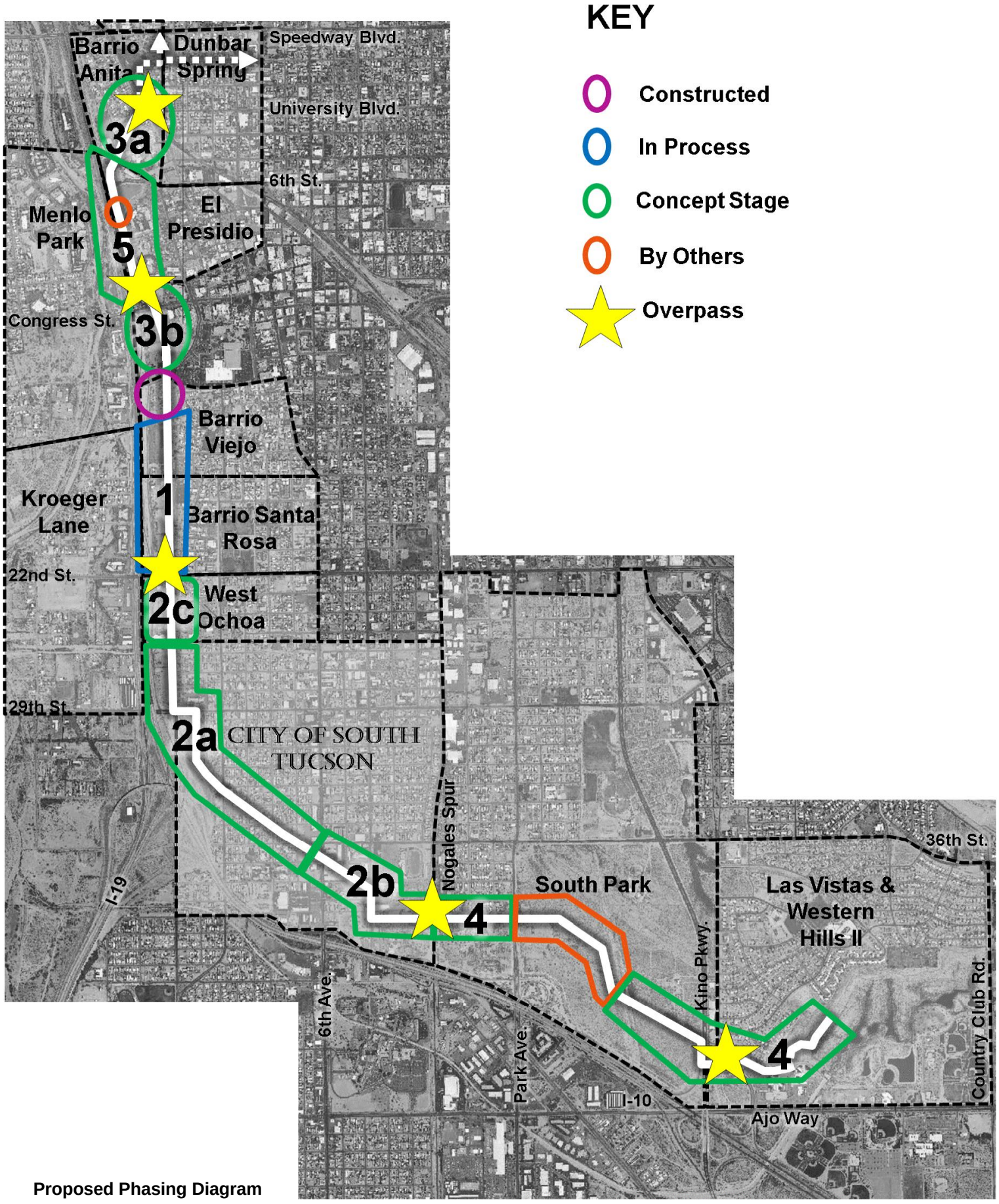
Phase 3: This phase contains the starting point of the EP&SW Greenway, as well as a disjunct segment on the southwest edge of Downtown Tucson. Between the two lies the most challenging segment, Phase 5, located along the west side of Downtown.

Phase 3a: Main Street to Saint Mary's. The majority of this phase falls within the Barrio Anita with the northeast edge within Dunbar Spring. This segment has had strong community support from the beginning. Construction of the UPRR overpass is included in this phase.

Phase 3b: Congress Street to Cushing Street. There are few significant issues here. Although it is a small segment, the cost will include the overpass at Congress Street. The greatest asset is its adjacency to the completed segment at Fire Central. It brings the Greenway closer to Downtown Tucson.

Phase 4: This segment begins within The Bridges development, excludes the Bridges construction, and takes the Greenway to its terminus at the Ajo Detention Basin. Development from Market Place Road to Kino Boulevard on the north side of the Greyhound Wash falls on County land. Coordination with the Tucson Market Place will be required. East of Kino the alignment is primarily on-street, so requires little pathway cost. The most significant cost to this segment is the Kino Overpass.

Phase 5: This phase spans from Saint Mary's to Congress Street and contains the most challenging piece of the El Paso & Southwestern Greenway. Although the small Inn Suites private parcel south of St. Mary's includes the Greenway in its Site Plan, the private parcels north and south of there provide challenges. The property owners currently do not perceive the Greenway as an asset to their properties making it difficult to obtain the small acquisitions or easements that will be required to complete the Greenway.



Proposed Phasing Diagram

THE FUTURE

Right-of-Way Acquisition

It is critical that future development of vacant properties, as well as expansion of existing uses along the EP&SW Greenway corridor, include provisions for the Greenway. If any segment is denied, the project's purpose and continuity will be strongly compromised. Properties in the alignment that require acquisition or easements should be noted by the City of Tucson Development Services Department so negotiations with the developer can include discussions about the Greenway and its community and economic benefit.

Educational outreach to property owners should be a priority. There are dozens of examples of successful greenways across the nation; greenways that have brought entire communities out of economic difficulties. Often a greenway will turn around the negative safety and blighted images that the adjacent properties previously bore. After the completion and visible benefits of Tucson segments are realized, the celebration of their successes should become well publicized community events.

The following chart indicates significant Properties of Interest along the EP&SW Greenway alignment. They are noted in the Alignment Descriptions beginning on page 13 as well. Parcels noted as "C" in the Priority column are critical to achieving the preferred alignment and continuity as shown in this Master Plan. They are privately owned or under jurisdiction of public entities other than the City of Tucson or COST. In these locations an easement, or full or partial acquisition, is necessary. Parcels noted as "AV" in the Priority column will bring great Added Value to the project. They also are not under COT or COST ownership and their inclusion is not critical. But these parcels would greatly enhance the Greenway experience by creating a wider space for the pathways to flow through, or by expanding the space so a small pocket park or larger park could be created.

Properties of Interest Along Greenway Alignment

Key	Lot Number	Owner Information	Square Feet	Priority
A	116-16-052A	Rincon, Jose & Adriana	7553	AV
B	116-16-0530	Rincon, Jose & Adriana	6968	AV
C	116-16-055A	Rincon, Jose & Adriana	9623	AV
D	116-16-1000	Gutierrez, Leopold & Geraldine	8614	AV
E	116-19-1600	State of Arizona	2755	C
F	116-19-154C	First Family Co. Ltd.	6764	C
G	116-19-228D	La Entrada Apartments II, LLC	2904	C
H	116-19-228C	Presidio Plaza LLC	2267	C
I	116-19-226C	Manning House LLC	6637	C
J	118-08-002P	Sandberg-Willret Family LLC	41567	C
K	118-08-002L	Atkinson Land Holdings	133952	AV
L	118-08-138A	MTB Davidson I	85262	AV
M	118-08-139A	DYBVIG Pima County LLC	104517	AV
N	Unknown #	Arizona Dept. of Transportation	247290	C
O	118-22-412B	La Frontera Center, LLC	2098	C
P	118-22-412C	La Frontera Center, LLC	5975	AV
Q	118-23-287C	So. Pacific Transportation Co.	256226	C
R	118-24-2250	Blanchard, Philip Louis	3059	AV
S	118-24-2260	Blanchard, Philip Louis	1498	AV
T	118-24-3290	Chevron USA, Inc.	21515	AV
U	118-24-3430	Chevron USA, Inc.	3385	AV
V	119-02-027D	Southern Pacific Transportation Co.	31367	C
W	119-01-025C	IBV, LLC	8129	C
X	119-01-020C	IBV, LLC	35798	C
Y	119-01-038B	IBV, LLC	45445	C
Z	132-13-0700	Pima County	387143	C
AA	132-13-0400	Eller Media Company	4200	C
AB	132-13-0420	Clear Channel Outdoor	2250	C
AC	132-13-0410	Layton A McHenry	6850	AV

Influences to Future Phasing

Development of the Greenway is based upon the recommended phases listed previously. As time progresses the order shown may change significantly. External linkages to other community activities or opportunities may provide the catalyst. Continuity of segments internal to the Greenway may also shift the phasing order. Speculative scenarios may include:

- Downtown Tucson experiences a surge of revitalization after completion of the Modern Streetcar. The increase of activity underlies a push for further expansion of multi-modal linkages. The Greenway from Congress to Cushing Street becomes a priority.

- The owners of the properties in Phase 5, from St. Mary's to Congress, who have been reluctant to participate in the Greenway, sell their land. The new owners are greenway advocates and agree to fund the Greenway along their frontages. Inn Suites decides the economy has improved and moves forward with development, including the Greenway. The remaining small gaps in the phase cost less than before the property owners agreed to fund their piece. There are funds equal to the lower available.

Economic Opportunities

In the future, various properties will be developed along the El Paso & Southwestern Greenway, either before or after phases of the construction are completed. Properties developed before the pathway's completion may have been initiated in anticipation of the Greenway's imminent construction, viewing it as an asset and complement to the development. Many businesses acknowledge the substantial benefits to employee health and life-balance that a greenway may bring. As existing property owners note the successes Greenway construction brings, they may encourage or participate in the completion of the segment adjacent to their property in order to receive the same benefits.

The El Paso & Southwestern Greenway will provide numerous benefits to the residents of Tucson and the City of South Tucson. One of the most important of the benefits is the economic return on investment.

There are numerous examples, both nationally and locally, that affirm the positive connection between trails and property values. Residential properties near the El Paso & Southwestern Greenway will realize a greater gain in value, particularly if they are directly adjacent to the Greenway.

In the Research Triangle Park, NC, arguably one of North Carolina's most important employment centers, the developer of the Park, the Research Triangle Foundation, has been working for 27 years to build an interconnected network of bicycle and pedestrian trails that will link together the Parks' Fortune 500 campuses. Elizabeth Rooks, Vice President of Development for the Foundation states, "Building our network of trails is an essential investment that enables the Research Triangle Park to remain globally competitive."

A 2010 national study conducted in Baltimore, MD concludes that between 11 and 14 jobs are created for every $1 million in spending on bicycle and pedestrian infrastructure. A 2003 study by the North Carolina Department of Transportation determined that the state's one time investment of $6 million in support of bicycle and pedestrian infrastructure in the northern Outer Banks yields $60 million in annual economic impact and support for 1,400 jobs in the region.

Health care is an important concern for Arizona, and trails, greenways, bicycle and pedestrian infrastructure plays an important role in keeping Arizonans healthy by virtue of an active lifestyle. Active living reduces risks for chronic disease, including heart disease and type 2 diabetes. Providing Arizonans with the ability to walk and bike close to where they live, work and go to school is an important element of our state's infrastructure and a low cost way of reducing health care costs. A network of parks, open space, and trails in Tucson and South Tucson will contribute to the overall health of residents by offering people attractive, safe, accessible places to bike, walk, hike, jog, and skate.

For every dollar invested in the development of the El Paso & Southwestern Greenway project, the city will enjoy between 3 to 10 dollars of annual economic benefit. This project will also transform an underutilized corridor into an asset that will make Tucson and the City of South Tucson more attractive communities for economic investment.

Funding Opportunities

Fundamentally, the El Paso & Southwestern Greenway is a rails-to-trails conversion project, and as such most of the funding used to construct the trail will likely come from federal, state and local transportation funding sources. The project also contains unique historic and cultural landscapes, and it extends through a variety of residential and central business district neighborhoods that may qualify for other types of federal, state and local funding.

The federal transportation program is currently in a holding pattern, pending reauthorization of the surface transportation act. SAFETEA LU, authorized in September 2005, officially expired in 2010 and is in emergency funding to September, 2011. It appears likely that the current act may be continued through the close of the federal fiscal year, ending September 2011. This is the single most important federal program that would support capital improvements associated with the El Paso & Southwestern Greenway.

Other federal funding that would support capital improvements for the El Paso & Southwestern Greenway is currently being evaluated by the 112th Congress. It is too soon to know which programs will survive and the type or amount of funding that will be available.

At the state level, Arizona has also seen reduction or elimination of programs and funding that support construction of bicycle and pedestrian projects. The ADOT Transportation Enhancements program is a likely source for capital funding, including the category specified for the removal and control of outdoor advertising. Arizona State Parks could be another source of funding, especially if the Land and Water Conservation Fund receives its full allotment of federal funding.

Local government funding will be needed to match state and federal sources. At a minimum, local governments should plan to provide no less than a 20% match to other sources, and may want to consider setting aside a higher percentage total of the overall capital costs of the project.

Finally, private sector support will be important for this project. Philanthropic support for the project could be a source of local funding match. It may also be possible to generate financial support from individual donors.

Maintenance

Maintenance has historically been a minimized or neglected issue for public development projects. Although funds for design and construction are often earmarked hand in hand, the maintenance for the future benefit of the project comes from a different funding source, often one with the most limited funding.

The most inexpensive way to minimize maintenance and lower annual costs is to design effectively. Proper selection and placement of plants eliminates the need to prune. Use of hardy, drought tolerant plant materials and water harvesting principles lessens water costs and need for plant replacement. The Geotech Report will inform the proper planting soil, allowing robust growth and plant survival. The Report will also guide the proper section for pathway design and other hardscape which will lessen the likelihood of structural failure and rebuild. Community involvement and use of the Greenway will discourage vandalism. Each of these reduces the cost of maintenance and the cost to the community. Development that occurs adjacent to the Greenway will benefit greatly from its proximity; therefore, these developments could become a partner in the on-going maintenance activities. Contribution toward maintenance expenses may be acceptable for activities such as:

• **On-going Greenway Upgrades** Roadway upgrades for lighting, re-paving or widening are often funded by assessments to adjacent property owners. A similar assessment could be made for properties adjacent to the Greenway, whether as an annual surcharge for on-going costs, or specific to a necessary improvement.
• **Large Events** The Greenway could support large event venues, providing staging areas for bicycle or running events. A portion of the proceeds may address maintenance issues.
• **Special Events** The adjacent development may use a nearby Destination Node for a special event such as a wedding. An event surcharge could be applied.
• **Recurring Events** The adjacent development may stage a recurring educational event as a service to their tenants. Outreach may include discussion of local plant or animal life, or local history. An annual fee may be applied.
• **Ramada Rentals** As with other parks in the Tucson area, ramadas are rented out for parties or events. Portions of the charges may be applied toward maintenance.

The Kiosko at San Cosme Park can be rented for events & parties through the City of Tucson Parks & Recreation Department.

The El Paso & Southwestern Greenway Concept from the Drachman Institute Concept Report

EL PASO & SOUTHWESTERN GREENWAY MASTER PLAN EXHIBIT

BARRIO ANITA

ESTEVAN PARK

Main Ave.

University Blvd.

To University of Arizona

OURY PARK

Hughes St.

Davis St.

BARRIO ANITA

St. Mary's Road

EL PRESIDIO

Interstate 10

EL PRESIDIO DOWNTOWN

Alameda St.

Congress St.

Granada Ave.

DOWNTOWN BARRIO VIEJO

Cushing St.

Simpson St.

17th St.

BARRIO VIEJO SANTA ROSA

18th St.

Osborne Ave.

La Paz St.

SANTA ROSA OCHOA

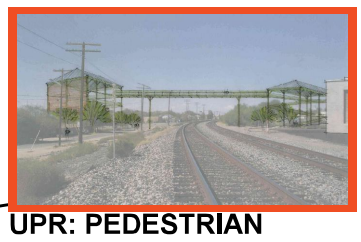
22nd St.

OCHOA C.O.S.T.

25th St.

* Ramadas
* Walking Paths
* Benches
* Interpretive Railroad Plaza
* Native Plantings
* Neighborhood Connection

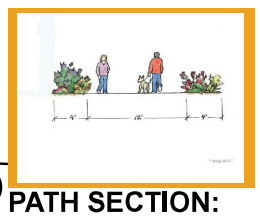
POTENTIAL PARK



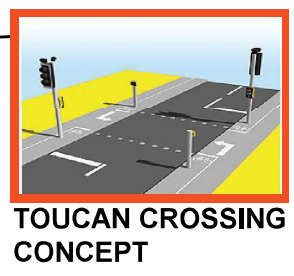
UPR: PEDESTRIAN CROSSING CONCEPT

BIKE SANCTUARY

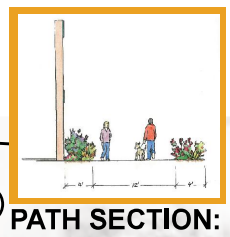
DAVIS ELEMENTARY SCHOOL



Ⓑ PATH SECTION: MINIMAL



TOUCAN CROSSING CONCEPT



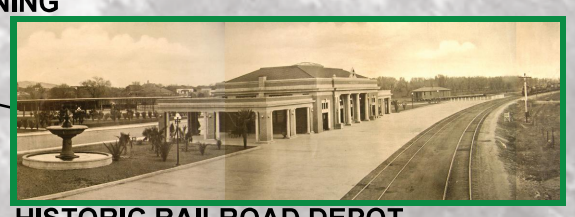
Ⓑ PATH SECTION: MINIMAL

INN SUITES: UNDER DEVELOPMENT

HISTORIC MANNING HOUSE

* Walking Path
* Interpretive Signage
* Native Groundcover Plantings
* Preserve Archaeology

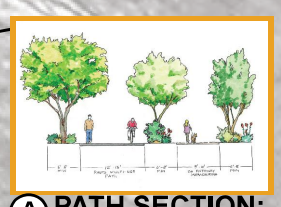
POTENTIAL ARCHAEOLOGICAL PARK



HISTORIC RAILROAD DEPOT

FIRE CENTRAL & SAN COSME PARK

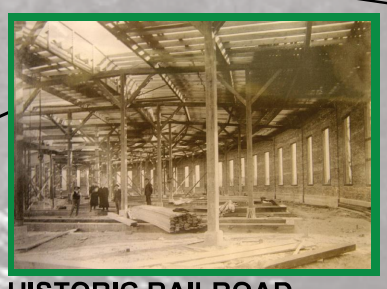
MODERN STREET CAR: UNDER DEVELOPMENT



Ⓐ PATH SECTION: ULTIMATE

* Ramada
* Walking Path
* Bench
* Native Plantings
* Neighborhood Connection

HISTORIC RAILROAD OFFICE BUILDING & POTENTIAL PARK



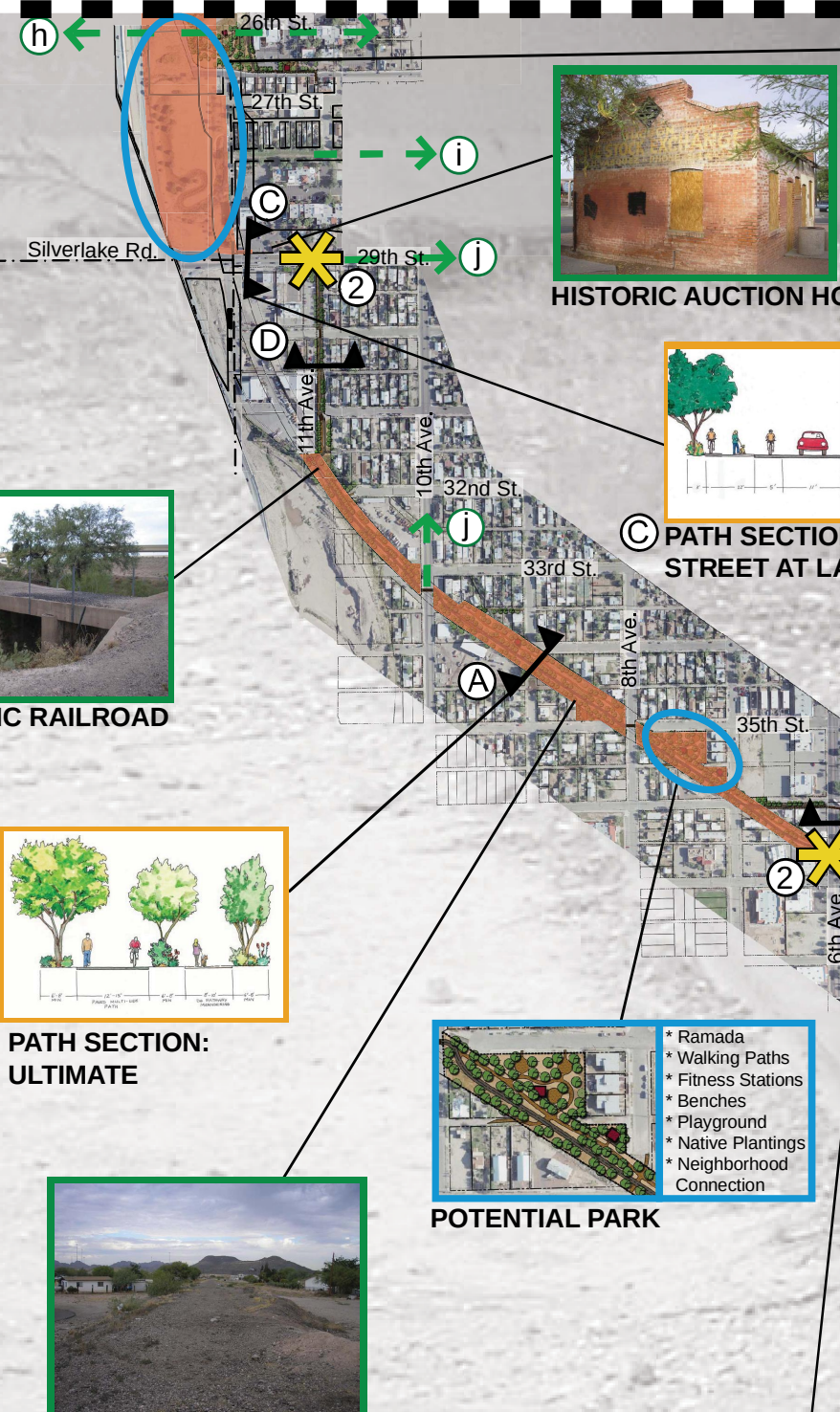
HISTORIC RAILROAD ROUNDHOUSE

* Ramadas
* Walking Paths
* Benches
* Interpretive Railroad Plaza
* Native Plantings
* Public Art
* Pedestrian Bridge
* Preserved Tracks
* Gateway Arch
* Neighborhood Connection

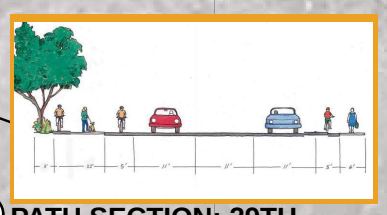
POTENTIAL PARK

Matchline - See Next Page

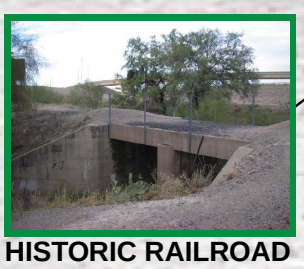
Matchline - See Previous Page



HISTORIC AUCTION HOUSE



C PATH SECTION: 29TH STREET AT LA FRONTERA



HISTORIC RAILROAD BRIDGE

* Connection to Historic Roundhouse
* Potential Transportation Museum or Retail
* Potential Outdoor Amphitheatre
* Ramadas
* Walking Paths
* Benches
* Dog Park
* Playground
* Bicycle Skills/BMX Park
* Native Plantings
* Skate Plaza
* 1/2 Mile Walking Loop
* Parking
* Restrooms
* Interpretive Areas
* Open Space
* Public Art
* Neighborhood Connection
* Approx. 10.7 Acres

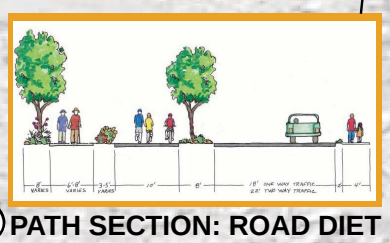
ADOT DETENTION BASIN: POTENTIAL PARK

A PATH SECTION: ULTIMATE

* Ramada
* Walking Paths
* Fitness Stations
* Benches
* Playground
* Native Plantings
* Neighborhood Connection

POTENTIAL PARK

HISTORIC RAISED RAILROAD ALIGNMENT



D PATH SECTION: ROAD DIET

E PATH SECTION: REVERSE PARKING AREA

LEGEND

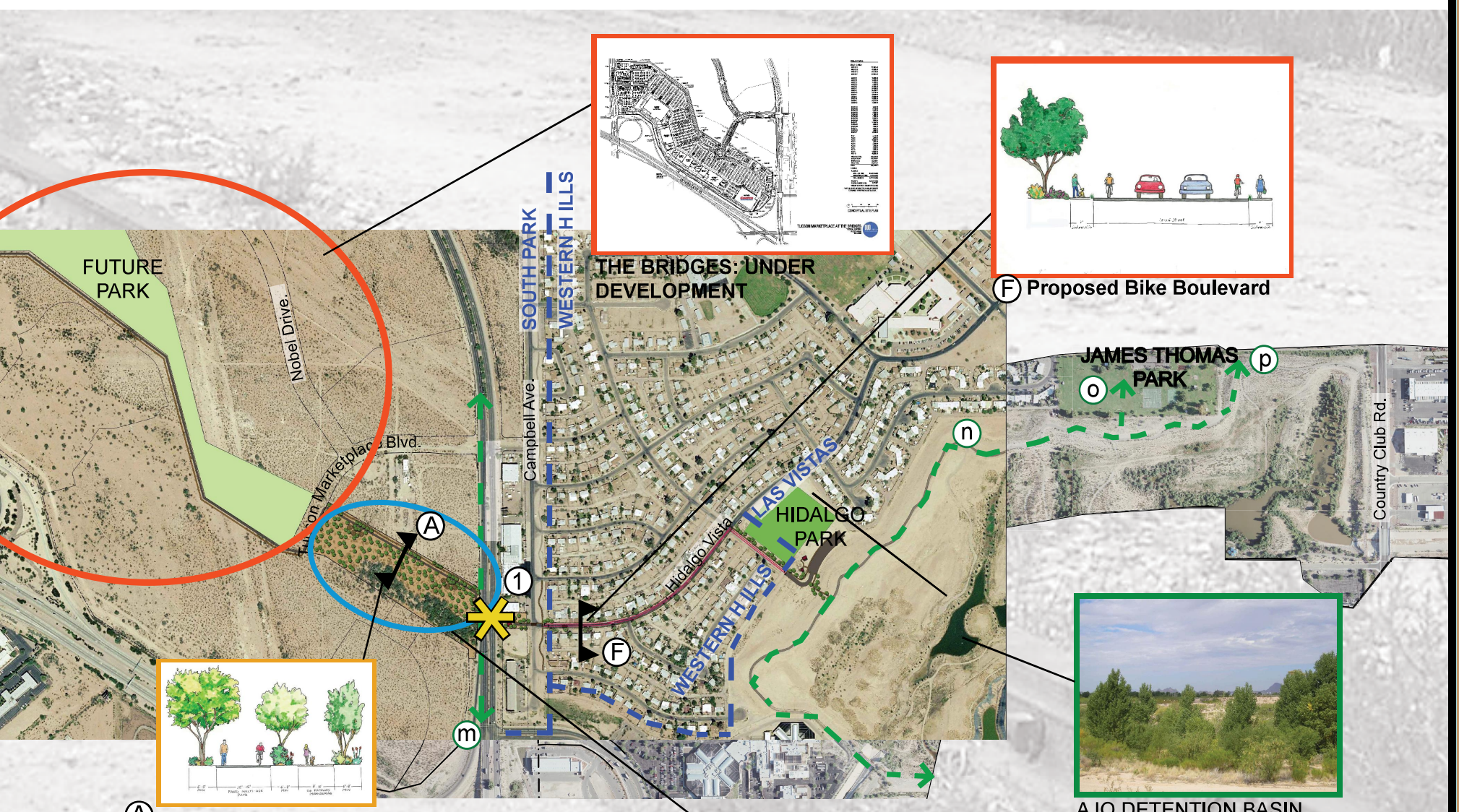
- NEIGHBORHOOD BOUNDARIES
- PROJECT DEVELOPMENT UNDERWAY
- POTENTIAL PARKS FOR FUTURE DEVELOPMENT
- SIGNIFICANT ROADWAY CROSSINGS
  - 1 Overpass
  - 2 At-Grade

KEY MULTI-MODAL LINKAGES, CURRENT AND FUTURE

- a University of Arizona
- b Estevan Park Link (Future)
- c Commuter Link: Pima College/Downtown
- d Arroyo Chico Linear Park Link (Future)
- e Cultural Center/Downtown Modern Street Car
- f 18th Street Pedestrian Underpass
- g Neighborhood Link (Future)
- h Santa Cruz River Park (Future)
- i Neighborhood Link (Future)
- j City of South Tucson Health Loop
- k Julian Wash Linear Park Link (Future)
- l Neighborhood Link (Future)
- m Commuter Link
- n Existing Path
- o James Thomas Park Link
- p Neighborhood Link (Future)

KEY FEATURES

- Alignment/Path Sections See page 50 for enlargements
- Signature Features
- Potential Park Sites
- Proposed Development



Ⓐ PATH SECTION: ULTIMATE

Ⓕ Proposed Bike Boulevard

AJO DETENTION BASIN

PATH SECTION

- Ⓐ Ultimate
- Ⓑ Minimal
- Ⓒ 29th St. at La Frontera
- Ⓓ Road Diet
- Ⓔ Back-In Parking Area
- Ⓕ Proposed Bike Boulevard

PARCEL OF INTEREST

POTENTIAL PARK

- * Ramadas
- * Walking Paths
- * Benches
- * Fitness Stations
- * Native Plantings
- * Playground
- * Interpretive Riparian Nodes
- * Interpretive Aviation Nodes
- * Natural Open Space
- * Public Art
- * Birding Areas
- * Neighborhood Connection

EL PASO & SOUTHWESTERN GREENWAY DESIGN GUIDELINES

Introduction

The purpose of the El Paso & Southwestern Design Guidelines is to preserve the intent of the EP&SW Greenway Master Plan. These Guidelines embody the historic effort and creative professional insight harnessed to generate the initial Greenway vision; they recognize the results of the technical research conducted by the design team and enhanced by the Technical Advisory Committee (TAC); and foremost, the Guidelines preserve the intricate understanding of the public's wishes that the design team revealed during the public Open Houses. This knowledge must be applied within the context of regulatory mandates and actual site conditions. In order to express this, there must be guidance of different levels in place. In order to fully realize this, future design teams must be required to employ this guidance in their design process. The EP&SW Design Guidelines are divided into two sections, **Mandatory Design Requirements** and **Recommended Design Guidelines**.

As a whole, the intent of the Design Guidelines fulfill several obligations:

- The obligation to adhere to the codes and requirements of the Tucson and City of South Tucson communities, as well as other mandatory codes
- The obligation to provide for the health, safety and welfare of the public
- The obligation to create a space that is identifiable, comprehensible, comfortable and user-friendly
- The obligation to provide for varying conditions along the alignment while maintaining the integrity of the whole
- The obligation to ensure the best possible practices for the stewardship of the community's available physical as well as financial resources
- The obligation to acknowledge that the future may bring changes and innovations that should be incorporated
- The obligation to allow future design teams varying degrees of flexibility in order to maintain their creativity and professional integrity

MANDATORY DESIGN REQUIREMENTS

The Mandatory Design Requirements are intrinsic to providing a high design standard and continuity to the Greenway. The Requirements include deference to current regulatory codes which must be followed to preserve the health, safety and welfare of Greenway users. They mandate principals of stewardship of the land and guide the solid foundation for the Greenway by using critical design principals. The Requirements will also result in visual ties, allowing this 6-mile park to be seen as a single cohesive unit. The Greenway must be designed with respect for the general over-riding influence of its core, the El Paso & Southwestern Railroad. It must also be designed with sensitivity to the context of the adjacent neighborhoods it passes through.

Mandatory Design Requirements include:

1. Regulatory Codes
2. Crime Prevention Through Environmental Design
3. Design Cohesion/Way-finding
4. Pathway Design
5. Sustainable Initiatives
6. Traffic Safety
7. Bicycle Signage
8. Lighting
9. Geotechnical Data
10. Utilities

1. Regulatory Codes

Regulatory codes provide the foundation for the health, safety and welfare of a project, and therefore the public. All codes are subject to revision over time. The following codes will assure compliance to national as well as local safety standards. Additional codes come into play when federal funding is included to support the project. Each source of funding may have its own set of regulations and all environmental requirements must be adhered to. When further design on the EP&SW Greenway begins, research of changes to the following codes, as well as definition of any additional codes, must be conducted before design begins.

- National Environmental Protection Act (NEPA)
- Section 404 Clean Water Act
- Arizona Pollutant Discharge Elimination System (AZPDES) through Arizona Department of Environmental Quality
- City of Tucson General Plan
- City of Tucson Land Use Code
- City of Tucson Sign Code
- City of Tucson Traffic Signal Design Manual, 2003.
- City of Tucson Water Harvesting Guidance Manual, October, 2005.
- City of Tucson Park Irrigation Design and Construction Requirements, November 2005.
- City of Tucson/ Pima County Ordinance No. 10135 Outdoor Lighting Code to ensure dark night skies
- Transportation Access Management Guidelines for the City of Tucson, Arizona, March 2003.
- National Association of City Transportation Officials (NACTO) Urban Bikeway Design Guide
- Americans with Disabilities Act of 1990.
- Policy on Geometric Design of Highways and Streets, 'Green Book,' AASHTO, 2004.
- Manual on Uniform Traffic Control Devices, 2009 Edition (MUTCD)
- AASHTO Roadside Design Guide, 2002.

The EP&SW Greenway must conform to the City of Tucson Parks and Recreation Department Specifications. At time of design, updated versions of these codes and specifications are required.

2. Crime Prevention Through Environmental Design (CPTED)

CPTED provides for the prevention of criminal activities through logical design principals. All design for the Greenway must follow these guidelines to the greatest extent possible.

- Natural Surveillance: "See and Be Seen" includes use of Lighting and Landscape to create spaces with open visibility to deter criminal behavior.
- Natural Access Control: Use of walkways, fences, lighting, signage and landscape to clearly guide people to and from proper entrances. It directs the flow of people to decrease the opportunity for crime.
- Territorial Reinforcement: Create/extend a "Sphere of Influence" through design elements such as pavement treatment, landscaping and signage to develop a sense of proprietorship which discourages potential trespassers.
- Maintenance: Development of a formal CPTED based maintenance plan creates safer neighborhoods by discouraging neglected properties seen as breeding grounds for criminal activity.

3. Design Cohesion/ Way Finding

It is critical to create design cohesion along the Greenway due to the long linear nature of the project. The consistent use of design elements and the similarity of materials, color and style will visually tie this project together. The consistent placement of the elements also reinforces this unity.

The signage concepts illustrated here are the key visual elements that must be used to create that cohesion. Signage incorporates way-finding which provides clear orientation to Greenway users of their location within the community.

Signage can be designed to distinguish different types of destinations by use of letter font, color, borders or logos. Destinations the guests to the EP&SW Greenway Open Houses identified could be grouped under the following suggested categories.

Quincy Douglas Library

<u>Public Services Destinations</u>
University of Arizona
BICAS
Downtown Tucson
Drachman School
City of South Tucson
John C. Valenzuela Youth Center
Sam Lena Library
City of South Tucson City Hall
Quincy Douglas Library

<u>Entertainment Destinations</u>
Downtown Arts District
Tucson Community Center
Tucson Museum of Art
Old Town Artisans
Fox Theater
Restaurants

<u>Historic Destinations/ Parks</u>
Oury Park
Garden of Gethsemane
El Presidio Park
Manning House
El Tiridito
San Cosme/ Elysian Grove
Santa Rosa Park

El Tiridito Shrine in Downtown Tucson

Fox Theater Downtown Tucson

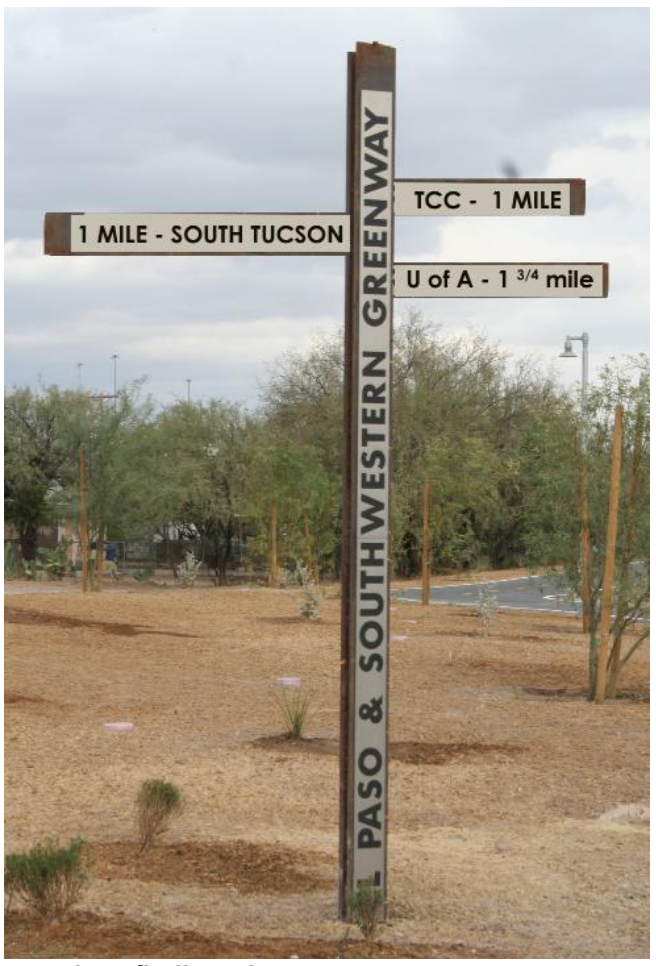
There is some flexibility in bringing the signage concepts into design detail, but the foundation is presented here. Final review by State Historic Preservation Office (SHPO) will be mandatory so historic value is not compromised.

Certain signage can also have a negative impact. Removal or screening of large billboards found off-site in locations which obscure or create negative views, or found on-site and dominate the foreground of the alignment, will enhance the Greenway experience.

Billboard Inteferes with View of A Mountain

The following are examples of how signage shall be used along the Greenway:

• Use of El Paso & Southwestern Greenway Entry Signage Wayfinding at every significant street crossing



Entry/Wayfinding Sign

• Use of EP&SW Greenway logo on all signage. Large format on bridge overpasses, both sides. Colors as shown below:

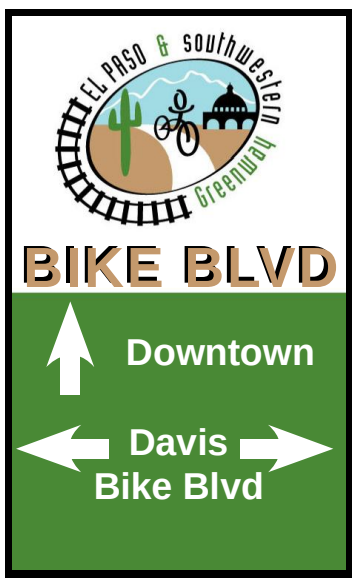
RGB: 73/137/53

RGB: 161/220/228

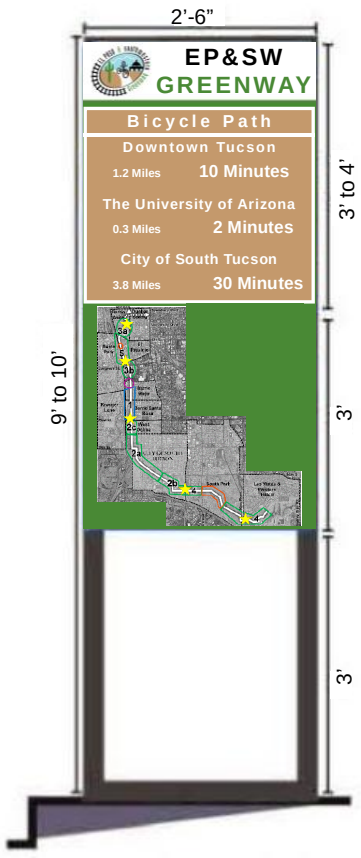
RGB: 196/153/108

EP&SW Logo

Possible Directional Greenway Signage at Intersecting Linkages.



Possible Greenway Bike Boulevard Signage



Wayfinding Signage Along Greenway

• Use of Neighborhood Markers to denote the borderlines of neighborhoods within the Greenway.

Neighborhood Marker

• Use of standardized Historic Interpretation signage or kiosks.

Interpretive Sign at Railroad Plaza

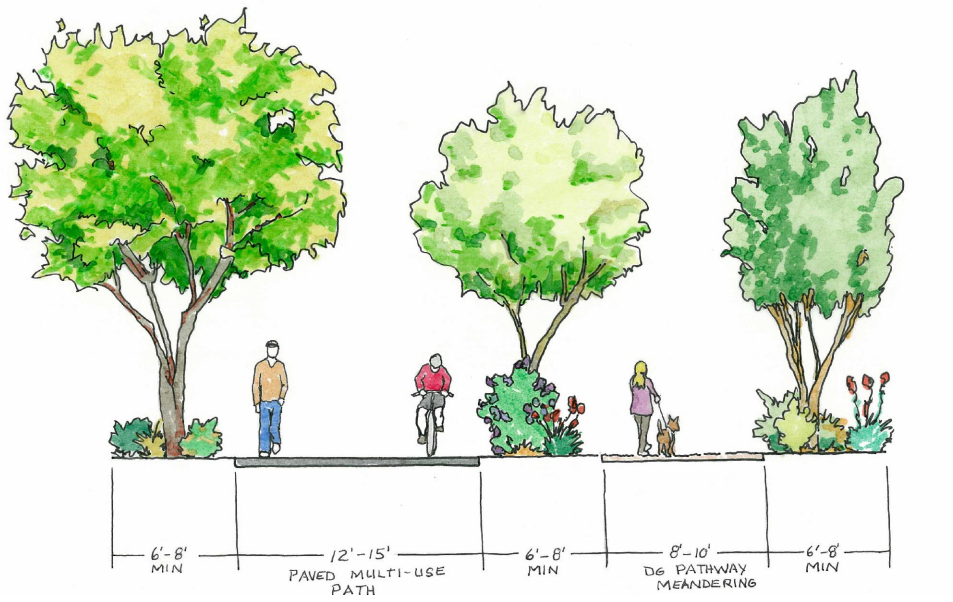
Interpretive Sign at Historic Feature

Information Kiosk Along Path

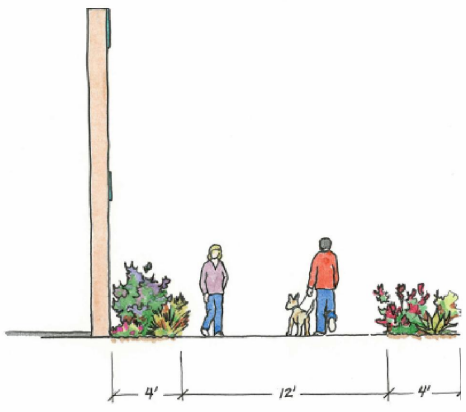
4. Pathway Design

Pima County's Divided Urban Pathway system is reflected in the 'Ultimate' cross-section of the El Paso & Southwestern Greenway. This cross-section reflects ideal right-of-way conditions that allow for the creation of a 12' wide paved multi-use pathway and an 8' wide soft surface pathway. The 12' path is typically asphalt but alternate materials should be explored to reduce heat issues. Pourous paving materials are under continual evaluation and should be researched for the latest products. The Divided Urban Pathway comfortably accommodates a broad range of potential user groups and provides the opportunity for multiple users to choose the path which best suits their individual needs. Increased safety is provided by separating different user types from each other and from vehicular traffic.

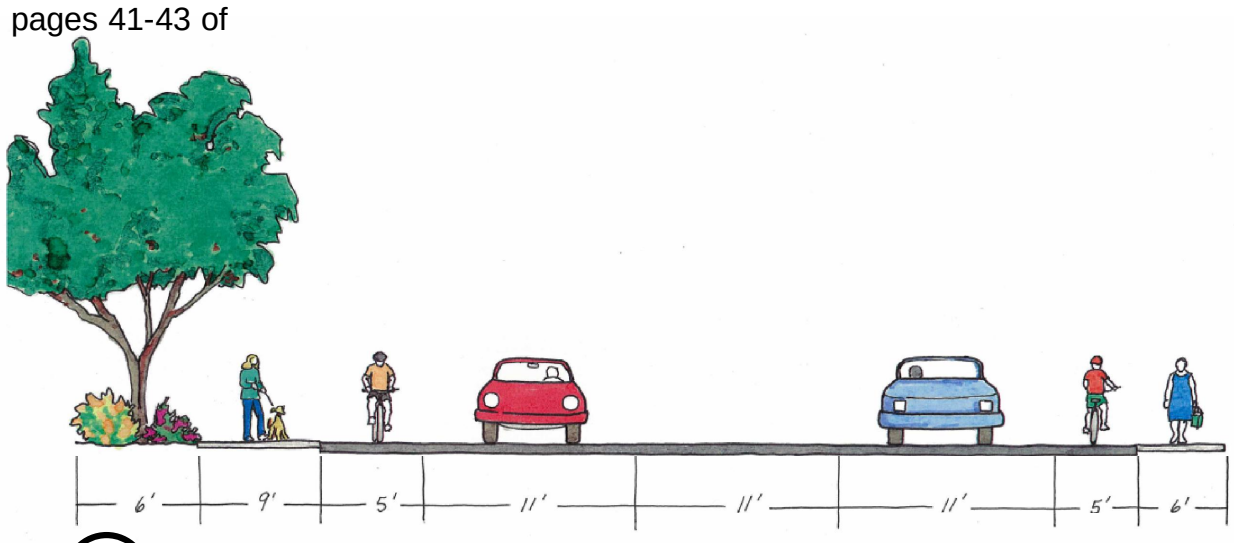
While the 'Ultimate' cross-section is the ideal condition, there are a number of areas along the alignment where complete separation of the Greenway users from vehicular traffic is not possible. Existing site conditions were considered along the entire Greenway, resulting in a variety of pathway section design solutions. Each of the pathway sections shown below is referenced in the Master Plan illustration located on pages 41-43 of this report.



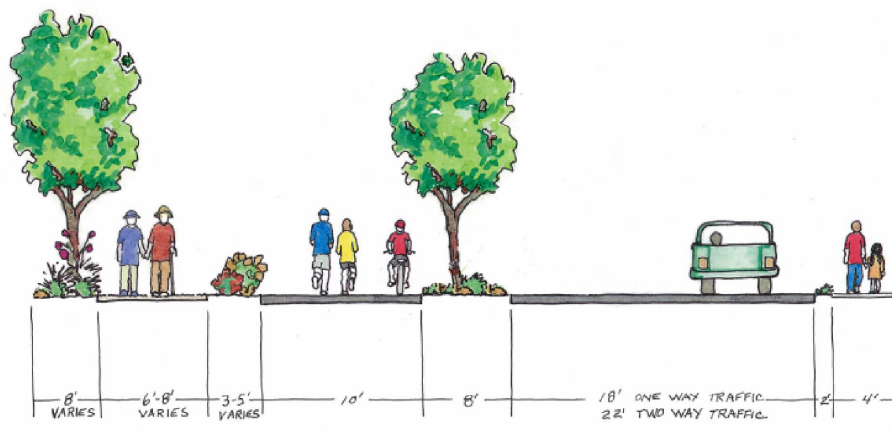
Ⓐ **Path Section: Ultimate**



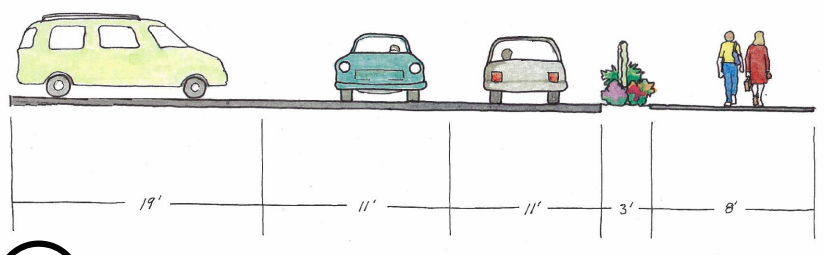
Ⓑ **Path Section: Minimal**



Ⓒ **Path Section: 29th Street at La Frontera**



Ⓓ **Path Section: Road Diet**



Ⓔ **Reverse Angle Parking Section**

Ⓕ **Proposed Bike Boulevard**

5. Sustainable Initiatives

Sustainable design initiatives must be followed to the greatest extent possible to promote proper stewardship of project resources. These initiatives will allow the EP&SW Greenway the maximum opportunity to reach construction and then thrive through time. Some initiatives streamline construction costs while others minimize maintenance costs. The goal is to save costs to the community thus allowing tax dollars to flow to other fundamental needs. These initiatives are under constant evolution and further innovations may be available in the future.

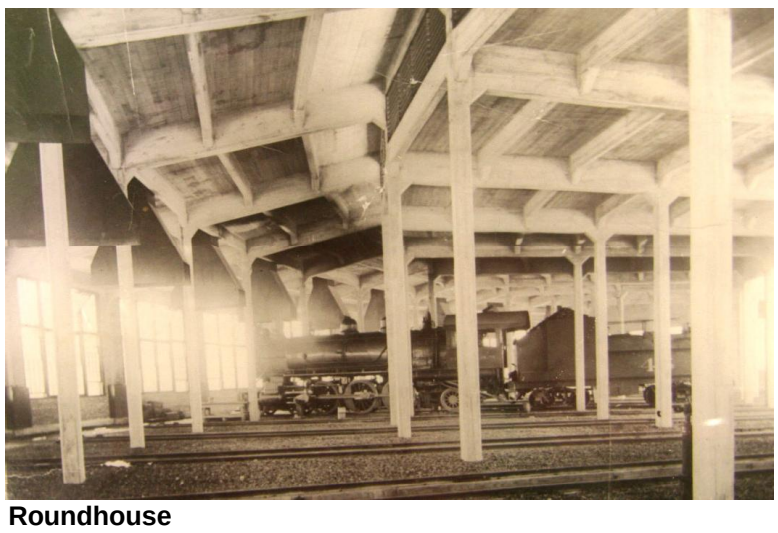
The following sustainable design principles will be adhered to:

Stewardship of History and Culture

- A full cultural evaluation and inventory has the potential to reveal resources of significant value. There is potential to encounter cultural remains of earlier civilizations such as pottery shards or domestic tools, or historic elements such as the currently visible EP&SW railroad tracks. Each discovery will require protection or incorporation per the State Historic Preservation Office guidelines and approval.

Hohokam pottery shards

- There are historic neighborhoods, buildings and other historic assets along the EP&SW Greenway. El Presidio Historic District is on the site of one of the nation's oldest continuously habituated sites. Barrio Anita and Barrios Santa Rosa are eligible for the National Historic Register. The El Paso Southwestern Depot is nominated for the Register of Historic Places. Several other buildings such as the Roundhouse and the Livestock Auction House are potential candidates.



Roundhouse

- Other assets include the 1911 Historic Railroad Bridge located at the southern end of 11th Avenue, the raised railroad bed running through South Tucson and the rails themselves found within several portions of the alignment. Within the segment from Congress to Cushing Street, the existing railroad track and ties will be preserved in the context of the historic EP&SW Railroad Depot.

- The disposition of existing tracks along other segments of the Greenway alignment will be determined after final consultation with SHPO. Until guidance is provided, wherever feasible, the existing railroad tracks and ties will be incorporated into the project with minimal impacts. Incorporation may include:

  o Using interpretive signage, feature portions of track that are unique, such as the location where dual tracks converge or diverge.

  o Expose portions of the track if obscured and if determined it will be an effective design element in-place.

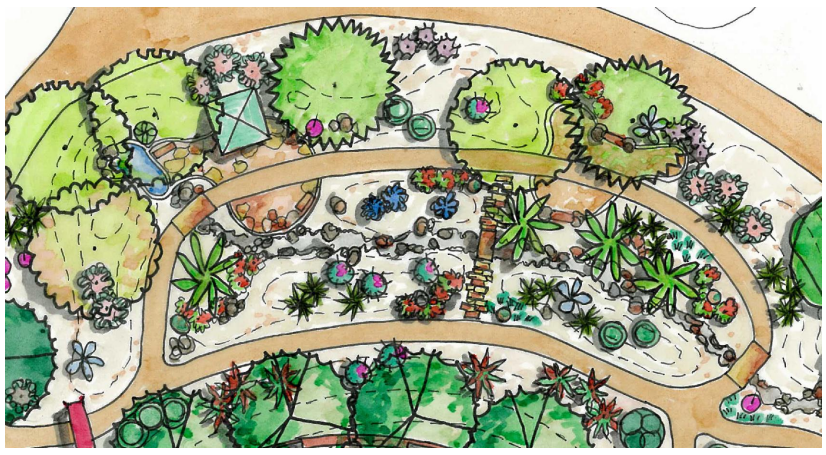
  o Remove or relocate portions of the track if determined it will be a hazard to the public or if it will cause substantial conflict with required design elements (such as the pathway alignment, significant utilities, irrigation system, ADA compatible grades, etc.).

  o Provide adaptive re-use of track or ties if appropriate.

Historic railroad tracks remaining in the Congress to Cushing St. area

Stewardship of Resources

• Contract design of the Greenway with professional design teams that include Landscape Architecture with Civil support. A cohesive team will collaborate effectively to design for maximum efficiency of resources. The savings over time benefit the community.



An integrated design team can effectively evaluate the site for rainwater harvesting options.

• Investigate and mitigate environmental hazards. Even now, without a detailed study completed, it is clear some areas along an abandoned railroad right-of-way will have contaminants due to the fuels and maintenance practices of the past. Mitigation will not only result in improved safety to the public but will allow plant materials to thrive, and minimize further impacts to the water table due to irrigation and future rain events.

• Prioritize the irrigation water source by initially lowering demand by use of drought tolerant plant materials, maximizing water harvesting practices. Utilize reclaimed if available, utilize CAP if available, and as a last resort utilize potable water. This conservation ethic will lower the maintenance costs allowing the Greenway to be less of a financial burden to the public.

• Select plant materials appropriate for site space restrictions so little or no shearing or pruning is required. Provide maintenance guidelines to eliminate or strictly minimize these unnecessary activities that increase maintenance costs of the project.

Limit pruning efforts allow native plants to fill in naturally.

• Investigate alternative energy options, and current innovative solutions such as solar irrigation controllers, solar lighting and LED lights. Currently, the cost for solar lighting is excessive. As time progresses these costs may reduce and become reasonable for the project.

• Maximize use of on-site materials, including rubble, concrete or other materials scheduled to be demolished, to the greatest extent possible. The materials can be included in gabions to provide vertical elements or as erosion protection directly on a slope. This practice will minimize export of demolished materials to landfills. Less material to remove translates into lower transport, fuel and dumping fees, thus saving cost.

Select and re-use excess soil, rock, and vegetation on the site.

Buy locally to reduce transportation costs when possible.

• Minimize use of pesticides and herbicides but monitor pest and weed growth and treat before it becomes critical.

• Introduce the use of recycled materials wherever possible

Stewardship of Water by Harvesting

• Follow water harvesting principals to conserve water by maximum retention and infiltration of rainwater on-site.

• Water Harvesting Infiltration Areas shall be designed to minimize ponding in areas that may create a nuisance for pedestrians. Pathways shall be designed higher than the water harvesting swales to allow continued circulation during wet seasons. Ponding is not allowed on or over public sidewalks or required pedestrian circulation paths.

• Water Harvesting Infiltration Areas shall be designed with limited compaction and amended with granular or structural soils so that water infiltrates into soil within twenty-four (24) hours.

• Land shall be formed following contours to create micro-basins and swales.

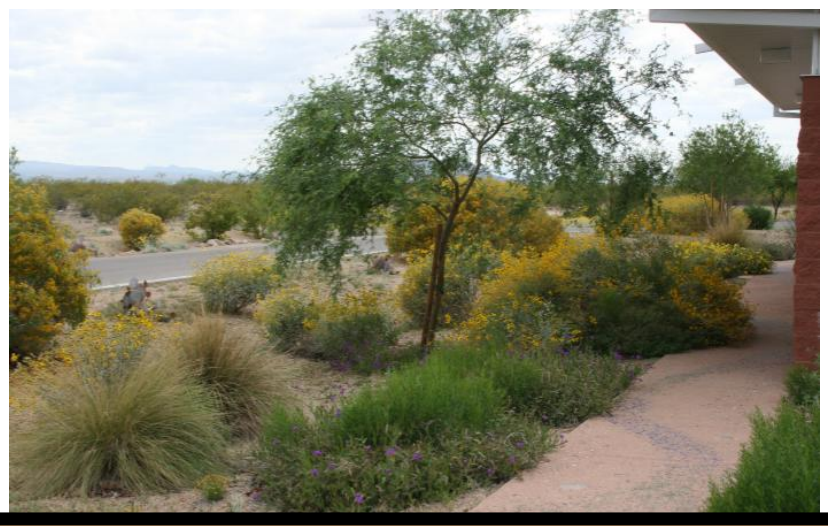
• When possible design to follow topography to limit grading and preserve existing vegetation.

Existing vegetation provides shade and interest.

• Consider “cascade” water collection basins with berms, swales, and rocks in slope areas prone to erosion.

Cascading water collection area lined with vegetation.

• Design depressed areas, berms and swales with soil levels below grade to slow and retain rainwater runoff.



• Design berm and swale edges to prevent erosion. Consider rock edging to reinforce steep sides on detention/retention basins.

Rock edging along swale edges prevents erosion.

• Use of HVAC condensate, if it is available from structures nearby, can provide considerable water in the hottest months.

• Use organic or rock mulch on rainwater harvesting areas to reduce evaporation. Place organic mulch away from plant base to avoid excess moisture accummulation.

• Provide dust control with the use of seed mix or ½ inch or larger washed rock mulch. Water infiltration will be maximized.

Seed mix controls dust while providing seasonal color.

• Water “borrowing” may be possible if an adjacent site has excess and topography permits.

• Evaluate anticipated rainwater capture for specific areas, for example pocket parks or micro-climates, to determine whether irrigation can be eliminated or reduced.

• Per Federal Highways Administration (FHWA), water harvesting alone is not an acceptable maintenance practice. Back-up irrigation systems are required for a minimum of 2 years.

Stewardship of Water by Irrigation Systems

• Irrigation shall be managed by the City Parks Master Control System. Systems adjacent to Fire Central shall be extensions of the 36-station Rain Master Eagle-1 T.W.I.C.E. controller.

• Irrigation design continues to develop into a system of components that conserve and self-regulate the use of water on a project's plant materials. Soil moisture sensors combined with rain gauges tell "Smart Controllers" when the soil has dried and plants require more water.

• Use non-potable water for irrigation when available or advocate for extension of source and future conversion.

• Use drip irrigation and/ or root watering systems to assure delivery of water directly where needed and to eliminate waste. Maintain all irrigation equipment for optimal function.

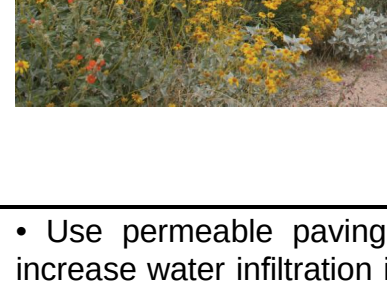
• Place plants with similar water demands in groups to allow zoning of irrigation water flows. Consider reducing/ eliminating irrigation after establishment of native species.

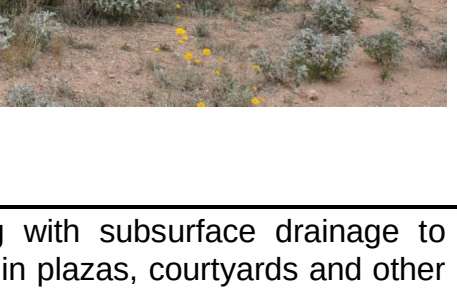
• Automatic underground drip irrigation is the standard for the arid Southwest.

• Schedule some zones, such as the most drought tolerant native trees, for complete weaning from supplemental irrigation. The irrigation system then becomes necessary only in times of greatest drought.

• Retain existing vegetation to save irrigation and watering costs as well as lower the need to import container plants.

• Use irrigation equipment that responds to plant water needs through the use of soil moisture sensors and/or other methods. The irrigation system should be capable of preventing the irrigation system from running if sufficient soil moisture is present to support the vegetation.





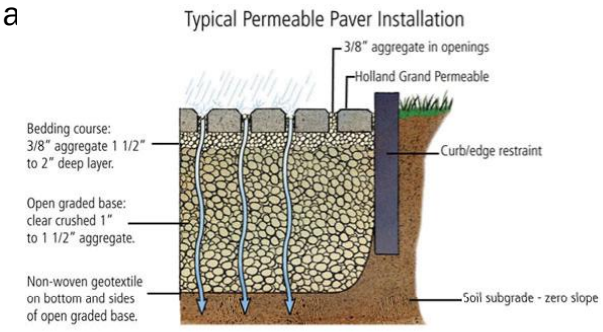
• Create zones of irrigated and non-irrigated planting, maximizing the effect of irrigated planting near high visibility and/or high use areas.

Stewardship of Water by Pavement Design

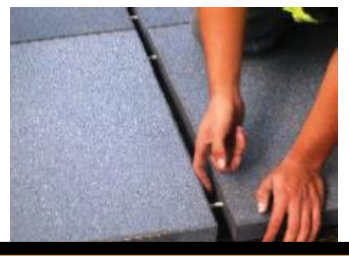
• Permeable pavement, loose mulches and well aerated substrate allow the maximum permeation of rainwater.

• Consider "cool" pavement surfaces (e.g. light colors) where appropriate to reduce local heat island effects and irrigation demands. Select high albedo products for maximum benefit.

• Use permeable paving with subsurface drainage to increase water infiltration in plazas, courtyards and other paved a



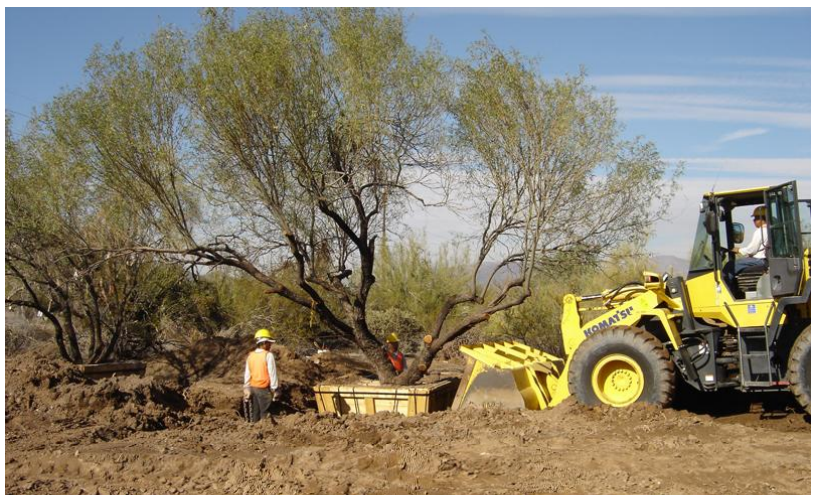
• Investigate alternatives to asphalt such as rubberized sifewalks for a more comfortable experience.



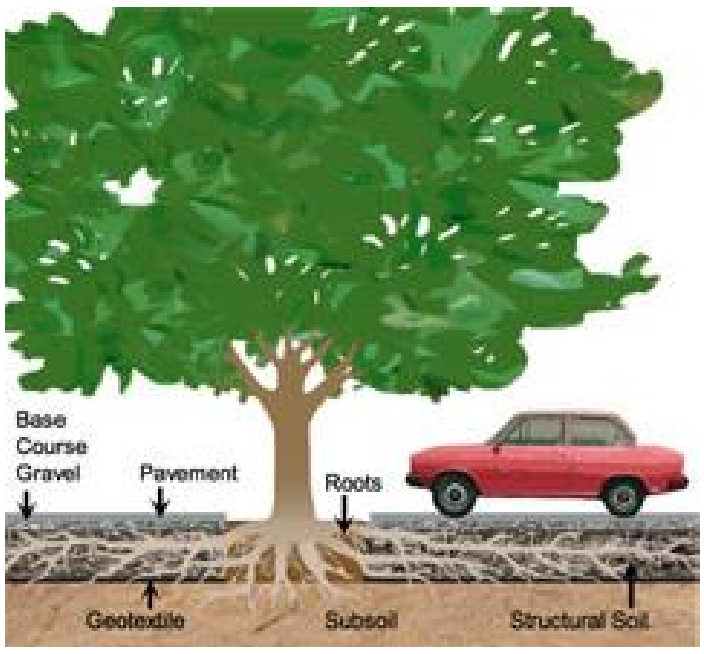
Stewardship of Plant Materials

• The simple placement of plants, grouping higher water needs separate from lower water needs, removes unnecessary demand on the water supply while allowing increased shade and beauty in areas of high use.

• Harvest and replant local disturbed plants when possible to provide local stock to project. These plants are site-adapted, and may reduce transportation needs.



• Existing well compacted soils, as well as soils compacted for hardscape needs, must be treated to allow proper aeration for plant materials.



• Use drought tolerant species when possible.

• Maximize canopy coverage of Trail Head parking nodes to increase comfort and decrease the urban heat island effect.

• Use trees to provide shade for understory plants, reducing smaller plant's water demand, cooling the area, and increasing plant survival.

• Preserve as much undisturbed native vegetation as possible. Supplement with pathway rainwater runoff through the use of grading, swales, and curb cuts if needed.

6. Traffic Safety Considerations

The safe design of the El Paso & Southwestern Greenway and the crossings is of utmost importance. A full Traffic Report can be found in Appendix C. A summary of the findings follows here.

The locations of the crossings and the ease with which the Greenway users are able to cross the more important streets is critical to having a safe and well used pathway. Although this is a long-range plan which will be implemented as opportunities arise, Tucson Department of Transportation Traffic Engineering staff and the City of South Tucson should be a major contributor to this project at the earliest stages of planning and design.

At some locations, the Greenway will deviate from the EP&SW Railroad right-of-way in order to direct the users to the best crossing location. At some locations, the pathway will be diverted to intersections with existing traffic signals rather than cross at the alignment locations at major streets. However, expecting some users to walk or bike hundreds of feet along a roadway to use an existing traffic signal may not be realistic. More than likely, they will cross the roadway at the point where the Greenway intersects the roadway, at their risk and at the risk of crossroad users (motor vehicle drivers, bicyclists and pedestrians). A logical design solution would be to realign the Greenway, with supporting signage and pavement markings, to an existing signalized location.

Crossings

Because the Greenway is crossing various roadway or path types, there will not be a simple treatment that can be used for each crossing. The following describes what will be encountered on the Greenway.

1. Physical barriers (railroad tracks) and high volume roadways

There are several locations where the Greenway alignment will cross the active Union Pacific Railroad (UPRR) tracks or high volume roadways; both types of interfaces are complex for the EP&SW Greenway users.

The railroad barriers will require an at-grade separation by overpass or underpass, or diversion from the Greenway alignment to an at-grade crossing. All crossings at the railroad tracks will require discussions with UPRR.

The Structural Concept Report in Appendix D provides more detailed study of these overpasses for the following complex interfaces.

- UPRR and University Boulevard
- Congress Street
- 22nd Street
- UPRR (Nogales Spur) at the Greenway alignment
- Kino Parkway

2. Major Streets

The Greenway must cross several major streets. These are three to five lane arterials and include

- St. Mary's Road
- 22nd Street
- 29th Street
- 10th Avenue
- 6th Avenue
- 4th Avenue
- Park Avenue

Several of the crossing locations are near existing or planned traffic signals, either at street intersections, or mid-block pedestrian signals. Options for crossing along the Greenway at these major streets can include providing a non-signalized crossing area (typical or specialized crosswalk; i.e. Zebra), a signalized pedestrian crossing (HAWK, Pelican, or Toucan), or routing Greenway users to existing traffic signal locations).

3. Local Streets

The Greenway crosses through several neighborhoods, and thus will cross local, or neighborhood streets. Each street is an opportunity or link to or from the Greenway to access other areas of the Tucson Community. Many are designated or are scheduled to be Bike Boulevards. The Greenway will also skirt several streets, especially between 22nd Street and 29th Street where an access point, or trailhead, rather than a crossing at the Greenway will be located. Intersection Ahead, Yield and/or Stop signs can be provided along the Greenway in advance of these cross streets.

On some local streets the Greenway must interface with existing parking. Whenever possible the parking adjacent to an on-street bike lane should be converted to reverse-angle only. There are many guidelines available for the design of this style of parking; the City of Tucson has implemented reverse-angle parking along high bicycle use streets, such as University Boulevard, and streets near the 4th Avenue business area.

General Design Considerations for Crossings

Several items must be considered in the design of the EP&SW Greenway crossings. Some of these include:

- At unsignalized intersection crossings, motorists do not expect to see bicyclists and pedestrians. Advance signing and pavement markings (including in-pavement lighting at crossings) can be provided to alert both cross street and Greenway users of the crossing.

- Along the Greenway, most of the roadways to be crossed have light to moderate traffic volumes, and there is good visibility on the trail users' and roadway users' approaches. However, some of the crossings will be at roadways that carry (or will carry) over 15,000 vehicles per day. A traffic study should be completed for roadway crossings as a part of the preliminary design phase for each segment as it moves toward implementation to determine the most appropriate and safe design features. Initial crossing design concepts can be refined during the design and constructions document stages.

- The alignment of the Greenway right-of-way, as shown in the Master Plan shows many of the pathway crossings aligned at a skew to the roadways they cross

(for instance where the Greenway alignment crosses at 10th Avenue, 8th Avenue and 5th Avenue. An example of a successful skewed crossing is at 10th Avenue and Julian Wash). Skewed alignments extend crossing distances and make the design treatments more difficult to implement. Efforts should be made to align crossings so that the crossings are made at 90 degree angles to the roadways.

Proposed crossing treatments are based on established standards, preliminary evaluation of the available data, and experience on similar existing facilities.

The goals of determining crossing treatments include:

• Reducing conflicts commensurate to the users of the Greenway and the crossroads. Signalized crossings would not be recommended at low volume roadways in most cases, but may be recommended where Greenway users would encounter high traffic volumes or complicated crossing conditions.

• Providing a cost effective crossing that maintains safe conditions for all who encounter the Greenway intersection.

• Recognizing that grade-separated crossings may be necessary to ensure the safety of the Greenway user. These will likely occur at existing railway crossings and at locations where Greenway crossers would experience great risks crossing the roadway.

For each of the crossing treatments, established regulatory, warning, signing, and accompanying pavement markings, will be necessary at the approaches to the crossings, and to establish the right-of-way hierarchy for users at the Greenway intersections.

For this study, three crossing categories are used:

Type I – Type I crossings (unsignalized, but possibly with other traffic control devices) are recommended where vehicles travel at speeds of less than 35 mph and are used by fewer than 10,000 vehicles per day, such as residential streets and some collector roads. Other traffic control devices may include high visibility crosswalks using Green Bike Lanes or stamped colored asphalt or a combination, signing, curb extensions and pedestrian refuges. Many of the crossings along the Greenway will be Type I crossings.

Type II – signalized crossings are recommended for crossings where posted speeds are 35 mph and above and/or ADT exceeds 15,000 vehicles, and where it is recommended that pathways receive a high level of crossing protection. Each crossing, regardless of traffic speed or volume, requires additional review by a registered engineer to identify sight lines, potential impacts on traffic progression, timing with adjacent signals, capacity, and safety. Green Bike Lane striping can be effective here as well.

Bike/pedestrian signals are normally activated by push buttons, but also may be triggered by motion or loop detectors. Minimum crossing times should be determined by the width of the street, pathway user profile, or other factors determined by the jurisdiction. Pathway signals should be supplemented by standard advanced warning and regulatory signs.

Pedestrian signals are located throughout the Tucson region, typically at mid-block locations where pedestrians would not walk to the closest signalized intersection. The City of Tucson has installed a variety of pedestrian signals including the HAWK, PELICAN and TOUCAN.

HAWK signals are single phase signals that stop vehicular traffic on the street for pedestrians to cross from curb side to curb side of the street. Pedestrians or bicyclists push the pedestrian call button to initiate the yellow light for traffic on the main street. The light then turns red for the major street traffic, and then flashing red. While the signal is solid red for major street traffic, the pedestrian has the Walk indication for this interval. When the light on the major street is flashing red, drivers on the major street must stop, look to ensure the pedestrian or bicyclist is out of the crosswalk, and then proceed. Pedestrians see the flashing “Don’t Walk” with a countdown timer during this interval.

PELICANs are two-stage signalized pedestrian crossings that stop traffic on the major street, one direction at a time. A second pedestrian call is necessary to cross to the other side of the street from the median refuge area. There is usually an offset in the walking path at a PELICAN crossing. PELICANs use the standard red-yellow-green pattern for traffic on the major street.

TOUCAN systems are placed at locations of heavy bicycle and pedestrian crossing activity and along roadways that are prioritized for non-motorized uses, sometimes known as “Bike Boulevards.” An added benefit to the TOUCAN signal system is that motorized traffic is not allowed to proceed through these signals, decreasing the number of cars on neighborhood streets, and enhancing the neighborhood’s quality of life.

Some of the pathway crossings that would fit the Type II crossing criteria are close to existing signalized intersection. Some of these crossings may be better provided at these existing signalized intersections.

Type III – grade-separated crossings may be needed when a physical barrier cannot be relocated (railroad track), and/or based on high traffic volumes and with the posted speed of 35 mph or higher. Personal safety may be a concern with overpasses and underpasses when pathway users may be temporarily out of sight from public view, and users may have poor visibility themselves. Type III crossings are preferred at the railroad crossings; one west of Main/University, and the other at the Nogales Spur, east of 4th Avenue. Type III crossings are also preferred at high-volume roadways. The EP&SW Greenway crosses Congress Street, 22nd Street and Kino Boulevard.

Design and operational measures are available which can address these pathway user safety concerns. For example, an underpass can be designed to be spacious (14 feet wide is recommended) and well-lit, equipped with emergency phones at each end, and completely visible for its entire length prior to entering.

Signage and Pavement Marking Guidelines

A uniform sign program will be developed for the Greenway. The signs will be provided based on the

specific locations, crossings, and guidance needs. For instance near the downtown venues, informational signs should be provided to direct Greenway users to specific uses. Several resources can be used to guide pathway and cross street designers in determining the best signing and pavement markings for this project. Examples of the proposed sign types are found in the Design Cohesion Section of the Mandatory Design Requirements of the Master Plan.

Monument Entry or Gateway Sign – These should identify a main entrance point to the Greenway. These signs can be constructed typically like other roadway signs, or artistically if the City wishes to promote a specific theme for the Greenway. A Greenway project logo should be provided on the sign, along with a map of the entire Greenway, or a map of a segment of the gateway near the entry.

Wayfinding or Directional Sign - These signs can be provided with a map of the Greenway path alongside, showing the user's position within the length of the Greenway path. The sign should identify the Greenway and perhaps upcoming locations.

Regulatory, Warning and Informational Signs – These signs may inform users of upcoming conflicts, specific pathway conditions, regulatory use of the path and other information relevant to the users. These signs should be erected whenever necessary along the Greenway. The size and shape of the signs will vary depending on the type of sign. The Manual of Uniform Traffic Control Devices (MUTCD), AASHTO and the NACTO Urban Bikeway Design Guide provide guidance and standards for regulatory, warning and informational signs.

Pavement Markings – Pavement markings such as white/yellow striping that delineate path usage and direction can accompany regulatory and warning signing (i.e., where passing is restricted, stopping is regulated). Striping to direct reverse angle parking will improve Greenway user safety.

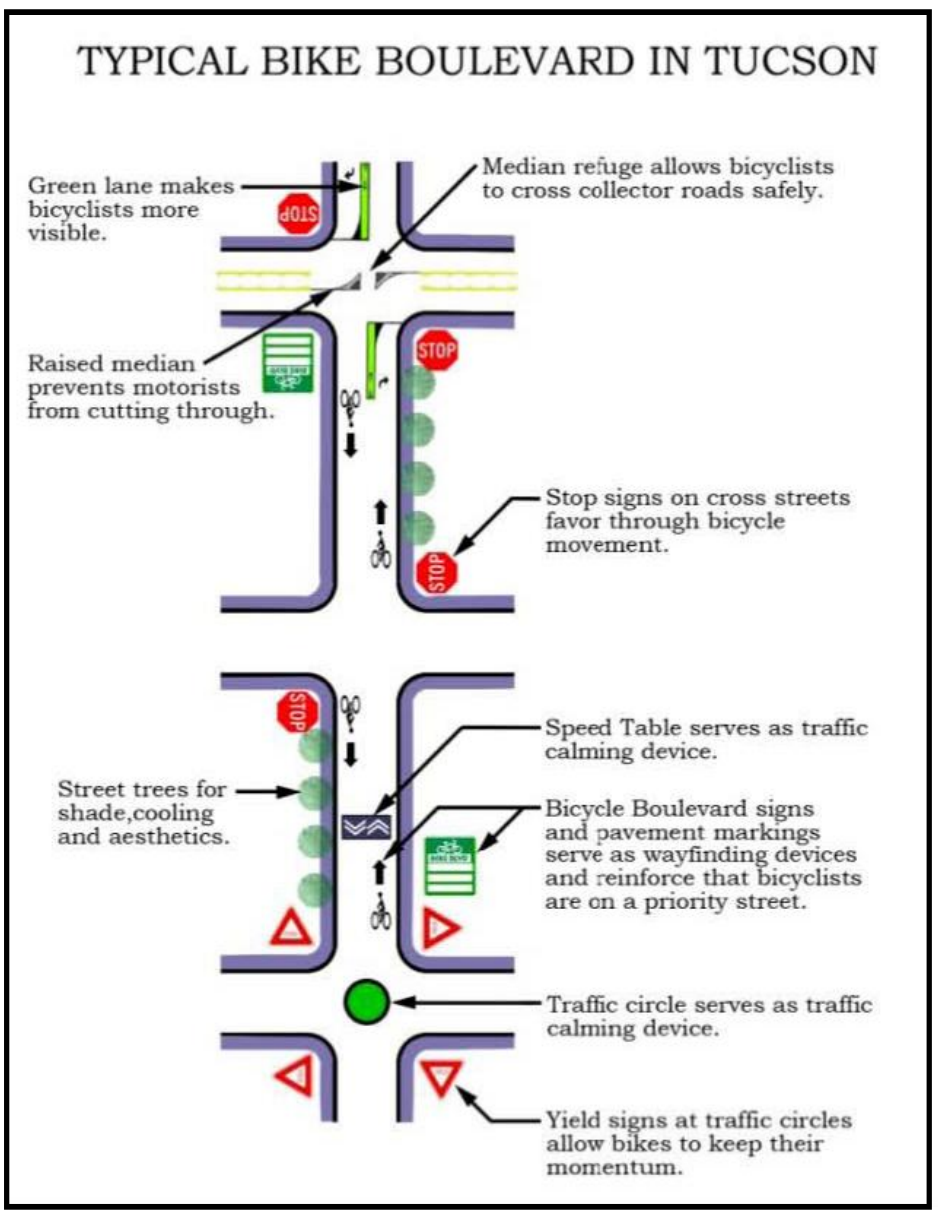
In addition to signing and striping, the use of traffic calming measures such as traffic circles, speed tables, speed humps and rumble strips may be helpful to stop/ slow traffic on streets at points where they intersect the Greenway.

Traffic Circle

Greenway Crossing Location Recommendations

El Paso & Southwestern Greenway (CLA 2009.13)

Roadway Crossing Locations	ADT	Posted Speed	Recommendation
Main Avenue	11,000 (2005)	30 mph	HAWK/TOUCAN Signal
UPRR near University Avenue	1,000 vpd (2005)	25 mph	Grade Separation
Van Alstine Street	< 1000 vpd	25 mph	Grade Separation
Anita Avenue	< 1000 vpd	25 mph	Sign/Stripe approaches
Oury/Kitchen Street	< 1000 vpd	25 mph	Sign/Stripe approaches
Hughes Street	< 1000 vpd	25 mph	Sign/Stripe approaches
St Mary's	22,500 vpd (2004, 2005)	35 mph	HAWK/TOUCAN Signal **Part of Downtown Links project**
Manning House Road (merge?)	NP	NP	Merge with PAAL
Congress Street	36,384 vpd (2006)	30 mph	Grade Separation
Granada/Cushing	4,441 vpd (2007)	30 mph	Full Signal **Part of Modern Street Car project**
Simpson Street	< 1000 vpd	25 mph	Sign/Stripe approaches
17th Street	< 1000 vpd	25 mph	Neighborhood Access Point
18th Street	< 1000 vpd	25 mph	Neighborhood Access Point
22nd Street	29,939 vpd (2007)	35 mph	Grade Separation **Part of 22nd Street Improvements**
25th Street	< 1000 vpd	25 mph	Neighborhood Access Point
26th Street	< 1000 vpd	25 mph	Neighborhood Access Point
27th Street	< 1000 vpd	25 mph	Neighborhood Access Point
Silverlake Road/29th Street (Along)	11,931 vpd (2007)	35 mph	HAWK/TOUCAN Signal
11th Avenue (Along)	< 1000 vpd	25 mph	
30th Street	< 1000 vpd	25 mph	No Change - Trail Signs
31st Street	< 1000 vpd	25 mph	No Change - Trail Signs
10th Avenue	6,347 vpd (2007)	35 mph	Refuge
8th Avenue	< 1000 vpd	25 mph	Sign/Stripe approaches
6th Avenue	21,365 vpd (2005)	35 mph	Traffic Study to Determine
5th Avenue	< 1000 vpd	25 mph	Sign/Stripe approaches
4th Avenue (Along)	3,970 vph (2007)	25 mph	HAWK/TOUCAN Signal, or Refuge
Nogales Spur (UPRR)	< 1000 vpd		Grade Separation
Park Avenue	20,660 vpd (2006)	35 mph	PELICAN Signal **Part of Bridges project**
Kino Parkway (and WB I-10 On Ramp)	33,121 vpd (2007)	40 mph	Grade Separation



7. Lighting

Due to the urban nature of the El Paso & Southwestern Greenway, this Master Plan provides for lighting the entire 6- mile length of the project. The Greenway lighting must conform to the City of Tucson/ Pima County Outdoor Lighting “Dark Skies” Code. It shall be a Class 2 Lighting system meeting total lumen light output requirements for lighting area type E3 per table 5.1.

Lighting of pedestrian walkways and bikeways is needed to create a sense of security and to provide safe movement of individuals who use them. Lighting is also one of the elements in this project which will be utilized to provide a unifying link between all the diverse neighborhoods in the Greenway alignment. It must be uniform in appearance, inviting, and draw the community into the pathways and to the diverse areas of interest, including the Greenway’s proposed Destination Nodes.

Guidelines for lighting have been implemented and are presently in place in the segment from Cushing Street to Simpson Street abutting the west side of the new Fire Central / Fire Station No 1 Building. This segment includes bicycle pathway lighting, pedestrian pathway lighting, and interpretive plaza lighting. Additional lighting required for the full EP&SW Greenway includes recreation areas and parking areas, as well as interpretive nodes.

Lighting systems on bicycle pathways should be spaced so that cyclists are guided by a consistent pattern of luminaire position. It should allow detection of other cyclists, detection of small obstacles, and detection of terrain variations. Average horizontal surface illumination level shall be 5 foot candles. Horizontal average to minimum shall be 10:1

For bicycle pathways, a small scale fixture that transcends architectural styles past and present has been selected. It is the “Universe Collection” with angled hood (ANG) as manufactured by Architectural Area Lighting. The fixture shall be full cut off straight arm mounted (PSTS) on 15’ high poles to minimize light trespass into adjacent neighborhood residences and to avoid an overpowering presence. The lamp shall be a 50W or 70W high pressure sodium lamp (50W or 70W) for better light blending with existing neighborhood lighting. Metal halide or fluorescent will not be allowed due to their stark contrast with any neighborhood lighting.

Bicycle Pathway Lighting

Lighting systems for pedestrian pathways should provide illumination of figures on the walkway. Where pathways are separated from bikeways, these systems will require lower light levels than bikeways. Fixtures will be a lower mounting height and closer spacing. Average horizontal surface illumination level shall be 2 foot candles. Horizontal average to minimum shall be 10:1.

For pedestrian pathways, a vandal resistant multi function round bollard round dome resembling the upper part of the pole mounted fixture has been selected. It is the VRB series as manufactured by Kim Lighting. This fixture may be selected in either single function for down lighting of walkways or dual function for down lighting lo walkways and vertical lighting of feature landscape areas. Lamp shall be 50W or 70W high pressure sodium. Metal halide or fluorescent will not be allowed due to their stark contrast with any neighborhood lighting.

Pedestrian Pathway Lighting

Destination Node lighting may be a combination of the light fixtures used for bikeway and walkway lighting.

Recreation area and parking area lighting may be achieved with the use of the “large scale” version of the bikeway “Universe Collection” light pole fixture. It shall be 150W or 250W high pressure sodium on 20’ poles.

Pole and bollard bases shall be no higher than 4” above adjacent grade or at same elevation as adjacent hardscapes to achieve an aesthetically appealing installation.

Lighting systems for interpretive features will be required for both smooth and irregular surface areas.

For interpretive feature lighting, an in grade corrosive resistant vandal proof adjustable lamp fixture was selected. It is the 6350 series as manufactured by Kim Lighting. It shall be 50W high pressure sodium narrow flood. Fixture shall be located closer to an irregular surface to accentuate its features and farther for a smooth surface to provide uniform illumination. They shall be carefully located to avoid hot spots.

Solar LED lighting technology was considered for this project but is presently about three times the cost of traditional lighting systems and therefore is not recommended at this time. It is a rapidly evolving technology and will be re-evaluated during design since cost might come down considerably. Benefits of its use are significantly longer lamp life of LED's compared to traditional lamps, self-powered through solar panels, and better controllability of lighting levels. During early evening hours light levels would be standard and later at night would dim to a preset level.

Interpretive Feature Lighting

8. Geotechnical Data

The Geotechnical Report provided in Appendix I supports Appendix D: Structure Concept Memo. Preliminary findings indicate pedestrian structures should bear on drilled shaft foundations. Lightly loaded portions of the structure (bridge approaches and stairs) may bear on shallow spread footings. Groundwater was not encountered at any of the exploration locations and we anticipate that construction can be completed with conventional excavating equipment. During the detailed design in the future, additional geotech may be required, especially when specific locations of ramadas, restrooms or other structures is identified.

9. Utilities

Utility extensions should be carefully planned to be efficient and cost effective. Locating amenities such as drinking fountains or rest rooms near existing utilities will provide important cost savings. In general, the vacated railroad R/W crosses many existing utilities at several locations, including public sewer, public water, fiber optic, communications, gas, overhead and underground electric, high pressure gas, storm drain improvements, and others. As the various phases of the project are funded, designed, and constructed an in-depth survey of existing utility infrastructure must be contracted. It is possible that some existing conflicting utility infrastructure will have to be relocated.

It is the intent of the design team to include area/path lighting and emergency call centers at even intervals along the entire greenway in order to facilitate a safe secure environment for path users while decreasing the amount of crime, vagrancy, and vandalism to the path improvements and adjacent parcels. The number of, and location of these new service locations will be quantified during each phase of the design process.

At the Master Plan level it is expected that there will be structures built with the Greenway project. Some of these structures will require new utility services including potable water, sewer, electric, and reclaimed water. Other utilities such as electric, communications and/or gas services may be required for some of those structures. Area lighting may also be needed for any parking areas designed and constructed appurtenant to the Greenway project.

New ramada structures are being considered in the following locations:

• 2 near the north connection of the Greenway path system

• 1 near the 17th Street intersection

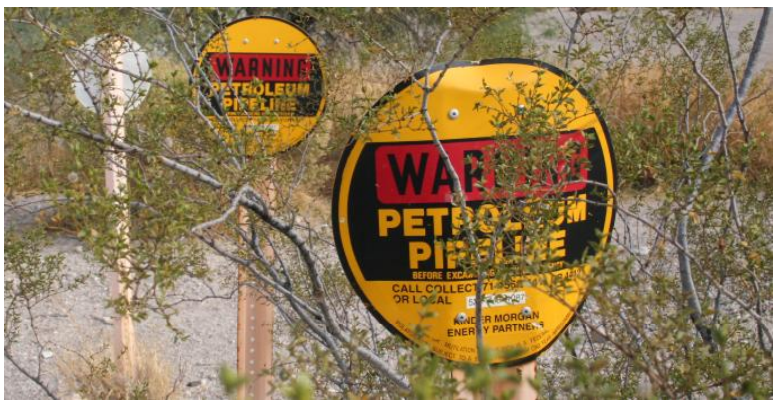
• 3 between 20th and 21st Streets

• 2 near the 25th Street intersection including the historic Roundhouse

• 5 within the planned park located between 27th and 29th Streets

• 1 near the 29th Street crossing

Other improvements which may require new utility services include restrooms, interpretive structures and other cultural restorative structures or exhibits.



Natural Gas Line Along the Greenway Alignment

RECOMMENDED DESIGN GUIDELINES

Recommended Design Guidelines have the common goal of the Design Requirements for maintaining continuity of design. Although these recommendations provide core values to design elements, they do allow the design team flexibility and creativity as each phase of the project progresses into construction.

These Recommendations includes product references to elements used in the first segment of the El Paso & Southwestern Greenway associated with the Fire Central Station #1 project at Granada and Cushing Street, completed in 2009. Although Fire Central was completed before this Master Plan was developed, it is a thoughtfully, well designed project with elements that will enhance the entire Greenway with their inclusion. Some caution must underlie exclusive use of these elements. Due to the prototypic nature of this segment, some elements have a higher value than what may be acceptable in future designs.

Recommended Design Guidelines include:

1. Positive Interface
2. Fluid Travel
3. Site Elements
4. Planting Design

1. Positive Interface

The value of promoting the Greenway to adjacent homeowners as well as adjacent or nearby potential developers is critical. Not only is their support for the construction of the Greenway beneficial, but their support for the Greenway's longevity may be essential. The list of benefits a greenway provides has been

discussed at depth in this report. Communicating these benefits must be a part of or precursor to development in the area.

• Promote the greenway as an asset

• Buffer the greenway from negative conditions such as parking lots, refuse storage, loading zones

• Allow easy access between the development and the Greenway

• Do not mix the Greenway pathways with access to the adjacent use pedestrian flow. Example: Greenway bicycle traffic may be in conflict to a retail guest searching for the correct store entry in an adjacent commercial strip.

2. Fluid Travel

Research during the Master Plan process resulted in the acknowledgement that overpasses are the best solution to continuity of travel across the Union Pacific Railroad and major high traffic/ high-risk street crossings.

The Structure Concept Memo found in Appendix D, documents preliminary structural analysis and approximate costs of five (5) crossings that will be required for the El Paso & Southwestern Greenway Project. The five crossings from North to South are: University Avenue at UPRR Overpass; Congress Street Overpass; 22nd Street Overpass; Nogales Spur Overpass and the Kino Boulevard Overpass.

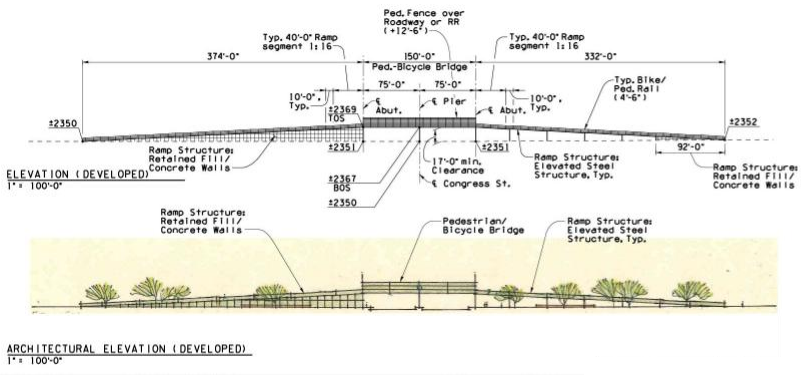
After analysis of numerous safety issues, overpass crossings were recommended at each location. Concerns include:
• low observability
• potentially insufficient lighting levels
• utility conflicts
• drainage issues
• associated higher maintenance requirements.

The cost implications with these and other issues also influenced the decision to consider only overpass alternatives. Substantial additional width to increase the safety of an underpass; drainage and associated maintenance concerns given that underpass structures would be below grade; the length of underpasses at the two UPRR crossings (given the assumption that the underpass structure would need to be the full width of UPRR right of way); higher construction costs due to required shoefly construction (a lengthy detour track that shifts trains away from the underpass excavation and construction); and the cost of the retaining walls required, were the primary cost impactors influencing the decision.

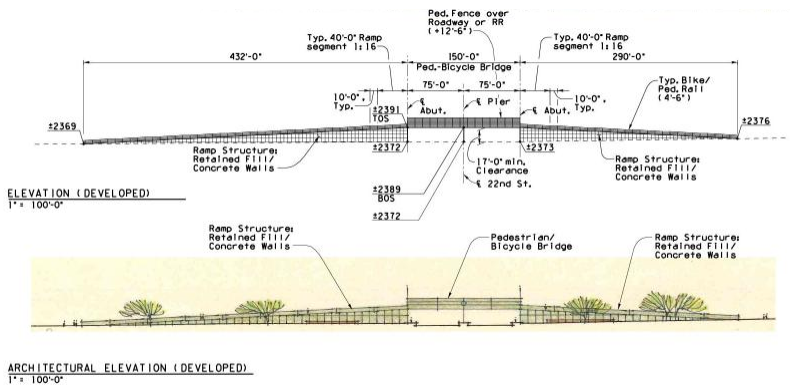
The goal of the visual design of the pedestrian bridges is to create a “light weight”, minimally intrusive and contextually sensitive response to the built historic, residential and multi-use environment in which the bridges are to be built.

Future design considerations should include response to linkages that exist and may be blocked by the new structure. Passage through the structures as well as linkages at street grade should be accomodated. The flow along the streets intersected must remain accessible. Therefore, the path will split and one leg will ramp up to the overpass and one will merge to access the street level.

Final design should respond to existing view-shed and should also minimize the “mass” of the new structures to help mitigate “out of scale” impact on the bridge sites. The structure type recommendation for the bridge portion of these crossings is a steel plate girder



Congress Street Overpass Concept



22nd Street Overpass Concept

superstructure with a concrete deck. For the ramp structure portion of each crossing, a combination of concrete walls retaining fill and/or an elevated steel plate girder structure with a concrete deck is recommended.

To create a tie to the Greenway, each bridge will have the EP&SW Greenway logo placed in the center of the bridge span allowing on-coming traffic from both sides to understand the significance of the overpass.

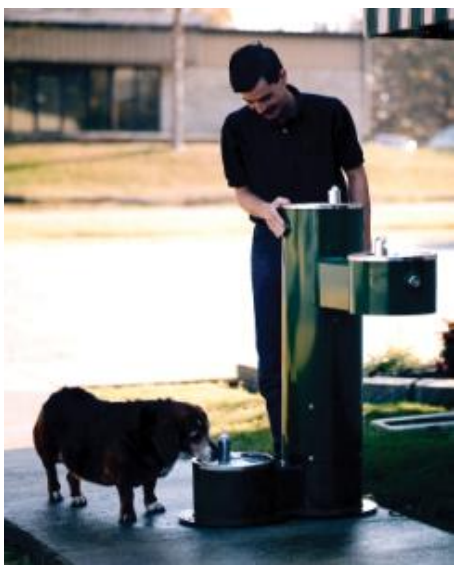
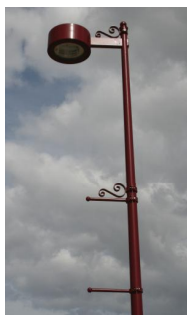
3. Site Elements

Numerous site amenities are necessary to create a usable space for the public that is inviting and functional. Illustrations for the following amenities follow. Although there is latitude for designer creativity, it is important to maintain a unifying foundation to allow the EP&SW Greenway to be perceived as a whole.

Amenities are divided into regions to allow consistency for project phases.

• Drinking fountains
• Lighting
• Bollards
• Benches
• Trash Receptacles
• Ash Urns
• Crosswalks
• Ramadas
• Bike Racks
• Bathrooms
• Picnic tables

	BACKED BENCHES	BACKLESS BENCHES	TRASH RECEPTICALS
BARRIOS	 SITESCAPES: MERIDIAN: CENTER ARM REST AVAILABLE	 SITESCAPES: MERIDIAN: AVAILABLE WITH CENTER ARM	 SITESCAPES: MERIDIAN
DOWNTOWN & EAST	 LANDSCAPE FORMS: SCARBOROUGH: POWDER-COAT SURFACE	  LANDSCAPE FORMS: STAY: AVAILABLE WITH ARMS	 LANDSCAPE FORMS: SCARBOROUGH
C.O.S.T.	  LANDSCAPE FORMS: PRESIDIO: STRAIGHT OR CURVED FORM; CENTER ARMS AVAILABLE	  LANDSCAPE FORMS: PRESIDIO: AVAILABLE WITH ARMS	 LANDSCAPE FORMS: PRESIDIO

DRINKING FOUNTAINS	LIGHTING	BOLLARDS	
 MOST DEPENDABLE: ADA AND PET	 ANP: AVON 208_DxO	 FORMS+SURFACES: 2231 LIGHT SCALE SECURITY BOLLARD  ALTERNATE: ILLUMINATOR: D150, SQUARE BOLLARD LIGHT	BARRIOS
 MOST DEPENDABLE: ADA AND PET, METAL FINISH TO MATCH EXISTING	 ANP: BVA06-H-1-2; AS USED AT FIRE CENTRAL  ANP: DARK SKY COMPLIANT BVB2001-H	 TO MATCH EXISTING NEAR FIRE CENTRAL  FORMS+SURFACES: 1993 5779 KNIGHT SECURITY BOLLARDS	DOWNTOWN & EAST
 ALTERNATE: BELSON: VANDAL PROOF HANDICAP 3202G	  ANP: BV-1_fs; AVAILABLE IN SINGLE LAMP POST  MATCH EXISTING ON 4TH AVE. C.O.S.T	 FORMS+SURFACES: 2231 LIGHT SCALE SECURITY BOLLARD  EASY RACK: 24” FLAT BOLLARDS, ALUMINUM	C.O.S.T.

	BIKE RACKS	FREESTANDING RESTROOMS	PICNIC TABLES
BARRIOS	  LANDSCAPE FORMS: RIDE METRO 40	 ROMTEC: 2004ES SINGLE/ UNISEX WITH STORAGE ROOM, SOLID REINFORCED CONCRETE AND TILT-UP SIP AVAILABLE	 THE PARK: GAME TABLE SQUARE  LANDSCAPE FORMS: PETOSKEY PICNIC TABLE
DOWNTOWN & EAST	  STEEL LINES: MILLENIUM	 ROMTEC: 2011 COMPACT DOUBLE, SOLID REINFORCED CONCRETE AND TILT-UP SIP DESIGN  ROMTEC: 2016 COMPACT DOUBLE, SOLID REINFORCED CONCRETE AND TILT-UP SIP DESIGN	 THE PARK: SQUARE STEEL STRAP SET
C.O.S.T.	 LANDSCAPE FORMS: FLO  STEEL LINES: MILLENIUM	 ROMTEC: 2011 COMPACT DOUBLE, SOLID REINFORCED CONCRETE AND TILT-UP SIP DESIGN  ROMTEC: 2016 COMPACT DOUBLE, SOLID REINFORCED CONCRETE AND TILT-UP SIP DESIGN	 THE PARK: ROUND AND ADA COMPLIANT

ASH URNS

SITESCAPES: CITYVIEW ASH URN

SITESCAPES: SMOKING POST BOLLARD

LANDSCAPE FORMS: GRENADIER ASH URN

LANDSCAPE FORMS: NAPOLEON ASH URN; OR PRESIDIO TO MATCH TRASH RECEPTACLES

CROSSWALKS

STREETSCAPES: "CULTURAL MOTIF" CROSSWALK PATTERN

STREETSCAPES: "BROAD RIPPLE" CROSSWALK PATTERN

STREETSCAPES: "SUNBURST" DURATHERM CROSSWALK

RAMADAS

ARTISTIC AND CANVAS SHADE STRUCTURES

WOODEN AND/OR STEEL STRUCTURES REFLECTING HISTORIC RAILROAD ROUNDHOUSE CONSTRUCTION

COLORFUL, DYNAMIC CANVAS SHADE STRUCTURES

BARRIOS

DOWNTOWN & EAST

C.O.S.T.

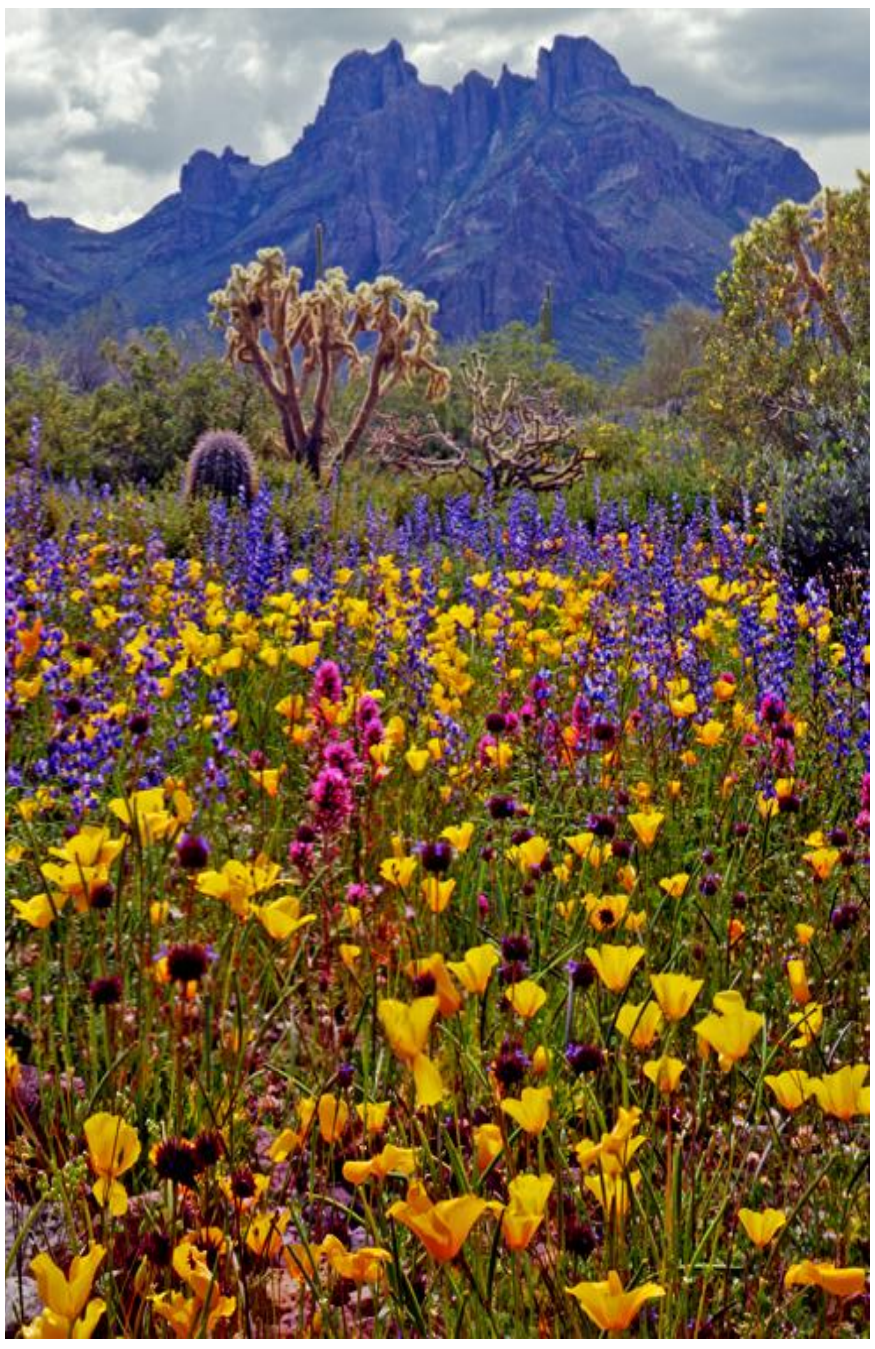
Planting Design

The Tucson area is situated within the Sonoran Desert, a biologically diverse desert environment. The EP & SW Greenway falls within urbanized areas of the desert that have lost most of their biotic value. Although the plant materials proposed by the Greenway Master Plan will greatly enhance the comfort and beauty of the area. Although existing conditions will be improved, the foundation they provide to the Greenway must be fully evaluated. Heavy compaction and residual elements resulting from years of railroad use must be mitigated to allow an environment for plants to thrive.

The plant materials proposed for the Greenway consist of drought tolerant natives as well as plants from areas of the world with similar climatic challenges. The zoning or grouping of plants into similar water needs allows the progression of plants from minimal water to higher water demand. The implementation of water harvesting principals augments the potable water demand and in some cases may allow removal of the supplemental source. Opportunities for reclaimed or other alternate water sources must be fully explored.

The justification for grouping plants with higher demand is the provision of more extensive shade and climate control, and an aesthetic expansion by use of blooming or special accent materials. High demand zones are preferred for areas of higher visibility and the most frequent use. Each section of the Greenway must be evaluated in those terms to achieve a more effective design.

The following list of plant materials can fulfill many design needs and provide for: canopy shade, color, bold contrast and accent, barrier, erosion control, screening of negative views, and fragrance to mitigate negative scents.

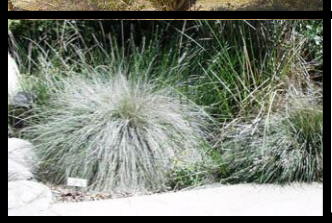


	NAME	TYPICAL SIZE	WATER USE	BLOOM COLOR/ SEASON	* E/D	GROWTH RATE	HARDINESS
TREES							
	*Acacia constricta* Whitethorn Acacia	H: 6-20' W: 6-20'	Low	Yellow/ Spring to Early Summer	D	Slow	9 F
	*Acacia greggi* Cat Claw Acacia	H: 10-15' W: 15-25'	Low	Yellow/ Early Summer	D	Mod	0 F
	*Chilopsis linearis* Desert Willow	H: 15-25' W: 10-25'	Low to Mod	Pink, Purple, White/ Spring to Late Summer	D	Fast	0 F
	*Olneya tesota* Ironwood Tree	H: 15-30' W: 15-25'	Low	Lavender-pink/ Late Spring	E	Slow	20-22 F
	*Parkinsonia florida* Blue Palo Verde	H: 15-30' W: 15-30'	Low	Yellow/ Spring	D	Fast	10 F
	*Parkinsonia microphyllum* Foothills Palo Verde	H: 10-20' W: 10-20'	Low	Yellow/ Spring	D	Slow	12-15 F
	*Prosopis glandulosa torreyana* Western Honey Mesquite	H: 10-30' W: 10-30'	Low	Yellow/ Spring to Mid Summer	D	Slow	10 F
	*Prosopis pubescens* Screwbean Mesquite	H: 25-40' W: 25-40'	Low	Yellow/ Summer	D	Slow	10-15 F
	*Prosopis velutina* Velvet Mesquite	H: 30' W: 30'	Low	Yellow/ Spring	D	Slow	10 F
SHRUBS							
	*Ambrosia deltoidea* Triangle Leaf Bursage	H: 1-3' W: 3'	Low	N/A	E	Fast	30 F
	*Anisacanthus thurberi* Chuparosa	H: 6' W: 6'	Low	Red-Orange/ Spring to Summer	D	Fast	15 F

	NAME	TYPICAL SIZE	WATER USE	BLOOM COLOR/ SEASON	*E/D	GROWTH RATE	HARDINESS
SHRUBS							
	*Asclepias subulata* Desert Milkweed	H: 4' W: 4'	Low	Yellow/ Spring to Late Fall	E	Mod	25 F
	*Atriplex canescens* Four-wing Saltbush	H: 4-8' W: 4-8'	Low	Yellow/ Summer	E	Mod	0 F
	*Baileya multiradiata* Desert Marigold	H: 1' W: 2'	Low	Yellow/ Early Spring to Mid Summer	D	Fast	32 F
	*Buddleia marrubifolia* Woolly Butterfly Bush	H: 5' W: 5'	Low	Orange/ All Year	E	Mod	10 F
	*Calliandra eriophylla* Fairy Duster	H: 1-3' W: 3-4'	Low	Pink/ Spring	E	Mod	15 F
	*Celtis pallida* Desert Hackberry	H: 10-16' W: 8-10'	Low	N/A	E	Mod	12-15 F
	*Dalea frutescens* Black Dalea	H: 3-4' W: 3-4'	Low	Lavender/ Late Summer to Fall	D	Slow	15 F
	*Datura discolor* Sacred Datura	H: 2' W: 2'	Low	White/ Summer	D	Fast	32 F
	*Dodonaea viscosa* Hop Bush	H: 12-15' W: 12'	Low	Green to Pink/ Spring	E	Mod	10 F
	*Encelia farinosa* Brittlebush	H: 3' W: 4'	Low	Yellow/Spring	E	Fast	26 F
	*Ephedra aspera* Mormon Tea	H: 3' W: 3'	Low	Yellow/ Spring	E	Fast	0 F

*E= EVERGREEN; D=DECIDUOUS

	NAME	TYPICAL SIZE	WATER USE	BLOOM COLOR/ SEASON	* E/D	GROWTH RATE	HARDINESS
SHRUBS							
	*Ericameria laricifolia* Turpentine Bush	H: 3’ W: 3’	Low	Yellow/ Spring to Fall	E	Fast	9 F
	*Hymenoxys acaulis* Angelita Daisy	H: 1’ W: 1.5’	Low	Yellow/ Late Spring to Fall	E	Fast	15 F
	*Hyptis emoryi* Desert Lavender	H: 15’ W: 15’	Low	Lavender/ Spring to Fall	D	Fast	32 F
	*Justicia californica* Chuparosa	H: 6’ W: 12’	Low	Red/ Late Spring to Fall	E	Fast	13 F
	*Larrea tridentata* Creosote Bush	H: 3-10’ W: 3-10’	Low	Yellow/ All Year	E	Mod	5 F
	*Leucophyllum laevigatum* Chihuahuan Rain Sage	H: 5’ W: 5’	Low	Blue/ Spring	E	Mod	18 F
	*Mimosa dysocarpa* Velvet Pod Mesquite	H: 3-6’ W: 2-4’	Low	Pink-Purple/ Spring to Summer	D	Slow	10 F
	*Penstemon spp.* Penstemon	H: 1-4’ W: 1-4’	Low	Varies/ Early Spring to Summer	D	Fast	9 F
	*Psilostrophe cooperi* Paper Flower	H: 1-1.5’ W: 2’	Low	Yellow/ Early Spring	D	Fast	13 F
	*Salvia spp.* Salvia	H: 1-3’ W: 1-3’	Low	Varies/ Early Spring to Fall	E	Fast	9 F
	*Senna covesii* Desert Senna	H: 2’ W: 2’	Low	Yellow/ Spring to Fall	D	Fast	25 F

	NAME	TYPICAL SIZE	WATER USE	BLOOM COLOR/ SEASON	* E/D	GROWTH RATE	HARDINESS
SHRUBS							
	*Simmondsia chinensis* Jojoba	H: 6-8' W: 6-8'	Low	Yellow/ Spring to Late Fall	E	Mod	20 F
	*Sphaeralcea spp.* Globe Mallow	H: 1-3' W: 1-3'	Low	Varies/ Summer to Fall	D	Fast	20 F
	*Vauquelinia californica* Arizona Rosewood	H: 5-25' W: 4-15'	Low	White/ Early Spring	E	Fast	13 F
	*Zinnia acerosa* Desert Zinnia	H: 1' W: 2'	Low	White/ Spring	D	Fast	20 F
ACCENTS							
	*Agave spp.* Agave	H: 1-6' W: 1-6'	Low	N/A	E	Mod	18 F
	*Carnegiea gigantea* Saguaro	H: 25' W: 8-10'	Low	White/ Spring	E	Slow	30 F
	*Dasylirion spp.* Desert Spoon	H: 3-6 W: 3-6'	Low	N/A	E	Mod	9 F
	*Echinicactus grusonni* Golden Barrel Cactus	H: 3' W: 1-2'	Low	Yellow/ Summer	E	Slow	10 F
	*Ferocactus spp.* Barrel Cactus	H: 2-5' W: 1-2'	Low	Orange/ Spring to Summer	E	Mod	15 F
	*Fouquieria splendens* Ocotillo	H: 5-25' W: 15'	Low	Orange/ Spring to Summer	E	Mod	10 F
	*Muhlenbergia rigens* Deer Grass	H: 4' W: 4'	Low	Yellow/ Fall	E	Fast	10 F

*E= EVERGREEN; D=DECIDUOUS

	NAME	TYPICAL SIZE	WATER USE	BLOOM COLOR/ SEASON	* E/D	GROWTH RATE	HARDINESS
ACCENTS							
	*Nolina spp.* Bear Grass	H: 3'-6 W: 8'	Low	White/ Early Spring	E	Fast	0 F
	*Opuntia spp.* Prickly Pear	H: 3-6' W: 3-10'	Low	Varies/ Spring to Summer	E	Fast	13 F
	*Yucca spp.* Yucca	H: 3-12' W: 3-6'	Low	White/ Spring to Summer	E	Mod	10 F
GROUNDCOVERS							
	*Calylophus spp.* Sundrops	H: 2' W: 3'	Low	Yellow/ Spring to Late Summer	E	Fast	20 F
	*Dalea greggii* Trailing Indigo Bush	H: 2' W: 9'	Low	Lavender/ Spring to Late Summer	E	Fast	9 F
	*Eschscholtzia californica* Gold Poppy	H: 0.5-1' W: 1'	Low	Orange-Yellow/ Early Spring	D	Fast	0 F
	*Kallstroemia spp.* Caltrop	H: 1' W: 3'	Low	Orange-Yellow/ Summer to Early Fall	D	Fast	0 F
	*Lupinus spp.* Lupine	H: 1.5' W: 1'	Low	Blue-Violet/ Spring	D	Fast	0 F
	*Melampodium leucanthum* Blackfoot Daisy	H: 1' W: 2'	Low	White/ Early Spring to Summer	D	Fast	0 F
	*Oenothera spp.* Primrose	H: 1' W: 3'	Low	Pink/ Early Spring to Fall	E	Fast	13 F
	*Verbena spp.* Verbena	H: 1-2' W: 2-3'	Low	Lavender/ Early Spring to Fall	D	Fast	5 F