

STEP

Safe **T**ransportation for
Every **P**edestrian



Leveraging FHWA Resources and Local Partnerships to Improve Pedestrian Crossings

Becky Crowe, Federal Highway Administration
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Kristen Brookshire, UNC Highway Safety Research Center



U.S. Department of Transportation
Federal Highway Administration

March 12, 2019

Housekeeping

⇒ **Problems with audio?**

Dial into the phone line instead of using “mic & speakers”

⇒ **Webinar issues?**

Re-Load the webpage and log back into the webinar. Or send note of an issue through the Question box.

⇒ **Questions?**

Submit your questions at any time in the Questions box.



Archive and Certificates

Archive posted at www.pedbikeinfo.org/webinars

- ⇒ Copy of presentations
- ⇒ Recording (within 1-2 days)
- ⇒ Links to resources

Follow-up email will include...

- ⇒ Link to certificate of attendance
- ⇒ Information about webinar archive



Webinars and News

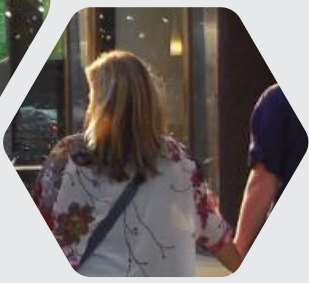
- ⇒ Find upcoming webinars and webinar archives at pedbikeinfo.org/webinars
- ⇒ Follow us for the latest PBIC News
facebook.com/pedbikeinfo
twitter.com/pedbikeinfo
- ⇒ Join the conversation using **#PBICWebinar**
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The screenshot shows the website for the Pedestrian and Bicycle Information Center (PBIC). The header is green with the PBIC logo (a pedestrian, a bicycle, and an information icon) and the text "Pedestrian and Bicycle Information Center". Below the header is a navigation menu with links for "Data & Resources", "Community Support", "Planning & Design", "Training & Events", and "Behavior Change". The main content area is white and features a sidebar on the left with a "TRAINING & EVENTS" section containing links for "Webinars", "Livable Communities", "Ped Focus Series", "PSAP Series", "Additional Webinars", "University Courses", "In Person Training", "CEU & PDH Information", "Course Costs", "Instructors", "Course References", "For Instructors", and "Conferences & Events". The main content area has a "Webinars" section with a sub-header "Webinars" and a paragraph explaining that PBIC offers webinars on various topics related to pedestrian and bicycle safety. It encourages users to sign up for a newsletter and follow on Facebook and Twitter. Below this are two sub-sections: "Upcoming Webinars" and "Recently Delivered Webinars". The "Upcoming Webinars" section lists a webinar on 4/10/2018 titled "Tools to Inventory Pedestrian Crossing Infrastructure" presented by Tim Fremaux, Lorraine Moyle, and Carey Shepherd. The "Recently Delivered Webinars" section lists two webinars: one on 1/30/2018 titled "Selecting Countermeasures for Uncontrolled Crossing Locations" presented by Gabe Rousseau, Lauren Blackburn, and Charlie Zegeer; and another on 12/14/2017 titled "Safety Performance Measures for Bicyclists and Pedestrians" presented by David Kopacz, Amy Schick, and National Highway Traffic Safety Administration. A third webinar on 12/11/2017 titled "Determining the Safety Impacts of Bicycling and Walking Investments" presented by Daniel Carter and Raghavan Srinivasan is also listed.



PEDESTRIAN SAFETY AND PUBLIC HEALTH



March 12, 2019

Sagar Shah, PhD, AICP
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American Planning Association

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American Planning Association
Making Great Communities Happen



Planning and Community Health Program at APA

- First nationwide program linking public health and planning practice.
- Provides tools and technical support to members so they can integrate health into planning practice at all levels.

Some Projects


ACTIVE LIVING



THE BENEFITS OF STREET-SCALE FEATURES FOR WALKING AND BIKING


American Planning Association
Making Great Communities Happen

Health Impact Assessment Toolkit for Planners



HIA TOOLKIT

September 2016




PAS Essential

INFO PAC

Planning & Zoning for Health in the Built Environment


The Planning Advisory Service (PAS) researchers are pleased to provide you with information from our world-class planning library. This packet represents a typical collection of documents PAS provides in response to research inquiries from our subscribers. For more information about PAS visit www.planning.org/pas.



American Planning Association
Making Great Communities Happen


PLAN4Health

An American Planning Association Project




HEALTHY PLANNING

An evaluation of comprehensive and sustainability plans addressing public health




American Planning Association
Making Great Communities Happen

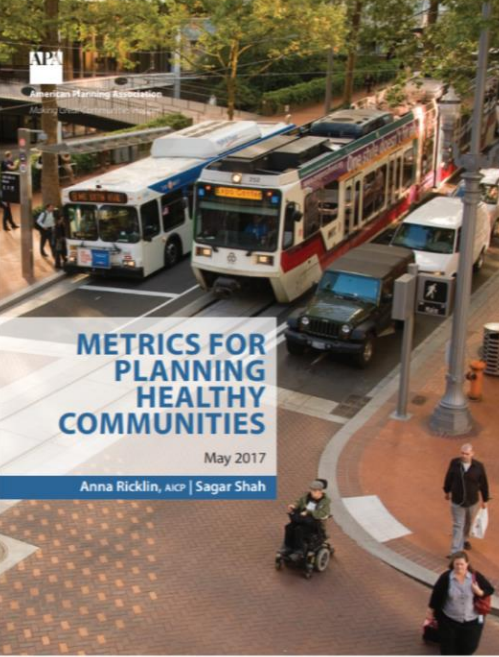


PLANNING FOR FOOD ACCESS AND COMMUNITY-BASED FOOD SYSTEMS: A National Scan and Evaluation of Local Comprehensive and Sustainability Plans

Kimberley Hodgson



American Planning Association



METRICS FOR PLANNING HEALTHY COMMUNITIES

May 2017

Anna Ricklin, AICP | Sagar Shah

What is a Healthy Community?

Healthy community is one that offers a positive physical, social, natural, and economic environment that supports the health and well-being of all its members and enables them to live to their fullest potential.



Domains for Planning Healthy Communities

1. Active Living

- Active transportation, Recreation, Traffic safety

2. Healthy Food System

- Access, Production

3. Environmental Exposures

- Air quality, Water quality, Soil contamination

4. Emergency Preparedness

- Natural hazards, Climate change, Infectious disease

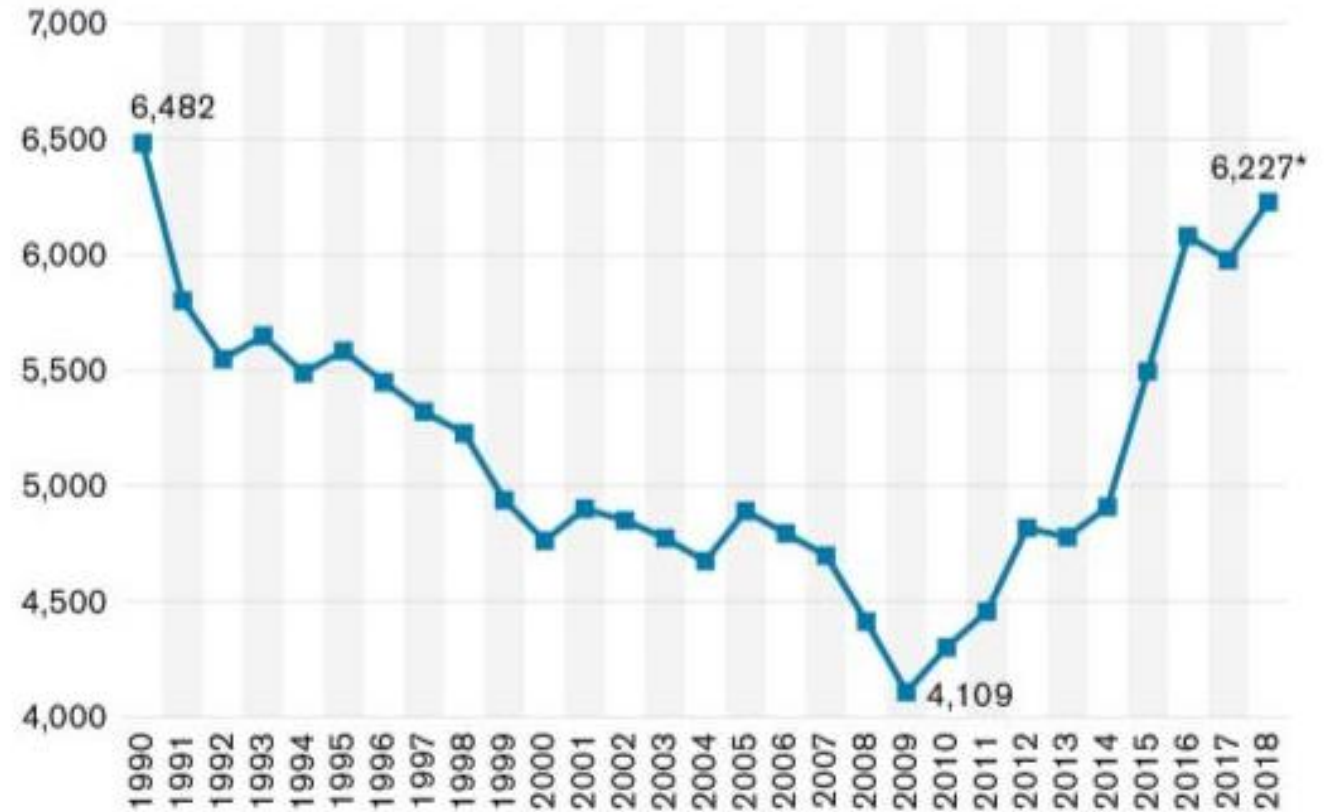
5. Social Cohesion

- Green infrastructure, Housing and community development, Public safety



The FACT...

U.S. Pedestrian Fatalities: 1990 - 2018



Source: SHSOs and FARS

What can we do?

- Vision Zero Action Plans
- Traffic Calming Measures
- Long Range Planning
- Zoning Regulations
- Design Standards
- Pedestrian Plans
- Tactical Urbanism
- Complete Streets

.....

INCLUSIVE

VISION ZERO NETWORK

New GHSA Report Predicts Increase in Pedestrian Fatalities Over the Next 10 Years

With Pedestrian Fatalities on the Rise, Solutions F...

[Read more >](#)

91 92 93 94 95 96 97 98 99 00 01 02 03 04 05 06 07 08





American Planning Association

Making Great Communities Happen

Sagar Shah

sshah@planning.org

STEP Safe Transportation for
Every Pedestrian



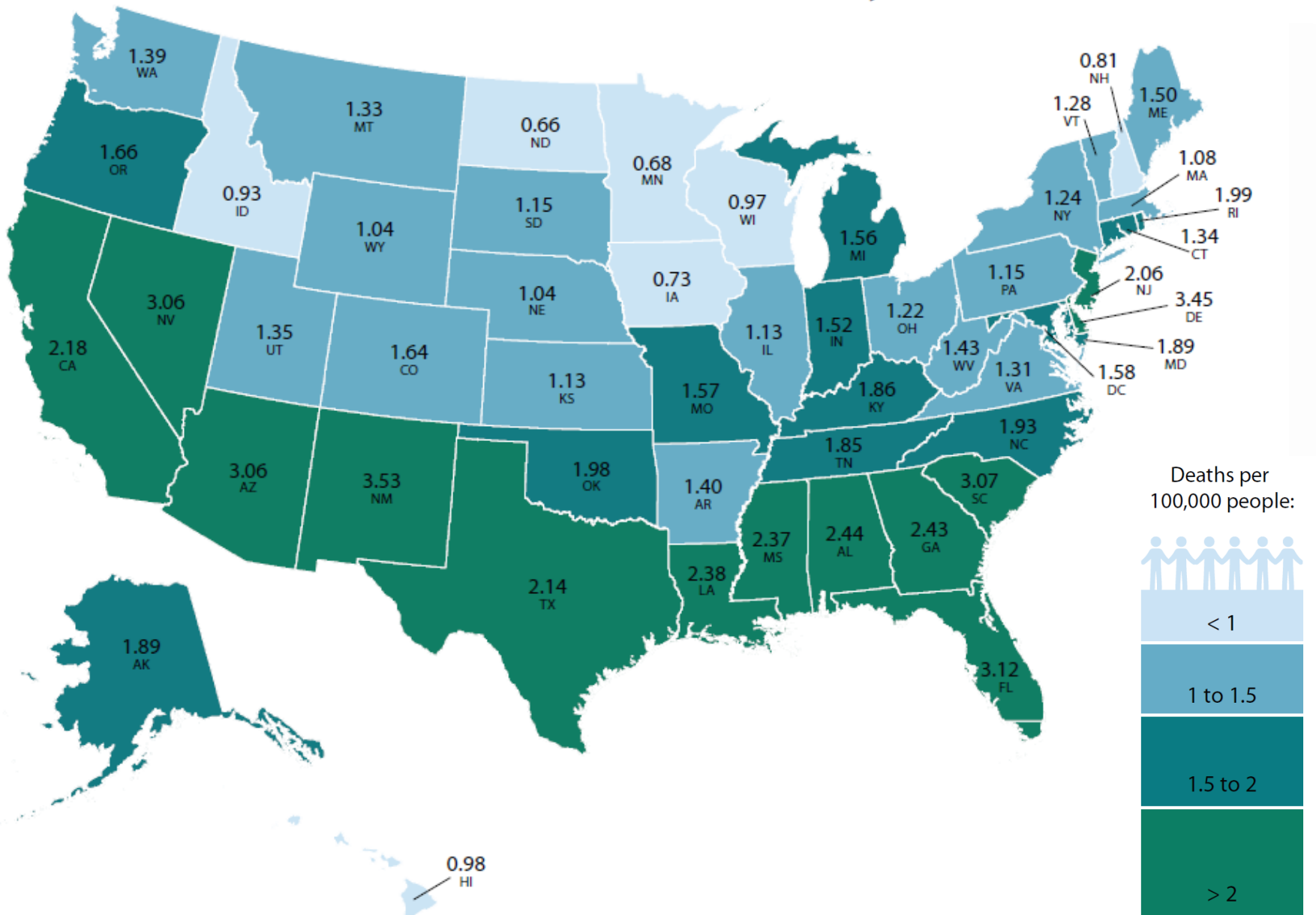
Planning for Pedestrian Crossing Safety

Lauren Blackburn, VHB



U.S. Department of Transportation
Federal Highway Administration

2017 Pedestrian Fatalities by State



Where would you cross?



1000 ft +

2000 ft +

72% of pedestrian fatalities
occur at non-intersection
locations

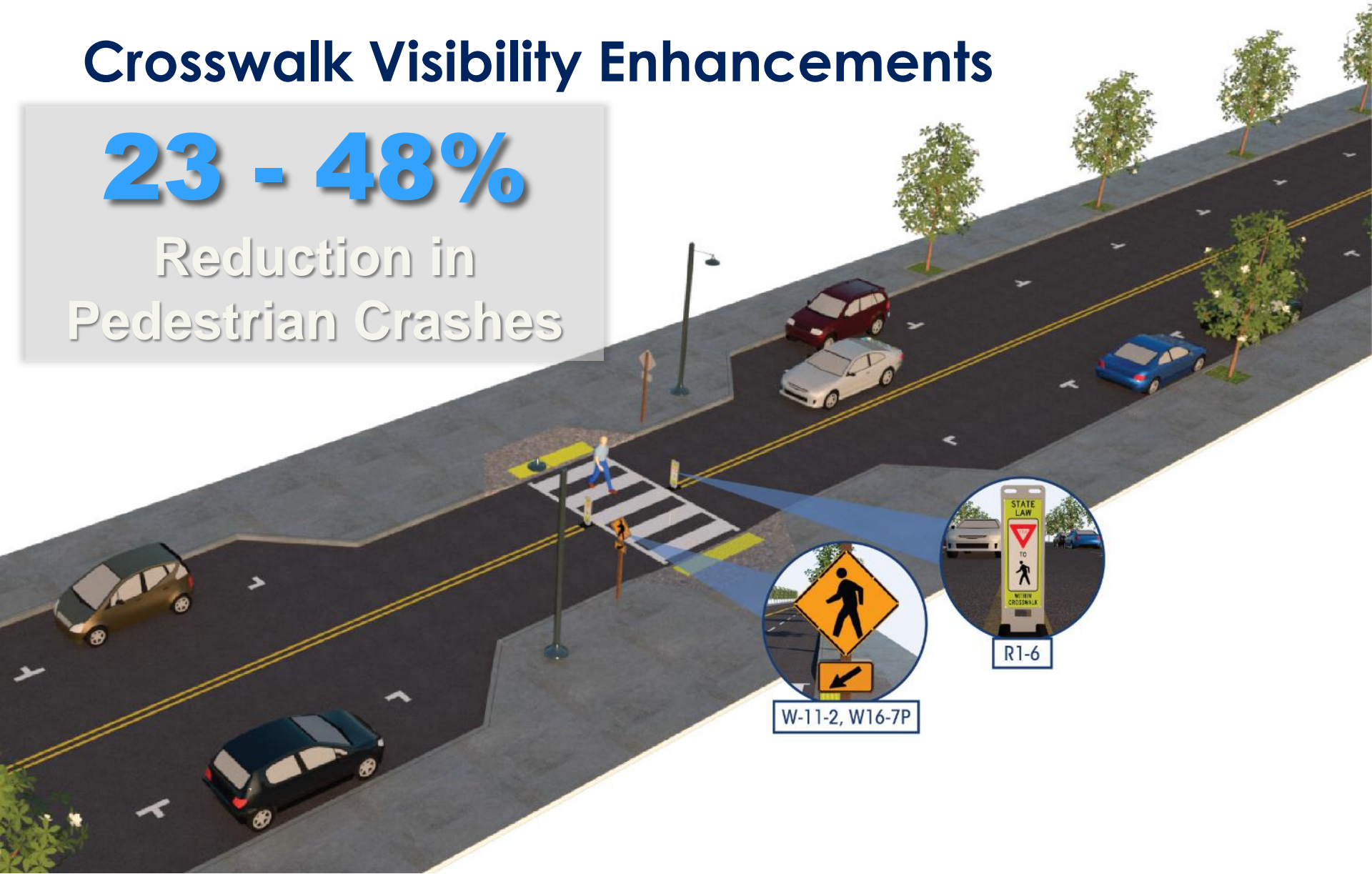


The Spectacular Seven

Crosswalk Visibility Enhancements

23 - 48%

Reduction in
Pedestrian Crashes



Raised Crosswalks



45% Reduction
in Pedestrian Crashes

Pedestrian Refuge Islands



R1-6

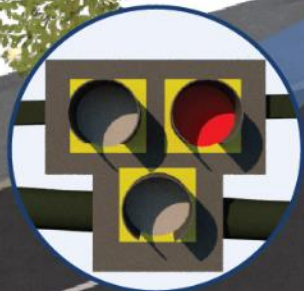


W-11-2, W16-7P



32% Reduction
in Pedestrian Crashes

Pedestrian Hybrid Beacons (PHB)



55% Reduction in
Pedestrian Crashes

Pedestrian Hybrid Beacons (PHB)



1
Blank for
drivers



2
Flashing
yellow



3
Steady yellow



4
Steady red



5
Wig-Wag



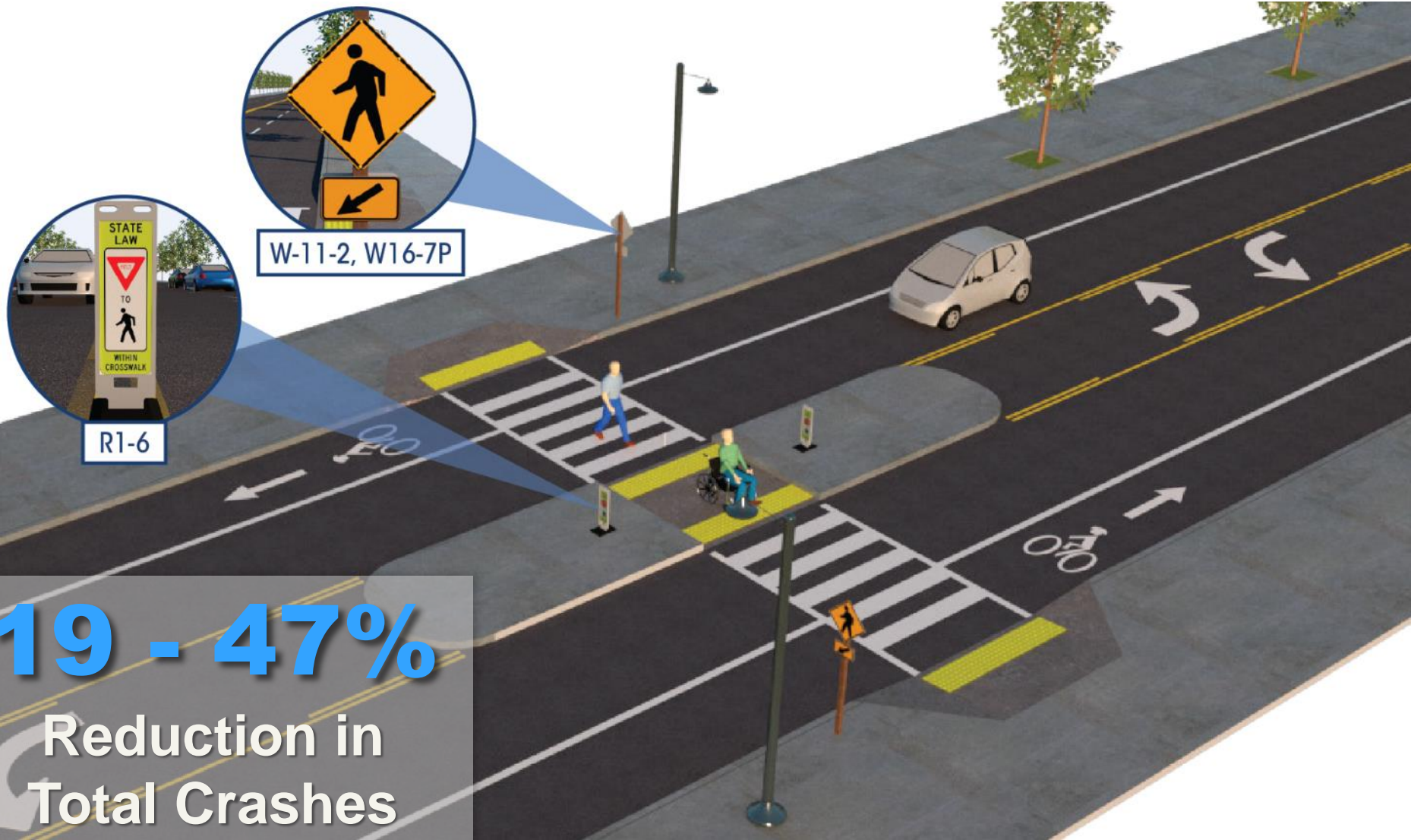
Return
to 1



Road Diet: Before



Road Diet: After



19 - 47%

Reduction in
Total Crashes

Rectangular Rapid Flashing Beacon



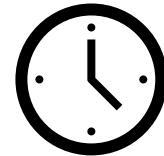
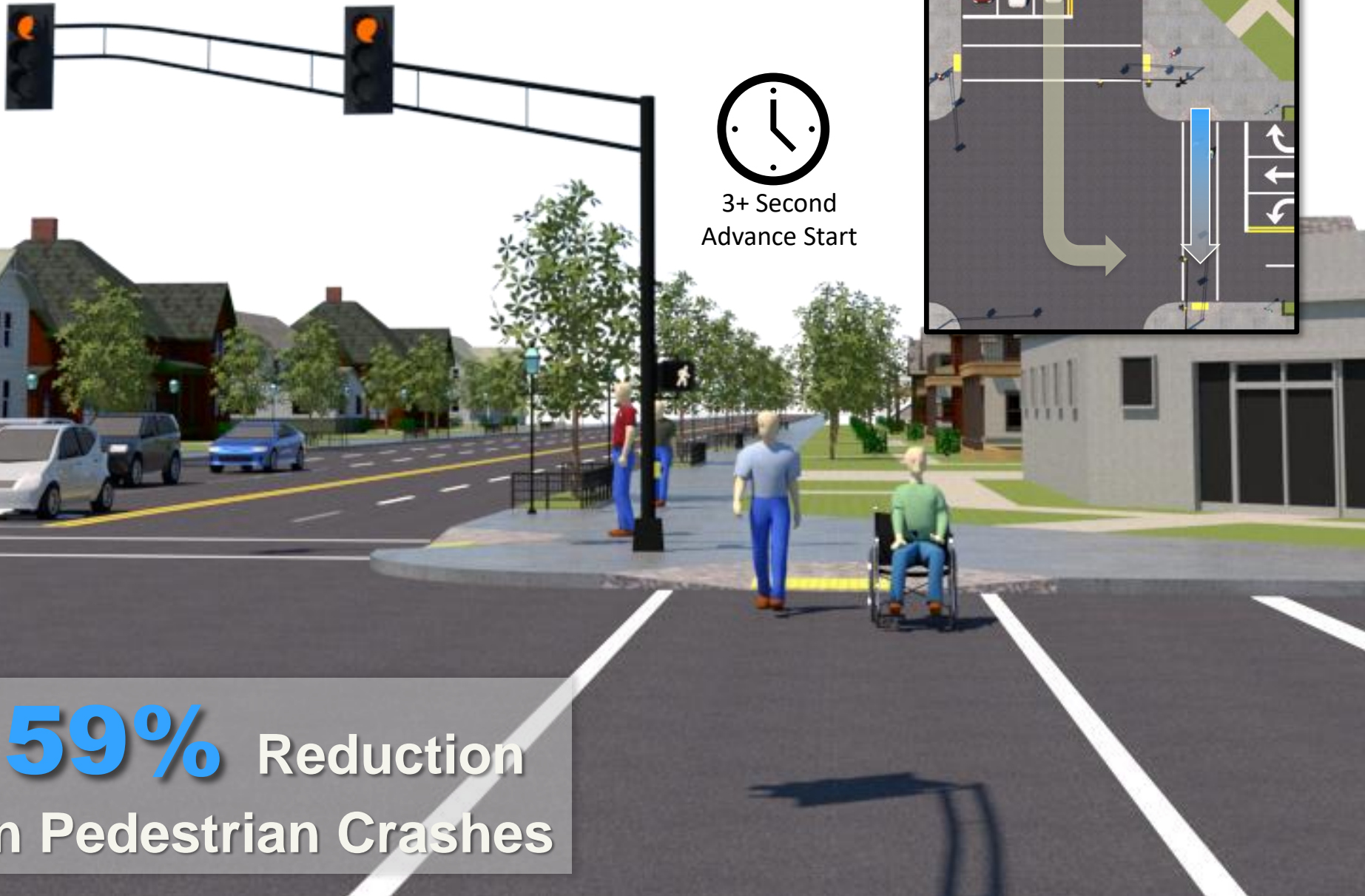
W-11-2, W16-7P



R1-5

47% Reduction
in Pedestrian Crashes

Leading Pedestrian Interval



3+ Second
Advance Start

59% Reduction
in Pedestrian Crashes

Countermeasure Selection Process

Following the process suggested in the guide offers countermeasure options based on road conditions, crash causes, and pedestrian safety issues.

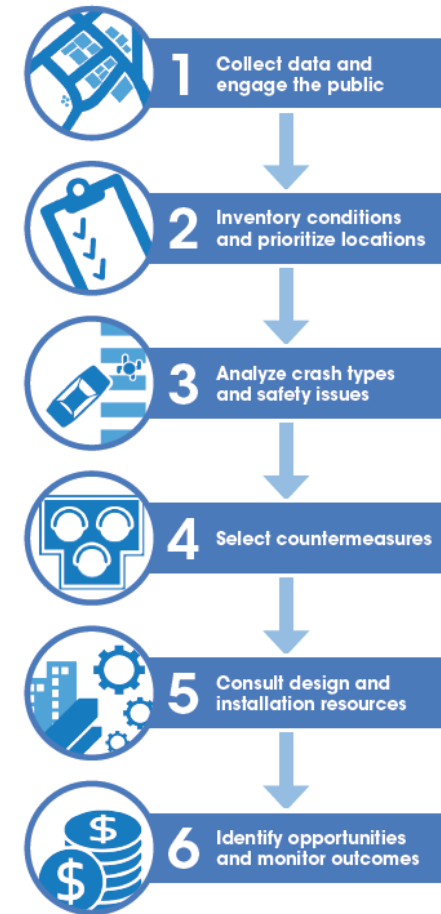


Figure 1. Process diagram for selecting countermeasures at uncontrolled pedestrian crossing locations.



1 Collect data and engage the public

Collect pedestrian crash and safety data

- » Location and conditions
- » Crash maps
- » Crash reports

Review existing traffic safety plans

- » SHSP
- » HSIP
- » HSP

Evaluate pedestrian accommodation and traffic safety policies

- » Complete Streets
- » Vision Zero

Initiate a PSAP

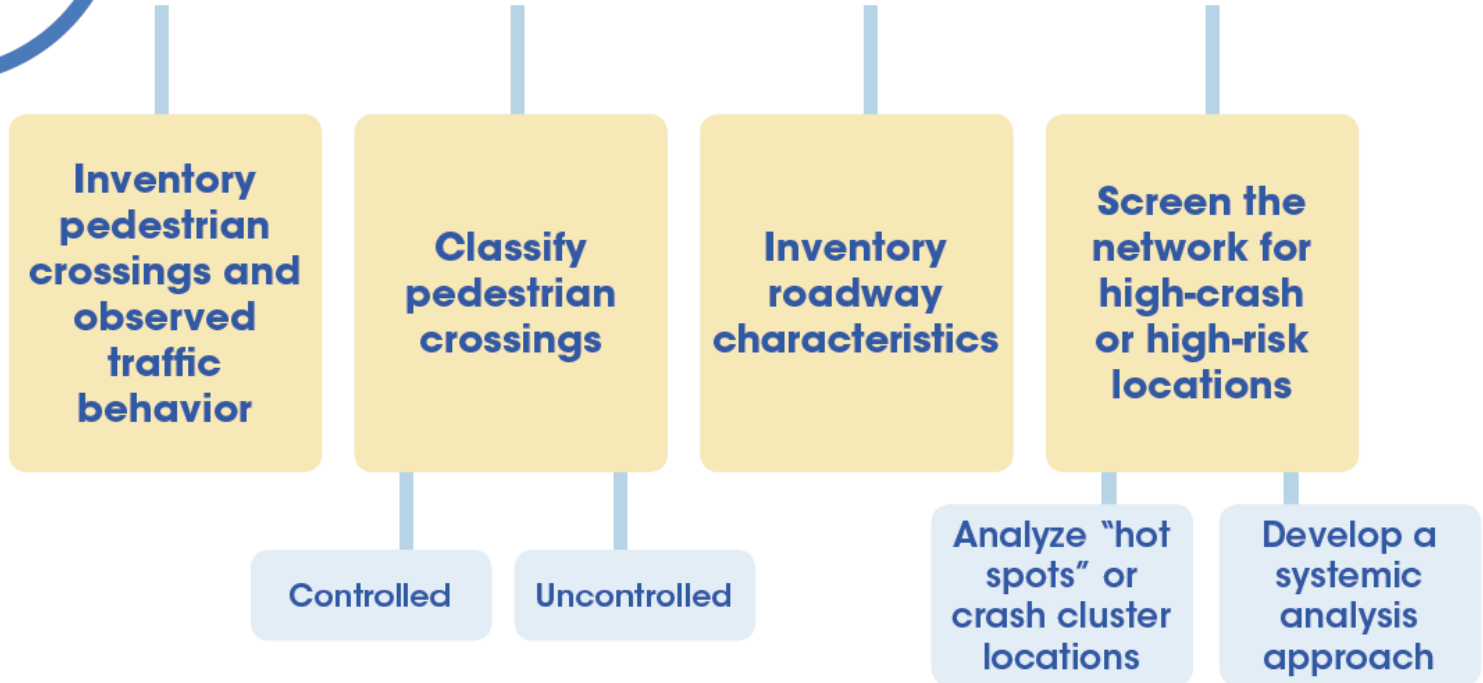
Review pedestrian master plans for proposed projects

Document informal public comments

Conduct a walkability audit



2 Inventory conditions and prioritize locations





3 Analyze crash types and safety issues

Diagram
crash
reports

Identify
crash
factors

Conduct
an RSA

Lead an
informal
site visit

Summarize pedestrian crash types and observed traffic safety issues



4 Select countermeasures

Review Table 1 (roadway features)

- » AADT
- » Number of lanes
- » Median presence
- » Speed limit

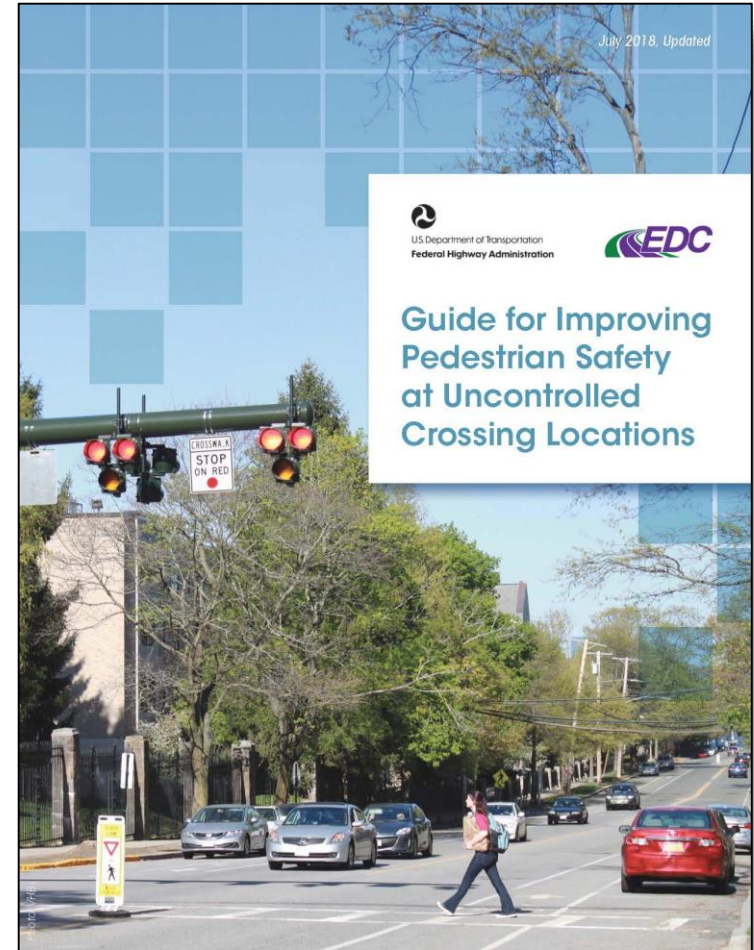
Review Table 2 (safety issues)

- » Conflicts at crossings
- » Excessive speed
- » Visibility issues
- » Other

Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations



2005



2018



Table 1. Application of pedestrian crash countermeasures by roadway feature.

Roadway Configuration	Posted Speed Limit and AADT								
	Vehicle AADT <9,000			Vehicle AADT 9,000–15,000			Vehicle AADT >15,000		
	≤30 mph	35 mph	≥40 mph	≤30 mph	35 mph	≥40 mph	≤30 mph	35 mph	≥40 mph
2 lanes (1 lane in each direction)	① 2 4 5 6	① 5 6 7 9	① 5 6 ⑦ ⑨	① 4 5 6	① 5 6 7 9	① 5 6 ⑦ ⑨	① 4 5 6 7 9	① 5 6 7 9	① 5 6 ⑨
3 lanes with raised median (1 lane in each direction)	① 2 3 4 5	① ③ 5 7 9	① ③ 5 ⑦ ⑨	① 3 4 5 7 9	① ③ 5 ⑦ ⑨	① ③ 5 ⑦ ⑨	① ③ 4 5 7 9	① ③ 5 ⑦ ⑨	① ③ 5 ⑨
3 lanes w/o raised median (1 lane in each direction with a two-way left-turn lane)	① 2 3 4 5 6 7 9	① ③ 5 6 7 9	① ③ 5 6 ⑨	① 3 4 5 6 7 9	① ③ 5 6 ⑦ ⑨	① ③ 5 6 ⑨	① ③ 4 5 6 7 9	① ③ 5 6 ⑨	① ③ 5 6 ⑨
4+ lanes with raised median (2 or more lanes in each direction)	① ③ 5 7 8 9	① ③ 5 7 8 9	① ③ 5 8 ⑨	① ③ 5 7 8 9	① ③ 5 ⑦ 8 ⑨	① ③ 5 8 ⑨	① ③ 5 ⑦ 8 ⑨	① ③ 5 ⑦ 8 ⑨	① ③ 5 ⑨
4+ lanes w/o raised median (2 or more lanes in each direction)	① ③ 5 6 7 8 9	① ③ 5 ⑥ 7 8 9	① ③ 5 ⑥ 8 ⑨	① ③ 5 ⑥ 7 8 9	① ③ 5 ⑥ ⑦ 8 ⑨	① ③ 5 ⑥ 8 ⑨	① ③ 5 ⑥ ⑦ 8 ⑨	① ③ 5 ⑥ ⑦ 8 ⑨	① ③ 5 ⑥ ⑨

①	③
	⑤ ⑥
	⑧ ⑨

Given the set of conditions in a cell,














































- # Signifies that the countermeasure is a candidate treatment at a marked uncontrolled crossing location.
- Signifies that the countermeasure should always be considered, but not mandated or required, based upon engineering judgment at a marked uncontrolled crossing location.
- Signifies that crosswalk visibility enhancements should always occur in conjunction with other identified countermeasures.*

The absence of a number signifies that the countermeasure is generally not an appropriate treatment, but exceptions may be considered following engineering judgment.

- 1 High-visibility crosswalk markings, parking lot crosswalk approach, adequate nighttime lighting, and crossing warning sign
- 2 Raised crosswalk
- 3 Advance Yield Here To (Stop Here For) Pedestrians sign and yield (stop) line
- 4 In-Street Pedestrian Crossing sign
- 5 Curb extension
- 6 Pedestrian refuge island
- 7 Rectangular Rapid-Flashing Beacon (RRFB)**
- 8 Road Diet
- 9 Pedestrian Hybrid Beacon (PHB)**

*Refer to Chapter 4, Using Table 1 and Table 2 to Select Countermeasures, for more information about using multiple countermeasures.

Table 2. Safety issues addressed per countermeasure.

Pedestrian Crash Countermeasure for Uncontrolled Crossings	Safety Issue Addressed				
	Conflicts at crossing locations	Excessive vehicle speed	Inadequate conspicuity/visibility	Drivers not yielding to pedestrians in crosswalks	Insufficient separation from traffic
Crosswalk visibility enhancement					
High-visibility crosswalk markings*					
Parking restriction on crosswalk approach*					
Improved nighttime lighting*					
Advance Yield Here To (Stop Here For) Pedestrians sign and yield (stop) line*					
In-Street Pedestrian Crossing sign*					
Curb extension*					
Raised crosswalk					
Pedestrian refuge island					
Pedestrian Hybrid Beacon					
Road Diet					
Rectangular Rapid-Flashing Beacon					



5 Consult design and installation resources

MUTCD

- » Part 2: Signs
- » Part 3: Markings
- » Part 4: Highway Traffic Signals

AASHTO Guide for the Design of Pedestrian Facilities

Local design guidance and selection criteria

- » PEDSAFE
- » Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations



6 Identify opportunities and monitor outcomes

Identify implementation opportunities

- » Routine maintenance activities
- » STIP

Consider funding options

- » HSIP
- » Other (TAP, CMAQ, STBG)

Construct improvements

- » Review design considerations
- » Conduct public outreach

Monitor results of implementation

- » Track performance measures
- » Obtain public feedback
- » Analyze crash data

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Pedestrian Safety in Arizona

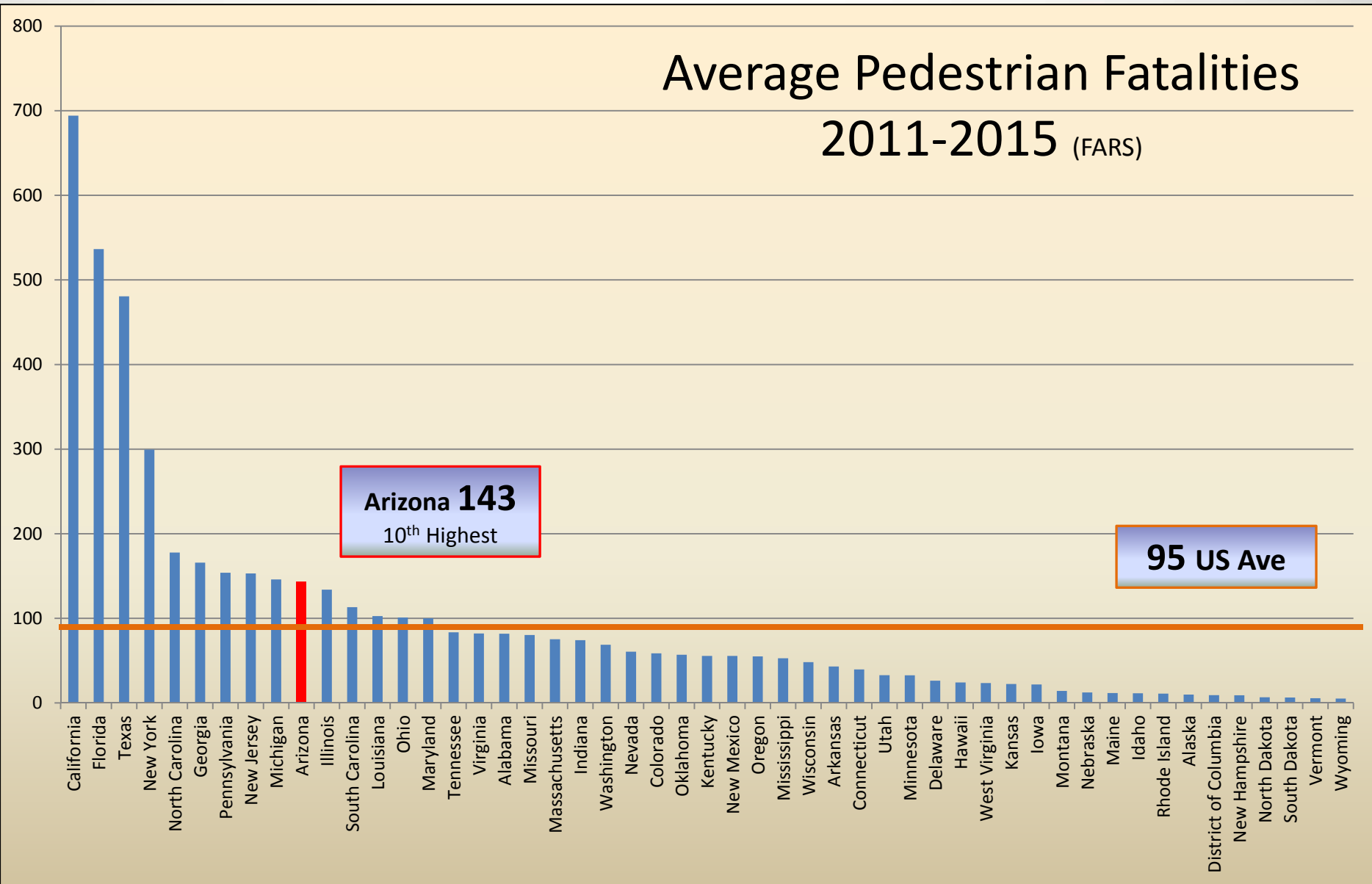
Kerry Wilcoxon, P.E., PTOE

Arizona Department of Transportation

State Traffic Safety Engineer

March 12, 2019

Average Pedestrian Fatalities 2011-2015 (FARS)



Arizona Stats-at-a-Glance

Pop: **7.016** million

14th Largest Population

6th Largest Area

Distribution:

70% Urban

(4.9 million)



Road System:

State – **20,000** miles

Local – **125,000** miles

Crash Stats:

2018* Fatalities **1018**

40% SHS – 60% Local

Ped fatalities **238**

10% SHS – 60% Local

* As of 3/11/19





Data Problems

- Historically heavily behavior based causation
 - No exposure data
- Majority of crashes, injuries and deaths on local system
 - Random and widely dispersed (even locally)
 - Crash types fundamentally differ:
 - Local: **Crossing (perpendicular) crashes**
 - State: **Parallel crashes**

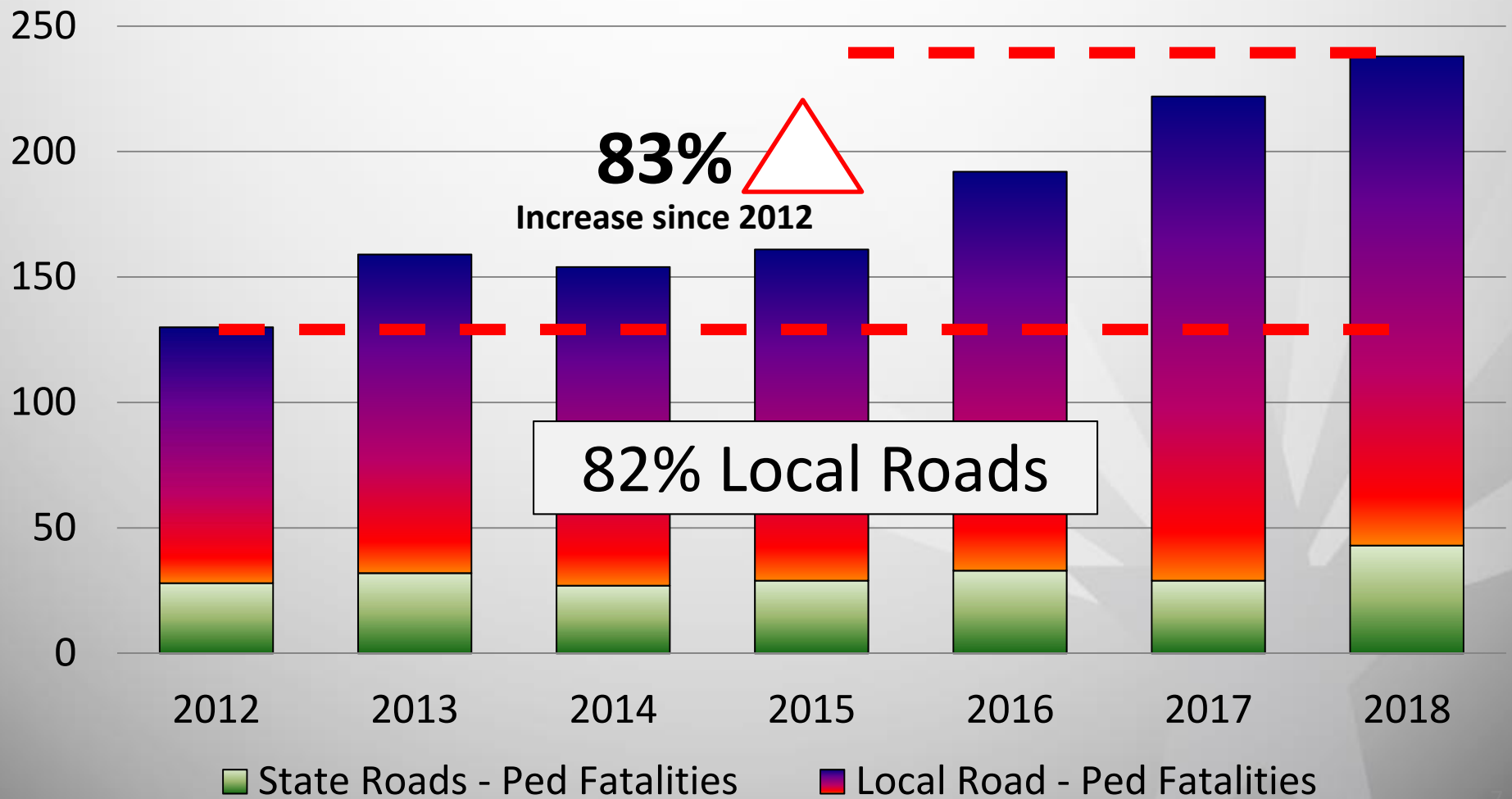
Fatal Crash Types – State vs. Local Roads

2012-2017

State		Local	
Multi-vehicle		Multi-vehicle	
Rear-end	21%	Ped/Bike	37%
Ped/Bike	21%	Angle	18%
Head-on	19%	Left-turn	15%
Single-vehicle		Single-vehicle	
Roll-over	55%	Roll-over	33%
RD-Hit Tree	8%	Curb Strike	16%

Pedestrian Fatalities

2012-2018



State Response

- Screening
- Funding
- Guidance



Screening: **Statewide Crash Data**

- Network screening of high crash locations statewide
- Screenings for:
 - Intersections and segments with high fatal and serious injury crash frequencies,
 - Locations on ADOT and Local Systems and,
 - Actionable countermeasures.
 - Work Orders
 - Road Safety Assessments
 - HSIP Applications.

Intent of screening is to improve traffic safety.

Network Data

Compiled from most recent five years of crash data including (but not limited to):

- Intersections – signalized
- Intersections – non-signalized
- Segments (SHS only)
- Most common fatal/serious injury crash types
- Most common fatal/serious injury driver violations.

High fatal/serious injury pedestrian crash locations identified

Crash Types – Pedestrian



Transportation Systems Management and Operations

Arizona Department of Transportation


Traffic Safety Section

Network Screening

Fatal/Serious Injury Crash Types - Statewide

Network: <u>Statewide</u>				Period: <u>2013-2017</u>		Query Date: <u>9/26/2018</u>		
	Intersections							
	#	Crash Type	Severity				Additional Details	
			K-A Total	Fatal	Serious	Inor/Po		PDO
	1	Left turn	2,732	238	2,494	22,231		34,547
	2	Angle	2,204	273	1,931	19,701		33,723
	3	Pedestrian	1,495	420	1,075	3,688		346
	4	Single Vehicle	1,344	254	1,090	6,576		19,439
	5	Rear End	1,109	60	1,049	25,027		68,104
	6	Pedalcyclist	749	86	663	445		690
	7	Head On	311	39	272	2,083		2,931
	8	Sidewipe Same	202	19	183	2,763		25,013
	9	Sidewipe opposite	73	6	67	876	3,136	

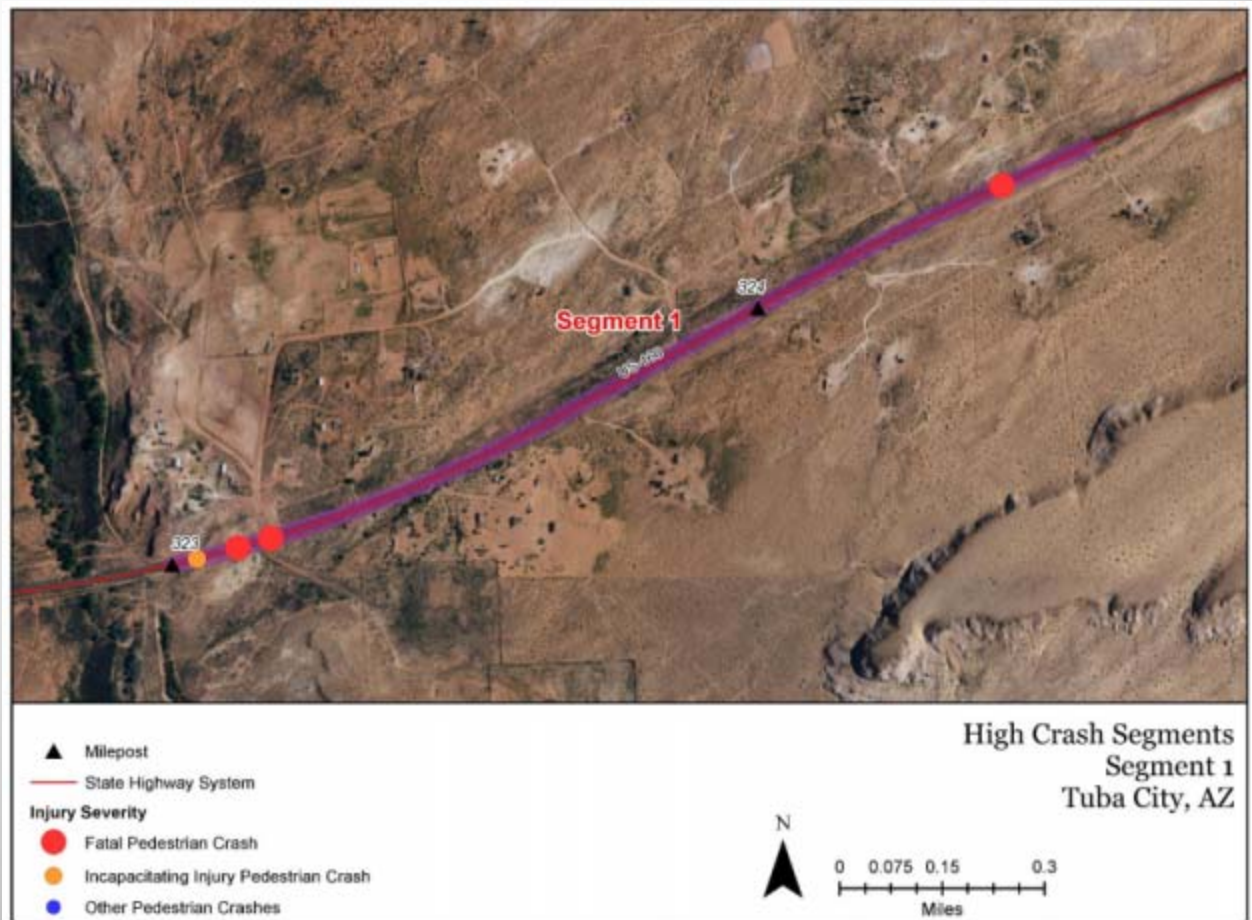
Crash Type Details – Pedestrian

 Arizona Department of Transportation Arizona Department of Transportation Traffic Safety Section Network Screening Intersection Crash Type - Statewide - High Crash Locations											
Crash Type 3: <u>Pedestrian</u> Network: <u>Statewide</u>			Period: <u>2013-2017</u>			Query Date: <u>10/12/2018</u>					
Intersections											
#	Street 1	Street 2	Traffic Control	Jurisdiction	COG/MPO	Severity					
						K-A Total	Fatal	Serious	Minor/Poss	PDO	TOTAL
1	Indian School Rd	27th Ave	Signalized	Phoenix	MAG	6	2	4	6	0	12
2	Central Ave	Thomas Rd	Signalized	Phoenix	MAG	5	2	3	6	1	12
3	Dunlap Ave	19th Ave	Signalized	Phoenix	MAG	5	0	5	6	0	11
4	19th Ave	Bell Rd	Signalized	Phoenix	MAG	5	1	4	5	0	10
5	19th Ave	Camelback Rd	Signalized	Phoenix	MAG	4	1	3	11	0	15
6	Indian School Rd	9th St	2-way stop	Phoenix	MAG	4	2	2	4	0	8
7	35th Ave	Bell Rd	Signalized	Phoenix	MAG	4	2	2	4	0	8
8	McDowell Rd	48th St	Signalized	Phoenix	MAG	4	1	3	4	0	8
9	Speedway Blvd	Richey Blvd	Signalized	Tucson	PAG	4	1	3	3	0	7
10	Indian School Rd	7th Ave	Div 2-way stop	Phoenix	MAG	3	0	3	9	0	12
11	Mesa Dr	Brown Rd	Signalized	Mesa	MAG	3	0	3	2	0	5
12	Peoria Ave	19th Ave	Signalized	Phoenix	MAG	3	2	1	1	0	4
13	McDowell Rd	41st St	1-way stop	Phoenix	MAG	3	2	1	1	0	4
14	35th Ave	Eva St	Div 1-way stop	Phoenix	MAG	3	0	3	1	0	4

Example Segment:

US 160 MP323-324.5 Tuba City, AZ

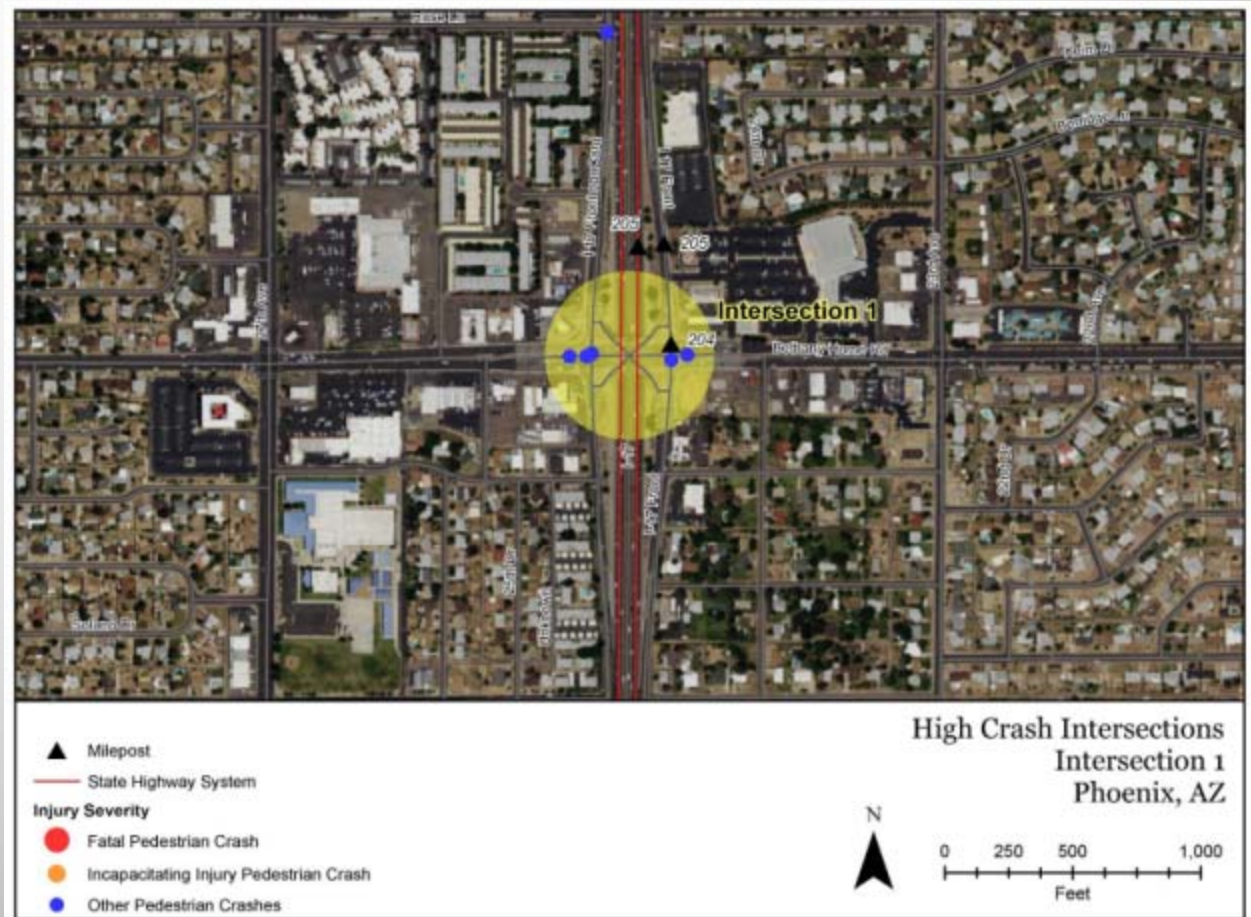
Highest pedestrian
crash SHS segment
Rural 2-lane
65 mph Speed Limit
4 pedestrian crashes
 3 fatal – 1 ser. Inj
 3 alcohol related
Primarily struck at
night while walking
parallel with traffic



Example Intersection:

I-17 and Bethany Home Road Phoenix, AZ

Highest pedestrian
 crash SHS intersection
 SPUI - Arterial
 6-lane divided
 5 pedestrian crashes
 0 fatal – 0 ser. Inj
 1 alcohol related
 Day and night crashes,
 pedestrians struck
 while crossing



Response

- For state highway locations, ADOT compiles comments, corrections or disposition updates including:
 - Reasons for no action or
 - Planned or completed:
 - Improvements,
 - Road Safety Assessments
 - HSIP or other funding applications.
- ADOT encourages but **cannot require** similar responses on local road locations.

Funding: Statewide HSIP Competition


Agency:		Title of Project:	
County:		COG/MPO:	
District:		Date:	
Contact:		Phone:	
		E-Mail:	
Type of Safety Improver	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"/> Construction <input type="checkbox"/> Maintenance <input type="checkbox"/> Infrastructure			
Anticipated Total Cost Estimate:		\$0.00	

- Funding based on statewide competition
- Highest B/C ratio projects funded regardless of jurisdiction
- Pedestrian projects very competitive:
 - High Benefit vs. Low Cost
 - HAWKs/Signals 100% funded

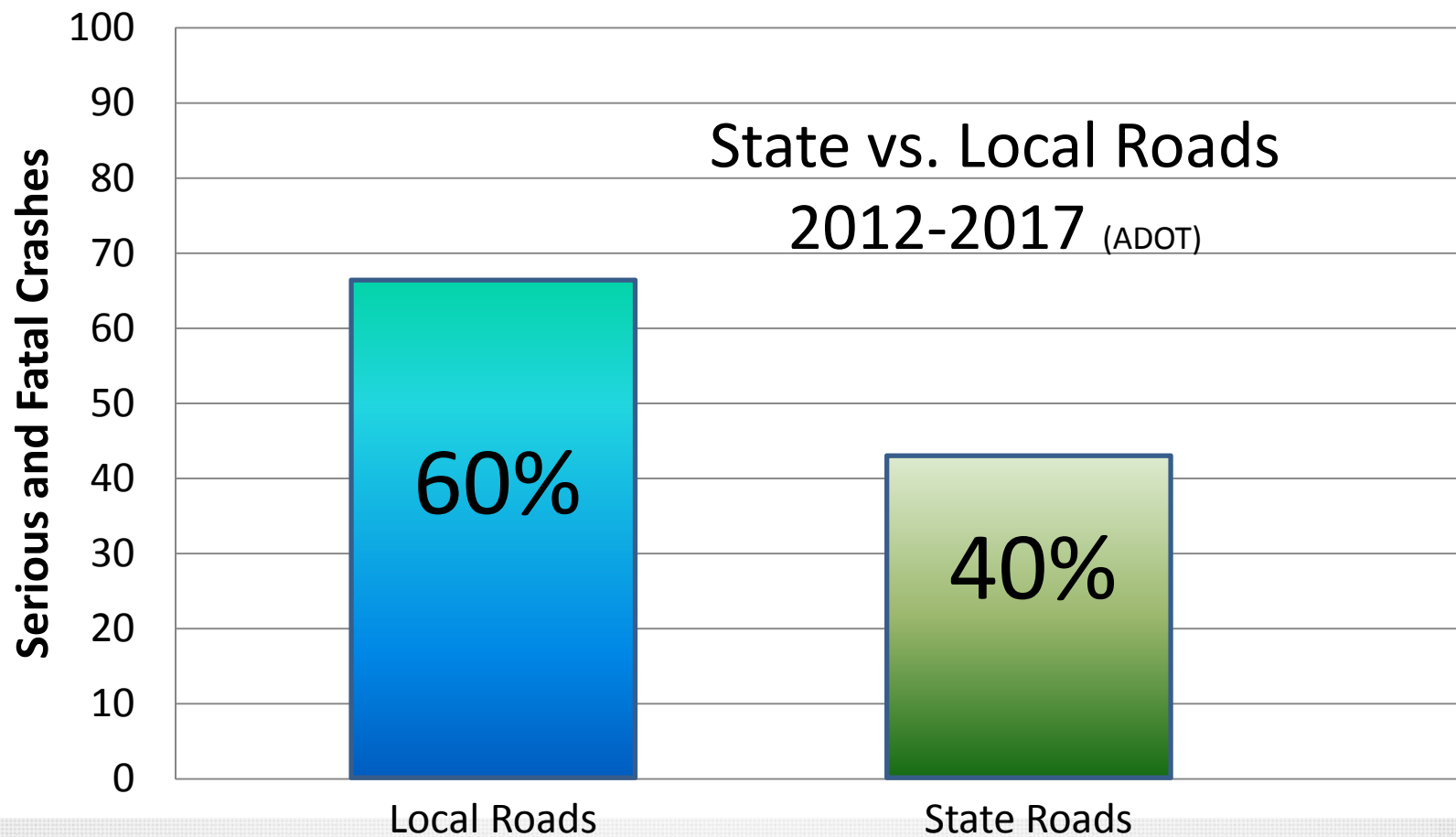
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**ARIZONA HIGHWAY SAFETY
IMPROVEMENT PROGRAM MANUAL**

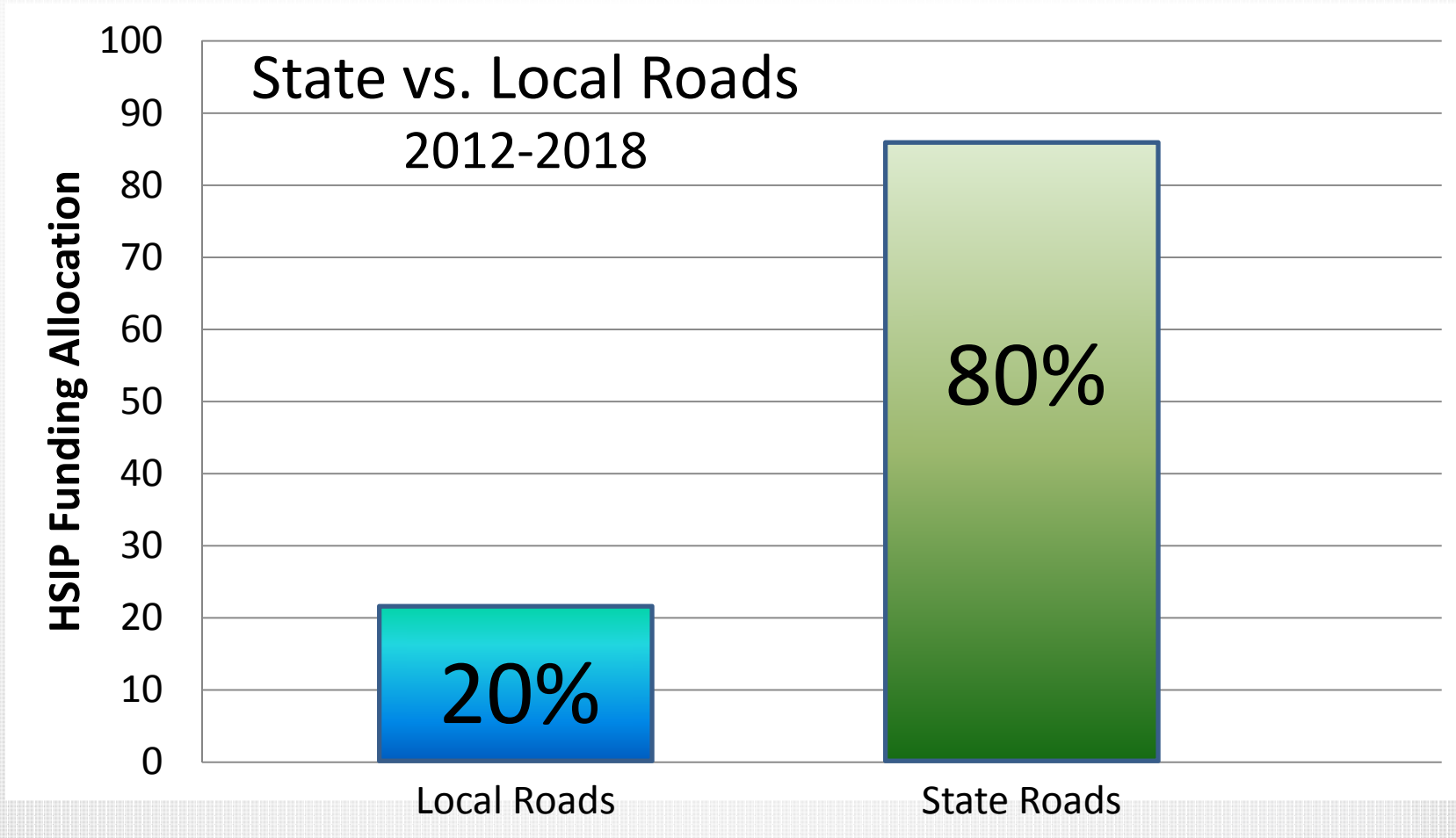
Arizona Department of Transportation
Transportation Systems Management & Operations Group
Traffic Safety Section
May 2015
(Revised February 2017)



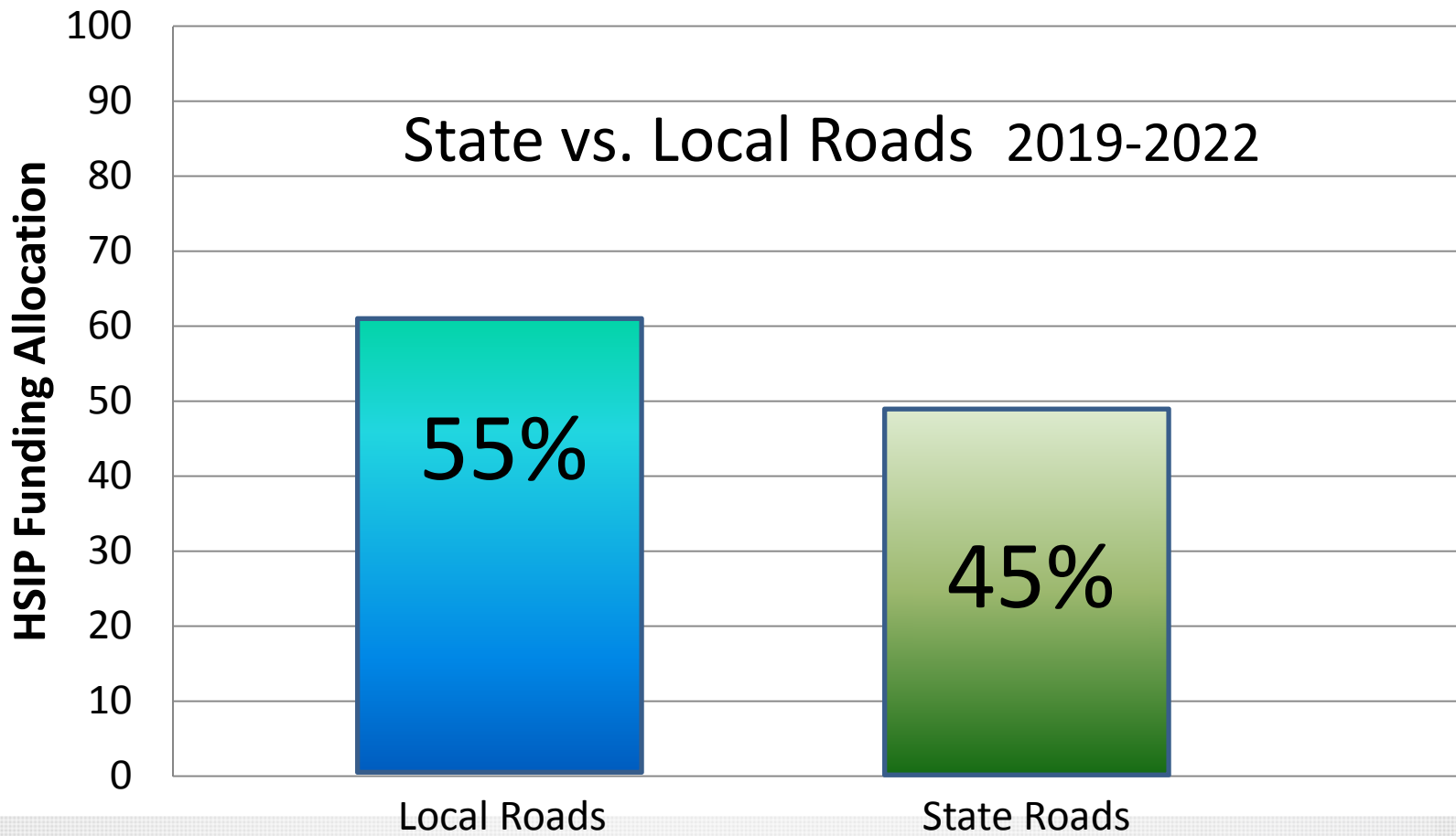
Fatal/Serious Injury Crashes



HSIP Funding Pre-2019



HSIP Funding: FY19+



HSIP Funding

Intent to provide funding for highest priority safety project statewide

Added emphasis to funding pedestrian projects:

- HAWK construction
- Flexible funding schedule

Eventual goal 60/40 - local/state funding split

Guidance: **Arizona STEP Guide**

EDC-4/5 Initiative Safe
Transportation for Every
Pedestrian (STEP)



Arizona STEP Tool – Public facing pedestrian safety tool developed by ADOT

Decision matrix for Arizona specific crossing treatment selection

Practical design level information on proven safety countermeasures

Links to state laws, standards/best practices (national and state), example installations (PDF and dwg)

AZ STEP Tool



Google Custom Search



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ADOT Business Coach On Demand

Engineering and Construction

Contracts and Specifications

Project Management Services

Highway Maintenance

Procurement

Engineering Consultants

Programs and Partnerships

Operational and Traffic Safety

AZ STEP Guide - *Safe Transportation for Every Pedestrian*

Overview	Two Lane (1 lane each direction)	Three Lanes (with raised median)
Three Lanes (without raised median)		Four + Lanes (with raised median)
Four + Lanes (without raised median)		Countermeasures

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.

AZ STEP Tool

ADOT

About Motor Vehicles Projects

Arizona DOT / Business / Transportation Systems Management and Operations

Overview

- ADOT Business Coach On Demand
- Engineering and Construction
- Contracts and Specifications
- Project Management Services
- Highway Maintenance
- Procurement
- Engineering Consultants
- Programs and Partnerships

Operational

AZ STEP

Overview

Three

Four

As part of the Ever

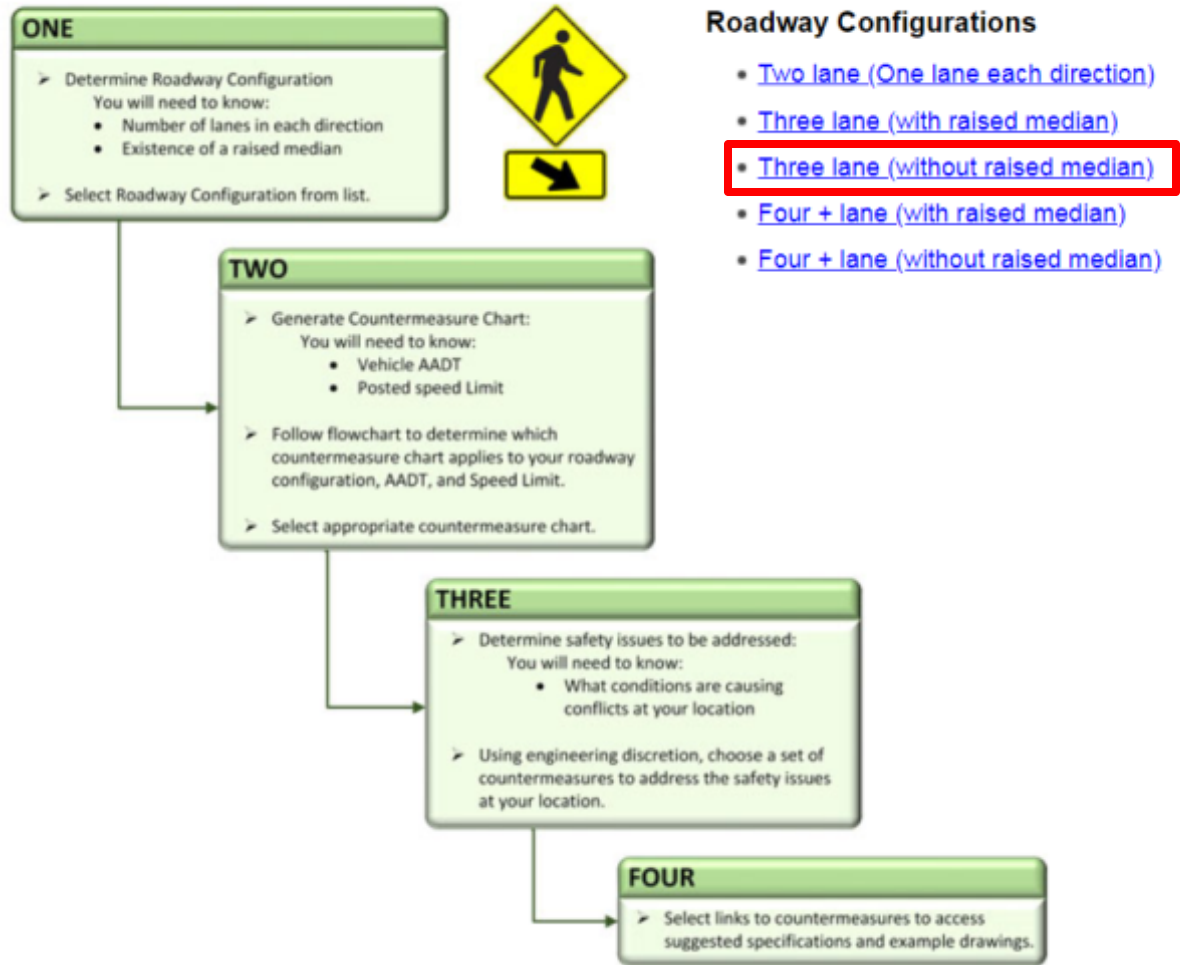
Federal Highway

[Uncontrolled Cross](#)

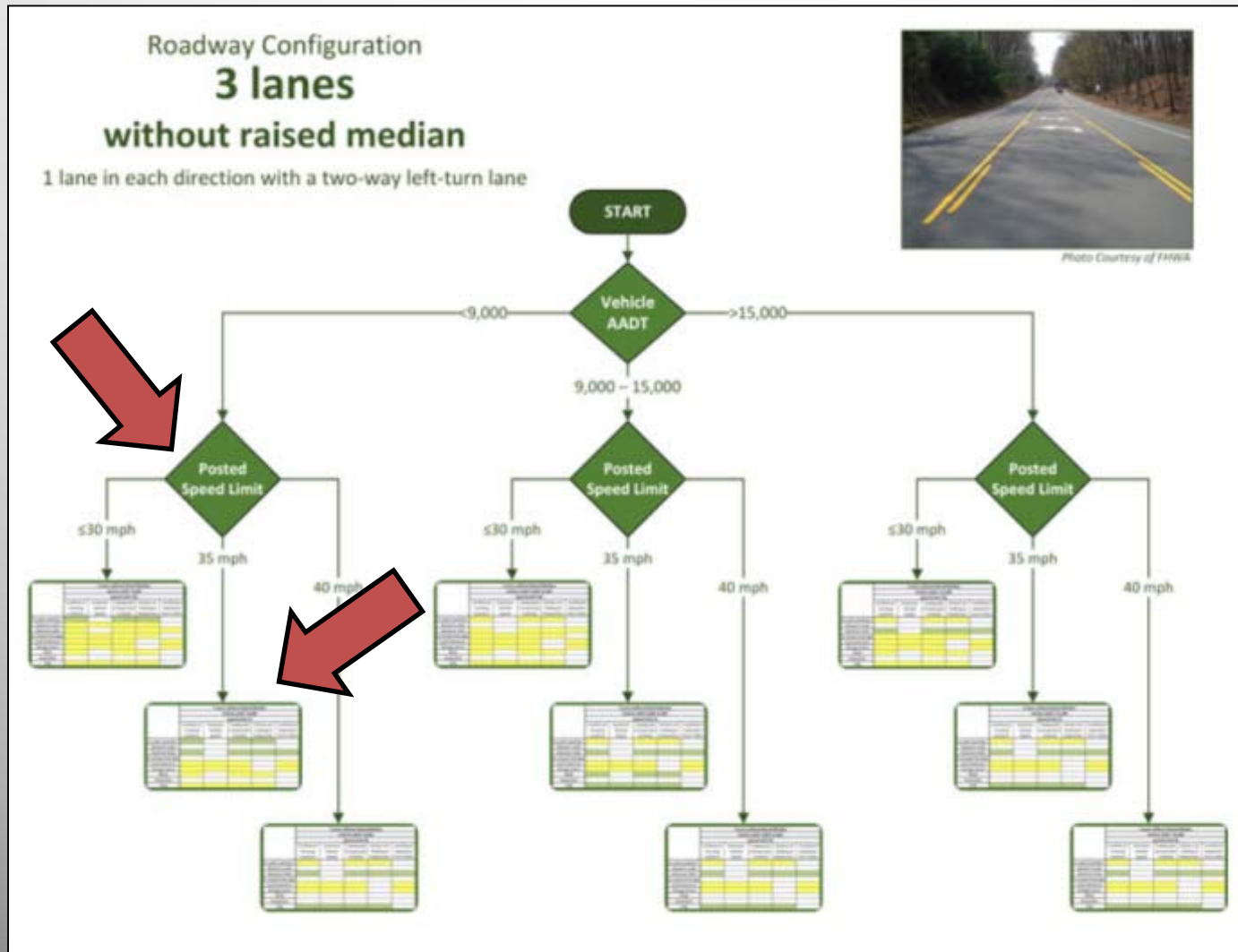
characteristics and

engineers can find

How to Use the AZ Step Guide



Example: 3 Lanes w/o Raised Median



Example: 3 Lanes w/o Raised Median

Roadway Configuration

without

1 lane in each direction

Three Lanes without Raised Median
 Vehicle AADT < 9,000 | Posted Speed Limit 35 MPH

SAFETY ISSUE

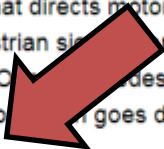
Countermeasure	Conflicts at Crossing Locations	Excessive Vehicle Speed	Inadequate Conspicuity/Visibility	Drivers not Yielding to Pedestrians	Insufficient Separation from Traffic
Crosswalk Visibility Enhancement*	Always		Always	Always	
Raised Crosswalk					
Advance Yield	Always		Always	Always	Always
In-Street Pedestrian Sign					
Curb Extension	Also	Also	Also		Also
Pedestrian Refuge Island	Also	Also	Also		Also
Rectangular Rapid-Flashing Beacon (RRFB)	Also		Also	Also	
Road Diet					
Pedestrian Hybrid Beacon (PHB)	Also	Also	Also	Also	



Countermeasure Selection

Pedestrian Hybrid Beacon (PHB)

The [pedestrian hybrid beacon \(PHB\)](#), or High Intensity Activated Crosswalk (HAWK), is a traffic control device designed to help pedestrians safely cross busy or higher-speed roadways at midblock crossings and uncontrolled intersections. The beacon head consists of two red lenses above a single yellow lens. The lenses remain "dark" until a pedestrian desiring to cross the street pushes the call button to activate the beacon. The signal then initiates a yellow to red lighting sequence consisting of steady and flashing lights that directs motorists to slow and come to a stop. The pedestrian signal flashes a WALK display to the pedestrian. Once the pedestrian has safely crossed, the hybrid beacon goes dark.



- [PHB Warrants](#)

The first PHB was developed in Tucson, Arizona in 2000. Since then, municipalities across the state of Arizona have constructed PHB's including Bullhead City, Bylas, Flagstaff, Sierra Vista, and throughout the Phoenix and Tucson metropolitan areas.

Countermeasure Tech Sheet

- [Countermeasure Tech Sheet](#)
- [FHWA Safety Proven Countermeasures](#)

Example Projects

- Florence Boulevard - [PDF](#) | [DGN](#) (4.5 MB .zip)



Photo courtesy of Mike Cyned

ADOT Traffic Engineering/Construction and Division
 June 2012
 Revision 002 Traffic Signals

4.40 PEDESTRIAN HYBRID BEACON

A pedestrian hybrid beacon (PHB) is a special type of hybrid beacon used to warn and control traffic at an uncontrolled location to assist pedestrians in crossing a street or highway at a marked crosswalk.

If used, PHBs shall be used in conjunction with signs and pavement markings to warn and control traffic at locations where pedestrians enter or cross a street or highway. A PHB shall only be installed at a marked crosswalk.

The design and operation of pedestrian hybrid beacons should follow the guidelines set forth in the MUTCD.

PHB Evaluation Guidelines

To improve pedestrian crossings there are many possible treatments. These treatments include, but are not limited to, marked crosswalks, high visibility crosswalks, two-stage crosswalks, median refuges, street lighting, pavement lights, rectangular rapid flash beacons, PHBs, and pedestrian signals. A comprehensive evaluation of pedestrian crossing safety should be conducted in order to identify the most effective treatment.

PHBs should not be installed on roadways with speed limits greater than 45 mph.

The evaluation form shown in Exhibit 402-A should be used in determining whether or not a Pedestrian Hybrid Beacon should be utilized. A minimum score of 35 points meets Pedestrian Hybrid Beacon consideration.

Additional factors that should be considered when a crossing merits PHB consideration:

- Is the location within a coordinated signal network?
- Does the roadway environment support the installation of a PHB? Does the street have adjoining sidewalks and/or pathways that will result in a lagged utilization of the PHB?
- Is right-of-way needed?
- Are there utility conflicts?
- Is there significant potential for environmental or cultural issues?
- Is funding of the PHB available?
- Is 120V/60 single phase power available at a reasonable cost?
- Does the local jurisdiction support the installation of a PHB? Is the local jurisdiction willing to pay for the power for the PHB? Is the local jurisdiction willing and capable of accepting the maintenance and operation of the PHB? Will the local jurisdiction pay for the power in order to light the crosswalk?

Countermeasure Selection

Pedestrian Hybrid Beacon (PHB)

The [pedestrian hybrid beacon \(PHB\)](#), or High Intensity Activated Crosswalk (HAWK), is a traffic control device designed to help pedestrians safely cross busy or high-speed roadways at midblock crossings and intersections. The beacon head consists of two signal heads above a single yellow lens. The lenses remain dark when a pedestrian desiring to cross the street pushes a button to activate the beacon. The signal then changes from yellow to red lighting sequence consisting of flashing lights that directs motorists to slow down and stop. The pedestrian signal then flashes a V-shaped signal to the pedestrian. Once the pedestrian has safely crossed the street, the hybrid beacon again goes dark.

- [PHB Warrants](#)

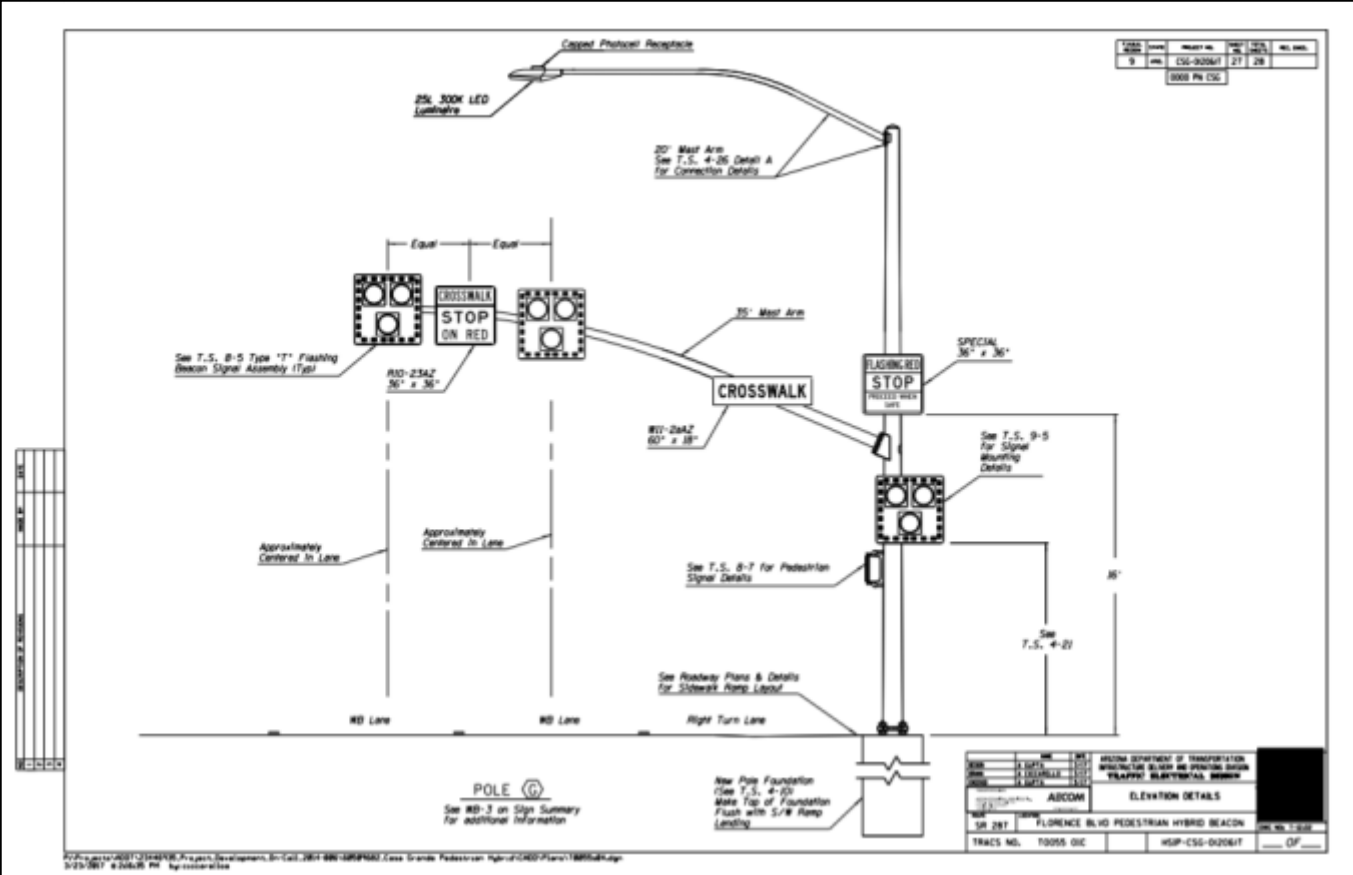
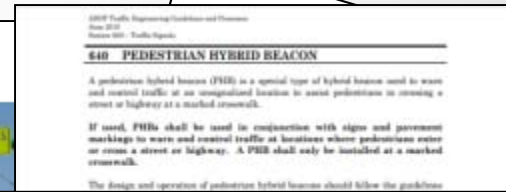
The first PHB was developed in Tucson, Arizona. Currently, several Arizona cities have constructed PHB's including Bismarck, Phoenix and Tucson metropolitan areas.

Countermeasure Tech Sheet

- [Countermeasure Tech Sheet](#)
- [FHWA Safety Program Countermeasure Selection](#)

Example Projects

- Florence Boulevard - [PDF](#) | [DGN](#) (4.5 MB)



AZ STEP Tool

Intent to provide easy decision tool to non-expert engineers, planners or elected officials

Currently under final testing

Scheduled release date: May 1, 2019

Pedestrian Safety in Arizona

ADOT is making every effort to provide local jurisdictions with:

- Crash data
- Project funding
- Design expertise

Questions?

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

PEDBIKESAFE

Pedestrian Safety Guide and Countermeasure Selection System
Bicycle Safety Guide and Countermeasure Selection System

The **Pedestrian Safety Guide and Countermeasure Selection System** is intended to provide practitioners with the latest information available for improving the safety and mobility of those who walk.

PEDSAFE

Index

Explore all available resources.

Guide

Create a viable pedestrian system.

Countermeasures

Also: **selection tool**, matrices.

Case Studies

Examples of various treatments.

BIKESAFE

Index

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Guide

Create a viable bicycling system.

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Also: **selection tool**, matrices.

Case Studies

Examples of various treatments.

The **Bicycle Safety Guide and Countermeasure Selection System** is intended to provide practitioners with the latest information available for improving the safety and mobility of those who bicycle.

Countermeasure Selection Tool

Step 2. Select the Goal of the Treatment

The goal may either be to achieve a specific performance objective, such as reduce traffic volumes, or to mitigate a specific type of pedestrian-motor vehicle collision.

Choose either a performance objective **OR** a crash type.

Name of location:

Performance Objectives

- Reduce Speed of Motor Vehicles
- Improve Sight Distance and Visibility
- Reduce Volume of Motor Vehicles
- Reduce Exposure for Pedestrians
- Improve Pedestrian Access and Mobility
- Encourage Walking by Improving Aesthetics
- Improve Compliance with Local Traffic Laws
- Eliminate Behaviors that Lead to Crashes
- Improve Safety at Uncontrolled Crossings



Crash Types (click for a brief description)

- Dart/Dash
- Multiple Threat/Trapped
- Unique Midblock
- Through Vehicle at Unsignalized Location
- Bus-Related
- Turning Vehicle
- Through Vehicle at Signalized Location
- Walking Along Roadway
- Working or Playing in Roadway
- Non-Roadway
- Backing Vehicle
- Crossing an Expressway

Proceed to Step 3

Guide: Background | Statistics | Analysis | Implementation | **Countermeasures:** List | Tool | Matrices | Case Studies | Resources

Authors and Acknowledgements



Countermeasure Selection Tool

Step 3. Describe the Site

Provide answers to all three questions related to the geometric and operational characteristics of the site in question. The answers to these questions are used to narrow the list of appropriate countermeasures for a specific goal.

Name of location:

Your Performance Objective: Improve Safety at Uncontrolled Crossings

1. What is the roadway configuration?

- 2 lanes (1 lane in each direction)
- 3 lanes with raised median (1 lane in each direction)
- 3 lanes without raised median (1 lane in each direction with a two-way left-turn lane)
- 4+ lanes with raised median (2 or more lanes in each direction)
- 4+ lanes without raised median (2 or more lanes in each direction)

2. What is the average annual daily traffic (AADT) for motor vehicles?

- < 9,000
- 9,000 - 15,000
- > 15,000

3. What is the posted speed limit?

- ≤ 30 mph
- 35 mph
- ≥ 40 mph

Get Results

Discussion

⇒ Send us your questions



⇒ Follow up with us:

⇒ Becky Crowe rebecca.crowe@dot.gov

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⇒ General Inquiries pbic@pedbikeinfo.org

⇒ Archive at www.pedbikeinfo.org/webinars