

2024

Arizona Active Transportation Safety Action Plan

OCTOBER 2024



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- Graham County
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- Maricopa County
- MetroPlan
- Mohave County
- Mountain Line
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- Navajo Nation
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- Pima County
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- Sierra Vista Metropolitan Planning Organization



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- Yuma Metropolitan Planning Organization
- Yuma Region Bicycle Coalition

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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

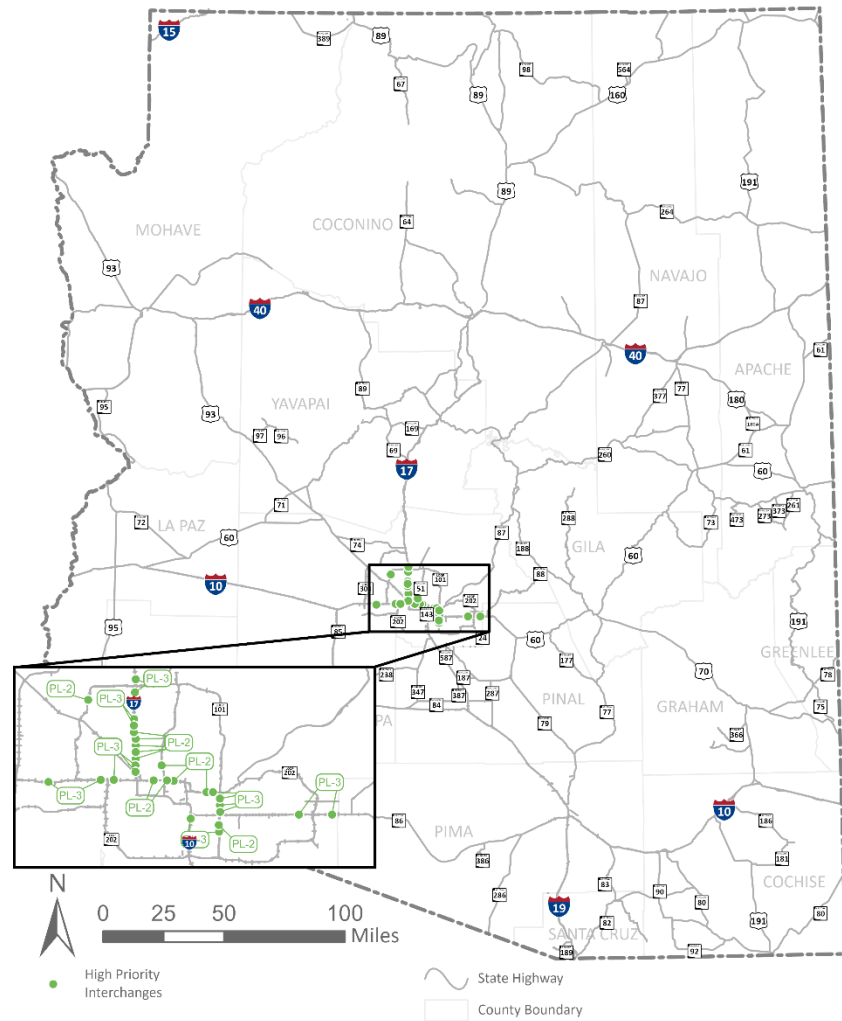
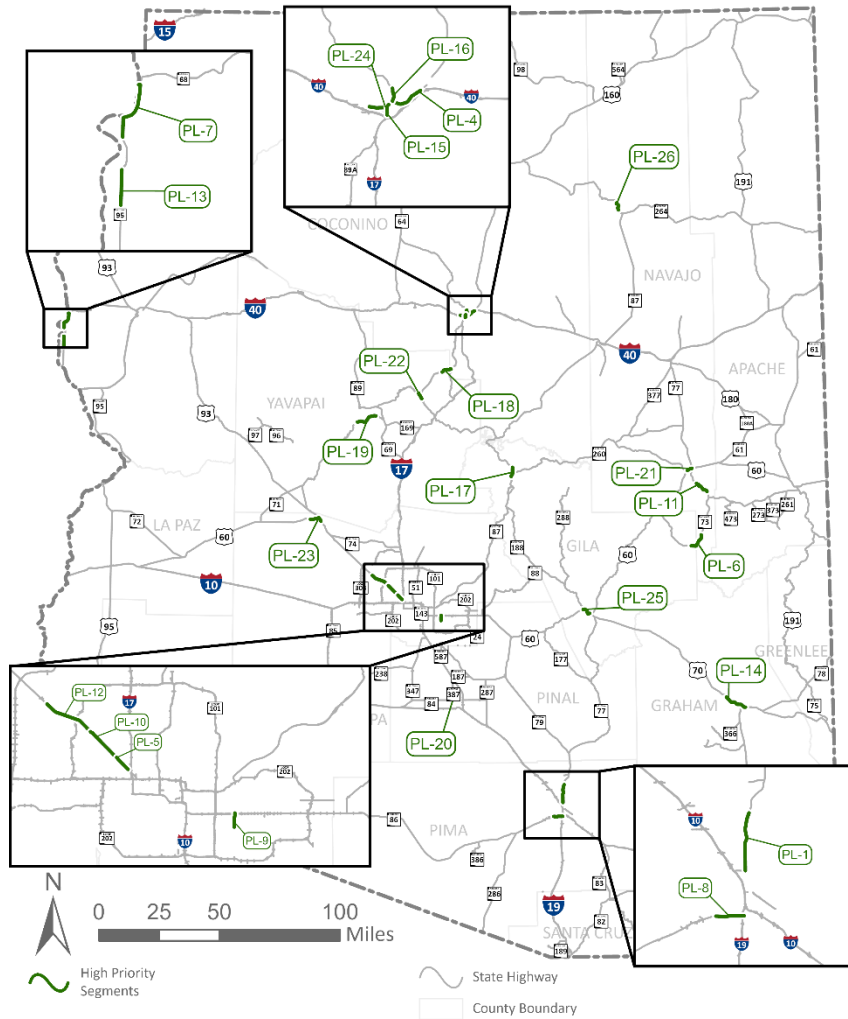
Priority Locations

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
						Total	\$103,102,000

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

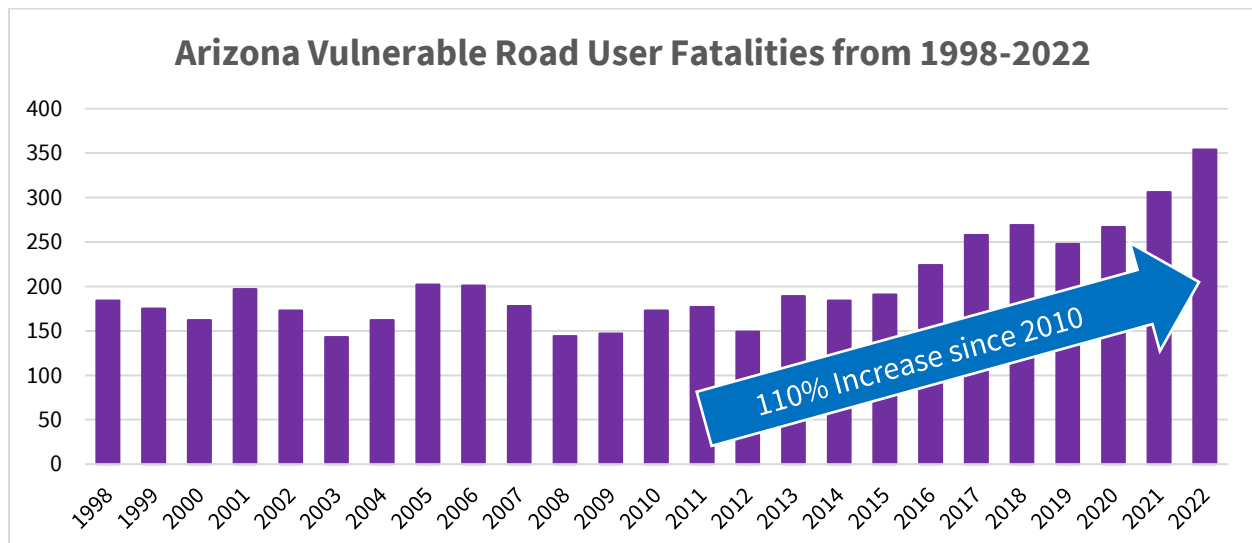
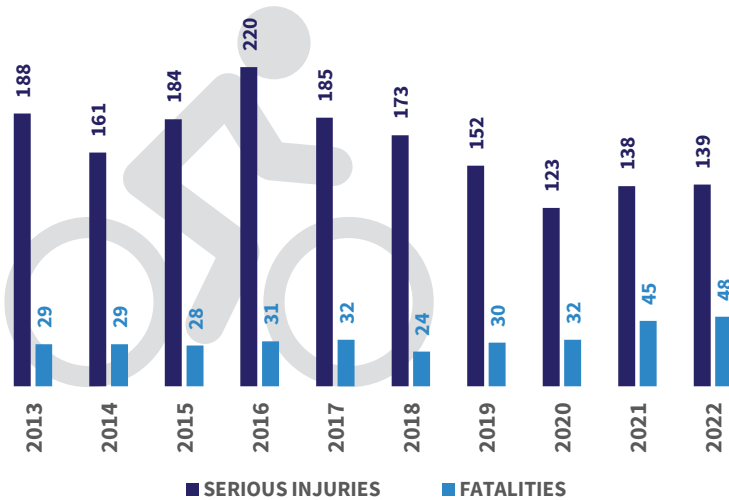
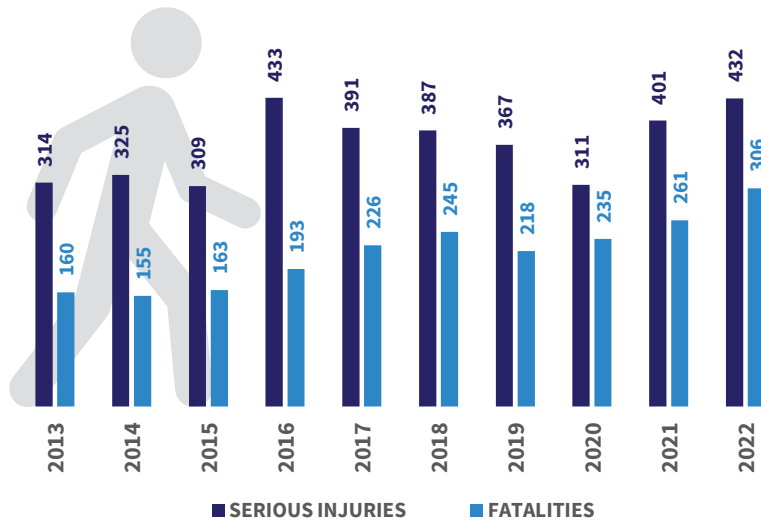
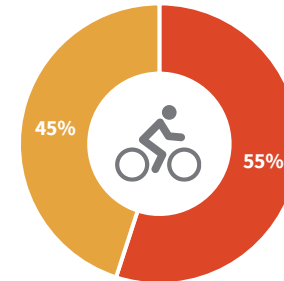
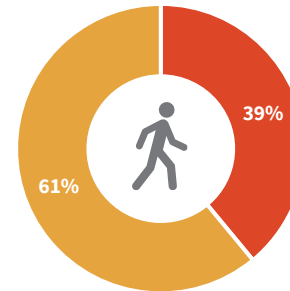


Figure 2 illustrates fatal and serious injury crashes from 2013 through 2022 for pedestrians and bicyclists on all roads (state and local). It shows if the crashes took place at an intersection or mid-block, the action of the pedestrian and bicyclist at the time of the crash, and lighting conditions 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

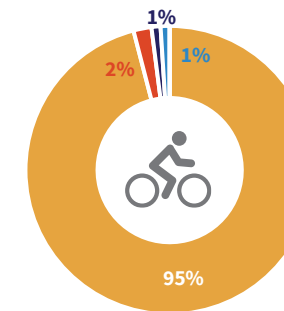
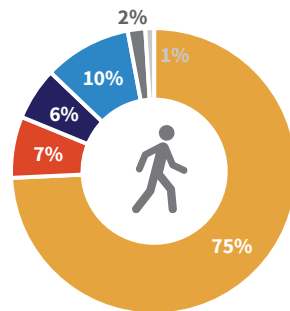


WHERE:



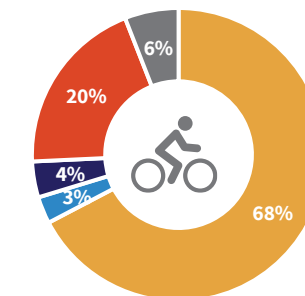
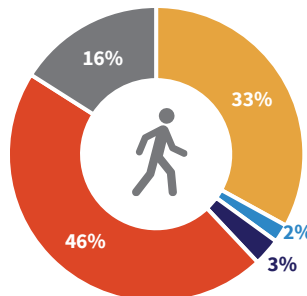
■ INTERSECTION
■ MID-BLOCK

WHILE:



■ CROSSING THE ROAD
■ TRAVELING WITH TRAFFIC
■ TRAVELING AGAINST TRAFFIC
■ STOPPED
■ LYING/SITTING ON THE ROAD
■ WORKING ON VEHICLE

WHEN:



■ DAYLIGHT
■ DAWN
■ DUSK
■ DARK WITH LIGHTING
■ DARK WITHOUT LIGHTING

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.



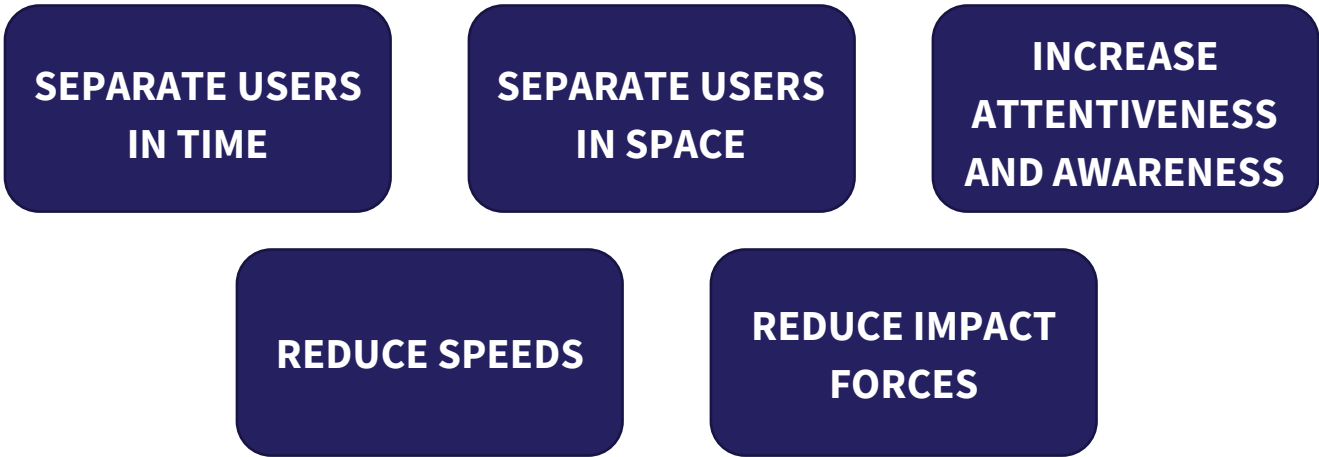
Safe System Elements

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:

	SAFE ROAD USERS	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.
	SAFE VEHICLES	Promote the availability of vehicles with safety features to aid in crash prevention and minimize the impact when a crash occurs.
	SAFE SPEEDS	Promote safe travel speed on all roadway environments by implementing context-appropriate roadway design, speed-limit setting, enforcement, and education.
	SAFE ROADS	Design roadway infrastructure to mitigate human mistakes, account for injury tolerances, encourage safe behavior, and facilitate safe travel by VRUs.
	POST-CRASH CARE	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





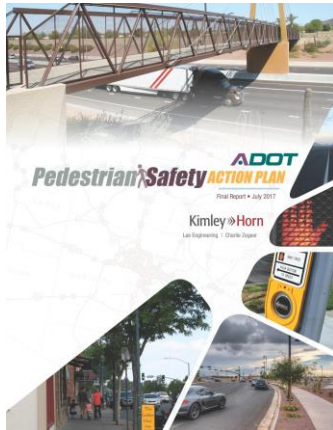
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Previous and Ongoing Plans Review

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.

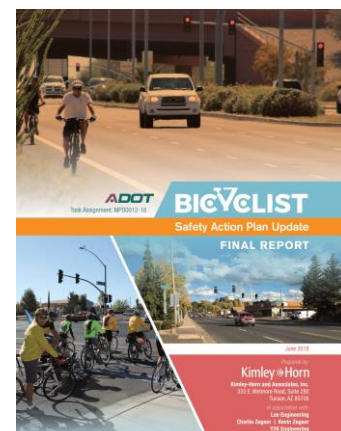
The PSAP assessed pedestrian crash data and identified high-crash intersections, high-crash segments, and high-risk segments. **Appendix A** shows the activities since completion of the plan, along with the change in number of crashes for the identified high-crash intersections, high-crash segments, 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.

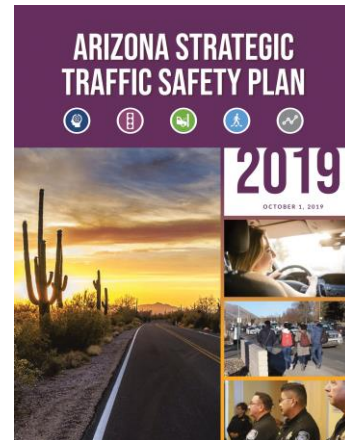
Table 1. 2018 BSAP Goal

	2012-2016 Crashes	2018 BSAP Goal	
Annual Average Bicyclist Crashes (State Highway System, fatalities, and injuries)	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

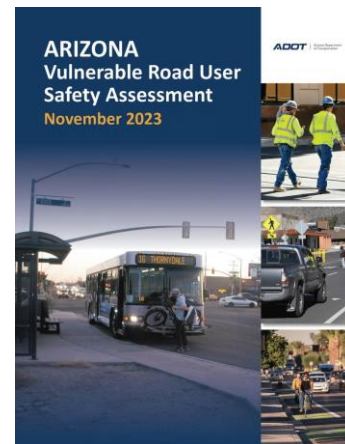
Goals:

- 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.



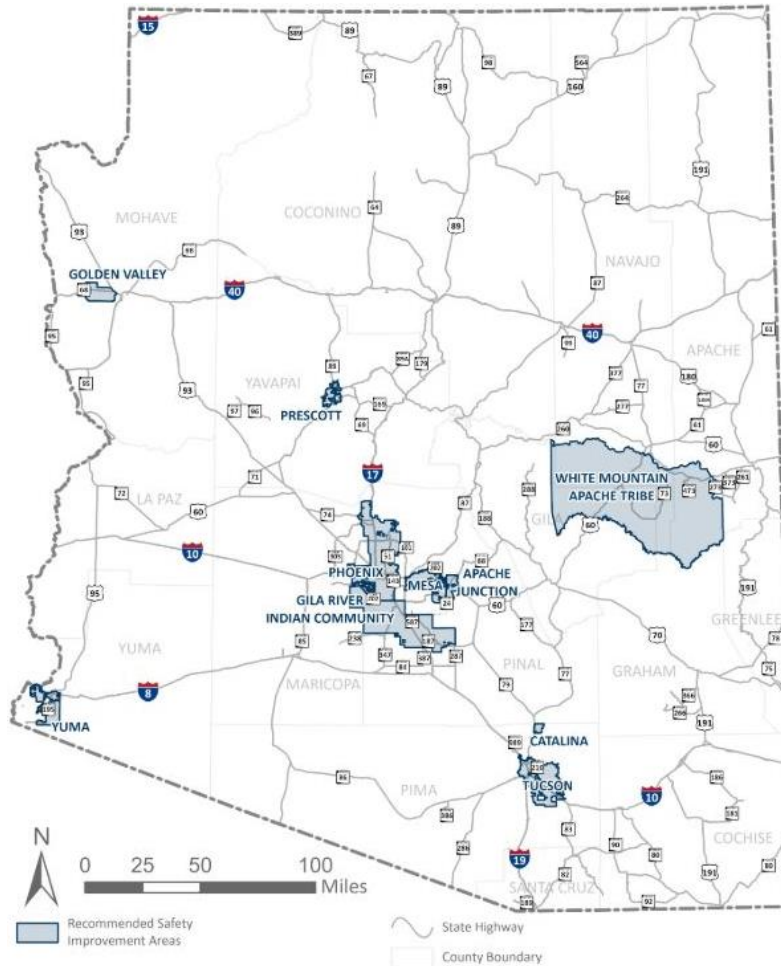
Goals:

- 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

Figure 4. VRUSA Recommended Safety Improvement Areas



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:

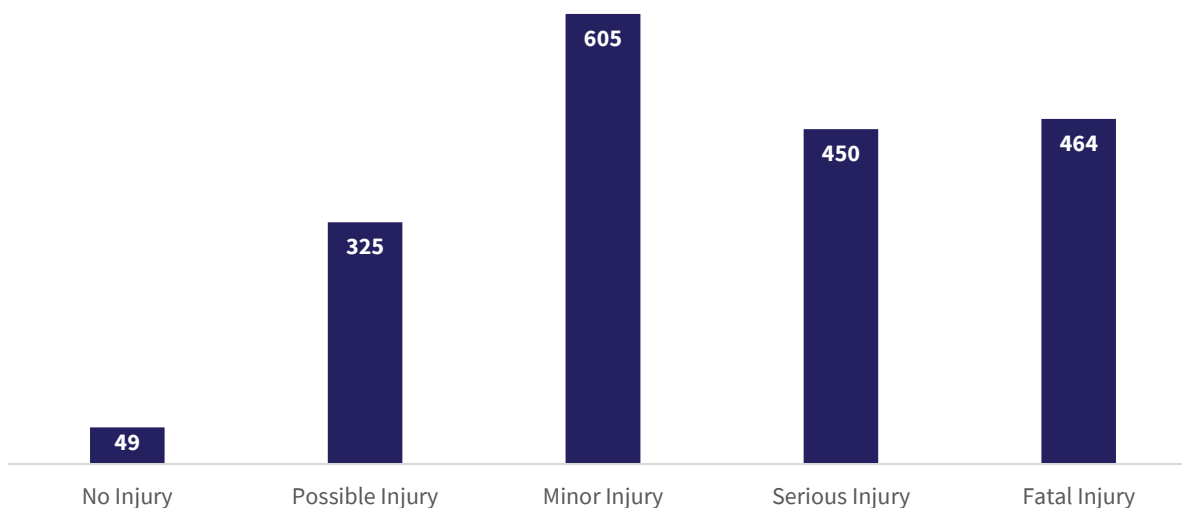
- 6 bicyclist or pedestrian-involved crashes of any severity; or
- 3 bicyclist or pedestrian-involved fatal and serious injury crashes; or
- 2 bicyclist or pedestrian-involved fatal crashes

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

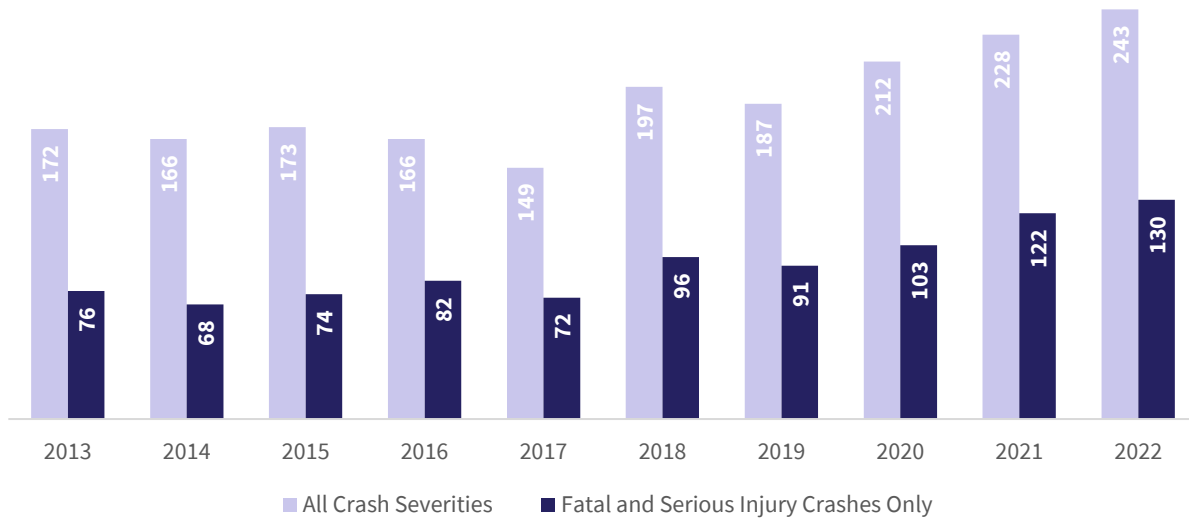
According to the VRUSA, pedestrian-involved crashes on ADOT facilities totaled 1,893 over the 10-year analysis period, as shown in **Figure 5**. Roughly 11% of all pedestrian-involved crashes statewide took place on State highways, while 22% of fatal pedestrian-involved crashes and 13% of serious injury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

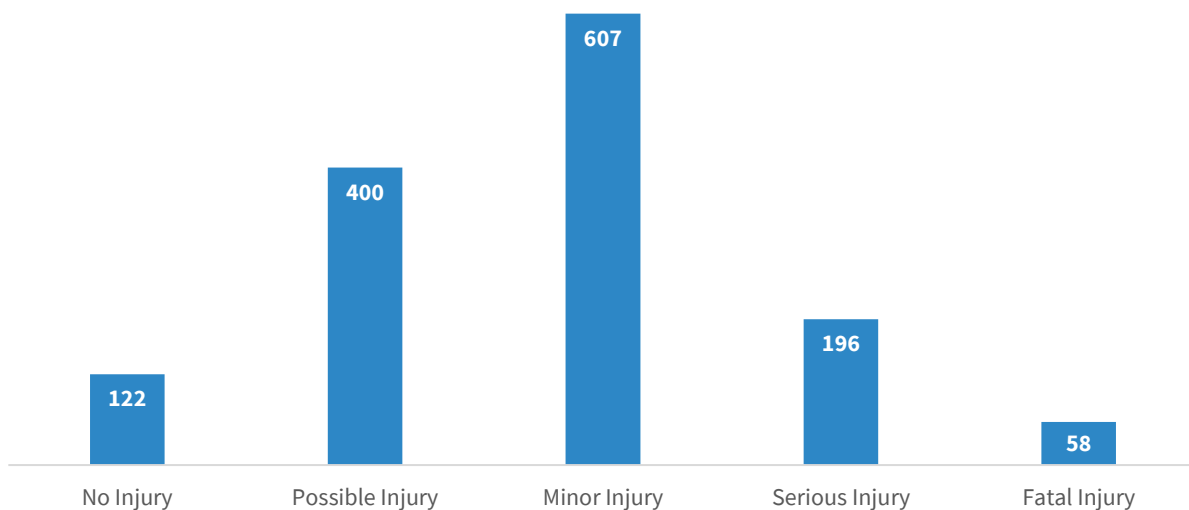
Figure 6. ADOT Facility Annual Pedestrian Crashes (2013-2022)



Bicyclist Crash Data Analysis

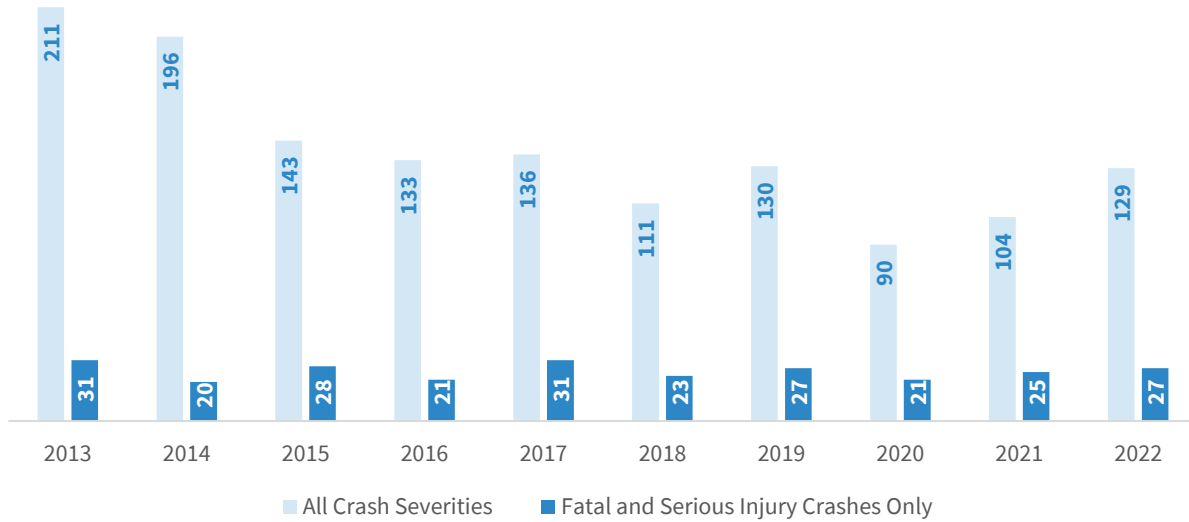
According to the VRUSA, bicyclist-involved crashes on ADOT facilities totaled 1,383 over the 10-year analysis period, as shown in **Figure 7**. Roughly 10% of all bicyclist-involved crashes took place on State roadways, while 18% of fatal bicyclist-involved crashes and 12% of serious injury bicyclist-involved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



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

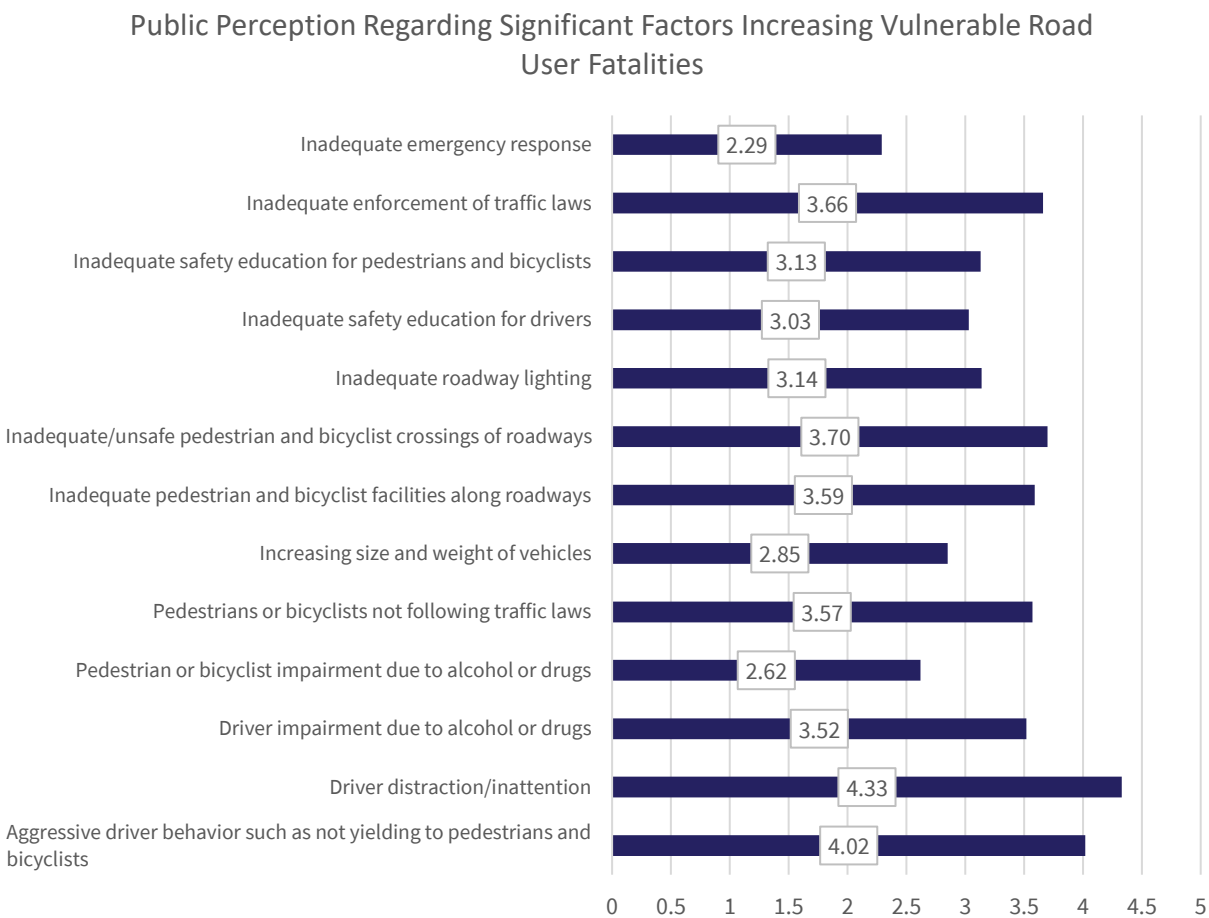


Figure 10 shows the public survey results for strategies to reduce VRU fatalities. The highest-ranking categories with weighted averages were:

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.

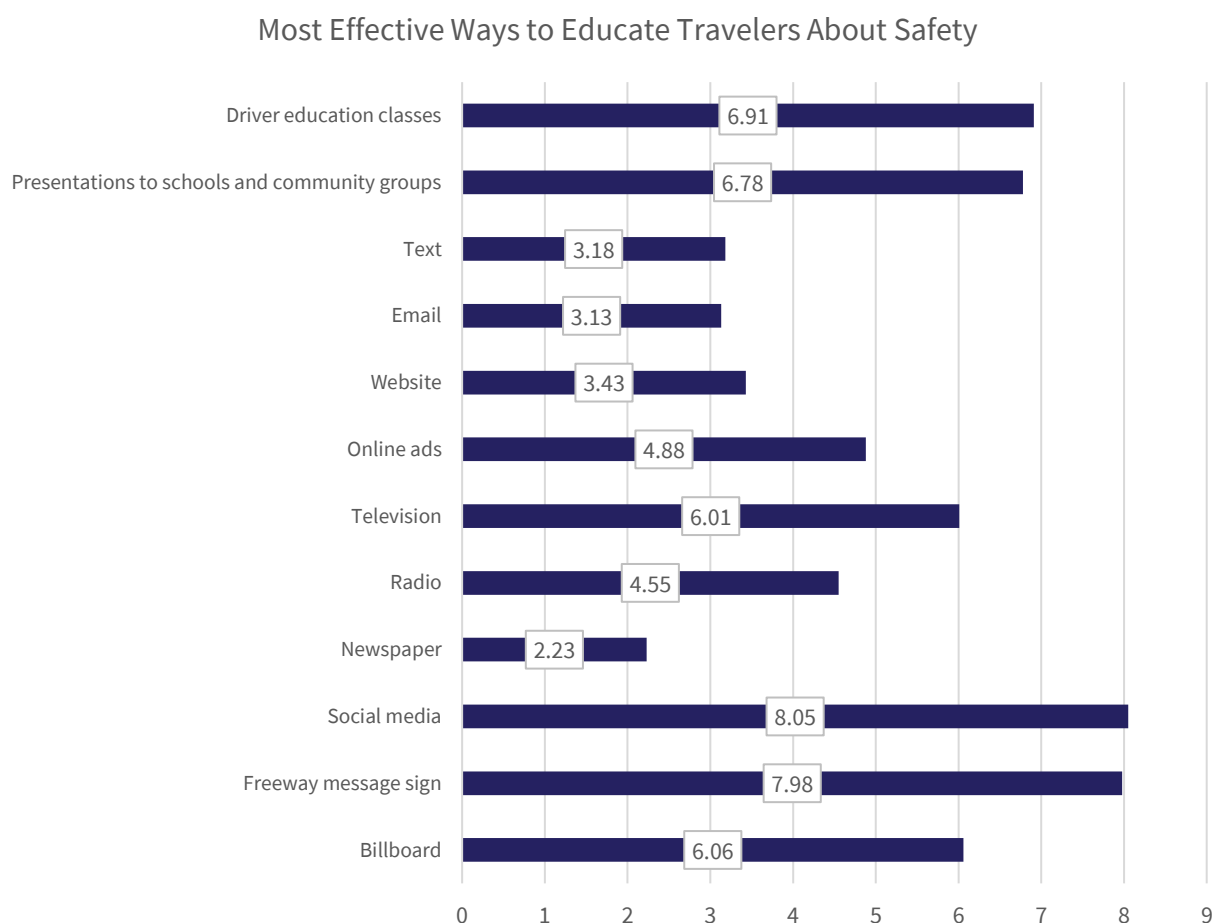
Figure 10. Survey Input on Strategies to Improve Vulnerable Road User Safety



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
Central	April 30, 2024	20	19
North	May 2, 2024	18	18
South	May 7, 2024	17	8
Virtual	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
Separated bike lanes and walkways	VRU safety education in schools	“Self-enforcing” roads*	E-bike regulations	Improve crash data
Increase visibility of VRUs and VRU facilities	Education for bicyclists and motorists	Automated and/or additional enforcement	Improve transit options	ADA/PROWAG compliance
Policies for VRUs	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)

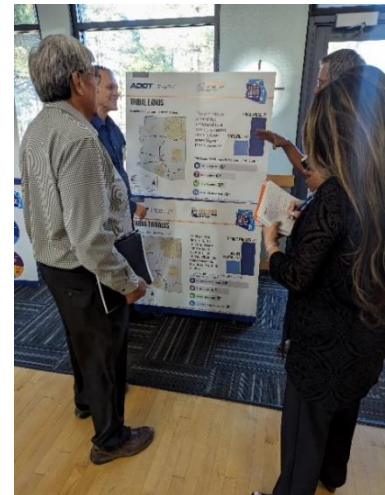
The roles and responsibilities of the TAC were the following:

- 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

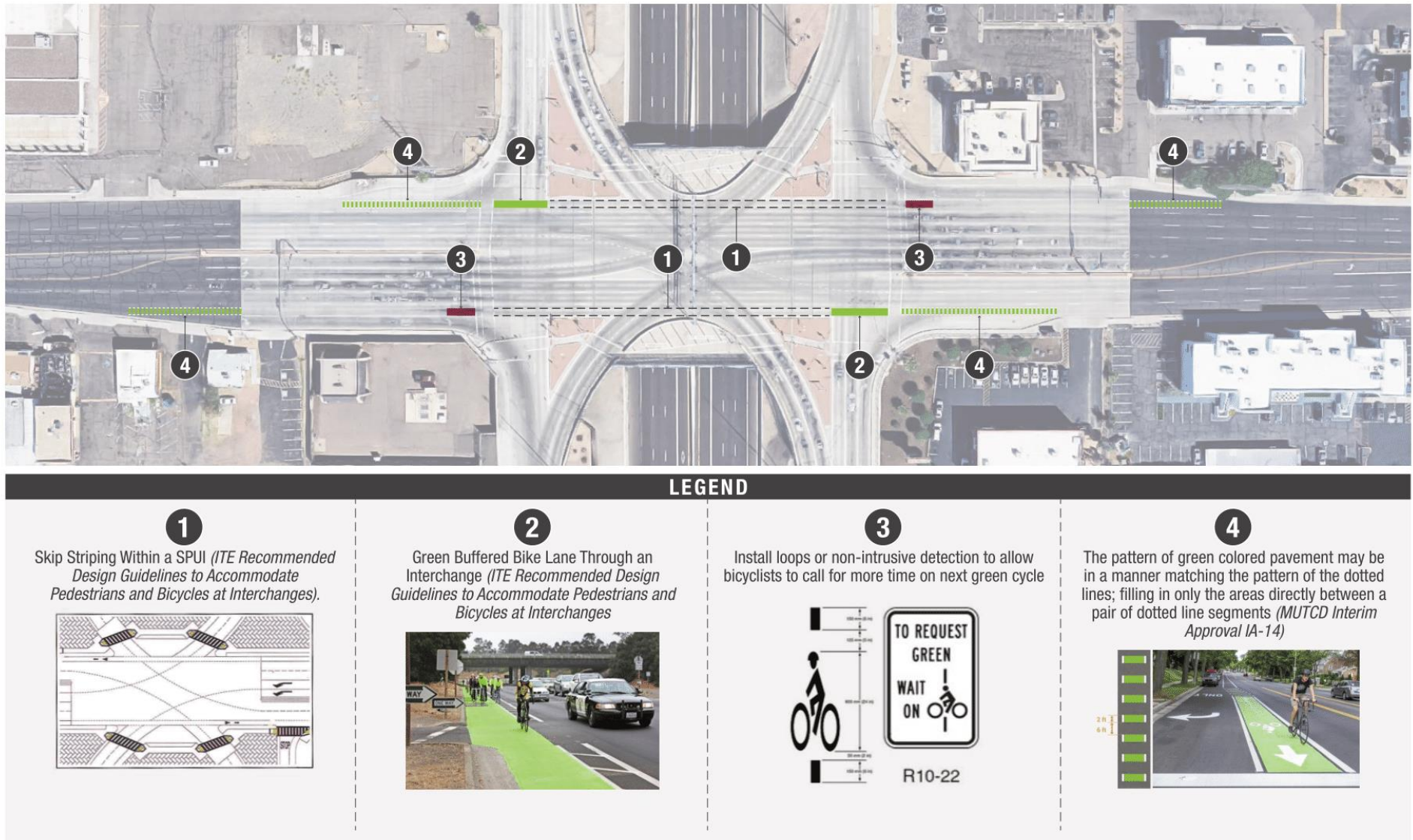
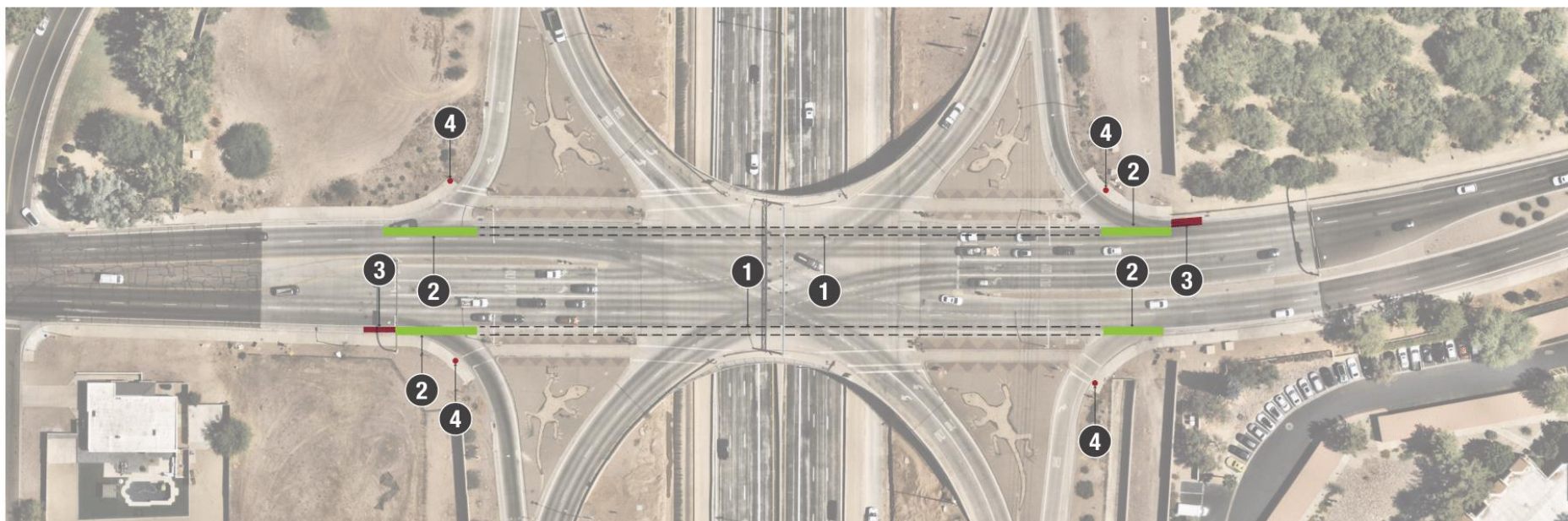


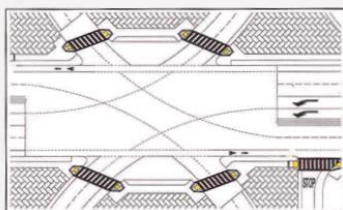
Figure 14. SPUI with Bike Lanes without Frontage Roads



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.

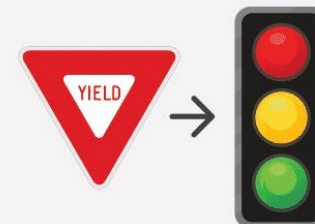


Figure 15. SPUI without Bike Lanes and with Frontage Roads

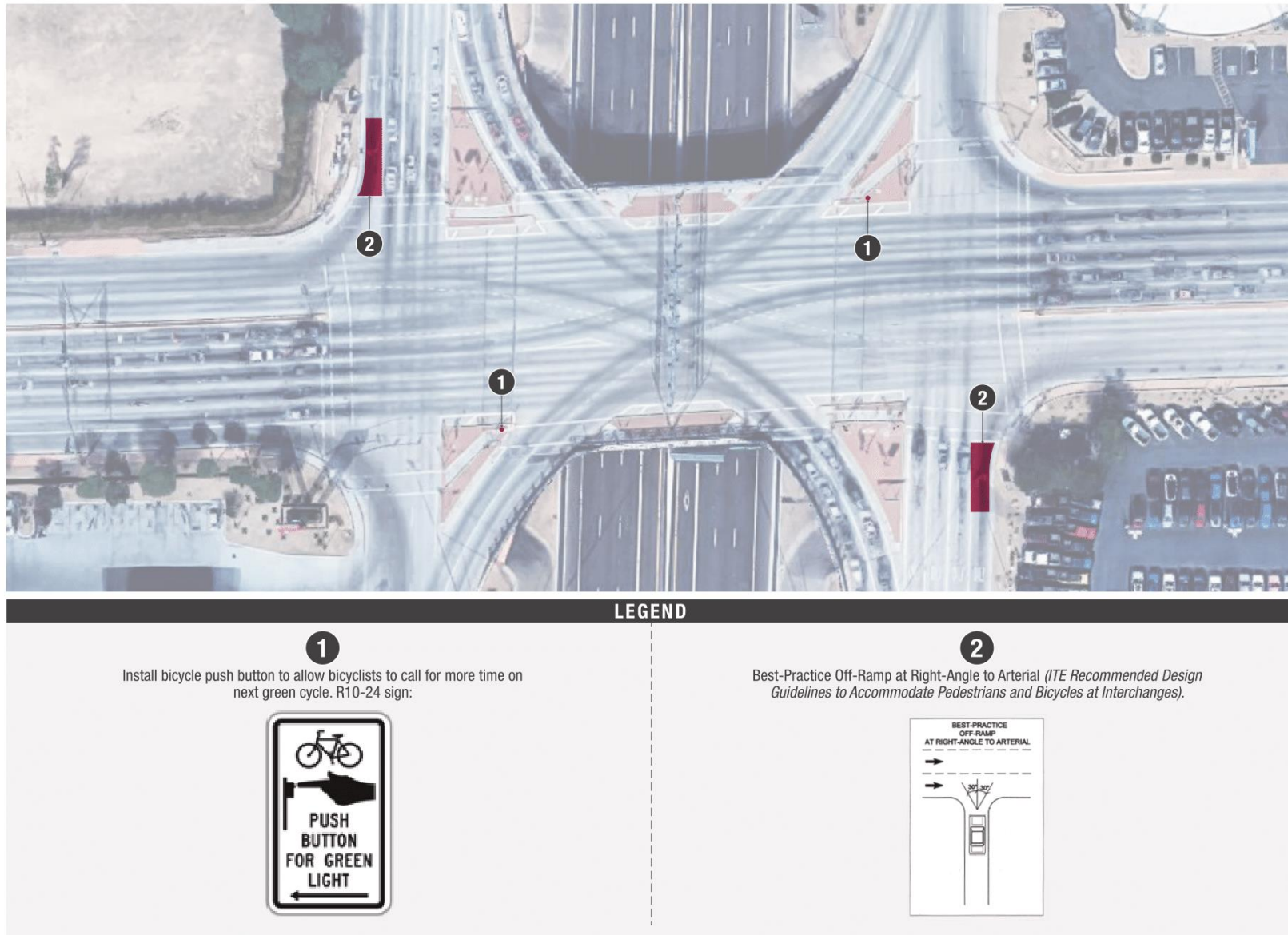


Figure 16. SPUI without Bike Lanes or Frontage Roads

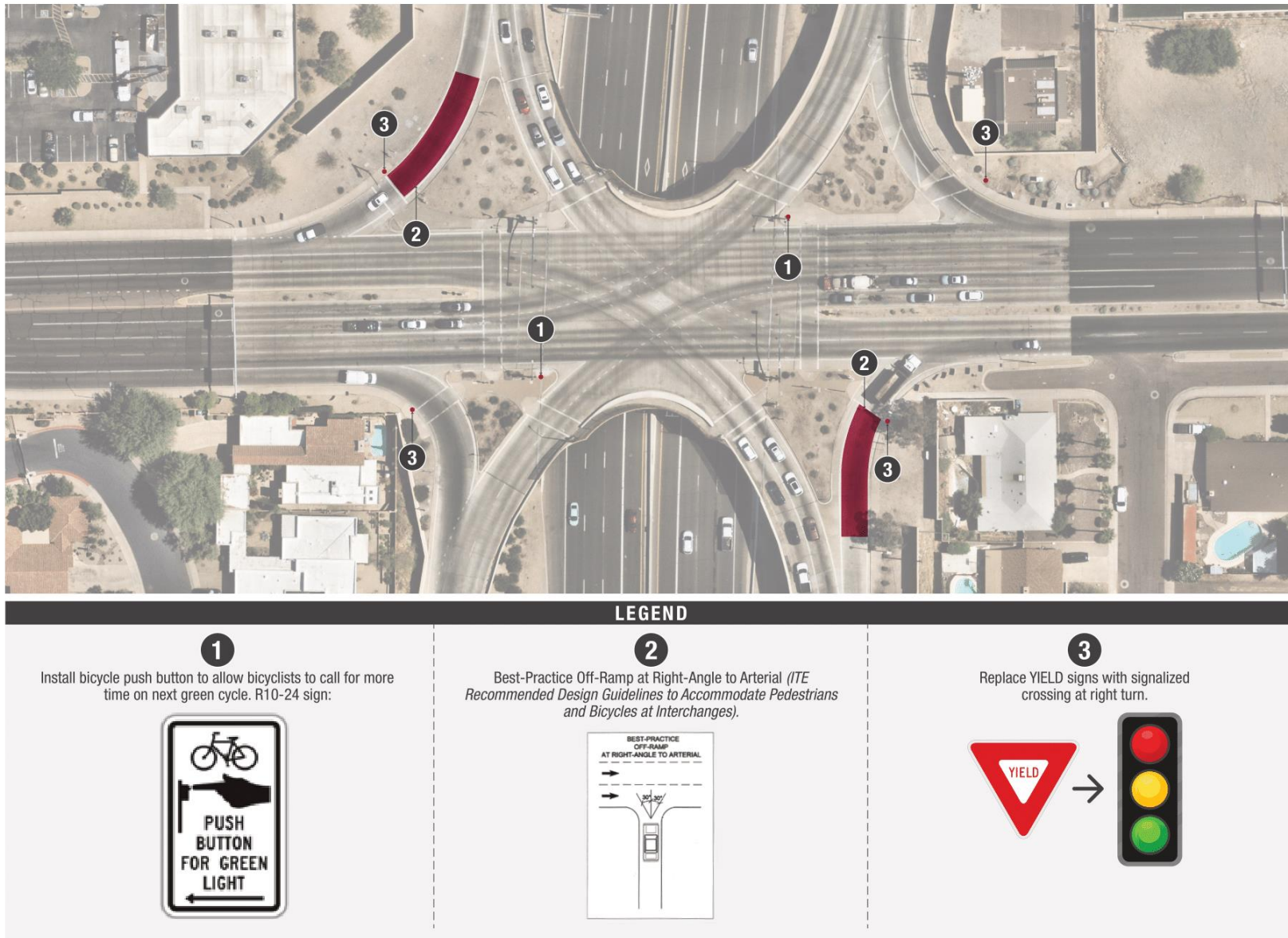


Figure 17. Diamond Interchange with Bike Lanes

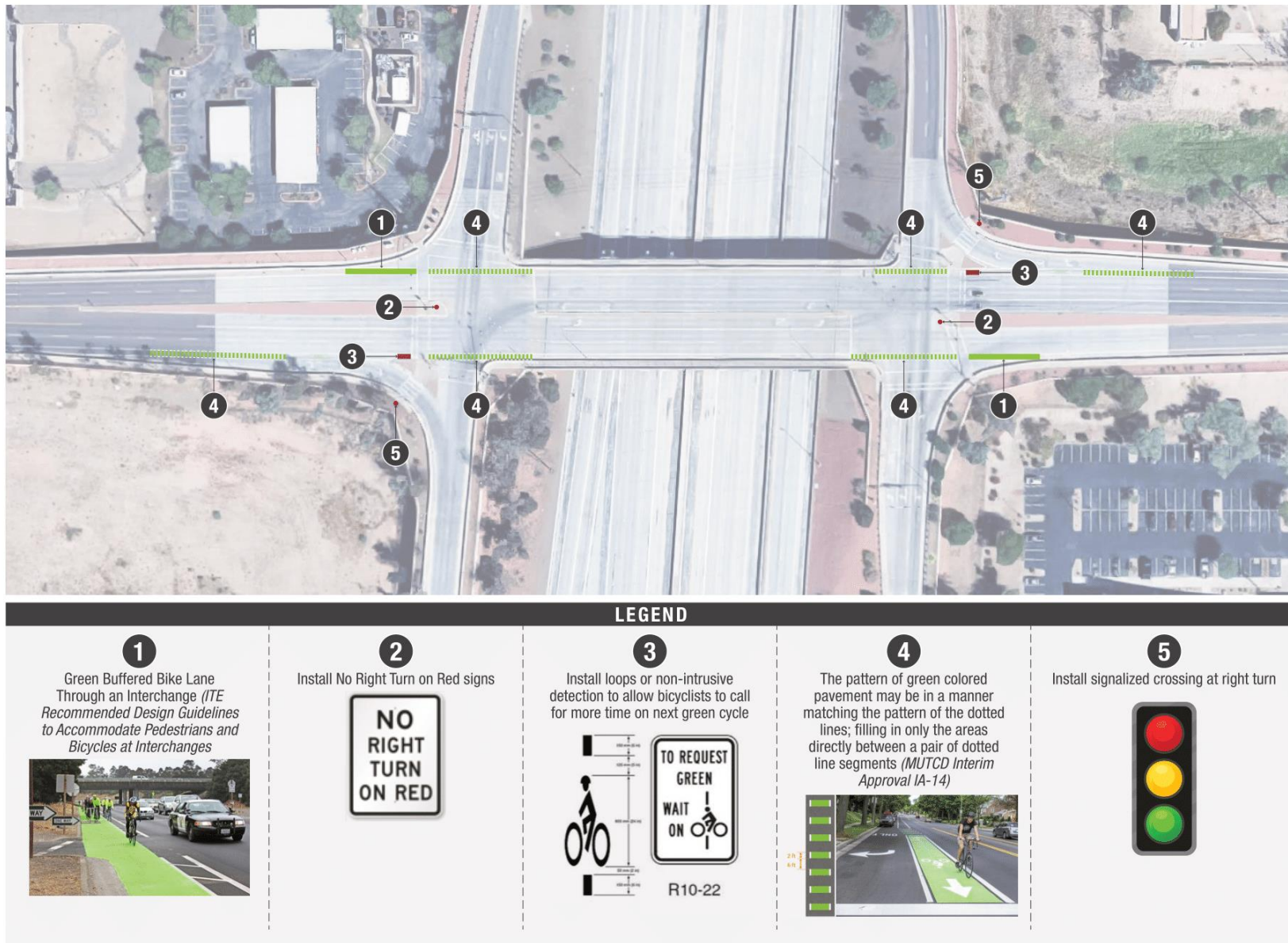
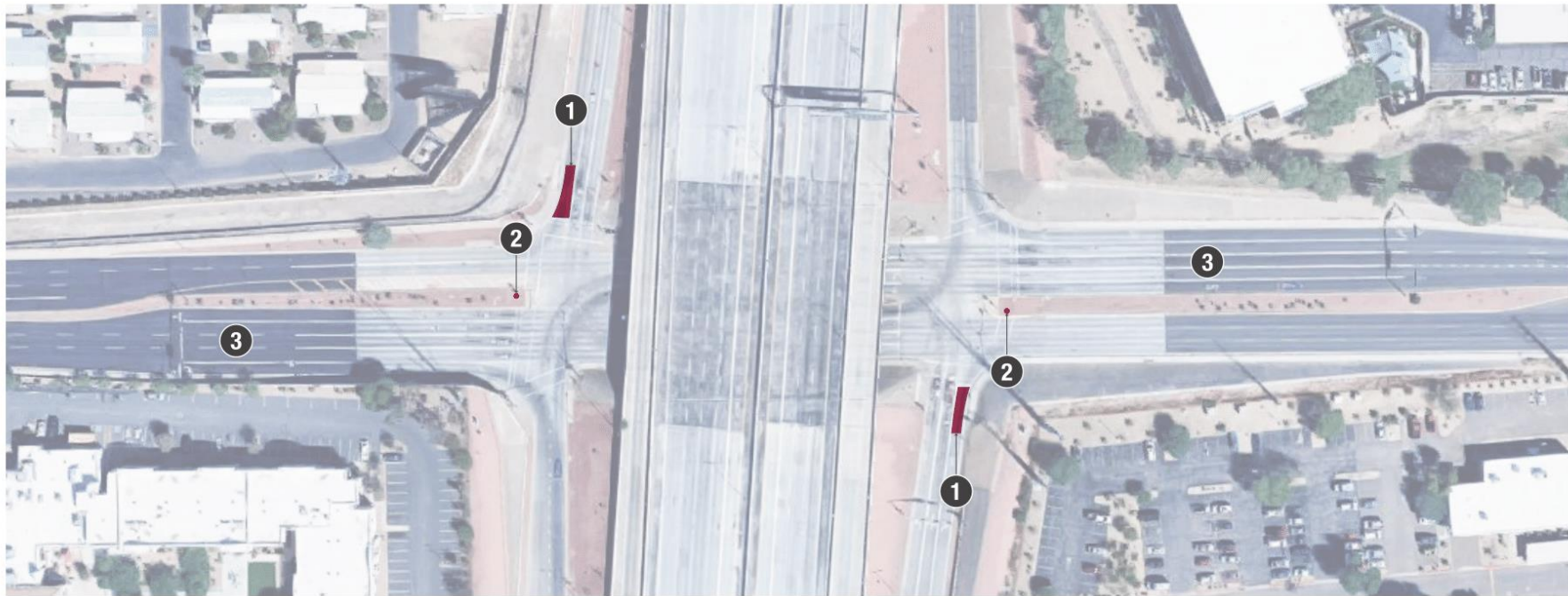


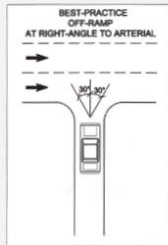
Figure 18. Diamond Interchange without Bike Lanes



LEGEND

1

Best-Practice Off-Ramp at Right-Angle to Arterial
(ITE Recommended Design Guidelines to Accommodate
Pedestrians and Bicycles at Interchanges).



2

Install No Right Turn on Red signs.



3

Widen bridge and/or reduce through lane width to provide
width for bike lanes on cross street.

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
Operating Environment/Width of Roadway	
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
Posted Travel Speed	
>45 miles per hour (mph)	6
35-45 mph	4
25-35 mph	2
<25 mph	0
Paved Shoulder Width	
0-4 feet	6
4-8 feet	3
> 8 feet	0
Pedestrian Exposure to Vehicles	
>25,000 ADT	6
8,000-25,000 ADT	3
<8,000 ADT	0
Prior Vehicle-Pedestrian Crashes at Location within past Five Years	
4 or more	6
1 – 3	3
Environment Type	
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
Population Density (Population per Square Mile)	
Low-density	0
Medium density	3
High-use recreational	6
Households in Poverty	
% 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
Sidewalk Connectivity	
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
Signalized Intersection Spacing or Distance to Alternate Crossing Facility	
>1,320 feet	6
1,319 – 660 feet	3
<660 feet	0
Attractors	
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
Operating Environment/Width of Roadway	
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
Posted Travel Speed	
50 mph or greater	6
35-45 mph	4
25-30 mph	2
20 mph or less	0
Paved Effective Shoulder Width/Wide Curb Lane	
0-4 feet	6
4-8 feet	0
Bicyclist Exposure to Vehicles	
>7,500 ADT	6
2,500-7,500 ADT	3
<2,500 ADT	0
Designated U.S. Bicycle Route (USBR) 90*	
Yes	3
No	0
Environment Type	
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

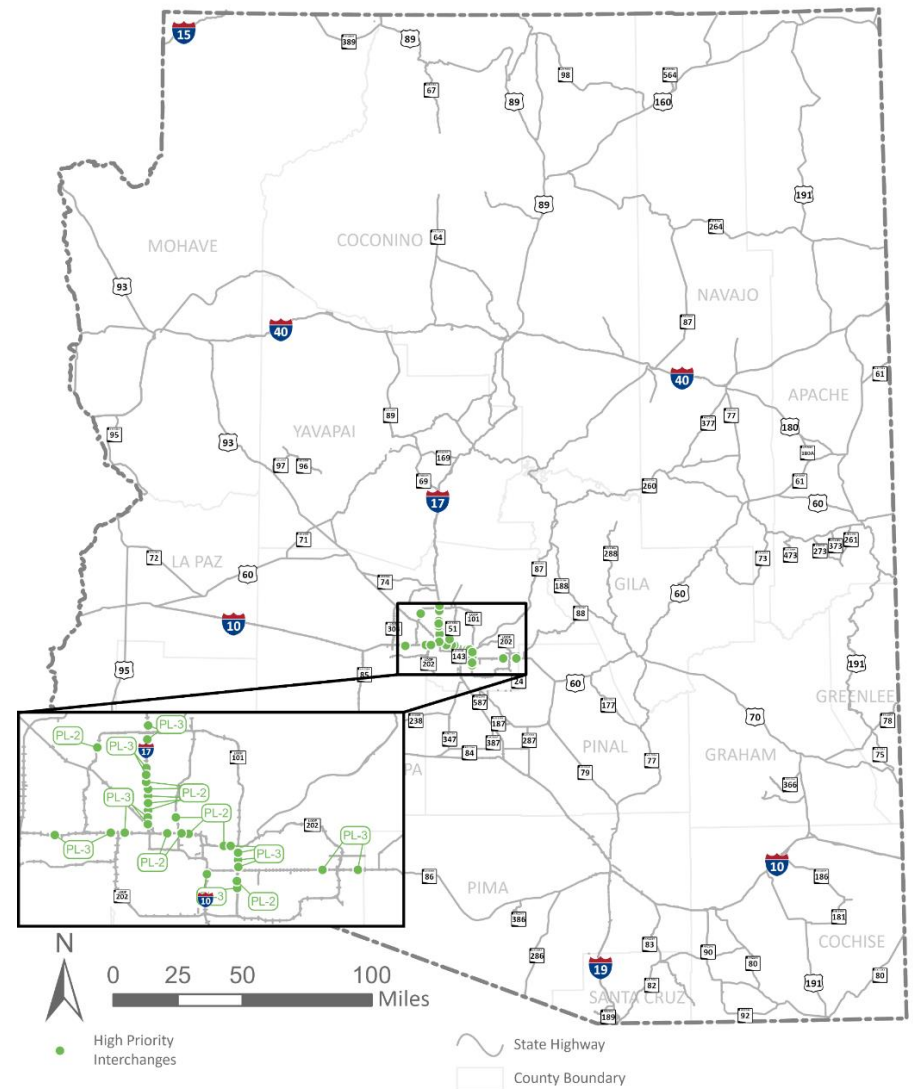
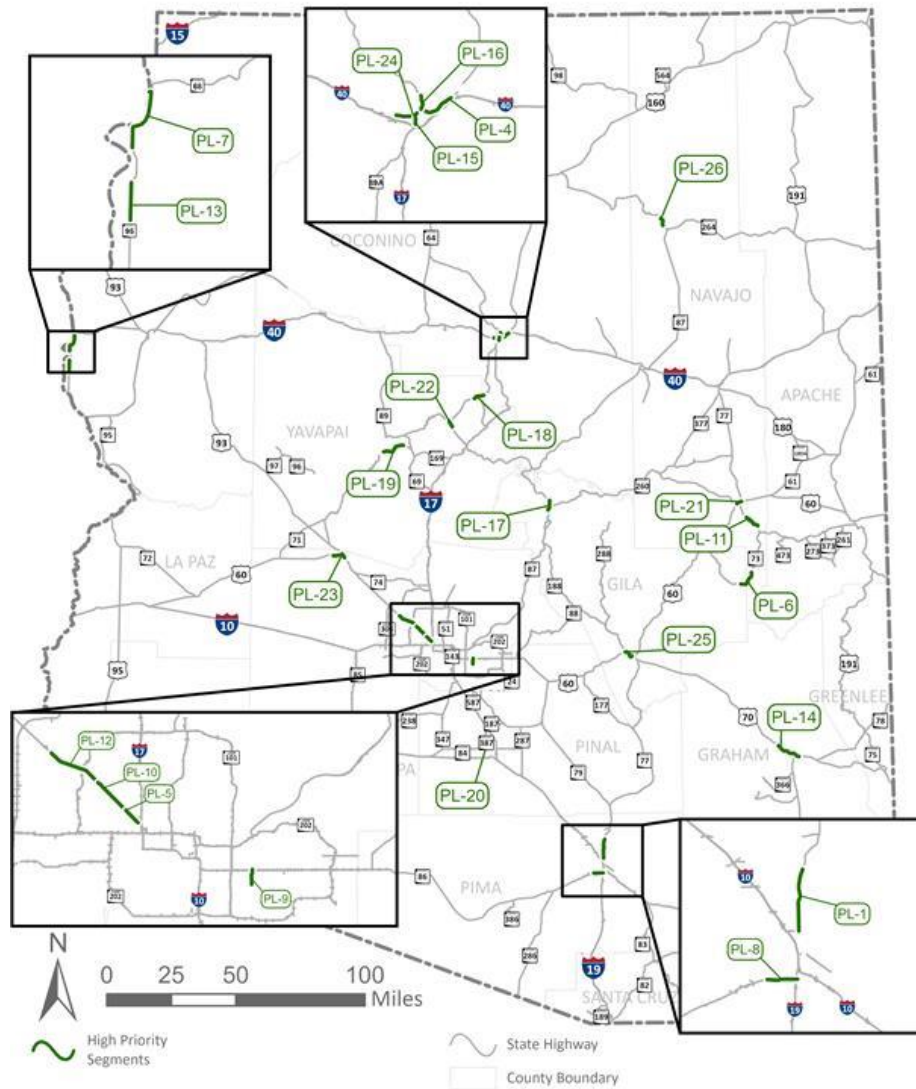


Table 8. Priority Locations Summary

Priority Location	County	Route Number	Route Name	Mile Post Start	Mile Post End	Corridor Length	Countermeasure Planning-Level Cost Estimate
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
						Total	\$103,102,000

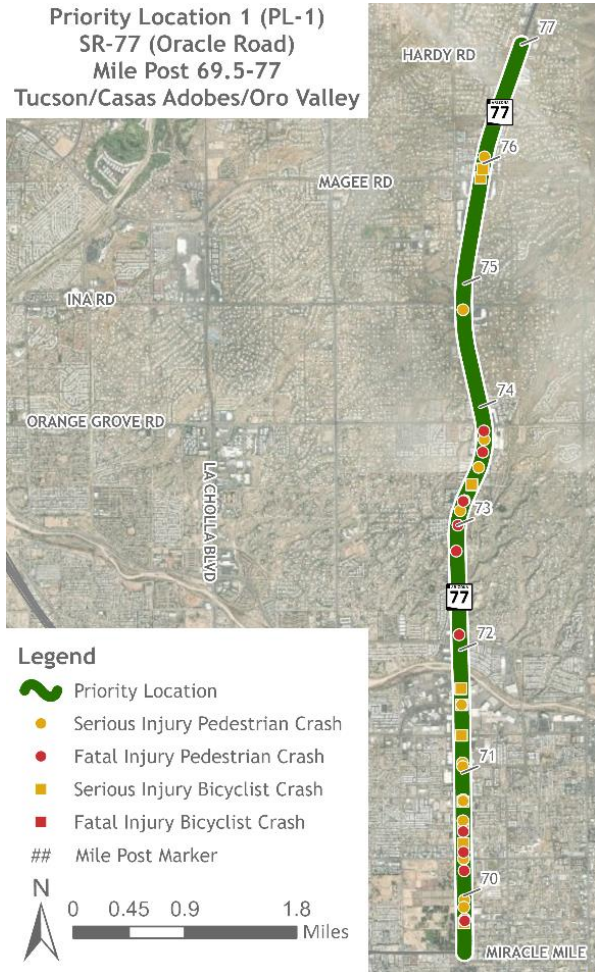
PL-1

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

Implementation Opportunities

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

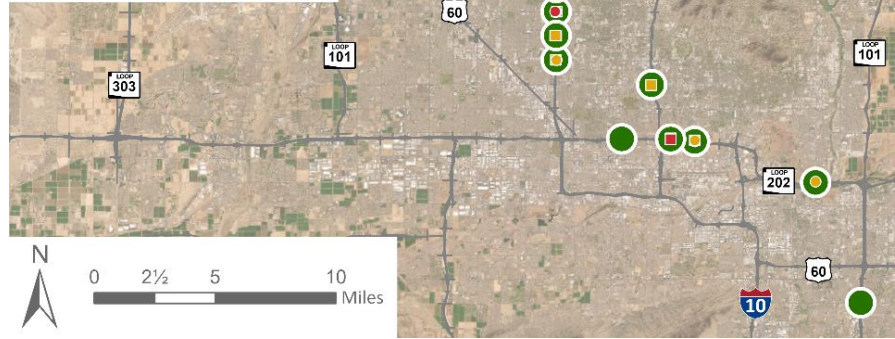
PL-2

Description

PL-2 is a group of 12 Single-Point Urban Interchanges (SPUI) in the Phoenix area (I-10: 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). 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/ Pedestrian	All
TOTAL	\$16,368,000				

Implementation Opportunities

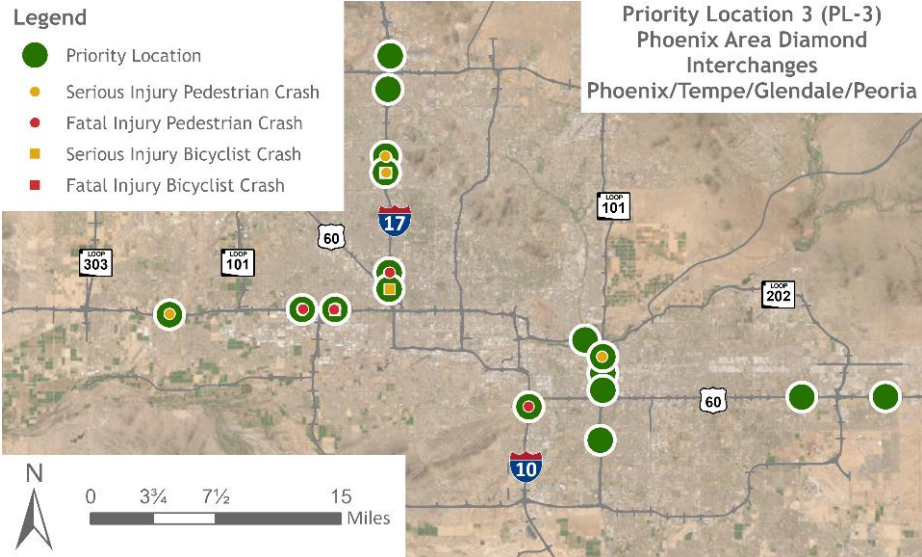
According to the ADOT Five Year Transportation Facilities Construction Program, ADOT has one upcoming project within PL-2.

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

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
TOTAL	\$3,884,000				

Implementation Opportunities

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

PL-5

Description

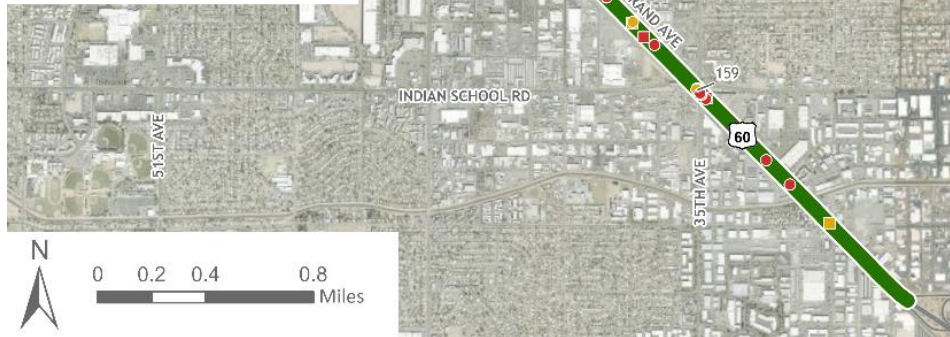
PL-5 is located along US-60 from MP 157.5 to 160 in the Phoenix area. PL-5 received an equity score of 14.

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/ 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 depending on existing radius	Vehicle/ Pedestrian	All
Upgrade Existing Crosswalk to High-Visibility Crosswalk	\$82,000	MP 159	0.6	Vehicle/ Pedestrian	All
Enhance Signal Operations with Leading Pedestrian Intervals (LPIs)	\$7,000	MP 159	0.9	All	All
TOTAL	\$4,732,000				

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, 35th 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)

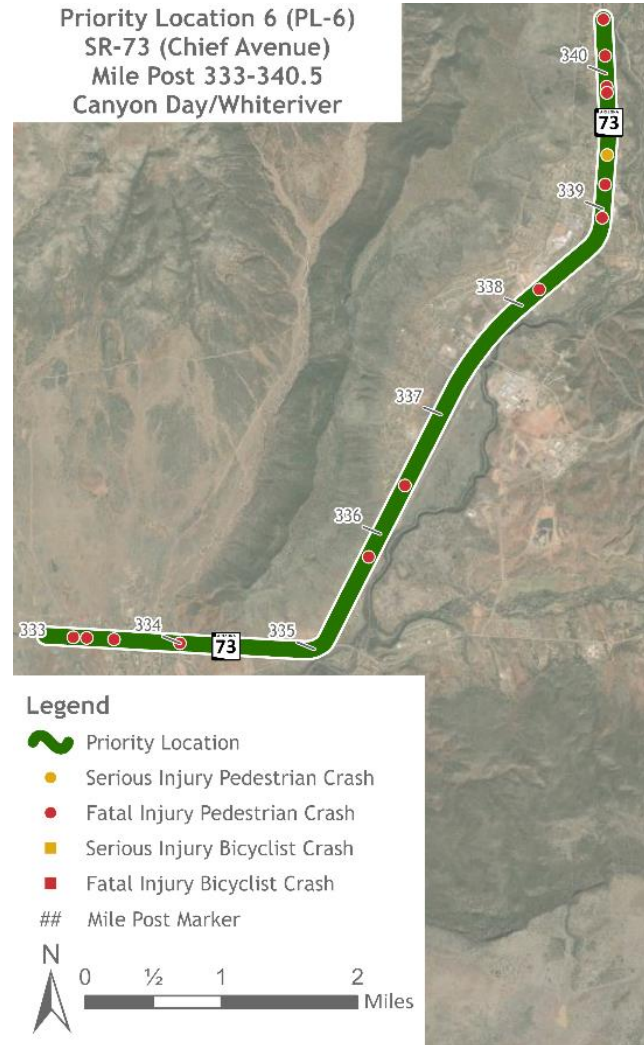
PL-6

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
Install Highway Lighting	\$1,122,000	MP 334.9-336.6	0.31	All	Fatal
Reduce Curb Radii to 35' at Signalized Intersections	\$220,000	MP 337.6	0.8-0.9 depending on existing radius	Vehicle/Pedestrian	All
Increase Enforcement	-	-	-	-	-
TOTAL	\$1,342,000				

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)

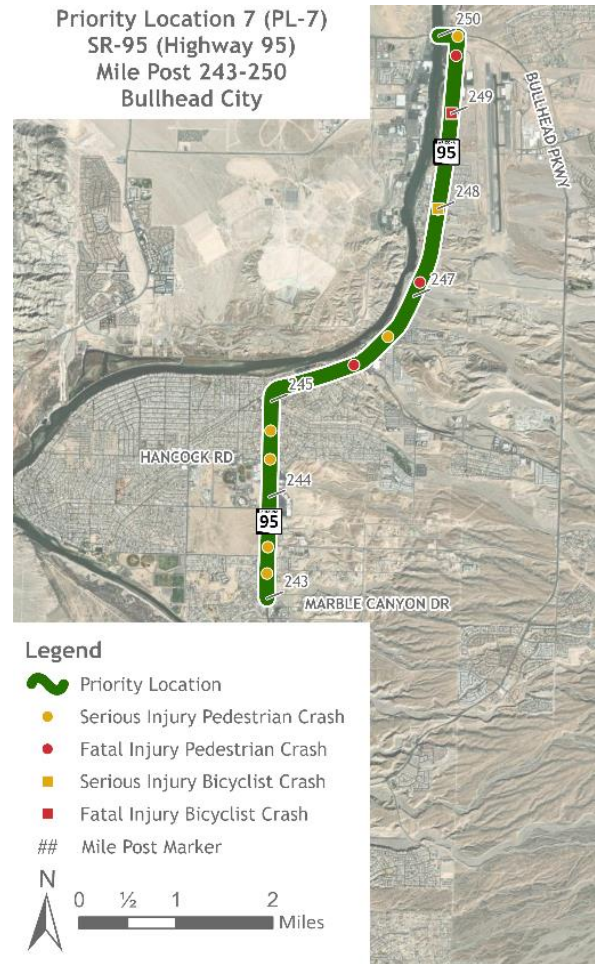
PL-7

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	-	-	-	-	-
TOTAL	\$1,040,000				

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

Implementation Opportunities

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

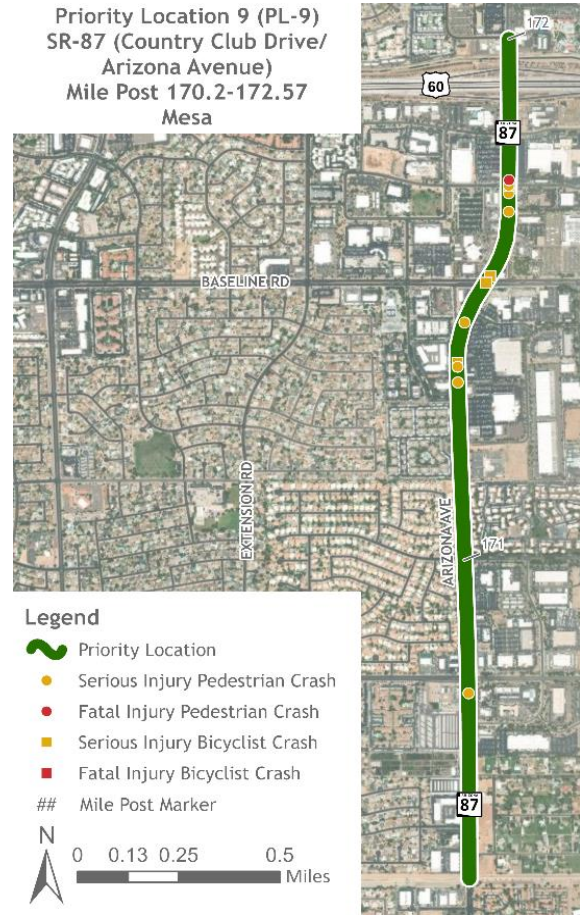
PL-9

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

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)

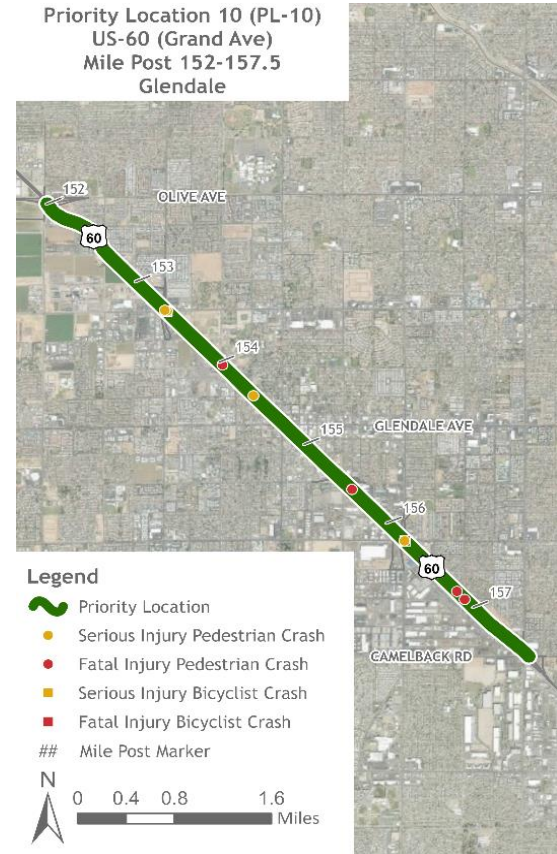
PL-10

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

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

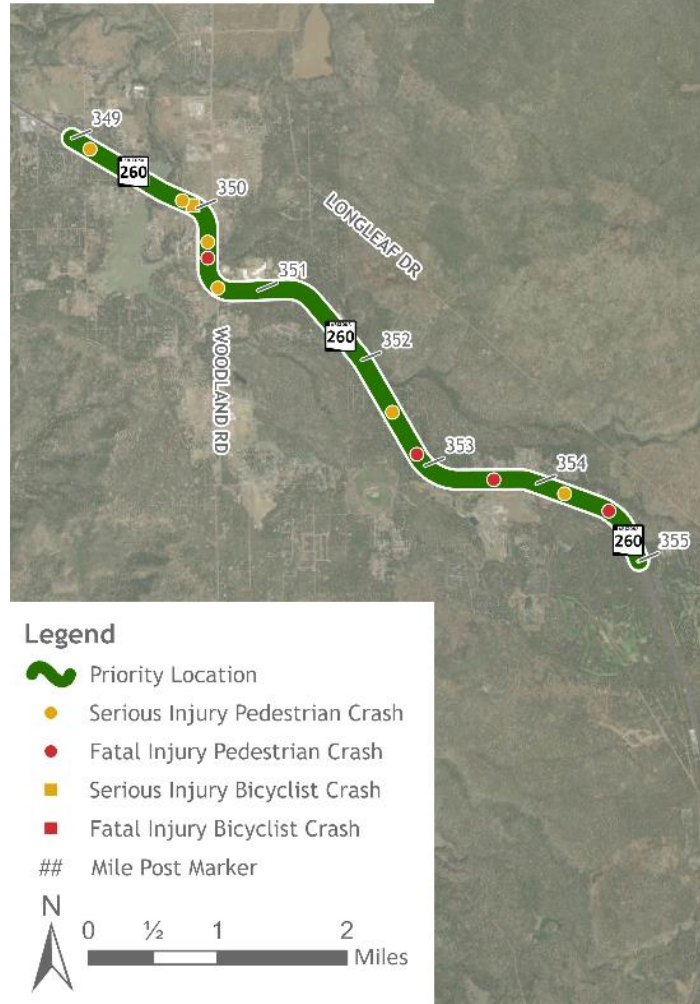
Description

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
TOTAL	\$4,002,000				

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)

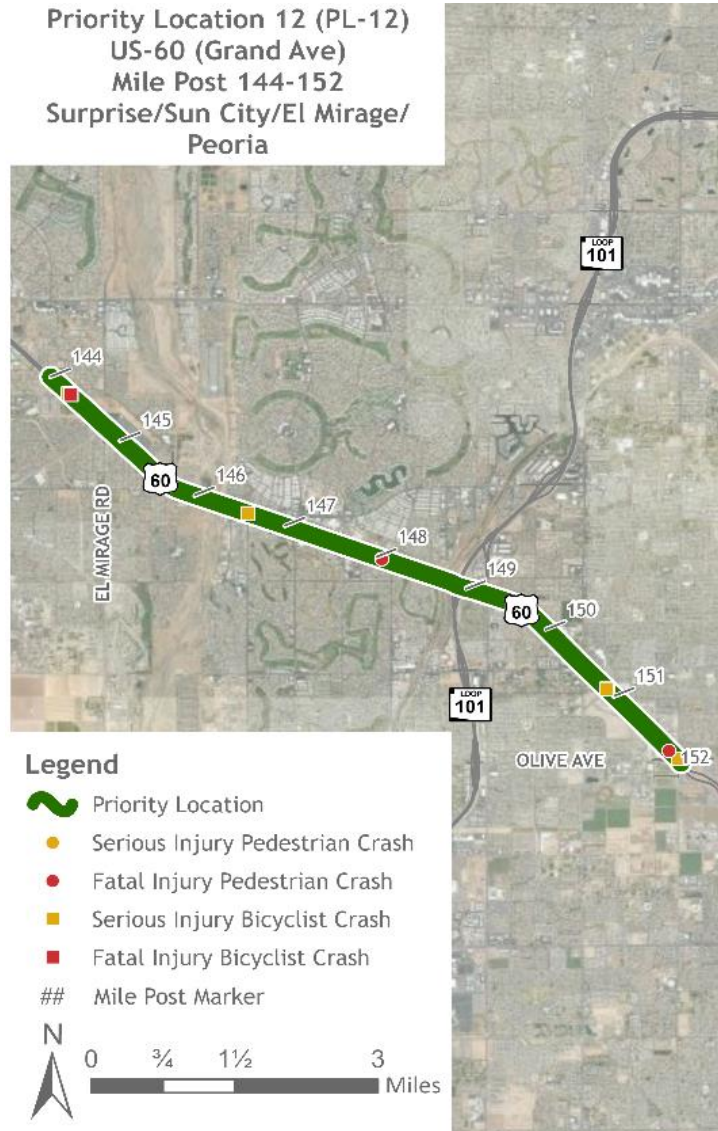
PL-12

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
Install Highway Lighting	\$3,564,000	North side from MP 144-149.4	0.31	All	Fatal
Enhance Signal Operations with Leading Pedestrian Intervals (LPIs)	\$105,000	15 intersections	0.9	All	All
TOTAL	\$3,669,000				

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)

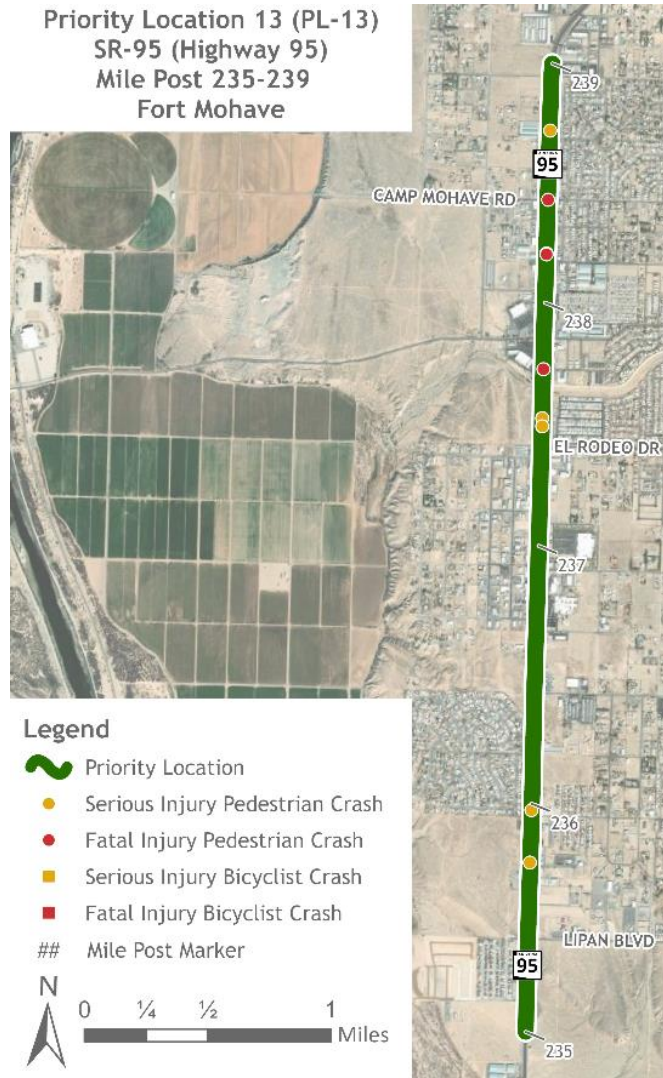
PL-13

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
Install Highway Lighting	\$2,640,000	MP 235-239	0.31	All	Fatal
Install Sidewalk or Walkway	\$5,580,000	MP 235-239	0.598	Vehicle/ Pedestrian	All
Install High-Visibility Crosswalk at Midblock Locations	\$80,000	MP 235.9	0.6	Vehicle/ Pedestrian	All
Enhance Signal Operations with Leading Pedestrian Intervals (LPIs)	\$49,000	7 intersections	0.9	All	All
TOTAL	\$8,349,000				

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

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)

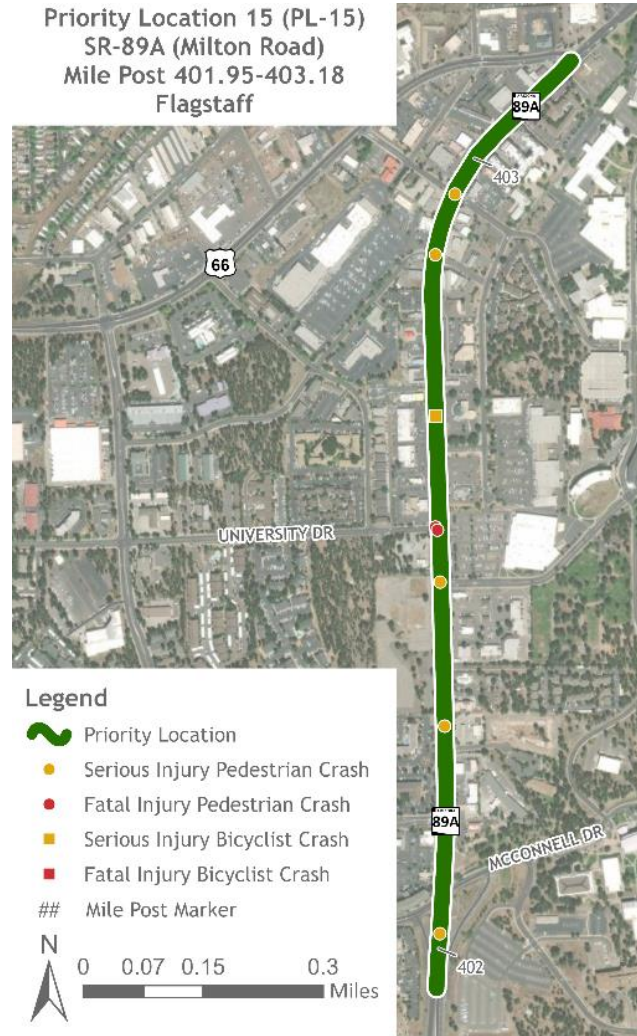
PL-15

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
TOTAL	\$965,000				

Implementation Opportunities

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

PL-16

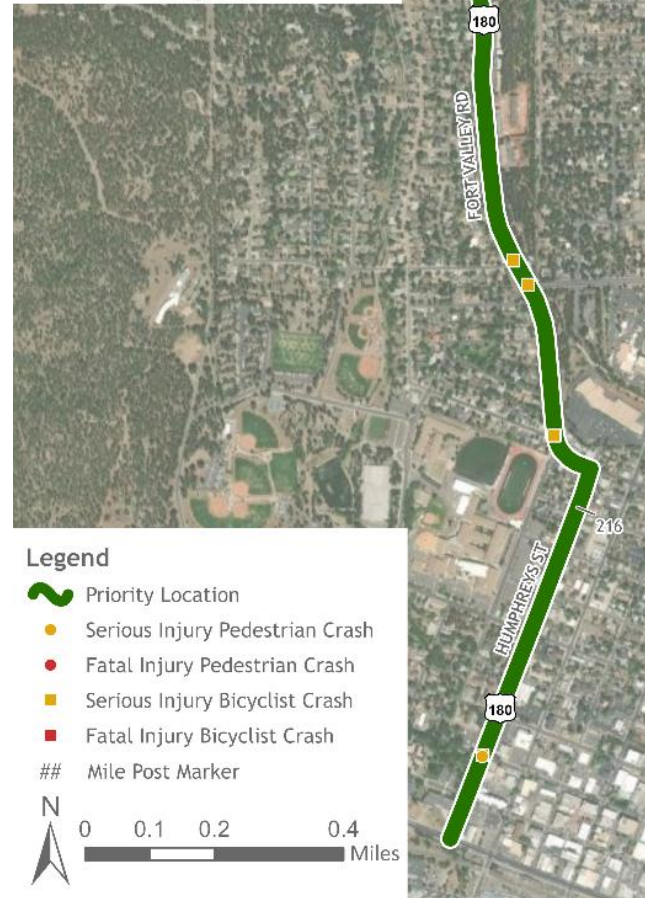
Description

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

Priority Location 16 (PL-16)
US-180 (Humphreys Street/Fort
Valley Road)
Mile Post 215.44-217
Flagstaff



Countermeasures and Preliminary Planning-Level Cost Estimate

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

Implementation Opportunities

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

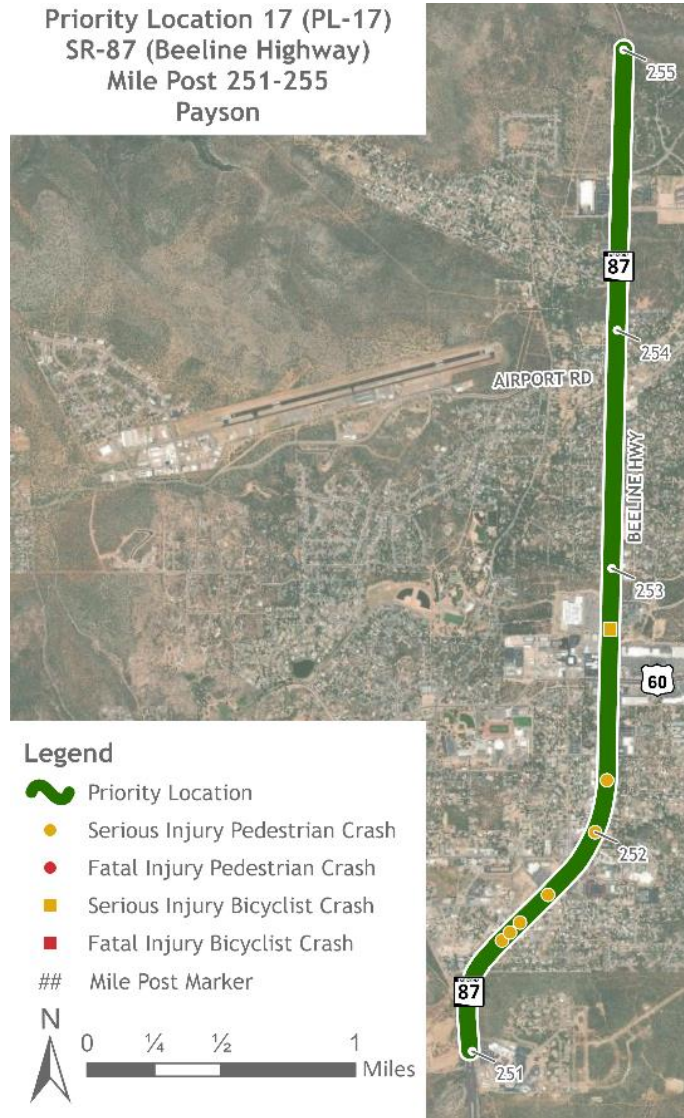
PL-17

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
Reduce Curb Radii to 30' at Signalized Intersections	\$440,000	8 curb radii reductions	0.8-0.9 depending on existing radius	Vehicle/ Pedestrian	All
Upgrade Existing Crosswalk to High-Visibility Crosswalk	\$410,000	5 intersections	0.6	Vehicle/ Pedestrian	All
TOTAL	\$850,000				

Implementation Opportunities

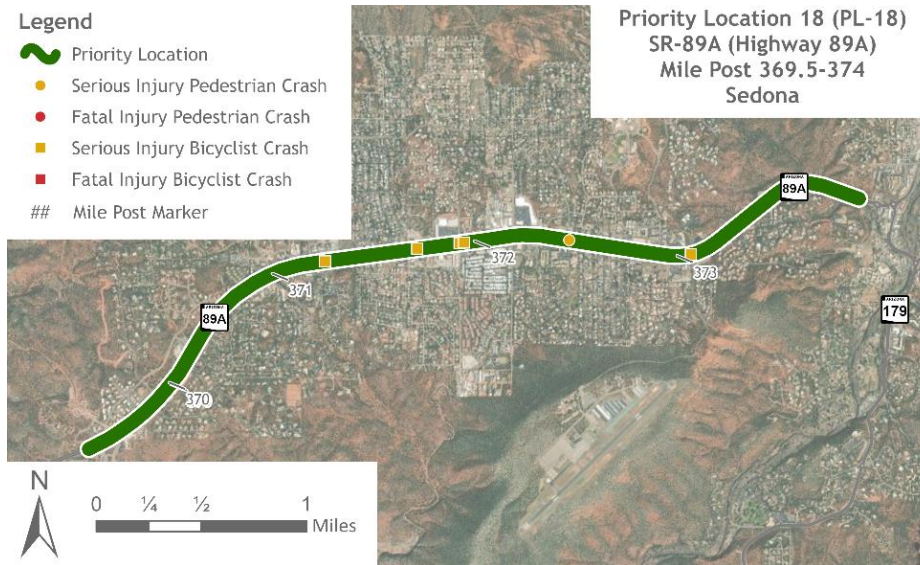
According to the ADOT Five Year Transportation Facilities Construction Program, ADOT has two upcoming projects within PL-17.

- 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/ 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/ Pedestrian	All
TOTAL	\$578,000				

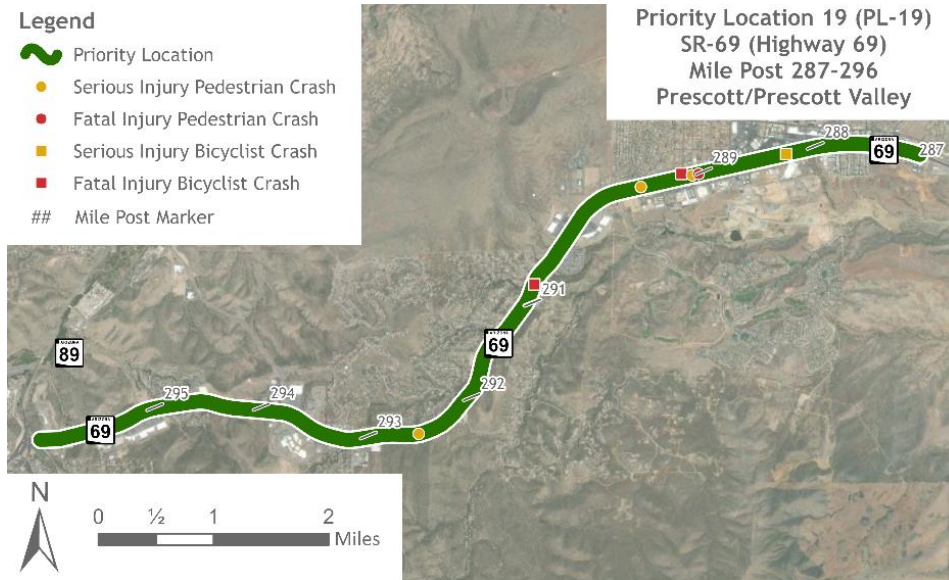
Implementation Opportunities

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
TOTAL	\$10,005,000				

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/ 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 depending on existing radius	Vehicle/ Pedestrian	All
Upgrade Existing Crosswalk to High-Visibility Crosswalk	\$164,000	MP 0.5 and 2.0	0.6	Vehicle/ Pedestrian	All
TOTAL	\$2,224,000				

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	-	-	-	-	-
TOTAL	\$479,000				

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)

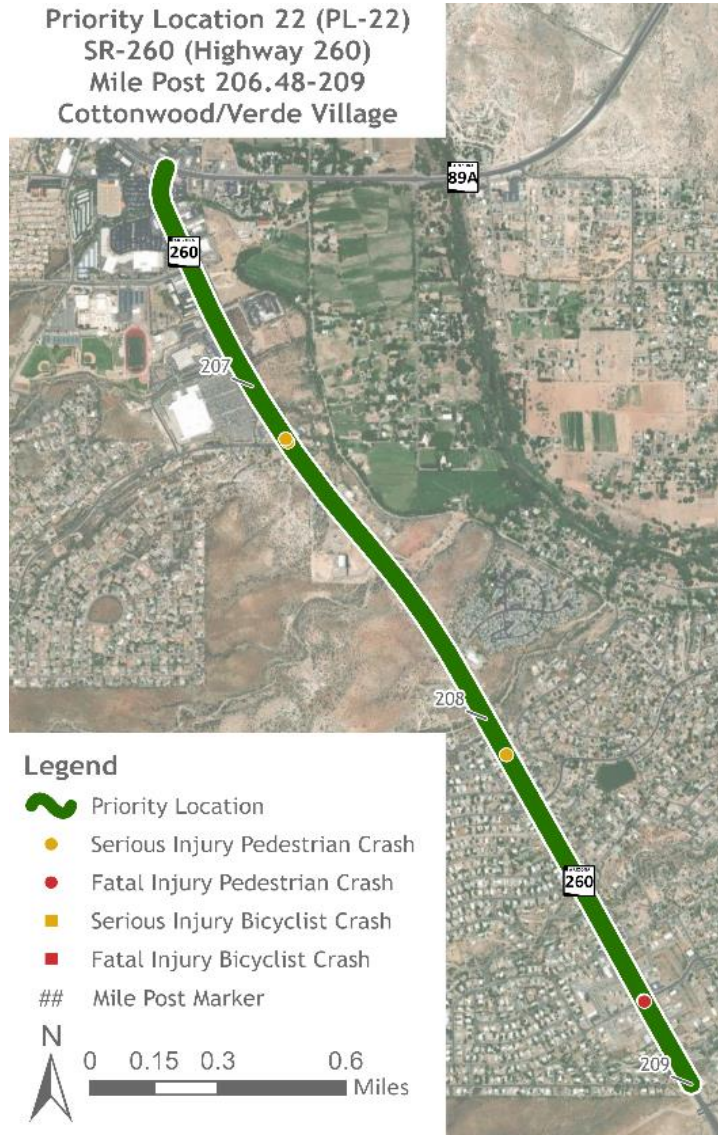
PL-22

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/ Pedestrian	All
Reduce Curb Radii to 35' at Signalized Intersections	\$110,000	2 curb radii reductions	0.8-0.9 depending on existing radius	Vehicle/ Pedestrian	All
Upgrade Existing Crosswalk to High-Visibility Crosswalk	\$164,000	MP 206.48 and 206.9	0.6	Vehicle/ Pedestrian	All
TOTAL	\$1,669,000				

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
Reduce Curb Radii to 35' at Signalized Intersections	\$165,000	3 curb radii reductions	0.8-0.9 depending on existing radius	Vehicle/ Pedestrian	All
Install Sidewalk or Walkway	\$2100,000	South side from MP 107.5-107.65	0.598	Vehicle/ Pedestrian	All
Upgrade Existing Crosswalk to High-Visibility Crosswalk	\$82,000	MP 107.65	0.6	Vehicle/ Pedestrian	All
Increase Enforcement	-	-	-	-	-
TOTAL	\$457,000				

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
Reduce Curb Radii to 30' at Signalized Intersections	\$165,000	3 curb radii reductions	0.8-0.9 depending on existing radius	Vehicle/Pedestrian	All
Enhance Signal Operations with Leading Pedestrian Intervals (LPIs)	\$14,000	2 intersections	0.9	All	All
TOTAL	\$179,000				

Implementation Opportunities

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

PL-25

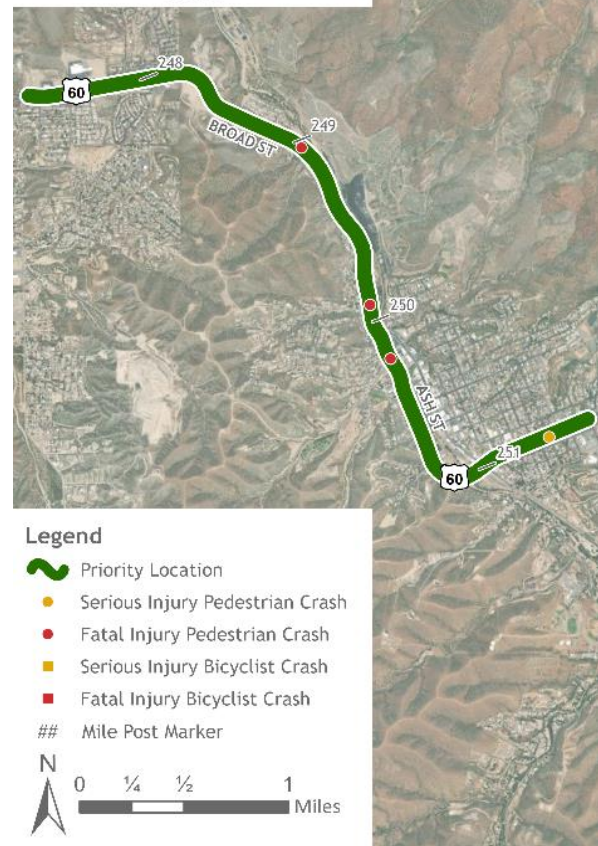
Description

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/ Pedestrian	All
Reduce Curb Radii to 35' at Signalized Intersections	\$110,000	2 curb radii reductions	0.8-0.9 depending on existing radius	Vehicle/ Pedestrian	All
Upgrade Crosswalks to High-Visibility Crosswalk at Midblock	\$246,000	MP 249.7, 249.9, and 250.2	0.6	Vehicle/ Pedestrian	All
Enhance Signal Operations with Leading Pedestrian Intervals (LPIs)	\$35,000	5 intersections	0.9	All	All
TOTAL	\$670,000				

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

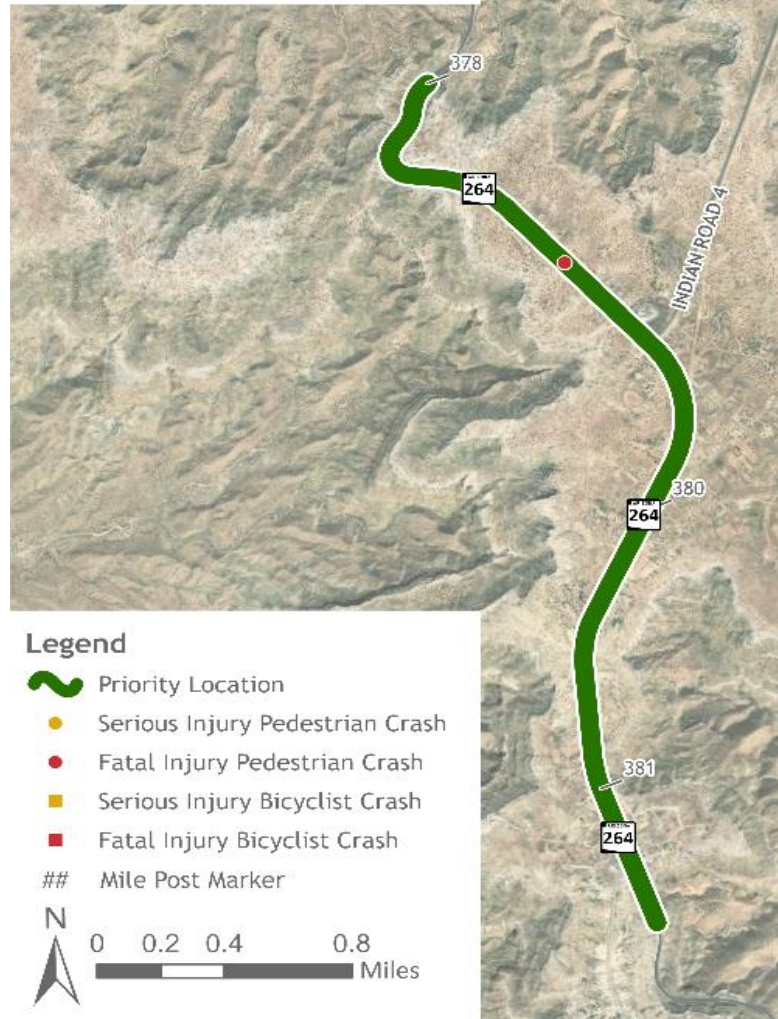
Description

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/ Pedestrian	All
Increase Enforcement	-	-	-	-	-
TOTAL	\$1,070,000				

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



PSAP High-Crash Intersections

Intersection / Interchange ID	Area	Location	Total Crashes (2011 to 2015)	Total Crashes (2018 to 2022)	Change	Activities Since PSAP
1	Phoenix	I-17/Bethany Home Road	5	3	-2	None
2	Tucson	SR 77/River Road	4	2	-2	None
3	Tucson	SR 77/Ina Road	3	0	-3	None
4	Phoenix	I-17/Northern Avenue	3	3	0	Road Safety Assessment completed
5	Phoenix	I-10/67 th Avenue	3	8	5	Road Safety Assessment completed
6	Phoenix	I-10/Dysart Road	4	1	-3	Road Safety Assessment completed
7	Fort Mohave	SR 95/Joy Lane	3	0	-3	Road Safety Assessment completed
8	Flagstaff	I-40B/Milton Road	3	3	0	None
9	Flagstaff	US 180/Birch Avenue	3	1	-2	None
10	San Luis	US 95/B Street	5	1	-4	None
11	Phoenix	I-17/Glendale Avenue	3	7	4	None
12	Phoenix	I-17/Indian School Road	3	7	4	None
13	Phoenix	I-17/Thomas Road	5	3	-2	None
		Total	47	39	-8	

PSAP High-Crash Segments

Segment ID	Area	Highway (Location)	Total Crashes (2011 to 2015)	Total Crashes (2018 to 2022)	Change	Activities Since PSAP
1	Tuba City	US 160 (MP 323 – MP 324.5)	4	0	-4	None
2	Chinle	US 191 (MP 448 – MP 449)	3	0	-3	None
3	Golden Valley	SR 68 (MP 18.0 – MP 24.3)	7	3	-4	Raised median installed in 2021 at MP 22.5 – MP 24.8
4	Bullhead City	SR 68 (MP 2.0 – MP 3.5)	3	1	-2	None
5	Fort Mohave	SR 95 (MP 237.4 – MP 239.2)	5	6	1	Raised median installed in 2016
6	Whiteriver	SR 73 (MP 339 – MP 341)	5	3	-2	Road Safety Assessment completed
7	Sierra Vista	SR 92 (MP 326.7 – SR 90)	12	6	-6	Road Safety Assessment completed
8	Three Points	SR 86 (MP 151.0 – MP 153.0)	3	1	-2	None
9	Tucson	SR 86 (MP 170.3 – MP 171.62)	12	8	-4	Road Safety Assessment completed
10	Pima County	SR 77 (Roller Coaster Road – Suffolk Drive)	17	10	-7	Pedestrian signal installed in 2018; Lighting and sidewalk installed in 2022
11A	Flagstaff	SR 89A (Forest Meadows – SR40B)	12	11	-1	Road Safety Assessment completed; Pedestrian underpass programmed for 2025
11B	Flagstaff	SR 40B (Intersection of SR 40B/Route 66/SR 89A – Eden Street)	14	9	-5	None
12	Flagstaff	SR 40B (Arrowhead Avenue – Park Drive)	6	3	-3	None
13	Surprise	US 60 (MP 143 – MP 145)	4	2	-2	Road Safety Assessment completed
14	Phoenix	US 60 (MP 158.5 – MP 159.5)	9	10	1	None
15	San Carlos	US 70 (MP 257.0 – MP 259.0)	3	0	-3	Road Safety Assessment completed
16	Mesa	US 60X, Apache Trail (Meridian Road – 83 rd Place)	15	10	-5	Road Safety Assessment completed; Road diet programmed in 2024
		Total	134	83	-51	

PSAP High-Risk Segments

High-Risk Segments		Total Crashes (2011 to 2015)	Total Crashes (2018 to 2022)	Change	Activities Since PSAP
Segment 1	SR 95, MP 244 - MP 246	8	6	-2	Road Safety Assessment completed
Segment 2	SR 95, MP 241.5 - MP 244	4	3	-1	Road Safety Assessment completed
Segment 3	SR 95, MP 235.5 - MP 239.5	2	4	2	Road Safety Assessment completed; Raised median installed in 2021
Segment 4	SR 95, MP 229.4 - MP 230.5	0	0	0	None
Segment 5	SR 347, MP 171.4 - MP 175.4	2	5	3	Road Safety Assessment completed; Road reconstructed in 2019
Segment 6	US 60, MP 156.5 - MP 160.0	2	5	3	None
Segment 7	US 60, MP 152.0 - MP 155.6	2	6	4	None
Segment 8	US 60, MP 149.0 - MP 152.0	1	3	2	None
Segment 9	US 60, MP 146.3 - MP 148.0	5	4	-1	None
Segment 10	US 60, MP 143.0 - MP 146.3	7	2	-5	Road Safety Assessment completed
Segment 11	SR 69, MP 286.5 - MP 289.7	3	4	1	Road Safety Assessment completed; Raised median installed in 2020 at MP 285.0-287.2
Segment 12	US 191, MP 365.5 - MP 366.1	1	1	0	Road Safety Assessment completed
Segment 13	SR 90, MP 320.0 - MP 323.8	5	7	2	Road Safety Assessment completed
Segment 14	SR 86, MP 169.7 - MP 171.3	0	0	0	Road Safety Assessment completed
Segment 15	SR 77, MP 69.5 - MP 72.0	14	30	16	None
Segment 16	SR 77, MP 72.0 - MP 74.9	14	14	0	Pedestrian signal installed in 2018; Lighting and sidewalk installed in 2022
Segment 17	SR 77, MP 74.9 - MP 79.1	4	5	1	None
Segment 18	US 60X, MP 189.0 - MP 194.0	16	10	-6	Road Safety Assessment completed; Road diet programmed in 2024
Total		90	109	19	

Appendix B

ADOT Bicyclist Safety Action Plan Activities and Crash Comparison



BSAP High-Crash Intersections

Intersection ID	Area	On Road	Intersecting Road	Total Bicycle Crashes (2012 to 2016)	Total Bicycle Crashes (2018 to 2022)	Change	Activities Since BSAP
18	Tempe	Scottsdale Road	SR 202	11	10	-1	None
36	Phoenix	Camelback Road	I-17	10	4	-6	None
37	Phoenix	Bethany Home Road	I-17	10	2	-8	None
38	Phoenix	Glendale Avenue	I-17	9	4	-5	None
39	Phoenix	Northern Avenue	I-17	9	3	-6	None
57	Flagstaff	Route 66	Ponderosa Parkway	9	2	-7	Constructed parallel off-street bicycle route
40	Phoenix	Dunlap Avenue	I-17	8	4	-4	None
1	Tucson	6th Avenue	I-10	7	1	-6	Road Safety Assessment completed
15	Mesa	Broadway Road	SR 101	6	7	1	Road Safety Assessment completed
16	Tempe	University Drive	SR 101	6	3	-3	Road Safety Assessment completed
23	Mesa	Power Road	US 60	6	0	-6	Road Safety Assessment completed
26	Phoenix	32nd Street	SR 202	6	3	-3	None
27	Phoenix	24th Street	SR 202	6	4	-2	None
56	Flagstaff	Route 66 (Santa Fe Ave)	US 180 (Humphreys Street)	6	0	-6	Constructed parallel off-street bicycle route
5	Tucson	SR 77	Wetmore Road	5	1	-4	None
7	Tucson	SR 77	Ina Road	5	1	-4	None
14	Mesa	Southern Avenue	SR 101	5	2	-3	Road Safety Assessment completed
17	Tempe	McClintock Drive	SR 202	5	4	-1	Road Safety Assessment completed
20	Tempe	Priest Drive	SR 202	5	0	-5	Road Safety Assessment completed
24	Mesa	SR 87	McKellips Road	5	2	-3	None
30	Phoenix	Indian School Road	SR 51	5	0	-5	None
35	Avondale	Dysart Road	I-10	5	6	1	Road Safety Assessment completed
41	Phoenix	Peoria Avenue	I-17	5	2	-3	Road Safety Assessment completed
45	Phoenix	Union Hills Drive	I-17	5	2	-3	Road Safety Assessment completed

49	Phoenix	McDowell Road	SR 143	5	4	-1	None
54	Kingman	Stockton Hill Road	I-40	5	2	-3	None
6	Tucson	SR 77	Prince Road	4	1	-3	None
8	Chandler	Arizona Avenue	SR 202	4	3	-1	Road Safety Assessment completed
11	Tempe	Elliot Road	SR 101	4	2	-2	Road Safety Assessment completed
12	Tempe	Guadalupe Road	SR 101	4	3	-1	None
22	Mesa	Greenfield Road	US 60	4	1	-3	Road Safety Assessment completed
25	Chandler	I-10	Baseline Road	4	1	-3	Road Safety Assessment completed
29	Phoenix	Thomas Road	SR 51	4	1	-3	None
32	Phoenix	Grand Avenue	McDowell Road / 19th Ave	4	1	-3	None
33	Phoenix	Grand Avenue	27th Avenue / Thomas Road	4	3	-1	None
43	Phoenix	Greenway Road	I-17	4	0	-4	Road Safety Assessment completed
44	Phoenix	Bell Road	I-17	4	2	-2	Road Safety Assessment completed
50	Phoenix	Bell Road	SR 51	4	2	-2	None
53	Peoria	Grand Avenue	Peoria Avenue	4	0	-4	None
4	Tucson	Kino Parkway	I-10	3	1	-2	Road Safety Assessment completed
13	Tempe	Baseline Road	SR 101	3	1	-2	Road Safety Assessment completed
28	Phoenix	McDowell Road	SR 51	3	1	-2	None
31	Phoenix	7th Street	I-10 / Portland Street	3	3	0	None
46	Phoenix	Deer Valley Road	I-17	3	3	0	Road Safety Assessment completed
47	Peoria	Thunderbird Road	SR 101	3	0	-3	Road Safety Assessment completed
51	Phoenix	Grand Avenue	35th Avenue	3	2	-1	None
52	Glendale	Grand Avenue	51st Avenue / Bethany Home Road	3	5	2	Road Safety Assessment completed
55	Flagstaff	SR 89A	University Drive	3	3	0	None
			Total	248	112	-136	

BSAP High-Crash Segments

Segment ID	Area	Highway	From	To	Total Bicycle Crashes (2012 to 2016)	Total Bicycle Crashes (2018 to 2022)	Change	Activities Since BSAP
61	Tucson	SR 77	Fort Lowell Rd	River Rd	32	9	-23	None
86	Flagstaff	SR 89A	SB 40	Elden St	29	10	-19	None
69	Maricopa County	US 60X	Meridian Rd	Sossaman Rd	20	12	-8	None
82	Sedona	SR 89A	Arroyo Pinon Dr	SR 179	15	8	-7	None
84	Flagstaff	SR 89A (Milton)	University Ave	SB 40	15	10	-5	None
63	Oro Valley	SR 77	Ina Rd	El Conquistador	13	4	-9	Pedestrian signal installed; Lighting and sidewalk installed from MP 72.0 – 74.9
88	Flagstaff	US 180	Humphreys St	Meade Lane	12	6	-6	Constructed parallel off-street bicycle route
89	Flagstaff	SB 40	Ponderosa Pkwy	Fanning Dr	12	9	-3	Constructed parallel off-street bicycle route
62	Tucson	SR 77	River Rd	Ina Rd	11	4	-7	Pedestrian signal installed; Lighting and sidewalk installed from MP 72.0 – 74.9
58	Sierra Vista	SR 92	Calle Mercancia	SR 90	10	3	-7	Extended paved shared-use path
72	Payson	SR 87	Green Valley Pkwy	Forest Dr	10	5	-5	None
85	Flagstaff	SB 40	Thompson St	Milton Rd	9	7	-2	None
60	Tucson	SR 77	Flowing Wells Rd	Oracle Rd	8	4	-4	None
71	Sun City	Grand Avenue	107th Ave	Bell Rd	8	7	-1	None

78	Bullhead City	SR 95	Bullhead Pkwy	Hancock Rd	8	5	-3	Road Safety Assessment completed
65	Casa Grande	SR 387	O'Neil Dr	Florence Blvd	7	1	-6	None
67	Mesa	SR 87	Baseline Rd	Campbell Rd	7	4	-3	None
68	Apache Junction	SR 88	US 60	Apache Trail	7	4	-3	None
66	Maricopa	SR 347	Edwards Ave	Cobblestone Farms Dr	6	4	-2	None
59	Tucson	SR 86	Mission Rd	Holiday Blvd	5	0	-5	None
73	Pinetop-Lakeside	SR 260	Woodland Lake Rd	Niels Hansen Dr	5	2	-3	None
74	Show Low	SR 260	Webb Dr	US 60	5	2	-3	None
80	San Luis	US 95	Juan Sanchez Blvd	Urtuzuastegui St	5	1	-4	None
87	Flagstaff	US 180	Route 66	Columbus Ave	5	2	-3	Constructed parallel off-street bicycle route
64	Catalina	SR 77	Golder Ranch Dr	Mainsail Blvd	4	3	-1	Pedestrian signal installed; Lighting and sidewalk installed from MP 72.0 – 74.9
70	Coolidge	SR 87	Coolidge Ave	SR 87	4	8	4	None
76	Kingman	Andy Devine Avenue	I-40	Thompson Ave	4	0	-4	None
79	Lake Havasu City	SR 95	Mulberry Ave	Lake Shore Blvd	4	0	-4	None
81	Cottonwood	SR 260	SR 89A	Cove Pkwy	4	4	0	None
83	Flagstaff	SR 89A (Milton Road)	McConnell Dr	West University Dr	4	4	0	None
75	Show Low	US 60	Clark Rd	SR 260	3	2	-1	None
77	Golden Valley	SR 68	Bowie Rd	Colorado Rd	3	0	-3	Raised median installed between MP 22.5 – MP 24.8
				Total	294	144	-150	

BSAP High-Risk Segments

ID	Segment	Area	Beginning Milepost	Ending Milepost	Total Bicycle Crashes (2012 to 2016)	Total Bicycle Crashes (2018 to 2022)	Change	Activities Since BSAP
1	SR 68	Bullhead City	MP 0	MP 4.0	0	0	0	Road Safety Assessment completed; Striped paved shoulder
2	SR 95	Bullhead City	MP 240.7	MP 250	9	4	-5	Road Safety Assessment completed; Striped paved shoulder
3	SR 95	Bullhead City	MP 234.4	MP 240.7	0	1	1	Road Safety Assessment completed; Striped paved shoulder
4	SR 95	South of Bullhead City	MP 227.3	MP 234.4	0	1	1	Road Safety Assessment completed; Striped paved shoulder
5	SR 95	Lake Havasu City	MP 177	MP 187.5	1	2	1	None
6	US 93	Kingman	MP 70	MP 71	0	1	1	None
7	US 93	Mohave County	MP 161	MP 174	0	0	0	None
8	SR 69	Prescott Valley	MP 282	MP 296	0	6	6	None
9	SR 89A	Cottonwood	MP 349	MP 353.1	1	1	0	None
10	SR 260	Cottonwood	MP 206.48	MP 209	2	2	0	None
11	SR 87	Payson	MP 251	MP 254	9	6	-3	None
12	SR 260	East of Star Valley	MP 257	MP 260	0	1	1	None
13	US 60	Globe – Miami	MP 247	MP 253	0	0	0	None
14	US 60	Surprise – El Mirage	MP 138.5	MP 149.0	10	8	-2	None
15	US 60	Peoria / Glendale	MP 149.0	MP 161.7	12	19	7	Road Safety Assessment completed
16	US 60X	Maricopa County	MP 189	MP 194	20	12	-8	None

17	SR 88	Apache Junction	MP 194	MP 196.1	7	5	-2	None
18	US 60	Apache Junction	MP 199	MP 203	0	0	0	None
19	SR 347	Maricopa	MP 172.5	MP 174.5	6	3	-3	None
20	SR 387	Casa Grande	Florence Blvd	MP 2.2	7	3	-4	None
21	SR 79	Florence	MP 134	MP 136.4	1	0	-1	None
22	US 70	Safford – Thatcher	MP 331	MP 342	0	2	2	None
23	US 191	Safford	MP 118.8	MP 121	0	0	0	None
24	US 90	Sierra Vista	MP 317.2	MP 321.2	2	1	-1	None
25	SR 92	Sierra Vista	MP 321.2	MP 328.5	10	4	-6	Extended paved shared-use path
26	SR 80	Bisbee	MP 340	MP 342	0	0	0	Extended paved shared-use path
27	SR 260	Pinetop – Lakeside	MP 345	MP 355	8	3	-5	None
28	SR 260	Show Low	MP 340.1	MP 342.2	3	4	1	None
29	SR 77	Snowflake – Taylor	MP 357	MP 360	0	0	0	None
30	SR 77	Tucson	MP 69.5	MP 75	44	17	-27	Pedestrian signal installed; Lighting and sidewalk installed from MP 72.0 – 74.9
31	SR 77	Tucson – Oro Valley	MP 75	MP 81.8	14	4	-10	None
				Total	166	110	-56	

Appendix C

Stakeholder Safety Workshops Summary





VULNERABLE ROAD USERS SAFETY FOCUS AREA - FLAGSTAFF

May 2, 2024

Safe Roads

Policy – acceptable service, speed, congestion – 1 vote
 Rural AZ no shoulder
 Bicyclists needs/safety – 4 votes
 Safe networks, partnerships – all state/local, etc. (eg Milton Rd - manage UCGSS & mobility)
 Over/under crossing (89 Cameron, Milton Rd)- 3 votes
 Separate road users (car, bike or road) – 2 votes
 P2P safety criteria - 1 vote
 Sight triangle – 2 votes
 Roundabouts at intersections – 2 votes
 Better transit integration – 1 vote
 Safer intersections and roundabouts – 1 vote
 Mid-block engineering standards be more flexible
 Higher tolerance for speed & congestions – 1 vote
 Improve bike and pedestrian safety
 Separation (physically and in time) of users – 2 votes
 Protected intersections, improve sight distance – 2 votes
 Pre-emptive measures – 1 vote
 Down Focus lighting
 Improved lighting (add-strategic LED conversion) – 2 votes
 No right on pedestrian in the same area
 Policy proactive analysis, HSIP – 2 votes
 Prioritize safety in P2P (weighting & project funded) – 1 vote
 Policy – predictive & HSIP
 Sight visibility – 2 votes
 Advanced flashers before stop – 1 vote
 Bike lane walk pattern – 1 vote
 Incorporate visibility on pavement, lighting, sight line – 2 votes
 Rural shoulders, tribal, maintenance, have priority – 4 votes
 Shoulder maintenance for bike/pedestrians – 2 votes

Safe Road Users

SRTS- 1 vote
 5th grade education bike/pedestrian
 Insurance policy (eg large trucks) – 2 votes
 Bicyclist license/certification
 Bike education (roundabout) – 4 votes
 V rental - education – 1 vote
 Bike rental companies, education for cyclists
 Knowledge of better route for bicyclist (google; map info) – 1 vote
 Education for new infrastructures – 1 vote
 Driver's ed – 3 votes
 Education, all levels of school – 3 votes
 Monitor driver's license – 6 votes
 PSA announcements – 1 vote
 Licensing for bicyclist – 2 votes
 Lower BAC to .05- 2 votes
 Educational incentive registration – 3 votes
 Grand Canyon signals not knowing rules of road, symbols vs words -4 votes
 Reflective vest – bikes
 Encourage multimer travel – 1 votes
 Bike incentives in education
 Education – cross at intersections

Input shown reflects the ideas that workshop attendees suggested for consideration. A prioritization exercise provided an opportunity for attendees to vote on the ideas they thought were highest priority.

2024 ADOT SHSP and ATSAP SAFETY STAKEHOLDER WORKSHOP



Safe Speeds

- Median design (foliage etc.) – 5 votes
- Create enclosed space – speeds reduce – 1 vote
- Narrow roadway (lane width & visual marking on pavement – 2 votes
- Access management to reduce speed
- Automated enforcement (cameras) – 2 votes
- Remote enforcement
- Policy AASHTO – manage speed transitions
- Enforcement to 25 mph – 1 vote
- Design to 25 mph – 2 votes
- Geometric design speed (visual cues) – 1 votes
- Encourage public input for traffic design in neighborhood – 1 vote
- E-bike speed on shared use path
- Pedestrian/bike placement – 3 votes
- Enforcement – 3 votes
- New muted – 1 vote
- Visual cues for speed reduction (Foliage, lane separation, pavement paint) – 1 vote
- Target speed vs design speed – 1 vote
- Lower speed limit, traffic calming, visual cues – 3 vote
- Community feedback – 3 votes
- New MUTCD, don't need to use 85%
- US limits (context)
- Pile of bricks – 1 vote
- Target speed – 3 votes

Safe Vehicles

- Safety inspection – vehicle – 2 votes
- Visualization around vehicle – 1 vote
- Blinkers for bikes

Post Crash Care

- Lead vehicle to clean route
- Rural AZ pre-emption for emergency vehicles – 1 vote
- Increase helicopter pad – 1 vote
- First aid kit in car – 1 vote

Input shown reflects the ideas that workshop attendees suggested for consideration. A prioritization exercise provided an opportunity for attendees to vote on the ideas they thought were highest priority.

2024 ADOT SHSP and ATSAP SAFETY STAKEHOLDER WORKSHOP



VULNERABLE ROAD USERS SAFETY FOCUS AREA - PHOENIX

April 16, 2024

Safe Roads

Better lighting, half street lighting (improve) and intersections – 2 votes
Build better intersections – 1 vote
Like lane drops
Don't forget about intersections
Funding (HSIP, TA with broaden efficient)
Risk-based approach – 2 votes
Tie funding to road crossings – 2 votes
Hawks for midblock crashes – 2 votes
Wide shoulders, separate from bikes that are using this area already. Policies that allow/encourage/facilitate markings of shoulders for bicycling.
Lighting (avoid half lighting)
Promote and fund lighting all 4 cores – 3 votes
LPIs – 1 vote

Safe Speeds

Enforcement – 4 votes
Speed feedback signs – 3 votes
Pedestrian ahead warning signs – 2 votes
Context specific speed limit – 1 vote
*Design context specific speed (traffic calming, roadway reconfiguration/reallocation, lane optimization)
Automated enforcement – 4 votes
Optimize timing of signals to promote platooning & maintain consistent speed – 3 votes
Emoji speed feedback – 1 vote

Post Crash Care

Safe Road Users

Safe Vehicles

Promote policies to receive auto vehicles – 1 vote
Lower front-end profile
Auto maintenance (lights, tires, headlights) – 3 votes
Blindspot monitor – 1 vote
Auto braking – 1 vote
Auto headlights
Collision avoidance test

Input shown reflects the ideas that workshop attendees suggested for consideration. A prioritization exercise provided an opportunity for attendees to vote on the ideas they thought were highest priority.

2024 ADOT SHSP and ATSAP SAFETY STAKEHOLDER WORKSHOP



VULNERABLE ROAD USERS SAFETY FOCUS AREA - TUCSON

May 7, 2024

Safe Roads

Lighting to standards – 1 ADOT vote, 6 non-ADOT votes
Protected left - 2 non-ADOT votes
Make designated crossing more comfortable -
Roundabouts - 1 non-ADOT vote
Separated bike/pedestrian paths – 1 ADOT vote, 2 non-ADOT votes
Line of sight 1 ADOT vote
Hawks/bike Hawks/Safe crossing - 2 non-ADOT votes
High visibility crosswalks as appropriate
Grade separation - 1 non-ADOT vote
Bridges and tunnels
Multi-use paths
Roadside memorials - 1 non-ADOT vote
LPI as makes sense - 1 ADOT vote
Connectivity-networks-Bike Blvd./multiuse paths - 3 non-ADOT votes

Safe Road Users

Impairment all users - 2 non-ADOT votes
Visibility of pedestrians (education) - 3 non-ADOT votes
Reflective gear, clothing (people and dogs)
Cross at designated crossing
Understand why people are crossing - 1 non-ADOT votes
Younger/older judging spread
Wrong way riding (education) - 2 non-ADOT votes
Homeless (education)
Education of drivers (don't drive in bike lanes)
Distracted driving - 2 non-ADOT votes
Large groups of people crossing and impatient drivers - 2 non-ADOT votes
Helmets (micro mobility and bike share) - 2 non-ADOT votes

Safe Speeds

Traffic calming
Slow people down - 5 non-ADOT votes
Slow speeds in different areas with mix housing and commercial – 1 ADOT vote
More congestion to slow people down
Reduce lane width
Increase sidewalks
Complete streets infrastructure
Context contingent speeds
reduce speed limit (variable)
Automated enforcement - 2 non-ADOT votes
Raised cross walks – 1 ADOT vote
Roundabouts – 1 ADOT vote

Safe Vehicles

Smaller vehicles
Micro mobility - 2 non-ADOT votes
AV/CV
Artificial noise for vehicles
A-pillar in vehicle (blindspot) - 1 non-ADOT vote
Back-up Cameras

Post Crash Care

Report on pedestrian fatalities
More data analysis - 3 non-ADOT votes
Data on crashes on multi-use paths
ADA compliance

Input shown reflects the ideas that workshop attendees suggested for consideration. A prioritization exercise provided an opportunity for attendees to vote on the ideas they thought were highest priority.



VULNERABLE ROAD USERS SAFETY FOCUS AREA - VIRTUAL

May 14, 2024

Safe Roads

Appropriate lighting (ped crossings per standard)
 Adequate space for VRUs (state hwy don't have paved shoulder – esp in rural areas)
 Inc multiuse paths off the roadway
 Education (ped re: midblock)
 Separated bike lanes (esp arterial roads)
 Wider sidewalks (for bikes/peds) also for ADA compliance
 Fund and implement AT programs (work w/ MAG)
 Safer width of bike lanes do not include curb and gutter as width
 Protected bike lanes – more space between faster and large vehicles
 Concern with wider bike lane and consequences (7-8ft)
 Protected bike lanes w/ vertical
 Wider bike lanes provide perceived and actual safety
 Connectivity in access /networks for safety
 Reduce speeds
 Separate users in time and space (especially with higher speeds)
 Protected facilities, separated bike lane with raised buffer, also helps pedestrians
 Improve lighting, improve lighting standards
 Allow standards so striping across state bridges/underpasses can match adjacent roads
 Designing entrance/exit ramps for arterial/city speeds, prioritize safety
 Make VRU facilities stand out by material/texture and color, like green pavement and textured crosswalk
 Bulb-outs have been game changer in downtowns, Prescott is an example
 Daylighting intersections
 Parking protected bike lanes, bike lane next to the curb, parking adjacent to lane
 Enhanced lighting
 Pavement condition, smooth for bicyclists; good friction for drivers, well maintained roads,

Safe Road Users

Education before enforcement (PSAs rules of the road; bike path rules)
 Conflicts after dark for peds (consider wearing something bright)
 Enforcement for all road users
 Mandatory lighting on bikes (enforcement)
 Education – bike safety on what is required; basic rules of the road (no wrong-way riding, etc.,)
 Driver's Ed (esp high schools)
 increase funding TIM members when off duty
 increase funding and education for bike
 Increase Helmets and proper attire to reduce road rash
 increase funding SRTS
 Better transit access
 Better bus stop placement and/or better crossings at stops
 More improved crossings
 Teach designers to understand motivation/perspective of pedestrians
 Education related to distractions for VRUs and drivers
 Separated facilities and crossings
 More enhanced crossings
 High visibility crossings at key locations
 Good crossing at transit stop locations

Input shown reflects the ideas that workshop attendees suggested for consideration.

2024 ADOT SHSP and ATSAP SAFETY STAKEHOLDER WORKSHOP



Safe Speeds

Separate facilities by speeds
w/in urban areas: separate users
separate bicyclists bike path/shared use path vs. on-street bike lane on arterials
Expand definition of VRU to include motorcyclists
Work zone workers (are included in current definition)
Education re: complete streets (i.e. road diet); respond to context
Education re: use of roundabouts
Design roundabouts safer for bikes/peds
Signals designed for hearing impaired (more visual)
Pull out lanes to pass slower vehicle (rural/tribal areas)
VRU crossings; signal where state highway is main street of town
Education of peds (where to walk)
Inform drivers of impact of their speed on VRUs (injury and fatality)
Self-enforcing streets
Set speed on context vs 85th percentile.
inc signage and enforcement in focused/ targeted area
Increase enforcement, rural and urban
Allow automated speed enforcement
Ties back to Safe Roads
Increase “self-enforcing” roads
Evaluate/allow/increase reduced speed limits
Narrow street width (Safe Roads)
Adequate passing lanes on rural roads
Increase “self-enforcing” roads

Post Crash Care

Drone flyover to get crash photos to better understand crash cause etc (for emergency response; crash investigation)
Increase funding TIM members when off duty
PDO limits to \$2 K, decreases reporting of ped/bike crashes, losing data,
Look to modify rule so all ped/bike crashes are reported (Ellie to take as a note, with MPD Crash Records, intake crash forms)

Safe Vehicles

Fleet of vehicles have become larger (and more dangerous)
Awareness
Lighting on bikes
Make sure bikes sold (Walmart) all bike equipped with lights
Auto braking and ped detection on new vehicles
Improved transit options
Better connections w/ transit
Safe bus / school bus– proper passenger restraints
In event of crash if fire – passengers may get trapped
Regulate size of vehicles and front ends
Use of anonymous technology in all cars, not just high end upgrades
Promote advanced braking and VRU detection systems in vehicles
E-bike regulations/education/enforcement/training etc.

Input shown reflects the ideas that workshop attendees suggested for consideration.

Q4 What potential safety strategies do you think would be most effective to implement in Arizona?

Answered: 13 Skipped: 1

#	RESPONSES	DATE
1	Context sensitive / complete streets design, continued development & refinement of connected and autonomous vehicles, setting of speed limits based on a comprehensive understanding of roadway characteristics and driver behavior (not just the 85th % speed), and eliminating any design features that crash data has demonstrated result in significant safety risks (e.g. protected-permissive dual lefts with obstructed sight distance and/or long turning path).	5/9/2024 8:31 AM
2	All what we discussed in the workshop (highlighting automated enforcement); less focus on education strategies. They simply are not as effective. A citation to consider: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8142340/	5/8/2024 7:32 PM
3	Human behavior is, in my mind, the big one. There needs to be a way for stakeholders to speak in one voice about the necessity for drivers to obey traffic laws.	5/8/2024 6:05 PM
4	P2P safety prioritization	5/7/2024 9:39 AM
5	Keeping up with maintenace and figuring out ways to better educate drivers, walkers, and bikers	5/6/2024 2:18 PM
6	Enforcement and education. I think bring back speed cameras and more red-light cameras. Bringing back drivers ed to schools.	5/6/2024 12:22 PM
7	Provide greater aid to Tribal Lands so their heavily traveled highways can be brought up to industry standard. Also, allow flexibility to guidance when setting speed limits in dense areas	5/6/2024 9:53 AM
8	Enforcement! on speeders.	5/6/2024 9:19 AM
9	Automated enforcement, road design to self-enforce speeds and provide adequate, quality multimodal transportation facilities.	4/23/2024 12:40 PM
10	Increased enforcement and better collaboration between law enforcement and engineers.	4/22/2024 12:36 PM
11	Prioritizing the safety of VRU should be front and center on implementation strategies.	4/22/2024 10:38 AM
12	Driver awareness to have no distractions. Slow speeds through variable and feedback signs Bike/ped safe streets	4/22/2024 7:58 AM
13	implement a primary seatbelt and helmet law, automated enforcement	4/22/2024 7:05 AM

Input shown reflects the ideas that workshop attendees suggested for consideration.

Q5 What “lessons learned” do you have, or have you heard about from others, regarding past successes/failures in implementing safety strategies?

Answered: 11 Skipped: 3

#	RESPONSES	DATE
1	One of the biggest lessons I have learned in my career is that a significant traffic control change (e.g. 2-way stop to All-Way stop) requires what might appear to be overkill in the way of temporary signage, flashers, message boards, etc. to attract motorists' attention to the change. Otherwise, commuters have a strong tendency to ignore or fail to recognize the change, no matter how well its permanent features have been designed.	5/9/2024 8:31 AM
2	We have to change how people consider road safety if we expect a culture change. We have to make them feel the fear on the roadway when they are speeding, for example; we have to make drivers uncomfortable. Without this, we cannot expect them to behave in a way we want them to. Ideally, we change our safety culture quickly; but until we do that, we need to assume that people will only be thinking of themselves on the road and that they think nothing bad will happen to them. Given this information, enforcement and infrastructure changes need to guide the behavior of people. Following the increase of risk homeostasis we saw across the US after the start of the pandemic, this is needed.	5/8/2024 7:32 PM
3	Plan for oversized vehicles using roundabouts.	5/8/2024 6:05 PM
4	Its about the money	5/7/2024 9:39 AM
5	There are always more options, just have to think outside the box and maybe don't always do things the way they have always been done.	5/6/2024 2:18 PM
6	Following ADOT guidance when setting speed limits suggested faster speeds despite dense multimodal conditions along an urban arterial. This was highly unpopular and was ultimately overruled by city Council. Write guidance that encourages flexibility to following the 85th percentile and allows engineers/planners to take the roadway context into consideration.	5/6/2024 9:53 AM
7	My group had same issue and concerns as I did rather on Tribal land or other locations.	5/6/2024 9:19 AM
8	It takes significant, persistent funding to make true changes in traffic crash trends. It also takes commitment to safety as a priority over moving vehicles from point A to B as fast as possible. A minute longer of average travel time needs to be a worthwhile cost to reduce fatal and serious injury crashes.	4/23/2024 12:40 PM
9	Following through and ensuring strategies are being deployed once the SHSP and ATSAP are developed.	4/22/2024 12:36 PM
10	Plans get done, but not enough funds to implement. Start planning realistic solutions	4/22/2024 7:58 AM
11	bring together law enforcement and engineers when considering making changes to infrastructure.	4/22/2024 7:05 AM

Input shown reflects the ideas that workshop attendees suggested for consideration.

2024 ADOT SHSP and ATSAP SAFETY STAKEHOLDER WORKSHOP



VULNERABLE ROAD USERS SAFETY FOCUS AREA – COALITION FOR TRANSPORTATION CHOICES

Safe Roads

- See more narrow roads to encourage drivers to slow down
- Medians
- Design to limit cars access to help bike/ped live
- More roundabouts

Safe Speeds

- Roundabouts
- Enforcement avoidance causing other safety issues
- Widths of roadways - more traffic and identify areas to include buffered/protected bike lanes and space for peds
- On rural roads and SHS need wider shoulders for bike/ped/ breakdown/pull over space
- Narrow roads provide visual to go slower
- Speed limit reduction on arterials - what is the result? How is enforcement supporting these efforts?

Post Crash Care

Safe Road Users

- Do the data show behavior since text/drive laws (wasn't on crash forms before a few years ago)?
- Text drive law is a secondary law. Must do something else unsafe first. Perhaps make it a primary law
- Provide protected bike lanes (safe roads)
- Do data tell story about jaywalkers - where are they trying to go? What's causing the behavior?
- Education for all road users (rules of the road for all, what to expect)
- Are seniors involved in more crashes? Education, transit options for those who can't/shouldn't drive. Recognize as people age that transportation needs change
- Look more at age going forward
- Crosswalk signals need to be automatic (safe roads)
- Increasing crossing time (safe roads)

Safe Vehicles

- Advocate for SUV and trucks to make smaller vehicles; those with lower frontal/height area
- Restriction on trucks for non-commercial use
- E-bike safety (regulation for minimum safety standards. Brakes that can handle speeds)

Input shown reflects the ideas that workshop attendees suggested for consideration.

Appendix D

Countermeasures with Cost Estimates



Arizona Active Transportation Safety Action Plan Draft Countermeasure Planning-Level Detailed Cost Estimates

	Countermeasures					
	Item	Unit	Unit Cost	Quantity	Total Cost	Notes
PL-1	Install High-Visibility Crosswalk at Midblock Locations	Each	\$ 80,000	2	\$ 160,000	At MP 74.5 and 76.15
	Install Sidewalk or Walkway	Mile	\$ 1,395,000	1.1	\$ 1,535,000	MP 75.9-77
	Install Highway Lighting	Mile	\$ 660,000	1.1	\$ 726,000	MP 75.9-77
	Reduce Curb Radii to 30' at Signalized Intersections	Each	\$ 55,000	39	\$ 2,145,000	Fort Lowell St (1 curb radius); Prince Rd (1 curb radius); Roger Rd (4 curb radii); Limberlost Dr (2 curb radii); Wetmore Rd (3 curb radii); Tucson Mall Dr (3 curb radii); River Rd (4 curb radii); Rudasill Rd (3 curb radii); Orange Grove Rd (4 curb radii); Ina Rd (3 curb radii); Suffolk Dr (4 curb radii); Magee Rd (4 curb radii); Hardy Rd (3 curb radii)
	Enhance Signal Operations with Leading Pedestrian Intervals (LPIs)	Each	\$ 7,000	13	\$ 91,000	13 signalized intersections
	Total				\$ 4,657,000	
	Countermeasures					
	Item	Unit	Unit Cost	Quantity	Total Cost	Notes
PL-2	Install Pedestrian/Bicyclist-Friendly Striping, Signage, and Push Buttons at SPUIs	Each	\$ 440,000	12	\$ 5,280,000	1/2 mile of green buffered bike lane; 2 yield signs to stop signs; 2 bicycle push buttons
	Install Signalized Crosswalk at Channelized Right-Turn Lanes	Each	\$ 176,000	48	\$ 8,448,000	4 per interchange
	Reduce Curb Radii at Signalized Intersections	Each	\$ 55,000	48	\$ 2,640,000	4 per interchange
	Total				\$ 16,368,000	
	Countermeasures					
	Item	Unit	Unit Cost	Quantity	Total Cost	Notes
PL-3	Install Pedestrian/Bicyclist-Friendly Striping, Signage, and Push Buttons at Diamond Interchanges	Each	\$ 440,000	17	\$ 7,480,000	1/2 mile of green buffered bike lane; 2 "no right on red" signs; 2 bicycle push buttons
	Improve Intersection Lighting	Each	\$ 69,000	17	\$ 1,173,000	17 interchanges
	Reduce Curb Radii at Signalized Intersections	Each	\$ 55,000	68	\$ 3,740,000	4 per interchange
	Upgrade Existing Crosswalk to High-Visibility Crosswalk	Each	\$ 82,000	68	\$ 5,576,000	4 per interchange
	Install Bike Lanes	Mile	\$ 47,000	4.25	\$ 200,000	1/4 mile per interchange
	Total				\$ 18,169,000	
	Countermeasures					
	Item	Unit	Unit Cost	Quantity	Total Cost	Notes
PL-4	Reduce Curb Radii to 30' at Signalized Intersections	Each	\$ 55,000	11	\$ 605,000	Milton Rd (1 curb radii); Ponderosa Pkwy (4 curb radii); 4th St (4 curb radii); Fanning Dr (2 curb radii)
	Install Highway Lighting	Mile	\$ 660,000	4.41	\$ 2,911,000	South side from MP 195.5-199.91
	Install High-Visibility Crosswalk at Midblock Locations	Each	\$ 80,000	2	\$ 160,000	
	Install Bike Lanes	Mile	\$ 47,000	4.41	\$ 208,000	From MP 195.5-199.91
	Total				\$ 3,884,000	

Arizona Active Transportation Safety Action Plan Draft Countermeasure Planning-Level Detailed Cost Estimates

	Countermeasures						
	Item	Unit	Unit Cost	Quantity	Total Cost	Notes	
PL-5	Install Sidewalk or Walkway	Mile	\$ 1,395,000	2.5	\$ 3,488,000	MP 157.5-160	
	Install Highway Lighting	Mile	\$ 660,000	1.5	\$ 990,000	From MP 158.5-160	
	Reduce Curb Radii to 35' at Signalized Intersections	Each	\$ 55,000	3	\$ 165,000	Indian School Rd (3 curb radii)	
	Upgrade Existing Crosswalk to High-Visibility Crosswalk	Each	\$ 82,000	1	\$ 82,000	MP 159	
	Enhance Signal Operations with Leading Pedestrian Intervals (LPIs)	Each	\$ 7,000	1	\$ 7,000	MP 159	
	Total				\$ 4,732,000		
	Countermeasures						
	Item	Unit	Unit Cost	Quantity	Total Cost	Notes	
PL-6	Install Highway Lighting	Mile	\$ 660,000	1.7	\$ 1,122,000	From MP 334.9-336.6	
	Reduce Curb Radii to 35' at Signalized Intersections	Each	\$ 55,000	4	\$ 220,000	Fatco Rd (4 curb radii)	
	Increase Enforcement	-	\$ -	0	\$ -		
	Total				\$ 1,342,000		
	Countermeasures						
	Item	Unit	Unit Cost	Quantity	Total Cost	Notes	
PL-7	Reduce Curb Radii to 35' at Signalized Intersections	Each	\$ 55,000	16	\$ 880,000	Riverview Dr (4 curb radii); Alta Vista Rd (2 curb radii); Silver Creek Rd (1 curb radii); Airport Center Dr (1 curb radii); Aviation Way (4 curb radii); Bullhead Pkwy (4 curb radii)	
	Install High-Visibility Crosswalk at Midblock Locations	Each	\$ 80,000	2	\$ 160,000	MP 244.6 and 245.6	
	Increase Enforcement	-	\$ -	0	\$ -		
	Total				\$ 1,040,000		
	Countermeasures						
	Item	Unit	Unit Cost	Quantity	Total Cost	Notes	
PL-8	Install Highway Lighting	Mile	\$ 660,000	2	\$ 1,320,000	From MP 168-170	
	Enhance Signal Operations with Leading Pedestrian Intervals (LPIs)	Each	\$ 7,000	4	\$ 28,000	4 intersections	
	Reduce Curb Radii to 30' at Signalized Intersections	Each	\$ 55,000	3	\$ 165,000	Mission Rd (2 curb radii); La Cholla Blvd (1 curb radii)	
	Total				\$ 1,513,000		
	Countermeasures						
	Item	Unit	Unit Cost	Quantity	Total Cost	Notes	
PL-9	Reduce Curb Radii to 25' at Signalized Intersections	Each	\$ 55,000	19	\$ 1,045,000	Guadalupe Rd (4 curb radii); San Angelo St (4 curb radii); Desert Ln (1 curb radii); Baseline Rd (2 curb radii); Iron Ave (4 curb radii); HWY 60 (4 curb radii)	
	Enhance Signal Operations with Leading Pedestrian Intervals (LPIs)	Each	\$ 7,000	8	\$ 56,000	8 intersections	
	Install Bike Lanes	Mile	\$ 47,000	2.37	\$ 112,000	From MP 170.2-172.57	
	Install High-Visibility Crosswalk at Midblock Locations	Each	\$ 80,000	1	\$ 80,000	MP 171.4	
	Total				\$ 1,293,000		

Arizona Active Transportation Safety Action Plan Draft Countermeasure Planning-Level Detailed Cost Estimates

	Countermeasures					
	Item	Unit	Unit Cost	Quantity	Total Cost	Notes
PL-10	Install Sidewalk or Walkway	Mile	\$ 1,395,000	5.5	\$ 7,673,000	South side from MP 152-157.5
	Install Highway Lighting	Mile	\$ 660,000	5.5	\$ 3,630,000	From MP 152-157.5
	Reduce Curb Radii to 35' at Signalized Intersections	Each	\$ 55,000	4	\$ 220,000	Bethany Home Rd (4 curb radii)
	Upgrade Existing Crosswalk to High-Visibility Crosswalk	Each	\$ 82,000	1	\$ 82,000	MP 156.2
	Enhance Signal Operations with Leading Pedestrian Intervals (LPIs)	Each	\$ 7,000	1	\$ 7,000	MP 156.2
				Total	\$ 11,612,000	
PL-11	Countermeasures					
	Item	Unit	Unit Cost	Quantity	Total Cost	Notes
	Install Highway Lighting	Mile	\$ 660,000	6	\$ 3,960,000	MP 349-355
	Enhance Signal Operations with Leading Pedestrian Intervals (LPIs)	Each	\$ 7,000	6	\$ 42,000	6 intersections
			Total	\$ 4,002,000		
PL-12	Countermeasures					
	Item	Unit	Unit Cost	Quantity	Total Cost	Notes
	Install Highway Lighting	Mile	\$ 660,000	5.4	\$ 3,564,000	North side from MP 144-149.4
	Enhance Signal Operations with Leading Pedestrian Intervals (LPIs)	Each	\$ 7,000	15	\$ 105,000	15 intersections
			Total	\$ 3,669,000		
PL-13	Countermeasures					
	Item	Unit	Unit Cost	Quantity	Total Cost	Notes
	Install Highway Lighting	Mile	\$ 660,000	4	\$ 2,640,000	MP 235-239
	Install Sidewalk or Walkway	Mile	\$ 1,395,000	4	\$ 5,580,000	MP 235-239
	Install High-Visibility Crosswalk at Midblock Locations	Each	\$ 80,000	1	\$ 80,000	MP 235.9
	Enhance Signal Operations with Leading Pedestrian Intervals (LPIs)	Each	\$ 7,000	7	\$ 49,000	7 intersections
				Total	\$ 8,349,000	
PL-14	Countermeasures					
	Item	Unit	Unit Cost	Quantity	Total Cost	Notes
	Install Highway Lighting	Mile	\$ 660,000	3	\$ 1,980,000	MP 332.5-335.5
	Install High-Visibility Crosswalk at Midblock Locations	Each	\$ 80,000	1	\$ 80,000	MP 336.1
	Reduce Curb Radii to 35' at Signalized Intersections	Each	\$ 55,000	3	\$ 165,000	20th Ave (3 curb radii)
	Enhance Signal Operations with Leading Pedestrian Intervals (LPIs)	Each	\$ 7,000	9	\$ 63,000	9 intersections
				Total	\$ 2,288,000	

Arizona Active Transportation Safety Action Plan Draft Countermeasure Planning-Level Detailed Cost Estimates

	Countermeasures					
	Item	Unit	Unit Cost	Quantity	Total Cost	Notes
PL-15	Install Retroreflective Tape on Vehicular Signal Heads	Each	\$ 1,000	60	\$ 60,000	60 total signal heads at 4 intersections; Forest Meadows St (17 signal heads), University Dr (13 signal heads), Rte 66 (13 signal heads), and Butler Ave (17 signal heads)
	Reduce Speed Limit to 25 mph through the Entire Corridor	-	\$ -	0	\$ -	
	Install Highway Lighting	Mile	\$ 660,000	1.23	\$ 812,000	MP 401.95-403.18
	Install Bike Lanes	Mile	\$ 47,000	1.23	\$ 58,000	MP 401.95-403.18
	Enhance signal operations with Leading Pedestrian Intervals (LPIs)	Each	\$ 7,000	5	\$ 35,000	5 intersections
				Total	\$ 965,000	
	Countermeasures					
	Item	Unit	Unit Cost	Quantity	Total Cost	Notes
PL-16	Install Highway Lighting	Mile	\$ 660,000	1	\$ 660,000	East side from MP 216-217
	Upgrade Existing Crosswalk to High-Visibility Crosswalk	Each	\$ 82,000	3	\$ 246,000	3 intersections
	Increase Enforcement	-	\$ -	0	\$ -	
	Install Pedestrian Refuge Island	Each	\$ 66,000	2	\$ 132,000	Fort Valley Rd/Forest Ave & Fort Valley Rd/Anderson Rd
				Total	\$ 1,038,000	
	Countermeasures					
	Item	Unit	Unit Cost	Quantity	Total Cost	Notes
PL-17	Reduce Curb Radii to 30' at Signalized Intersections	Each	\$ 55,000	8	\$ 440,000	Main St (2 curb radii); Longhorn Rd (4 curb radii); Malibur Dr (2 curb radii)
	Upgrade Existing Crosswalk to High-Visibility Crosswalk	Each	\$ 82,000	5	\$ 410,000	5 intersections
				Total	\$ 850,000	
	Countermeasures					
	Item	Unit	Unit Cost	Quantity	Total Cost	Notes
PL-18	Install Bike Lanes	Mile	\$ 47,000	1.2	\$ 57,000	From MP 369.5-370.7
	Reduce Curb Radii to 35' at Signalized Intersections	Each	\$ 55,000	7	\$ 385,000	Coffee Pot Dr (3 curb radii); Soldiers Pass Rd (1 curb radii); Airport Rd (3 curb radii)
	Enhance Signal Operations with Leading Pedestrian Intervals (LPIs)	Each	\$ 7,000	8	\$ 56,000	8 intersections
	Install High-Visibility Crosswalk at Midblock Locations	Each	\$ 80,000	1	\$ 80,000	MP 370.6
				Total	\$ 578,000	

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	Countermeasures					
	Item	Unit	Unit Cost	Quantity	Total Cost	Notes
PL-19	Install Highway Lighting	Mile	\$ 660,000	4	\$ 2,640,000	From MP 287-291
						Heather Heights (3 curb radii); Frontier Village Shopping (4 curb radii); Yavpe Connector (2 curb radii); Holiday Dr (4 curb radii); Prescott Lakes Pkwy (2 curb radii); Lee Blvd (1 curb radii); Walker Rd (2 curb radii); Sunrise Blvd (3 curb radii); Robin Dr (2 curb radii); Ramada Dr (1 curb radii); Sundog Ranch Rd (1 curb radii); Stoneridge Dr (1 curb radii); Prescott E Hwy (2 curb radii); Glassford Hill Rd (1 curb radii); Lake Valley Rd (1 curb radii); Robert Rd (1 curb radii)
	Reduce Curb Radii to 35' at Signalized Intersections	Each	\$ 55,000	31	\$ 1,705,000	
	Install High-Visibility Crosswalk at Midblock Locations	Each	\$ 80,000	1	\$ 80,000	MP 289
	Install Sidewalk or Walkway	Mile	\$ 1,395,000	4	\$ 5,580,000	MP 287-291
	Total				\$ 10,005,000	
	Countermeasures					
	Item	Unit	Unit Cost	Quantity	Total Cost	Notes
PL-20	Install High-Visibility Crosswalk at Midblock Locations	Each	\$ 80,000	1	\$ 80,000	MP 1.27
	Install Highway Lighting	Mile	\$ 660,000	2.5	\$ 1,650,000	From MP 0-2.5
	Reduce Curb Radii to 50' at Signalized Intersections	Each	\$ 55,000	6	\$ 330,000	Cottonwood Ln (4 curb radii); Kortsen Rd (2 curb radii)
	Upgrade Existing Crosswalk to High-Visibility Crosswalk	Each	\$ 82,000	2	\$ 164,000	MP 0.5 and 2.0
	Total				\$ 2,224,000	
	Countermeasures					
	Item	Unit	Unit Cost	Quantity	Total Cost	Notes
PL-21	Install Bike Lanes	Mile	\$ 47,000	2	\$ 94,000	From MP 340-342
	Reduce Curb Radii to 35' at Signalized Intersections	Each	\$ 55,000	7	\$ 385,000	White Mountain Rd (2 curb radii); Old Linden Rd (1 curb radii); McNeil (2 curb radii); Clark Rd (2 curb radii)
	Increase Enforcement	-	\$ -	0	\$ -	
	Total				\$ 479,000	
	Countermeasures					
	Item	Unit	Unit Cost	Quantity	Total Cost	Notes
PL-22	Install Sidewalk or Walkway	Mile	\$ 1,395,000	1	\$ 1,395,000	MP 206.5-207.5
	Reduce Curb Radii to 35' at Signalized Intersections	Each	\$ 55,000	2	\$ 110,000	Del Rio Dr (1 curb radii); Fir St (1 curb radii)
	Upgrade Existing Crosswalk to High-Visibility Crosswalk	Each	\$ 82,000	2	\$ 164,000	MP 206.48 and 206.9
	Total				\$ 1,669,000	

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Countermeasures						
	Item	Unit	Unit Cost	Quantity	Total Cost	Notes
PL-23	Reduce Curb Radii to 35' at Signalized Intersections	Each	\$ 55,000	3	\$ 165,000	Tegner St (1 curb radii); Vulture Mine Rd (2 curb radii)
	Install Sidewalk or Walkway	Mile	\$ 1,395,000	0.15	\$ 210,000	South side of street from MP 107.5-107.65
	Upgrade Existing Crosswalk to High-Visibility Crosswalk	Each	\$ 82,000	1	\$ 82,000	MP 107.65
	Increase Enforcement	-	\$ -	0	\$ -	
	Total				\$ 457,000	
Countermeasures						
	Item	Unit	Unit Cost	Quantity	Total Cost	Notes
PL-24	Reduce Curb Radii to 30' at Signalized Intersections	Each	\$ 55,000	3	\$ 165,000	Woodlands Village Blvd (3 curb radii)
	Enhance Signal Operations with Leading Pedestrian Intervals (LPIs)	Each	\$ 7,000	2	\$ 14,000	2 intersection
	Total				\$ 179,000	
Countermeasures						
	Item	Unit	Unit Cost	Quantity	Total Cost	Notes
PL-25	Install Sidewalk or Walkway	Mile	\$ 1,395,000	0.2	\$ 279,000	MP 247.8-248
	Reduce Curb Radii to 35' at Signalized Intersections	Each	\$ 55,000	2	\$ 110,000	Radanovich Blvd (2 curb radii)
	Upgrade Crosswalks to High-Visibility Crosswalk at Midblock	Each	\$ 82,000	3	\$ 246,000	MP 249.7, 249.9, and 250.2
	Enhance Signal Operations with Leading Pedestrian Intervals (LPIs)	Each	\$ 7,000	5	\$ 35,000	5 intersections
	Total				\$ 670,000	
Countermeasures						
	Item	Unit	Unit Cost	Quantity	Total Cost	Notes
PL-26	Install Highway Lighting	Mile	\$ 660,000	1.5	\$ 990,000	MP 379-381.5
	Install High-Visibility Crosswalk at Midblock Locations	Each	\$ 80,000	1	\$ 80,000	MP 381.3
	Increase Enforcement		\$ -	0	\$ -	
	Total				\$ 1,070,000	

Note: All costs include an assumed indirect cost multiplier of 2.2

Appendix E

Crash Modification Factors



Active Transportation Safety Action Plan
Crash Modification Factors

CMF ID	Countermeasure Category	Countermeasure	CMF Value	Crash Type	Crash Severity	Area Type	Publication Year	Stars
11181	Pedestrians	Presense of a pedestrian crosswalk at midblock locations	0.82	Vehicle/Pedestrian	All	Urban	2022	4
11246	Pedestrians	Install sidewalk	0.598	Vehicle/Pedestrian	All	Not Specified	2022	4
9245	Pedestrians	Install sidewalk	1.78	Vehicle/Bicycle	All	Urban	2017	3
9251	Pedestrians	Install sidewalk	1.87	Vehicle/Bicycle	All	Urban	2017	3
10221	Pedestrians	Install sidewalk	1.53	Vehicle/Bicycle	All	Urban	2019	3
10227	Pedestrians	Install sidewalk	3.09	Vehicle/Bicycle	All	Urban	2019	3
9240	Pedestrians	Install sidewalk	0.41	Vehicle/Bicycle	K (fatal), A (serious injury)	Urban	2017	2
9255	Pedestrians	Install sidewalk	2.71	Vehicle/Bicycle	K (fatal), A (serious injury)	Urban	2017	2
191	Highway lighting	Provide highway lighting	0.31	All	K (fatal) A (serious injury), B (minor injury), C (possible injury)	All	2004	3
192	Highway lighting	Provide highway lighting	0.72	Nighttime	(possible injury)	All	2004	3
11220	Intersection geometry	Change corner right turn radius	1.59	Vehicle/Pedestrian	All	Urban and Suburban	2022	3
11215	Intersection geometry	Change corner right turn radius	1.18	Vehicle/Pedestrian	All	Urban and Suburban	2022	3
11216	Intersection geometry	Change corner right turn radius	1.3	Vehicle/Pedestrian	All	Urban and Suburban	2022	3
11217	Intersection geometry	Change corner right turn radius	1.39	Vehicle/Pedestrian	All	Urban and Suburban	2022	3
11218	Intersection geometry	Change corner right turn radius	1.47	Vehicle/Pedestrian	All	Urban and Suburban	2022	3
11219	Intersection geometry	Change corner right turn radius	1.53	Vehicle/Pedestrian	All	Urban and Suburban	2022	3
9901	Intersection traffic control	Modify signal phasing (implement a leading pedestrian interval)	0.9	All	All K (fatal), A (serious injury), B (minor injury), C (possible injury)	Urban and Suburban	2018	5
9902	Intersection traffic control	Modify signal phasing (implement a leading pedestrian interval)	0.83	All	injury)	Urban and Suburban	2018	5
9903	Intersection traffic control	Modify signal phasing (implement a leading pedestrian interval)	0.81	Vehicle/Pedestrian	All	Urban and Suburban	2018	5
9904	Intersection traffic control	Modify signal phasing (implement a leading pedestrian interval)	0.9	All	All K (fatal), A (serious injury), B (minor injury), C (possible injury)	Urban and Suburban	2018	5
9905	Intersection traffic control	Modify signal phasing (implement a leading pedestrian interval)	0.85	All	injury)	Urban and Suburban	2018	5
9906	Intersection traffic control	Modify signal phasing (implement a leading pedestrian interval)	0.81	Vehicle/Pedestrian	All	Urban and Suburban	2018	5
9907	Intersection traffic control	Modify signal phasing (implement a leading pedestrian interval)	0.83	All	All	Urban and Suburban	2018	5
9910	Intersection traffic control	Modify signal phasing (implement a leading pedestrian interval)	0.84	All	All K (fatal), A (serious injury), B (minor injury), C (possible injury)	Urban and Suburban	2018	5
9911	Intersection traffic control	Modify signal phasing (implement a leading pedestrian interval)	0.86	All	injury)	Urban and Suburban	2018	5
9916	Intersection traffic control	Modify signal phasing (implement a leading pedestrian interval)	0.87	All	All K (fatal), A (serious injury), B (minor injury), C (possible injury)	Urban and Suburban	2018	5
9917	Intersection traffic control	Modify signal phasing (implement a leading pedestrian interval)	0.86	All	injury)	Urban and Suburban	2018	5
9918	Intersection traffic control	Modify signal phasing (implement a leading pedestrian interval)	0.87	Vehicle/Pedestrian	All	Urban and Suburban	2018	5
1993	Intersection traffic control	Modify signal phasing (implement a leading pedestrian interval)	0.413	Vehicle/Pedestrian	All	Urban	2009	4

Active Transportation Safety Action Plan
Crash Modification Factors

CMF ID	Countermeasure Category	Countermeasure	CMF Value	Crash Type	Crash Severity	Area Type	Publication Year	Stars
9908	Intersection traffic control	Modify signal phasing (implement a leading pedestrian interval)	0.72	All	K (fatal), A (serious injury), B (minor injury), C (possible injury)	Urban and Suburban	2018	4
9909	Intersection traffic control	Modify signal phasing (implement a leading pedestrian interval)	0.9	Vehicle/Pedestrian	All	Urban and Suburban	2018	4
9912	Intersection traffic control	Modify signal phasing (implement a leading pedestrian interval)	0.91	Vehicle/Pedestrian	All	Urban and Suburban	2018	4
9913	Intersection traffic control	Modify signal phasing (implement a leading pedestrian interval)	0.9	All	All	Urban and Suburban	2018	4
9914	Intersection traffic control	Modify signal phasing (implement a leading pedestrian interval)	1.09	All	K (fatal), A (serious injury), B (minor injury), C (possible injury)	Urban and Suburban	2018	4
9915	Intersection traffic control	Modify signal phasing (implement a leading pedestrian interval)	0.54	Vehicle/Pedestrian	All	Urban and Suburban	2018	3
11026	Highway lighting	Improve street lighting illuminance and uniformity	0.679	All	All	Urban and Suburban	2021	4
11027	Highway lighting	Improve street lighting illuminance and uniformity	0.581	All	All	Urban and Suburban	2021	4
4123	Pedestrians	Install high-visibility crosswalk	0.6	Vehicle/Pedestrian	All	Urban	2012	2
10737	Bicyclist	Install bicycle lanes	0.435	All	All	Urban	2021	4
10738	Bicyclist	Install bicycle lanes	0.51	All	All	Urban	2021	4
10741	Bicyclist	Install bicycle lanes	0.734	All	All	Urban	2021	4
10742	Bicyclist	Install bicycle lanes	0.694	All	All	Urban	2021	4
10743	Bicyclist	Install bicycle lanes	0.649	All	All	Urban	2021	4
10733	Bicyclist	Install bicycle lanes	0.901	All	All	Urban	2021	3
10734	Bicyclist	Install bicycle lanes	0.9751	All	K (fatal), A (serious injury), B (minor injury), C (possible injury)	Urban	2021	3
10735	Bicyclist	Install bicycle lanes	1.032	All	K (fatal), A (serious injury), B (minor injury), C (possible injury)	Urban	2021	3
10736	Bicyclist	Install bicycle lanes	0.558	All	All	Urban	2021	3
10739	Bicyclist	Install bicycle lanes	0.643	All	All	Urban	2021	3
10740	Bicyclist	Install bicycle lanes	0.756	All	K (fatal), A (serious injury), B (minor injury), C (possible injury)	Urban	2021	3
10744	Bicyclist	Install bicycle lanes	1.287	All	K (fatal), A (serious injury), B (minor injury), C (possible injury)	Urban	2021	3
10727	Bicyclist	Install bicycle lanes	0.7859	All	All	Urban	2021	3
10728	Bicyclist	Install bicycle lanes	1.3065	All	All	Urban	2021	3
1410	Intersection traffic control	Add 3-inch yellow retroreflective sheeting to signal backplates	0.85	All	All	Urban	2005	4
8799	Pedestrians	Install raised median with or without marked crosswalk	0.685	Vehicle/Pedestrian	All	Urban and Suburban	2017	4
8800	Pedestrians	Install raised median with or without marked crosswalk	0.742	All	All	Urban and Suburban	2017	4
9014	Pedestrians	Install raised median with or without marked crosswalk	0.714	All	A (serious injury), B (minor injury), C (possible injury)	Urban and Suburban	2017	4