

MAG

Transportation
Review Committee

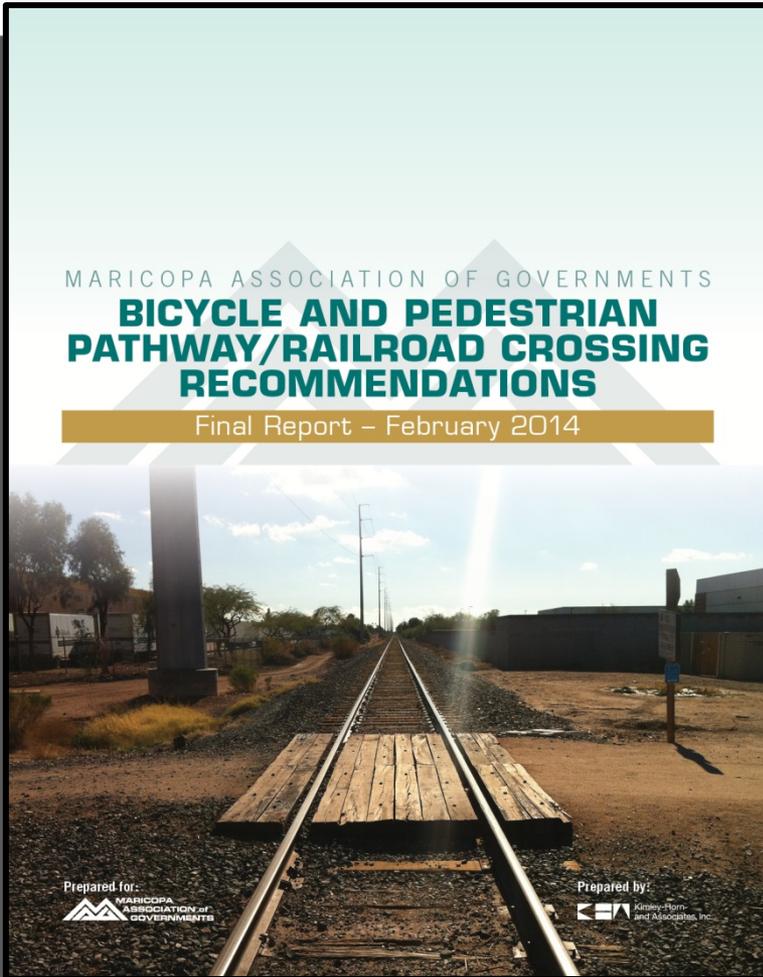
May 29, 2014

MARICOPA ASSOCIATION OF GOVERNMENTS
**BICYCLE AND PEDESTRIAN
PATHWAY/RAILROAD CROSSING
RECOMMENDATIONS**

Final Report – February 2014



**BICYCLE AND
PEDESTRIAN
PATHWAY/ RAILROAD
CROSSING
RECOMMENDATIONS**

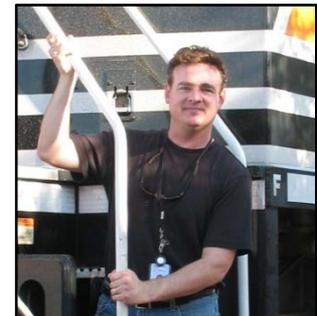


Prepared for:
MARICOPA
ASSOCIATION of
GOVERNMENTS

Prepared by:
Kinney-Horn
and Associates, Inc.

Introductions

- Alex Oreschak, Transportation Planner
 - Maricopa Association of Governments
- Marc Pearsall, Transit Planner
 - Maricopa Association of Governments
- Brian Sager, PLA
 - Kimley-Horn and Associates, Inc.



Overview

- Introduction
- Background
- Project Need
- Recommendations
- Crossing Design
 - Test Case
 - Process Checklist

Introduction

- Why this study? Why now?
 - Increase interaction with railroads
 - Increase in regional pathway system
 - More attention given to canal pathways



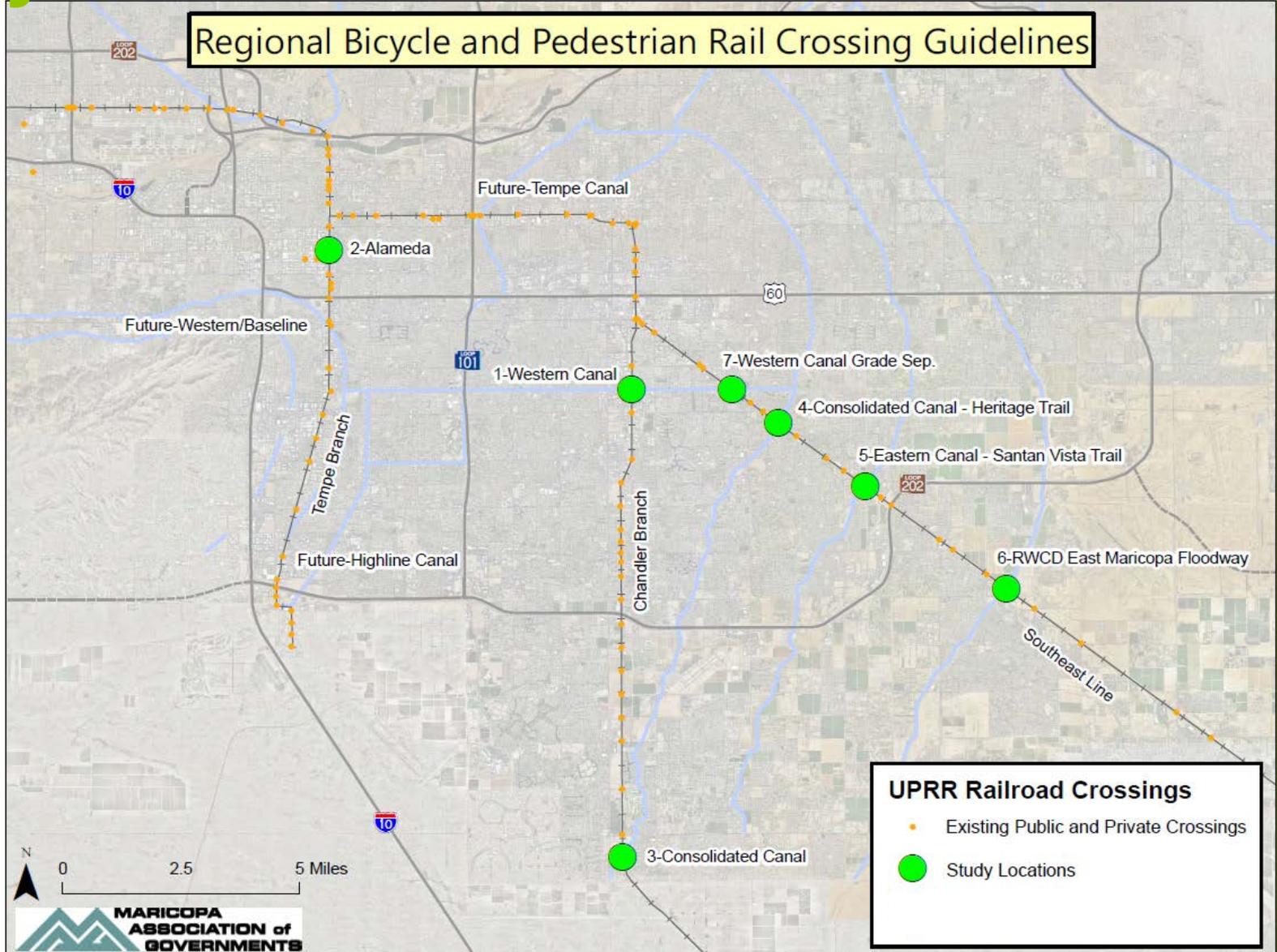
Background

- East Valley Focus
- UPRR
- Transferrable
- Project Management Team
 - Chandler
 - Gilbert
 - Tempe
 - Others

Project Need

- Popular Regional Trail System
 - More pathway use
- Gaps where trails meet railroad tracks
- “No Trespassing” signs
 - UPRR: this is an illegal crossing
- Safety Concerns

Project Need



Project Need

- Train/ Pedestrian collisions are severe
 - 64% result in death
- Pedestrians tend to look down, may lack awareness, will create their own pathways, will take shortest route
 - Cause as little deviation as practical from a direct pathway
- Crossing angle is important, especially for bicycles
- Rails-With-Trails projects don't automatically result in injuries

Standards

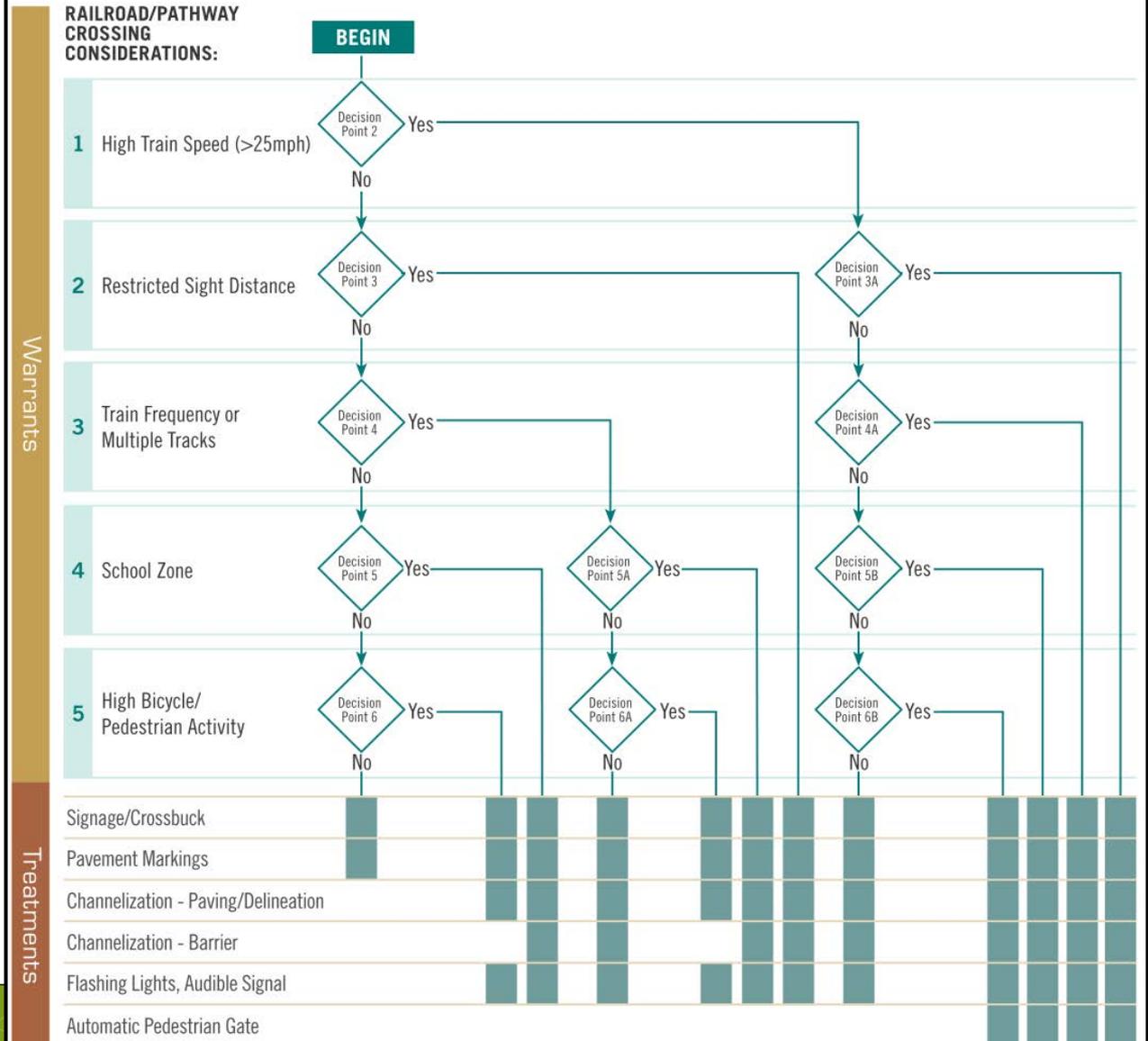
- There are no national crossing design standards
- Design Guidelines do exist in:
 - MUTCD
 - AASHTO Greenbook
 - FHWA Guidance on Traffic Control Devices at Highway-Rail Grade Crossings
 - FHWA: Designing Sidewalk and Trail for Access, Part II.

Recommendations

- Where feasible, implement grade-separated crossings
- Work with the Railroad to create action plan for implementing safe at-grade crossings
 - UPRR requires closing of 2 existing at-grade crossings to open 1 new at-grade crossing
- Use the Process Checklist from report when considering crossing treatments
- Address crossings on a case-by-case, as needed basis

Flowchart

AT GRADE CROSSING INFRASTRUCTURE SELECTION FLOWCHART



Crossing Design

Passive Warning

- Signs (Crossbuck, Stop, Yield, Warning, Both Ways)
- Pavement Markings
- Detectable Tactile Tiles
- Clearly mark stopping location and crossing location
- Fencing
- Gates

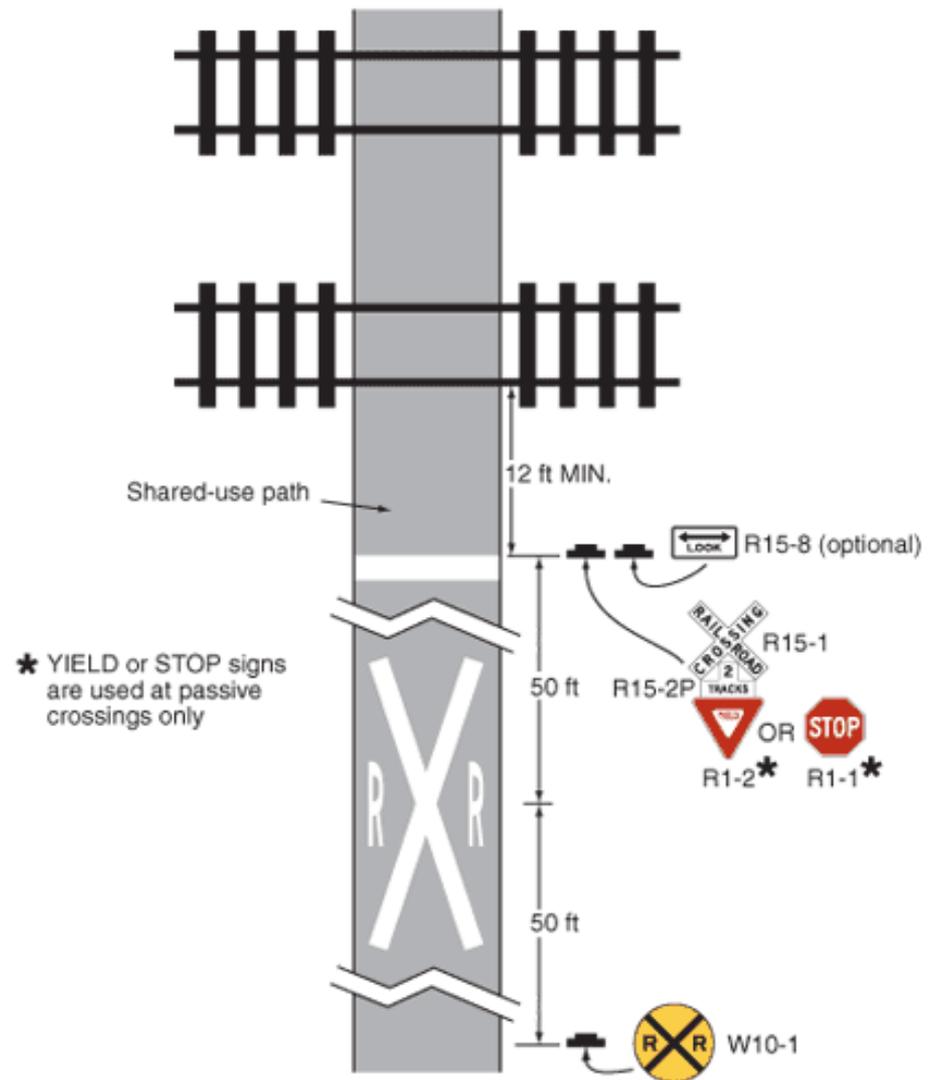


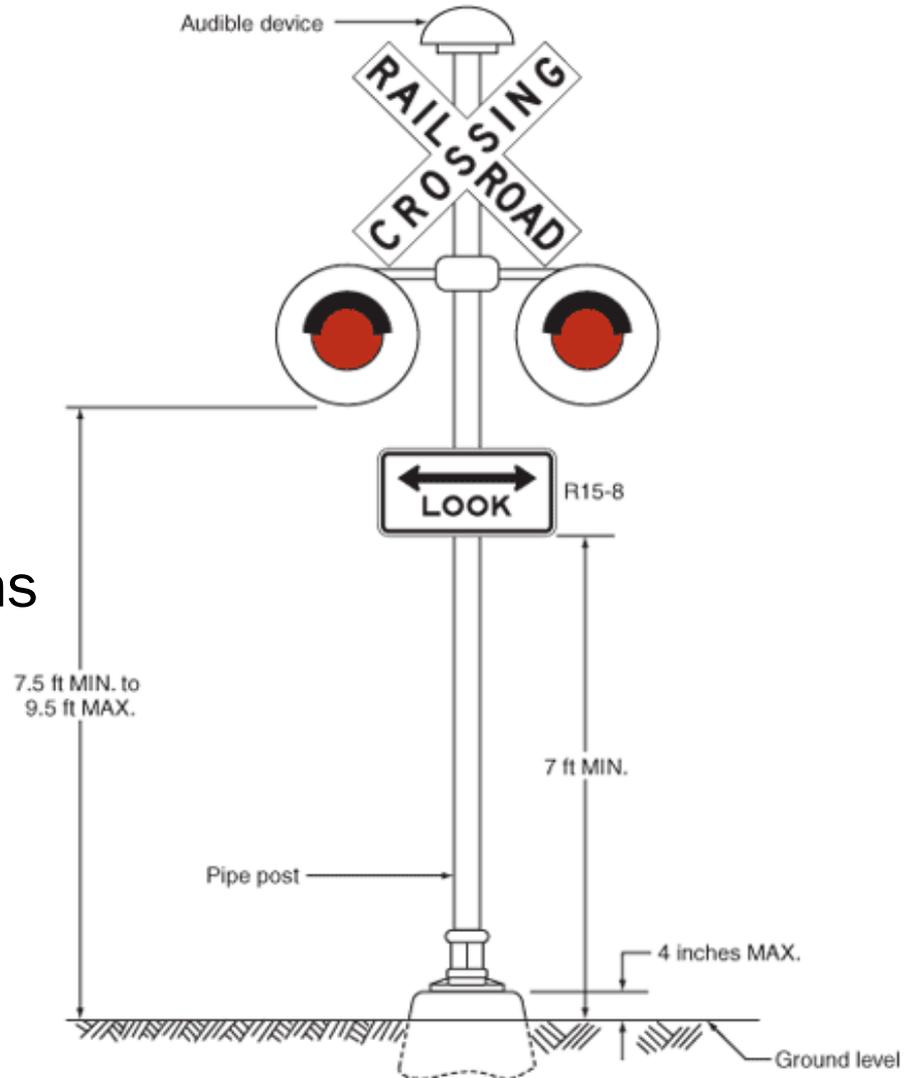
Figure 8D-1. Example of Signing and Markings for a Pathway Grade Crossing

Crossing Design

Figure 8C-4. Example of Flashing-Light Signal Assembly for Pedestrian Crossings

Active Warning

- Flashers
- Audible Devices
- Automated pedestrian gates
- Maze barriers
- Variable message signs



Crossing Design

Test Case

- Chandler/ Gilbert boundary
- Part of the Sun Circle Trail
- Low train volume, low train speeds
- Discontinuous pathway
- SRP



Crossing Design

Design Recommendations

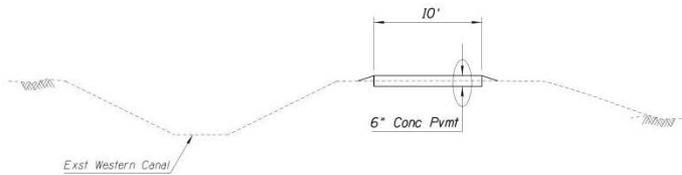
- Regulatory and Advance Warning Signage
- Pavement Marking
- Striping
- Channelization
- Flashing Lights
- Audible Device
- Clear vegetation,
 - Sight distance



Crossing Design

15% Design Plans

PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
C-01-444-E-01	2	4	



TYPICAL SECTION



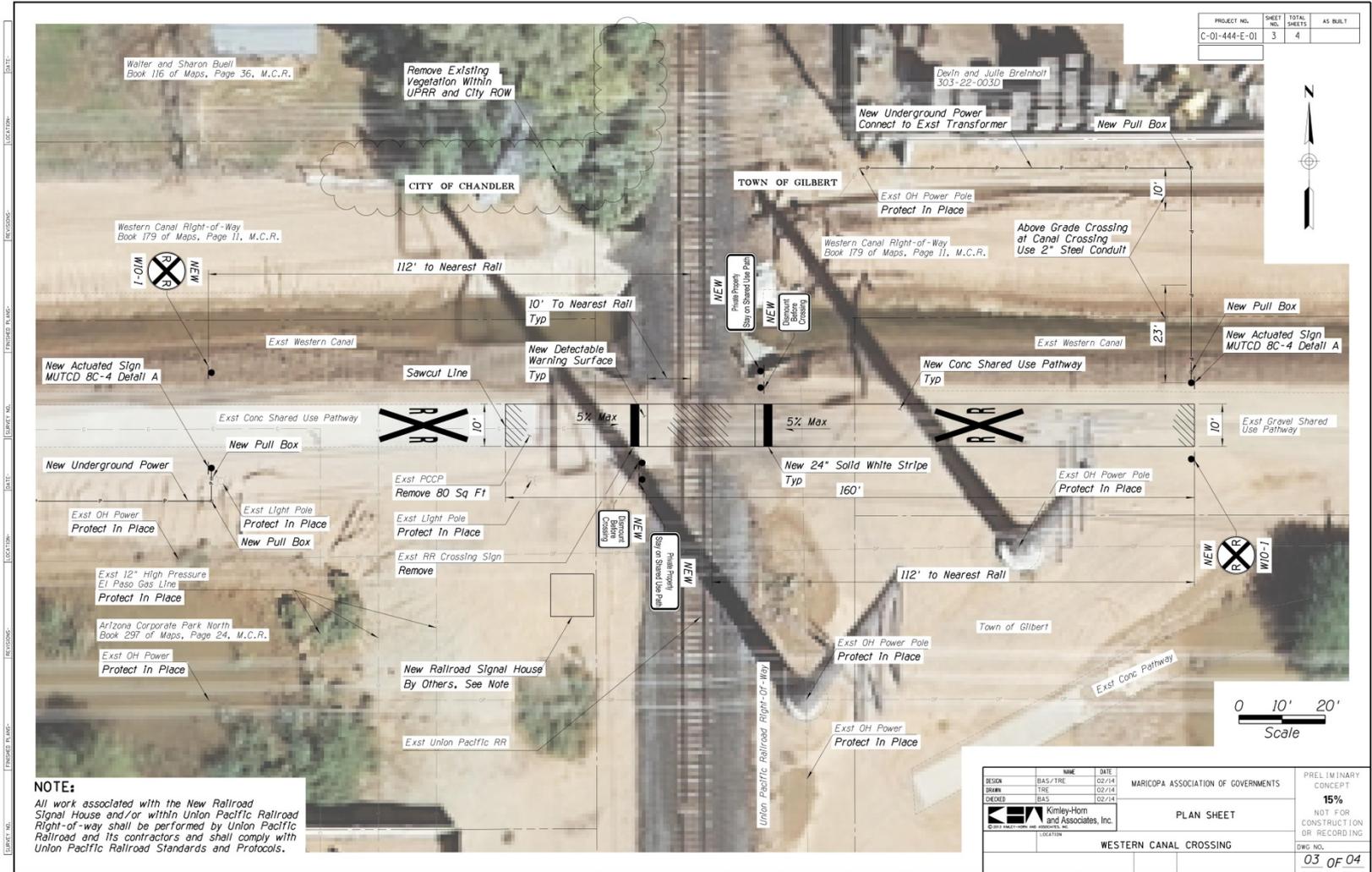
0 100' 200'
Scale

DESIGN	NAME	DATE	MARICOPA ASSOCIATION OF GOVERNMENTS	PRELIMINARY CONCEPT 15% NOT FOR CONSTRUCTION OR RECORDING	
DRAWN	BAS/TRE	02/14			OVERVIEW
CHECKED	TRE	02/14			
Kimley-Horn and Associates, Inc. 4000 N. CENTRAL AVENUE, SUITE 100 PHOENIX, AZ 85018			WESTERN CANAL CROSSING	DWG. NO. 02 OF 04	

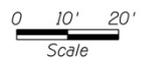
SHEET NO. PROJECT NO. LOCATION REVISIONS

Crossing Design

15% Design Plans



PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
C-01-444-E-01	3	4	



NOTE:
All work associated with the New Railroad Signal House and/or within Union Pacific Railroad Right-of-way shall be performed by Union Pacific Railroad and its contractors and shall comply with Union Pacific Railroad Standards and Protocols.

DESIGN	DATE	 KINLEY-HORN AND ASSOCIATES, INC. 1001 N. GILBERT AVENUE, SUITE 100 GILBERT, AZ 85134	MARICOPA ASSOCIATION OF GOVERNMENTS	PRELIMINARY CONCEPT 15% NOT FOR CONSTRUCTION OR RECORDING DWG. NO. 03 OF 04
DRAWN	DATE			
CHECKED	DATE			
DATE	DATE			
LOCATION			WESTERN CANAL CROSSING	

Checklist

BICYCLE AND PEDESTRIAN PATHWAY CROSSING DEVELOPMENT PROCESS CHECKLIST (PAGE 1 OF 4):

Your Name/ Agency: _____

Date: _____

Describe proposed change to Crossing: _____

STEP 1: Gather Existing Railroad Crossing Information

Crossing ID Number: _____

(This is a 7 character identification number, six numbers followed by one letter. If the crossing has a Crossing ID Number, it will be posted at the current intersection)

Is there another Crossing within ¼ mile? If so, what is the Crossing ID Number? _____

(For example, one canal may create two crossings, each with a unique Crossing ID Number and within the same corridor)

City in or near: _____

For the following information, visit the FRA website and enter the Crossing ID Number into the online query tool found here: <http://safetydata.fra.dot.gov/OfficeofSafety/PublicSite/Crossing/Crossing.aspx>

Crossing Easement Holder: *(if known)* _____

Crossing Position: ___ At-Grade | ___ RR under Roadway | ___ RR over Roadway

Crossing Type: ___ Public | ___ Private | ___ Pedestrian

Signs/Signals: ___ None | Signs: _____ | Signals: _____

Type of Warning Devices:

___ None

___ Stop Sign

___ Yield Sign

___ ENS *(Emergency Notification Sign, a blue sign with white letters providing an emergency phone number to contact and providing the crossing number)*

___ Crossbuck *(Typical railroad crossing sign in an 'X' configuration)*

___ RR Advance Warning Sign

___ Pavement Markings – Stopline

___ Pavement Marking – RR Xing Symbols

___ Gates

___ Barrier Fencing

___ Flashing Lights

___ Audible Device

___ Other

Railroad Crossing Approach Surface: ___ Asphalt | ___ Concrete | ___ Unpaved

(The approach is the area leading to the crossing, not the material directly in the crossing)

Railroad Crossing Surface:

___ Timber

___ Asphalt

___ Concrete

___ Rubber

___ Gravel

___ Other (specify): _____

Is Crossing Illuminated? _____

(Street lights within 50 feet from nearest rail)

Checklist

BICYCLE AND PEDESTRIAN PATHWAY CROSSING DEVELOPMENT PROCESS CHECKLIST (PAGE 2 OF 4):

- What type of development is within 1000 feet of Crossing?**
 - Open Space (sparsely developed, lightly populated, and/or agricultural)
 - Residential (single family or multi-family residential area)
 - Commercial (retail stores, businesses, offices, and/or personal services)
 - Industrial (manufacturing, construction, factories, and/or warehouses)
 - Institutional (schools, churches, hospitals, parks, and/or community facilities)
- How near is the next available bicycle and pedestrian Crossing?** _____
- Are any schools within 1 mile of Crossing?** _____

(provide name, location and distance from Crossing)
- List the Transit Stops within ¼ mile of Crossing:** _____
(bus stops, shuttle stops, or light rails stops – name, location, and distance)
- Railroad Information:**
Check FRA website for additional information about this Crossing –
<http://safetydata.fra.dot.gov/OfficeofSafety/PublicSite/Crossing/Crossing.aspx>
 - **Branch or Line Name:** _____
 - **Quiet Zone:** Yes | No | Unknown
 - **Type of Service:** _____
(AMTRAK, other - commuter, tourist, no passenger service)
 - **Average Train Count Per Day:** _____
 - **# Of Daily Train Movements:** _____
 - **Speed of Train at Crossing:** _____
 - **Type and Number of Tracks** *(main, spur, etc.):* _____
 - **Does any other RR operate on this track?** Yes | No | Don't know

STEP 2: Determine if Crossing is Public or Private

- Does Railroad Crossing have a Crossing ID Number?**
 - Yes – Continue to next question
 - No – this crossing is, in the view of the Railroad, not a legal Crossing. Unfortunately this project can't continue with improvements until crossing is legally recognized by the Railroad. Proceed to **STEP 5**
- Is the Crossing Public or Private?**
 - Public – Contact Arizona Corporation Commission (ACC) to discuss modifications to railroad crossing.
<http://www.cc.state.az.us/divisions/Safety/railroad.asp>
 - Private – Proceed to **STEP 3**

STEP 3: Determine Recommended Crossing Infrastructure

- Determine Recommended Crossing Elements**
Apply the Crossing information collected in STEP 1 to the At-Grade Crossing Infrastructure Flowchart found in this same document (“Bicycle and Pedestrian Pathway/Railroad Crossing Recommendations”) to determine recommended infrastructure.
(Note that the UPRR prefers Grade Separated Crossings in all occasions)
- Circle the Flowchart Recommended Treatments:** _____
Signage/Crossbuck | Pavement Markings | Channelization - Paving/Delineation | Channelization - Barrier
Flashing Lights, Audible Signal | Automatic Pedestrian Gate
- Develop Preliminary Design Plans**

Checklist

BICYCLE AND PEDESTRIAN PATHWAY CROSSING DEVELOPMENT PROCESS CHECKLIST (PAGE 3 OF 4):

STEP 4: Preliminary Cost Estimate

Costs below are preliminary ranges and depend on site conditions

_____	Crossbuck/Emergency Notification Sign (ENS) (\$2500 - \$5000)
_____	Active Warning and Surfacing (\$185,000 to \$400,000)
_____	Grade Separated Railroad Crossing (\$750,000 to \$4,000,000+) <i>(Cost varies on local site conditions and design)</i>
_____	Project Scoping (\$4,500 - \$25,000) <i>(This will not be a "0". May include: Survey, Environmental Determination, Hazardous Materials Assessment, and Railroad Preliminary Engineering Service Fees)</i>
_____	NEPA Compliance (\$5,000 - \$20,000) <i>(This will not be a "0". This is required whenever federal funds are a component of project construction. Complexity will be determined in the scoping document)</i>
_____	Design (\$20,000 - \$75,000) <i>(Depends on complexity, and includes Plans, Special Provisions, and Cost Estimate. Also includes Geotechnical Report, Drainage Report, Storm Water Pollution Plan - SWPPP - if disturbance is over 1 acre.)</i>
_____	Construction of At-Grade Crossing (\$20,000 - \$1,000,000) <i>(Greatly depends on project elements and complexity. Includes: Right-Of-Way acquisitions, SWPPP, site preparation, demolition, hazardous materials abatement, utility relocation, earthwork, pathway materials, pavement marking, pedestrian ADA ramp, pedestrian lighting, and signs)</i>
_____	Mobilization and Administration (\$12,000 - \$125,000) <i>(Contractor mobilization, traffic control, construction survey & layout, construction contingencies, construction administration)</i>
_____	Basic Annual Maintenance (\$4,000 to \$10,000)

Total Anticipated Project Cost

Your Project Budget

- Proceed?**
____ Continue to **STEP 5**

STEP 5: Identify Partners

- Contact Public Affairs Office or Public Project Managers at the agencies:**
- Railroad, UPRR: http://www.up.com/aboutup/community/community_contacts/index.htm#13
 - Railroad, BNSF: <http://www.bnsf.com/communities/contact-us/>
 - Utilities, SRP: www.srpnet.com/menu/community.aspx
 - Utilities, APS: <http://www.aps.com/en/communityandenvironment/Pages/home.aspx>
 - Maricopa County Flood Control District *(if within a river or floodway)*:
<http://www.fcd.maricopa.gov/PIO/contactUs.aspx>
 - Adjacent City, Town, or County
 - Arizona Department of Transportation
 - Arizona Corporation Commission
 - Commercial or Private Entity

Checklist

BICYCLE AND PEDESTRIAN PATHWAY CROSSING DEVELOPMENT PROCESS CHECKLIST (PAGE 4 OF 4):

STEP 6: Official Dialog

- Start official dialog with the Railroad about Crossing Improvements**
- Setup agreement with Railroad for 'Preliminary Engineering Services'**
(This agreement includes RR field review of crossing, RR determination of required crossing safety infrastructure, design review of preliminary plans, development of cost estimates)
- Involve Partners in Design Discussions**
- Negotiate terms of liability, responsibilities and financing**

STEP 7: Construction Phase

- Before construction, set up agreements for:**
 - ___ License
 - ___ Rights of Entry
 - ___ Construction and Maintenance
(Involves Railroad, Partners, and Initiating Entity)
(Railroad will expect the City to pay for maintenance of this facility)
 - ___ Execute close out agreements between all agencies that govern use of the Crossing.

Thank You.

Find this document at the MAG Bike and Pedestrian Committee website

Contact:

- Brian Sager, 480-207-2670 or brian.sager@kimley-horn.com
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