

# Speed Management Action Plan

## Speed Management Action Plan

Pennsylvania Department of Transportation

Final

11/2/2016



# ▶ National Selection Criteria

Criteria	Description
Fatalities	The number of fatalities resulting from speeding-related crashes.
Percentage	Compares total fatalities in each State to those attributed to speeding-related factors.
Fatality Rate	Shows speeding-related fatalities per 100 million vehicle miles traveled (VMT).
Potential Reduction	Estimates the number of fatalities that could be reduced in relation to the size of the transportation network.
HSIP/SHSP	Identifies and assesses elements contained within each Highway Safety Improvement Program and Strategic Highway Safety Plan.
Opportunity	Rates each State based on rankings for each criterion above.

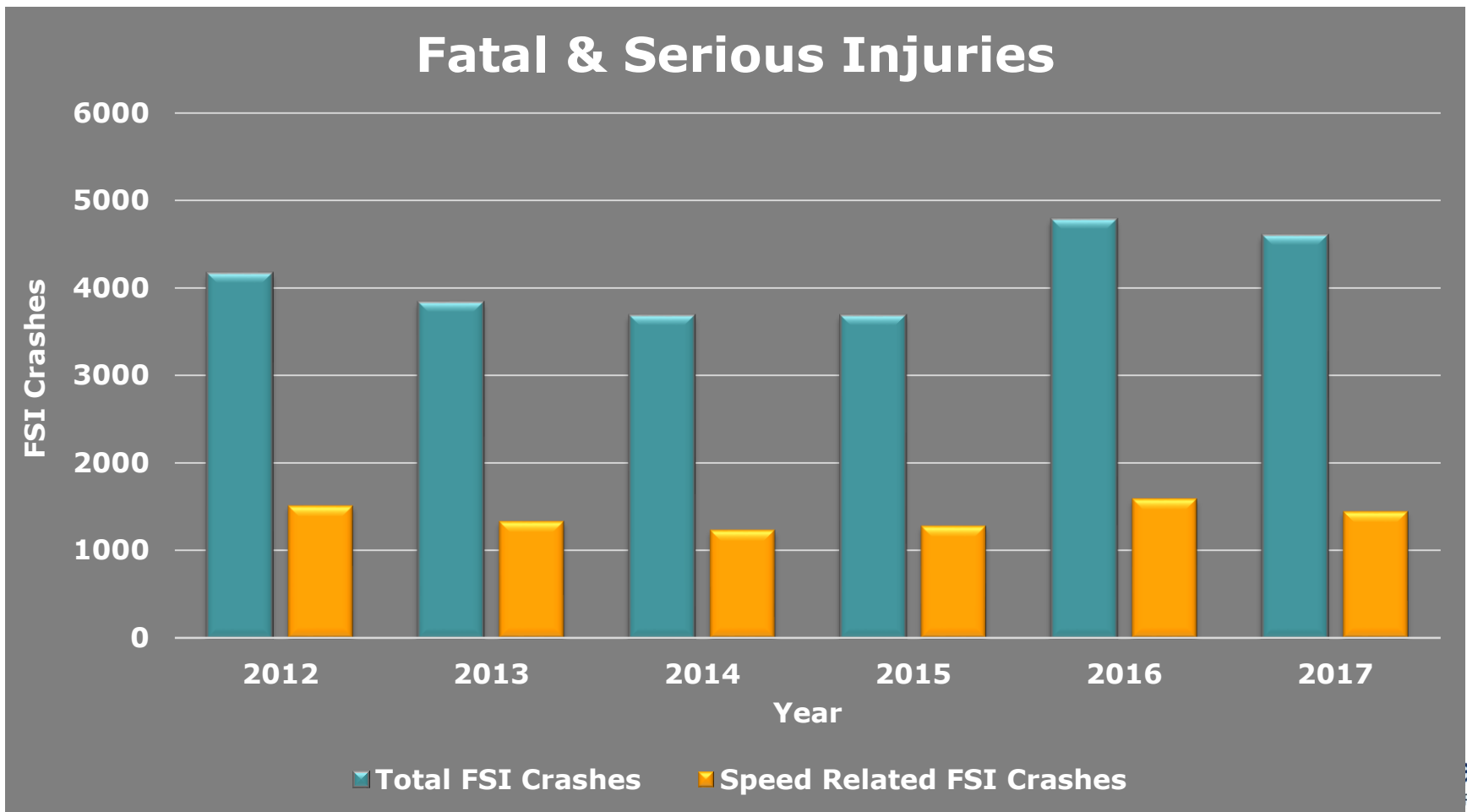
# State's Results

State	Speeding Related Fatalities	Percent	Speeding Fatalities Per 100m VMT	Percent Change Possible	Potential Fatalities Saved	HSIP SM Engr Actions (2014)	SHSP Elements (2014)	Summary/ Opportunity
West Virginia	144	42%	0.75	-54%	(78)	N	moderate	6
Montana	88	43%	0.74	-54%	(47)	N	weak	6
Pennsylvania	614	47%	0.62	-45%	(274)	Y	moderate	5
South Carolina	316	37%	0.64	-47%	(147)	Y	weak	5
Texas	1,247	37%	0.52	-34%	(428)	Y	strong	4
North Dakota	62	36%	0.61	-44%	(27)	N	weak	4
Illinois	387	40%	0.37	-7%	(27)	N	weak	4
Arizona	297	36%	0.49	-30%	(90)	Y	strong	3
Oklahoma	218	31%	0.46	-24%	(53)	N	moderate	3
Alabama	272	31%	0.42	-18%	(48)	N	weak	3
Louisiana	208	29%	0.44	-22%	(47)	N	weak	3
Hawaii	67	53%	0.67	-48%	(32)	Y	strong	3
Maine	78	48%	0.55	-37%	(29)	Y	strong	3
Delaware	46	40%	0.50	-31%	(14)	Y	moderate	3
Missouri	326	39%	0.48	-28%	(90)	Y	moderate	2
North Carolina	440	34%	0.42	-18%	(79)	N	strong	2
New Mexico	121	33%	0.47	-27%	(33)	N	weak	2
Nevada	100	39%	0.41	-17%	(17)	Y	weak	1

- 2012 FARS data
- 18 States

# Data Analysis Results

Speeding-related Fatal/Serious Injury crashes account for **33%** of all FSI crashes in Pennsylvania



# Speed Management

## What is a Speed Management Action Plan (SMAP)?

- Federal Speed Management Team
  - Multimodal/Multidisciplinary is attacking the problem
- A Speed Management Action Plan can help
  - Integrate SM concepts into other action plans and focus areas
  - Provide collaboration opportunities engineering, driving behavior, education, and enforcement
  - Prioritize short- and long-term SM actions

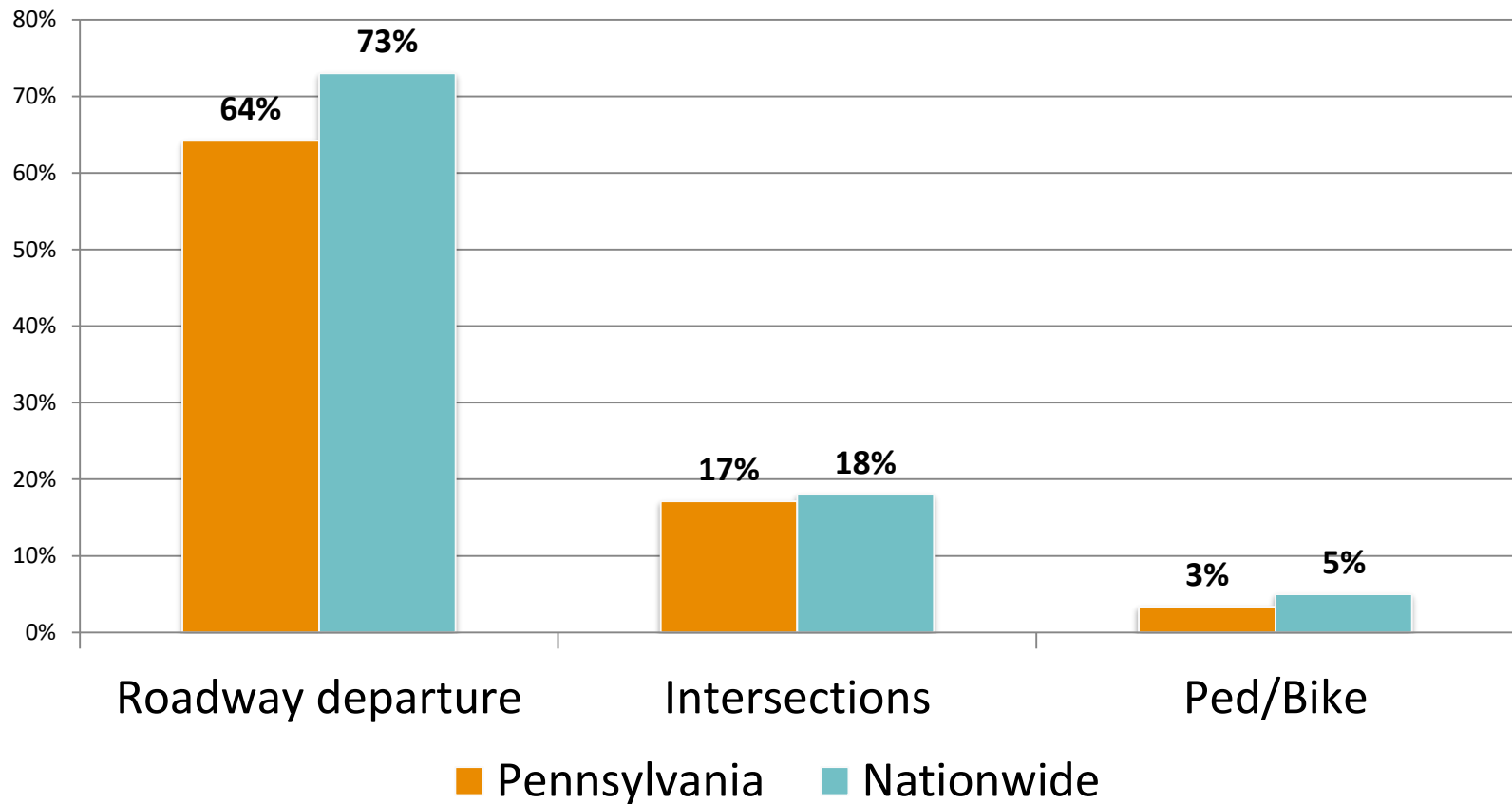
# ▶ Data Analysis Approach

- Speeding is key factor in many safety areas
- Speeding is a cross-cutting issue
- Focus areas with potential speed management fatalities reduction:
  - ❑ Roadway Departures
  - ❑ Intersections
  - ❑ Pedestrians & Bicycles



# Data Analysis Results

## Percent Speeding-related FSI Crashes grouped by Focus Area





# Roadway Departure Strategies

- Pavement, HFST and drainage improvements
- Evaluate passing zones on two-lane highways
- Rural ITS solutions
- Improve recovery area/clear zone
- Improve roadway design and geometric enhancements
- Consider road diets, pavement marking medians, lane reconfigurations, etc.



# Intersection Strategies

- Roundabouts
- Revise geometry of complex intersections
- Complete Streets to safely accommodate all road users
- Enhanced ITS solutions & dilemma zone protection
- Reduction of lane width markings
- Advance intersection warning



# Pedestrian/Bicycle Strategies

- Reduce exposure to vehicular traffic
- Improve signal hardware for pedestrians
- Improve shoulders/int for bike traffic
- Increase public awareness on bike/pedestrian safety
- Promote bicycle helmet use
- Accommodate bicycle use on roads



## ➤ Overall Key Themes

- Enhancing Speeding-related Data Collection
- Setting Appropriate Speed Limits
- Systemic Approach To Proactively Addressing Speeding Related Crashes
- Performance Measurement

# Speed Management Strategies

- Road Geometry
- Speed Setting Criteria
- Traffic Signals
- Targeted Enforcement
- Internal Training
- Collaboration with External Partners
- Policy and Guidance
- Data
- Education and Outreach

# Table 1

Strategy	Impact Area			Relative Implementation Time			Relative Cost			Relative Impact		
	RwD	Intersections	Ped/Bike	Immediate	Short Term	Long Term	Low	Midrange	High	High	Midrange	Project Specific
<b>Road Geometry</b>												
Widen lanes and/or shoulders on curves and rural highways	X					X			X		X	
Utilize HSM to Evaluate Geometric Improvements												
Consider roundabouts to help transition from higher speed to lower speed roadways.		X	X			X		X				X
Review existing 4-lane undivided roadways to determine candidate roads for reconfiguring the lanes.			X		X		X					X
Revise intersection geometrics, use left/right turn channelization, j-turns, offset/longer turn lanes, lane widths. Consider on-street parking, street trees, sidewalks, bicycle facilities, planter strips, and other street elements to create visual friction without introducing new crash types (such as fixed objects).		X	X		X			X				X
Improve sight distance at intersections and availability of gaps in traffic and assist drivers in judging gap sizes at unsignalized intersections		X			X			X		X		
Assess existing pedestrian and bicycle facilities to identify areas where these users may be more vulnerable to speed-related crashes.			X			X		X			X	
<b>Speed Setting Criteria</b>												
Develop an alternative process to identify higher risk roads and conduct a screening	√	√	√		√		√			√		

## Appendix A – Countermeasure List

- Static Signing
- Interactive Signing
- Surface Treatments & Markings
- Intersection Treatments
- Vertical Changes Within the Roadway
- Horizontal Changes Within the Roadway
- Vertical Delineation
- Enforcement & Education Related
- Other Countermeasures



# Appendix A – Speed Management Countermeasures List

Countermeasure	Description	Safety Focus	Urban/Rural Applicability	Roadway Environment	Priority to Implement (scale of 1-5) 1 - low; 5 - high
<b>STATIC SIGNING</b>					
One direction large arrow sign (W1-6)		RwD	Rural	Curves	5
Add flashers to existing curve warning signs		RwD	Rural	Curves	4
Add orange diamonds to existing curve warning signs		RwD	Rural	Curves	4
Curve Treatment Level 1: Basic Curve Signing (advanced warning, chevrons, speed plates)	Installing basic curve signing to meet MUTCD minimum	RwD	Rural	Curves	5
Curve Treatment Level 2: Enhanced signing/delineation	Installing enhanced signing/delineation (oversized signs, florescent sheeting, full post delineation, etc)	RwD	Rural	Curves	4
<b>INTERACTIVE SIGNING</b>					
Sequential Dynamic Curve Warning System	series of blinking chevron signs installed throughout a curve, flashes sequentially through the curve to warn speeding drivers	RwD	Urban, Rural	Curves	4
Speed feedback signs	sign that dynamically displays speed of passing vehicles with the message, "YOUR SPEED XX"	RwD	Rural, Urban	Any roads; school zones, advance of signalized intersection; work zones	5

# ▶ Linking SMAP to the 2017 SHSP


Speed Management Action Plan

---

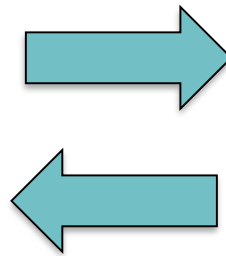

Pennsylvania Department of Transportation

Final

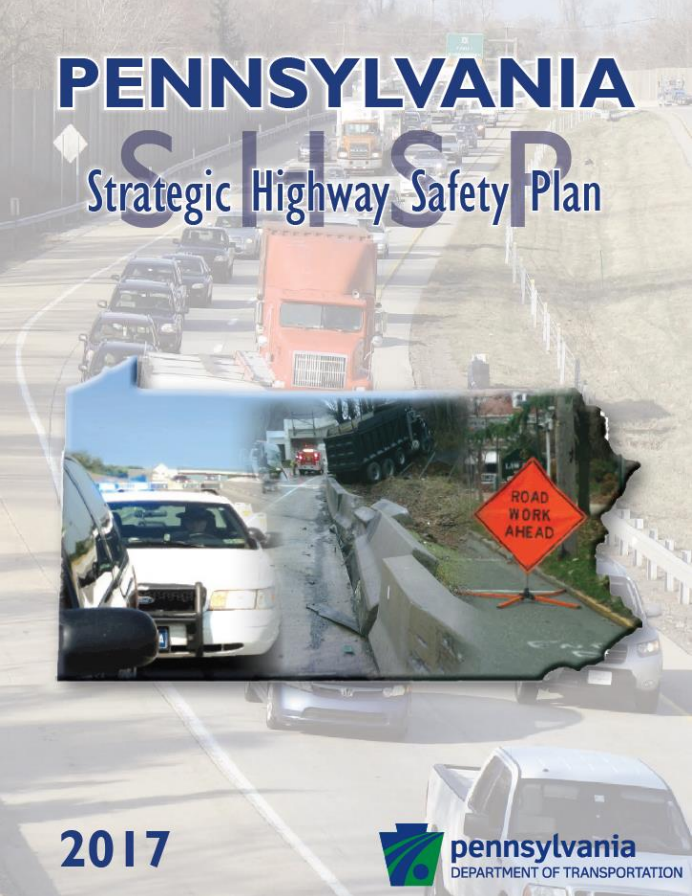
11/2/2016




U.S. Department of Transportation  
Federal Highway  
Administration



**PENNSYLVANIA**  
Strategic Highway Safety Plan



2017





# SHSP Strategies

1. Reducing Speeding & Aggressive Driving
2. Enhancing Safety in Work Zones
  - Improve speed management and enforcement in work zones
3. Enhancing Safety on Local Roads
  - Assist local agencies with speed limit guidance that analyzes operating speeds versus design speeds

# Speed Management Action Plan

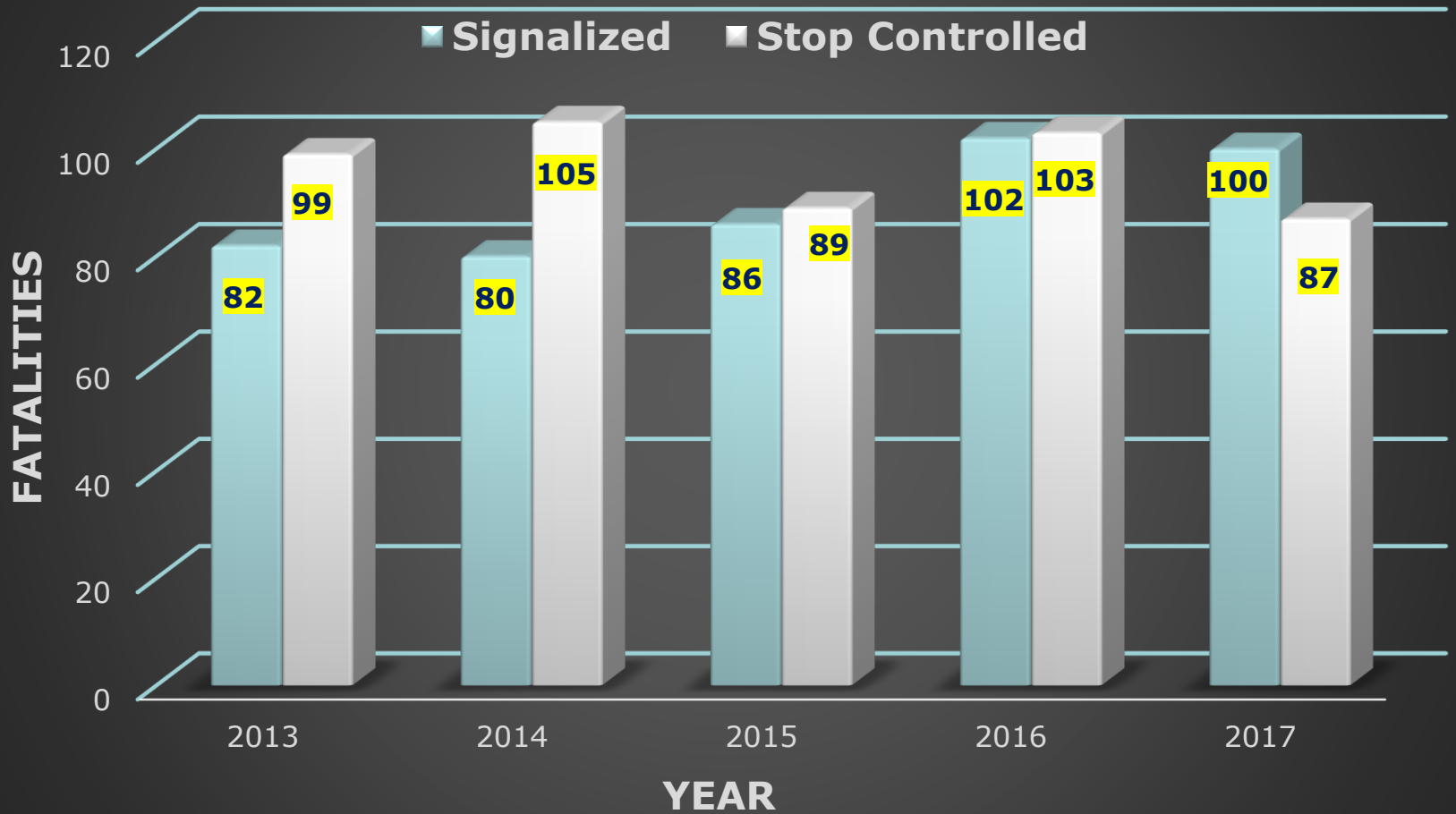
What are we currently doing

- Analyzing signalized intersections with 40 & 45 MPH approaches



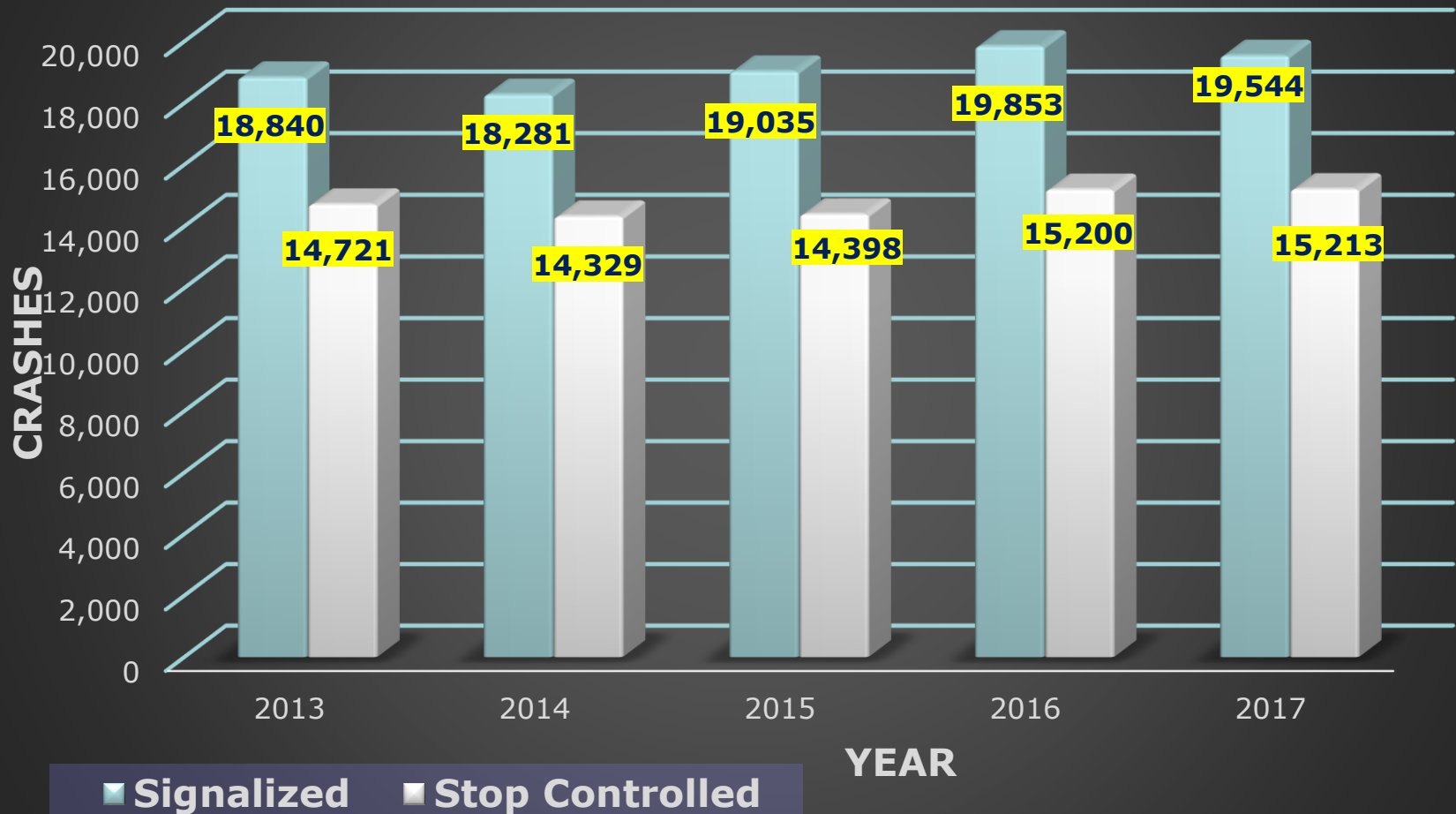
# Crash Data

## Intersection Fatalities



# Crash Data

## Intersection Crashes



## ➤ Narrowing Down the Data

- Signalized Intersection crashes and fatalities are on the rise
- Year end reports were showing a negative trend for intersections despite intersection safety projects being completed every year
- A recent in-house study showed that not all intersection safety projects were resulting in respectable safety returns

## ▶ Narrowing Down the Data

- In Pennsylvania, 32 percent of all intersection Fatal & Serious Injury crashes are speeding-related at roads with posted speed limits between 40 to 45mph.
- Focusing on road sections with this speed limit range may lead to more effective fatality reductions. Provide direction to start at roads with posted **40 & 45 MPH Speed Limit**

- Page 14 of the Speed Management Action Plan

## ▶ Data for Signalized Intersections & Speed Limits

- All signalized intersection locations
- The streets where these signals are located
- The speed limit of those streets
- Crash data at those intersections

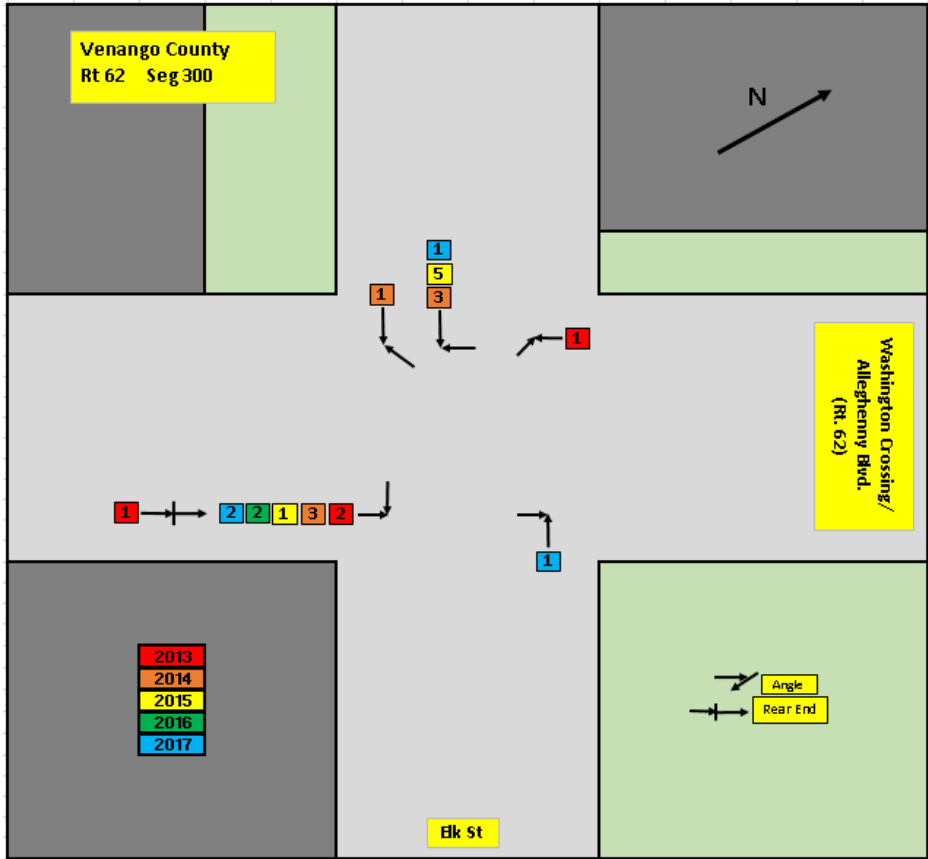
# Intersection Safety Review

- Reviewed 3,525 signalized intersections that met criteria
- Determined main crash type, main causation factor along other key factors
  - % running red light
  - % proceeding w/o clearance
  - % night time crashes
  - % speeding related

Major segment	Major offset	Minor Street	State Route	Major segment	Major offset	Intersection Criticality	Total Crashes (2013-17)	F&I Crashes (2013-17)	Main Crash Type	Main Causation Factor	Percent Running Red Light	Percent Proceeding w/o Clearance	Percent Nighttime Crashes	Percent Speeding Related Crash	On County Network Screening? (Y/N)
0420	0000	MAIN ST (SR 0073)	0073	0070	0000	C	35	11	Rear-End	Too Fast For Condition	3%	3%	37%	31%	Y
0140	1008	RUIZTUPPW RD (SR 2011) & NORTH HEADING PLAZA DWAY (DDP)	2011	0100	1435	C	18	10	Angle LT	Improper Turn	11%	2%	44%	11%	Y
0140	0000	LEESPORT AVE (SR 1004/TWP)	1004	0040	2061	C	11	5	Angle NT	Running Red Light	17%	4%	9%	18%	Y
0160	0513	PARK RD (SR 1010)	1010	0010	0000	C	10	5	Rear-End	Other	6%	0%	30%	30%	N
0130	0856	TUCKERTON AVE & TUCKERTON RD	T547			C	5	2	Angle LT	Improper Turn	0%	10%	40%	0%	N
0040	3490	PRIVATE DR & QUARRY RD	TWP			C	1	0	Rear-End	Too Fast For Condition	0%	0%	0%	100%	N
0640	1668	MAPLEWOOD DR	T642			C	6	6	Rear-End	Physical Condition	8%	0%	33%	17%	N
0641	0000	MAPLEWOOD DR	T642			C	14	7	Angle LT	Distracted Driving	6%	0%	21%	0%	N
0650	0849	RIVER BRIDGE RD (SR 2077)	2077	0010	2365	C	21	16	Angle NT	Running Red Light	29%	0%	19%	19%	Y
0590	0000	LUMERLIN RD (SR 2025) & MUNICIPAL CREEK RD (SR 2025)	2025	0270	0000	C	40	24	Rear-End	Too Fast For Condition	4%	0%	25%	33%	Y
0650	0000	OLD SWEDE ROAD (SR 0662)	0662	0010	0000	C	16	8	Angle NT	Running Red Light	17%	3%	44%	13%	N
0040	1897	BROADMOOR BLVD	TWP			C	3	1	Angle NT	Running Red Light	33%	0%	0%	33%	N
0090	1059	NB SR 0222 OFFRAMP (SR 0222) (RAMP A & D)	8022	0250/0010	0663/0000	C	9	6	Rear-End	Failure to Respond To	11%	0%	33%	11%	N
0150	0000	PALISADES DR (SR 4030) & PLUM CREEK RD (SR 4030)	4030	0010	0000	C	7	4	Rear-End	Improper Turn	0%	0%	14%	43%	N
0090	2200	SB SR 0222 OFFRAMP (SR 0222) (RAMP C-1)	8022	0750	1413	C	4	2	Rear-End	Other	8%	0%	25%	50%	N
0090	0808	VAN REED RD	T560			C	16	10	Angle NT	Failure to Respond To	14%	0%	25%	6%	Y
0280	0000	COVER BRIDGE RD (SR 1030/T-711)	1030	0090	0000	D	6	5	Rear-End	Other	8%	0%	0%	33%	N
0150	0000	MEMORIAL HWY (SR 0662)	0662	0120	0000	D	8	4	Angle LT	Improper Turn	0%	14%	38%	0%	N
0040	1890	SHELBOURNE RD (SR 2033)	2033	0030	3665	D	0	0	---	---	0%	0%	0%	0%	N
0200	0000	WALL ST (SR 1003)	1003	0030	2811	C	9	7	Angle LT	Improper Turn	10%	0%	11%	33%	N



# Collision Diagrams



- Created 5 collision diagrams for each county (335 total)
- 5 locations selected based on total crashes at intersection

# Implementing Improvements

- HSIP funds are a possible funding source since SMAP is part of the SHSP
- Lower cost improvements can also be implemented by 715 funds or on capital projects
- Work with HOP units to address challenging intersections where new development is coming

## ▶ NCHRP 17-76 (Guidance for Setting Speed Limits)

- PennDOT is a member
  - Bob Pento is PennDOT's representative
- Project began in December 2016
- Will complete final deliverables April 2019
- Project will:
  - Identify factors that influence operating speeds
  - Provide guidance to make informed decisions related to establishing speed limits on roadways
- Oversight and research team includes
  - Federal, State, & Local governments
  - Texas Transportation Institute
  - Michigan State University.

# Questions

