

Highway Safety Improvement Program (HSIP)

Arizona Association of County Engineers

June 14, 2012



U.S. Department of Transportation

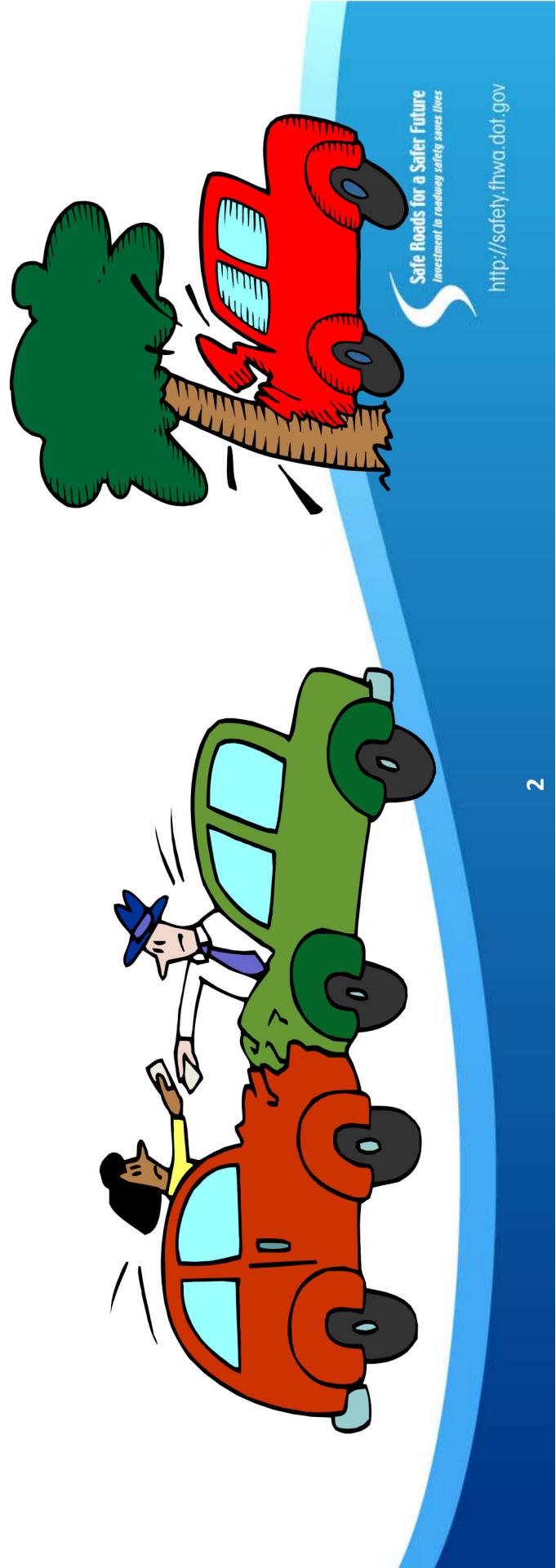
Federal Highway Administration



<http://safety.fhwa.dot.gov>

Purpose of the HSIP

To achieve a significant reduction in fatalities and serious injuries on all public roads through the implementation of infrastructure-related highway safety improvements.



Legislative References



- SAFETEA-LU
 - 23 U.S.C. 148: Highway Safety Improvement Program
 - 23 U.S.C. 130: Railway-Highway Crossing Program
- Federal Regulation
 - 23 CFR 924: Highway Safety Improvement Program

23 CFR 924.5(b)

“In order for an eligible improvement to be funded with HSIP funds, States shall first consider whether the activity maximizes opportunities to advance safety. States shall fund safety projects or activities that are most likely to reduce the number of, or potential for, fatalities and serious injuries.”



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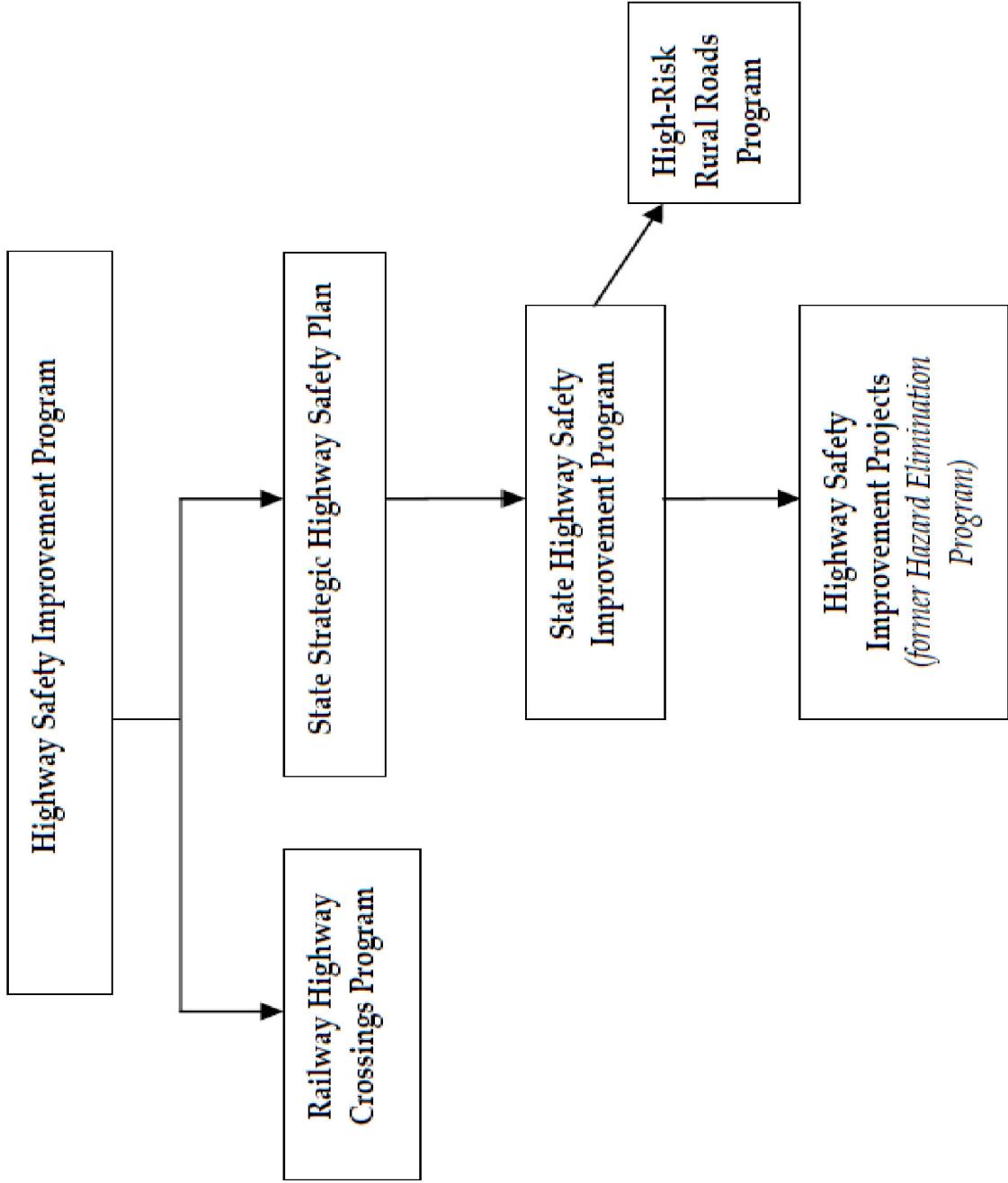
HSIP Programs—4 Major Components:

- Strategic Highway Safety Plans (SHSP)
- State Highway Safety Improvement Program
 - Highway safety improvement projects
- High Risk Rural Roads Program (HRRRP)
- Railway-Highway Grade Crossing Program (RHGCP)



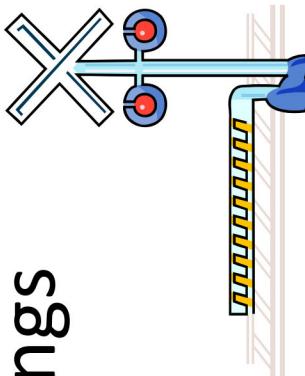
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Relationship of HSIP Programs



Railway-Highway Crossings Program

- Considers relative hazard of public railway-highway grade crossings based on a hazard index formula
- Includes onsite inspection of public grade crossings
- Statutory requirement: All public crossings be provided with standard signing and pavement markings



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Strategic Highway Safety Plans (SHSP)

- Data-driven, statewide plan of strategies that provide a framework for reducing highway fatalities and serious injuries
- Developed through a collaborative process with safety stakeholders
- Integrates the 4ES – Engineering, Education, Enforcement, and Emergency services
- Considers the safety needs of all public roads
- Guides investment decisions



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Strategic Highway Safety Plans (SHSP)



ARIZONA
Strategic Highway Safety Plan

Four small images with labels:

- * ENGINEERING: A map of a highway interchange.
- * EDUCATION: A person wearing a helmet and safety vest.
- * ENFORCEMENT: A police officer on a motorcycle.
- * EMERGENCY RESPONSE: Emergency responders at a scene.



<http://azdot.gov/Highways/Traffic/9620.asp>

Adopted in August, 2007

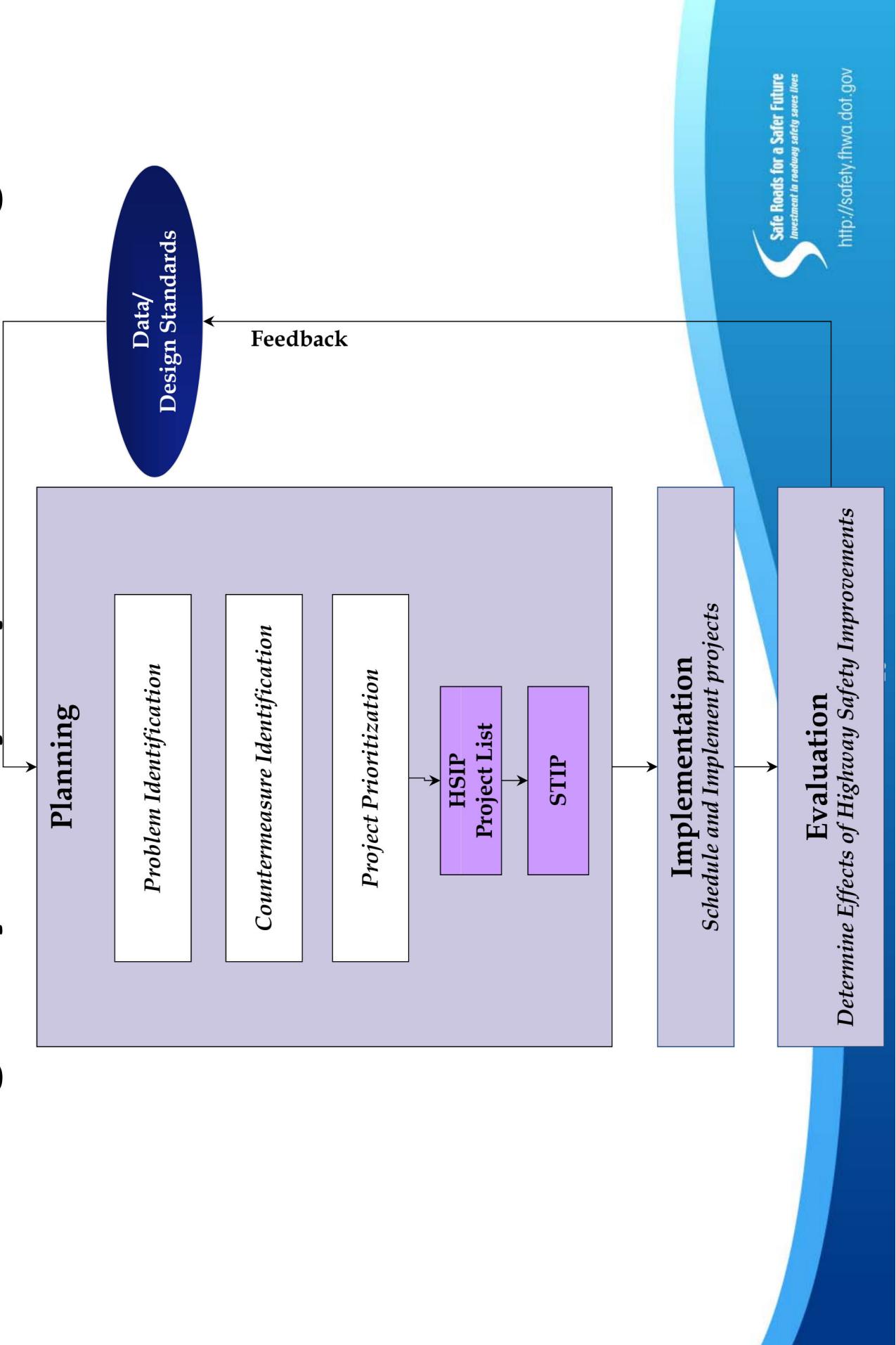
Arizona SHSP Emphasis Areas:

1. Restraint Usage
2. Young Drivers
3. Speeding
4. Impaired Driving
5. Roadway/Roadside
6. Data Improvement

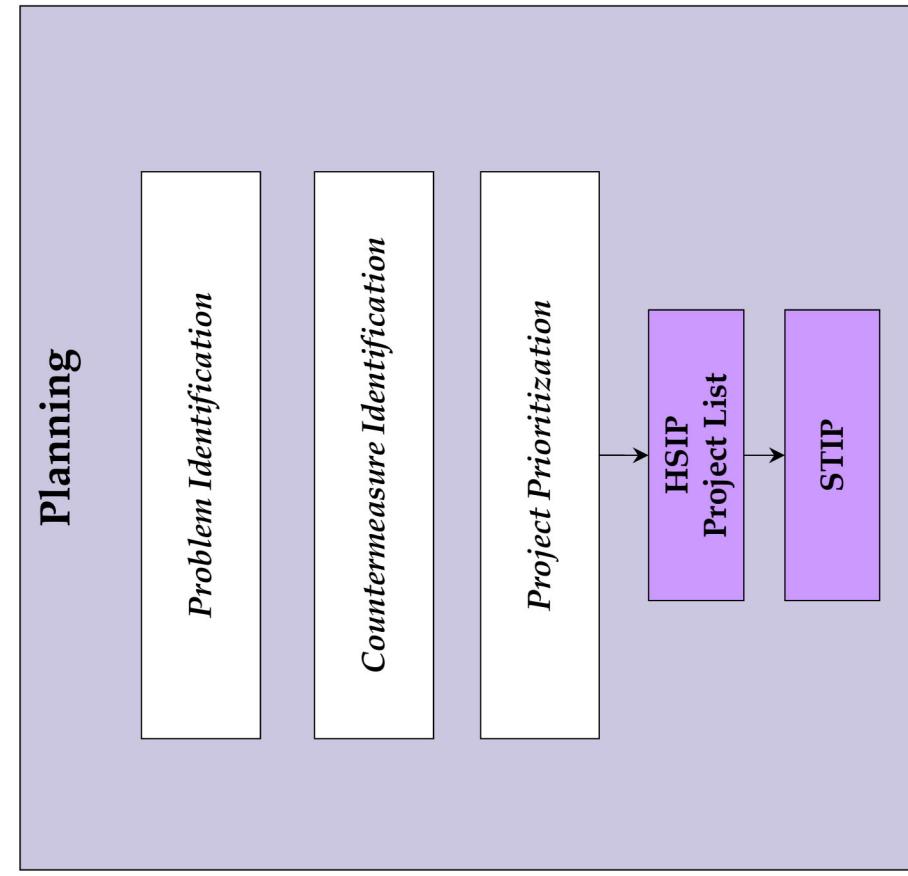


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State Highway Safety Improvement Program



HSIP Planning Process Steps

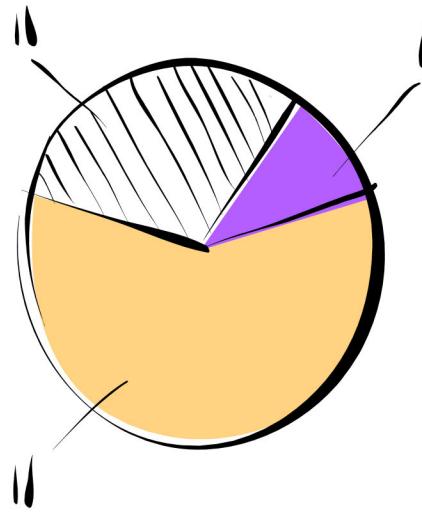


1. Project Identification
 - Data Collection
 - Network Screening Process
2. Countermeasure Identification
3. Project Prioritization
4. Evaluation



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Planning Process Step 1: Project Identification



- Data Collection
 - Crash Data
 - Traffic Volumes
 - Roadway Inventory Data
 - RSAs
- Network Screening Process

Network Screening

- Identify Sites for Potential Safety Improvement
 - Intersections
 - Segments
 - Traditional problem identification methodology
- Identify Systemic Safety Improvements
 - Based on SHSP Emphasis Areas & Strategies
 - Identify key crash types and patterns to address
- High Risk Rural Roads Program (HRRRP)



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Planning Process Step 2: Countermeasure Identification

Four essential steps:

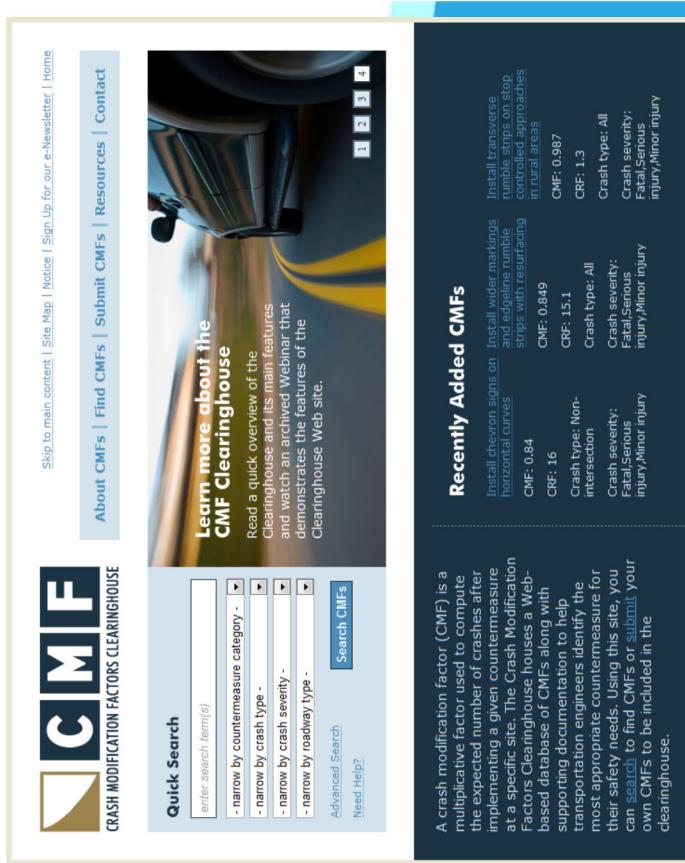
1. Analyze the Data
2. Conduct Field Review
3. Identify Countermeasures
4. Assess Countermeasure Effectiveness



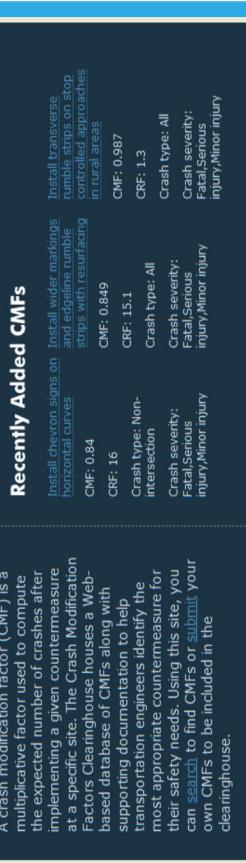
<http://safety.fhwa.dot.gov>

Countermeasure Resources

- Crash Modification Factor Clearinghouse
www.CMFclearinghouse.org/
- Highway Safety Manual – Part D
www.highwaysafetymanual.org/
- NCHRP Report 500 Series
www.trb.org/
- NHI Training
www.nhi.fhwa.dot.gov/



The screenshot shows the CMF Clearinghouse homepage. At the top right, there are links for 'Skip to main content' (highlighted), 'Site Map', 'Notice', 'Sign Up for our e-Newsletter', 'Home', 'About CMFs', 'Find CMFs', 'Submit CMFs', 'Resources', and 'Contact'. Below this is a large image of a car driving at night. To the left of the image is a section titled 'Learn more about the CMF Clearinghouse' with a brief description and a link to the 'Clearinghouse Web site'. On the right side of the image, there is a navigation bar with page numbers 1, 2, 3, and 4. Below the image is a search bar with placeholder text 'enter search term(s)'. Underneath the search bar is a list of search filters: 'narrow by countermeasure category', 'narrow by crash type', 'narrow by crash severity', and 'narrow by roadway type'. There are also links for 'Advanced Search' and 'Search CMFs'. At the bottom left of the page is a 'Help?' link.



The screenshot shows a detailed article from the CMF Clearinghouse. The article title is 'A crash modification factor (CMF) is a multiplicative factor used to compute the expected number of crashes after implementing a given countermeasure at a specific site.' It includes a sub-section 'The Crash Modification Factors Clearinghouse houses a Web-based database of CMFs along with supporting documentation to help transportation engineers identify the most appropriate countermeasure for their safety needs.' Below the article, there is a sidebar with a heading 'Recently Added CMFs' and a table of recent additions:

CMF	CRF	Crash type	Intersection	Crash severity	Fatal/Serious injury	Minor injury
CMF: 0.84	CRF: 16	Non-intersection	Crash type: All	Crash severity: Fatal/Serious injury	Crash severity: Minor injury	
CMF: 0.849	CRF: 15.1	Non-intersection	Crash type: All	Crash severity: Fatal/Serious injury	Crash severity: Minor injury	
CMF: 0.987	CRF: 1.3	Crash type: All	Crash severity: All	Crash severity: Fatal/Serious injury	Crash severity: Minor injury	

Countermeasure Resources

NHI Training

www.nhi.fhwa.dot.gov/

NHI Training

Improving the Performance of the Transportation Industry
Through Training

NHI
**Application of Crash Modification
Factors (CMF)**
Monday July 9, 2012

[REGISTER NOW!](#)

[Join Our Mailing List](#)



[Please join us for this innovative Web-conference Training.](#)

Description

The Application of Crash Modification Factors (CMF) course covers the project development cycle (starting from network screening and site selection for safety review), diagnostics of safety concerns, cost-benefit evaluation, and countermeasure selection, with a focus on the application of CMF to select countermeasures.

This course begins with a one-hour Web-based training and concludes with a two-hour Web conference that aids in application to your current projects. The Web-based training must be completed prior to the date of the Web conference. You will need access to both a telephone and Internet connection to participate in the live Web sessions.

QUESTIONS?

E-Mail
NHITraining@dot.gov

Additional Resources:

1. For more registration information, please visit the [Introduction to Participating in an NHI Training](#) page on the [NHI Web Site](#).
2. If you have additional questions about registering for this session, please contact NHI Training at NHITraining@dot.gov.
3. For more information about this course and similar NHI courses, please visit the [NHI Web Site](#).

Who Should Attend

This course is intended for individuals that have the responsibility for identifying, recommending, selecting, installing, and maintaining appropriate countermeasures to help reduce the number of crashes.

Dates and Location

Participants must have completed the one-hour Web-based training in order to gain access to the Web conference, which will take place on the following date:

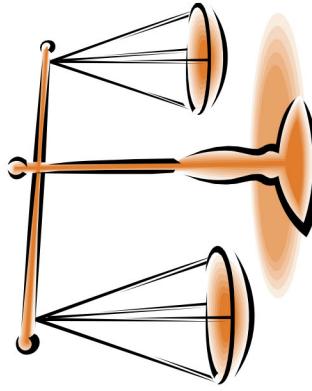
July 9, 2012

How to Register

To register for this training, please click on the "Register Now" link

Planning Process Step 3: Project Prioritization

- Objective Approach (e.g. Benefit/Cost Ratio)
- Countermeasure Prioritization
- Project Prioritization
- Balance of Projects
- Approaches Addressing Current & Future Safety Problems



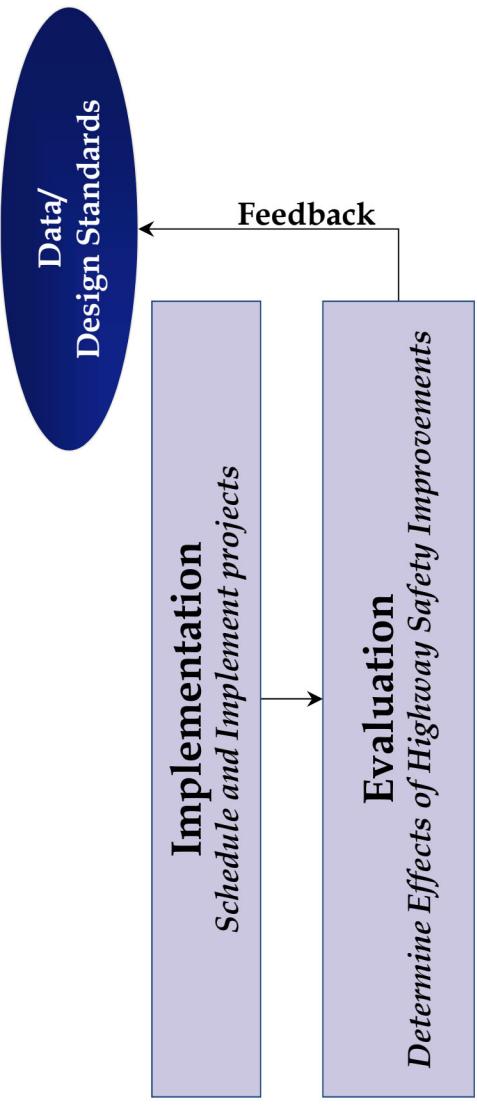
Prioritization Considerations

- Potential reduction in # fatalities and serious injuries
- SHSP Priorities
- Cost effectiveness of projects and resources available
- Correction and prevention of hazardous locations
- Other safety data-driven criteria
- Integration with statewide/metropolitan transportation planning process and S/TIP



<http://safety.fhwa.dot.gov>

Implementation & Evaluation



Evaluation

- Project Evaluation
- Program Evaluation
- Feedback to Future Planning



<http://safety.fhwa.dot.gov>

Arizona HSIP Manual

ADOT HSIP Manual

<http://azdot.gov/Highways/Traffic/9620.asp>

FHWA HSIP Website

<http://safety.fhwa.dot.gov/hsip/>

THE ARIZONA HIGHWAY SAFETY
IMPROVEMENT PROGRAM MANUAL



Arizona Department of Transportation
Highway Enhancements for Safety (HES) Section
Traffic Engineering Group
March 2010

HSIP Reporting



Online Reporting Tool
Transparency / 5% Report
Arizona - 2011

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STATE ROUTE 10, NORTHBOUND, MP 7.0 TO MP 7.9	4
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51 st AVENUE AND VAN BUREN STREET	13
7 th STREET AND BELL ROAD	13
BASELINE ROAD AND HARDY DRIVE	13
51 st AVENUE AND INDIAN SCHOOL ROAD	13
24 th STREET AND BROADWAY ROAD	13
RIVER ROAD AND SWAN ROAD	13
40 th STREET AND BROADWAY ROAD	13
7 th AVENUE AND BELL ROAD	13
BROADWAY BOULEVARD AND CRAYCROFT ROAD	13
51 st AVENUE AND PEORIA AVENUE	13
COLD SPRINGS ROAD	13
COLONIAL ROAD	13
Supporting Text:	20
Question # 1 - Arizona DOT Traffic Safety Section	21
Response : - Arizona DOT Traffic Safety Section	21
Question # 2 - What percentage of public roads does the crash data system currently cover	23
Response : 100	23
Question # 3 - Is the program extent less than 100%, briefly describe the schedule for upgrading the crash data system to full coverage	24
Response : Not Applicable	24
Supporting Text:	28
Question # 4 - What percentage of public roads does the crash data system currently cover	28
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Supporting Text:	37
Question # 8 - Is the program extent less than 100%, briefly describe the schedule for upgrading the crash data system to full coverage	38
Response : Not Applicable	38
Supporting Text:	39
Question # 9 - Is the program extent less than 100%, briefly describe the schedule for upgrading the crash data system to full coverage	39
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- Highway Safety Improvement Program
- Transparency (5%) Report

<http://safety.fhwa.dot.gov/hsip/fivepercent/>

- Railway-Highway Crossings Report

Arizona Transparency Report

2011 Annual Report



Arizona Department of Transportation
Traffic Safety Section
September 26, 2011

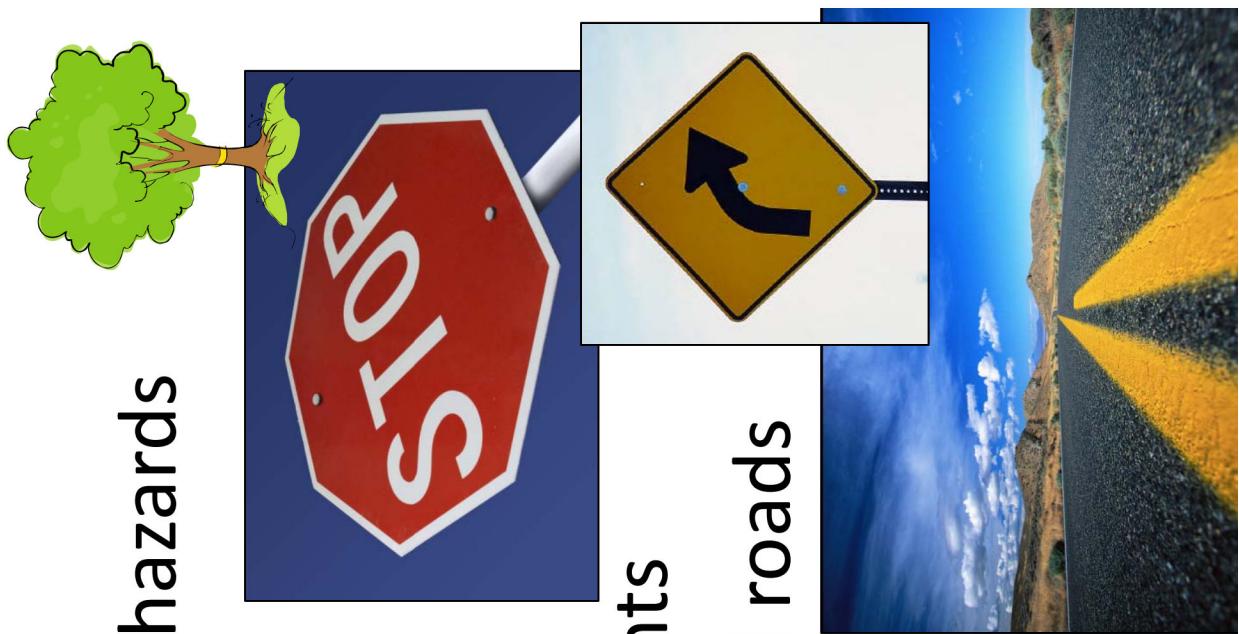
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Examples of Eligible Projects for HSIP

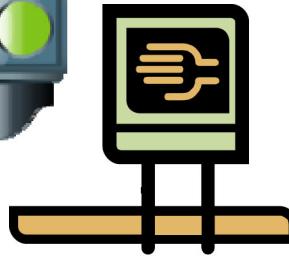
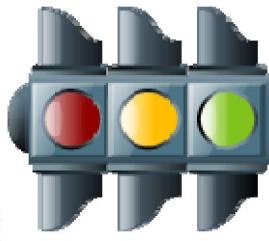


- Eliminate roadside obstacles or hazards
- Upgrade signage
- Upgrade pavement markings
- Rumble strips
- Upgrade guardrail end treatments
- Improvements on high risk rural roads
- Conducting road safety audits

Examples of Eligible Projects for HSIP

At Intersections:

- Converting from 8-inch to 12-inch signals
- Roundabouts
- Advance street name signing



For Pedestrians:

- Pedestrian countdown signals
- Install new or upgrade pedestrian crosswalk pavement markings



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Systematic Improvements

- Low-cost, efficient to implement
- Do not require lengthy environmental review
- Many qualify for Group 1 or Condensed Group 2 Categorical Exclusions (no or minor ground disturbance)
- Usually no additional right-of-way and no utility coordination or adjustments



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Examples of Systematic Improvements

On Roadway Segments:

- Shoulder and centerline rumble strips
- Barrier and obstacle delineation
- Upgrade guardrail end treatments
- Upgrade regulatory and warning signs
- Upgrade pavement markings
- Install RPMS



Examples of Systematic Improvements

At Signalized Intersections:

- Converting from 8-inch to 12-inch signals
- Installation / upgrading street name signing
- Advance street name signing



At Unsignalized Intersections:

- Upgrade STOP signs
- Install advance stop ahead markings

Examples of Systematic Improvements

For Pedestrians:

- Pedestrian crosswalk countdown signals
- Install new or upgrade pedestrian crosswalk pavement markings
- Enhanced school crossings
- Provide pedestrian refuges



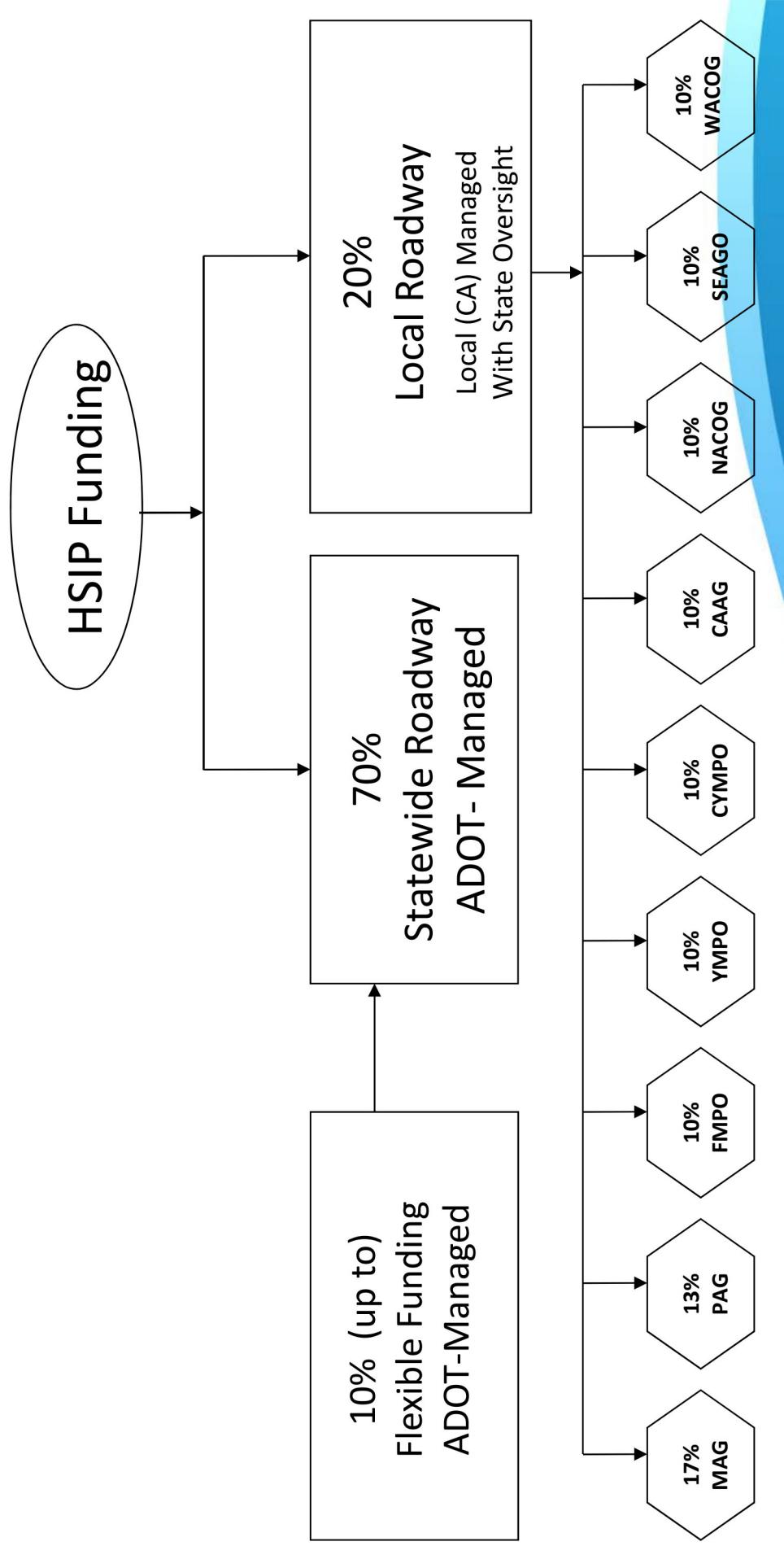
Emergency Response Improvements:

- Establish or upgrade milepost system



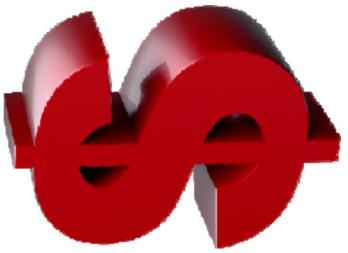
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Arizona HSIP Funding Allocations



Arizona HSIP Funding

- Statewide HSIP (70%)
- Local Government HSIP (20%)
- High Risk Rural Roads Program (HRRRP)
- Railway-Highway Grade Crossing Program (RHGCP)
- Road Safety Assessment (RSA) Program
- Safe Routes to School (SRTS) Program
 - Separate Legislation



<http://safety.fhwa.dot.gov>

Local Match Requirements

- 5.7% for most projects
- No match required per 23 U.S.C. 120 (c) for:

- Roundabouts
- Traffic Signals
- Pavement markings
- Signs
- Streetlighting
- Guardrail



Important HSIP Requirements



- Based on SHSP Emphasis Areas & Strategies
- Focused on reducing fatalities and serious injury crashes
- Carried out through the STIP Process
- Addresses an identified highway safety problem
- Identified through a data-driven process

HSIP Application Process



- Submit through local COG/MPO for Local Government HSIP
- Submit through ADOT Traffic Safety Section for State-managed HSIP
- Must be identified in TIP/STIP
- Must get eligibility approval from ADOT/FHWA
- Then get Funding Authorization. **Any work performed prior to Funding Authorization is not eligible for reimbursement**



<http://safety.fhwa.dot.gov>

High Risk Rural Roads Program (HRRRP)

ADOT HSIP/HRRRP Contact: Irene Higgs

Local/ Gov't Program Manager

602-712-7581

ihiggs@azdot.gov



U.S. Department of Transportation

Federal Highway Administration



<http://safety.fhwa.dot.gov>

High Risk Rural Roads—Eligibility

- Any roadway functionally classified as a rural major collector, rural minor collector, or rural local road
- On which the crash rate for fatalities and incapacitating injuries exceeds the statewide average for those functional classes of roadway; or
- That will likely have increases in traffic volume that create a crash rate for fatalities or incapacitating injuries that exceeds the statewide average
- Current Arizona focus is on local and tribal roads (non-State roads)



<http://safety.fhwa.dot.gov>

HRPP Eligibility Criteria

Candidate roads with following minimum crash frequencies during past 10 years

Major Collectors:

2 fatal crashes or 3 fatal + incapacitating injury crashes over any 3-year period

Minor Collectors/Local Roads:

2 fatal + incapacitating injury crashes and 10 total crashes over the 10-year period



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HRPP Selection Process

- ADOT crash data analysis used to identify eligible segments
- Local Agency/Tribe can use their own crash data to submit locations to ADOT for consideration (can use combination of state and local data)
- Utilize same HSIP Planning Process



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Example HRRRP Projects

- **Coconino County**, Lake Mary Road: Rumble strips, pavement markings (\$503,603)
- **Coconino County**, Leupp Road: Rumble strips, pavement markings, guardrail (\$983,228)
- **Gila County**, Ice House Canyon, Six Shooter: Pavement Markings (\$280,800)
- **Mohave County**, Guardrail, Pavement Markings, Rumble Strips, Intersection Warning System, Pavement Widening (\$1,003,000)
- **Santa Cruz County**, RPM's, Turn Lanes, Shoulder Widening, Chevrons (\$1,526,387)
- **Graham County**, 8th Ave & Airport Rd: Roundabout (\$2,500,000)
- **Graham County**, Reay Lane & Safford Bryce: Intersection Improvement (\$556,370)



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Road Safety Assessment Program (RSA)

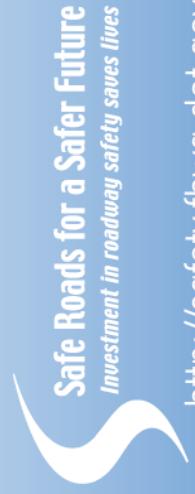
ADOT RSA Program Contact: *Mike Blankenship*
602-712-7601

mblankenship@azdot.gov



U.S. Department of Transportation

Federal Highway Administration



<http://safety.fhwa.dot.gov>

What is an RSA?

- A Road Safety Assessment is the formal safety performance examination of an existing or future road or intersection by an independent, multidisciplinary team. It qualitatively estimates and reports on potential road safety issues and identifies opportunities for improvements in safety for all road users. RSAs are encouraged to be integrated into the project development process for new roads and intersections, and also on existing facilities.



<http://safety.fhwa.dot.gov>

What is an RSA?

The aim of an RSA is to answer the following questions:

- What elements of the road may present a safety concern: to what extent, to which road users, and under what circumstances?
- What opportunities exist to eliminate or mitigate identified safety concerns?

<http://safety.fhwa.dot.gov/rsa/>



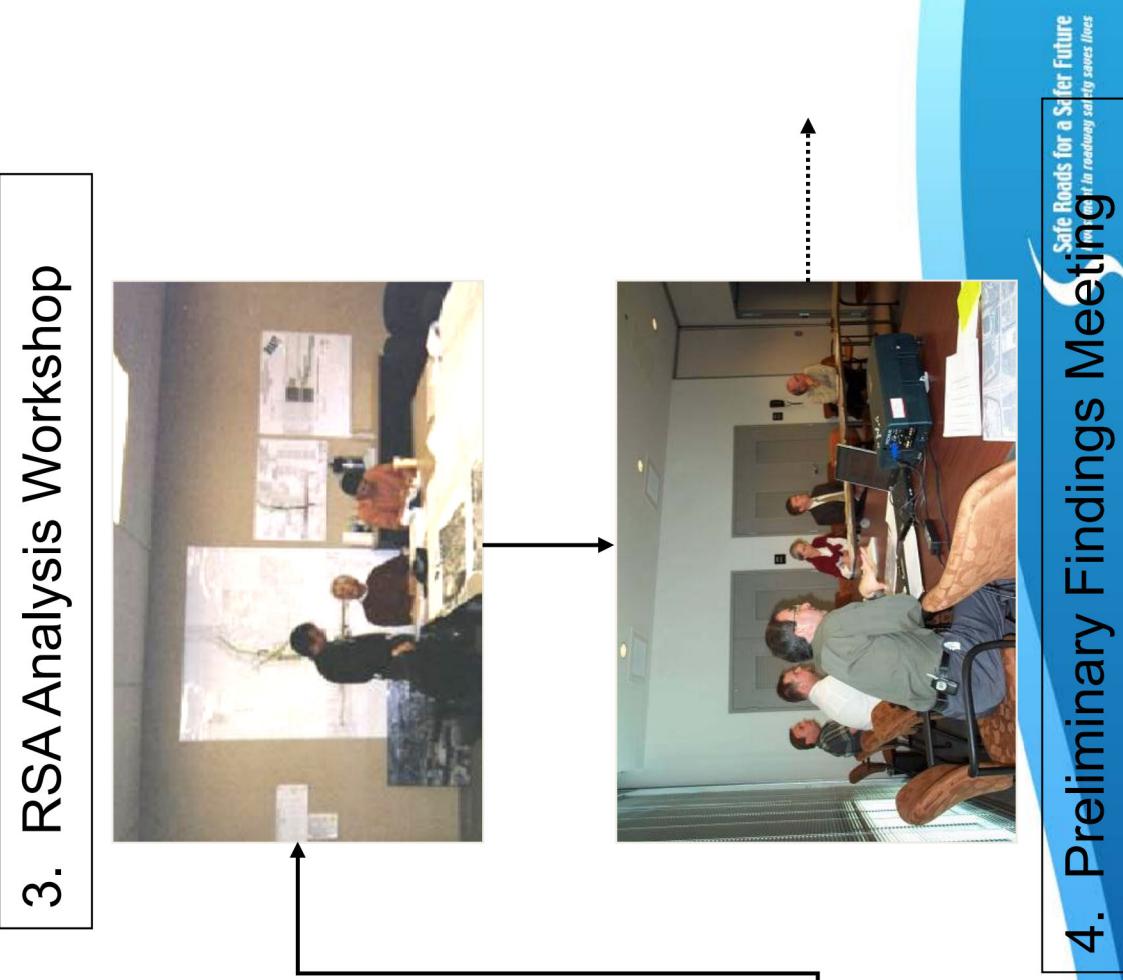
<http://safety.fhwa.dot.gov>

RSA Process

1. Start-up Meeting



3. RSA Analysis Workshop



2. Site Visit

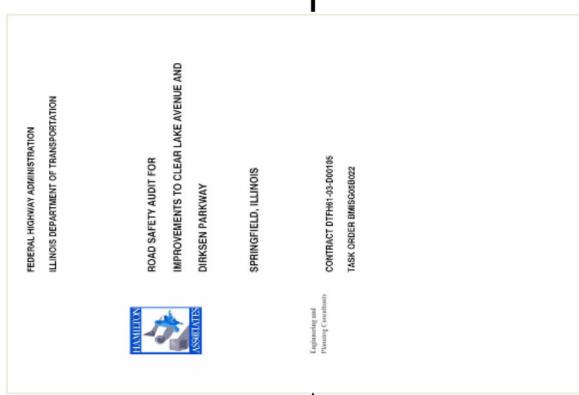


4. Preliminary Findings Meeting



3. RSA Analysis Workshop

RSA Process (continued)



5. RSA Report

6. Owner Response

7. Implementation



ARIZONA ROAD SAFETY ASSESSMENT APPLICATION

1. Name, Position/Title, Address of Contact Person:
Phone Number: _____
Fax: _____
Email: _____
2. Type of assessment requested (planning, design, construction, existing): _____
3. Specific location of proposed RSA project (intersection, spot location, road segment or project, or new facility):
Route(s): _____ Segment: _____ Project: _____
From/To (if segment/project): _____ Segment Length: _____
City/County/Tribe: _____
4. Describe any improvement plans, including stage (scoping, design, construction, etc.), for this location:

5. Reasons for requesting RSA:

6. What is the crash experience for the most recent 3-year period (total crashes, fatal crashes, injury crashes, crash rate, etc.)? (not applicable for new facility) _____
7. Does your agency have a method to identify and prioritize road safety issues? _____ If yes, where does this location rank within your agency's problem locations? _____
8. Average Daily Traffic (ADT) volume for road(s): _____
9. Please list month and/or days of week when safety issues are most prevalent, if applicable: _____
10. Describe any future development planned for this area:

11. Please include any additional road owners, photos and/or other information that highlight the location:

12. Signature (and printed name) of Person with Authority to Respond To/Implement the RSA Findings:
Date: _____

<http://azdot.gov/Highways/Traffic/9620.asp>

Safe Roads for a Safer Future
Investment in roadway safety saves lives

<http://safety.fhwa.dot.gov>

RSAs in Arizona

- 25 of 53 RSAs conducted in past 6 years have been rural RSAs



Projects Resulting from RSAs

- Coconino County- improve Leupp Rd (\$983,000)
- Graham County- roundabout at 8th Ave/Airport Rd (\$2,500,000), intersection improvement at Reay Ln/Safford-Bryce Rd (\$556,000)
- Tohono-O'odham Nation- improve SR 86/IRR 15 intersection (\$2,000,000)
- Bullhead City- various roads: Pedestrian Hybrid Beacon (HAWK), street lighting, intersection improvements, roadway improvements (\$2,100,000)
- Scottsdale- improve Thomas Rd/Hayden Rd intersection (\$1,200,000)



<http://safety.fhwa.dot.gov>

Questions???



FHWA Arizona Division

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602-382-8991

kelly.larosa@dot.gov

ADOT RSA Program

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ADOT Traffic Safety Section

Local Gov't HSIP & HRRP

Irene J. Higgs

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ihiggs@azdot.gov

Statewide HSIP Program

Mona Aglan-Swick

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maglan@azdot.gov



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