

# 2024

## Arizona Active Transportation Safety Action Plan

### OCTOBER 2024



## Acknowledgements

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- Graham County
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- Maricopa Association of Governments
- Maricopa County
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- Sierra Vista Metropolitan Planning Organization



- Southeastern Arizona Governments Organization
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- Sun Corridor Metropolitan Planning Organization
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- Town of Prescott Valley
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- Yuma Metropolitan Planning Organization
- Yuma Region Bicycle Coalition

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#### **PROGRAM MONITORING AND REPORTING REQUIREMENTS**

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# Executive Summary

## Executive Summary

The Arizona Active Transportation Safety Action Plan (ATSAP) is a statewide initiative to improve safety for active transportation users in the state of Arizona. Active transportation is defined as any non-motorized mode of transportation, typically people walking and people riding bicycles. The ATSAP applies to the State Highway System (SHS) owned or operated by the Arizona Department of Transportation (ADOT).

The ATSAP was simultaneously developed with ADOT's 2024 Strategic Highway Safety Plan (SHSP), resulting in significant coordination between the two efforts, including combined public and stakeholder engagement efforts. The ATSAP and SHSP will work together to improve roadway safety throughout Arizona. The ATSAP establishes goals and recommendations to increase safety for people walking or riding bicycles throughout the SHS.

### Short-Term Goal

**Reduce life-altering crashes involving pedestrians and bicyclists on the State Highway System by 20% by 2030.**

### Long-Term Goal

**Eliminate all life-altering crashes involving pedestrians and bicyclists on the State Highway System.**

## Policy Recommendations

Building on past planning efforts, the ATSAP developed policy recommendations to improve safety for people walking or riding bicycles. The policy recommendations include:

- Planning to Programming (P2P) Safety Prioritization
- Pedestrian-Friendly and Bicyclist-Friendly Interchanges
- Updates to the ADOT Roadway Design Guidelines
- Signalize Channelized Right-Turn Lanes
- Legislative Recommendations

## Priority Locations

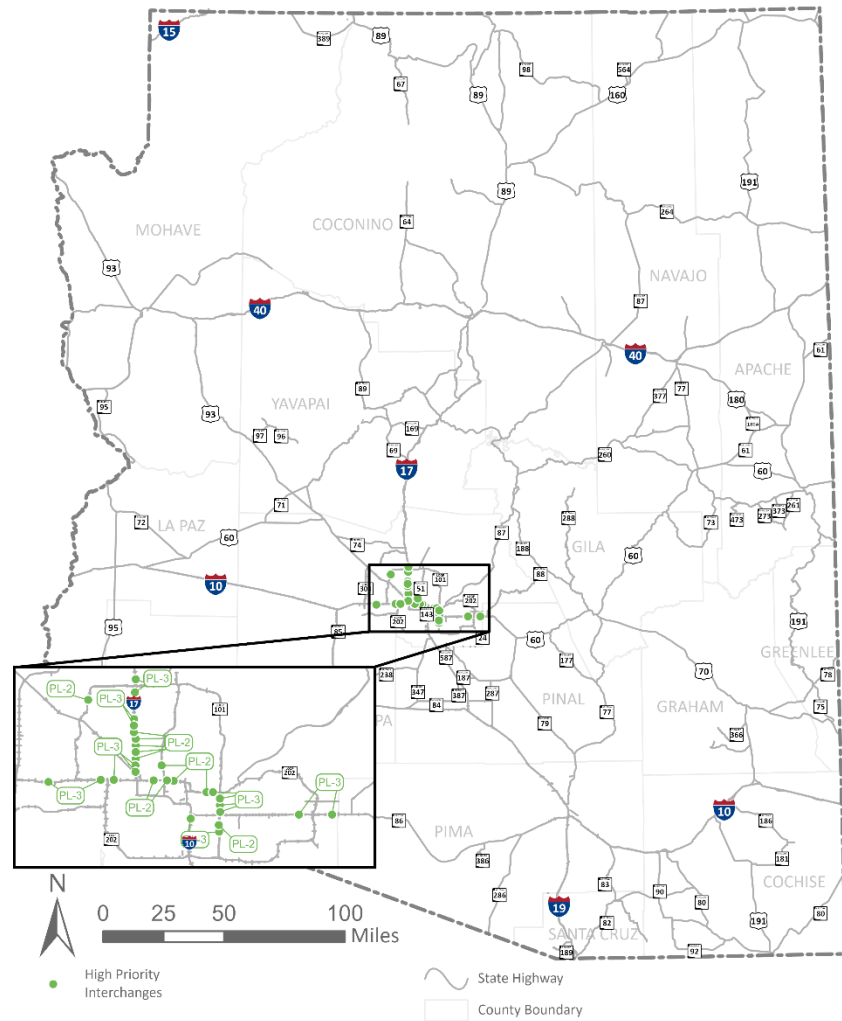
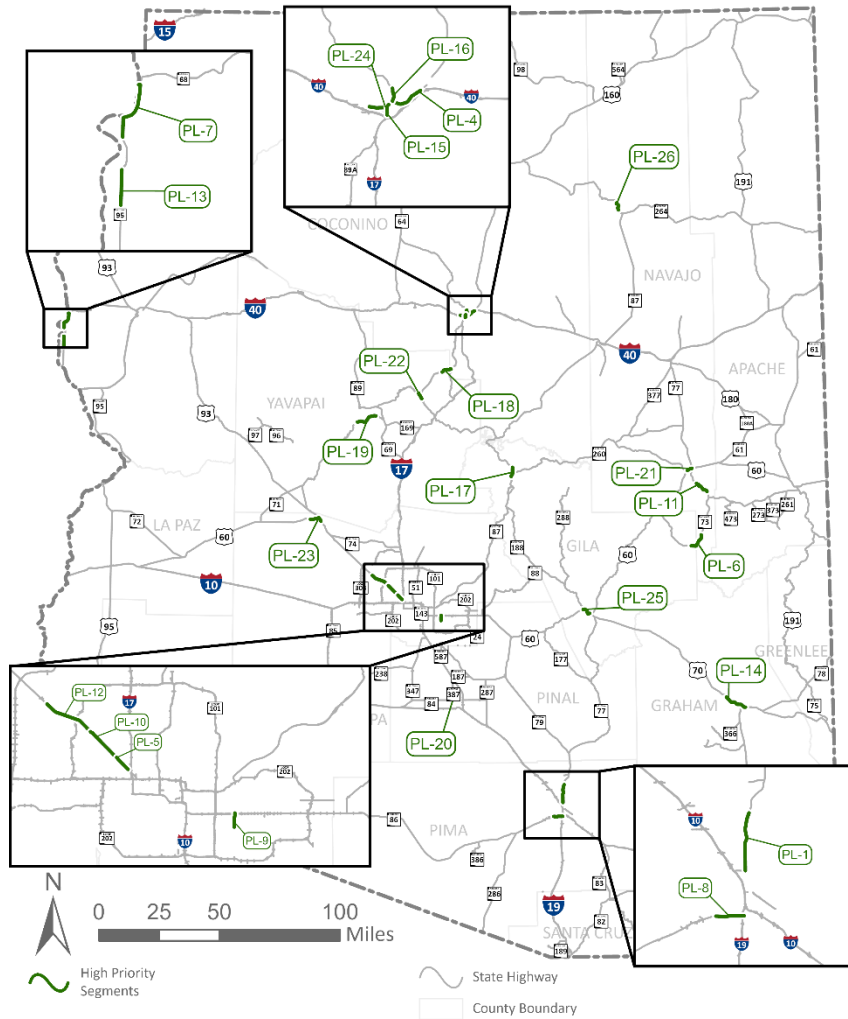
Through crash data analysis and public and stakeholder engagement, the ATSAP identifies 26 Priority Locations (PL) on Arizona's SHS. The PLs are organized from most fatal/serious injury crashes to least. PL 1 through PL 15 are high-crash locations whereas PL 16 through PL 26 are high-risk locations with lower overall number of crashes but high potential for future crashes. The ATSAP provides recommended countermeasures with preliminary planning-level cost estimates for each PL. The preliminary planning-level cost estimates are subject to change due to inflation and refinements that may be identified during final design. An indirect cost multiplier of 2.20 has been applied to the unit costs to account for indirect costs such as utility relocations and traffic control. Countermeasures were developed following a review of existing safety efforts, the Crash Modification Factors (CMF) Clearinghouse, and discussion with stakeholders. **Table ES-1** lists each PL and the preliminary planning-level cost estimate of the recommended countermeasures for each location. **Figure ES-1** shows all the PL locations throughout the State of Arizona.



Table ES-1. Priority Locations Summary

| Priority Location | County   | Route Number   | Route Name                    | Mile Post Start | Mile Post End | Corridor Length | Countermeasure Planning-Level Cost Estimate |
|-------------------|----------|--|-------------------------------|-----------------|---------------|-----------------|---|
| PL-1              | Pima     | SR-77  | Oracle Rd                     | 69.5            | 77            | 7.5             | \$4,657,000                                 |
| PL-2              | Maricopa | Phoenix Area SPUI Interchanges (I-10: 7th Street; I-17: Camelback Road, Bethany Home Road, Glendale Avenue, Northern Avenue, Dunlap Avenue; SR-51: Indian School Road; SR-101: Bell Road, Guadalupe Road; SR-202: 24th Street, 32nd Street, Scottsdale Road)   |                               |                 |               |                 | \$16,368,000                                |
| PL-3              | Maricopa | Phoenix Area Diamond Interchanges (I-10: Dysart Road, 67th Avenue, 51st Avenue, Baseline Road; I-17: Thomas Road, Indian School Road, Peoria Avenue, Union Hills Drive, Cactus Road, Deer Valley Drive; US-60: Power Road, Signal Butte Road; SR-101: Elliot Road, Broadway Road, Southern Avenue, University Drive; SR-202: McClintock Drive) |                               |                 |               |                 | \$18,169,000                                |
| PL-4              | Coconino | B-40   | Route 66                      | 195.5           | 199.91        | 4.41            | \$3,884,000                                 |
| PL-5              | Maricopa | US-60  | Grand Ave                     | 157.5           | 160           | 2.5             | \$4,732,000                                 |
| PL-6              | Navajo   | SR-73  | Chief Ave                     | 333             | 340.5         | 7.5             | \$1,342,000                                 |
| PL-7              | Mohave   | SR-95  | Highway 95                    | 243             | 250           | 7               | \$1,040,000                                 |
| PL-8              | Pima     | SR-86  | Ajo Way                       | 168             | 171.63        | 3.63            | \$1,513,000                                 |
| PL-9              | Maricopa | SR-87  | Country Club Dr / Arizona Ave | 170.2           | 172.57        | 2.37            | \$1,293,000                                 |
| PL-10             | Maricopa | US-60  | Grand Ave                     | 152             | 157.5         | 5.5             | \$11,612,000                                |
| PL-11             | Navajo   | SR-260   | Highway 260                   | 349             | 355           | 6               | \$4,002,000                                 |
| PL-12             | Maricopa | US-60  | Grand Ave                     | 144             | 152           | 8               | \$3,669,000                                 |
| PL-13             | Mohave   | SR-95  | Highway 95                    | 235             | 239           | 4               | \$8,349,000                                 |
| PL-14             | Graham   | US-70  | Thatcher Blvd                 | 332.5           | 342           | 9.5             | \$2,288,000                                 |
| PL-15             | Coconino | SR-89A   | Milton Rd                     | 401.95          | 403.18        | 1.23            | \$965,000                                   |
| PL-16             | Coconino | US-180   | Humphreys St / Fort Valley Rd | 215.44          | 217           | 1.56            | \$1,038,000                                 |
| PL-17             | Gila     | SR-87  | Beeline Highway               | 251             | 255           | 4               | \$850,000                                   |
| PL-18             | Yavapai  | SR-89A   | Highway 89A                   | 369.5           | 374           | 4.5             | \$578,000                                   |
| PL-19             | Yavapai  | SR-69  | Highway 69                    | 287             | 296           | 9               | \$10,005,000                                |
| PL-20             | Pinal    | SR-387   | Pinal Ave                     | 0               | 2.5           | 2.5             | \$2,224,000                                 |
| PL-21             | Navajo   | US-60  | Deuce of Clubs                | 340             | 342           | 2               | \$479,000                                   |
| PL-22             | Yavapai  | SR-260   | Highway 260                   | 206.48          | 209           | 2.52            | \$1,669,000                                 |
| PL-23             | Maricopa | US-60  | Wickenburg Way                | 107             | 112.5         | 5.5             | \$457,000                                   |
| PL-24             | Coconino | B-40   | Route 66                      | 193.25          | 195.5         | 2.25            | \$179,000                                   |
| PL-25             | Gila     | US-60  | Broad St / Ash St             | 247.5           | 251.5         | 4               | \$670,000                                   |
| PL-26             | Navajo   | SR-264   | Highway 264                   | 378             | 381.5         | 3.5             | \$1,070,000                                 |
|                   |          |  |                               |                 |               | <b>Total</b>    | <b>\$103,102,000</b>                        |

Figure ES-1. Map of ATSAP Priority Locations





# 1

## Introduction



## Introduction

The Active Transportation Safety Action Plan (ATSAP) is a statewide initiative to improve safety for active transportation users in the state of Arizona. Active transportation is defined as any non-motorized mode of transportation, such as people walking or riding bicycles. The plan evaluates historical crashes involving pedestrians and bicyclists to develop strategies and countermeasures to improve safety in Arizona. The ATSAP applies to the State Highway System (SHS) owned or operated by the Arizona Department of Transportation (ADOT).

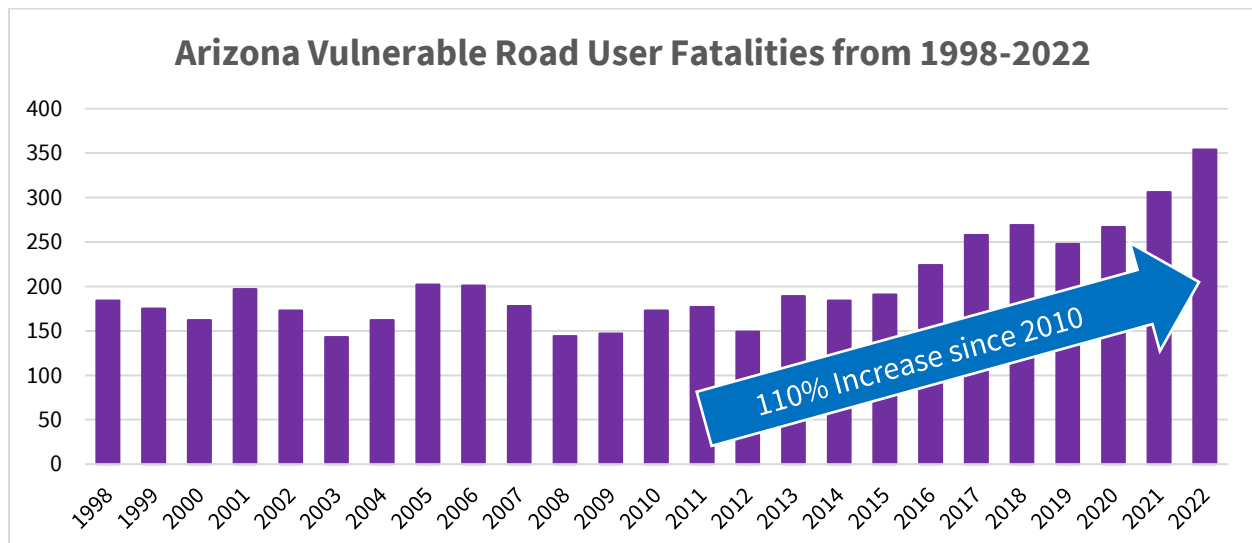
## Background and Purpose

While Arizona's population has increased 12% since 2013, annual traffic fatalities increased 55%, and active transportation fatalities increased 90%. ADOT is taking action to reverse this trend of increased active transportation fatalities by developing a data-driven, multi-year safety plan that establishes statewide goals and strategies for improving safety. The ATSAP recommends location-specific projects for high-crash and high-risk locations throughout Arizona to achieve the long-term goal of eliminating all life-altering crashes involving pedestrians and bicyclists on the SHS.

## Statewide Safety Trends

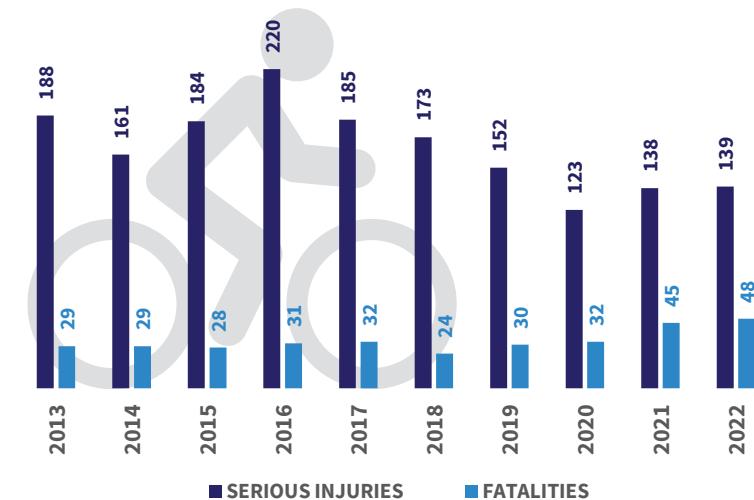
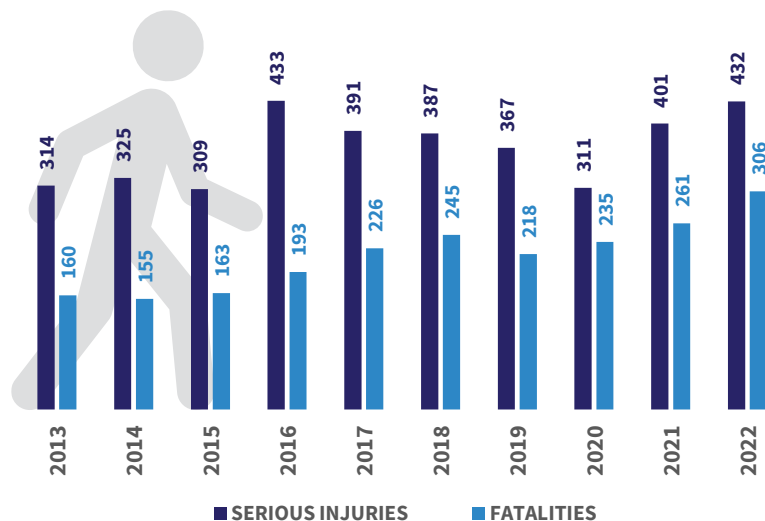
**Figure 1** shows the number of fatal crashes on all roads (state and local) in Arizona involving vulnerable road users (VRU), which include pedestrians and bicyclists, from 1998 through 2022, with a drastic increase in VRU fatalities since 2010. Since 1998, on average, approximately 200 VRUs have died in crashes per year. Preliminary 2023 crash data shows a slight reduction in fatalities and serious injuries for pedestrians and bicyclists compared to 2022 crash data.

*Figure 1. Vulnerable Road User Fatalities by Year*

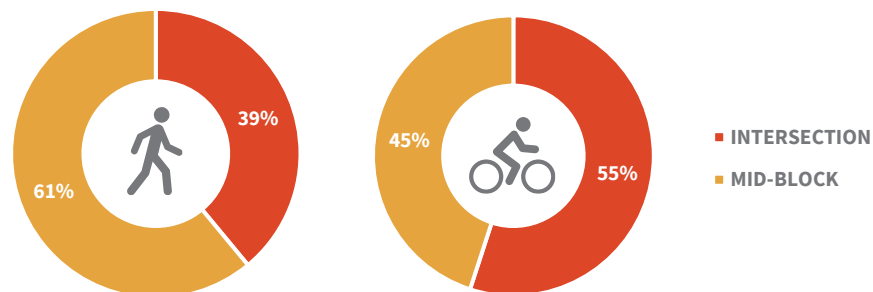


**Figure 2** illustrates fatal and serious injury crashes from 2013 through 2022 for pedestrians and bicyclists on all roads (state and local). It shows if the crashes took place at an intersection or mid-block, the action of the pedestrian and bicyclist at the time of the crash, and lighting conditions at the time of the crash. Pedestrian crashes occurred more often at night and in mid-block locations while bicyclist crashes happened more often during the day and at intersections.

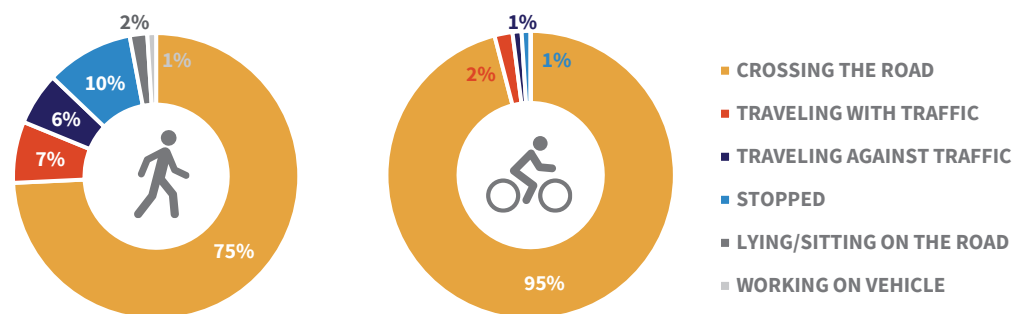
Figure 2. Vulnerable Road User Fatal and Serious Injury Crashes



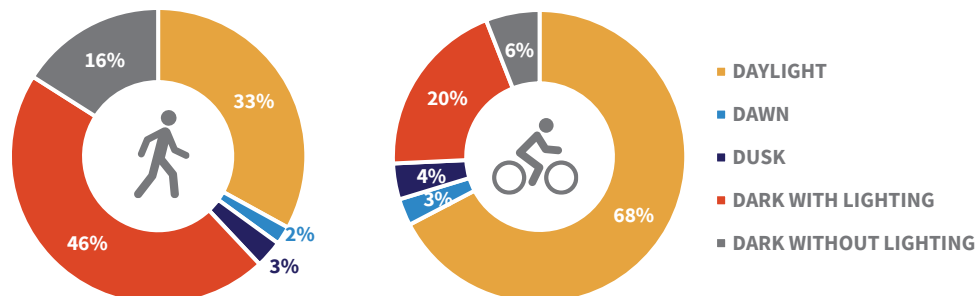
WHERE:



WHILE:



WHEN:



## Goals and Objectives

The ATSAP establishes goals and objectives to increase safety for people walking or riding bicycles throughout the SHS.

### Short-Term Goal

**Reduce life-altering crashes involving pedestrians and bicyclists on the State Highway System by 20% by 2030.**

### Long-Term Goal

**Eliminate all life-altering crashes involving pedestrians and bicyclists on the State Highway System.**

## Objectives

### Development Objectives

- Equitably obtain community input on our shared responsibility for pedestrian/bicyclist safety.
- Integrate the Safe System Approach into the crash analysis and development of recommendations.
- Focus on high-risk locations as well as high-crash locations.
- Recognize differences in rural vs. urban pedestrian/bicyclist safety needs.
- Recommend a variety of improvements that focus on safe road users, safe vehicles, safe speeds, safe roads, and post-crash care strategies.

### Implementation Objectives

- Increase physical separation between vehicles and pedestrians/bicyclists.
- Increase separation in time at conflict areas between vehicles and pedestrians/bicyclists.
- Increase attentiveness and awareness for drivers as well as pedestrians/bicyclists.
- Reduce vehicle speeds in pedestrian/bicyclist activity areas.
- Reduce impact forces on pedestrians/bicyclists.





# 2

## Safe System Approach

## Safe System Approach

The ATSAP adopts the U.S. Department of Transportation (USDOT) Safe System Approach (SSA) framework to inform analysis of existing conditions and development of projects and strategies to improve active transportation safety in Arizona. The SSA was considered in all elements of Arizona's ATSAP. The SSA requires all elements of the transportation system shown in the graphic to the right to work together to create a safer transportation system. It is a holistic and comprehensive approach that provides a guiding framework to make places safer for all people.

The SSA aims to minimize the possibility of injuries or fatalities to road users through a holistic view of the roadway system. This is accomplished through implementing adequate roadway design, considering likeliness of human error, and accommodating human injury tolerance by considering impact energy that the body can tolerate. The SSA identifies a key component of roadway safety to be quality data. Data-driven approaches allow states, municipalities, tribes, and other governmental organizations to prioritize areas of high risk.



Source: Federal Highway Administration (FHWA)

## Safe System Principles






The SSA incorporates the following principles:

- **DEATH/SERIOUS INJURY IS UNACCEPTABLE.** The SSA prioritizes the elimination of crashes that result in death and serious injuries.
- **HUMANS MAKE MISTAKES.** People will inevitably make mistakes and decisions that can lead to crashes, but transportation infrastructure can be designed and operated to accommodate certain human mistakes and avoid fatal or serious injuries when crashes do occur.
- **HUMANS ARE VULNERABLE.** Human bodies have a limited tolerance to crash forces before death or serious injuries occur. It is crucial to design and operate a transportation network that is human-centric and accommodates physical vulnerabilities.
- **RESPONSIBILITY IS SHARED.** All stakeholders are vital to implementing the SSA and reducing fatalities and serious injuries on the roadway network.
- **SAFETY IS PROACTIVE.** Proactive strategies should be used to identify and address safety issues in advance of crashes occurring.
- **REDUNDANCY IS CRUCIAL.** Reducing risk requires all aspects of the transportation network to be strengthened, if one aspect fails, other parts can protect people.



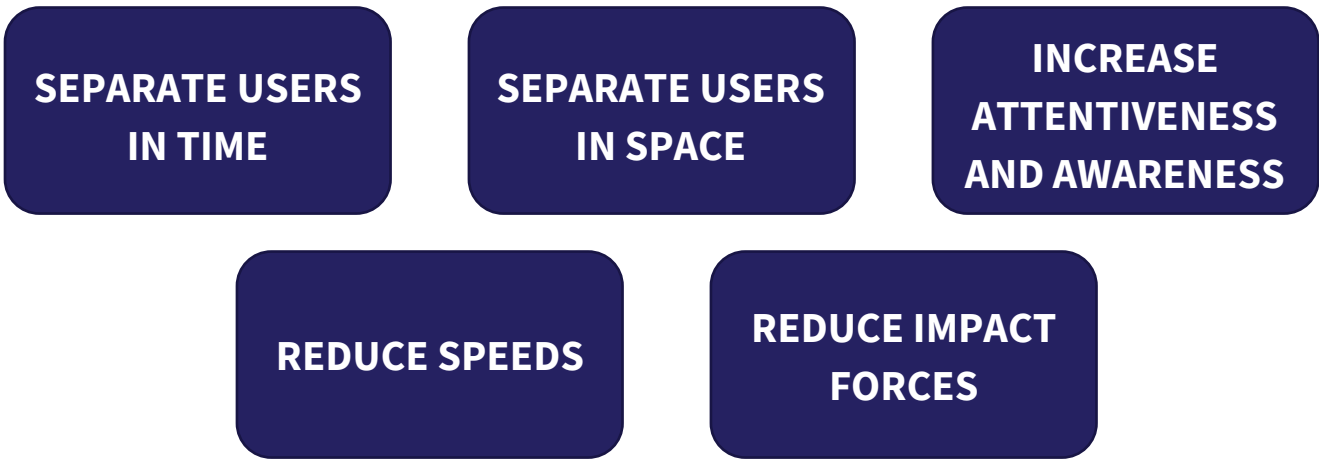
Safe System Elements

The Safe System elements are complementary objectives to achieve the Safe System principles and to work towards the SSA’s vision. The Safe System elements include:

|   |                        |  |
|---|------------------------|--|
|  | <b>SAFE ROAD USERS</b> | Encourage safe driving, walking, and cycling behavior by those who are using the roadway network and create conditions that prioritize their ability to reach their destination unharmed.                                  |
|  | <b>SAFE VEHICLES</b>   | Promote the availability of vehicles with safety features to aid in crash prevention and minimize the impact when a crash occurs.  |
|  | <b>SAFE SPEEDS</b>     | Promote safe travel speed on all roadway environments by implementing context-appropriate roadway design, speed-limit setting, enforcement, and education.   |
|  | <b>SAFE ROADS</b>      | Design roadway infrastructure to mitigate human mistakes, account for injury tolerances, encourage safe behavior, and facilitate safe travel by VRUs.  |
|  | <b>POST-CRASH CARE</b> | Enhance survivability of crashes through fast access to emergency medical services, creating a safe work environment for first responders, and preventing secondary crashes through traffic incident management practices. |

The ATSAP will implement the SSA by utilizing the components found in **Figure 3** to work together to reduce risk of serious injuries and fatalities.

Figure 3. Safe System Approach Components







# 3

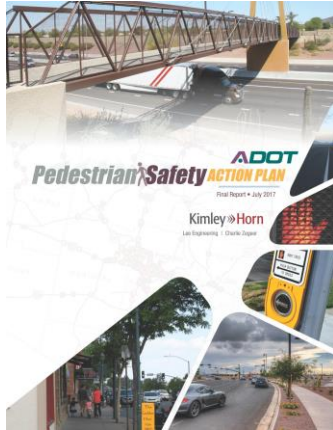
## Previous and Ongoing Plans Review



## Previous and Ongoing Plans Review

A review of previous and ongoing planning efforts in the State of Arizona provides a baseline understanding of relevant safety performance and goals.

### ADOT Pedestrian Safety Action Plan (2017)



Completed in 2017, the ADOT Pedestrian Safety Action Plan (PSAP) is a strategic action plan aimed to reduce the number of fatal and serious injury pedestrian-vehicle crashes on State highways.

#### Goals:

- Reduce the frequency of all pedestrian-involved crashes (including fatal, injury, and non-injury) on the SHS by 25% by the year 2025.
- Reduce the frequency of pedestrian fatal and incapacitating injury crashes on the SHS by 25% by the year 2025.

#### Objectives:

- Reduce crashes at high-crash locations.
  - Prevent crashes at high-risk crash locations as identified through the risk assessment process.
  - Reduce pedestrian crossing roadway crash types (vehicle turning and vehicle not turning).
  - Reduce the number of pedestrian-involved crashes in which the pedestrian was 20–34 years of age.
  - Reduce the number of crashes in dark-not lighted conditions.
  - Reduce pedestrian crashes on controlled access or interstate facilities.

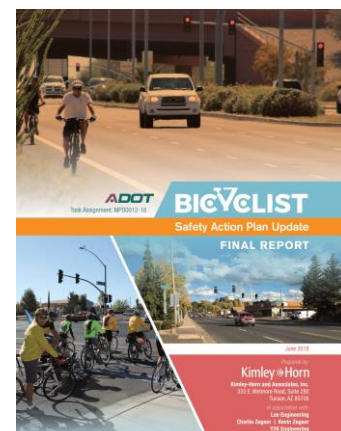
The PSAP assessed pedestrian crash data and identified high-crash intersections, high-crash segments, and high-risk segments. **Appendix A** shows the activities since completion of the plan, along with the change in number of crashes for the identified high-crash intersections, high-crash segments, and high-risk segments. There has been limited implementation of the recommended strategies in the PSAP. The change in crashes could be due to small data sets and the random nature of pedestrian-involved crashes on the SHS.

### ADOT Bicyclist Safety Action Plan (2018)

The 2018 ADOT Bicycle Safety Action Plan (BSAP) aims to reduce the number of serious injury and fatal bicyclist-motor vehicle crashes on State highways. The action plan followed a data-driven approach that evaluated strategies, progress, and effectiveness from prior studies, identified high-priority bicyclist-involved crash locations, and developed countermeasures to reduce the number of serious injury and fatal bicyclist crashes. The goal in **Table 1** established the bicycle safety goal for ADOT through 2022.

#### Objectives:

- Evaluate the strategies, progress, and effectiveness of the 2012 BSAP to reduce the frequency of bicyclist crashes.



- Collect and analyze bicyclist crash data on the SHS for the most recent five years available (2012- 2016). Identify crash types and review contributing factors to the crashes.
- Identify high-priority bicyclist crash locations.
- Identify specific steps, actions, and potential countermeasures that, upon implementation and over time, will measurably reduce bicyclist crashes, injuries, and fatalities on the SHS.

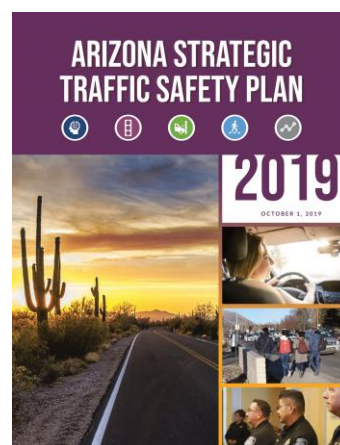
Table 1. 2018 BSAP Goal

|  | 2012-2016 Crashes | 2018 BSAP Goal                  |                       |
|--|-------------------|---------------------------------|-----------------------|
| <b>Annual Average Bicyclist Crashes (State Highway System, fatalities, and injuries)</b> | 156 per year      | Fewer than 125 crashes per year | 20% reduction by 2022 |

The BSAP assessed pedestrian crash data and identified high-crash intersections, high-crash segments, and high-risk segments. **Appendix B** shows the activities since the completion of the plan, along with the change in number of crashes for the identified high-crash intersections, high-crash segments, and high-risk segments. There has been limited implementation of the recommended strategies in the BSAP. The change in crashes could be due to small data sets and the random nature of bicyclist-involved crashes on the SHS.

## Arizona Strategic Traffic Safety Plan (2019)

The ADOT Strategic Traffic Safety Plan (STSP) was developed in 2019. The STSP is a statewide coordinated policy-based framework aimed to reduce serious injuries and fatalities on public roads. The plan established a vision and goals using the following emphasis areas as a basis for its analysis: Highway Safety (behavior-related), Intersections, Lane Departures, Pedestrians and Safety-Related Data. The identified emphasis areas help with understanding safety trends in Arizona.



### Vision

*Toward Zero Deaths by Reducing Crashes for a Safer Arizona*

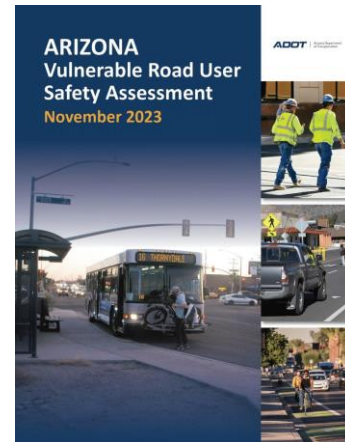
### Goals:

- Use enforcement, education, and awareness to create a safety culture in which Arizona road users are always focused and alert, and to minimize behaviors such as:
  - Speeding/Reckless Driving
  - Impaired Driving
  - No restraint used, including seat belts and child safety seats
  - Distracted Driving
- Use the 4 E's – Engineering, Enforcement, Education, and EMS/ Emergency Response to reduce the frequency and severity of intersection-related crashes across Arizona.
- Create a safer roadway network by reducing the risk and severity of lane-departure crashes by employing traffic safety improvements and initiatives geared toward keeping vehicles on the road, influencing driver focus on the road, and enabling advanced vehicle technologies.

- Create a safer Arizona for all pedestrians through targeted engineering, enforcement, education, and EMS/emergency response (4-E's). Emphasize accountability for all road users including motorists and pedestrians. Work in collaboration with the State of Arizona Highway Safety Plan, prepared by the Governor's Office of Highway Safety (GOHS).
- Improve the quantity, quality, timeliness, and analysis of safety-related data, including expanding the use of standardized electronic crash data collection methods.
  - By 2024, increase electronic reporting of crash data to 90% of all reports submitted to ADOT.
  - By 2024, assist a majority of the 22 Tribal Communities with submitting crash data to ADOT in electronic format.
  - Implement Highway Safety Manual predictive safety analysis statewide by 2024.

## Arizona Vulnerable Road User Safety Assessment (2023)

ADOT's Vulnerable Road User Safety Assessment (VRUSA) is an assessment required by FHWA for inclusion in the Strategic Highway Safety Plan (SHSP) that focuses on VRUs in Arizona. The term VRU refers to pedestrians, bicyclists, and others walking on the road such as construction workers and first responders. The study evaluated historical safety trends for crashes involving VRUs, VRU activity, equity, and stakeholder consultation to develop strategies and programs to improve the safety of VRUs in Arizona. The VRUSA established the following goals for Arizona.

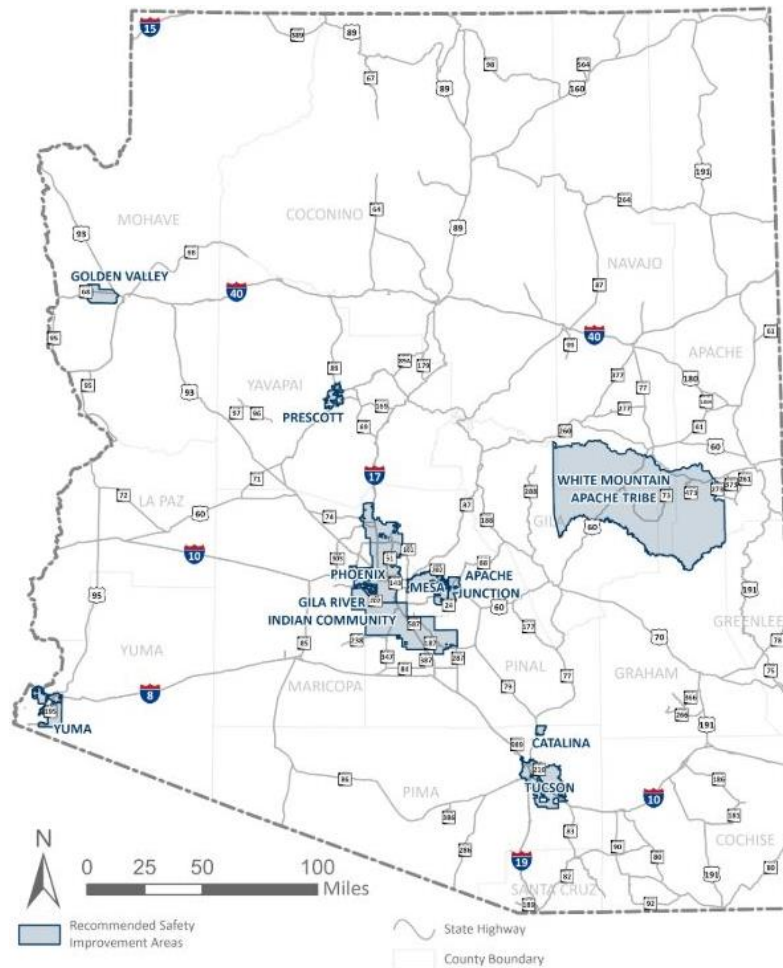


### Goals:

- Improve design to better accommodate VRUs.
- Discourage distracted and impaired traveling.
- Manage vehicle speed.
- Provide VRU facilities.
- Improve crash data and analysis.
- Improve visibility.

The quantitative analysis scores for VRU crash history, VRU activity, and equity considerations were used to determine high-risk locations in most need of VRU safety improvements which were termed Safety Improvement Areas (SIAs). The recommended SIAs are ranked below and **Figure 4** shows a map of the SIAs established by the VRUSA.

1. Phoenix
2. White Mountain Apache Tribe (WMAT)
3. Yuma (City)
4. Tucson
5. Gila River Indian Community (GRIC)
6. Mesa
7. Golden Valley (Mohave County)
8. Prescott
9. Catalina (Pima County)
10. Apache Junction



## ADOT Strategic Highway Safety Plan (2024)

The ATSAP was simultaneously developed with ADOT's 2024 Strategic Highway Safety Plan (SHSP), resulting in significant coordination between the two efforts, including combined public and stakeholder engagement efforts. The SHSP, which is an update to the 2019 STSP, has identified preliminary emphasis areas to guide the planning effort, including Human Behavior, Lane Departure, Intersections, Vulnerable Road Users, and Tribal Lands. The identified emphasis areas will guide the policy-based strategies developed in the SHSP.



## Vision

*Creating shared responsibility so everyone arrives safely home.*

## Goal

*Reduce life-altering traffic crashes by 20% by 2030.*





# 4

## Crash Data Analysis

## Crash Data Analysis

### Data Collection Process

Based on data reported to ADOT's Arizona Crash Information System (ACIS), 3,276 bicyclist or pedestrian-involved crashes were reported on State roadways from 2013 to 2022. The crash data was analyzed to identify intersections and segments with high crash frequencies. This was achieved by identifying bicyclist and pedestrian-involved crashes that were recorded within a certain proximity to intersections or along half-mile segments and met any of the following severity criteria:

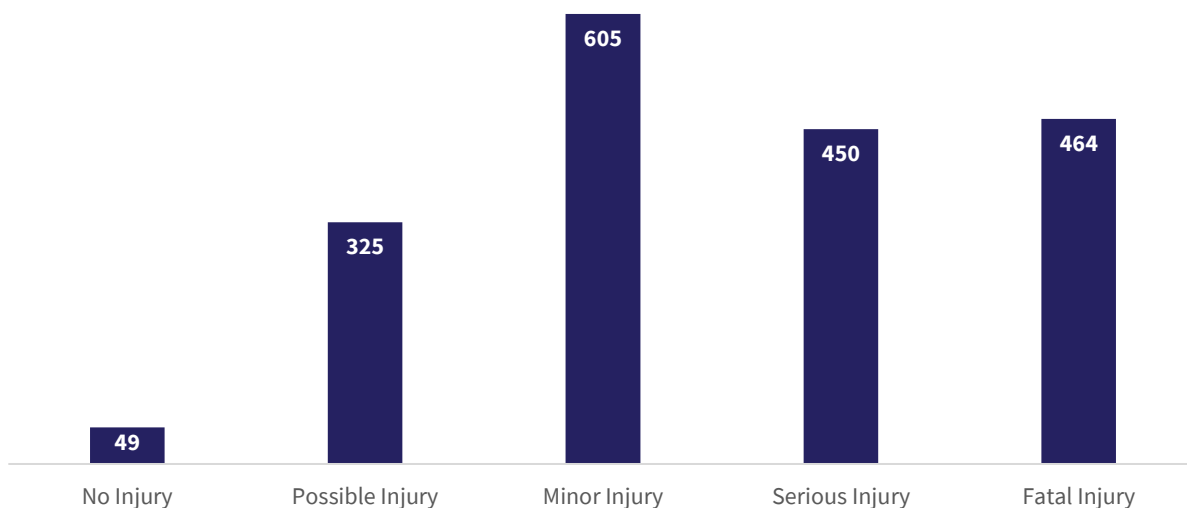
- 6 bicyclist or pedestrian-involved crashes of any severity; or
- 3 bicyclist or pedestrian-involved fatal and serious injury crashes; or
- 2 bicyclist or pedestrian-involved fatal crashes

In addition to crash frequency, intersections and segments were also analyzed based on bicyclist and pedestrian risk. The risk analysis was completed in accordance with the methodology of the BSAP and PSAP. The risk factors include number of travel lanes, posted travel speed, paved shoulder width, average daily traffic (ADT), rural or urban environments, and existing pedestrian or bicyclist infrastructure.

### Pedestrian Crash Data Analysis

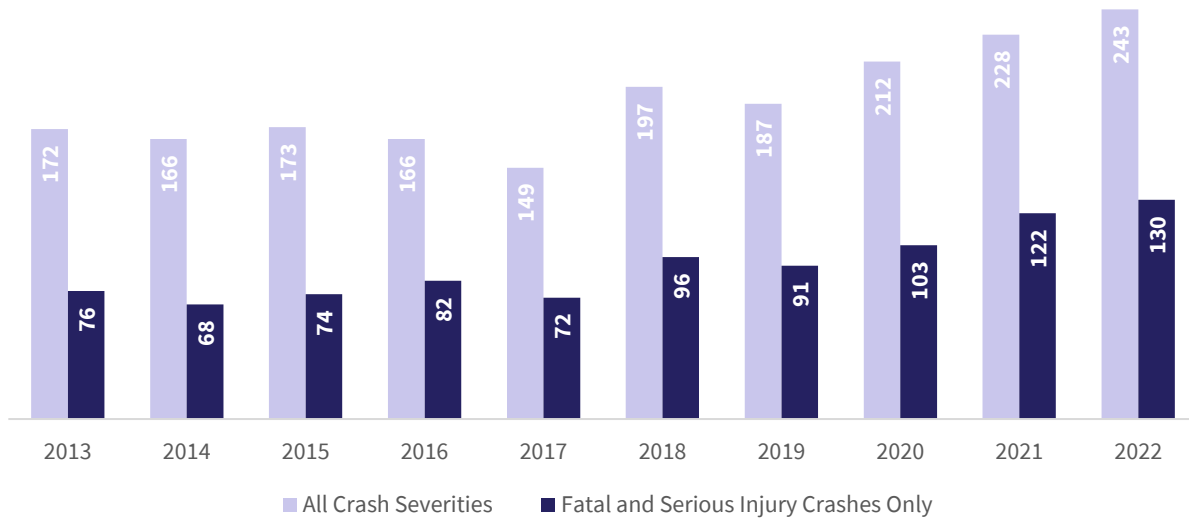
According to the VRUSA, pedestrian-involved crashes on ADOT facilities totaled 1,893 over the 10-year analysis period, as shown in **Figure 5**. Roughly 11% of all pedestrian-involved crashes statewide took place on State highways, while 22% of fatal pedestrian-involved crashes and 13% of serious injury pedestrian-involved crashes took place on State highways.

Figure 5. ADOT Facility Pedestrian Crashes by Severity (2013-2022)



Pedestrian-involved crashes have steadily increased over the analysis period with a stronger increase occurring from 2018 through 2022, as shown in **Figure 6**. Pedestrian-involved fatal and serious injury crashes have also increased over the analysis period.

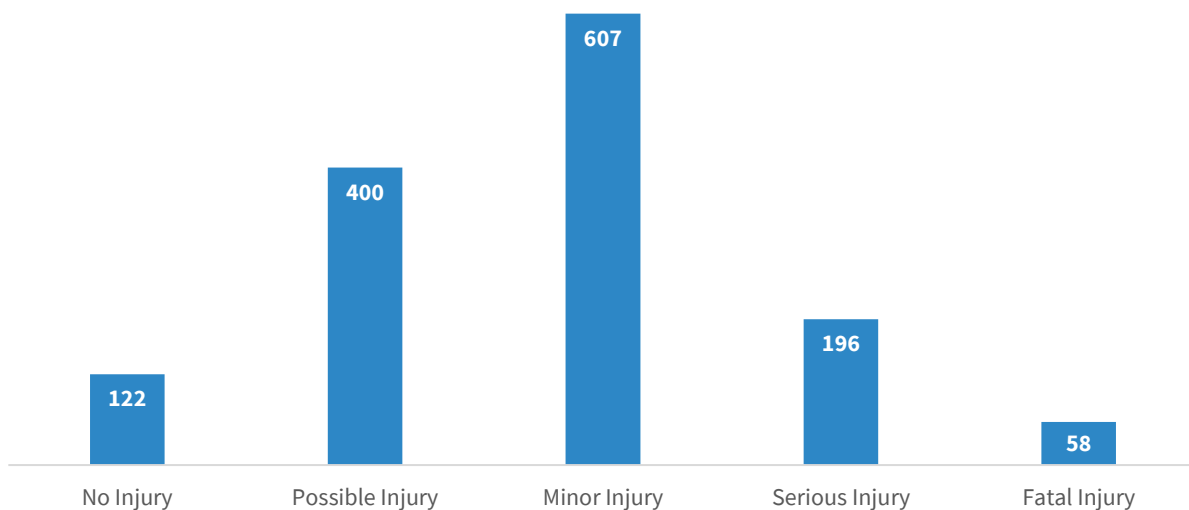
Figure 6. ADOT Facility Annual Pedestrian Crashes (2013-2022)



## Bicyclist Crash Data Analysis

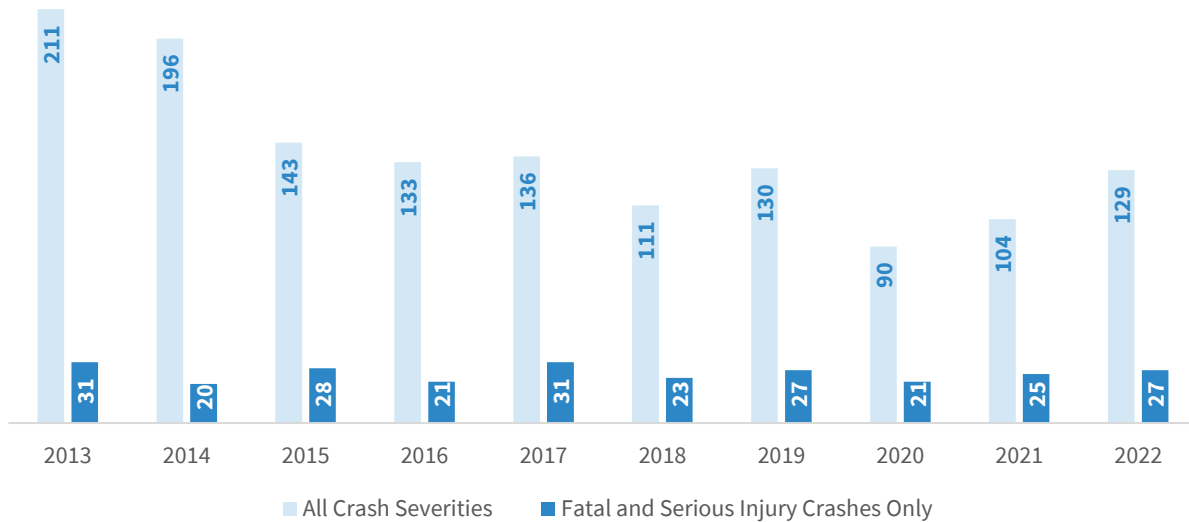
According to the VRUSA, bicyclist-involved crashes on ADOT facilities totaled 1,383 over the 10-year analysis period, as shown in **Figure 7**. Roughly 10% of all bicyclist-involved crashes took place on State roadways, while 18% of fatal bicyclist-involved crashes and 12% of serious injury bicyclist-involved crashes took place on State roadways.

Figure 7. ADOT Facility Bicyclist Crashes by Severity (2013-2022)



Shown in **Figure 8**, bicyclist-involved crashes have steadily decreased over the analysis period while bicyclist-involved fatal and serious injury crashes have remained relatively constant over the analysis period.

Figure 8. ADOT Facility Annual Bicyclist Crashes (2013-2022)



## Equity

As part of the VRUSA effort, an equity assessment was conducted. According to FHWA, equity in transportation seeks fairness in mobility and accessibility to meet the needs of all community members. The equity assessment compiled data from different equity sources and tools, including Justice 40, the Social Vulnerability Index, EJScreen, and a proprietary Equity Needs Analysis using Census data to establish a comprehensive equity score.

### Justice 40

The Justice 40 Initiative encourages federal agencies to direct at least 40% of benefits in climate, clean energy, and transportation areas towards underserved communities. Identification of underserved communities is done through the Climate and Economic Justic Screening Tool (CEJST) which was created by the White House Council on Environmental Quality (CEQ). The CEJST utilizes a variety of publicly available data to determine what deems a community underserved.

### Social Vulnerability Index

The Social Vulnerability Index (SVI) is a tool used to determine the risk and resiliency of communities in the face of disaster, ranging from natural disasters to human-caused disasters. The SVI was created by the Center for Disease Control (CDC) to “help public health officials and emergency response planners identify and map the communities that will most likely need support before, during, and after a hazardous event.” The SVI uses 16 U.S. Census variables, including age, crowding, and disabilities, to help identify communities that may need support in the face of disaster.

### EJScreen

The Environmental Justice Screening and Mapping Tool (EJScreen) originated from the 1994 Executive Order 12898, where the Environmental Protection Agency (EPA) was tasked with determining where and what the potential for disproportionate environmental impact would be in the United States. EJScreen, in its current form, was released to the public in 2015 and is updated annually. The EJScreen indicators and indexes include:





- Environmental Indicators
- Socioeconomic Indicators
- EJ Indexes which are a combination of environmental and socioeconomic information
- Supplemental Demographics

### **Equity Needs Analysis**

An equity needs tool was developed to analyze demographics data for the state by block group. This analysis is based on 2020 Census data, including population, employment, race/ethnicity, sex, income, and disability status. Demographics included in the equity needs analysis include:

- |                      |              |
|----------------------|--------------|
| • Population density | • Sex        |
| • Employment density | • Ethnicity  |
| • Foreign born       | • Poverty    |
| • Race               | • Disability |

### **Comprehensive Equity Score**

Each tool mentioned previously uses different measurements to display equity severity. Each measurement was converted to a scoring system on a zero-to-five-point scale. The scores were then combined to establish a 20-point scale from the four sources to create a comprehensive lens to view equity throughout Arizona. The maximum equity score along each segment or intersection were applied to help identify the priority locations. Results are shown in each Priority Location in chapter 7 of the ATSAP.



# 5

## Public and Stakeholder Engagement



## Public and Stakeholder Engagement

The project team conducted significant public outreach and stakeholder outreach to seek input on both ATSAP and SHSP development. Public outreach included an online survey, a series of in-person and virtual public meetings, and a project website. ADOT used numerous methods to notify the public of opportunities to engage in the planning process including digital and print ads, GovDelivery email alerts, news releases, social media, newsletters, and providing information to key stakeholders to share with their constituencies. A detailed summary of ATSAP public and stakeholder outreach is available in the appendix of the SHSP document available at [azdot.gov/safetyplan](http://azdot.gov/safetyplan).



### Participation Results

- **11,412 project website views**, with approximately **7,725 total visitors**.
- **1,330,182 social media impressions** were made during the public outreach period on ADOT social media channels.
- **4,378 public comments**: 2,833 survey form comments, 1,014 vision board comments, 346 draft documents comments, 47 verbal comments at in-person meetings, 77 Q&A responses at the virtual meeting, 56 emails, 4 mailed comments and 1 phone call.
- **165 attendees** at public meetings.

## Public Engagement

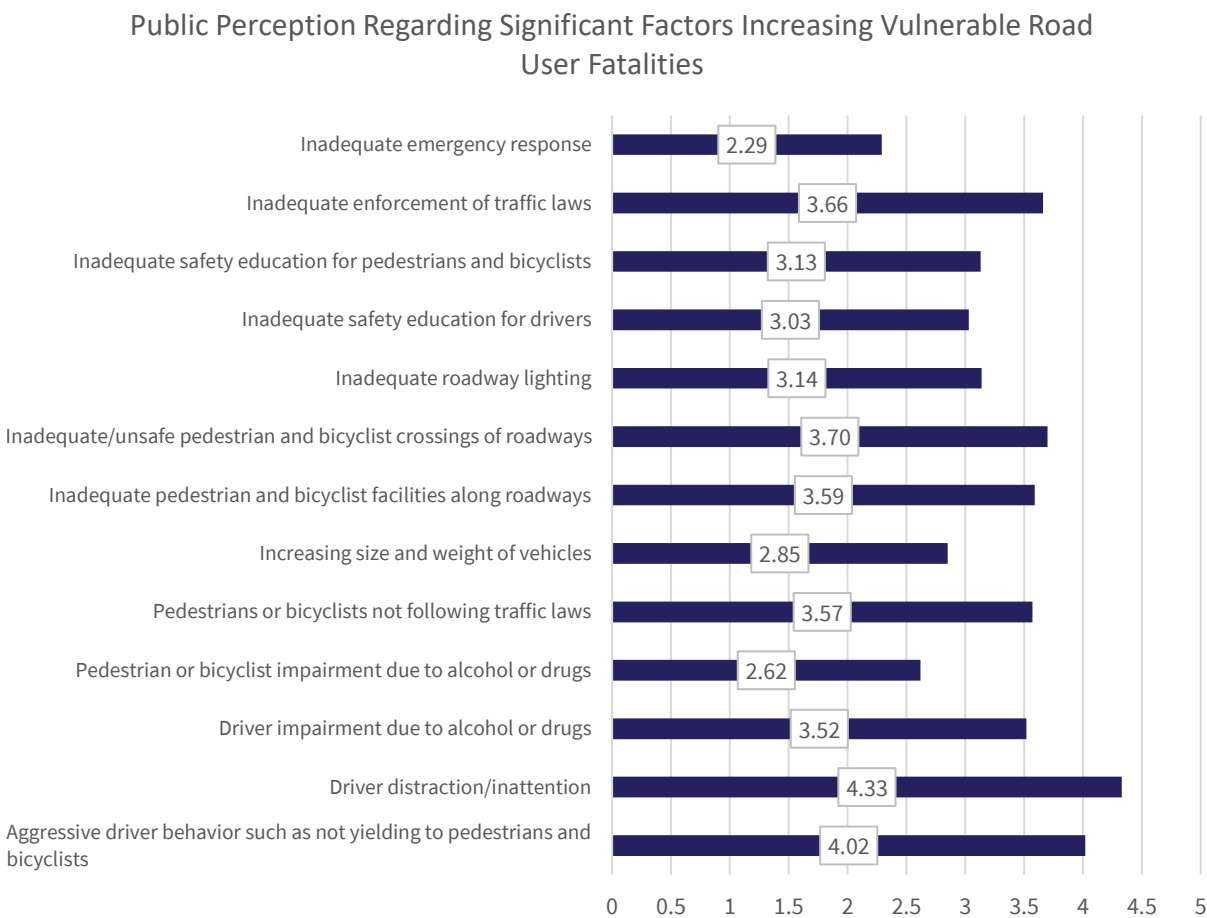
### Survey Results

An online survey was conducted between April 15 and May 17, 2024. The survey was available in English, Spanish, Arabic, French, Portuguese, Russian, Tagalog, Vietnamese, Korean, Hindi, and Chinese (Mandarin). The survey link was promoted through the project website, meeting ads, social media, and email notices.

**Figure 9** shows public perception regarding what factors increase VRU fatalities. The highest-ranking categories with weighted averages were:

1. Driver distraction/inattention.
2. Aggressive driver behavior such as not yielding to pedestrians and bicyclists.
3. Inadequate/unsafe pedestrian and bicyclist crossings of roadways.
4. Inadequate enforcement of traffic laws.
5. Inadequate pedestrian and bicyclist facilities along roadways.

*Figure 9. Public Perception Regarding Significant Factors Increasing Vulnerable Road User Fatalities*





**Figure 10** shows the public survey results for strategies to reduce VRU fatalities. The highest-ranking categories with weighted averages were:

1. Providing additional “protected” pedestrian and bicyclist crossings (such as a crossing with a traffic signal).
2. Increasing enforcement of traffic laws or enacting new traffic laws.
3. Providing more pedestrian and bicyclist facilities along roadways.
4. Making roadway improvements that slow drivers down.
5. Education campaigns discouraging distracted driving, such as use of mobile phones.

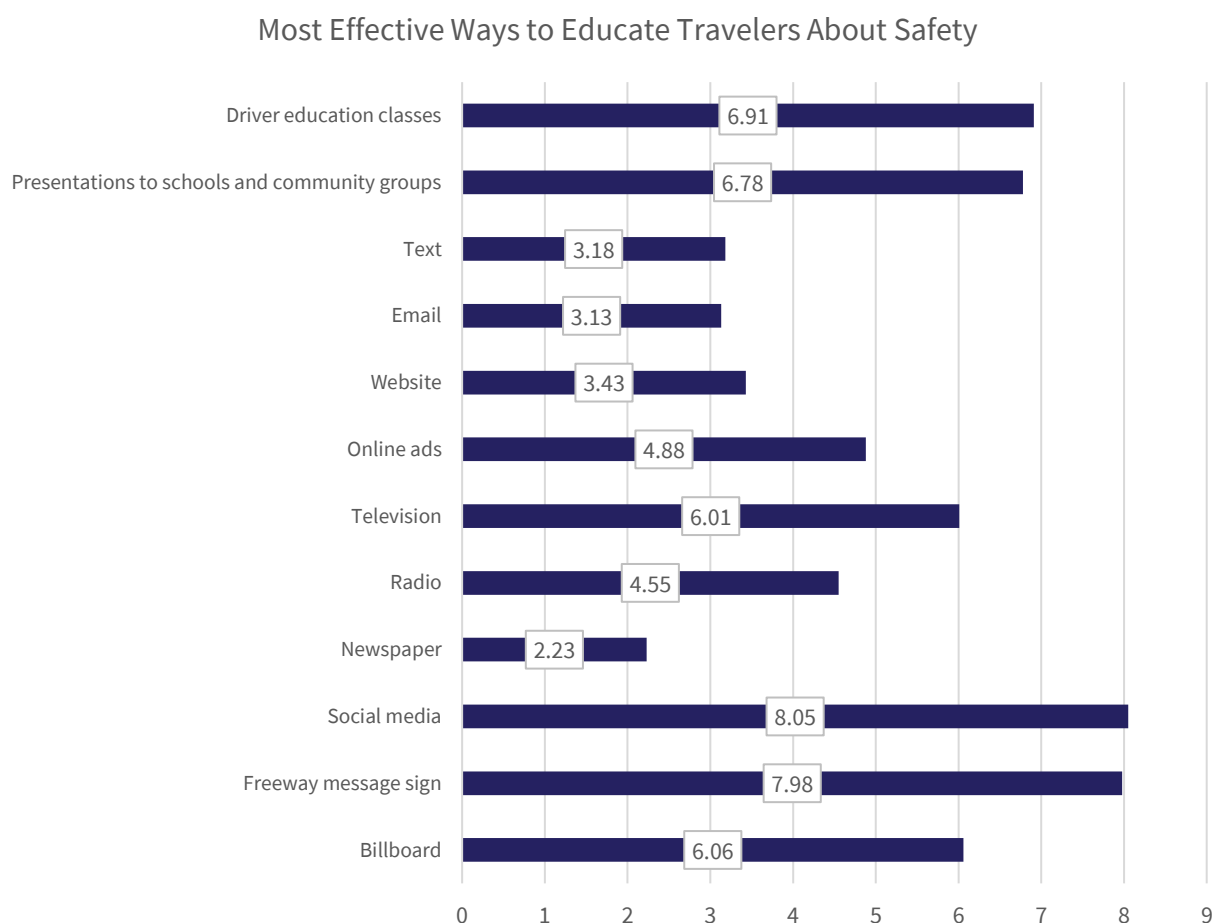
*Figure 10. Survey Input on Strategies to Improve Vulnerable Road User Safety*



**Figure 11** shows the survey results for effective ways to educate travelers about safety. The highest-ranking categories with weighted averages were:

1. Social media
2. Freeway message sign
3. Driver education classes
4. Presentations to schools and community groups
5. Billboard

*Figure 11. Survey Input on Most Effective Ways to Educate Travelers About Safety*



## Public Meetings

Four public meetings were held throughout the State to gain input from local residents. **Table 2** shows attendance information from each meeting. More detail on the public outreach efforts and comments received can be found in the SHSP document.

Table 2. Public Meeting Attendance and Comments Collected

| Meeting        | Date           | Number of Attendees | Number of Comments Collected |
|----------------|----------------|---------------------|------------------------------|
| <b>Central</b> | April 30, 2024 | 20                  | 19                           |
| <b>North</b>   | May 2, 2024    | 18                  | 18                           |
| <b>South</b>   | May 7, 2024    | 17                  | 8                            |
| <b>Virtual</b> | May 9, 2024    | 110                 | 77                           |

## Stakeholder Engagement

### Stakeholder Safety Workshops

Stakeholder Safety Workshops were held throughout Arizona to gain input on key focus areas in conjunction with the Arizona SHSP. **Table 3** shows an overview of the four Stakeholder Safety Workshops. A summary of VRU-related comments from the Stakeholder Safety Workshops can be found in **Appendix C**.



Table 3. Stakeholder Safety Workshops Overview

| Location                        | Phoenix   | Flagstaff   | Tucson  | Virtual  |
|---------------------------------|---|---|---|--|
| Date                            | 4/16/2024   | 5/2/2024  | 5/7/2024  | 5/14/2024  |
| Attendance (Non-Project Team)   | 28  | 21  | 11  | 70   |
| Format                          | 5 rotating groups with stationary facilitators  | 4 rotating groups with stationary facilitators  | 1 stationary group with rotating facilitators   | 5 stationary virtual groups with rotating facilitators   |
| Agencies Represented (Non-ADOT) | GOHS, FMCSA, NHTSA, FHWA, Ak-Chin Indian Community, MAG, SCMPD, NACOG, Maricopa County, Mesa, Scottsdale, Glendale, Goodyear, Superior, Tempe, Phoenix, Chandler, Consultants | AZ State Transportation Board, Navajo Nation DOT, Cameron CERT, MetroPlan, NACOG, NAU, Banner Health, Coconino County, Flagstaff, Buckeye | FHWA, Governor's Southern Arizona Office, PAG, CAG, Pima County, U of A, Marana, DUID Victim Voices | DHS, Hualapai Tribe, Hopi Tribe, SRPMIC, IHS, AZ Corp. Commission, MAG, PAG, Counties (Yuma, Graham, Cochise, Coconino, Pinal, Gila, Mohave, Maricopa, Yavapai), Prescott, Prescott Valley, Coolidge, Yuma, Avondale, Payson, Safford, Somerton, Phoenix, Tempe, Mesa, Gilbert, Glendale, Sierra Vista, Pinnacle Prevention, Consultants |

**Table 4** shows a synopsis of key focus areas from the Stakeholder Safety Workshops.

*Table 4. Stakeholder Workshop Input*

| Safe Roads  | Safe Road Users                        | Safe Speeds                             | Safe Vehicles           | Post-Crash Care                            |
|---|--|---|-------------------------|--|
| <b>Separated bike lanes and walkways</b>              | VRU safety education in schools        | “Self-enforcing” roads*                 | E-bike regulations      | Improve crash data                         |
| <b>Increase visibility of VRUs and VRU facilities</b> | Education for bicyclists and motorists | Automated and/or additional enforcement | Improve transit options | ADA/PROWAG compliance                      |
| <b>Policies for VRUs</b>                              | High visibility gear for VRUs          | Community input on street design        | Automatic braking       | Traffic Incident Management (TIM) training |

\*“Self-enforcing” roads are roadways that are planned and designed to encourage drivers to select operating speeds consistent with the posted speed limit.

## ATSAP Technical Advisory Committee

A Technical Advisory Committee (TAC) was organized to guide the development of the ATSAP. The TAC met bi-monthly to discuss progress on the ATSAP and consisted of representatives from the following agencies:

- ADOT
- Arizona Department of Health Services
- Association of Bicyclist and Pedestrian Professionals
- Bullhead City
- Central Arizona Governments (CAG)
- Central Yavapai MPO (CYMPO)
- City of Flagstaff
- City of Mesa
- City of Phoenix
- City of Tucson
- Coalition of Arizona Bicyclists
- FHWA
- Inter Tribal Council of Arizona (ITCA)
- Lake Havasu MPO (LHMPO)
- Maricopa Association of Governments (MAG)
- Maricopa County
- MetroPlan Flagstaff
- Navajo Nation
- Northern Arizona COG (NACOG)
- Pima Association of Governments (PAG)
- Pima County
- Pinnacle Prevention
- Sierra Vista MPO (SVMPO)
- Southeastern Arizona Governments Organization (SEAGO)
- Sun Corridor MPO (SCMPO)
- Western Arizona COG (WACOG)
- Yuma MPO (YMPO)

The roles and responsibilities of the TAC were the following:

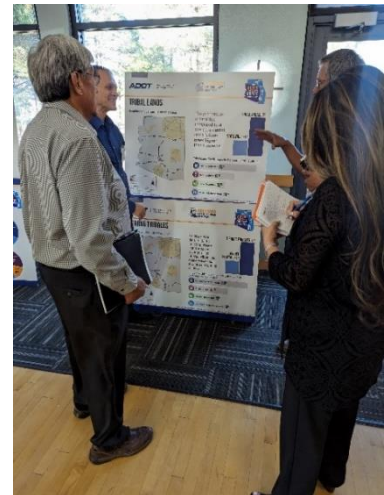
- Attend virtual TAC meetings (generally meet every other month).
- Confirm project scope and work plan.
- Set goals and objectives of the ATSAP.
- Review project progress and draft deliverables.
- Help address challenges and remove barriers to improving safety.
- Consult the ATSAP when updating other agency or organization plans and programs.
- Be a safety advocate in Arizona.



## Tribal Outreach

To better reach Tribal partners, ADOT sent a flyer to each Tribe to inform them about the Stakeholder Safety Workshops and public meetings along with a brochure with directions to the nearest public meeting location. Through these efforts, representatives from seven of the 22 Tribes in Arizona and several Tribal-related entities participated in the Stakeholder Safety Workshops and public meetings. **Figure 12** shows an example of the flyer sent to each Tribe.

Figure 12. Tribal Notification Flyer Example



## Other Outreach Activities

### *Pima County Transportation Advisory Committee*

On May 28, 2024, the project team presented the SHSP and ATSAP to the Pima County Transportation Advisory Committee (PCTAC). The PCTAC makes recommendations related to transportation improvements in the unincorporated area of Pima County and for transportation improvements within incorporated cities and towns where County funds are being spent. The purpose of the presentation was to provide an overview of the SHSP and ATSAP, introduce the Safe Systems Approach, and provide an opportunity for the PCTAC to ask questions and provide comments.

### *American Traffic Safety Services Association*

On June 11, 2024, the project team presented the SHSP and ATSAP to the Arizona chapter of the American Traffic Safety Services Association (ATSSA). The ATSSA represents the roadway safety infrastructure industry and strives to shift the focus of transportation towards saving lives and reducing injuries. The purpose of the presentation was to provide an overview of the SHSP and ATSAP, introduce the Safe Systems Approach, and provide an opportunity for the ATSSA to ask questions and provide comments.

### *Coalition for Transportation Choices Coordination Meeting*

On June 12, 2024, the project team presented the SHSP and ATSAP to the Coalition for Transportation Choices. The Coalition for Transportation Choices includes organizations from across the state of Arizona that advocate for a complete and equitable transportation system that benefits all people and the environment. The purpose of the presentation was to provide an overview of the SHSP and ATSAP, introduce the Safe Systems Approach, and provide an opportunity for the Coalition for Transportation Choices to ask questions and provide comments. The meeting was held in a workshop format to obtain input like the Stakeholder Workshops. Input provided is summarized in **Appendix C**.



# 6

## Policy Recommendations



## Policy Recommendations

The ATSAP developed policy recommendations to improve safety for pedestrians and bicyclists. ADOT is not limited to these recommendations and is encouraged to continually look for ways to improve roadway safety for all users through policy or other measures.

### Planning to Programming Safety Prioritization

ADOT applies a Planning to Programming (P2P) scoring criteria which results in the Statewide Prioritized Project List. The P2P process is conducted annually by the ADOT Multimodal Planning Division (MPD) to prioritize prospective statewide highway and other transportation facility improvements. The P2P process is a performance-based process resulting in the development of the Draft Five-Year Transportation Facilities Construction Program (Five-Year Program).

The P2P scoring process is separated into scoring sub-categories:

- **Technical Score:** Based on prioritization provided directly from the respective ADOT Technical Groups, the project's originating study document or the MPD expansion project evaluation process. **The Technical Score makes up between 35% and 60% of the overall P2P final score depending on the applicable investment category.**
- **Policy Score:** Derived from planning-level criteria including freight flow, corridor significance, equity and local funding contributions. **The Policy Score makes up 10% of the overall P2P final score.**
- **Safety Score:** Based on the weighted Level of Safety Service (LOSS) values identified in the statewide database developed utilizing the American Association of State Highway and Transportation Officials (AASHTO) Safety Analyst tool. **The Safety Score makes up 25% of the overall Modernization P2P final score and 15% of the overall Expansion P2P final score.**
- **District Score:** Derived from each ADOT District Engineer's prioritization of projects and supported by a scoring evaluation of each project. **The District Score makes up between 25% and 45% of the overall P2P final score, depending on the investment category.**

It is recommended that ADOT place a greater emphasis on the Safety Score (i.e., a higher percentage) in the overall P2P final score, particularly for Modernization category projects. Safety trends have not improved in recent years so ADOT could consider increasing LRTP funding for Modernization category projects to provide more opportunity for safety-related projects to receive funding.

### Pedestrian-Friendly and Bicyclist-Friendly Interchanges

The crash analysis identified that a significant number of motor vehicle-bicyclist crashes that occur on the SHS take place at interstate interchanges with local arterials. It is recommended that ADOT incorporate additional pedestrian-friendly and bicyclist-friendly design elements for Single Point Urban Interchanges (SPUIs) and Diamond Interchanges. **Figure 13, Figure 14, Figure 15, and Figure 16** show potential retrofit safety countermeasures for SPUIs. **Figure 17 and Figure 18** show potential retrofit safety countermeasures for Diamond Interchanges. Pedestrian-friendly and bicyclist-friendly design elements such as these should be incorporated into the ADOT Roadway Design Guidelines as well as ongoing programs such as pavement preservation and signing/markings maintenance.

Figure 13. SPUI with Bike Lanes and Frontage Roads

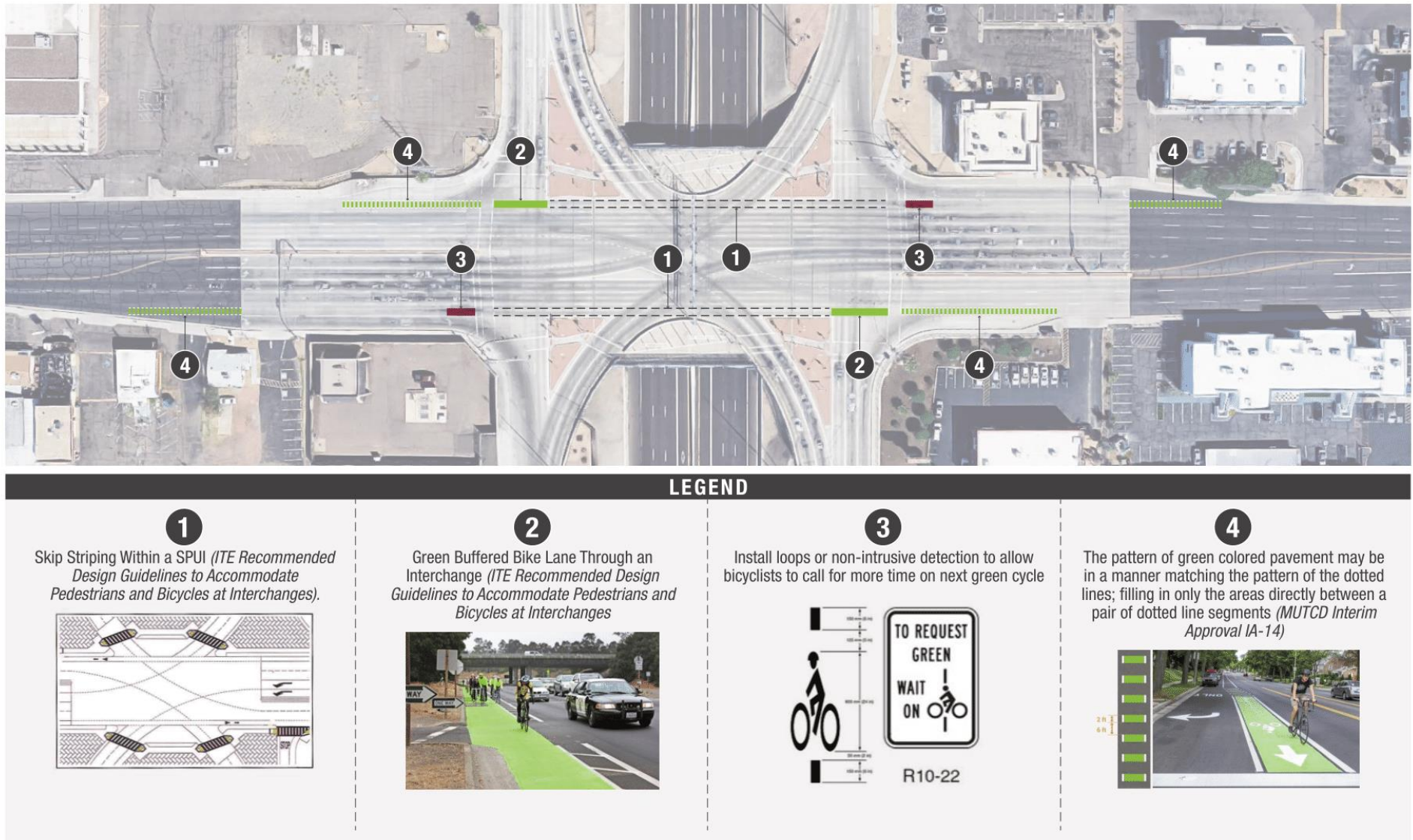
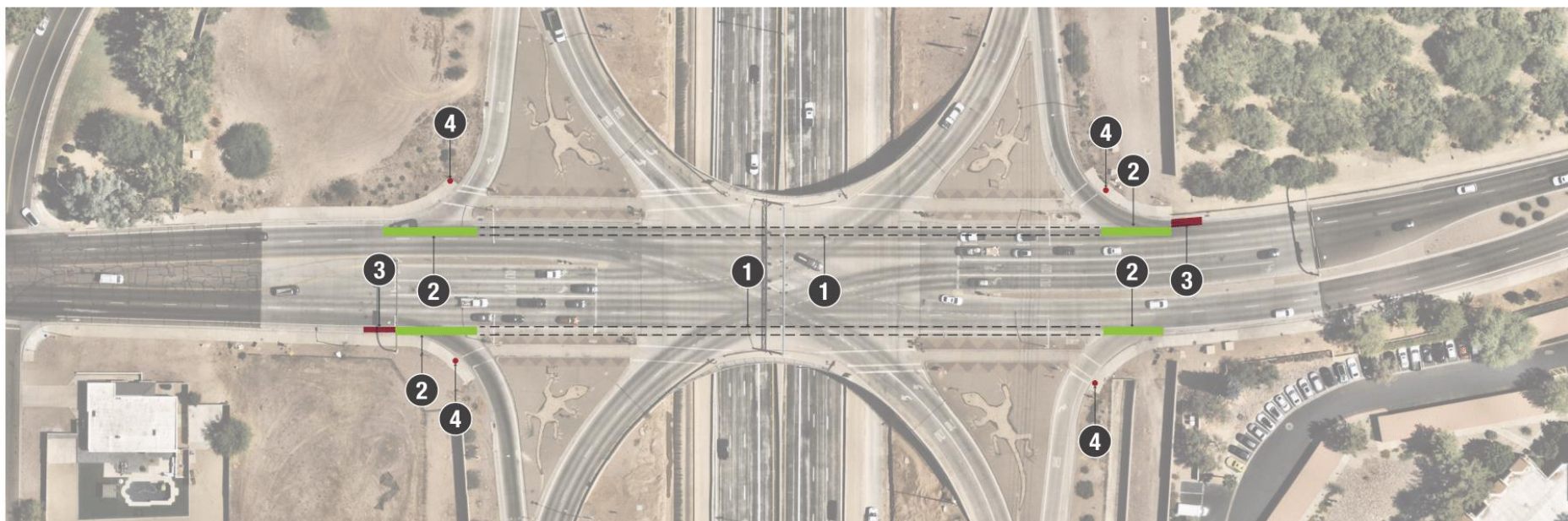




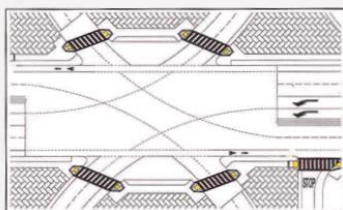
Figure 14. SPUI with Bike Lanes without Frontage Roads



**LEGEND**

**1**

Skip Striping Within a SPUI (*ITE Recommended Design Guidelines to Accommodate Pedestrians and Bicycles at Interchanges*).



**2**

Green Buffered Bike Lane Through an Interchange (*ITE Recommended Design Guidelines to Accommodate Pedestrians and Bicycles at Interchanges*).



**3**

Install loops or non-intrusive detection to allow bicyclists to call for more time on next green cycle



**4**

Replace YIELD signs with signalized crossing at right turn.

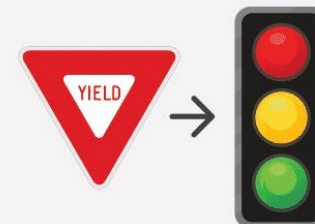


Figure 15. SPUI without Bike Lanes and with Frontage Roads

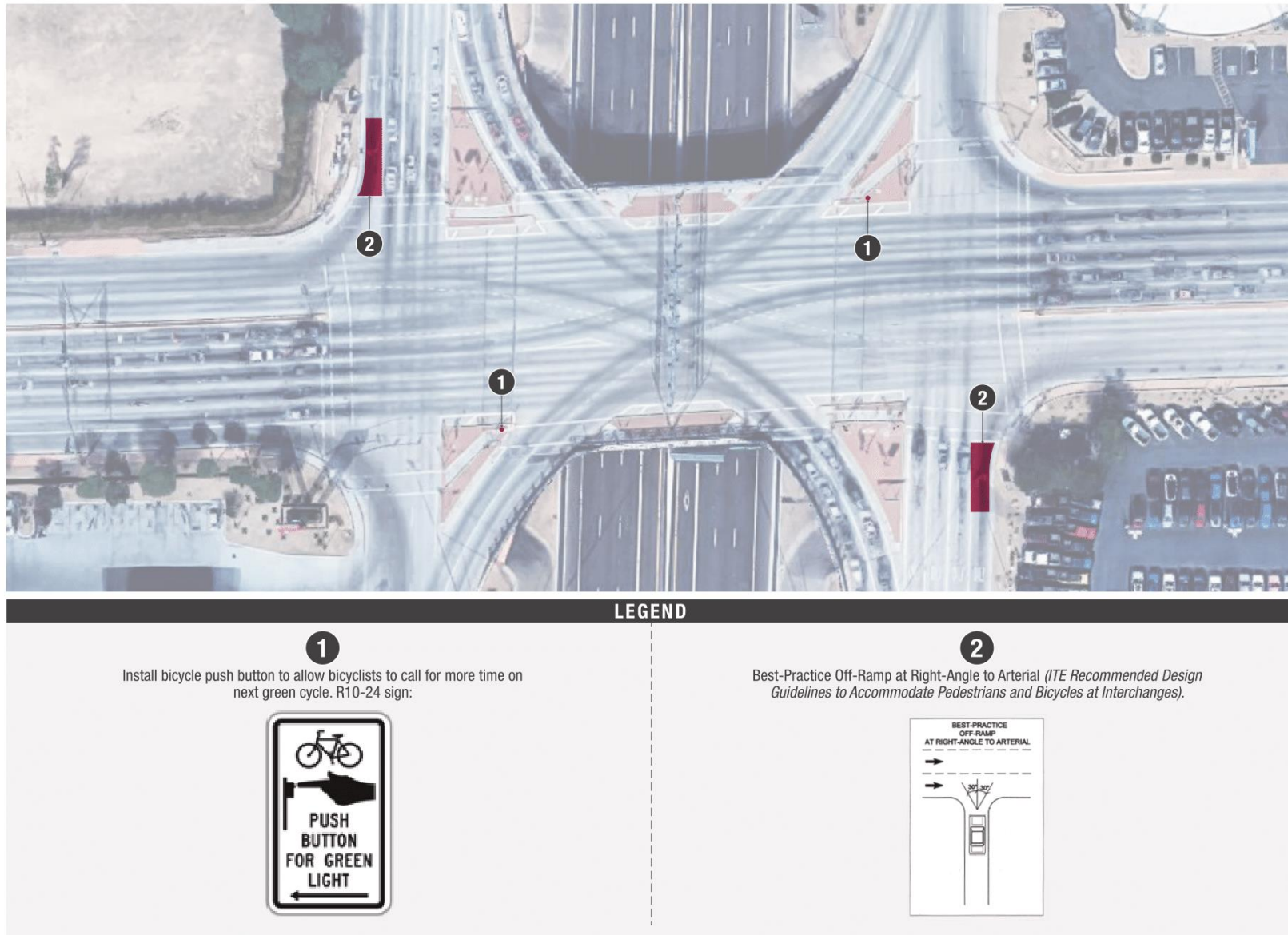




Figure 16. SPUI without Bike Lanes or Frontage Roads

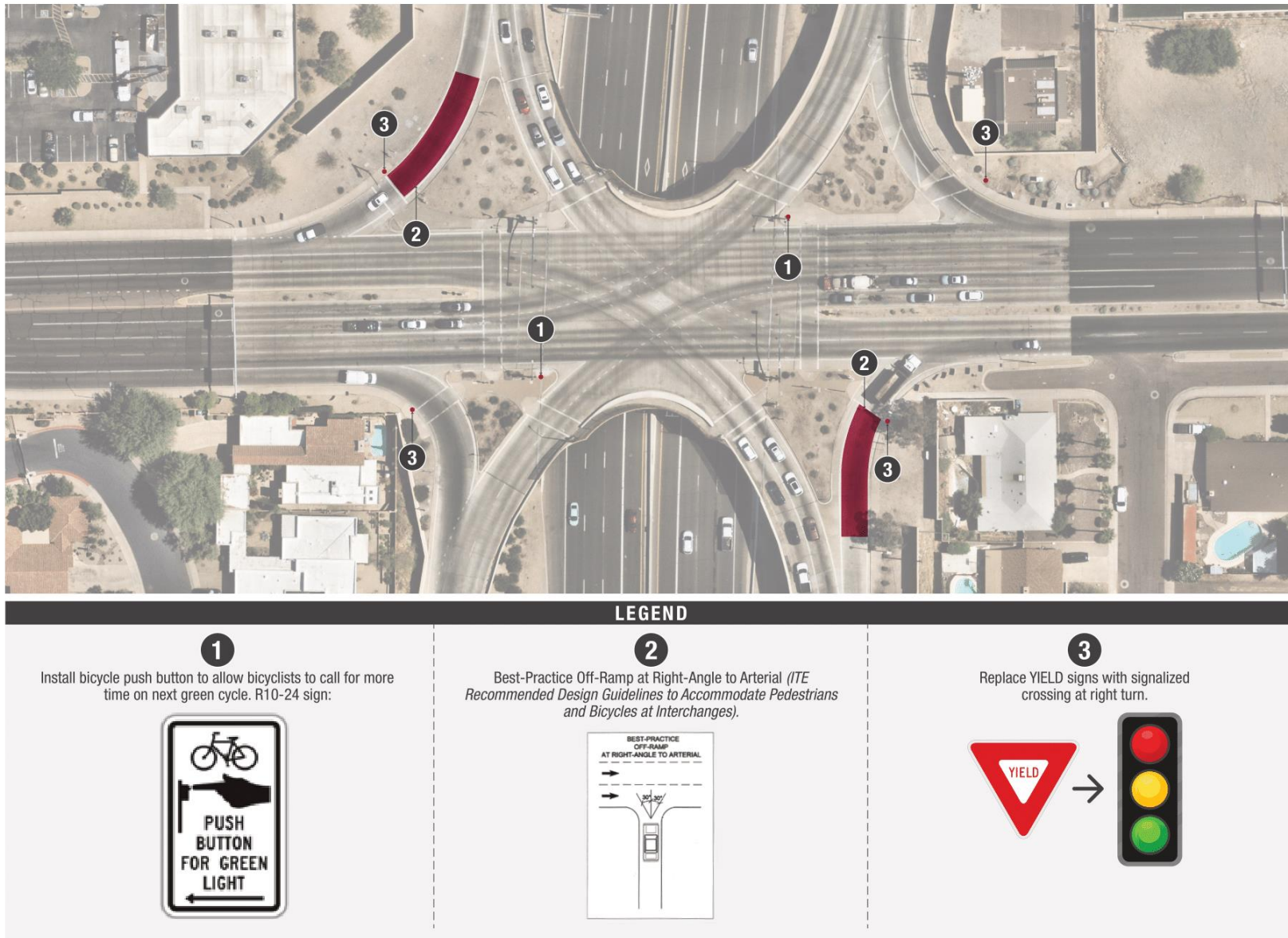


Figure 17. Diamond Interchange with Bike Lanes

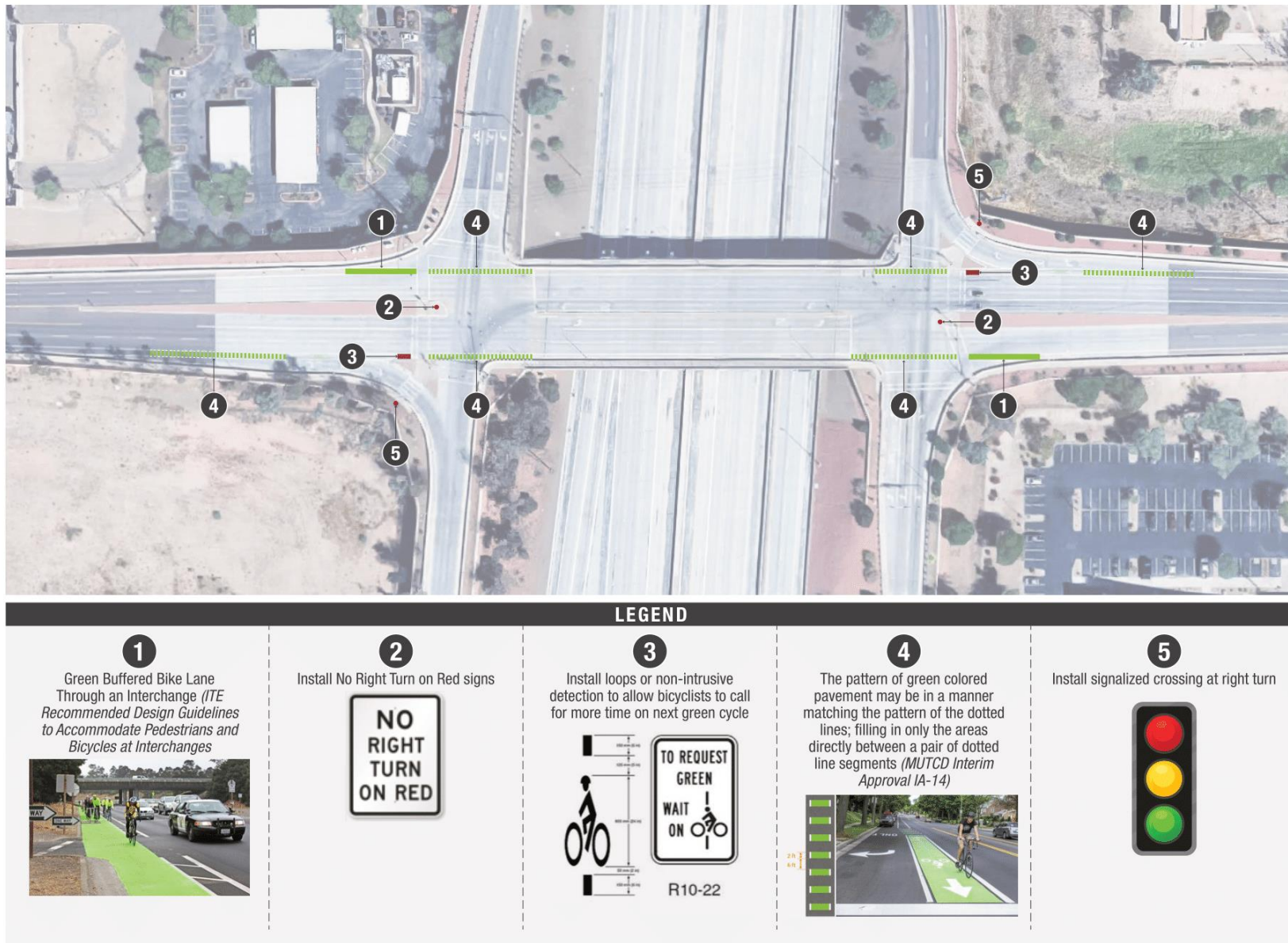
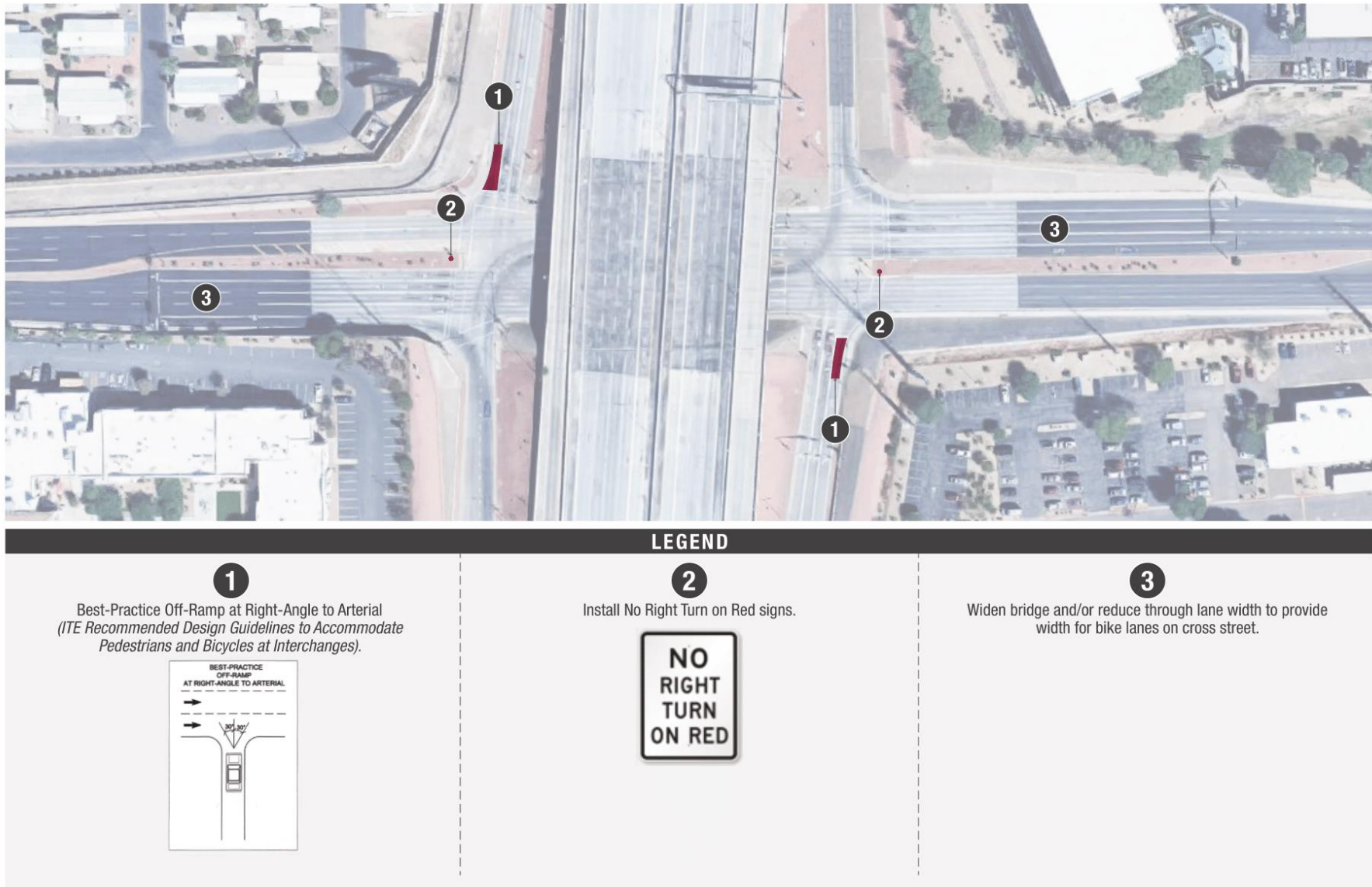




Figure 18. Diamond Interchange without Bike Lanes



## Updates to the ADOT Roadway Design Guidelines

The 2021 ADOT Roadway Design Guidelines sets the standard for roadway design on ADOT right-of-way. The following updates, shown in red-colored text, should be implemented to improve safety for people walking or riding bicycles.

### Pedestrian-Friendly and Bicyclist-Friendly Interchanges

The pedestrian-friendly and bicyclist-friendly interchange recommendations mentioned in the previous section should be incorporated into the ADOT Roadway Design Guidelines.

### Lane Width on ADOT Intersections

Some local governments use narrower lane width standards than ADOT. It is recommended that ADOT update their standards to create consistent lane widths through intersections. It is recommended that Section 301.3 – Lane Width and Pavement Width be updated to:

*“The width of all traffic lanes including through lanes, auxiliary lanes between interchanges, HOV lanes, ramp and frontage road lanes, left-turn and right-turn lanes shall be 12 ft except at urban intersections where right-of-way restrictions, local government standards, or existing roadway conditions may govern. At such intersections, through lane widths may be reduced to **11-ft match the local government standards** and left-turn lanes may be as narrow as 10 ft if necessary. **Bike lanes should be added, with associated signage and pavement marking, to match the roadway configuration set by the local government.** In curb and gutter sections on the right side of traffic, a minimum 5 ft paved shoulder, inclusive of the gutter, shall be provided, **and marked as a bike lane.**”*

### Bicycle Facilities

It is recommended that Section 107.1 – Bicycle Facilities be updated to:

*“It is ADOT’s goal to develop a transportation infrastructure that provides safe and convenient bicycle access. ADOT further advocated that bicyclists have the right to operate in a legal manner on all State highways including fully controlled-access highways except where specifically excluded by administrative regulation and where posted signs give notice of a prohibition. All major construction and major reconstruction projects on the state highway system should include a shared roadway cross section to accommodate bicycle travel. Dedicated bicycle lanes **may should be considered installed** when incremental costs for construction and maintenance are funded by a local agency and the **bicycle lane is included as a part of a bicycle facilities plan adopted by the local agency local agency has requested the bicycle facility.**”*

*In addition to the shared roadway cross section, shared use paths **may should** be accommodated within the ADOT right of way when the facilities are designed and located in accordance with accepted criteria for a proper and safe facility and funded and properly maintained by the local agency.”*

### Shoulder Width

Since “bicyclists have the right to operate in a legal manner on all State highways including fully controlled-access highways except where specifically excluded by administrative regulation and where posted signs give notice of prohibition” (107.1 – Bicycle Facilities), Section 316.2 – Traffic Lanes and Shoulder Widths should be updated to:

*“Undivided highways: the minimum detour shoulder width for a two-lane two-directional detour on a rural undivided highway is **2 ft 4 ft**. ~~When bicycle traffic is prevalent, a minimum 4 ft shoulder should be provided.~~ When the shoulder width of the approach roadway is equal to or greater than 4 ft, the existing shoulder width may be carried through the detour but may be reduced to no less than 4 ft after consideration is given to the factors listed above. Where longitudinal barriers **or vertical curb** are required, an additional 2 ft offset to face of barrier should be provided.”*

## Right-Turn Channelization

Since “...bicyclists have the right to operate in a legal manner on all State highways including fully controlled-access highways except where specifically excluded by administrative regulation and where posted signs give notice of prohibition” (107.1 – Bicycle Facilities), Subsection E of Section 408.11 – Right-Turn Channelization should be updated to:

*“E) Bicycle Buffer: ~~Where bicycles are expected to be prevalent,~~ A buffer area between the through lane and the right-turn lane should be provided **in all urban areas, and in rural areas where bicycles are expected to be prevalent**. Figure 408.11A shows the bicycle buffer with a wide curb lane. The buffer area is formed by the extension of the through lane and the face of curb line. Figure 408.11B shows the bicycle buffer for non-curb and gutter sections. ~~The buffer may be omitted where bicycle traffic or right-turn traffic is expected to be infrequent.~~”*

## Construction and Maintenance Responsibilities

The Roadway Design Guidelines indicate local agencies are responsible for constructing and maintaining bicyclist and shared use path facilities on the SHS and could be asked to help fund sidewalks. In some cases, it may make more sense for ADOT to construct and maintain these facilities, such as at a traffic interchange. The Roadway Design Guidelines language regarding construction and maintenance responsibilities for pedestrian and bicyclist facilities should be reviewed and updated as needed.

## Process for Updating ADOT Roadway Design Guidelines

The ADOT Roadway Design Guidelines are reviewed by a committee annually for any potential updates. A request for any potential updates would need to be made to the committee that updates the Roadway Design Guidelines. The review process starts mid-year, with several rounds of review performed within ADOT, and updates typically implemented at the beginning of the next calendar year.

## Signalize Channelized Right-Turn Lanes

The crash analysis identified that a number of motor vehicle-pedestrian crashes that occur on the SHS take place at interchanges with channelized right-turn lanes. ADOT should adopt design standards that require a traffic signal to be placed at channelized right-turn lanes that have a striped crosswalk. **Figure 19** shows an example of a recently installed traffic signal at the channelized right-turn lane at Interstate 10 (I-10) and Watson Road in Buckeye, Arizona.



*Figure 19. Signalized Channelized Right-Turn Lane at I-10 and Watson Road*



## Legislative Recommendations

### Review the Arizona Revised Statutes (ARS)

Review the language of Arizona state laws affecting how engineering treatments and educational messages involving people walking or riding bicycles are developed, and enforcement is conducted. For example, Arizona is a “yield to pedestrians” state instead of a “stop for pedestrians” state. If this were to change, it would affect the type of signing or pavement markings that can be used in advance of crosswalks, and potentially the messaging to drivers and enforcement approach.

### Update Distracted Driver Legislation

The Arizona State Legislature has implemented strategies to address the growing problem of distracted driving. ARS 28-914 prohibits drivers from using any wireless device while driving unless the motor vehicle is parked or stopped. The following civil penalties are currently in place:

- At least \$75 but not more than \$149 for a first violation.
- At least \$150 but not more than \$250 for a second or subsequent violation.

Arizona currently assesses three points against an individual’s permanent driving record for “speeding” and “driving over or parking in a gore area” but does not assess any points for distracted driving. Arizona should consider updating ARS 28-914 to assess three points against an individual’s permanent driving record, in addition to the existing fine, for a second and subsequent distracted driving violation.



Currently, the list of states that assess points against an individual's permanent driving record for a first distracted driving violation include Alabama, Colorado, Indiana, Kentucky, Missouri, Nebraska, and New York. States that assess points only after a second violation include Nevada, Florida, and Georgia.

## **Strategic Highway Safety Plan Strategies**

The SHSP has the following strategies to improve safety for people walking or riding bicycles. The strategies should be implemented as feasible. For more information, please view the SHSP.

- Separate VRUs from vehicles using space and time.
- Improve visibility of VRUs.
- Enhance VRU connectivity.
- Incorporate VRUs more prominently in planning, design, and programming process.
- Reduce VRU safety risks through education of pedestrians and bicyclists.
- Promote driver education on VRU behaviors.
- Clarify and enforce laws and policies related to VRUs.
- Clarify and enforce laws and policies related to electric/micromobility devices.
- Utilize context-appropriate speed limits.
- Promote early implementation of automated detection of VRUs by vehicles.
- Support, through the provision of information, programs that incentivize lower weight and height vehicles.
- Promote safety at crash scenes.
- Improve VRU crash and trauma data collection and sharing.
- Improve crash and trauma data-sharing with VRU advocacy groups.

## **Education Strategies**

According to "Countermeasures That Work: A Highway Safety Countermeasure Guide for State Highway Safety Offices Tenth Edition, 2020" published by the National Highway Traffic Safety Administration (NHTSA), education campaigns are most effective when they teach people something they do not already know, are targeted towards specific groups, and are paired with enhanced enforcement. Any safety education campaign in Arizona should strive to implement these strategies.



# 7

## Priority Locations and Countermeasures

## Priority Locations and Countermeasures

Through the 2013 to 2022 crash data analysis and public involvement, the ATSAP identifies 26 Priority Locations (PL) with recommended countermeasures for each location. The PLs are organized from most fatal/serious injury crashes to least. PL 1 through PL 15 are high-crash locations whereas PL 16 through PL 26 are high-risk locations with lower overall number of crashes but high potential for future crashes. ADOT should focus medium-term implementation on the high-crash Priority Locations and long-term implementation on the high-risk Priority Locations. A detailed list of countermeasures and cost estimates for each PL can be found in **Appendix D**. The project team reviewed crash modification factors (CMF) from the CMF Clearinghouse to establish the list of countermeasures. CMFs are used to compute the expected number of crashes after implementing a countermeasure on a road or intersection. A list of CMFs used in this plan can be found in **Appendix E** and can be used to help calculate benefit-cost ratios for grant applications such as Highway Safety Improvement Program (HSIP).

### Methodology

To establish PLs, the ATSAP analyzed high-crash intersections, high-crash road segments, and high-risk road segments. A PL was created everywhere that there was an overlap between at least two high-crash intersections, high-crash road segments, and/or high-risk road segments. Crash data from 2013 through 2022 was used throughout the analyses.

### High-Crash Intersections

Two separate intersection analyses were performed utilizing ArcGIS, one for high-crash pedestrian intersections and one for high-crash bicyclist intersections. The crash data was analyzed in relation to ADOT intersections. Crashes within a 150-foot radius were counted towards each intersection. The crash data for pedestrians and bicyclists was combined into one data set once both analyses were performed. An intersection was designated as a “High-Crash Intersection” if it met the following criteria:

- 6 crashes of any severity, or
- 3 fatal and serious injury crashes, or
- 2 fatal crashes.

### High-Crash Road Segments

Crash data was analyzed in relation to a calibrated state roadway system file that allowed for inputting a table of start and end mileposts (MPs). The ADOT roadway system was divided into 0.5-mile segments and set in two layers. The first layer was segmented from MP 0 to MP 0.5 and so on. The second set was segmented from MP 0.25 to MP 0.75 and so on. This double roadway segmentation overlap was to ensure that no half-mile segments that met the criteria for being a high-crash location were left out because they had nearby crashes on either side of the half-mile or full-mile MP marks. A road segment was designated as a “High-Crash Road Segment” if it met the following criteria:

- 6 crashes of any severity within a half mile segment, or
- 3 fatal and serious injury crashes within a half mile segment, or
- 2 fatal crashes within a half mile segment.

## High-Risk Road Segments

Risk analysis for pedestrians and bicyclists utilized methodology established in the Pedestrian Safety Action Plan (PSAP) and Bicyclist Safety Action Plan (BSAP). For the high-risk road segment analysis, the ADOT roadway system was divided into 0.5-mile segments and set in two layers, similar to the analysis for the high-crash road segments.

### *Pedestrian Safety Action Plan*

The PSAP risk analysis consisted of a two-tier analysis. The first tier consisted of factors that are common to pedestrian-involved crashes. A road segment was designated as preliminarily “High-Risk” for pedestrians if the overall “Tier 1” score was equal to or greater than 32. High-Risk segments were then given a “Tier 2” visual scan. The second tier was a visual screen with three factors. **Table 5** and **Table 6** summarize the factors and scoring for the analysis.

*Table 5. Pedestrian Tier 1 Risk Analysis*

| Factor   | Score |
|--|-------|
| <b>Operating Environment/Width of Roadway</b>                                    |       |
| 6-Lane Highway   | 6     |
| 4- or 5-Lane Undivided Highway   | 3     |
| 2- or 3-Lane Undivided Highway   | 2     |
| 2- or 3- or 4-Lane Divided Highway   | 1     |
| <b>Posted Travel Speed</b>   |       |
| >45 miles per hour (mph)   | 6     |
| 35-45 mph  | 4     |
| 25-35 mph  | 2     |
| <25 mph  | 0     |
| <b>Paved Shoulder Width</b>  |       |
| 0-4 feet   | 6     |
| 4-8 feet   | 3     |
| > 8 feet   | 0     |
| <b>Pedestrian Exposure to Vehicles</b>   |       |
| >25,000 ADT  | 6     |
| 8,000-25,000 ADT   | 3     |
| <8,000 ADT   | 0     |
| <b>Prior Vehicle-Pedestrian Crashes at Location within past Five Years</b>       |       |
| 4 or more  | 6     |
| 1 – 3  | 3     |
| <b>Environment Type</b>  |       |
| Within urbanized area (as designated by U.S. Census)                             | 6     |
| Within one mile of urbanized area (indicates an area with potential to urbanize) | 3     |
| Within a rural area  | 0     |
| <b>Population Density (Population per Square Mile)</b>                           |       |
| Low-density  | 0     |
| Medium density   | 3     |
| High-use recreational  | 6     |
| <b>Households in Poverty</b>   |       |
| % of Households in Poverty 2 x statewide average                                 | 6     |
| % of Households in Poverty above statewide average                               | 3     |



Table 6. Pedestrian Tier 2 Visual Scan Analysis

| Factor   | Score |
|--|-------|
| <b>Sidewalk Connectivity</b>   |       |
| No walkway   | 6     |
| Walkway connectivity exists but is fragmented  | 4     |
| Continuous walkway on one side of highway  | 2     |
| Continuous walkway on both sides of highway  | 0     |
| <b>Signalized Intersection Spacing or Distance to Alternate Crossing Facility</b>  |       |
| >1,320 feet  | 6     |
| 1,319 – 660 feet   | 3     |
| <660 feet  | 0     |
| <b>Attractors</b>  |       |
| Directly adjacent to known pedestrian attractors: convenience/liquor stores, schools and education facilities, parks, transit stops (approximately ¼ mile) | 6     |

A road segment was designated as a “High-Risk Road Segment” for pedestrians if the overall score after the “Tier 2” scan was greater than 48.

#### *Bicyclist Safety Action Plan*

The BSAP methodology consists of factors or environmental/facility conditions that are common to bicyclist-involved crashes. **Table 7** summarizes the factors and scoring for the analysis.

Table 7. Bicyclist High-Risk Factors

| Factor   | Score |
|--|-------|
| <b>Operating Environment/Width of Roadway</b>        |       |
| 6-Lane Highway                                       | 6     |
| 4- or 5-Lane Undivided Highway                       | 3     |
| 2- or 3-Lane Undivided Highway                       | 2     |
| 2- or 3- or 4-Lane Divided Highway                   | 1     |
| <b>Posted Travel Speed</b>                           |       |
| 50 mph or greater                                    | 6     |
| 35-45 mph  | 4     |
| 25-30 mph  | 2     |
| 20 mph or less                                       | 0     |
| <b>Paved Effective Shoulder Width/Wide Curb Lane</b> |       |
| 0-4 feet   | 6     |
| 4-8 feet   | 0     |
| <b>Bicyclist Exposure to Vehicles</b>                |       |
| >7,500 ADT   | 6     |
| 2,500-7,500 ADT                                      | 3     |
| <2,500 ADT   | 0     |
| <b>Designated U.S. Bicycle Route (USBR) 90*</b>      |       |
| Yes  | 3     |
| No   | 0     |
| <b>Environment Type</b>                              |       |
| Urban  | 6     |
| Rural  | 3     |

\*The USBR is not a crash potential factor, it is used to gain higher priority for improvements with that designation.

A road segment was designated as a “High-Risk Road Segment” for bicyclists if the overall score was equal to or greater than 20.

## Equity

The equity score discussed in the Crash Data Analysis section is noted for each PL, but it did not affect the overall rankings.

## Statewide Recommendations

### Trends

- High number of crashes at interchanges
- High number of crashes at intersections
- High number of crashes at mid-block crossings
- High number of crashes at night

### Countermeasures

- Increase visibility of people walking or riding bicycles
  - Update ADOT policies to sign and mark bike lanes at interchanges and intersections
  - Adopt pedestrian-friendly and bicyclist-friendly striping, signage, and push buttons at SPUIs and Diamond Interchanges
  - Enhance signal operations for people walking or riding bicycles
- “Self-enforcing” roads
  - Reduce curb radii at signalized intersections, traffic interchanges, and driveways where feasible
  - Install protected mid-block crossings
  - Install sidewalks and lighting
- Increase enforcement for distracted and speeding drivers

## Priority Locations Summary

The ATSAP establishes 26 Priority Locations throughout the State of Arizona with countermeasures for each location. **Figure 20** shows all the PL locations and **Table 8** lists each PL and the preliminary planning-level cost estimate of the recommended countermeasures for each location. The preliminary planning-level cost estimates are subject to change due to inflation and refinements that may be identified during final design. An indirect cost multiplier of 2.20 has been applied to the unit costs to account for indirect costs such as utility relocations and traffic control. The 2.20 indirect cost multiplier was developed as part of ADOT’s Corridor Profile Study process for use in developing preliminary planning-level cost estimates.

Figure 20. Map of ATSAP Priority Locations

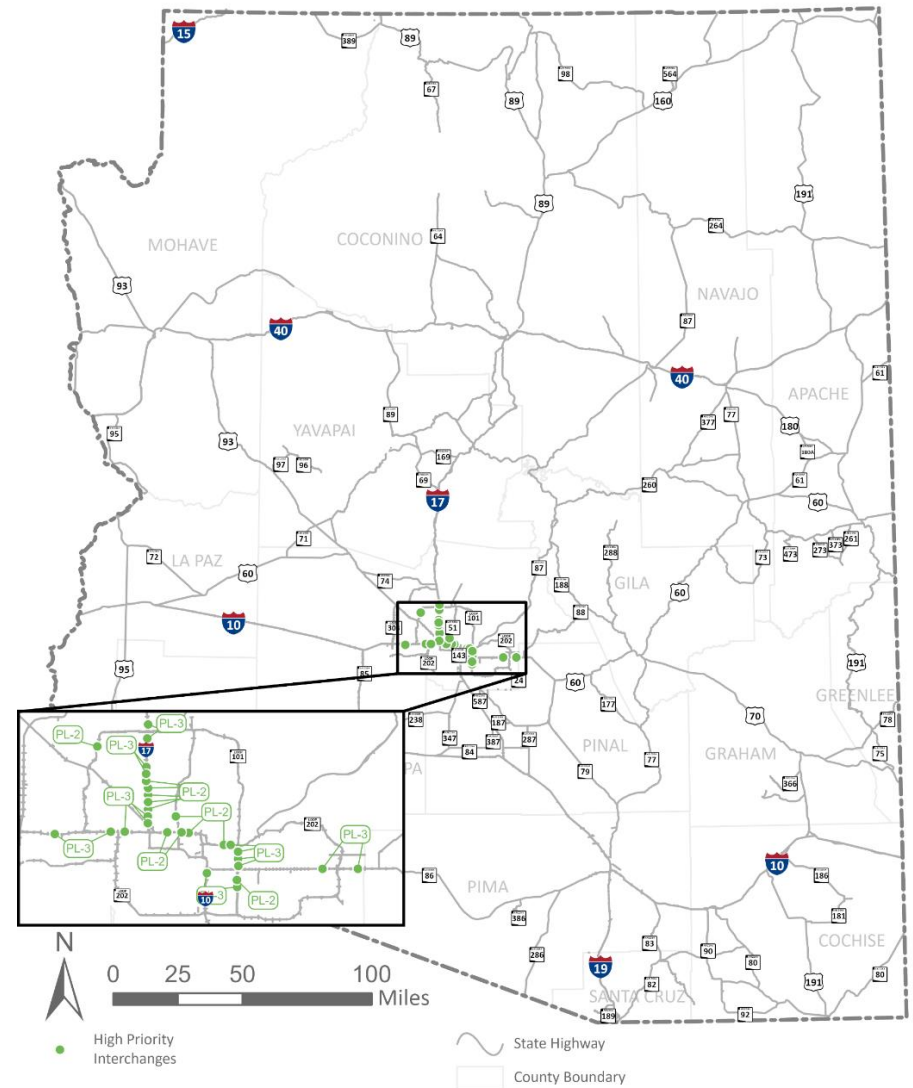
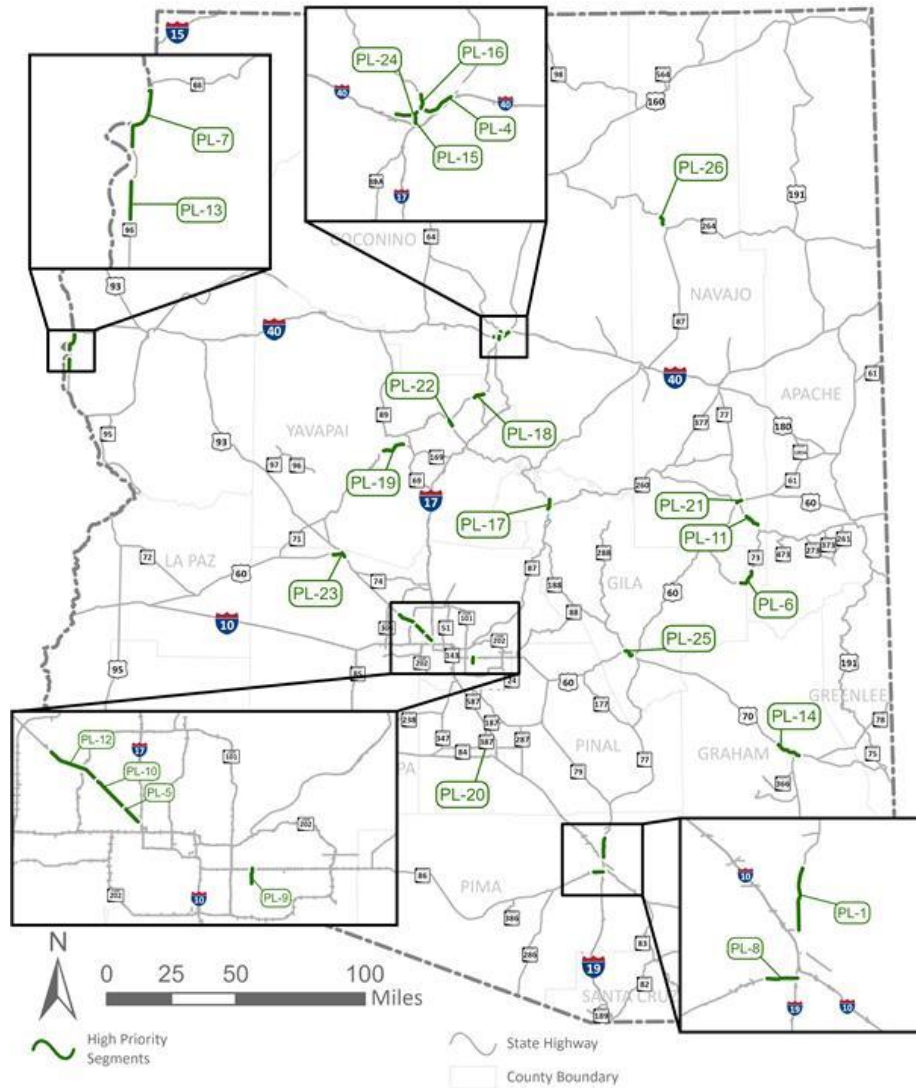




Table 8. Priority Locations Summary

| Priority Location | County   | Route Number   | Route Name                    | Mile Post Start | Mile Post End | Corridor Length | Countermeasure Planning-Level Cost Estimate |
|-------------------|----------|--|-------------------------------|-----------------|---------------|-----------------|---|
| <b>PL-1</b>       | Pima     | SR-77  | Oracle Rd                     | 69.5            | 77            | 7.5             | \$4,657,000                                 |
| <b>PL-2</b>       | Maricopa | Phoenix Area SPUI Interchanges (I-10: 7th Street; I-17: Camelback Road, Bethany Home Road, Glendale Avenue, Northern Avenue, Dunlap Avenue; SR-51: Indian School Road; SR-101: Bell Road, Guadalupe Road; SR-202: 24th Street, 32nd Street, Scottsdale Road)   |                               |                 |               |                 | \$16,368,000                                |
| <b>PL-3</b>       | Maricopa | Phoenix Area Diamond Interchanges (I-10: Dysart Road, 67th Avenue, 51st Avenue, Baseline Road; I-17: Thomas Road, Indian School Road, Peoria Avenue, Union Hills Drive, Cactus Road, Deer Valley Drive; US-60: Power Road, Signal Butte Road; SR-101: Elliot Road, Broadway Road, Southern Avenue, University Drive; SR-202: McClintock Drive) |                               |                 |               |                 | \$18,169,000                                |
| <b>PL-4</b>       | Coconino | B-40   | Route 66                      | 195.5           | 199.91        | 4.41            | \$3,884,000                                 |
| <b>PL-5</b>       | Maricopa | US-60  | Grand Ave                     | 157.5           | 160           | 2.5             | \$4,732,000                                 |
| <b>PL-6</b>       | Navajo   | SR-73  | Chief Ave                     | 333             | 340.5         | 7.5             | \$1,342,000                                 |
| <b>PL-7</b>       | Mohave   | SR-95  | Highway 95                    | 243             | 250           | 7               | \$1,040,000                                 |
| <b>PL-8</b>       | Pima     | SR-86  | Ajo Way                       | 168             | 171.63        | 3.63            | \$1,513,000                                 |
| <b>PL-9</b>       | Maricopa | SR-87  | Country Club Dr / Arizona Ave | 170.2           | 172.57        | 2.37            | \$1,293,000                                 |
| <b>PL-10</b>      | Maricopa | US-60  | Grand Ave                     | 152             | 157.5         | 5.5             | \$11,612,000                                |
| <b>PL-11</b>      | Navajo   | SR-260   | Highway 260                   | 349             | 355           | 6               | \$4,002,000                                 |
| <b>PL-12</b>      | Maricopa | US-60  | Grand Ave                     | 144             | 152           | 8               | \$3,669,000                                 |
| <b>PL-13</b>      | Mohave   | SR-95  | Highway 95                    | 235             | 239           | 4               | \$8,349,000                                 |
| <b>PL-14</b>      | Graham   | US-70  | Thatcher Blvd                 | 332.5           | 342           | 9.5             | \$2,288,000                                 |
| <b>PL-15</b>      | Coconino | SR-89A   | Milton Rd                     | 401.95          | 403.18        | 1.23            | \$965,000                                   |
| <b>PL-16</b>      | Coconino | US-180   | Humphreys St / Fort Valley Rd | 215.44          | 217           | 1.56            | \$1,038,000                                 |
| <b>PL-17</b>      | Gila     | SR-87  | Beeline Highway               | 251             | 255           | 4               | \$850,000                                   |
| <b>PL-18</b>      | Yavapai  | SR-89A   | Highway 89A                   | 369.5           | 374           | 4.5             | \$578,000                                   |
| <b>PL-19</b>      | Yavapai  | SR-69  | Highway 69                    | 287             | 296           | 9               | \$10,005,000                                |
| <b>PL-20</b>      | Pinal    | SR-387   | Pinal Ave                     | 0               | 2.5           | 2.5             | \$2,224,000                                 |
| <b>PL-21</b>      | Navajo   | US-60  | Deuce of Clubs                | 340             | 342           | 2               | \$479,000                                   |
| <b>PL-22</b>      | Yavapai  | SR-260   | Highway 260                   | 206.48          | 209           | 2.52            | \$1,669,000                                 |
| <b>PL-23</b>      | Maricopa | US-60  | Wickenburg Way                | 107             | 112.5         | 5.5             | \$457,000                                   |
| <b>PL-24</b>      | Coconino | B-40   | Route 66                      | 193.25          | 195.5         | 2.25            | \$179,000                                   |
| <b>PL-25</b>      | Gila     | US-60  | Broad St / Ash St             | 247.5           | 251.5         | 4               | \$670,000                                   |
| <b>PL-26</b>      | Navajo   | SR-264   | Highway 264                   | 378             | 381.5         | 3.5             | \$1,070,000                                 |
|                   |          |  |                               |                 |               | <b>Total</b>    | <b>\$103,102,000</b>                        |

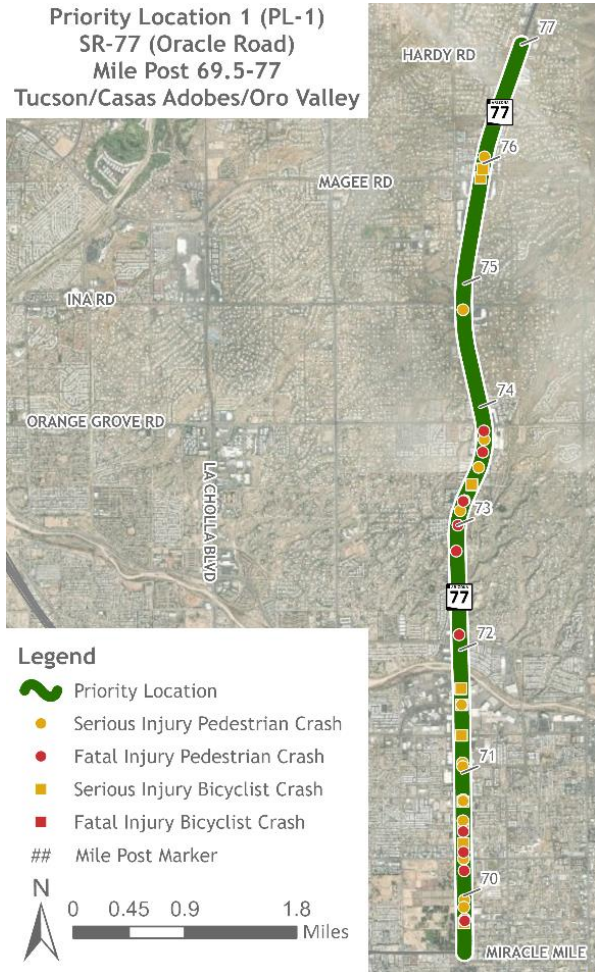
## PL-1

### Description

PL-1 is located along SR-77 from MP 69.5 to 77 in the Tucson area. PL-1 received an equity score of 18.

### Trends

- Pedestrians: 10 fatal and 18 serious injury crashes
- Bicyclists: 0 fatal and 11 serious injury crashes
- Lighting: 75% of pedestrian and 45% of bicyclist crashes are at night
- Crash Location:
  - 19 intersections
  - 18 non-intersections
  - 2 driveway access
- Mid-block: 50% of pedestrian crashes while crossing mid-block



### Countermeasures and Preliminary Planning-Level Cost Estimate

| Countermeasure  | Cost Estimate      | Notes                       | CMF Value                                  | CMF Crash Type         | CMF Crash Severity |
|---|--------------------|-----------------------------|--|------------------------|--------------------|
| <b>Install High-Visibility Crosswalk at Midblock Locations</b>            | \$160,000          | MP 74.5 and 76.15           | 0.82                                       | Vehicle/<br>Pedestrian | All                |
| <b>Install Sidewalk or Walkway</b>  | \$1,535,000        | From MP 75.9-77             | 0.598                                      | Vehicle/<br>Pedestrian | All                |
| <b>Install Highway Lighting</b>   | \$726,000          | From MP 75.9-77             | 0.31                                       | All                    | Fatal              |
| <b>Reduce Curb Radii to 30' at Signalized Intersections</b>               | \$2,145,000        | 39 curb radii reductions    | 0.8-0.9<br>depending on<br>existing radius | Vehicle/<br>Pedestrian | All                |
| <b>Enhance Signal Operations with Leading Pedestrian Intervals (LPIs)</b> | \$91,000           | 13 signalized intersections | 0.9  | All                    | All                |
| <b>TOTAL</b>  | <b>\$4,657,000</b> |                             |  |                        |                    |

### Implementation Opportunities

According to the ADOT Five Year Transportation Facilities Construction Program, ADOT has no planned projects in PL-1.

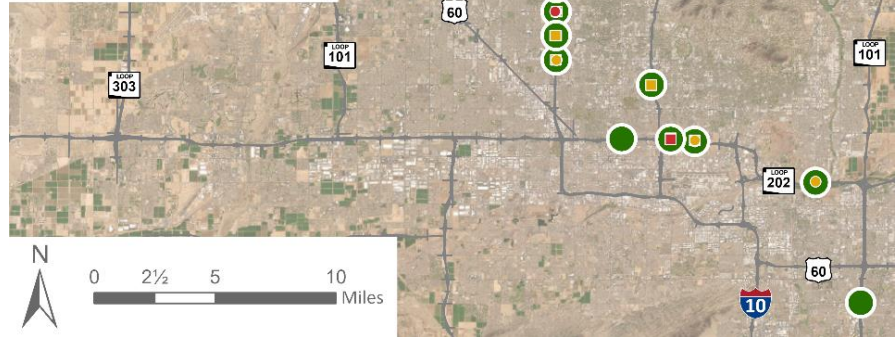
## PL-2

### Description

PL-2 is a group of 12 Single-Point Urban Interchanges (SPUI) in the Phoenix area (I-10: 7<sup>th</sup> Street; I-17: Camelback Road, Bethany Home Road, Glendale Avenue, Northern Avenue, Dunlap Avenue; SR-51: Indian School Road; SR-101: Bell Road, Guadalupe Road; SR-202: 24th Street, 32nd Street, Scottsdale Road). PL-2 received an equity score of 15.

#### Legend

- Priority Location
- Serious Injury Pedestrian Crash
- Fatal Injury Pedestrian Crash
- Serious Injury Bicyclist Crash
- Fatal Injury Bicyclist Crash



### Trends

- Pedestrians: 4 fatal and 9 serious injury crashes
- Bicyclists: 1 fatal and 13 serious injury crashes
- Crash Location:
  - 9 intersection
  - 7 ramp
  - 6 non-junction
  - 1 driveway access
  - 4 unknown
- Motorist Maneuver: 12 motorist turning and 6 motorist going straight crashes

### Countermeasures and Preliminary Planning-Level Cost Estimate

| Countermeasure   | Cost Estimate       | Notes             | CMF Value | CMF Crash Type         | CMF Crash Severity |
|--|---------------------|-------------------|-----------|------------------------|--------------------|
| Install Pedestrian/Bicyclist-Friendly Striping, Signage, and Push Buttons at SPUIs | \$5,280,000         | 12 interchanges   | -         | -                      | -                  |
| Install Signalized Crosswalk at Channelized Right-Turn Lanes                       | \$8,448,000         | 4 per interchange | -         | -                      | -                  |
| Reduce Curb Radii at Signalized Intersections                                      | \$2,640,000         | 4 per interchange | 0.82      | Vehicle/<br>Pedestrian | All                |
| <b>TOTAL</b>   | <b>\$16,368,000</b> |                   |           |                        |                    |

### Implementation Opportunities

According to the ADOT Five Year Transportation Facilities Construction Program, ADOT has one upcoming project within PL-2.

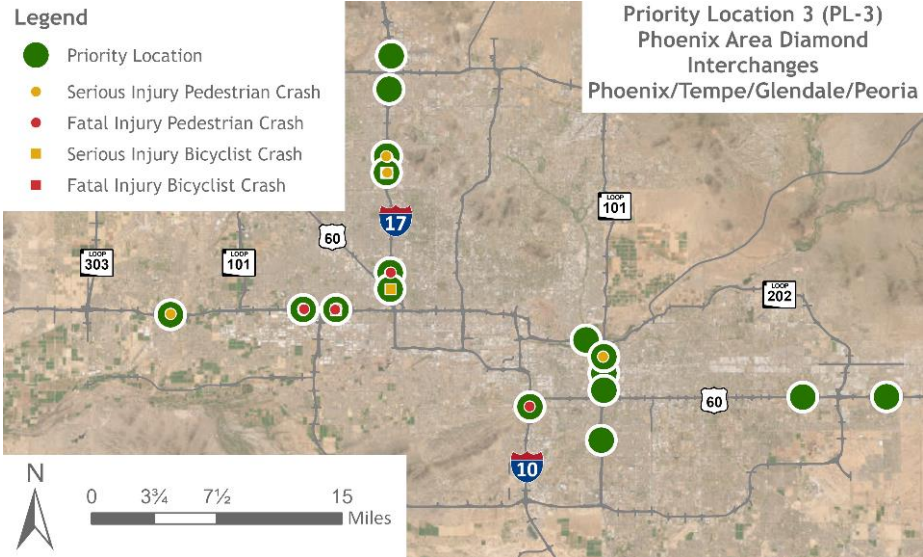
- Reconstruct the existing I-17/Camelback Road SPUI to accommodate future Valley Metro high-capacity transit extension (eSTIP ID: 8887)



## PL-3

### Description

PL-3 is a group of 17 Diamond Interchanges in the Phoenix area (I-10: Dysart Road, 67th Avenue, 51st Avenue, Baseline Road; I-17: Thomas Road, Indian School Road, Peoria Avenue, Union Hills Drive, Cactus Road, Deer Valley Drive; US-60: Power Road, Signal Butte Road; SR-101: Elliot Road, Broadway Road, Southern Avenue, University Drive; SR-202: McClintock Drive). PL-3 received an equity score of 13.



### Trends

- Pedestrians: 5 fatal and 19 serious injury crashes
- Bicyclist: 5 serious injury crashes
- Pedestrian Crash Lighting: 14 dark, 9 daylight, 1 unknown
- Motorist Maneuver: 15 motorists going straight and 9 motorists turning crashes

### Countermeasures and Preliminary Planning-Level Cost Estimate

| Countermeasure   | Cost Estimate       | Notes                  | CMF Value | CMF Crash Type         | CMF Crash Severity |
|--|---------------------|------------------------|-----------|------------------------|--------------------|
| <b>Install Pedestrian/Bicyclist-Friendly Striping, Signage, and Push Buttons at Diamond Interchanges</b> | \$7,480,000         | 17 interchanges        | -         | -                      | -                  |
| <b>Improve Intersection Lighting</b>   | \$1,173,000         | 17 interchanges        | 0.679     | All                    | All                |
| <b>Reduce Curb Radii at Signalized Intersections</b>   | \$3,740,000         | 4 per interchange      | 0.82      | Vehicle/<br>Pedestrian | All                |
| <b>Upgrade Existing Crosswalk to High-Visibility Crosswalk</b>   | \$5,576,000         | 4 per interchange      | 0.6       | Vehicle/<br>Pedestrian | All                |
| <b>Install Bike Lanes</b>  | \$200,000           | ¼ mile per interchange | 0.435     | All                    | All                |
| <b>TOTAL</b>   | <b>\$18,169,000</b> |                        |           |                        |                    |

### Implementation Opportunities

According to the ADOT Five Year Transportation Facilities Construction Program, ADOT has one upcoming project within PL-3.

- Reconstruct the existing I-17/Indian School Road Diamond Interchange (eSTIP ID: 8888)

## PL-4

### Description

PL-4 is located along B-40/Route 66 from MP 195.5 to 199.91 in the Flagstaff area. PL-4 received an equity score of 14.



### Trends

- Pedestrians: 5 fatal and 13 serious injury crashes
- Bicyclists: 0 fatal and 3 serious injury crashes
- Lighting: 15 crashes in dark/dusk and 6 in daylight conditions
- Motorist Maneuver: 18 motorists going straight and 3 motorists turning crashes

### Countermeasures and Preliminary Planning-Level Cost Estimate

| Countermeasure  | Cost Estimate      | Notes                    | CMF Value                            | CMF Crash Type     | CMF Crash Severity |
|---|--------------------|--------------------------|--------------------------------------|--------------------|--------------------|
| Reduce Curb Radii to 30' at Signalized Intersections    | \$605,000          | 11 curb radii reductions | 0.8-0.9 depending on existing radius | Vehicle/Pedestrian | All                |
| Install Highway Lighting                                | \$2,911,000        | MP 195.5-199.91          | 0.31                                 | All                | Fatal              |
| Install High-Visibility Crosswalk at Midblock Locations | \$160,000          | 2 midblock crosswalks    | 0.82                                 | Vehicle/Pedestrian | All                |
| Install Bike Lanes                                      | \$208,000          | MP 195.5-199.91          | 0.435                                | All                | All                |
| <b>TOTAL</b>  | <b>\$3,884,000</b> |                          |                                      |                    |                    |

### Implementation Opportunities

According to the ADOT Five Year Transportation Facilities Construction Program, ADOT has no planned projects in PL-4.



## PL-5

### Description

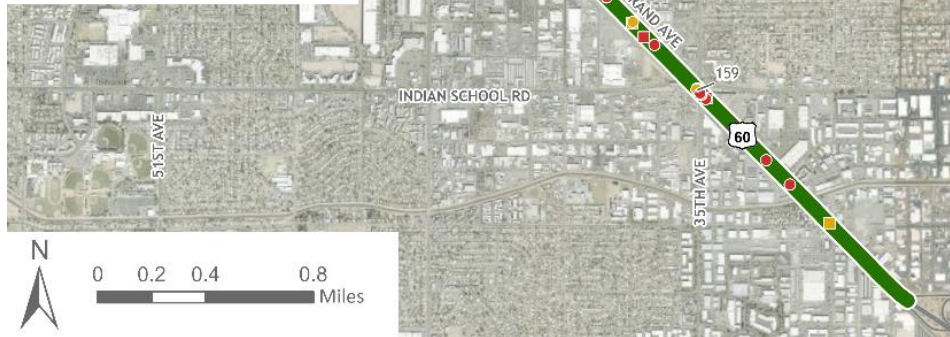
PL-5 is located along US-60 from MP 157.5 to 160 in the Phoenix area. PL-5 received an equity score of 14.

### Trends

- Pedestrians: 8 fatal and 3 serious injury crashes
- Bicyclists: 1 fatal and 5 serious injury crashes
- Intersections: All 6 bike crashes occurred at intersections
- Lighting: 15 dark/dusk and 2 daylight conditions
- Crash Location:
  - 11 intersection
  - 5 non-intersection
  - 1 ramp

#### Legend

- Priority Location
- Serious Injury Pedestrian Crash
- Fatal Injury Pedestrian Crash
- Serious Injury Bicyclist Crash
- Fatal Injury Bicyclist Crash
- ## Mile Post Marker



**Priority Location 5 (PL-5)**  
Grand Avenue  
Mile Post 157.5-160  
Phoenix

### Countermeasures and Preliminary Planning-Level Cost Estimate

| Countermeasure   | Cost Estimate      | Notes        | CMF Value                                  | CMF Crash Type         | CMF Crash Severity |
|--|--------------------|--------------|--|------------------------|--------------------|
| Install Sidewalk or Walkway  | \$3,488,000        | MP 157.5-160 | 0.598                                      | Vehicle/<br>Pedestrian | All                |
| Install Highway Lighting   | \$990,000          | MP 158.5-160 | 0.31                                       | All                    | Fatal              |
| Reduce Curb Radii to 35' at Signalized Intersections               | \$165,000          | MP 159       | 0.8-0.9<br>depending on<br>existing radius | Vehicle/<br>Pedestrian | All                |
| Upgrade Existing Crosswalk to High-Visibility Crosswalk            | \$82,000           | MP 159       | 0.6  | Vehicle/<br>Pedestrian | All                |
| Enhance Signal Operations with Leading Pedestrian Intervals (LPIs) | \$7,000            | MP 159       | 0.9  | All                    | All                |
| <b>TOTAL</b>   | <b>\$4,732,000</b> |              |  |                        |                    |

### Implementation Opportunities

According to the ADOT Five Year Transportation Facilities Construction Program, ADOT has two upcoming projects within PL-5.

- Reconstruct the existing US-60/Grand Avenue, 35<sup>th</sup> Avenue and Indian School Road four-leg intersection (eSTIP 8893); consider adding a walkability audit to this project.
- Pavement rehabilitation on US-60 from MP 150 to 160 (eSTIP 103682)



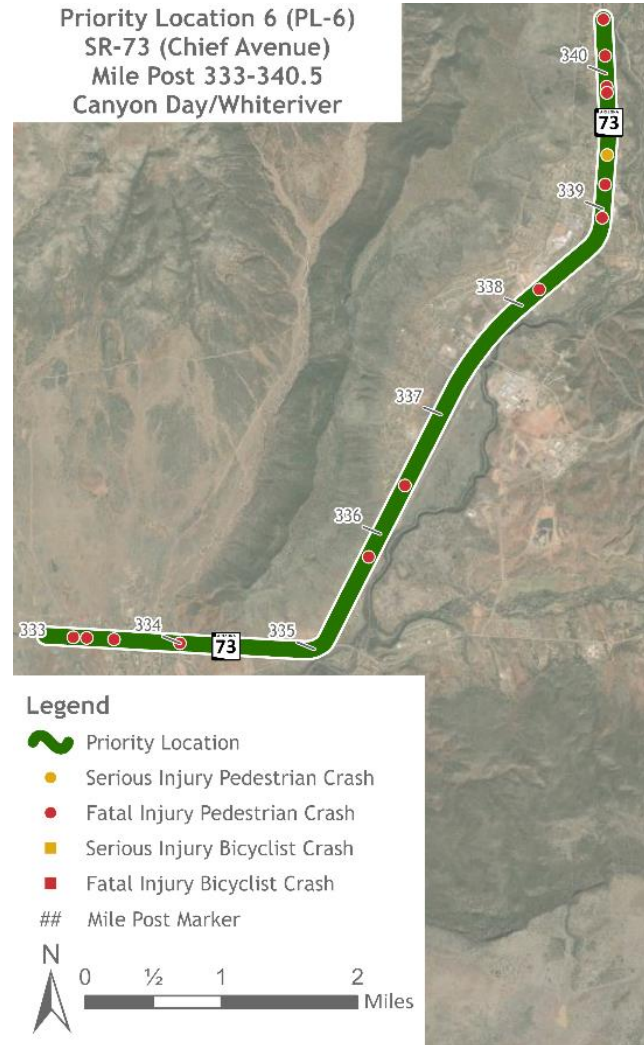
## PL-6

### Description

PL-6 is located along SR-73 from MP 333 to 340.5 in the Whiteriver area. PL-5 received an equity score of 13.

### Trends

- Pedestrians: 12 fatal and 1 serious injury crashes
- Bicyclists: 1 fatal and 0 serious injury crashes
- Lighting: Only 1 crash occurred during daylight
- Crash Location:
  - 8 non-intersection
  - 6 unknown



### Countermeasures and Preliminary Planning-Level Cost Estimate

| Countermeasure  | Cost Estimate      | Notes          | CMF Value                            | CMF Crash Type     | CMF Crash Severity |
|---|--------------------|----------------|--------------------------------------|--------------------|--------------------|
| <b>Install Highway Lighting</b>                             | \$1,122,000        | MP 334.9-336.6 | 0.31                                 | All                | Fatal              |
| <b>Reduce Curb Radii to 35' at Signalized Intersections</b> | \$220,000          | MP 337.6       | 0.8-0.9 depending on existing radius | Vehicle/Pedestrian | All                |
| <b>Increase Enforcement</b>                                 | -                  | -              | -                                    | -                  | -                  |
| <b>TOTAL</b>  | <b>\$1,342,000</b> |                |                                      |                    |                    |

### Implementation Opportunities

According to the ADOT Five Year Transportation Facilities Construction Program, ADOT has one upcoming project within PL-6.

- Install street lighting along SR-73 from MP 333.2 to 334.0 (eSTIP 103655)

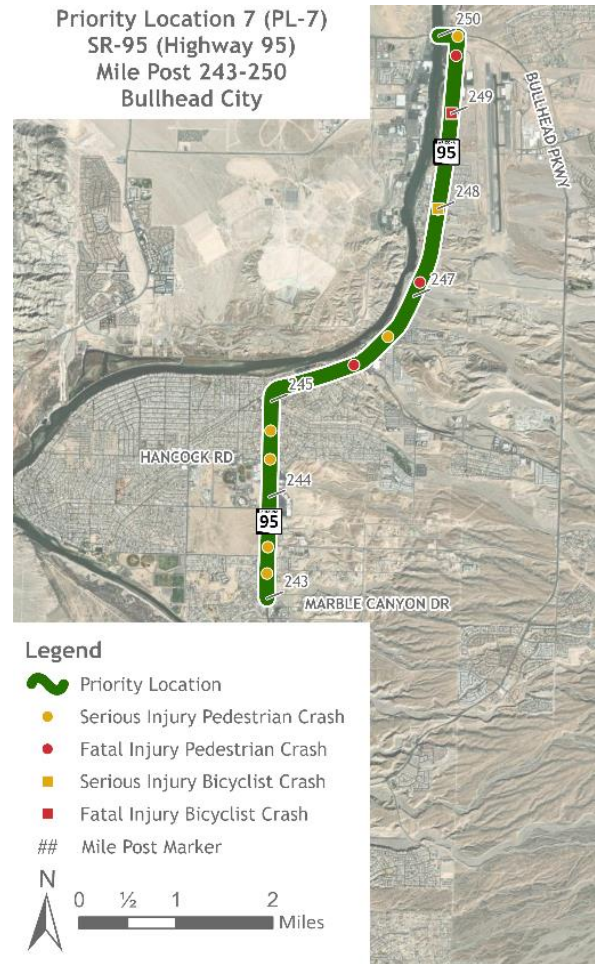
## PL-7

### Description

PL-7 is located along SR-95 from MP 243 to 250 in the Bullhead City area. PL-7 received an equity score of 13.

### Trends

- Pedestrians: 4 fatal and 6 serious injury crashes
- Bicyclists: 1 fatal and 1 serious injury crashes
- Crash Location:
  - All pedestrian crashes were non-intersection crashes
  - Bike crashes were split (1 non-intersection and 1 intersection)
- Age: 67% of fatal and serious injury crashes involved victims over 50 years old (30% of all Priority Locations involve victims over 50 years old)



### Countermeasures and Preliminary Planning-Level Cost Estimate

| Countermeasure  | Cost Estimate      | Notes                    | CMF Value                            | CMF Crash Type      | CMF Crash Severity |
|---|--------------------|--------------------------|--------------------------------------|---------------------|--------------------|
| Reduce Curb Radii to 35' at Signalized Intersections    | \$880,000          | 16 curb radii reductions | 0.8-0.9 depending on existing radius | Vehicle/ Pedestrian | All                |
| Install High-Visibility Crosswalk at Midblock Locations | \$160,000          | MP 244.6 and 245.6       | 0.6                                  | Vehicle/ Pedestrian | All                |
| Increase Enforcement                                    | -                  | -                        | -                                    | -                   | -                  |
| <b>TOTAL</b>  | <b>\$1,040,000</b> |                          |                                      |                     |                    |

### Implementation Opportunities

According to the ADOT Five Year Transportation Facilities Construction Program, ADOT has no planned projects in PL-7.

## PL-8

### Description

PL-8 is located along SR-86 from MP 168 to 171.63 in the Tucson area. PL-8 received an equity score of 17.



### Trends

- Pedestrians: 6 fatal and 2 serious injury crashes
- Bicyclists: 0 fatal and 5 serious injury crashes
- Lighting: 11 dark/dusk condition crashes and 2 daylight crashes
- Crash Location:
  - 8 non-intersection
  - 3 intersection
  - 2 unknown

### Countermeasures and Preliminary Planning-Level Cost Estimate

| Countermeasure  | Cost Estimate      | Notes                   | CMF Value                            | CMF Crash Type     | CMF Crash Severity |
|---|--------------------|-------------------------|--------------------------------------|--------------------|--------------------|
| <b>Install Highway Lighting</b>   | \$1,320,000        | MP 168-170              | 0.31                                 | All                | Fatal              |
| <b>Enhance Signal Operations with Leading Pedestrian Intervals (LPIs)</b> | \$28,000           | 4 intersections         | 0.9                                  | All                | All                |
| <b>Reduce Curb Radii to 30' at Signalized Intersections</b>               | \$165,000          | 3 curb radii reductions | 0.8-0.9 depending on existing radius | Vehicle/Pedestrian | All                |
| <b>TOTAL</b>  | <b>\$1,513,000</b> |                         |                                      |                    |                    |

### Implementation Opportunities

According to the ADOT Five Year Transportation Facilities Construction Program, ADOT has no planned projects in PL-8.



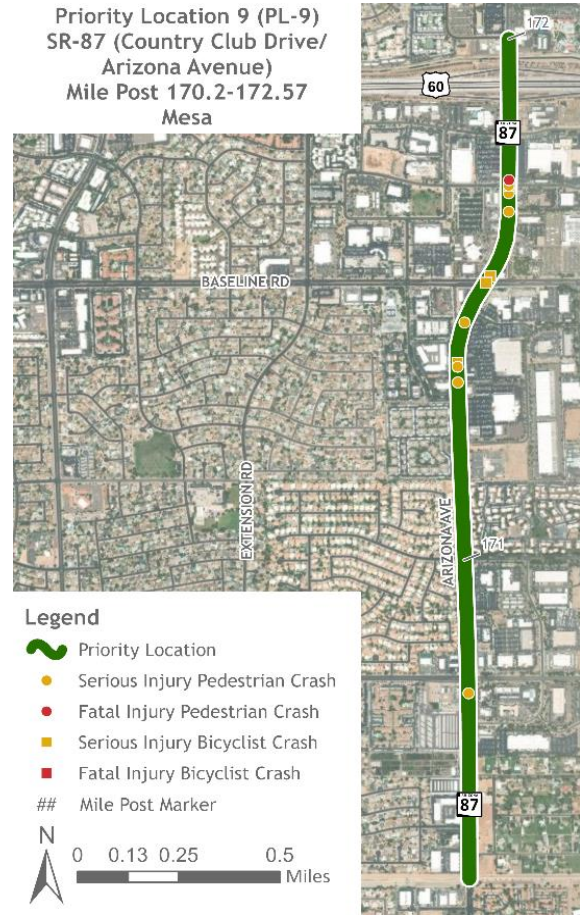
## PL-9

### Description

PL-9 is located along SR-87 from MP 170.2 to 172.57 in the Mesa area. PL-9 received an equity score of 14.

### Trends

- Pedestrians: 1 fatal and 6 serious injury crashes
- Bicyclists: 0 fatal and 5 serious injury crashes
- Crash Location:
  - 5 intersection
  - 7 non-intersection
- Motorist Maneuver: 9 motorists going straight crashes



### Countermeasures and Preliminary Planning-Level Cost Estimate

| Countermeasure  | Cost Estimate      | Notes                    | CMF Value                            | CMF Crash Type         | CMF Crash Severity |
|---|--------------------|--------------------------|--------------------------------------|------------------------|--------------------|
| <b>Reduce Curb Radii to 25.5' at Signalized Intersections</b>             | \$1,045,000        | 19 curb radii reductions | 0.8-0.9 depending on existing radius | Vehicle/<br>Pedestrian | All                |
| <b>Enhance Signal Operations with Leading Pedestrian Intervals (LPIs)</b> | \$56,000           | 8 intersections          | 0.9                                  | All                    | All                |
| <b>Install Bike Lanes</b>   | \$112,000          | MP 170.2-172.57          | 0.435                                | All                    | All                |
| <b>Install High-Visibility Crosswalk at Midblock Locations</b>            | \$80,000           | MP 171.4                 | 0.6                                  | Vehicle/<br>Pedestrian | All                |
| <b>TOTAL</b>  | <b>\$1,293,000</b> |                          |                                      |                        |                    |

### Implementation Opportunities

According to the ADOT Five Year Transportation Facilities Construction Program, ADOT has one upcoming project within PL-9.

- Pavement rehabilitation on SR-87 from MP 170.19 to 171.75 (eSTIP 103122)

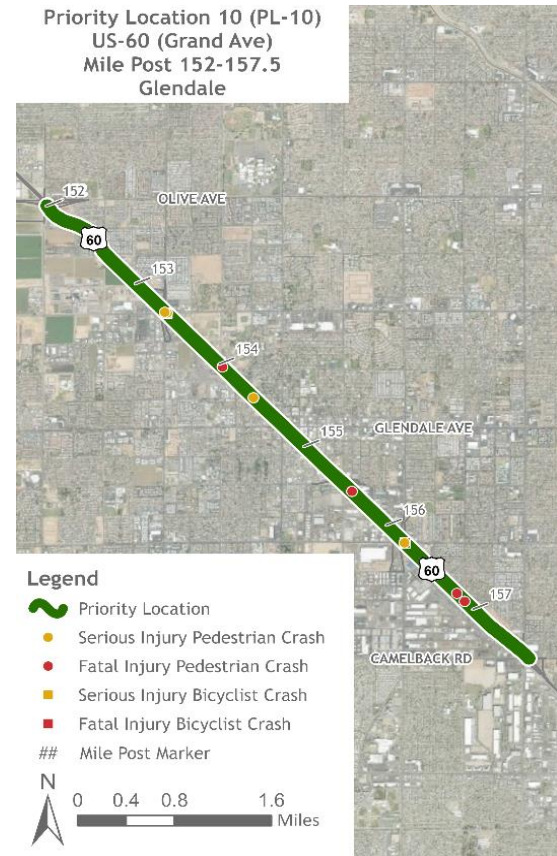
## PL-10

### Description

PL-10 is located along US-60 from MP 152 to 157.5 in the Glendale area. PL-10 received an equity score of 19.

### Trends

- Pedestrians: 4 fatal and 3 serious injury crashes
- Bicyclists: 2 fatal and 2 serious injury crashes
- Lighting:
  - Pedestrian crashes were mostly dark (5 dark, 1 unknown, 1 daylight)
  - Bicyclist crashes were mostly light (3 daylight, 1 dark)
- Motorist Maneuver: 10 crashes with motorist going straight and 1 unknown



### Countermeasures and Preliminary Planning-Level Cost Estimate

| Countermeasure  | Cost Estimate       | Notes                        | CMF Value                                  | CMF Crash Type         | CMF Crash Severity |
|---|---------------------|------------------------------|--|------------------------|--------------------|
| <b>Install Sidewalk or Walkway</b>  | \$7,673,000         | South Side from MP 152-157.5 | 0.598                                      | Vehicle/<br>Pedestrian | All                |
| <b>Install Highway Lighting</b>   | \$3,630,000         | MP 152-157.5                 | 0.31                                       | All                    | Fatal              |
| <b>Reduce Curb Radii to 35' at Signalized Intersections</b>               | \$220,000           | 4 curb radii reductions      | 0.8-0.9<br>depending on<br>existing radius | Vehicle/<br>Pedestrian | All                |
| <b>Upgrade Existing Crosswalk to High-Visibility Crosswalk</b>            | \$82,000            | MP 156.2                     | 0.6  | Vehicle/<br>Pedestrian | All                |
| <b>Enhance Signal Operations with Leading Pedestrian Intervals (LPIs)</b> | \$7,000             | MP 156.2                     | 0.9  | All                    | All                |
| <b>TOTAL</b>  | <b>\$11,612,000</b> |                              |  |                        |                    |

### Implementation Opportunities

According to the ADOT Five Year Transportation Facilities Construction Program, ADOT has one upcoming project within PL-10.

- Pavement rehabilitation on US-60 from MP 150 to 160 (eSTIP 103682)

## PL-11

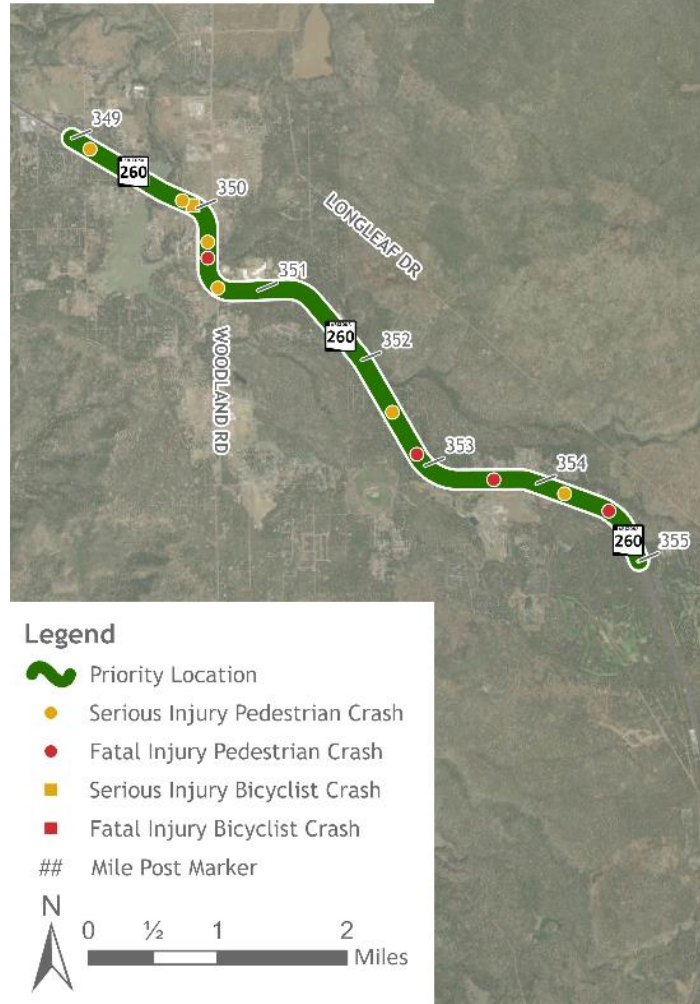
### Description

PL-11 is located along SR-260 from MP 349 to 355 in the Lakeside area. PL-11 received an equity score of 10.

### Trends

- Pedestrians: 4 fatal and 6 serious injury crashes
- Bicyclists: 0 fatal and 1 serious injury crashes
- Lighting: 4 crashes occurred in daylight, 5 in dark, and 2 unknown
- Crash Location:
  - 3 non-intersection
  - 1 intersection
  - 7 unknown

Priority Location 11 (PL-11)  
SR-260 (Highway 260)  
Mile Post 349-355  
Lakeside



### Countermeasures and Preliminary Planning-Level Cost Estimate

| Countermeasure   | Cost Estimate      | Notes           | CMF Value | CMF Crash Type | CMF Crash Severity |
|--|--------------------|-----------------|-----------|----------------|--------------------|
| Install Highway Lighting   | \$3,960,000        | MP 349-355      | 0.31      | All            | Fatal              |
| Enhance Signal Operations with Leading Pedestrian Intervals (LPIs) | \$42,000           | 6 intersections | 0.9       | All            | All                |
| <b>TOTAL</b>   | <b>\$4,002,000</b> |                 |           |                |                    |

### Implementation Opportunities

According to the ADOT Five Year Transportation Facilities Construction Program, ADOT has one upcoming project within PL-11.

- Pavement rehabilitation on SR-260 from MP 346 to 357 (eSTIP 103948)



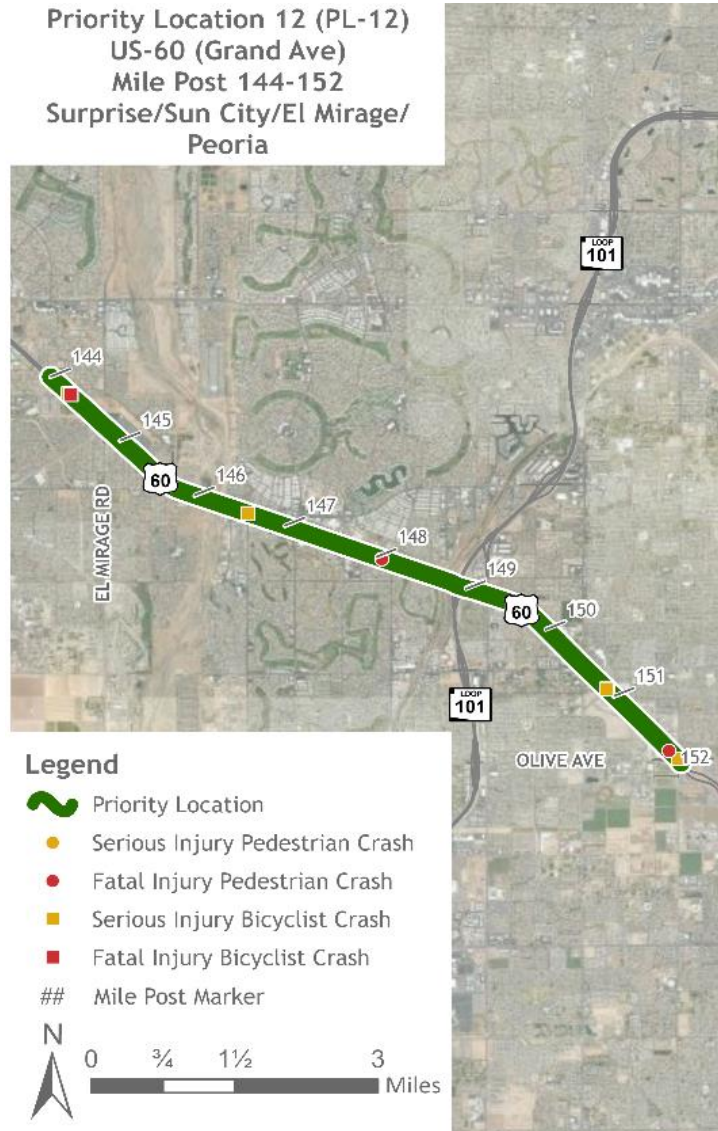
## PL-12

### Description

PL-12 is located along US-60 from MP 144 to 152 in the Sun City area. PL-12 received an equity score of 15.

### Trends

- Pedestrian: 2 fatal crashes
- Bicyclists: 1 fatal and 5 serious injury crashes
- Lighting: 6 dark lighted crashes and 2 daylight crashes
- Crash Location:
  - 4 intersection
  - 2 non-intersection
  - 2 unknown
- Motorist Maneuver: 5 motorists going straight crashes



### Countermeasures and Preliminary Planning-Level Cost Estimate

| Countermeasure  | Cost Estimate      | Notes                        | CMF Value | CMF Crash Type | CMF Crash Severity |
|---|--------------------|------------------------------|-----------|----------------|--------------------|
| <b>Install Highway Lighting</b>   | \$3,564,000        | North side from MP 144-149.4 | 0.31      | All            | Fatal              |
| <b>Enhance Signal Operations with Leading Pedestrian Intervals (LPIs)</b> | \$105,000          | 15 intersections             | 0.9       | All            | All                |
| <b>TOTAL</b>  | <b>\$3,669,000</b> |                              |           |                |                    |

### Implementation Opportunities

According to the ADOT Five Year Transportation Facilities Construction Program, ADOT has one upcoming project within PL-12.

- Pavement rehabilitation on US-60 from MP 150 to 160 (eSTIP 103682)

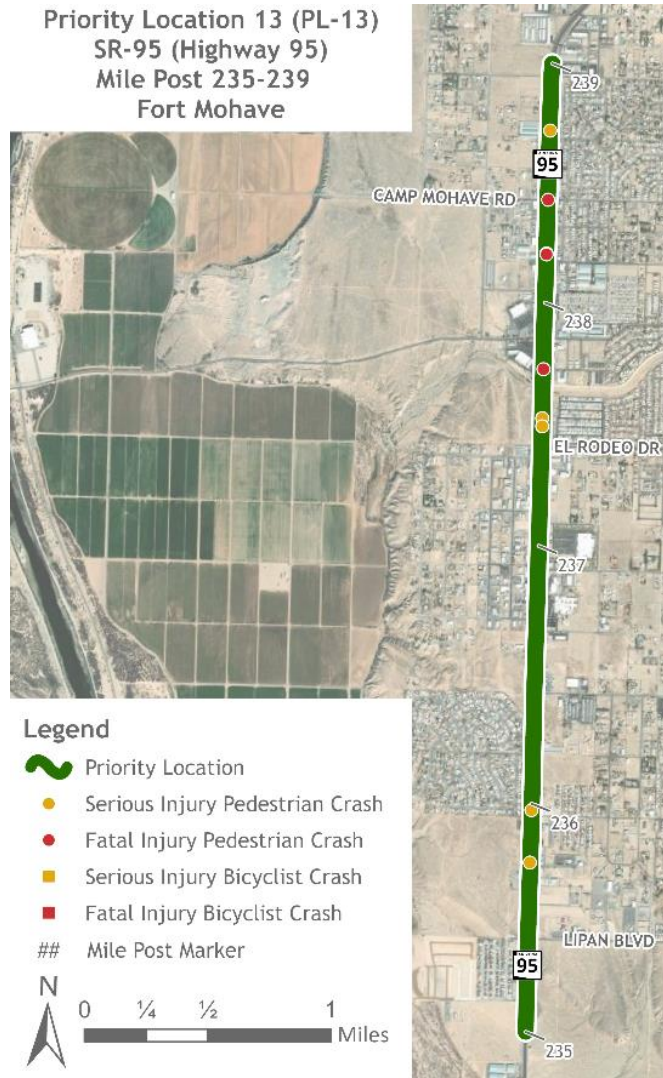
## PL-13

### Description

PL-13 is located along SR-95 from MP 235 to 239 in the Fort Mohave area. PL-13 received an equity score of 9.

### Trends

- Pedestrians: 4 fatal and 5 serious injury crashes
- Gender: 66% of fatal and serious injury crashes involved female victims (23% of all PLs involve female victims)
- Lighting: All pedestrian crashes occurred in dark conditions
- Motorist Maneuver: All pedestrian crashes involved vehicles going straight



### Countermeasures and Preliminary Planning-Level Cost Estimate

| Countermeasure  | Cost Estimate      | Notes           | CMF Value | CMF Crash Type         | CMF Crash Severity |
|---|--------------------|-----------------|-----------|------------------------|--------------------|
| <b>Install Highway Lighting</b>   | \$2,640,000        | MP 235-239      | 0.31      | All                    | Fatal              |
| <b>Install Sidewalk or Walkway</b>  | \$5,580,000        | MP 235-239      | 0.598     | Vehicle/<br>Pedestrian | All                |
| <b>Install High-Visibility Crosswalk at Midblock Locations</b>            | \$80,000           | MP 235.9        | 0.6       | Vehicle/<br>Pedestrian | All                |
| <b>Enhance Signal Operations with Leading Pedestrian Intervals (LPIs)</b> | \$49,000           | 7 intersections | 0.9       | All                    | All                |
| <b>TOTAL</b>  | <b>\$8,349,000</b> |                 |           |                        |                    |

### Implementation Opportunities

According to the ADOT Five Year Transportation Facilities Construction Program, ADOT has no planned projects in PL-13.



## PL-14

### Description

PL-14 is located along US-70 from MP 332.5 to 342 in the Safford area. PL-14 received an equity score of 8.

### Trends

- Pedestrians: 4 fatal and 2 serious injury crashes
- Bicyclists: 0 fatal and 1 serious injury crashes
- Lighting: 100% of pedestrian crashes were dark conditions
- Intersection: 100% of bicyclist crashes involved right-turning vehicles



### Countermeasures and Preliminary Planning-Level Cost Estimate

| Countermeasure  | Cost Estimate      | Notes                   | CMF Value                                  | CMF Crash Type         | CMF Crash Severity |
|---|--------------------|-------------------------|--|------------------------|--------------------|
| <b>Install Highway Lighting</b>   | \$1,980,000        | MP 332.335.5            | 0.31                                       | All                    | Fatal              |
| <b>Install High-Visibility Crosswalk at Midblock Locations</b>            | \$80,000           | MP 336.1                | 0.6  | Vehicle/<br>Pedestrian | All                |
| <b>Reduce Curb Radii to 35' at Signalized Intersections</b>               | \$165,000          | 3 curb radii reductions | 0.8-0.9<br>depending on<br>existing radius | Vehicle/<br>Pedestrian | All                |
| <b>Enhance Signal Operations with Leading Pedestrian Intervals (LPIs)</b> | \$63,000           | 9 intersections         | 0.9  | All                    | All                |
| <b>TOTAL</b>  | <b>\$2,288,000</b> |                         |  |                        |                    |

### Implementation Opportunities

According to the ADOT Five Year Transportation Facilities Construction Program, ADOT has two upcoming projects within PL-14.

- Pavement rehabilitation on US-70 from MP 330 to 335 (eSTIP 104412)
- Pavement rehabilitation on US-70 from MP 335 to 340 (eSTIP 103723)



## PL-15

### Description

PL-15 is located along SR-89A from MP 401.95 to 403.18 in the Flagstaff area. PL-15 received an equity score of 13.

### Trends

- Pedestrians: 2 fatal and 5 serious injury crashes
- Bicyclists: 0 fatal and 1 serious injury crashes
- Lighting: 4 daylight crashes and 4 dark crashes
- Crash Location:
  - 2 intersection
  - 6 non-intersection



### Countermeasures and Preliminary Planning-Level Cost Estimate

| Countermeasure   | Cost Estimate    | Notes            | CMF Value | CMF Crash Type | CMF Crash Severity |
|--|------------------|------------------|-----------|----------------|--------------------|
| Install Retroreflective Tape on Vehicular Signal Heads             | \$60,000         | 60 signal heads  | 0.85      | All            | All                |
| Reduce Speed Limit to 25 MPH                                       | -                | MP 401.95-403.18 | 0.74      | All            | All                |
| Install Highway Lighting   | \$812,000        | MP 401.95-403.18 | 0.31      | All            | Fatal              |
| Install Bike Lanes   | \$58,000         | MP 401.95-403.18 | 0.435     | All            | All                |
| Enhance Signal Operations with Leading Pedestrian Intervals (LPIs) | \$35,000         | 5 intersections  | 0.9       | All            | All                |
| <b>TOTAL</b>   | <b>\$965,000</b> |                  |           |                |                    |

### Implementation Opportunities

According to the ADOT Five Year Transportation Facilities Construction Program, ADOT has no planned projects in PL-15.

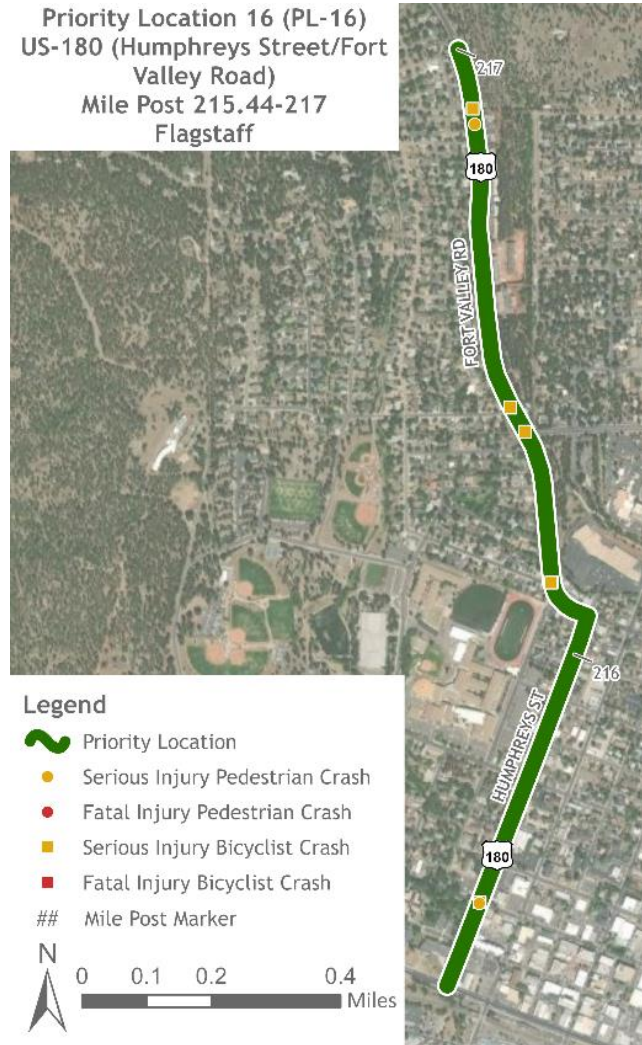
## PL-16

### Description

PL-16 is located along US-180 from MP 215.44 to 217 in the Flagstaff area. PL-16 received an equity score of 6.

### Trends

- Pedestrians: 2 serious injury crashes
- Bicyclists: 6 serious injury crashes
- Lighting: 6 daylight and 2 dark crashes
- Motorist Maneuver:
  - 3 motorist turning left crashes
  - 2 motorist turning right crashes



### Countermeasures and Preliminary Planning-Level Cost Estimate

| Countermeasure   | Cost Estimate      | Notes  | CMF Value | CMF Crash Type         | CMF Crash Severity |
|--|--------------------|--|-----------|------------------------|--------------------|
| <b>Install Highway Lighting</b>                                | \$660,000          | East side from MP 216-217                              | 0.31      | All                    | Fatal              |
| <b>Upgrade Existing Crosswalk to High-Visibility Crosswalk</b> | \$246,000          | 3 intersections  | 0.6       | Vehicle/<br>Pedestrian | All                |
| <b>Increase Enforcement</b>                                    | -                  | -  | -         | -                      | -                  |
| <b>Install Pedestrian Refuge Island</b>                        | \$132,000          | Fort Valley Rd/Forest Ave & Fort Valley Rd/Anderson Rd | 0.685     | Vehicle/<br>Pedestrian | All                |
| <b>TOTAL</b>   | <b>\$1,038,000</b> |  |           |                        |                    |

### Implementation Opportunities

According to the ADOT Five Year Transportation Facilities Construction Program, ADOT has no planned projects in PL-16.



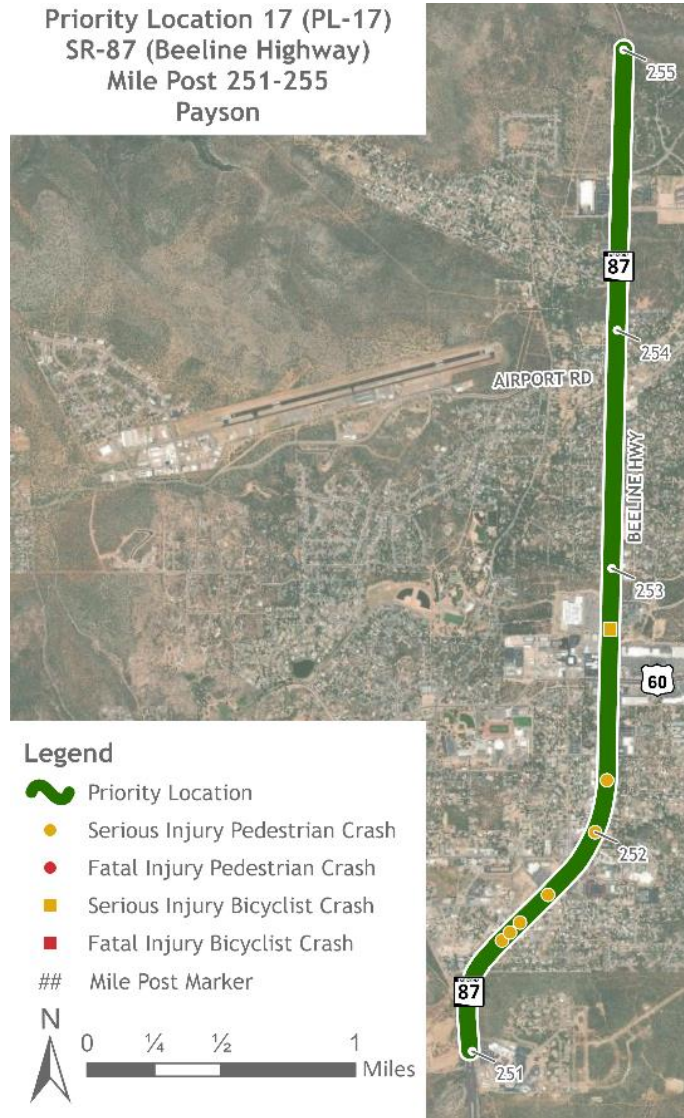
## PL-17

### Description

PL-17 is located along SR-87 from MP 251 to 255 in the Payson area. PL-17 received an equity score of 9.

### Trends

- Pedestrians: 6 serious injury crashes
- Bicyclists: 1 serious injury crash
- Lighting: 5 daylight and 2 dark crashes
- Crash Location:
  - 4 intersection
  - 3 non-intersection



### Countermeasures and Preliminary Planning-Level Cost Estimate

| Countermeasure   | Cost Estimate    | Notes                   | CMF Value                            | CMF Crash Type         | CMF Crash Severity |
|--|------------------|-------------------------|--------------------------------------|------------------------|--------------------|
| <b>Reduce Curb Radii to 30' at Signalized Intersections</b>    | \$440,000        | 8 curb radii reductions | 0.8-0.9 depending on existing radius | Vehicle/<br>Pedestrian | All                |
| <b>Upgrade Existing Crosswalk to High-Visibility Crosswalk</b> | \$410,000        | 5 intersections         | 0.6                                  | Vehicle/<br>Pedestrian | All                |
| <b>TOTAL</b>   | <b>\$850,000</b> |                         |                                      |                        |                    |

### Implementation Opportunities

According to the ADOT Five Year Transportation Facilities Construction Program, ADOT has two upcoming projects within PL-17.

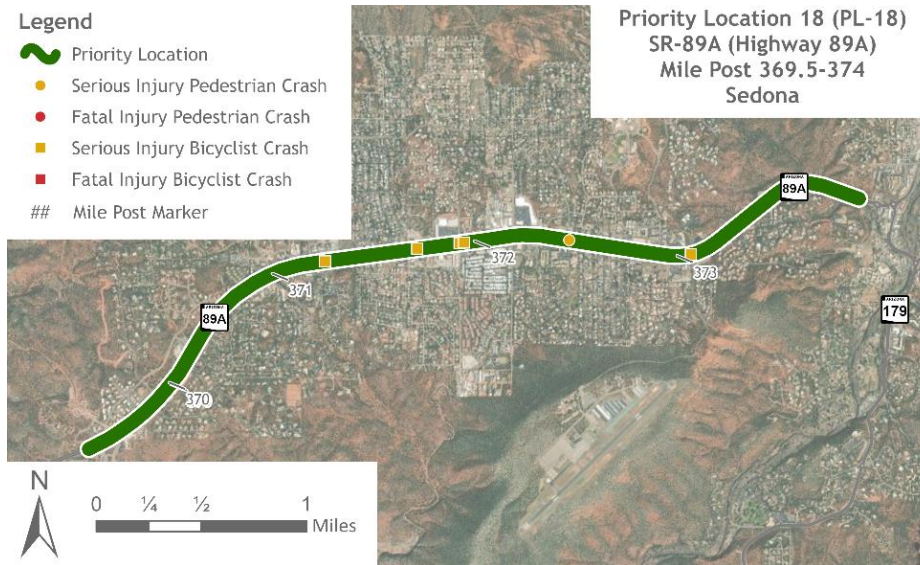
- Pavement rehabilitation on SR-87 from MP 250.9 to 254.7 (eSTIP 103123)
- Traffic signal communication upgrade from MP 250.9 to 254.9 (eSTIP 103587)



## PL-18

### Description

PL-18 is located along SR-89A from MP 369.5 to 374 in the Sedona area. PL-18 received an equity score of 6.



### Trends

- Pedestrian: 2 serious injury crashes
- Bicyclists: 5 serious injury crashes
- Crash Locations:
  - 3 intersection
  - 2 non-intersection
  - 2 driveway

### Countermeasures and Preliminary Planning-Level Cost Estimate

| Countermeasure   | Cost Estimate    | Notes                   | CMF Value                            | CMF Crash Type         | CMF Crash Severity |
|--|------------------|-------------------------|--------------------------------------|------------------------|--------------------|
| Install Bike Lanes   | \$57,000         | MP 369.5-370.7          | 0.435                                | All                    | All                |
| Reduce Curb Radii to 35' at Signalized Intersections               | \$385,000        | 7 curb radii reductions | 0.8-0.9 depending on existing radius | Vehicle/<br>Pedestrian | All                |
| Enhance Signal Operations with Leading Pedestrian Intervals (LPIs) | \$56,000         | 8 intersections         | 0.9                                  | All                    | All                |
| Install High-Visibility Crosswalk at Midblock Locations            | \$80,000         | MP 370.6                | 0.6                                  | Vehicle/<br>Pedestrian | All                |
| <b>TOTAL</b>   | <b>\$578,000</b> |                         |                                      |                        |                    |

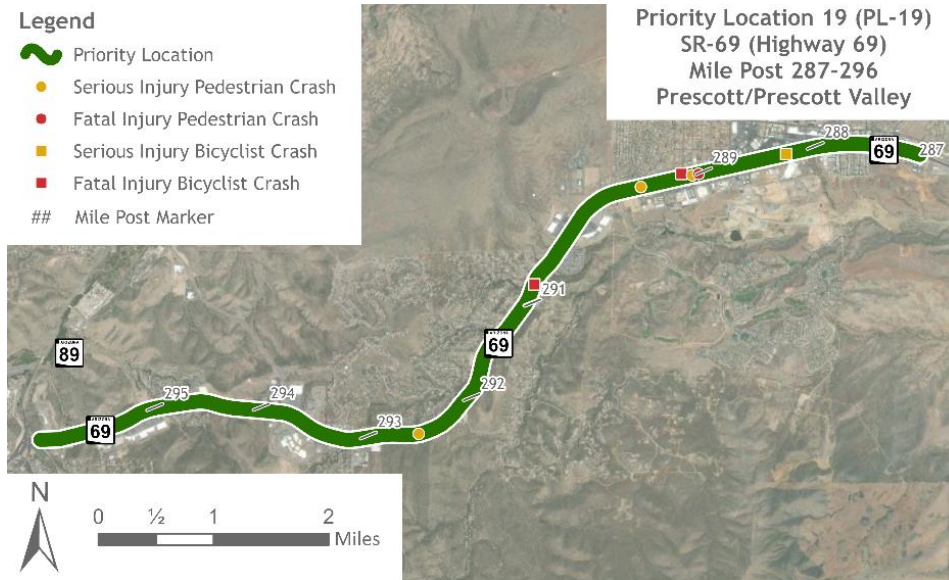
### Implementation Opportunities

According to the ADOT Five Year Transportation Facilities Construction Program, ADOT has no upcoming projects within PL-18.

## PL-19

### Description

PL-19 is located along SR-69 from MP 287 to 296 in the Prescott/Prescott Valley area. PL-19 received an equity score of 12.



### Trends

- Pedestrians: 1 fatal and 3 serious injury crashes
- Bicyclists: 1 fatal and 1 serious injury crashes
- Lighting: 4 in dark/dusk and 2 in daylight conditions
- Crash Locations:
  - 3 intersection
  - 3 non-intersection

### Countermeasures and Preliminary Planning-Level Cost Estimate

| Countermeasure  | Cost Estimate       | Notes                    | CMF Value                            | CMF Crash Type     | CMF Crash Severity |
|---|---------------------|--------------------------|--------------------------------------|--------------------|--------------------|
| Install Highway Lighting                                | \$2,640,000         | MP 287-291               | 0.31                                 | All                | Fatal              |
| Reduce Curb Radii to 35' at Signalized Intersections    | \$1,705,000         | 31 curb radii reductions | 0.8-0.9 depending on existing radius | Vehicle/Pedestrian | All                |
| Install High-Visibility Crosswalk at Midblock Locations | \$80,000            | MP 289                   | 0.6                                  | Vehicle/Pedestrian | All                |
| Install Sidewalk or Walkway                             | \$5,580,000         | MP 287-291               | 0.598                                | Vehicle/Pedestrian | All                |
| <b>TOTAL</b>  | <b>\$10,005,000</b> |                          |                                      |                    |                    |

### Implementation Opportunities

According to the ADOT Five Year Transportation Facilities Construction Program, ADOT has one upcoming project within PL-19.

- Extended acceleration lane on SR-69 from MP 292 to 292.6 (eSTIP 103633)

## PL-20

### Description

PL-20 is located along SR-387 from MP 0 to 2.5 in the Casa Grande area. PL-20 received an equity score of 17.

### Trends

- Pedestrians: 1 fatal and 4 serious injury crashes
- Lighting: 3 crashes occurred in dark and 2 in daylight conditions



### Countermeasures and Preliminary Planning-Level Cost Estimate

| Countermeasure  | Cost Estimate      | Notes                   | CMF Value                                  | CMF Crash Type         | CMF Crash Severity |
|---|--------------------|-------------------------|--|------------------------|--------------------|
| Install High-Visibility Crosswalk at Midblock Locations | \$80,000           | MP 1.27                 | 0.6  | Vehicle/<br>Pedestrian | All                |
| Install Highway Lighting                                | \$1,650,000        | From MP 0-2.5           | 0.31                                       | All                    | Fatal              |
| Reduce Curb Radii to 30' at Signalized Intersections    | \$330,000          | 6 curb radii reductions | 0.8-0.9<br>depending on<br>existing radius | Vehicle/<br>Pedestrian | All                |
| Upgrade Existing Crosswalk to High-Visibility Crosswalk | \$164,000          | MP 0.5 and 2.0          | 0.6  | Vehicle/<br>Pedestrian | All                |
| <b>TOTAL</b>  | <b>\$2,224,000</b> |                         |  |                        |                    |

### Implementation Opportunities

According to the ADOT Five Year Transportation Facilities Construction Program, ADOT has one upcoming project within PL-20.

- Design and construct a High Intensity Activated Crosswalk (HAWK) along SR-387 at Pinal and Viola Street (eSTIP 103643)



## PL-21

### Description

PL-21 is located along US-60 from MP 340 to 342 in the Show Low area. PL-21 received an equity score of 7.



### Trends

- Pedestrians: 1 fatal and 2 serious injury crashes
- Bicyclists: 1 fatal and 1 serious injury crashes
- Lighting: 3 crashes in dark/dusk and 2 crashes in daylight
- Crash Location:
  - 4 non-intersection
  - 1 driveway access

### Countermeasures and Preliminary Planning-Level Cost Estimate

| Countermeasure                                       | Cost Estimate    | Notes                   | CMF Value                            | CMF Crash Type      | CMF Crash Severity |
|--|------------------|-------------------------|--------------------------------------|---------------------|--------------------|
| Install Bike Lanes                                   | \$94,000         | MP 340-342              | 0.435                                | All                 | All                |
| Reduce Curb Radii to 35' at Signalized Intersections | \$385,000        | 7 curb radii reductions | 0.8-0.9 depending on existing radius | Vehicle/ Pedestrian | All                |
| Increase Enforcement                                 | -                | -                       | -                                    | -                   | -                  |
| <b>TOTAL</b>   | <b>\$479,000</b> |                         |                                      |                     |                    |

### Implementation Opportunities

According to the ADOT Five Year Transportation Facilities Construction Program, ADOT has one upcoming project within PL-21.

- Pavement rehabilitation along US-60 from MP 240 to 243 (eSTIP 103947)

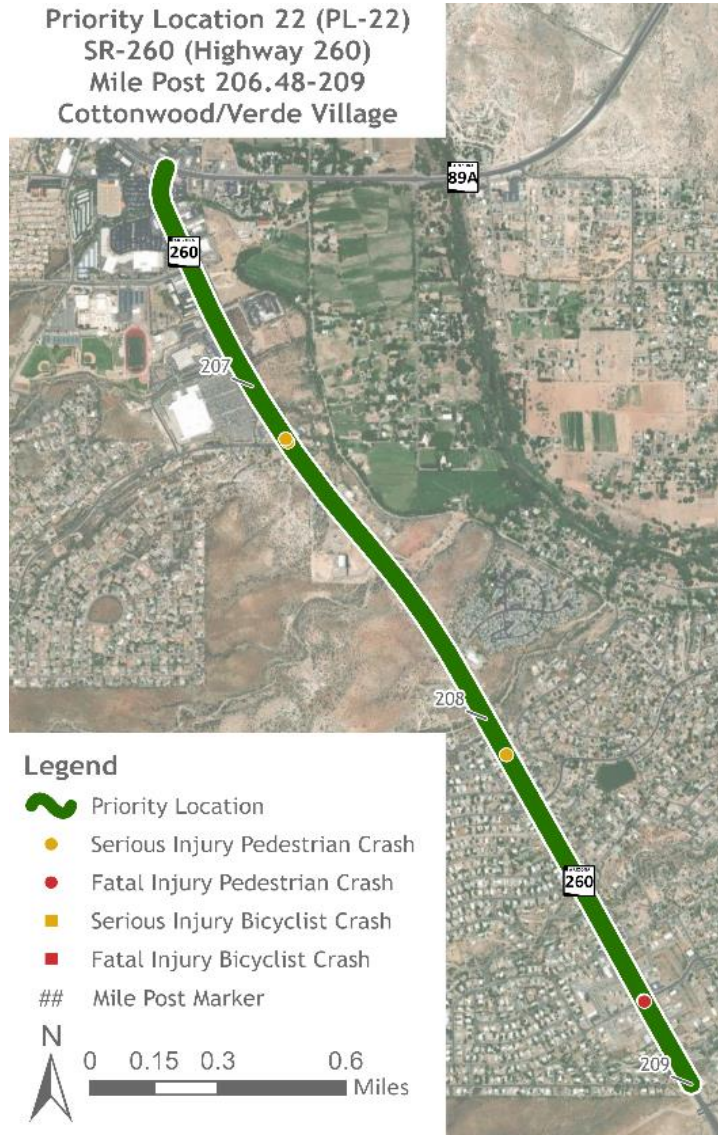
## PL-22

### Description

PL-22 is located along SR-260 from MP 206.48 to 209 in the Cottonwood area. PL-22 received an equity score of 10.

### Trends

- Pedestrians: 2 fatal and 3 serious injury crashes
- Lighting: 4 crashes occurred in dark conditions
- Crash Location:
  - 3 intersection
  - 1 non-intersection
  - 1 unknown
- Motorist Maneuver: 3 motorists going straight and 1 turning left (1 unknown)



### Countermeasures and Preliminary Planning-Level Cost Estimate

| Countermeasure  | Cost Estimate      | Notes                   | CMF Value                                  | CMF Crash Type         | CMF Crash Severity |
|---|--------------------|-------------------------|--|------------------------|--------------------|
| Install Sidewalk or Walkway                             | \$1,395,000        | MP 206.5-207.5          | 0.598                                      | Vehicle/<br>Pedestrian | All                |
| Reduce Curb Radii to 35' at Signalized Intersections    | \$110,000          | 2 curb radii reductions | 0.8-0.9<br>depending on<br>existing radius | Vehicle/<br>Pedestrian | All                |
| Upgrade Existing Crosswalk to High-Visibility Crosswalk | \$164,000          | MP 206.48 and 206.9     | 0.6  | Vehicle/<br>Pedestrian | All                |
| <b>TOTAL</b>  | <b>\$1,669,000</b> |                         |  |                        |                    |

### Implementation Opportunities

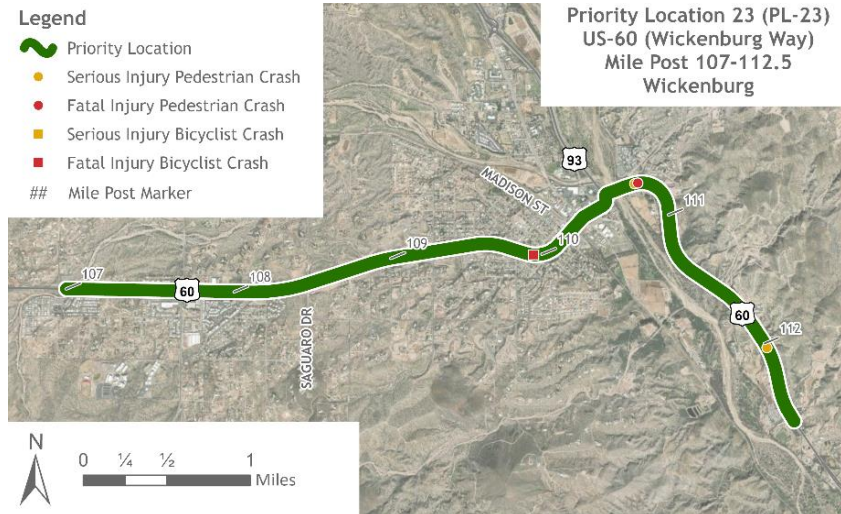
According to the ADOT Five Year Transportation Facilities Construction Program, ADOT has no upcoming projects within PL-22.



## PL-23

### Description

PL-23 is located along US-60 from MP 107 to 112.5 in the Wickenburg area. PL-23 received an equity score of 6.



### Trends

- Pedestrians: 1 fatal and 3 serious injury crashes
- Bicyclists: 1 fatal crash
- Crash Location:
  - 3 intersection
  - 2 non-intersection
- Motorist Maneuver: 4 motorist going straight crashes

### Countermeasures and Preliminary Planning-Level Cost Estimate

| Countermeasure   | Cost Estimate    | Notes                           | CMF Value                            | CMF Crash Type         | CMF Crash Severity |
|--|------------------|---------------------------------|--------------------------------------|------------------------|--------------------|
| <b>Reduce Curb Radii to 35' at Signalized Intersections</b>    | \$165,000        | 3 curb radii reductions         | 0.8-0.9 depending on existing radius | Vehicle/<br>Pedestrian | All                |
| <b>Install Sidewalk or Walkway</b>                             | \$2100,000       | South side from MP 107.5-107.65 | 0.598                                | Vehicle/<br>Pedestrian | All                |
| <b>Upgrade Existing Crosswalk to High-Visibility Crosswalk</b> | \$82,000         | MP 107.65                       | 0.6                                  | Vehicle/<br>Pedestrian | All                |
| <b>Increase Enforcement</b>                                    | -                | -                               | -                                    | -                      | -                  |
| <b>TOTAL</b>   | <b>\$457,000</b> |                                 |                                      |                        |                    |

### Implementation Opportunities

According to the ADOT Five Year Transportation Facilities Construction Program, ADOT has one upcoming project within PL-23.

- Pavement rehabilitation along US-60 from MP 110 to 121 (eSTIP 104055)



## PL-24

### Description

PL-24 is located along B-40/Route 66 from MP 193.25 to 195.5 in the Flagstaff area. PL-24 received an equity score of 13.



### Trends

- Pedestrian: 1 fatal crash
- Bicyclists: 3 serious injury crashes
- Lighting: 2 crashes occurred in dark conditions
- Crash Location:
  - 1 intersection
  - 2 driveway

### Countermeasures and Preliminary Planning-Level Cost Estimate

| Countermeasure  | Cost Estimate    | Notes                   | CMF Value                            | CMF Crash Type     | CMF Crash Severity |
|---|------------------|-------------------------|--------------------------------------|--------------------|--------------------|
| <b>Reduce Curb Radii to 30' at Signalized Intersections</b>               | \$165,000        | 3 curb radii reductions | 0.8-0.9 depending on existing radius | Vehicle/Pedestrian | All                |
| <b>Enhance Signal Operations with Leading Pedestrian Intervals (LPIs)</b> | \$14,000         | 2 intersections         | 0.9                                  | All                | All                |
| <b>TOTAL</b>  | <b>\$179,000</b> |                         |                                      |                    |                    |

### Implementation Opportunities

According to the ADOT Five Year Transportation Facilities Construction Program, ADOT has no upcoming projects within PL-24.

## PL-25

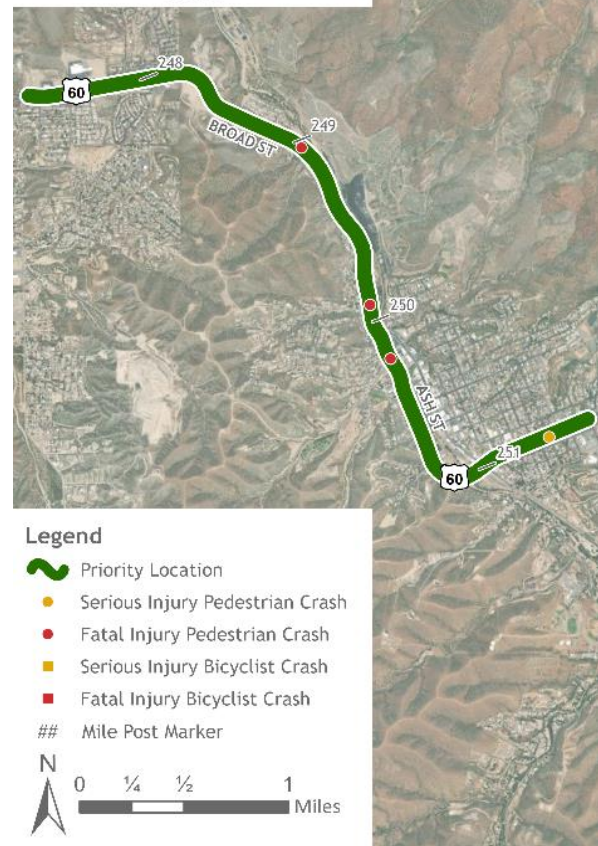
### Description

PL-24 is located along US-60 from MP 247.5 to 251.5 in the Globe area. PL-24 received an equity score of 10.

### Trends

- Pedestrians: 3 fatal and 1 serious injury crashes
- Lighting: 3 crash in dark conditions and 1 crash in daylight
- Crash Location:
  - 1 non-intersection
  - 1 driveway
  - 2 unknown

Priority Location 25 (PL-25)  
US-60 (Broad Street/Ash Street)  
Mile Post 247.5-251.5  
Globe



### Countermeasures and Preliminary Planning-Level Cost Estimate

| Countermeasure   | Cost Estimate    | Notes                         | CMF Value                                  | CMF Crash Type         | CMF Crash Severity |
|--|------------------|-------------------------------|--|------------------------|--------------------|
| Install Sidewalk or Walkway  | \$279,000        | MP 247.8-248                  | 0.598                                      | Vehicle/<br>Pedestrian | All                |
| Reduce Curb Radii to 35' at Signalized Intersections               | \$110,000        | 2 curb radii reductions       | 0.8-0.9<br>depending on<br>existing radius | Vehicle/<br>Pedestrian | All                |
| Upgrade Crosswalks to High-Visibility Crosswalk at Midblock        | \$246,000        | MP 249.7, 249.9,<br>and 250.2 | 0.6  | Vehicle/<br>Pedestrian | All                |
| Enhance Signal Operations with Leading Pedestrian Intervals (LPIs) | \$35,000         | 5 intersections               | 0.9  | All                    | All                |
| <b>TOTAL</b>   | <b>\$670,000</b> |                               |  |                        |                    |

### Implementation Opportunities

According to the ADOT Five Year Transportation Facilities Construction Program, ADOT has one upcoming project within PL-25.

- Pavement rehabilitation along US-60 from MP 250 to 252 (eSTIP 103679)



## PL-26

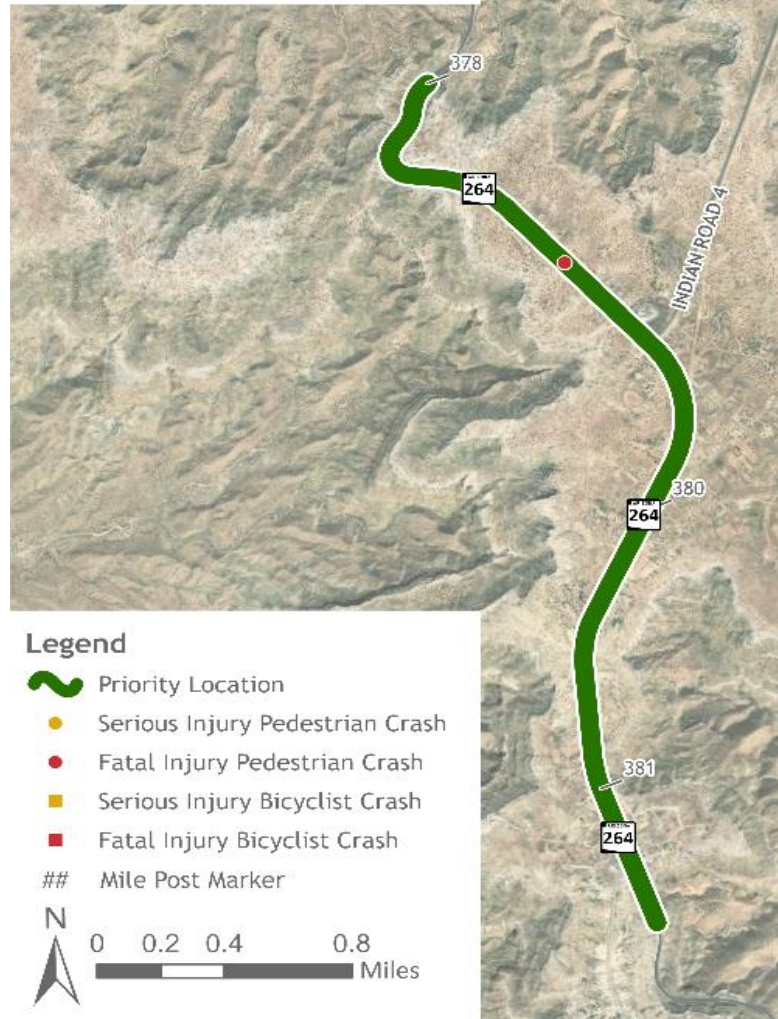
### Description

PL-26 is located along SR-264 from MP 378 to 381.5 in the Shongopovi area. PL-26 received an equity score of 9.

### Trends

- Pedestrians: 2 fatal crashes
- Lighting: 1 dark and 1 unknown lighting
- Crash Location:
  - 2 non-intersection

Priority Location 26 (PL-26)  
SR-264 (Highway 264)  
Mile Post 378-381.5  
Shongopovi/Second Mesa



### Countermeasures and Preliminary Planning-Level Cost Estimate

| Countermeasure   | Cost Estimate      | Notes        | CMF Value | CMF Crash Type         | CMF Crash Severity |
|--|--------------------|--------------|-----------|------------------------|--------------------|
| Install Highway Lighting                               | \$990,000          | MP 379-381.5 | 0.31      | All                    | Fatal              |
| Install High-Visibility Crosswalk at Midblock Location | \$80,000           | MP 381.3     | 0.6       | Vehicle/<br>Pedestrian | All                |
| Increase Enforcement                                   | -                  | -            | -         | -                      | -                  |
| <b>TOTAL</b>   | <b>\$1,070,000</b> |              |           |                        |                    |

### Implementation Opportunities

According to the ADOT Five Year Transportation Facilities Construction Program, ADOT has one upcoming project within PL-26.

- Construct a multi-use path on SR-264 at SR-264 and IR-4 (eSTIP 103654)





# 8

## Funding Sources

## Funding Sources

Funding for improvements and/or new facilities for people walking or riding bicycles is available from a variety of sources, including federal programs and state and regional revenue sources.

### Federal Funding Sources

Several federal funding sources have potential to be used for pedestrian or bicyclist facility improvement projects:

- Rebuilding American Infrastructure with Sustainability and Equity (RAISE) Grant
- Transportation Infrastructure Finance and Innovation Act (TIFIA)
- Federal Transit Administration (FTA) Grant Programs
- Congestion Mitigation/Air Quality (CMAQ) Program
- Highway Safety Improvement Program (HSIP)
- National Highway Performance Program (NHPP)
- Surface Transportation Block Grant Program (STBG)
- Recreational Trails Program (RTP)
- Safe Routes to School (SRTS)
- Safe Streets and Roads for All (SS4A) Grant Program
- Statewide Planning and Research (SP&R) or Metropolitan Planning Funds
- NHTSA Section 402: State and Community Highway Safety Grant Program
- NHTSA Section 405: National Priority Safety Programs (Nonmotorized Safety)
- Federal Lands and Tribal Transportation Programs
- Promoting Resilient Operations for Transformative, Efficient, and Cost-saving Transportation Program (PROTECT)

A brief overview of these programs is provided as follows:

#### *Rebuilding American Infrastructure with Sustainability and Equity (RAISE) Grant*

The competitive RAISE grant program supports innovative projects, including multi-modal and multijurisdictional projects, which are difficult to fund through traditional federal programs. In each round of RAISE, the U.S. Department of Transportation (DOT) receives hundreds of applications to build and repair critical pieces of our freight and passenger transportation networks. Projects are evaluated on the benefits their project would deliver for five long-term outcomes: safety, economic competitiveness, state of good repair, quality of life, and environmental sustainability. DOT also evaluates projects on innovation, partnerships, project readiness, benefit cost analysis, and cost share.

#### *Transportation Infrastructure Finance and Innovation Act (TIFIA)*

The TIFIA program provides credit assistance for qualified projects of regional and national significance. Many large-scale, surface transportation projects – highway, transit, railroad, intermodal freight, and port access – are eligible for assistance. Eligible applicants include state and local governments, transit agencies, railroad companies, special authorities, special districts, and private entities. The program's fundamental goal is to leverage Federal funds by attracting substantial private

and other non-Federal co-investment in critical improvements to the nation's surface transportation system.

#### *Federal Transit Administration (FTA) Grant Programs*

The following FTA grant programs listed pedestrian improvements as eligible for funding to provide access to transit:

- FTA Section 5310: Enhanced Mobility of Seniors and Individuals with Disabilities – Information on this program cites examples of funding for pedestrian improvements to improve transit access such as building an accessible path to a bus stop or providing curb-cuts, sidewalks, accessible pedestrian signals, or other accessible features.
- FTA Section 5311: Rural Areas – Grants can support a joint development improvement, such as pedestrian and bicyclist access to a public transportation facility.

#### *Congestion Mitigation/Air Quality (CMAQ) Program*

The Bipartisan Infrastructure Law (BIL) continued the CMAQ program to provide a flexible funding source to state and local governments for transportation projects and programs to help meet the requirements of the Clean Air Act. Funding is available to reduce congestion and improve air quality for areas that do not meet the National Ambient Air Quality Standards for ozone, carbon monoxide, or particulate matter (nonattainment areas) and for former nonattainment areas that are now in compliance (air quality maintenance areas).

#### *Highway Safety Improvement Program (HSIP)*

The BIL continued the HSIP. The purpose of this program is to achieve a significant reduction in traffic fatalities and serious injuries on all public roads, including non-state-owned roads and roads on Tribal land. The HSIP requires a data-driven, strategic approach to improving highway safety on all public roads with a focus on performance.

#### *National Highway Performance Program (NHPP)*

The BIL continued the NHPP, which was established under Moving Ahead for Progress in 2021 (MAP-21). The NHPP provides support for the condition and performance of the National Highway System (NHS). All pedestrian/bicyclist improvements must be associated with an NHS facility.

#### *Surface Transportation Block Grant Program (STBG)*

The STBG provides flexible funding that may be used by states and localities for projects to preserve and improve the conditions and performance on any Federal-aid highway. Eligible projects related to pedestrian safety include pedestrian and bicyclist projects, safety projects, recreational trails, safe routes to school projects, and projects within the pre-FAST Act Title 23 definition of “transportation alternatives” (see the Transportation Alternatives Set-Aside description below). Projects must be identified in the Statewide Transportation Improvement Program (STIP) and be consistent with the Long-Range Statewide Transportation Plan and the Metropolitan Transportation Plan.



#### *Recreational Trails Program (RTP)*

The RTP provides funds to the states to develop and maintain recreational trails and trail-related facilities for both nonmotorized and motorized recreational trail uses. The BIL of 2021 reauthorized the RTP for Federal fiscal years 2022 through 2026 as a set-aside of funds under the STBG.

#### *Safe Routes to School (SRTS)*

SRTS funds are available until expended (they are not subject to the usual Federal-aid highway four-year rule of availability).

#### *Safe Streets and Roads for All (SS4A) Grant Program*

The SS4A grant program with \$5 billion in funds for a 5-year period, from 2022 to 2026. The program funds regional, local, and Tribal initiatives through grants to prevent roadway deaths and serious injuries.

#### *Statewide Planning and Research (SP&R) or Metropolitan Planning Funds*

Funding is provided for SP&R by a 2% set-aside from each state's apportionments of four programs: NHPP, Surface Transportation Program (STP), HSIP, and CMAQ. A minimum of 25% must be used for research purposes, and the remaining funds are used for statewide and metropolitan planning.

#### *NHTSA Section 402: State and Community Highway Safety Grant Program*

To receive Section 402 grant funds, a state must have an approved HSP and provide assurances that it will implement activities in support of national goals that also reflect the primary data-related factors within the state, as identified by the state highway safety planning process. States can distribute highway safety grant funds to a wide network of sub-grantees, including local law enforcement agencies, municipalities, universities, health care organizations, and other local institutions. States may spend 402 funds in accordance with an approved HSP that complies with the uniform national guidelines for highway safety programs. One of the eligible programs is to improve pedestrian and bicyclist safety.

#### *NHTSA Section 405: National Priority Safety Programs (Nonmotorized Safety)*

Under the FAST Act, Section 405 is the National Priority Safety Program, which provides grant funding to address selected national priorities for reducing highway deaths and injuries. The FAST Act added two new grants under this program, one of which is for nonmotorized safety. States are eligible if the annual combined pedestrian and bicyclist fatalities in the state exceed 15 percent of the total annual crash fatalities in the state using the most recently available final data from NHTSA's Fatality Analysis Reporting System (FARS). Eligible states may use Section 405 grant funds only for training law enforcement on state laws applicable to pedestrian and bicyclist safety; enforcement mobilizations and campaigns designed to enforce those state laws; or public education and awareness programs designed to inform motorists, pedestrians, and bicyclists of those state laws.

### *Federal Lands and Tribal Transportation Programs*

Programs under the FHWA, Office of Federal Lands Highway relate to projects to improve transportation to and within Federal and Tribal lands. Programs that can potentially fund pedestrian safety improvements are:

- Federal Lands Access Program
- Federal Lands Transportation Program
- Tribal Transportation Program
- Nationally Significant Federal Lands and Tribal Projects

### *Promoting Resilient Operations for Transformative, Efficient, and Cost-saving Transportation Program (PROTECT)*

Under the BIL, the PROTECT grant program provides funding to ensure surface transportation resilience to natural hazards including climate change, sea level rise, flooding, extreme weather events, and other natural disasters through support of planning activities, resilience improvements, community resilience and evacuation routes, and at-risk coastal infrastructure. The PROTECT discretionary program offers two types of awards: planning grants and competitive resilience improvement grants.

## **State Funding Sources**

### *Highway User Revenue Fund*

The State of Arizona taxes motor fuels and collects a variety of fees and charges relating to the registration and operation of motor vehicles on the public highways of the state. These collections include gasoline and use fuel taxes, motor carrier taxes, vehicle license taxes, motor vehicle registration fees, and other miscellaneous fees. These revenues are deposited in the Arizona Highway User Revenue Fund (HURF) and are then distributed to the cities, towns, and counties and to the State Highway Fund. These taxes represent a primary source of revenues available to the state for highway construction, improvements, and other related expenses.

### *AZ State Match Advantage for Rural Transportation (SMART) Fund*

The AZ SMART Fund was established by the Arizona Legislature in 2022 to assist cities, towns, counties, and ADOT in competing for federal discretionary surface transportation grants. The fund is administered by ADOT and all cities, towns, and counties outside of Maricopa County and Pima County are eligible for the AZ SMART Fund (within Maricopa County, only Gila Bend is eligible). Applicants may request AZ SMART Funds for eligible uses associated with developing a project for, applying for, or providing a local, non-federal match on a federal grant.

- Reimbursement of up to 50% of the eligible costs associated with grant development and submission of an application for a federal discretionary grant. Limited to counties with a population of less than 100,000 and cities and towns with a population of less than 10,000.
- Reimbursement of non-federal match for a federal grant.
- Reimbursement of design and other engineering services expenditures that meet federal standards for projects eligible for a federal grant. For the purposes of the AZ SMART Fund, design and other engineering services includes preliminary engineering through final design

related to a road, bridge, rail, or transit infrastructure construction project that the applicant intends to submit for a federal grant in a future year.

## Regional Funding Sources

### *Maricopa County Transportation Excise Tax and Regional Area Road Fund*

In November 2004, the voters of Maricopa County approved the extension of the levy of the Maricopa County Transportation Excise Tax for an additional 20 years, ending December 31, 2025. Often referred to as the "half-cent sales tax," the tax is levied upon business activities in Maricopa County. The tax revenues are distributed as follows:

- 66.7% goes into the Maricopa County RARF consisting of 56.2% for freeways and routes on the SHS, including design, right-of-way, construction, maintenance, and debt service for projects included in the Regional Transportation Plan (RTP) for Maricopa County and 10.5% for major arterial streets and intersection improvements, including debt service, capital expense, and implementation studies.
- 33.3% goes to a public transportation fund to be used solely for capital costs, maintenance, and operation of public transportation classifications along with capital costs and utility relocation costs associated with a light rail public transit system.

### *Pinal County Half-Cent Sales Tax*

In 2005, Pinal County voters approved the extension of a 20-year half-cent sales tax that can be used to build and maintain roads in Pinal County. These improvements can include safety improvements.

### *Pima Association of Governments (PAG) Regional Transportation Authority (RTA) Half-Cent Sales Tax*

Pima County voters approved the half-cent sales tax on May 16, 2006, to fund the RTA Plan. The state, in turn, transfers the collected funds to a regional transportation fund. The RTA is limited to collecting the tax for up to 20 years, so it will expire shortly. Over 20 years, the tax levy is expected to generate \$2.1 billion. Of the \$2.1 billion, \$80 million will fund pedestrian improvements (as part of the Safety and Environmental Elements in the RTA Plan) such as crosswalks and sidewalks to increase pedestrian accessibility. The Roadway Element in the RTA Plan is expected to receive \$1.2 billion over 20 years and is comprised of 35 distinct roadway projects that also have pedestrian components.

### *Gila County Half-Cent Sales Tax*

In 2014, Gila County implemented a voter-approved 20-year half-cent sales tax that can be used for highway and street improvements only. These improvements can include safety improvements.

## Local Funding Sources

Local funding sources for safety improvements can include resources such as general fund allocations, local dedicated transportation taxes, special improvement districts, and impact fees.





# 9

## Conclusion

## Conclusion

The ATSAP establish goals, describes existing conditions, and provides policy recommendations and countermeasures to improve safety for people walking or riding bicycles on the Arizona SHS. ADOT is not limited to the recommendations made in the ATSAP and is encouraged to continually look for ways to improve roadway safety for all users through policy or other measures. To accomplish the goals set, the plan must be implemented in a deliberate way. Successful plan implementation will rely on committed leadership from ADOT and local jurisdictions.

## Next Steps

### Near-Term (0-2 years)

Near-term implementation should focus on the following:

1. Establish a VRU Emphasis Area Team as part of the ADOT SHSP.
2. Review ADOT's Planning-to-Programming process to potentially place greater emphasis on the Safety Score.
3. Adopt pedestrian/bicyclist-friendly design standards for Single Point Urban Interchanges (SPUIs) and Diamond Interchanges.
4. Update the ADOT Roadway Design Guidelines for the following areas:
  - a. Lane Width on ADOT Intersections
  - b. Bicycle Facilities
  - c. Shoulder Width
  - d. Right-Turn Channelization
5. Adopt the following legislative recommendations
  - a. Review the Arizona Revised Statutes that relate to people walking or riding bicycles
  - b. Update Distracted Driver Legislation

### Medium-Term (2-5 years)

Medium-term implementation should focus on the following:

1. Implement countermeasures for Priority Locations 1 through 15.
2. Implement SHSP VRU Emphasis Area strategies

### Long-Term (5-10 years)

Long-term implementation should focus on the following:

1. Implement countermeasures for Priority Locations 16 through 26.
2. Signalize channelized right-turn lanes
3. Identify additional funding sources to implement ATSAP countermeasures.

## **Appendix A**

### **ADOT Pedestrian Safety Action Plan Activities and Crash Comparison**





## **Appendix B**

### **ADOT Bicyclist Safety Action Plan Activities and Crash Comparison**



## **Appendix C**

### **Stakeholder Safety Workshops Summary**



## **Appendix D**

### **Countermeasures with Cost Estimates**





## **Appendix E**

### **Crash Modification Factors**

