

MAG Street Committee

August 12, 2014

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

Final Report – February 2014



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Marc Pearsall, MAG**



Prepared for:
MARICOPA
ASSOCIATION of
GOVERNMENTS

Prepared by:
Kinney-Horn
and Associates, Inc.

Overview

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

Background

- Expansion of regional pathway system
- More usage on canal pathways

Summary of 2011 & 2013 8-Hour Bicycle Counts along Chandler's Western Canal

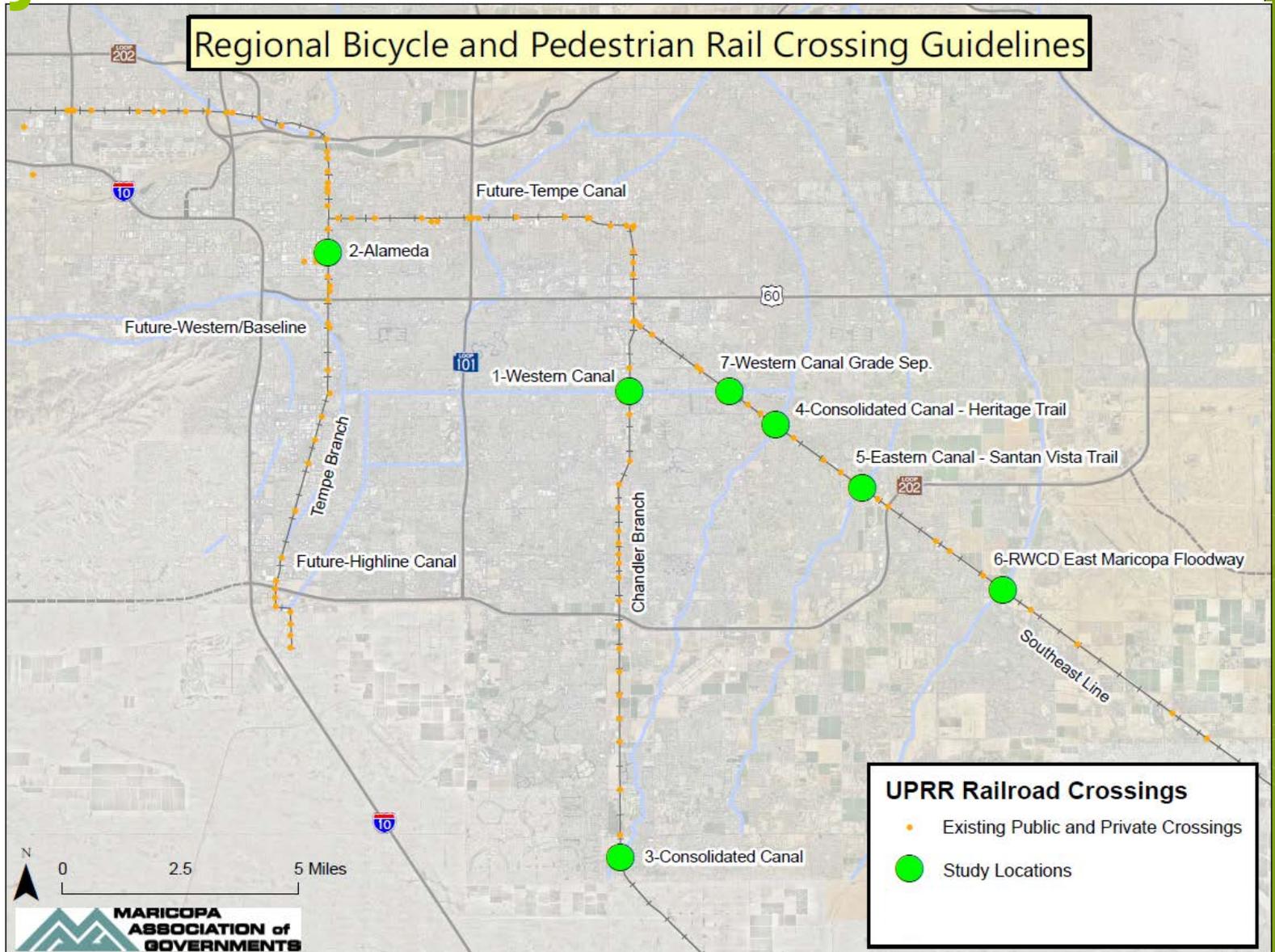
Crossing	2011	2013	Percent Change
Price Frontage Road	215	321	49%
Dobson Road	172	264	53%
Alma School Road	111	200	80%
Arizona Avenue	97	173	78%
Total	595	958	61%

Source: City of Chandler; Traffic Research & Analysis

Background

- Focused on private canal / UPRR crossings in East Valley
 - Chandler, Gilbert, Tempe
- Transferrable to other situations
- Project Team included SRP, ADOT, ACC, and Operation Lifesaver

Project Need



Alameda - Tempe



Background

- Gaps where pathways meet RR tracks
- Pathway users illegally crossing
- Safety/liability concerns



Project Need

- 64% of Train/Pedestrian collisions result in death
- Pedestrians tend to look down, may lack awareness, will create their own pathways, will take shortest route when available
- Limited visibility of oncoming trains due to proximity of walls, vegetation, etc.
- Direct routes are important
- Crossing angle is important, especially for people on bikes

Standards

- No national crossing design standards
- Design Guidelines exist:
 - MUTCD
 - AASHTO Green Book
 - 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 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 flowchart and process checklist to work with railroad
- Address crossings on a case-by-case basis

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: _____

Checklist

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**

Checklist

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):

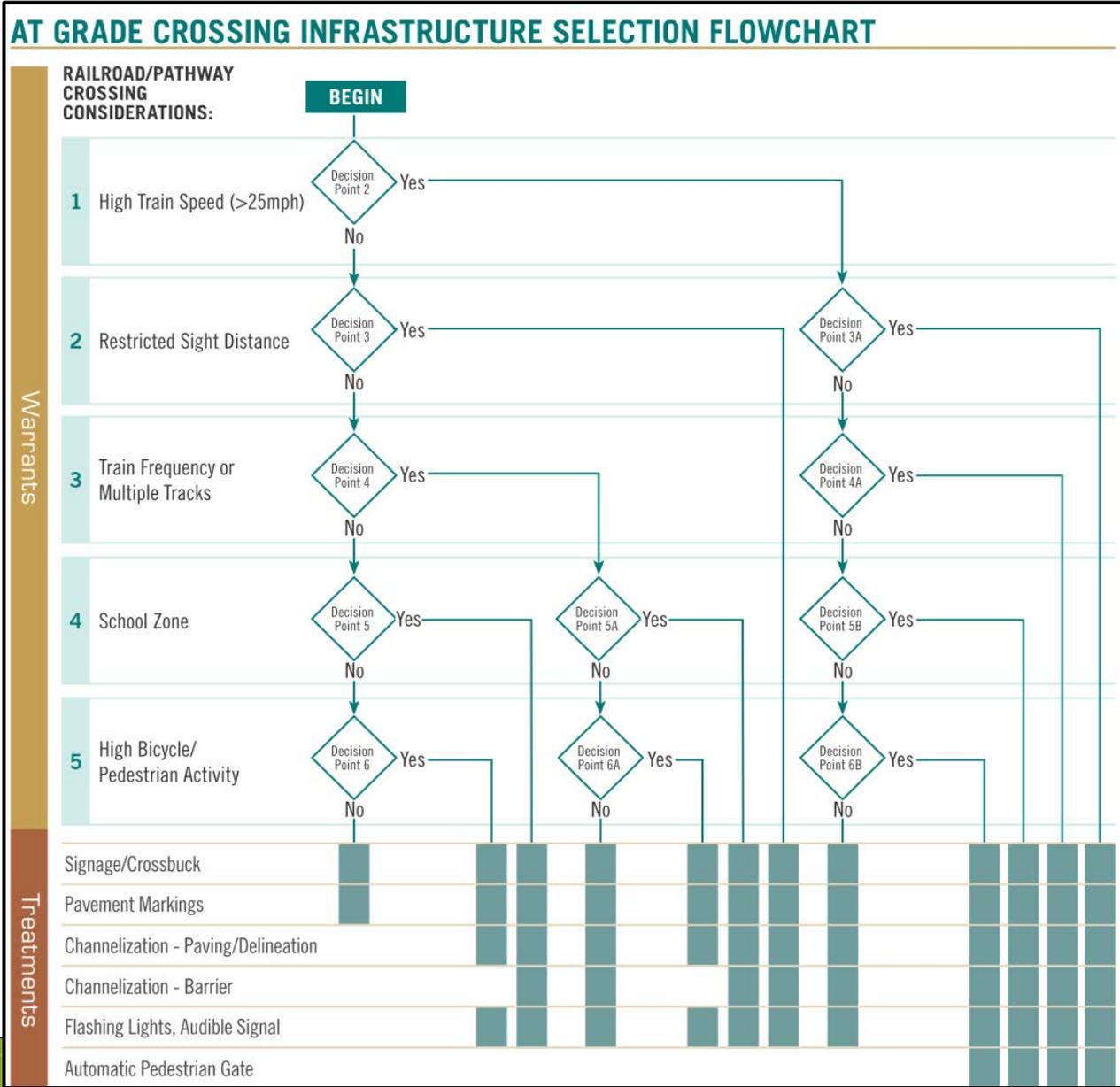
STEP 6: Official Dialog

- 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.

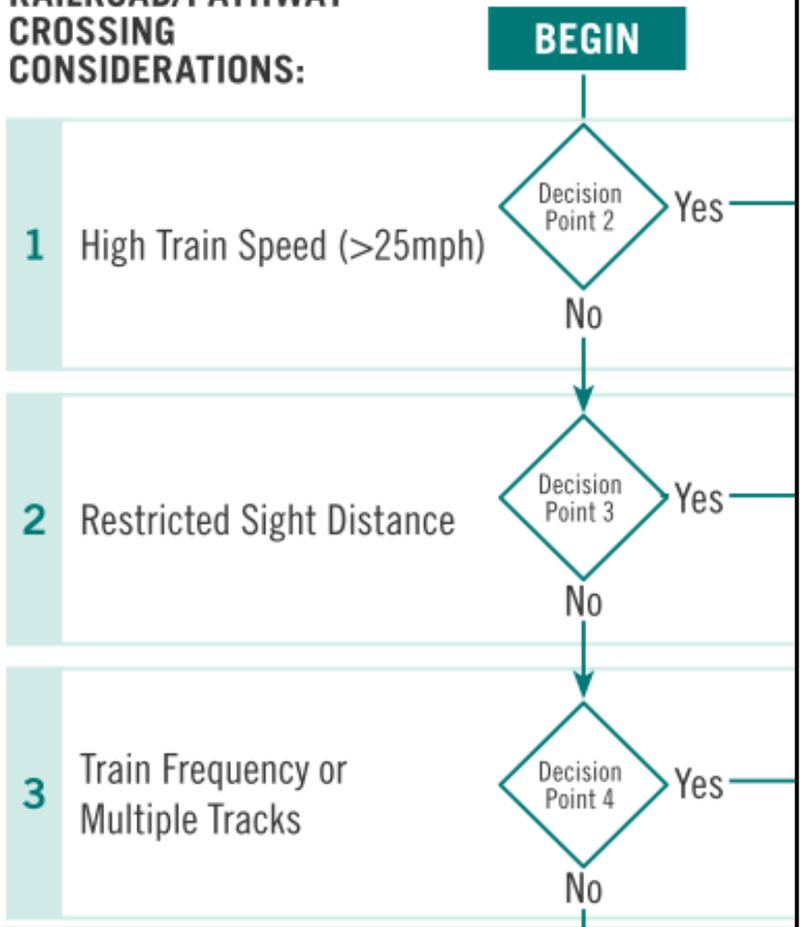
Flowchart



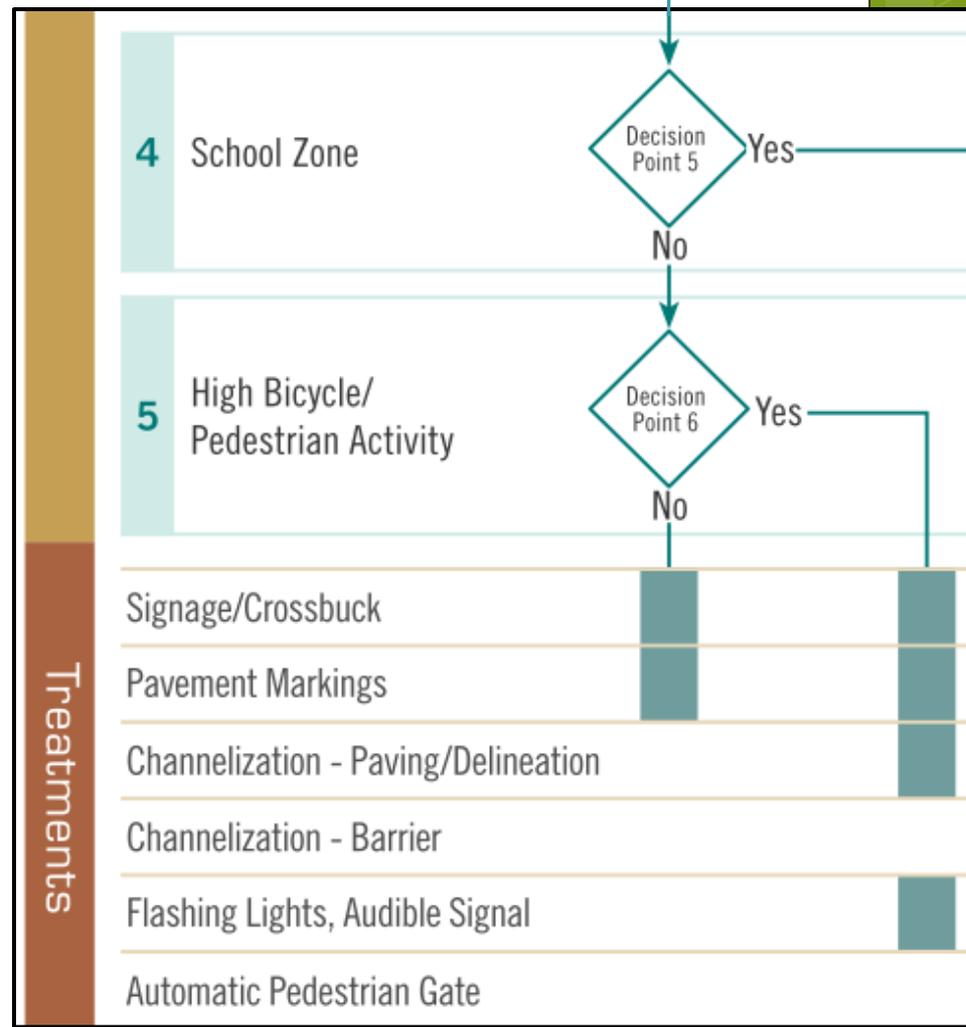
Flowchart

AT GRADE CROSSING INFRASTRUCTURE

RAILROAD/PATHWAY CROSSING CONSIDERATIONS:



Warrants



Treatments

4 School Zone

Decision Point 5 Yes

No

5 High Bicycle/
Pedestrian Activity

Decision Point 6 Yes

No

Signage/Crossbuck

Pavement Markings

Channelization - Paving/Delineation

Channelization - Barrier

Flashing Lights, Audible Signal

Automatic Pedestrian Gate

Crossing Design

Passive Warning

- Signage
- Pavement markings
- Tactile strips
- Fencing
- Gates

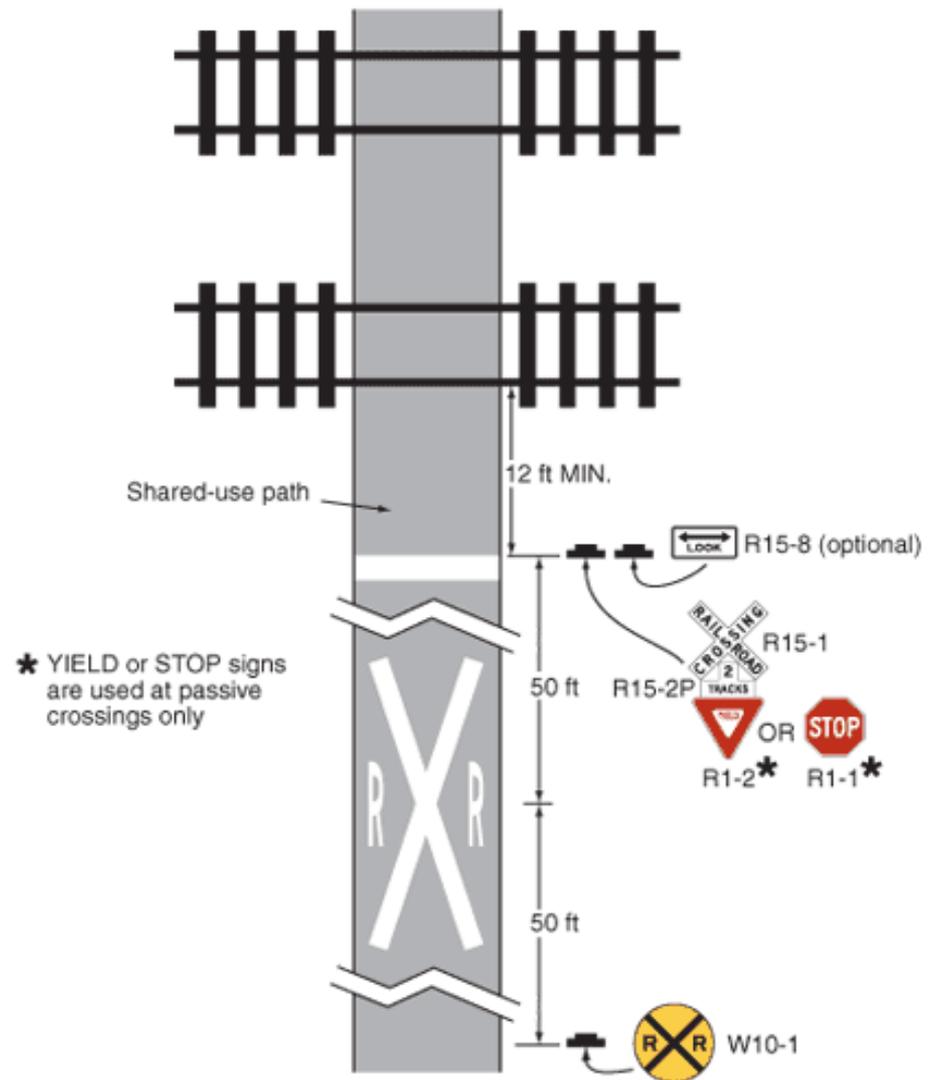


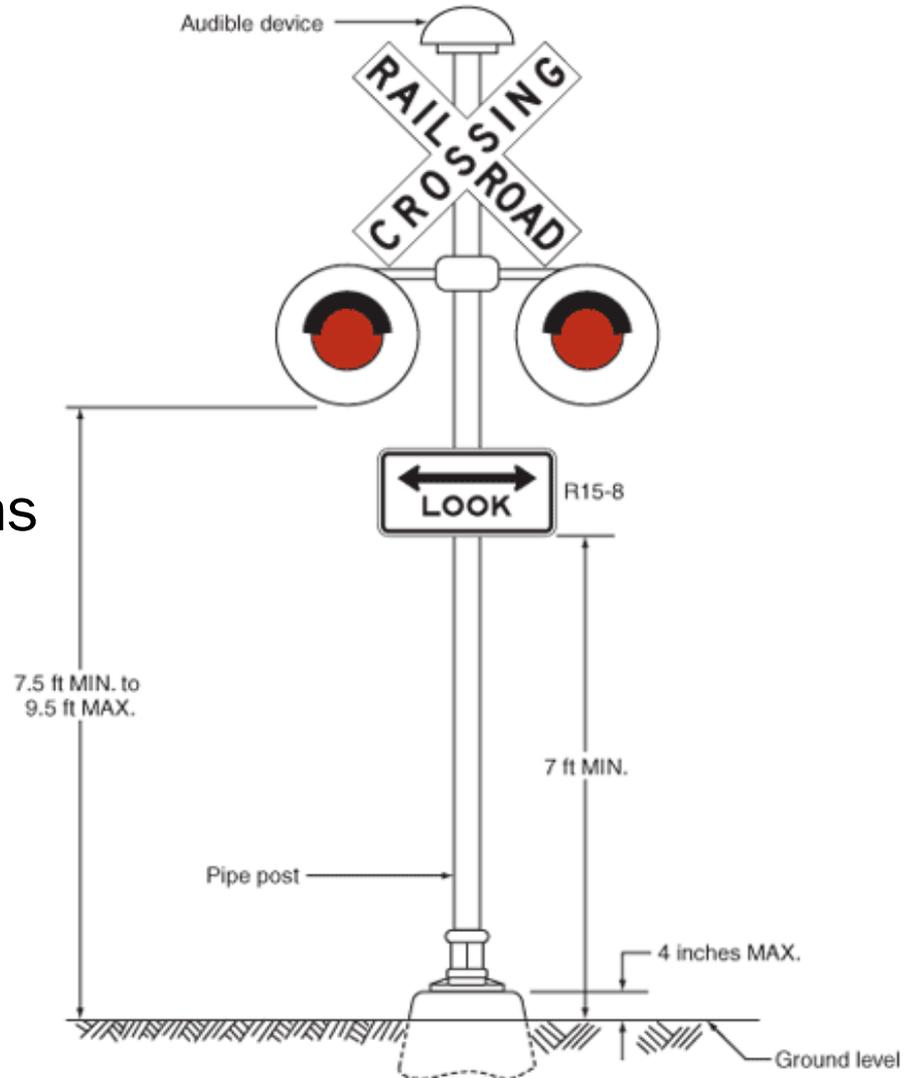
Figure 8D-1. Example of Signage and Markings for a Pathway Grade Crossing

Crossing Design

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

Active Warning

- Flashers
- Audible devices
- Automated gates
- Maze barriers
- Variable message signs



Crossing Design

- Chandler/ Gilbert boundary
- Part of the Sun Circle Trail
- Low train volume
- Low train speeds
- Discontinuous pathway
- SRP
- Line of sight distance



Crossing Design

Design Recommendations

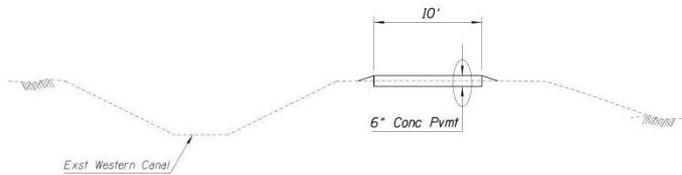
- Regulatory and Advance Warning Signage
- Pavement Marking
- Striping
- Channelization
- Flashing Lights
- Audible Device
- Clear vegetation
 - Sight distance



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

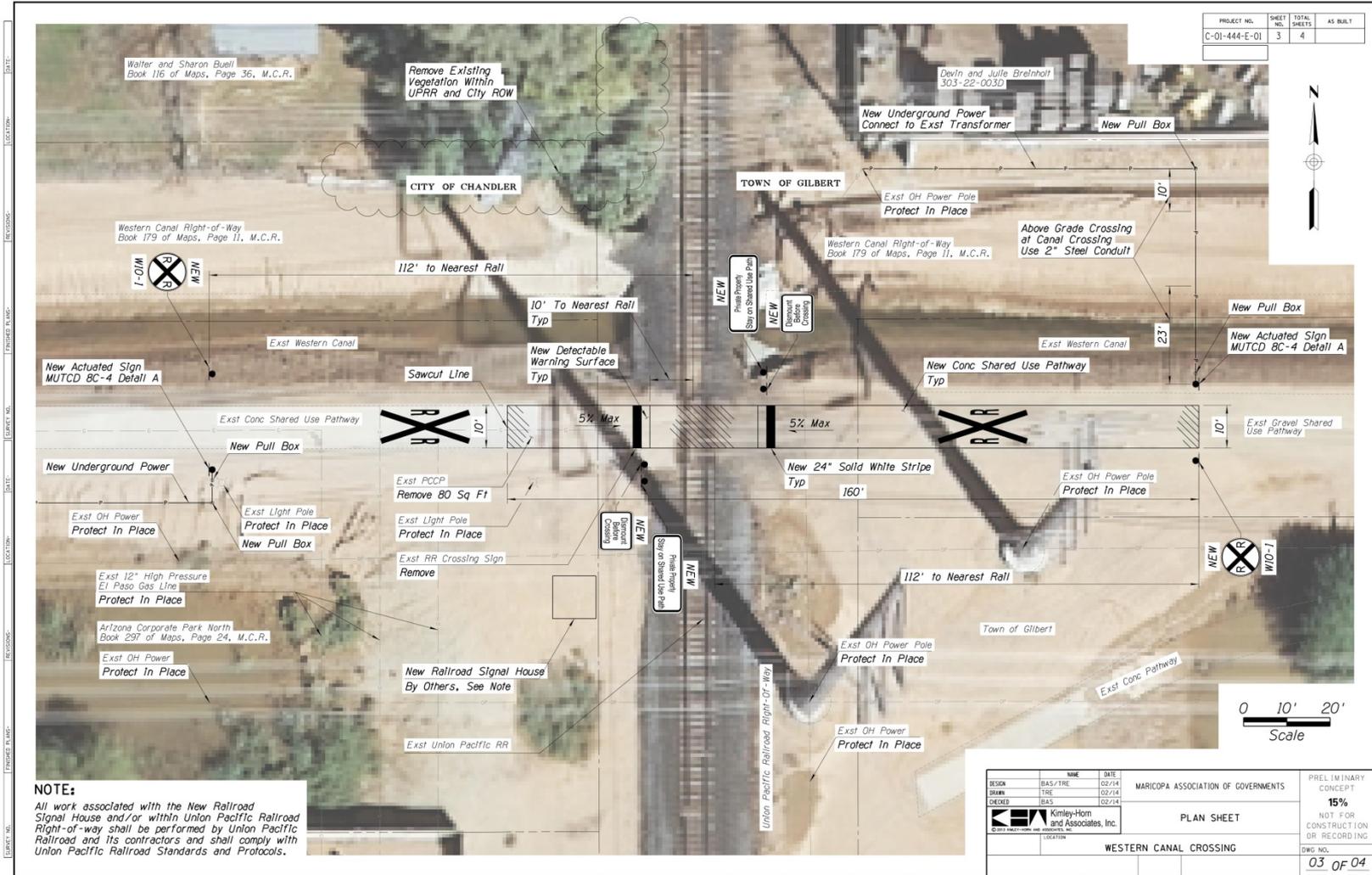
DESIGN	NAME	DATE	MARICOPA ASSOCIATION OF GOVERNMENTS	PRELIMINARY CONCEPT 15% NOT FOR CONSTRUCTION OR RECORDING	
DESIGN	BAS/TRE	02/14			OVERVIEW
DRAWN	TRE	02/14			
DESIGNED	BAS	02/14			
Kimley-Horn and Associates, Inc. <small>© 2014 Kimley-Horn and Associates, Inc.</small>			WESTERN CANAL CROSSING	DWG. NO. 02 OF 04	

SHEET NO. PROJECT NO. LOCATION REVISIONS

Crossing Design

Street
Committee

15% Design Plans



Thank You.

Find this document at the MAG Bike and Pedestrian Committee website

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