

Statewide Webinar

**ADOT**

# **FY25 and FY26 HSIP Call For Projects**

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**March 9, 2022**

# Housekeeping

- Please place your microphone on mute
- Please type questions in the chat box
- After each presentation, there will be an opportunity to ask questions.

# Purpose of the Webinar

- To make the participants aware of the changes between the SFY23/24 HSIP and the SFY25/26 HSIP and the impact of the Infrastructure Improvement and Jobs Act (IIJA) on ADOT's HSIP.
- To familiarize new participants who have not completed an ADOT HSIP application with the application, the FHWA Crash Modification ClearingHouse and the B/C ratio worksheet.

# Current Operating Constraints

- Until Congress approves the Federal Budget, the Federal Government and the State of Arizona are still operating under a Continuing Resolution thru 03/11/2022; therefore, the additional BIL funding has not been distributed.

**STSP**

**VISION**

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

**GOAL**

*Reduce Traffic Fatalities on  
Arizona's Roadways*

**CURRENT STATUS**

*In 2018, there were 1,021\* traffic-related  
deaths on Arizona's roadways.*

\*Number of fatalities as in ADOT  
ALISS database, July 18, 2019.

# Highway Safety Improvement Program

## Purpose:

Reduce fatalities and serious injuries on ALL public roads

# FY25/26 HSIP Call for Projects

## Specifics:

- **Initial call issued 2/28/22** - Infrastructure and previously eligible non-infrastructure projects only
- \$24 million available for SFY25
- \$35 million available for SFY26
- Projects ranked based on B/C ratio
- Possible non-infrastructure CFP to be issued later in 2022

# Lessons Learned

- Anticipated Cost Estimates were in almost all cases underestimated
- Inflation rate included in FY25/26 application is higher than the previous call for projects.
- Sub- structures (i.e. roadways/shoulders) were found to be unsuitable for countermeasures (i.e. centerline & shoulder rumble strips)
- PHB's seemed to be the automatic go to solution for pedestrian fatalities (no intermediate solutions)
- JPA's have to be executed prior to design SFY
- Appendices in the HSIP Manual have changed

# Changes to the HSIP Program

- All applications are submitted for SFY25 and SFY26 programs.
- All draft applications must be submitted for review.
- Minimum funding for non-infrastructure projects is reduced to \$100,000.00
- Safe Transportation for Every Pedestrian (STEP) requirements added
- Project Initiation Timeline added
- Lead agency responsibility for multi-agency projects
- Expanded guidance on requirements for the State's progress toward achieving the State Safety Performance Targets
- Vulnerable Road User Special Rule guidance added to Manual
- Appendix D, Non-Infrastructure Projects, added (Under Development)



## AZ STEP Guide Safe Transportation for Every Pedestrian

As part of the Every Day Counts (EDC-5) program on safe transportation for every pedestrian (STEP), the Federal Highway Administration (FHWA) published an updated "Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations" to help agencies choose countermeasures based on roadway characteristics and pedestrian safety issues. We're creating an Arizona-specific guide so that local engineers can find examples and drawings and specs for these countermeasures.

While AZ STEP program contains information about national, state and local best practices, site specific design solutions, national standards and state laws, the document remains a guide to practitioners. It is not intended to supersede local practices, standards or engineering judgment.

### How to Use the AZ Step Guide

**ONE**

➤ Determine Roadway Configuration  
You will need to know:

- Number of lanes in each direction
- Existence of a raised median

➤ Select Roadway Configuration from list.



#### Roadway Configurations

- [Two lanes \(One lane each direction\)](#)
- [Three lanes \(with raised median\)](#)
- [Three lanes \(without raised median\)](#)
- [Four+ lanes \(with raised median\)](#)
- [Four+ lanes \(without raised median\)](#)

**TWO**

➤ Generate Countermeasure Chart:  
You will need to know:

- Vehicle AADT
- Posted speed limit

➤ Follow flowchart to determine which countermeasure chart applies to your roadway configuration, AADT, and Speed Limit.

➤ Select appropriate countermeasure chart.

**THREE**

➤ Determine safety issues to be addressed:  
You will need to know:

- What conditions are causing conflicts at your location

➤ Using engineering discretion, choose a set of countermeasures to address the safety issues at your location.

**FOUR**

➤ Select links to countermeasures to access suggested specifications and example drawings.

[View larger version](#)

#### Business

- [ADOT Broadband Office](#)
- [ADOT Business Coach On Demand](#)
- [Business Engagement and Compliance](#)
- [Civil Rights/External EEO Contractor Compliance](#)
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- [Environmental Planning](#)
- [Right of Way / Properties](#)
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- [Road Safety Assessments](#)
- [Crash Modification Factors](#)

# AZ Safe Transportation for Every Pedestrian

Page A-5, Para. 9 Pedestrian Countermeasures: Included in the ADOT guide is a "Field Review Form" which must be completed and submitted with all pedestrian countermeasures.

STEP Web Page:

<https://azdot.gov/business/tsmo/operational-and-traffic-safety/az-step>

# Anticipated Milestones

- February 28, 2022      **Call for HSIP projects notification**
  - 3/9/2022, HSIP Webinar/Workshop 3/9/22
- April 29, 2022      **Draft applications due**
  - TSS/LPA/PMG combined comments sent out 5/27/22
- July 1, 2022      **Final applications due**
- October 28, 2022      **HSIP Safety Committee approval**
  - Eligibility letters issued 12/30/2022
- January 2023      **Project list submitted for Tentative 5-Year Program**

Questions?



# General HSIP Eligibility

- Ensuring consistency with SHSP [23 U.S.C. 148(a)(4)(A)]
- Using a data-driven process [23 U.S.C. 148(c)(2)(B)(iv)]
- Focusing on Safety Performance [23 U.S.C. 148(b)]
- Investing in all public roads [23 U.S.C. 148(e)(1)(A)]

# Ensuring Consistency with SHSP

Highway safety improvement projects are defined as being “consistent” with a State's SHSP (23 U.S.C. 148(a)(4)(A)) – which means that projects should logically flow from the emphasis areas and strategies identified in the State’s SHSP. The SHSP emphasis areas should guide HSIP problem identification, and SHSP strategies should influence countermeasure identification and HSIP project selection. Implementation of highway safety improvement projects supports implementation of the SHSP actions and strategies, and HSIP evaluation results feed back into the SHSP evaluation process.

# Arizona's Strategic Traffic Safety Plan

State strategic highway safety plan.-The term "State strategic highway safety plan" means a comprehensive plan, based on safety data, developed by a State transportation department that-

- (A) is developed after consultation with partners and other stakeholders
- (B) analyzes and makes effective use of State, regional, local, or tribal safety data;
- (C) addresses engineering, management, operation, education, enforcement, and emergency services elements (including integrated, interoperable emergency communications) of highway safety as key factors in evaluating highway projects;
- (D) considers safety needs of, and high-fatality segments of, all public roads, including non-State-owned public roads and roads on tribal land;
- (E) considers the results of State, regional, or local transportation and highway safety planning processes;
- (F) describes a program of strategies to reduce or eliminate safety hazards;
- (G) includes a vulnerable road user safety assessment;
- (H) is approved by the Governor of the State or a responsible State agency;
- (I) is consistent with section 135(g); and
- (J) is updated and submitted to the Secretary for approval as required under subsection (d)(2).

## ARIZONA STRATEGIC TRAFFIC SAFETY PLAN



# 2019

OCTOBER 1, 2019



# 2019 AZ's STSP Emphasis Areas and Strategies

Emphasis Area	Number of Engineering Strategies
Highway Safety (Behavior-Related)	4
Intersections	3
Lane Departure	3
Pedestrians	1
Safety-Related Data	1

# Highway Safety Improvement Project

In general.-The term "highway safety improvement project" means strategies, activities, and projects on a public road that are consistent with a State strategic highway safety plan and-

- (i) correct or improve a hazardous road location or feature; or
- (ii) address a highway safety problem.



# HSIP Application Header - Q 4a.

Agency:		Title of Project:	
County:		COG/MPO:	
District:		Date of Application:	
Contact:		Phone:	E-Mail:
Type of Safety Improvement:		Spot: <input type="checkbox"/> YES <input type="checkbox"/> NO	Systemic: <input type="checkbox"/> YES <input type="checkbox"/> NO
Mark all that apply to your project: <input type="checkbox"/> Design <input type="checkbox"/> Construction <input type="checkbox"/> Procurement <input type="checkbox"/> Non-Infrastructure			
Anticipated Total Cost Estimate:			\$0.00
Anticipated dollar amount of HSIP Funding:			\$0.00
Anticipated Dollar amount of Local Match (5.7%) (5.66%):			\$0.00
Anticipated Dollar amount of Other:			\$0.00
Funding Source: <input type="checkbox"/> 100% HSIP <input type="checkbox"/> 94.3% HSIP <input type="checkbox"/> 94.34% HSIP		Cost Estimate Tab:	
Administration of Project:		Agency: <input type="checkbox"/> YES <input type="checkbox"/> NO	ADOT: <input type="checkbox"/> YES <input type="checkbox"/> NO
Name and Title of COG/MPO Representative:			
<b>Basic Project Information</b>			
Anticipated Design Year (Construction year cannot be the same): <input type="checkbox"/> FY25 <input type="checkbox"/> FY26			
If additional ROW is needed, what FY is purchase anticipated?: <input type="checkbox"/> FY25 <input type="checkbox"/> FY26			
Anticipated Construction Year: <input type="checkbox"/> FY25 <input type="checkbox"/> FY26			
1. Have lower cost countermeasures been considered or implemented? <input type="checkbox"/> YES <input type="checkbox"/> NO			
1a. If "Yes", describe: If "No", explain why not:			
2. Which 23 USC 148 highway safety improvement project category does this project come under?			
2a.			
3. Describe your safety improvement project in detail: (50 words or less)			
3a.			
4. Describe the location of this safety project:			
4a.			

General Information

From Cost Estimate  
Also used in Cover Letter

Dropdown lists the 28 23 USC 148  
countermeasures

Use this description in the Cover Letter

# HSIP Application

## Q5. - Q22.

5.	What crash data screening method was used to identify this project?
5a.	
6.	What is the safety justification for the proposed project?
6a.	
7.	Will there be ground disturbing activities? <input type="checkbox"/> YES <input type="checkbox"/> NO
8.	Is project within applicants permanent ROW? <input type="checkbox"/> YES <input type="checkbox"/> NO
8a.	If NO please explain:
9.	Will any temporary right-of-way acquisitions be required? <input type="checkbox"/> YES <input type="checkbox"/> NO
10.	Will there be any utility relocation needed? <input type="checkbox"/> YES <input type="checkbox"/> NO
10a.	If YES please explain:
11.	Does Section 4(f) apply to any portion of this project? <input type="checkbox"/> YES <input type="checkbox"/> NO
11a.	If YES please explain:
12.	Are there any other issues that may impact or delay development or construction of this project? <input type="checkbox"/> YES <input type="checkbox"/> NO
12a.	If YES please explain:
13.	Is this project in compliance with revised ADA Standards? <input type="checkbox"/> YES <input type="checkbox"/> NO
13a.	If NO please explain:
14.	Does the project support Arizona's Strategic Traffic Safety Plan? <input type="checkbox"/> YES <input type="checkbox"/> NO
15.	Are there any Studies, RSA's or Other evaluations that support this project? <input type="checkbox"/> YES <input type="checkbox"/> NO
16.	If the project is a traffic control device requiring a warrant, is a copy attached? <input type="checkbox"/> YES <input type="checkbox"/> NO
17.	HSIP Roadway Functional Classification:
18.	For projects on State System: BMP: EMP:
19.	Average Daily Traffic Volume and Year Collected: ADT: Year:
20.	What is the source of ADT?:
21.	What is the posted speed limit?:
22.	Detailed engineer's cost estimate attached: <input type="checkbox"/> YES <input type="checkbox"/> NO

RoW purchase is limited to 10% of total countermeasure cost

If the application is for a Traffic Signal a copy of the warrant is required to accompany the application

Information used in HSIP Annual Report to FHWA

# HSIP Application

## Q23. - Q43a.

"Systemic" Safety Project	
23. Completed B/C Ratio Tabulation Sheet Attached (Required):	<input type="checkbox"/> YES <input type="checkbox"/> NO
24. Most current 5 Years Crash Data from ADOT ACIS database sorted by year & severity (required):	
25. What are the inclusive dates of the crash data?	
26. Have all crashes that will not be influenced by this countermeasure been deleted from the crash list? (pedestrian, pedalcycle, etc. as applicable)	<input type="checkbox"/> YES <input type="checkbox"/> NO
27. If purchasing equipment or materials, who will install?	<input type="checkbox"/> Town/City <input type="checkbox"/> County <input type="checkbox"/> Tribe <input type="checkbox"/> Contractor
28. Does the project require proprietary Items (23CFR 635.411)?:	<input type="checkbox"/> Yes <input type="checkbox"/> No
29. Is a list of locations for systemic projects provided on the attached form?	<input type="checkbox"/> Yes <input type="checkbox"/> No
30. How are (will) the proposed locations be prioritized for replacement? (explain below)	
30a.	
31. Are the supporting structures in good condition, meet local standards and have an anticipated service life longer than the countermeasure being installed?	<input type="checkbox"/> Yes <input type="checkbox"/> No
"Spot" Improvement Projects Only	
32. Completed B/C Ratio Tabulation Sheet Attached (required):	<input type="checkbox"/> YES <input type="checkbox"/> NO
33. Is the most current 5 Years Crash Data from ADOT ACIS database sorted by year & severity attached and in correct format? (required):	
34. What are the inclusive dates of the crash data?	
35. Have all crashes that will not be influenced by this countermeasure been deleted from the crash list? (pedestrian, pedalcycle etc. as applicable)	<input type="checkbox"/> YES <input type="checkbox"/> NO
36. Have any infrastructure changes occurred within the work limits of this project during the years the crash data covers?	<input type="checkbox"/> YES <input type="checkbox"/> NO
37. If YES please explain:	
38. Are the supporting structures in good condition, meet local standards and have an anticipated service life longer than the countermeasure being installed?	<input type="checkbox"/> YES <input type="checkbox"/> NO
39. Project vicinity map is provided:	<input type="checkbox"/> YES <input type="checkbox"/> NO
40. Project work limits map is provided:	<input type="checkbox"/> YES <input type="checkbox"/> NO
Pedestrian Projects	
41. Has the AZSTEP Field Review Form been completed and attached?	<input type="checkbox"/> YES <input type="checkbox"/> NO
42. If more than one project location in this application, has the AZSTEP Field Review Form been completed for each location and attached?	<input type="checkbox"/> YES <input type="checkbox"/> NO
43. If this application is for a HAWK, please provide the date and peak hour the on site pedestrian count was completed. (If more than one location, provide the date and hour on the PHB Evaluation Form beside question 2, Peak hour pedestrian crossing volume.)	
43a. Date:	Peak Hour: <input type="checkbox"/> AM <input type="checkbox"/> PM

Inclusive dates of crash data: 07/01/2016 - 06/30/2021

AZSTEP Field Review required

# HSIP Application

## Q44. - Q49.

All drop-downs. When one of the 5 EAs is selected, the Strategies for that EA can be seen and the one that applies to your project selected

2019 STSP - All Projects	
44.	Which STSP Emphasis Area (EA) does this project support?:
44a.	Which EA Strategy supports this EA?
44b.	Does this project support a <u>second</u> STSP EA? If so, which EA.:
44c.	Which EA Strategy supports this EA? (Not all Strategies have a Sub-Strategy)
44d.	Does this project support a <u>third</u> STSP EA? If so, which EA.:
44e.	Which EA Strategy supports the third EA? (Not all Strategies have a Sub-Strategy)
44f.	Which STSP Emphasis Area (EA) does this project support?:
44g.	Which EA Strategy supports this EA?
44h.	Which STSP Emphasis Area (EA) does this project support?
44i.	Which EA Strategy supports this EA?
45.	Does this project support one of the 28 FHWA proven safety countermeasures?: <input type="checkbox"/> YES <input type="checkbox"/> NO
45a.	If so, which countermeasure?:
46.	Does this project support one of the two Arizona Focus Areas?: <input type="checkbox"/> YES <input type="checkbox"/> NO
46a.	If so, which focus area?:
47.	Does your COG/MPO have a Strategic Transportation Safety Plan (STSP)?: <input type="checkbox"/> YES <input type="checkbox"/> NO
47a.	If "YES", does this project support an Emphasis Area in the COG/MPO STSP?:
47b.	List the EA:
47c.	If your COG/MPO has a STSP and it was Federally Funded and you answered NO in 44a, explain why this project is being submitted over a STSP identified project. (For Local Agencies Only)
47d.	Rational:
48.	Are any temporary safety countermeasures needed prior to this permanent solution being installed?
48a.	If yes, please explain:
49.	For all agencies, has the Regional Traffic Engineer been made aware of this potential project and does he/she concur with it? <input type="checkbox"/> YES <input type="checkbox"/> NO

# HSIP Application

## Q50. - Q55.

Strategic Transportation Safety Plans Funds (COG/MPO)			
47.	What is the date of your last STSP or update completed?		
48.	How many projects that were identified in your last STSP or update were submitted for HSIP funding?		
49.	What was the total dollar amount of the projects in question 48?		
50.	How many projects that were submitted for HSIP funding were eligible and funded by ADOT?		
51.	What was the total dollar amount of the projects in question 50?		
B/C Ratio			
52.	The calculated B/C Ratio is:	#####	CMF ID Number (Required):
			2nd CMF ID No.:
			3rd CMF ID NO.:
TSS Use Only			
RTE Approval:		<input type="checkbox"/> YES <input type="checkbox"/> NO	
Date:		Print Name	Signature
STSE Approval:		<input type="checkbox"/> YES <input type="checkbox"/> NO	
Date:		Print Name	Signature

CMF ID # Required

2nd & 3rd CMF Required if a Combined CMF is used in B/C Ratio



Required for all HSIP Applications					
Agency:	0	Title of Project:			
Benefit / Cost Ratio Tabulation					
Annual Benefit Tabulation					
Severity	Annual Average	Estimated CRF* Reduction	Total Reduction	Unit Cost	Annual Benefit
Fatal	0.00	0%	0.00	\$9,515,371	\$0
Incapacitating Injury	0.00	0%	0.00	\$550,499	\$0
Total Annual Benefits					\$0
Costs					
Total Project Cost	←				\$0
Project Life (years)	← Appendix B				10
Interest Rate (%)					8%
Capital Recovery Factor					0.1490
Annual Construction Cost					\$0
Annual Maintenance Cost	←				\$0.00
Total Annual Costs					\$0
Benefit / Cost					
Annual Benefit	Annual cost	Benefit / Cost Ratio			
\$0	\$0	#DIV/0!			
*REQUIRED: Use 4 and 5 star CMFs from FHWA CMF Clearing House should be used if listed. The CMF's CRF is used in the above calculation					

## B-C Ratio Calculation Form

If multiple locations or countermeasures are being combined into one application, each location or countermeasure must have a separate B/C ratio analysis included in the application and each location or countermeasure must have a B/C ratio of  $\geq 2.5$ . For ranking purposes, a B/C ratio must be calculated using the total cost of the project and the 5-year average of all crashes used in the individual calculations. (The exception to this requirement is if the project is systemic.)

Example: Installation of traffic signal and LT lane  
 History: 3 angle K & A crashes & 2 LT K & A crashes  
 3 B/C Ratios required:

1. Cost of signal utilizing 3 angle crashes
2. Cost of LT lane utilizing 2 LT crashes
3. Total cost of project utilizing all 5 crashes

## CRASH MODIFICATION FACTORS CLEARINGHOUSE

[ABOUT THE CLEARINGHOUSE](#) | [USING CMFs](#) | [DEVELOPING CMFs](#) | [ADDITIONAL RESOURCES](#)

The **Crash Modification Factors Clearinghouse** provides a searchable database of CMFs along with guidance and resources on using CMFs in road safety practice.

FREQUENT SEARCHES: [ROUNDAABOUT](#) | [SIGNAL](#) | [PEDESTRIAN](#) | [COMPLETE STREETS](#) | [TSMO](#) | [BROWSE ALL](#)



### WHAT ARE CMFs?

A crash modification factor (CMF) is used to compute the expected number of crashes after implementing a countermeasure on a road or intersection.

[LEARN MORE](#)


### NEWSLETTER

Hot off the press! The CMF Clearinghouse Update: Winter 2021 newsletter is now available. Read for the latest on the Clearinghouse's additions and activities.

[READ NOW](#)


### UPDATED RATINGS

The CMF Clearinghouse transitioned to the CMF rating criteria developed as part of the NCHRP 17-72 project for the 2nd edition of the Highway Safety Manual on February 15, 2021.

[LEARN MORE](#)

### RECEIVE THE QUARTERLY EMAIL NEWSLETTER






CMFs were last added to the clearinghouse on November 9, 2021.

# FHWA CMF Clearinghouse

Web Address:

<http://www.cmfclearinghouse.org/>

## SEARCH RESULTS

There were 780 CMFs returned for your search on "rumble strips". [\[MODIFY YOUR SEARCH\]](#).

Having trouble deciding between similar CMFs? Use our [COMPARISON TOOL](#) or [CHECK OUT OUR FAQs](#).

Overwhelmed by too many results? See our [SEARCH TIPS](#).

**STAR QUALITY RATING**

1 (68)

2 (144)

3 (352)

4 (171)

5 (45)

**COUNTRY**

U.S. & Canada (770)

International (10)

**CRASH TYPE**

**CRASH SEVERITY**

**ROADWAY TYPE**

**AREA TYPE**

**INTERSECTION TYPE**

**INTERSECTION GEOMETRY**

**TRAFFIC CONTROL**

**IN HSM**

Results Control: [COLLAPSE ALL](#) | [EXPAND ALL](#)  
Click on the links below to expand individual categories.

▶ Category: Delineation (20)

▼ Category: Roadway (316)

▼ Subcategory: Roadway rumble strips (312)

▼ Countermeasure: Install centerline and shoulder rumble strips

<input type="checkbox"/>	CMF	CRF(%)	Quality	Crash Type	Crash Severity	Area Type	Reference	Comments
<input type="checkbox"/>	0.8	20	★★★★★	All	All	Rural	PERSAUD ET AL., 2015	CMF for total crashes (all ... <a href="#">[READ MORE]</a> )
<input type="checkbox"/>	0.771	22.9	★★★★★	All	K (fatal),A (serious injury),B (minor injury),C (possible injury)	Rural	PERSAUD ET AL., 2015	CMF for injury crashes (K... <a href="#">[READ MORE]</a> )
<input type="checkbox"/>	0.742	25.8	★★★★★	Run off road	All	Rural	PERSAUD ET AL., 2015	CMF for run-off-road crashes (all ... <a href="#">[READ MORE]</a> )
<input type="checkbox"/>	0.632	36.8	★★★★★	Head on	All	Rural	PERSAUD ET AL., 2015	CMF for head-on crashes (all ... <a href="#">[READ MORE]</a> )
<input type="checkbox"/>	0.767	23.3	★★★★★	Sideswipe	All	Rural	PERSAUD ET AL., 2015	CMF for head-on and sideswipe... <a href="#">[READ MORE]</a> )
<input type="checkbox"/>	0.842	15.8	★★★★★	All	All	Rural	PERSAUD ET AL., 2015	CMF for total crashes (all ... <a href="#">[READ MORE]</a> )

# FHWA CMF Clearinghouse

Select which CMF you are going to use.

It is the **CRF** you will use in the B/C Ratio calculation

Web Address:

<http://www.cmfclearinghouse.org/>





## CMF / CRF Details

CMF ID: 8259

Install separated bicycle lane

Description: Bike lanes separated from motorized traffic by different types of barriers and/or parking lane configurations

Prior Condition: No separate bicycle lane

Category: Bicyclists

Study: [Separated Bike Lane Crash Analysis, Rothenberg et al., 2016](#)

Star Quality Rating:	★★★★
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Crash Modification Factor (CMF)	
Value:	0.687
Adjusted Standard Error:	
Unadjusted Standard Error:	

Crash Reduction Factor (CRF)	
Value:	31.3 (This value indicates a <b>decrease</b> in crashes)
Adjusted Standard Error:	

Country:	USA
Type of Methodology Used:	3
Sample Size Used:	

Other Details	
Included in Highway Safety Manual?	No
Date Added to Clearinghouse:	Jan-17-2017
Comments:	CMF Applies to average total crashes when bicycle lane is separated by concrete/curb only. Study sites were located in Texas, Illinois, Oregon, California, Montana, New York, Florida, and Washington DC; however, it is unclear which States were used for the development of this CMF. The number of crashes in the after period were not reported in this study, however, they have been recorded as 300 to give 10 points as a benefit of doubt for one or more of the following: (1) number of miles/sites in the reference/treatment group, (2) number of crashes in the references/treatment group, (3) reporting AADTs for the aggregate dataset but not for the disaggregate dataset used for CMF development.

This site is funded by the U.S. Department of Transportation Federal Highway Administration and maintained by the University of North Carolina Highway Safety Research Center

*The information contained in the Crash Modification Factors (CMF) Clearinghouse is disseminated under the sponsorship of the U.S. Department of Transportation in the interest of information exchange. The U.S. Government assumes no liability for the use of the information contained in the CMF Clearinghouse. The information contained in the CMF Clearinghouse does not constitute a standard, specification, or regulation, nor is it a substitute for sound engineering judgment.*

# CMF Requirements

← CMF Applies to average total crashes when bicycle lane is separated by concrete/curb only.

# Example of 100% State Cost Estimate

Agency:	ADOT		Name of Project:	US 60, MP 247 - MP 248, Lighting				
HSIP Project Cost Estimate Worksheet								
Project Cost Estimate:	Description:	Quantity:	Unit Cost:	Total Cost:	HSIP:	State Match:	Other Amt:	TOTAL COST
					100.00%	0.00%	0.00%	
Planning or Study:		0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Preliminary Engineering:	Design	1	\$ 130,000.00	\$ 130,000.00	\$ 130,000.00	\$ -	\$ -	\$ 130,000.00
Other		0	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
ADOT Admin Costs:	Includes Environmental	1	\$ 50,000.00	\$ 50,000.00	\$ 50,000.00	\$ -	\$ -	\$ 50,000.00
<b>Sub-Total</b>				<b>\$ 180,000.00</b>	<b>\$ 180,001.00</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 180,000.00</b>
ADOT ICAP:		10.14%		\$ 18,252.00	\$ 18,252.00	\$ -	\$ -	\$ 18,252.00
<b>Design Sub-Total</b>				<b>\$ 198,252.00</b>	<b>\$ 198,253.00</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 198,252.00</b>
Construction:	Pole (Type G) Standard Base	14	\$1,800.00	\$ 25,200.00	\$ 25,200.00	\$ -	\$ -	\$ 25,200.00
	Breakaway Base for Lighting Pole	14	\$550.00	\$ 7,700.00	\$ 7,700.00	\$ -	\$ -	\$ 7,700.00
	Pole Foundation(Type G) (Standard Base)	14	\$950.00	\$ 13,300.00	\$ 13,300.00	\$ -	\$ -	\$ 13,300.00
	Luminaire (Horizontal Mount) LED	14	\$850.00	\$ 11,900.00	\$ 11,900.00	\$ -	\$ -	\$ 11,900.00
	Conduit, pull boxes, conductors & other electrical	1	\$78,000.00	\$ 78,000.00	\$ 78,000.00	\$ -	\$ -	\$ 78,000.00
	Load Centre Cabinet (Type II) (240/480 VOLT)	1	\$15,000.00	\$ 15,000.00	\$ 15,000.00	\$ -	\$ -	\$ 15,000.00
	Load Centre Cabinet Foundation	1	\$1,500.00	\$ 1,500.00	\$ 1,500.00	\$ -	\$ -	\$ 1,500.00
	Miscellaneous Electrical(As-Built Drawing & Device Number Install)	1	\$4,000.00	\$ 4,000.00	\$ 4,000.00	\$ -	\$ -	\$ 4,000.00
Construction:		0	\$0.00	\$ -	\$ -	\$ -	\$ -	\$ -
<b>Sub-Total</b>		<b>0</b>		<b>\$ 156,600.00</b>	<b>\$ 156,600.00</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 156,600.00</b>
	Mobilization (10%)	1	\$ 15,660.00	\$ 15,660.00	\$ 15,660.00	\$ -	\$ -	\$ 15,660.00
	Traffic Control (10%)	1	\$ 15,660.00	\$ 15,660.00	\$ 15,660.00	\$ -	\$ -	\$ 15,660.00
	Public Relations (5%)	1	\$ 7,830.00	\$ 7,830.00	\$ 7,830.00	\$ -	\$ -	\$ 7,830.00
<b>Sub-Total</b>				<b>\$ 172,260.00</b>	<b>\$ 172,260.00</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 172,260.00</b>
Construction Admin :		14.00%		\$ 24,116.40	\$ 24,116.40	\$ -	\$ -	\$ 24,116.40
Contingencies :		5.00%		\$ 8,613.00	\$ 8,613.00	\$ -	\$ -	\$ 8,613.00
Post Design		1.00%		\$ 1,722.60	\$ 1,722.60	\$ -	\$ -	\$ 1,722.60
				\$ -	\$ -	\$ -	\$ -	\$ -
<b>Post Sub-Total</b>				<b>\$ 34,452.00</b>	<b>\$ 34,452.00</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 34,452.00</b>
<b>Construction Sub-Total</b>				<b>\$ 206,712.00</b>	<b>\$ 206,712.00</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 206,712.00</b>
ADOT ICAP:		10.14%		\$ 20,960.60	\$ 20,960.60	\$ -	\$ -	\$ 20,960.60
<b>Construction Sub-Total</b>				<b>\$ 227,672.60</b>	<b>\$ 227,672.60</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 227,672.60</b>
<b>TOTAL REQUEST</b>				<b>\$ 425,924.60</b>	<b>\$ 425,925.60</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 425,925.60</b>
Comments:								

Local Projects are designed by Consultants

In enough detail that ADOT can review and comment

# Use this CE for Projects with 94.3% & 100% Eligible Countermeasures

Agency:		Use this worksheet if there is one or more 94.3% countermeasure and one or more 100% countermeasure			Name of Project:		Corridor Improvements				
HSIP Project Cost Estimate Worksheet											
						Project Costs broken out by eligible percentage					
Project Cost Estimate:	Description:	Unit	Quantity:	Unit Cost:	Total Cost:	0.0%				Total	
						94.30%	5.70%	100%			
Design:					\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Environmental Clearance					\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
ADOT Admin Costs:					\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
					\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>Design Sub-Total</b>					\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	ICAP	0.0%			\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>Design Sub-Total</b>					\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Inflation Factor		13.5%			\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	<b>TOTAL DESIGN</b>				\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Construction:					\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Construction:					\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Construction:					\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Construction:					\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>Construction - Subtotal</b>					\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Construction:	Traffic Control	10.0%		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Construction:	Mobilization	10.0%		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	#VALUE!			\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>Construction - Subtotal</b>					\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Post Const:	Construction Admin	14%		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Post Const:	Construction Contingency	5%		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Post Const:	Post Design	1%		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Post Const:	Community Relations	5%		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>Post Const - Subtotal</b>					\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>Const &amp; Post Const - Sub Total</b>					\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	ICAP	0.00%	0		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>Construction Total</b>					\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Inflation Factor		18%			\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>TOTAL REQUEST</b>					\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

If the installation of a 100% HSIP eligible item is the result of a 94.3% countermeasure, then it will become 94.3% eligible

If there are multiple stand alone countermeasures in a project, then each will be estimated based on their eligibility %.

Design and below the line costs will then be based on each countermeasures % of the total project cost.

Comments: The % of Design and Below the Line percentages is based on the construction costs percentages of 94.3% and 100% countermeasure breakout

# Countermeasures eligible for 100% HSIP

[23 U.S.C. 120 \(c\)\(1\)](#) states that the federal share payable may amount to 100 percent of the construction of any project for:

- Traffic control signalization (including HAWK),
- Maintaining minimum levels of retroreflectivity of highway signs or pavement markings,
- Traffic circles/roundabouts,
- Safety rest areas,
- Pavement marking,
- Shoulder and centerline rumble strips and stripes,
- Commuter carpooling and vanpooling,

# Countermeasures Eligible for 100% HSIP

(Continued:)

- Rail-highway crossing closure,
- Installation of traffic signs, traffic lights, guardrails, impact attenuators, concrete barrier end treatments, breakaway utility poles, or
- Priority control systems for emergency vehicles or transit vehicles at signalized intersections.
- When an eligible project uses funds from a program apportioned under 23 U.S.C. 104 and that project is located within the boundaries of an Indian reservation, national park, or national monument, the Federal share may be 100%.

# Support Resources



**Interactive Crash Data**

- › [Crash Data Analysis](#)
- › [Crash Count Overview](#)
- › [STSP](#)
- › [HSIP](#)
- › [TIM](#)
- › [GOHS](#)

**Interactive Crash Data**

- Crash Data Analysis**
- [Crash Count Overview](#)
- [STSP](#)
- [HSIP](#)
- [TIM](#)
- [GOHS](#)

These reports display the agency based crash data summaries in graphs and charts for various crash parameters and also provide top locations by on-road for the selected agency. [PDF list](#) of the tables and graphs that are in each dashboard.


[Crash Data by City/County](#)

[Crash Data by Engineering District](#)

[Crash Data by COG/MPO](#)

[Crash Data by Tribal Area](#)


# Crash Data Resource

## Safety Analysis Program

Saroja Devarakonda

[sdevarakonda@azdot.gov](mailto:sdevarakonda@azdot.gov)

602-712-8283

## Network Screening/Safety Analysis

John Riemer

[jriemer@azdot.gov](mailto:jriemer@azdot.gov)

602-712-6259

Sumera Kayani

[skayani@azdot.gov](mailto:skayani@azdot.gov)

602-712-8527





Transportation Systems Management and Operations  
Traffic Safety Section

## HSIP Construction Pricing Examples



December 2020

# Resource for Construction Cost Comparison

Examples Include:

Intersection Countermeasures: 16

Roadway Countermeasures: 9

Non-Motorized Countermeasures: 13

ADOT HSIP Webpage:

<https://azdot.gov/business/transportation-systems-management-and-operations/operational-and-traffic-safety/arizona-0>



Countermeasure: Roundabout

H8278 - US 89 and Road 4 North, Intersection Improvements

Scope of Work: The proposed work was located in Yavapai County on SR 89 within the Town of Chino Valley, between mileposts 330.48 and 330.78. The work consisted of constructing a new roundabout at the intersection of SR 89 and Road 4 North. Additional work included the removal and replacement of Asphalt Concrete pavement; installing new drainage facilities; replacing pavement markings; removing and installing lighting; and other miscellaneous work.

Construction Bidder 1 = \$2,183,908.24

Construction Bidder 2 = \$2,274,155.95

Construction Bidder 3 = \$2,294,542.00

Bid Award Date: 10/10/2014

Design Cost: \$614,493.00

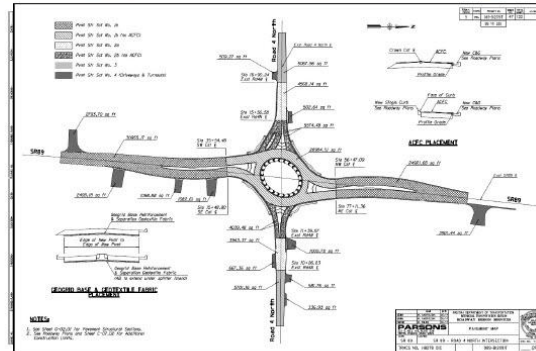
Indirect Costs: \$387,057.00

ADOT Review and Delivery Fees: \$573,577.00

Construction Budget: \$2,691,041.00

**Total Project Cost: \$4,266,168.00**

Construction Compete: 11/13/2015



# Construction Cost Example

# 2020 Network Screening Report



Transportation Systems Management and Operations

**Arizona Department of Transportation**  
**Traffic Safety Section**  
**Network Screening**  
**Non-signalized Intersections (Excl Roundabouts) - Statewide**

**Network:** Statewide
**Period:** 2015-2019
**Query Date:** 10/9/2020

#	Street 1	Street 2	District	Jurisdiction	COG/MPO	Severity					Total	Primary Fatal/Serious Crash Type	Comments
						K-A	Fatal	Serious	Minor/	PDO (O)			
3	Sheldon St	Mount Vernon Ave	Northwest	Prescott	CYMPO	2	0	2	5	11	18	Angle	Locals to consider options.
4	McCulloch Blvd	El Dorado Ave	Northwest	Lake Havasu	LHMPO	2	0	2	2	9	13	Angle	Locals to consider options.
5	Stockton Hill Rd	Pacific Ave	Northwest	Kingman	WACOG	2	0	2	1	2	5	Angle	Locals to consider options.
2	Avenue A	22nd St	Southwest	Yuma	YMPO	2	1	1	4	9	15	None	Local agencies to consider options
3	Avenue 5 E	40th St	Southwest	Yuma	YMPO	2	0	2	5	7	14	Angle	Local agencies to consider options
4	339th Ave	Lower Buckeye Rd	Southwest	MCSO	MAG	2	0	2	3	1	6	Left turn	Local agencies to consider options
5	Somerton Ave	8th St	Southwest	Yuma County	YMPO	2	1	1	0	0	2	Single Vehicle	Local agencies to consider options

**Notes:**

2017 Arizona Traffic Crash Manual Definition only without intersection related check box. Any crash within 150 feet of the intersection irrespective of if the intersection related box was checked or not on the report.

This report is subject to the provisions of 23 USC § 409. Any intentional or inadvertent release of this material, or any data derived from its use does not constitute a waiver of privilege pursuant to 23 USC §409.

23 USC § 409 - Discovery and admission as evidence of certain reports and surveys.

Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or railway-highway crossings, pursuant to sections 130, 144, and 148 of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in

**Data Sources:**

2015-2019 ADOT ALISS Database

**Further Information:**

Kerry Wilcoxon, ADOT State Traffic Safety Engineer, 602-712-2060 or kwilcoxon@azdot.gov

**DISTRICTS**

Central
Northwest
Northeast
Northcentral
Southcentral
Southwest
Southeast

# HSIP Application Checklist

**Operational Traffic and Safety Group, TSMO  
ADOT Traffic Safety Section  
HSIP Eligibility Determination Checklist**

Agency: \_\_\_\_\_ Date: \_\_\_\_\_

Project Title: \_\_\_\_\_

**Eligibility Determination Requirements:**

**General Requirements:**

YES	NO	
<input type="checkbox"/>	<input type="checkbox"/>	Does the description of the project adequately describe the countermeasure(s) and the safety problem that it proposes to address?
<input type="checkbox"/>	<input type="checkbox"/>	Final submittal, is the cover/transmittal letter signed by appropriate individual?
<input type="checkbox"/>	<input type="checkbox"/>	For Traffic or Pedestrian Signals, is the Signal Warrant or PHB Evaluation included in the submittal?
<input type="checkbox"/>	<input type="checkbox"/>	For PHB is the STEP form included?
<input type="checkbox"/>	<input type="checkbox"/>	Is there a State Location Map?
<input type="checkbox"/>	<input type="checkbox"/>	Is there a Work Limits Map? (Preferred screen capture from Google Maps or equivalent)
<input type="checkbox"/>	<input type="checkbox"/>	Is the work aligned with one or more of Arizona's SHSP Emphasis Areas and Strategies?
<input type="checkbox"/>	<input type="checkbox"/>	Are the supporting structures in good condition, meet local or state standards and have an anticipated service life longer than the countermeasure being installed?

**Crash Requirements:**

YES	NO	
<input type="checkbox"/>	<input type="checkbox"/>	Is a list of K and/or A crashes provided?
<input type="checkbox"/>	<input type="checkbox"/>	Are the crashes relevant to the countermeasure or does the countermeasure have the potential to reduce the types of crashes? e.g. type of crash – left turn, countermeasure – left turn lane
<input type="checkbox"/>	<input type="checkbox"/>	Did the crashes occur within the most recent 5-year history available to the agency?
<input type="checkbox"/>	<input type="checkbox"/>	For a roadway segment countermeasure, did the crashes occur within the limits of the segment?
<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	

**CMF/CRF Requirements:**

YES	NO	
<input type="checkbox"/>	<input type="checkbox"/>	Does the proposed project countermeasure have a CMF in the FHWA CMA Clearinghouse?
<input type="checkbox"/>	<input type="checkbox"/>	Is the CMF identified by CMFID Number?

<input type="checkbox"/>	<input type="checkbox"/>	Is the CMF appropriate for the countermeasure identified? e.g., Crash Type, Crash Severity, Area, etc.
<input type="checkbox"/>	<input type="checkbox"/>	If a CCRF is used, are the calculations shown either in the cover letter or B/C analysis Tab?
<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	

**B/C Ratio Analysis Requirements:**

YES	NO	
<input type="checkbox"/>	<input type="checkbox"/>	Is the B/C ratio equal to or greater than 2.5?
<input type="checkbox"/>	<input type="checkbox"/>	For multiple countermeasures, is there a B/C ratio analysis for each countermeasure with each having a B/C equal to or greater than 2.5 and an overall combined B/C ratio analysis?
<input type="checkbox"/>	<input type="checkbox"/>	For multiple locations, is there a B/C ratio analysis for each countermeasure with each having a B/C equal to or greater than 2.5 and an overall combined B/C ratio analysis?
<input type="checkbox"/>	<input type="checkbox"/>	Does the 5 year crash average match the number of K & A crashes identified?
<input type="checkbox"/>	<input type="checkbox"/>	If multiple countermeasures or crash locations, are the number of crashes used in the 5-year average only the types of crashes impacted by the countermeasure or crashes that occurred at that location?
<input type="checkbox"/>	<input type="checkbox"/>	Does the CRF(s) or CCRF(s) percentage match the percentage identified in the cover letter and CRF ID?
<input type="checkbox"/>	<input type="checkbox"/>	Is the CMF properly used in the B/C ratio analysis? i.e. Crash Severity both K & A or only K or A?
<input type="checkbox"/>	<input type="checkbox"/>	Are the "Unit Costs" the correct costs for the year of the application?
<input type="checkbox"/>	<input type="checkbox"/>	Is the "Project Life" correct? (Appendix D)
<input type="checkbox"/>	<input type="checkbox"/>	Is there a yearly "Maintenance Cost" included?
<input type="checkbox"/>	<input type="checkbox"/>	

**Cost Estimate Requirements:**

YES	NO	
<input type="checkbox"/>	<input type="checkbox"/>	Is the countermeasure correctly identified at 100%, 94.3% or 94.34% (Interstate) HSIP funded?
<input type="checkbox"/>	<input type="checkbox"/>	Is the cost estimate on the correct cost estimate TAB? Local vs State
<input type="checkbox"/>	<input type="checkbox"/>	Does the cost estimate include funding for ADOT time? i.e. Environmental, ROW, etc.
<input type="checkbox"/>	<input type="checkbox"/>	Does the cost estimate include funding for a consultant's design fee?
<input type="checkbox"/>	<input type="checkbox"/>	Does the construction cost estimate have a high level breakout and is not a lump sum submittal?
<input type="checkbox"/>	<input type="checkbox"/>	Has PMG or LPA reviewed this cost estimate?
<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	

ADOT HSIP Webpage:



## Arizona Highway Safety Improvement Program

[Road Safety Assessments](#)
[Crash Modification Factors Clearinghouse](#)
[Stewardship and Oversight Agreement for Arizona](#)
[Arizona Highway Safety Improvement Program](#)
[Arizona Strategic Traffic Safety Plan](#)
[AZ Step Guide](#)
[Related Links](#)
[Arizona Crash Report Forms, Resources and Training Events](#)
[Smart Work Zone \(SWZ\)](#)
[Work Zone Safety and Mobility](#)

The Highway Safety Improvement Program (HSIP) works to achieve a significant reduction in traffic fatalities and serious injuries on public roads through the implementation and guidance of the SHSP.

- [Arizona Highway Safety Improvement Program \(HSIP\) Manual](#)
- [Appendix A](#)
- [Appendix B](#)
- [Appendix C](#)
- [Appendix D \(Under Development\)](#)
- [HSIP Construction Pricing Examples](#)
- [HSIP Checklist](#)

The HSIP Manual is aligned with the Arizona SHSP and will be updated periodically when SHSP updates takes place.

### Presentations

### Contact Us

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 Safety Programs Manager  
 602.712.7374  
[Larry Talley](#)  
 HSIP Coordinator  
 602.712.7709

### Business

- ADOT Broadband Office
- ADOT Business Coach On Demand
- Business Engagement and Compliance
- Civil Rights/External EEO Contractor Compliance
- Engineering and Construction
- Contracts and Specifications
- Project Management Services
- Highway Maintenance
- Procurement
- Engineering Consultants
- Programs and Partnerships
- Permits
- Equipment Services
- Standards and Guidelines
- Environmental Planning
- Right of Way / Properties
- ADOT Innovation
- Transportation Systems Management and Operations
- Overview
- ITS Master Plan
- Initiatives and Innovations
- Operational Traffic & Safety
- Road Safety Assessments

# Resources

## Website for HSIP documents:

<https://azdot.gov/business/transportation-systems-management-and-operations/operational-and-traffic-safety/arizona-0>

# Anticipated Incorporation of Changes

- Add Appendix E to the HSIP Manual which will address the non-infrastructure and enforcement projects
- A separate call-for-projects will be issued for SFY23 or SFY24 when the additional funding is made available? This will hinge on when appropriation bill is signed into law.

Questions?





# Thank You!

## Operational Traffic and Safety Group

### Traffic Safety Section:

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