



DELAWARE STRATEGIC HIGHWAY SAFETY PLAN: TOWARD ZERO DEATHS



**Delaware's Highway Safety
Improvement Program
MASITE Annual Meeting**

September 27, 2019

Agenda

- Safety in Delaware
- Delaware's HSIP
 - Site selection process
 - Systemic safety program
- Innovation/Challenges FG10



Slide 2

FG10

Remove "SHSP Process" from agenda

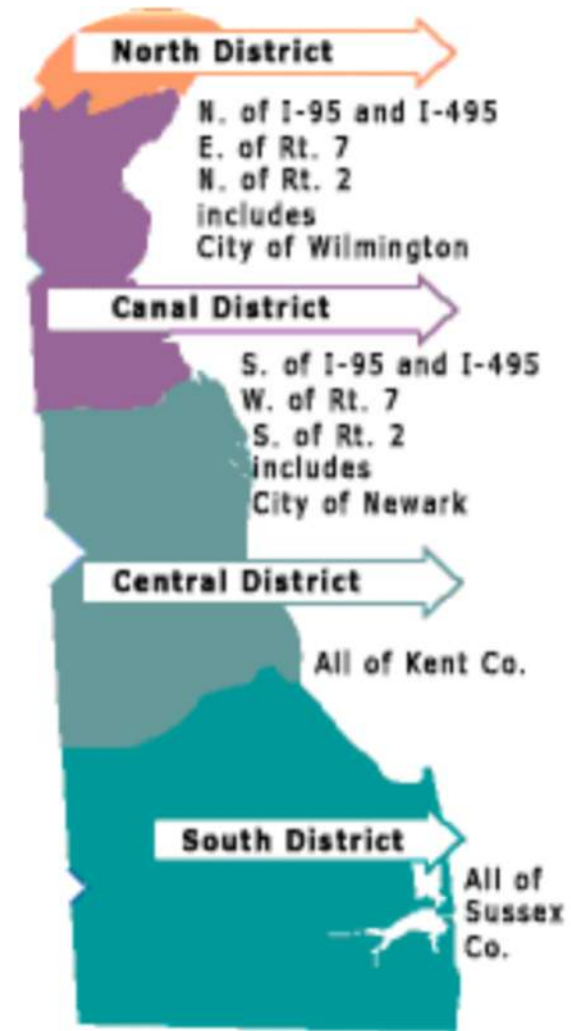
Frisby, Gregory, 9/19/2019

Safety in Delaware



Delaware Snapshot

- 13,954 total lane miles
 - DeIDOT maintains approximately 90%
- 3 counties
- 57 municipalities
- 4 maintenance districts
- 1 statewide Transportation Management Center



2015 SHSP Mission & Overall Goal Statements

MISSION

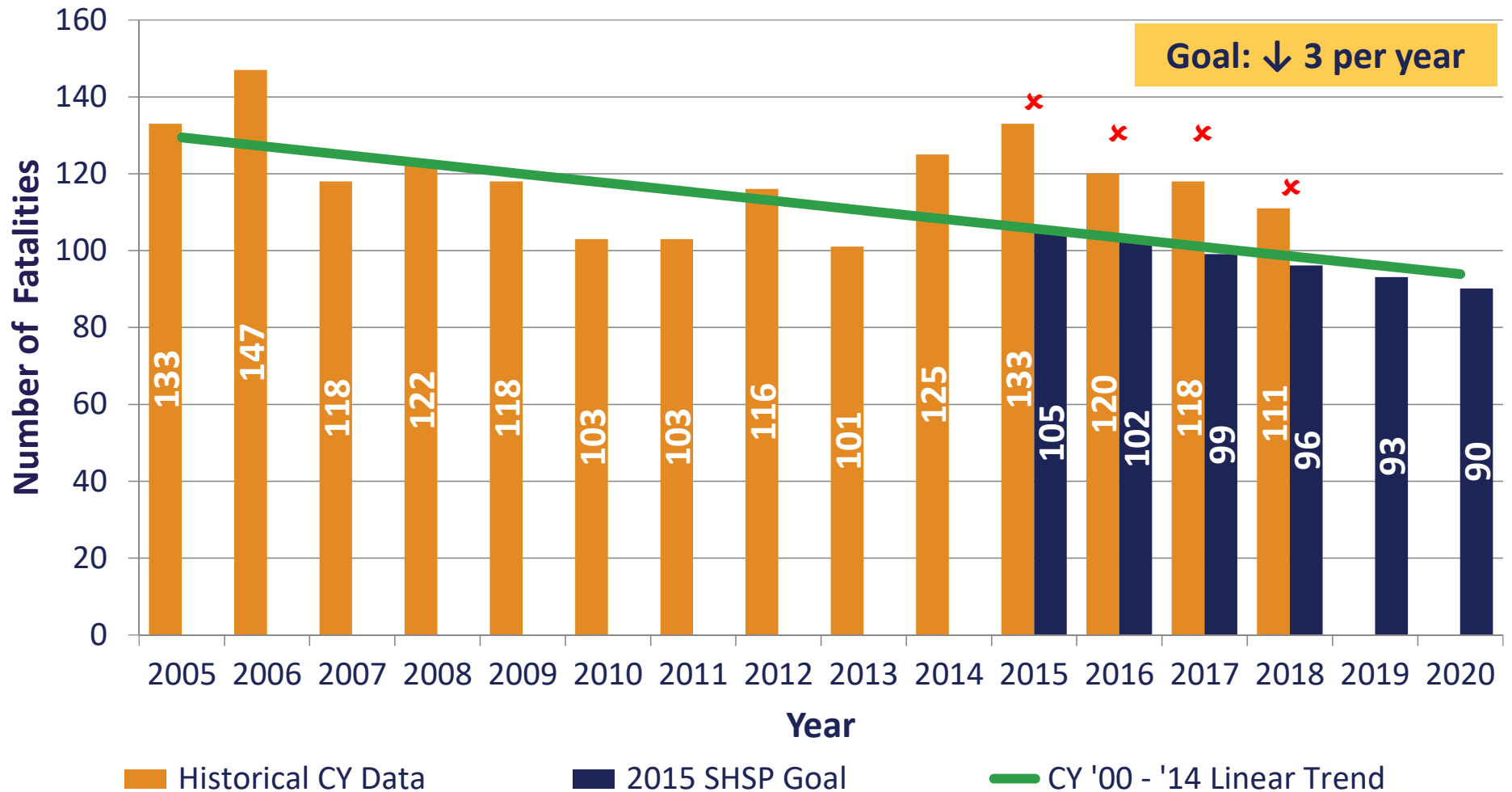
The *Delaware Strategic Highway Safety Plan: Toward Zero Deaths* aims to eliminate fatalities and serious injuries on Delaware's roadways through a multi-agency approach that utilizes education, enforcement, engineering and emergency medical service strategies.

OVERALL GOAL

The goal of the *Delaware Strategic Highway Safety Plan: Toward Zero Deaths* is to achieve a reduction of at least 3 fatalities and 15 serious injuries annually and continue to reduce the total number of fatalities and serious injuries to achieve at least a 50 percent reduction by 2035.



Number of Fatalities

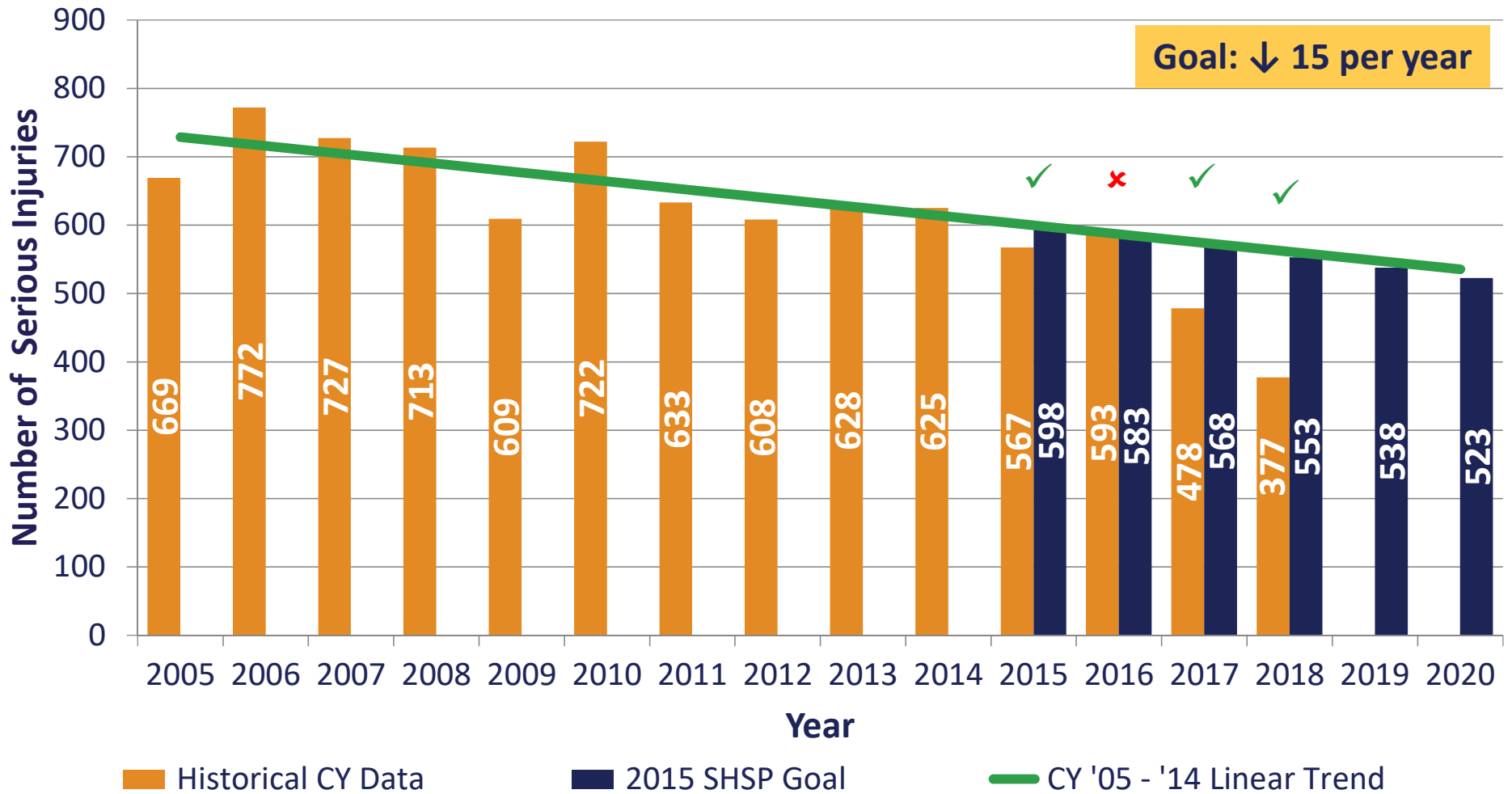


Source: CARS

✓ Goal Met ✗ Goal Not Met



Number of Serious Injuries



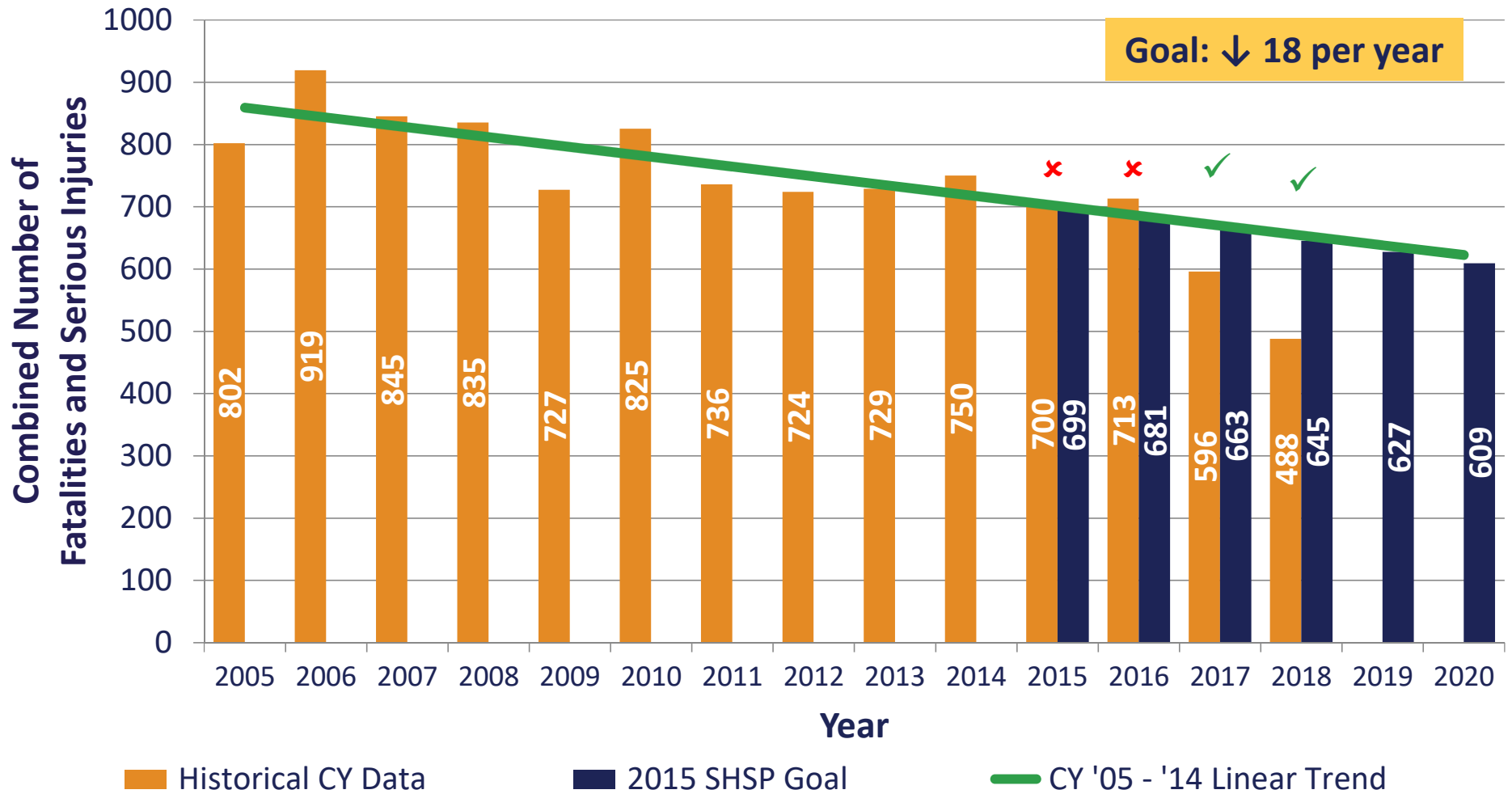
Source: CARS

✓ Goal Met ✗ Goal Not Met



2015 SHSP Overall Goal

(Combined Fatalities & Serious Injuries)



Source: CARS

✓ Goal Met ✗ Goal Not Met



2018 Fatalities Snapshot

	2017	2018	2018 - 2017
Total Fatalities	118	111	-7 (-6%)
Person Type			
Vehicle Occupants	68	64	-4 (-6%)
Seat Belts Worn	31	27	-4 (-13%)
Seat Belts Not Used	34	33	-1 (-3%)
Seat Belt Use Unknown	3	4	+1 (+33%)
Motorcyclists	10	17	+7 (+70%)
Pedestrians	34	24	-10 (-29%)
Bicyclists	4	6	+2 (+50%)
Crash Involvement			
Alcohol/Drug Related	54	31	-23 (-57%)*
Roadway Departure	41	43	+2 (+5%)
Work Zones	1	5	+4 (+500%)

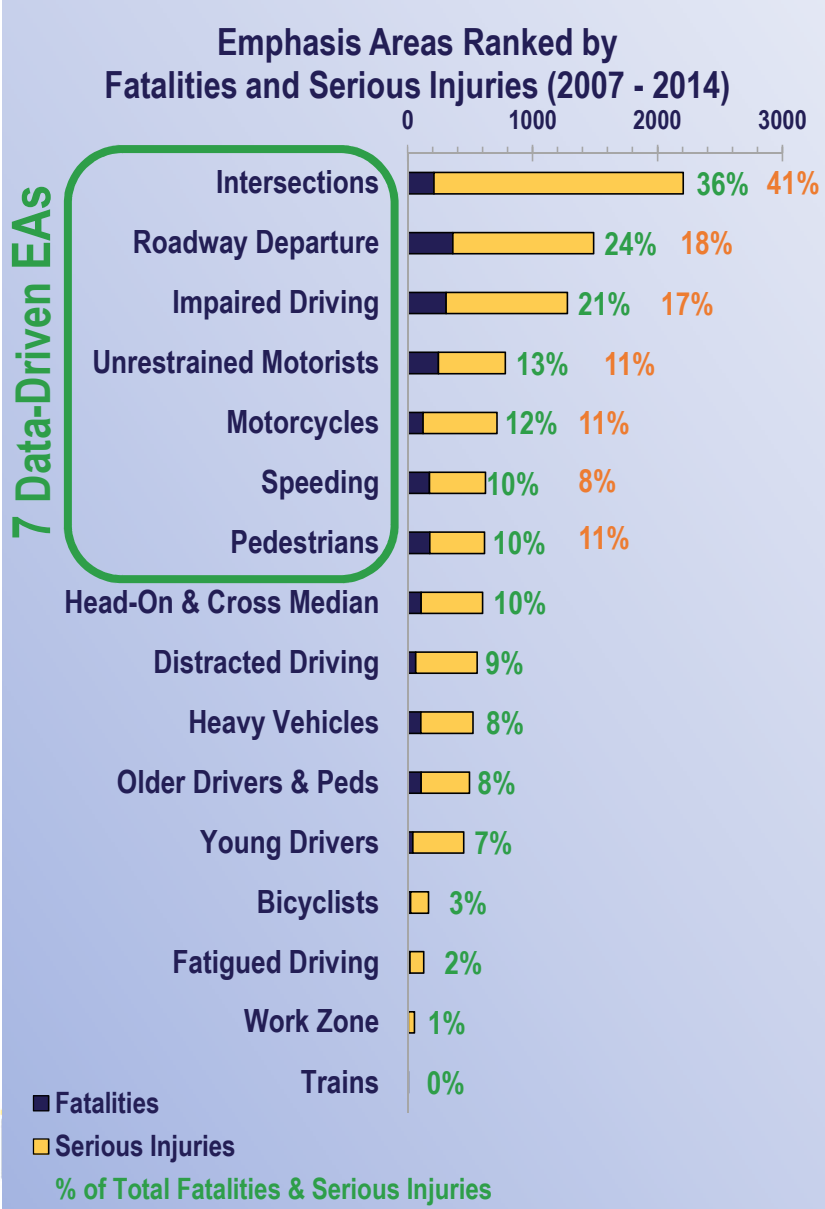
Source: OHS and DeIDOT based on analysis of CARS and fatal crash notices;

2018 year count is unofficial and could rise as fatal investigations are completed

* Alcohol/drug involvement is determined once the final/approved fatal crash report is completed. As of 1/28/2019, there are 31 fatal crashes pending final approvals



Delaware's 2015 SHSP Emphasis Areas

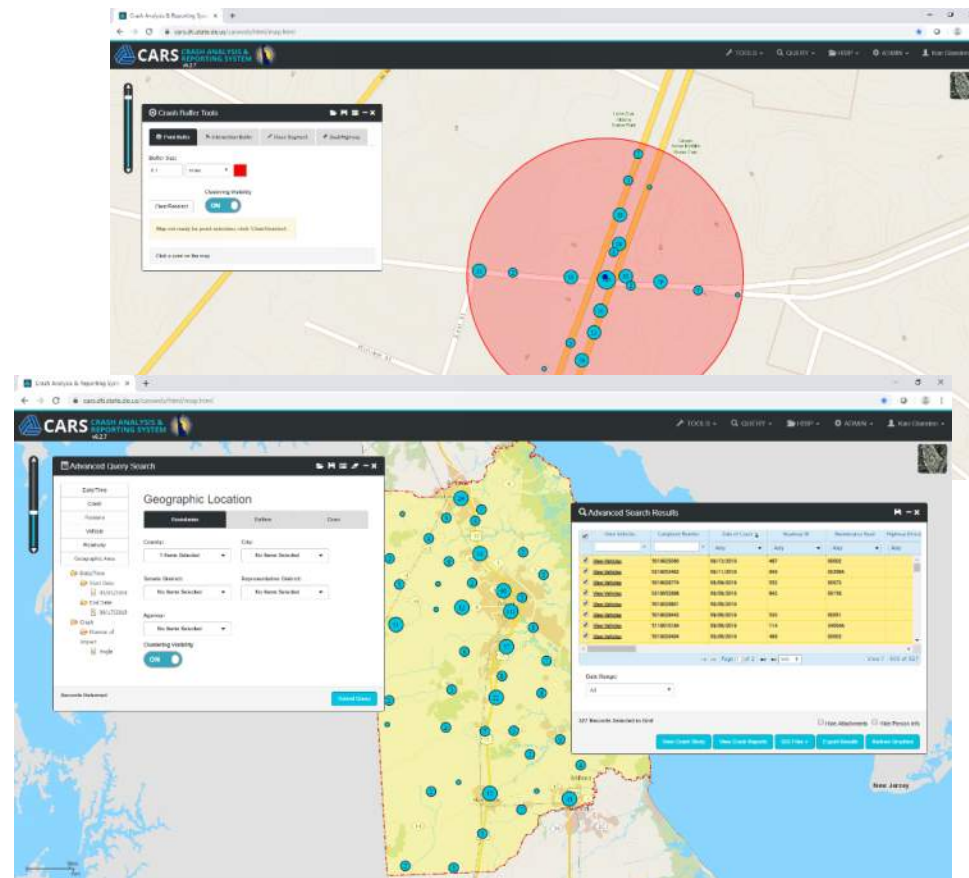


**Account for
94% (91%) of fatalities and
81% (75%) of serious injuries
(2007 – 2014 data)
(2015 – 2017 data)**



Crash Analysis Reporting System

- DeIDOT's crash database
- “Real-time” data
- Access to reports, summaries, user-defined queries, etc.
- Shared with Office of Highway Safety and Delaware State Police



Slide 11

FG1

Just verifying - It is public knowledge DelDOT is considering a new system, correct?

Frisby, Gregory, 9/18/2019

WA1

I'll double check with Scott, but I believe that is correct. He's working on the RFP now.

Weiser, Adam, 9/19/2019

Fatal & Serious Crash Investigations

- DeIDOT Safety staff dispatched to crash scene
- Close coordination with CRU Team
- Traffic control for scene preservation
- DeIDOT's investigation focuses on roadway elements
 - Signing
 - Pavement Markings
 - Sight Distances
 - Pavement Drop-Offs
 - Clear Zone / Fixed Objects
- Results used to evaluate trends in crashes and address roadway deficiencies if necessary
 - Location of crash
 - Other similar locations



Delaware's HSIP



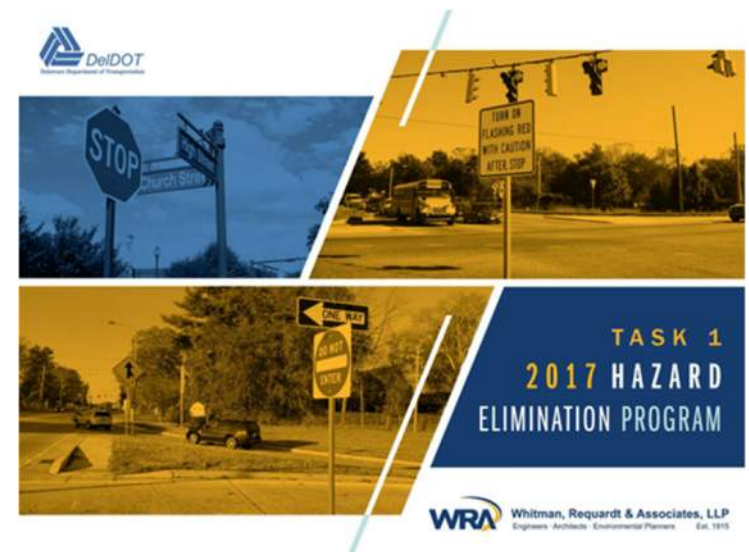
Delaware's HSIP

- Data driven safety programs
 - Based on SHSP
- Reactive and proactive components
- Safety Partners:
 - Delaware State Police
 - Delaware Office of Highway Safety
 - Delaware Office of Emergency Medical Services
 - Federal Highway Administration
 - National Highway Traffic Safety Services Administration
 - Other state and local partners



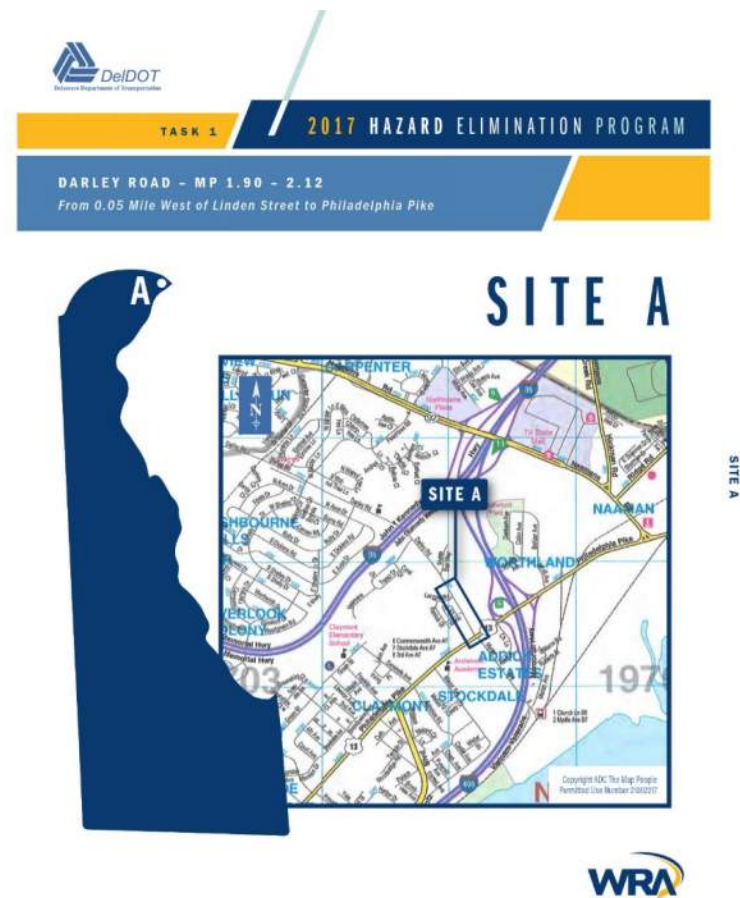
Delaware's HSIP

- Strategic Highway Safety Plan
 - 7 data driven emphasis areas
 - 1 non-data driven emphasis area (Traffic Records)
 - Sets strategies for overall safety programs in state
- Hazard Elimination Program (HEP)
 - Segment based ranking of high crash locations
 - Critical crash ratio methodology
 - Added intersection ranking component in 2018
- Systemic Safety Improvement Program
 - Developed in 2013
 - Countermeasure deployment



Hazard Elimination Program

- Original site selection process (prior to 2018)
 - Segment based approach
 - 15 sites per year
 - No severity weighting factors
 - 3 years of crash data for all crash severities
 - Yielded lots of repeat sites



Hazard Elimination Program

- Modified segment based site selection
 - Similar to previous approach except:
 - 3 years of crash data, only fatal and injury crashes
 - Segments must have minimum of 5 fatal and/or injury crashes within a 3-year period to be considered for study
 - Aligns more closely with SHSP
 - Works to avoid repeat sites



Slide 17

FG9

Talking Point for why we adjusted process: Kept seeing repeat sites. Particularly low volume roadway crossing high volume roadway.

Frisby, Gregory, 9/19/2019

Hazard Elimination Program

- Intersection based site selection
 - Developed in 2018
 - Identify intersections with the highest safety needs while considering crash severity
 - Consistent with SHSP EA-1: Intersections
 - Crash frequency, not crash rate
 - Prioritize locations with highest potential for reduction of fatal and serious injury crashes
 - Signalized and unsignalized intersections ranked separately
 - 5 intersections of each type selected for further study
 - Crash severity index based on research performed at University of Delaware
 - Not currently utilizing EB methodologies



Slide 18

FG2

I seem to recall us deciding not to share the actual index weight scores. I need to pull out my notes in the office.

Frisby, Gregory, 9/18/2019

FG7

Adam - I did write this down in my notes from our brainstorming meeting. I have a note to indicate we are not using Emperical Bayes

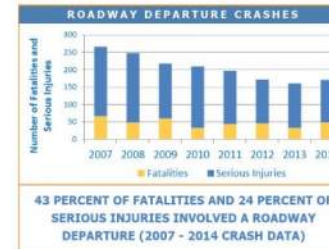
Frisby, Gregory, 9/19/2019

Systemic Safety Improvements Program

- Developed in 2013
- Utilized SHSP data to determine countermeasure implementation
 - Specifically for roadway departure crashes
- Developed several improvement projects:
 - Longitudinal rumble strips
 - High-friction surface treatments
 - Freeway median barrier
 - Others underway



Why systemic? Certain crashes don't follow a hot-spot pattern



Change how we think about safety improvements

- Identify problems based on system-wide data
- Identify types of crashes that are spread across the roadway network and not clustered at specific locations
- Identify roadway characteristics that are frequently present in severe crashes:
 - Geometry (shoulder/lane width, curvature)
 - Traffic volume
 - Functional classification



LONGITUDINAL RUMBLE STRIPS

- Consider both center line and edge line (rumble strips and rumble stripes)
- Prioritize all arterials, collectors, and local roadways statewide based on curvature, shoulder width, lane width, and ADT
- Consider noise impacts, presence of bike traffic, and pavement condition
- Standard design of rumble strips modified to address concerns from bike community
- Three-year open-end contract established for implementation using HSIP, HRRRP, and Section 154 Penalty Transfer Funds

HIGH-FRICTION SURFACE TREATMENT (HFST)

- Prioritize all roadways statewide based on roadway departure crash rates on wet pavement
- Focus on horizontal curves and high wet-weather crash locations
- Three-year open-end contract established for implementation using HSIP, HRRRP, and Section 154 Penalty Transfer Funds



FREEWAY MEDIAN BARRIER

- Consider both high-tension cable barrier and double-faced guardrail (when HTCB is not viable)
- Prioritize remaining I-95 and SR 1 locations without median barrier based on daily traffic volumes, curvature, and head-on and cross-median crash rates
- Three-year open-end contract to address remaining freeway medians in New Castle and Kent Counties without barrier



Systemic: Rumble Strips

- Proven safety countermeasure at reducing the frequency of roadway departure crashes
- Rumble Strip Open-End Contract:
 - 223 miles of center line installed
 - 133 miles of edge line installed
- Upcoming testing of sinusoidal rumble strips, ^{FG8} (i.e., Mumble Strips)



FG8

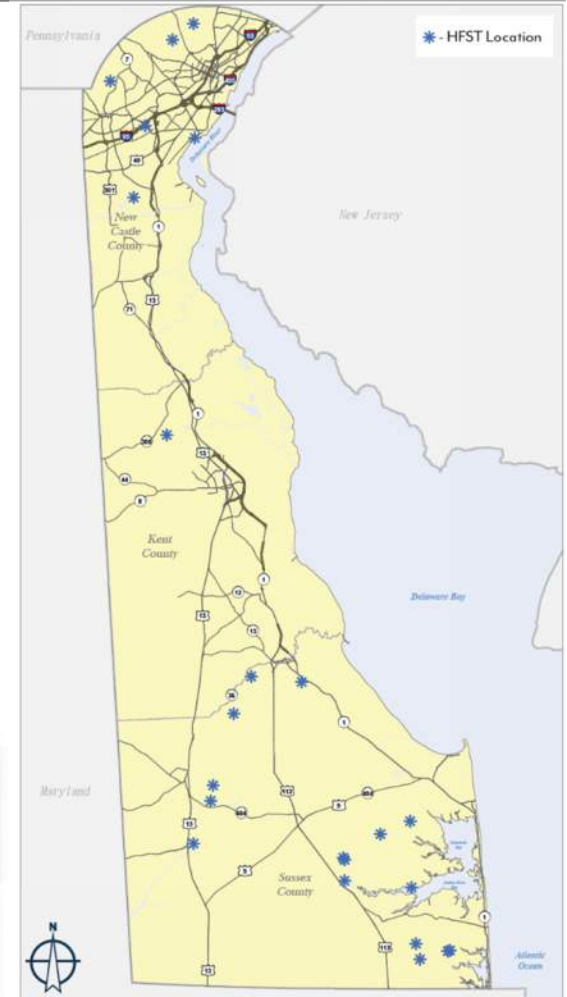
Add "(i.e., Mumble Strips)

Frisby, Gregory, 9/19/2019

Systemic: High Friction Surface Treatment (HFST)

- Candidate locations identified using data-driven process and screening based on several factors
- After testing, 34,500 SF was installed @ over 25 locations (thru 2017)
- Before/after evaluation:
 - Reduced wet-weather crashes per year by 55%
 - Reduced total crashes per year by 21%
 - Reduced roadway departure crashes by 56%
- DeIDOT is planning to award a new open-end contract for installation

**National Roadway Safety Award
for Infrastructure and Operational
Improvements Award Winner**



Systemic: Freeway Median Barrier

Route 1 cable barrier catches crash; saves lives

Mike Phillips | Jan 24, 2018 - 11:08 am | (0)

- Median barrier installations since 2009:
 - SR 1 – 4.2 miles of HTCB from SR 299 to SR 896 (2009)
 - SR 1 – 2.9 miles of steel guardrail from north of Tybouts Corner to north of SR 273 (2009/2010)
 - I-495 – 0.85 miles of HTCB from I-95 to US 13 (2013)
 - SR 1 – 2.3 miles of HTCB from Roth Bridge to US 13 (2014)
 - I-95 – 1.2 miles of steel guardrail from north of Rest Area to north of SR 273 (2017)
 - SR 1 – Approx. 11.5 miles from Smyrna to Odessa (2019)
 - SR 1 – Approx. 1 mile from north of SR 896 to south of Biddles Toll Plaza (2019)
- Additional median barrier design underway/planned:
 - I-95 – Approx. 2.5 miles from ½ mile south of Harvey Rd to the PA State Line (*construction starting soon*)
 - SR 1 – Approx. 12 miles from south of SR 9 to south of Smyrna
 - Installations will be primarily HTCB with small sections of w-beam guardrail



Systemic: Horizontal Curves

- Horizontal Curve Safety Project (ongoing)
 - Arterial and collector roadways > 1,000 AADT
 - 3,400 locations statewide
- Investigating feasibility/benefits of increasing yellow centerline width to 10" within curves (pilot will be implemented at a speed transition area)
- DeIDOT working with utility companies to relocate and/or improve delineation of utility poles in locations with crash histories



Innovations and Challenges



Program Challenges

- Public involvement
 - NIMBY – rumble strip placement
 - What is that new stuff on the pavement? – HFST
 - Emergency response concerns with HTCB
 - How many people have to die...?
- Legislative involvement
 - Not in my constituents back yard...
 - How many people have to die...?
 - Ease of access to Department staff
- Pedestrians
- Bicyclists, especially resort areas

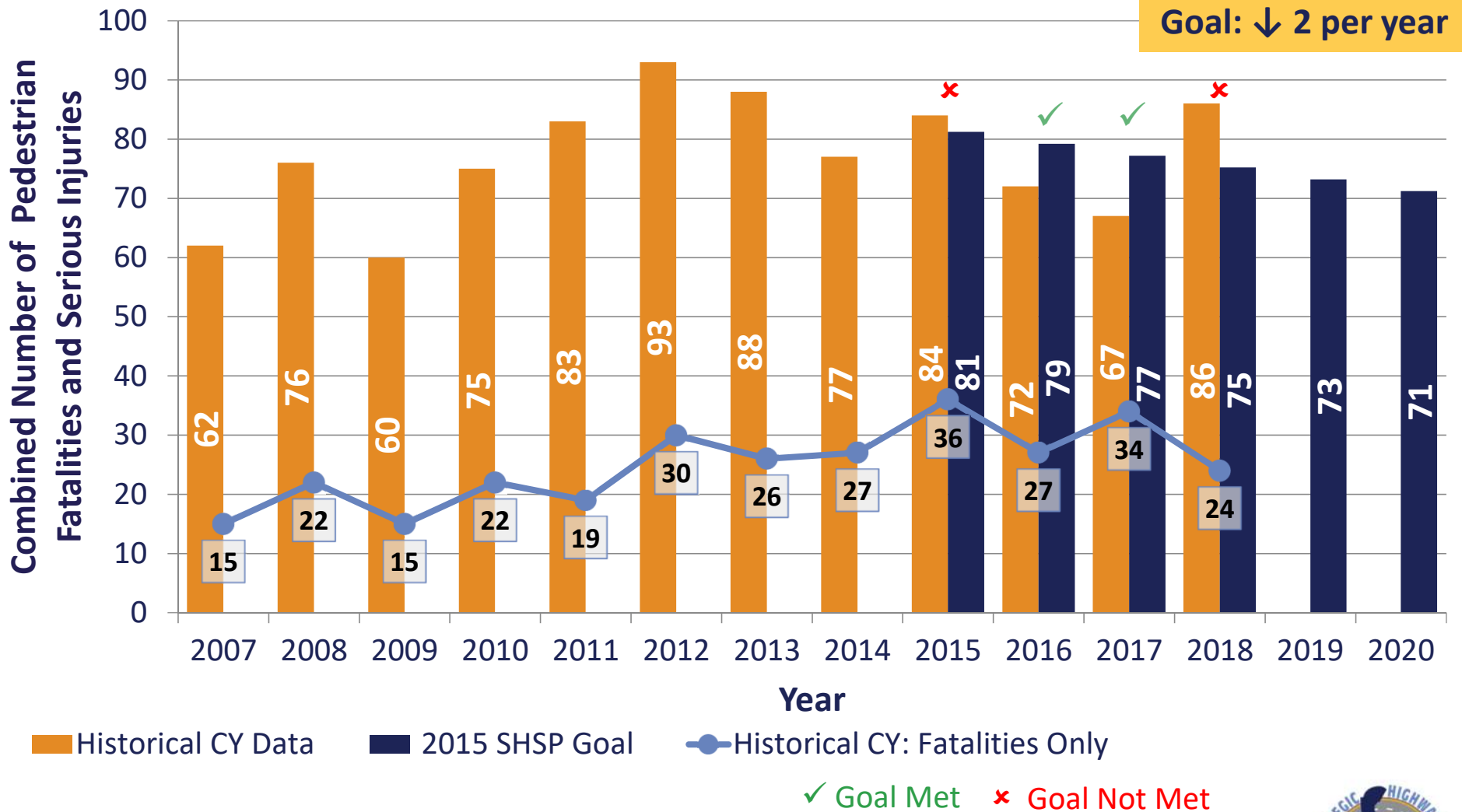
Slide 25

FG11

I anticipate you'll be able to share a lot of experiences here.

Frisby, Gregory, 9/19/2019

Delaware Pedestrian Crashes



Source: CARS



Pedestrian Fatality Rate per Capita Delaware vs. Nation

Pedestrian fatalities per 100k population	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Delaware	1.85	2.41	1.69	2.45	1.98	2.94	2.70	2.67	3.70	2.84	3.43
DE National Rank*	13	2	10	1	4	1	1	3	1	4	2
DC	3.23	1.52	2.33	2.15	1.29	1.11	1.39	1.37	1.93	1.17	1.59
Maryland	2.06	2.06	1.98	1.75	1.75	1.63	1.82	1.69	1.53	1.73	1.88
Pennsylvania	1.21	1.10	1.06	1.14	1.15	1.28	1.15	1.26	1.18	1.32	1.15
Virginia	1.14	0.98	0.93	0.91	0.90	1.20	0.91	1.06	0.92	1.45	1.31
West Virginia	1.49	0.72	1.15	0.70	1.08	1.67	1.51	1.03	1.03	1.31	1.43
Max. State Rate/Yr	3.23 (DC)	2.67 (FL)	2.51 (FL)	2.45 (DE)	2.57 (FL)	2.94 (DE)	2.70 (DE)	3.55 (NM)	3.70 (DE)	3.51 (NM)	3.54 (NM)
Min. State Rate/Yr.	0.38 (WY)	0.28 (NE)	0.37 (WY)	0.44 (NE)	0.38 (NE)	0.24 (SD)	0.14 (ND)	0.48 (NE)	1.48 (ID)	0.63 (NE)	0.66 (ND)

States in NHTSA's Region 3

Source: National Highway Traffic Safety Administration (NHTSA)

* Includes 50 States and District of Columbia



HAWK Construction



HAWK Construction



HAWK Pedestrian Signal Compliance Review

October 2017



Rectangular Rapid Flash Beacon (RRFB)

State St at Bayhealth



Gills Neck Road



Polly Drummond Hill Road



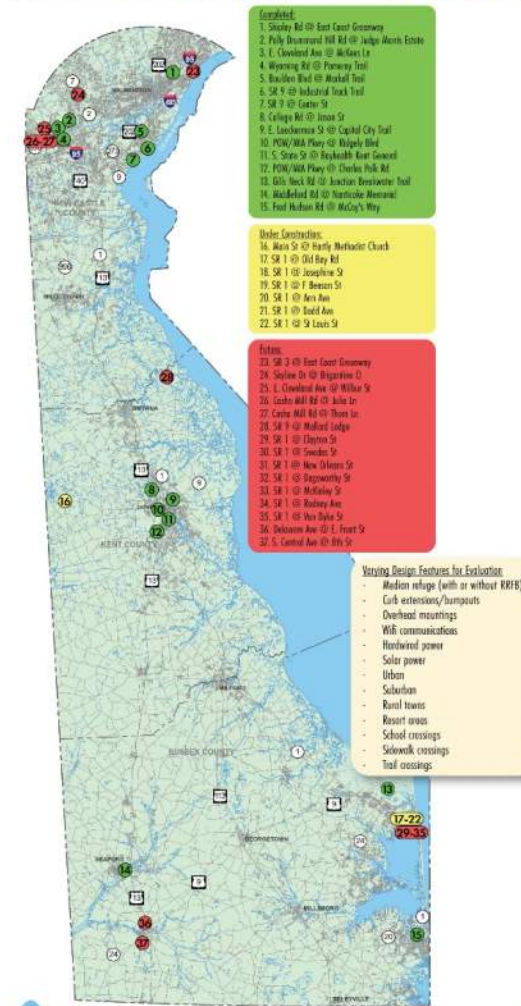
7th St at Dobbinsville

Rectangular Rapid Flash Beacon (RRFB)

BEFORE/AFTER MOTORIST YIELDING COMPLIANCE

	BEFORE RRFB	WITH RRFB	
			
Florida 2009	2-4%	55-70%	60% improvement
Florida 2009	2%	54%	52% improvement
Florida 2010	4%	72-96%	80% improvement
Texas 2011	<1%	80%	79% improvement
Oregon 2011	2-25%	74-83%	63% improvement
Michigan 2014	20%	69%	49% improvement
Texas 2014	<1-28%	37-89%	49% improvement
1 Shipley Rd @ East Coast Greenway	27-38%	46%	14% improvement
2 Polly Drummond Hill Rd @ Judge Morris Estate	3%	34-36%	32% improvement
3 E. Cleveland Ave @ McKees Ln	5-7%	49-58%	48% improvement
4 Wyoming Rd @ Pomeroy Trail	24%	68-84%	52% improvement
6 SR 9 @ Industrial Track Trail	6-14%	37-44%	31% improvement
7 SR 9 @ Center St	9-11%	46-51%	39% improvement
8 College Rd @ Jason St	3%	53-54%	51% improvement
9 E. Lockeman St @ Capital City Trail	10-37%	56-61%	35% improvement
10 POW/MIA Pkwy @ Ridgely Blvd	3-9%	35-37%	30% improvement
11 S. State St @ Bayhealth Kent General	29-51%	71-85%	38% improvement
12 POW/MIA Pkwy @ Charles Polk Rd	3-10%	14-48%	25% improvement
13 Gills Neck Rd @ Junction Breakwater Trail	73-74%	69-82%	2% improvement
14 Middleford Rd @ Nanticoke Memorial	3-30%	75-76%	59% improvement
15 Fred Hudson Rd @ McCoy's Way	30-34%	50-53%	20% improvement

PLANNED & CONSTRUCTED RRFB PILOT DEPLOYMENT LOCATIONS



Program Innovations

- Use of open-end contracts
 - Get more done quickly
 - Reduces “design” time
- New products /countermeasures
 - Can get new innovations on street faster
 - Fewer “hoops” to jump through
 - Ex: RRFBs, HAWKs, HFST, lane narrowing, etc.



FG6

This feels out of place - breaks up ped topics

Frisby, Gregory, 9/18/2019

Thank You!



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Associate
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Slide 33

FG12

Up to you, but I'd recommend adding PE, PTOE, PSP to your names.

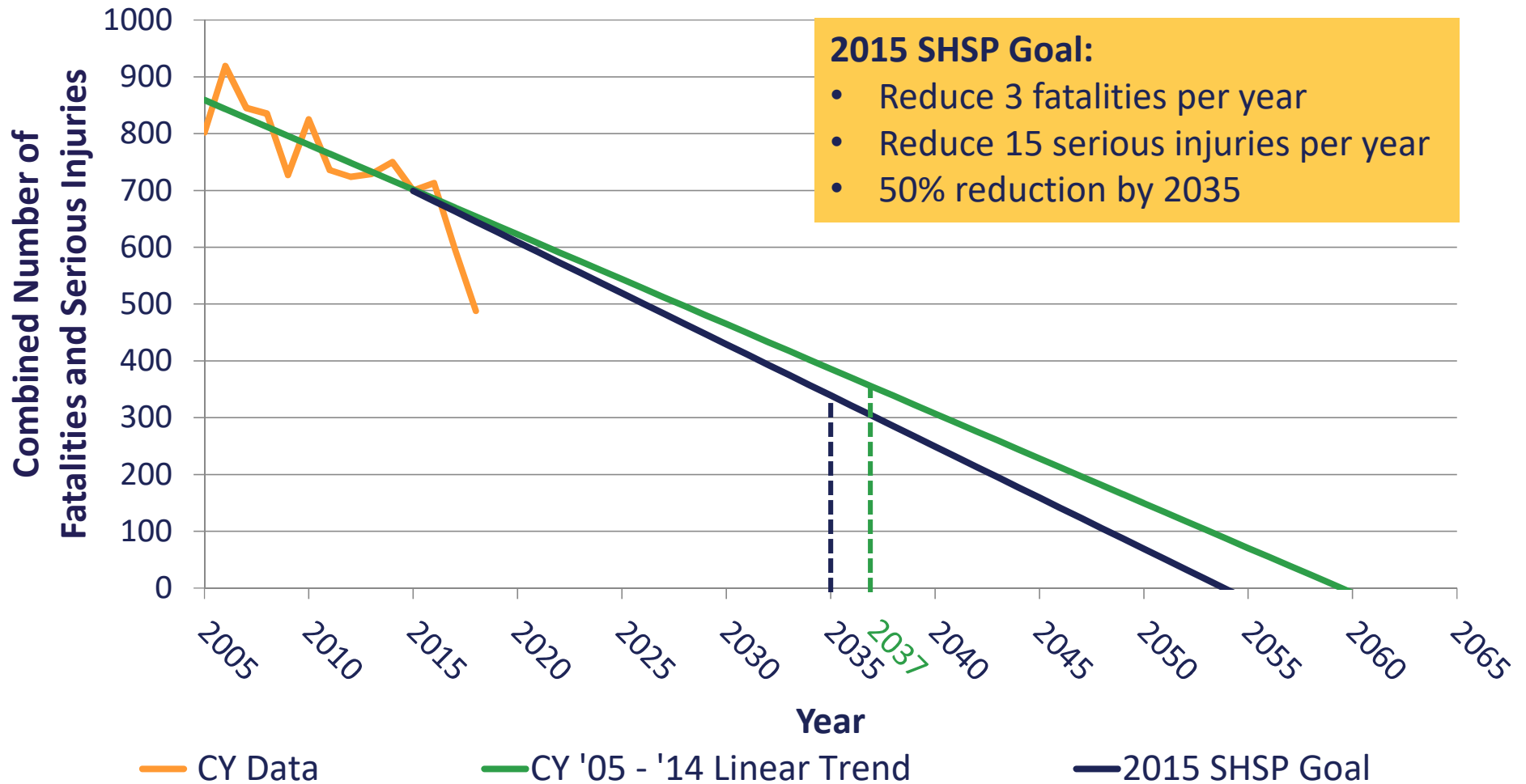
Frisby, Gregory, 9/19/2019

EXTRA SLIDES



2015 SHSP Overall Goal

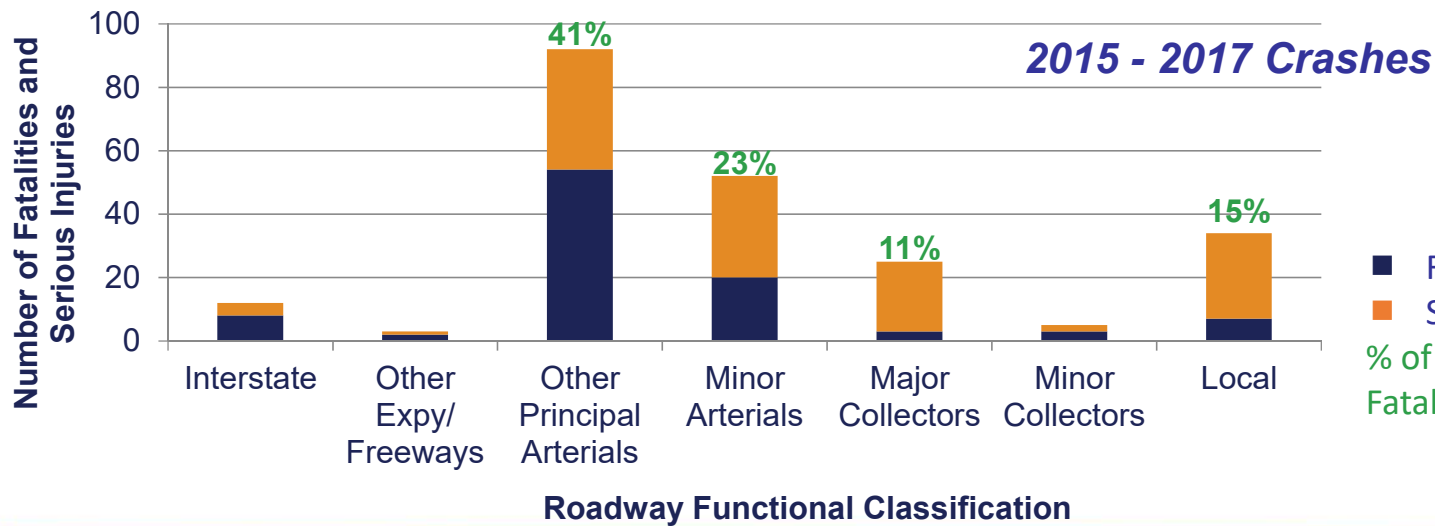
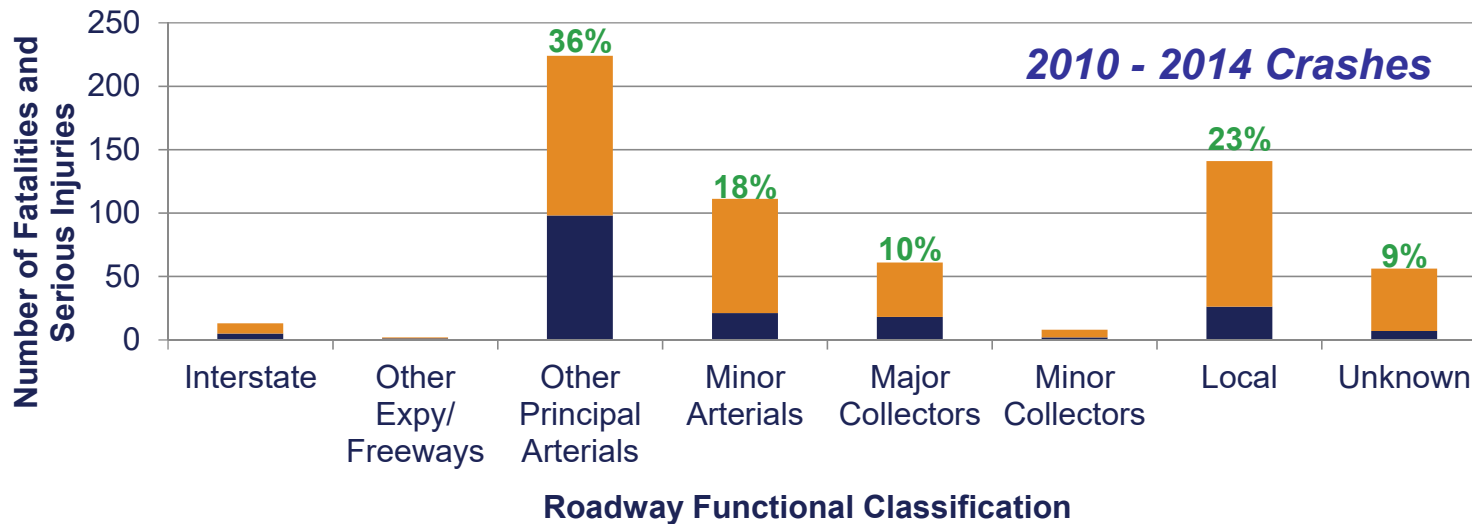
(Combined Fatalities & Serious Injuries)



Source: CARS



Pedestrians – Where?



EA 7: Pedestrians

Data Trends of Fatal and Serious Injury Persons (2015-2017 Crashes)

- 88% occurred in urban areas
- 61% were in New Castle County (decrease from 68%)
- 73% were male (increase from 63%)
- 50% were 20 to 49 years old
- 56% occurred between 4 and 11 PM
- 56% occurred along divided roadways (increase from 42%)
- 48% occurred on principal arterials (increase from 36%)
- 21% of fatalities were impaired (decrease from 33%)
- 37% occurred during dark (unlit) conditions
- 34% occurred on a Friday or Saturday
- 24% were at an intersection

Compared to Data Trends Reported in 2015 SHSP (based on 2007-2014 crash data)



Delaware Pedestrian Council

- Executive Order #54 re-established the Advisory Council on Walkability and Pedestrian Awareness (Pedestrian Council) - signed by Governor Markell on October 12, 2015
- Council's purpose is to assist DeIDOT with re-evaluation, implementation, and recommendations regarding the Statewide Pedestrian Action Plan and prioritization of pedestrian infrastructure improvements
- The Council has 6 specific goals as outlined in Executive Order #54:
 - Identify gaps in the system of pedestrian paths and sidewalks to create continuous, interconnected pathways
 - Provide advice regarding design standards for crosswalks, sidewalks, and pathways ensuring ADA compliance
 - Provide advice regarding implementation of DeIDOT's Sidewalk and Multi-Use Path Maintenance Policy
 - Review traffic rules to help support a safe pedestrian environment
 - Provide advice regarding accessibility and connectivity to make transit a more viable option for DE citizens
 - Develop strategies for pedestrian safety, education, and awareness
- Initial recommendations included in March 2017 Report



Pedestrian Emphasis Area Strategies

- Continue multi-agency approach (DeIDOT, OHS, DSP, etc.)
- Consistent Public Education/Information
- Conduct targeted enforcement campaigns
- Improve pedestrian infrastructure
- Research and implement latest "best practice" pedestrian countermeasures
- Conduct pedestrian safety audits at high-crash locations
- Install effective pedestrian countermeasures
- Perform before/after studies of safety treatments
- Ensure vehicle-pedestrian laws are included in drivers education lesson plans
- Support legislative enhancements to strengthen pedestrian safety laws
- Develop policies and guidelines to support pedestrian safety measures



Crash Analysis Reporting System

Crash Occurs

- DSP or local police agency responds to collect data.
- Drivers, passengers and witnesses are interviewed

Report Approval

- Higher ranking officers within each troop review all crash reports for clarity and accuracy
- Reports are approved and then included in the database

Transfer of Data

- On a nightly basis, crash data is electronically transferred from DeIJIS to DeIDOT and stored in DeIDOT's crash database
- Database populates information into CARS for study purposes

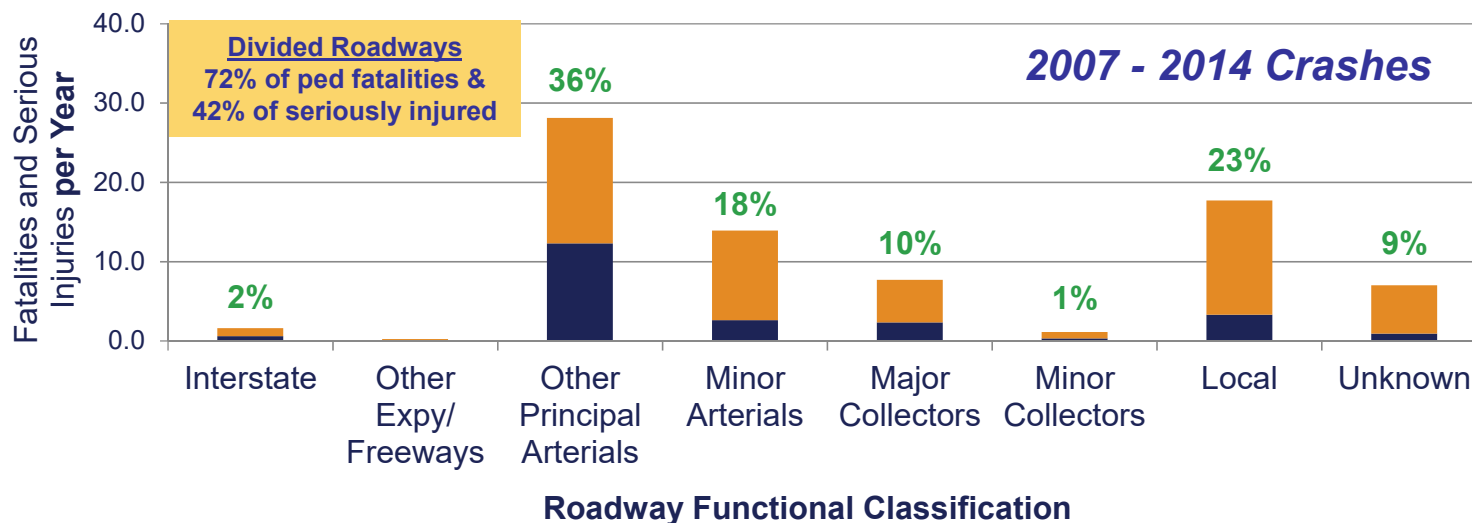
Crash Data Review

- DeIDOT staff utilizes database to review crash data
- Crash data can be viewed in the mapping program or specialized queries can be developed, depending upon need

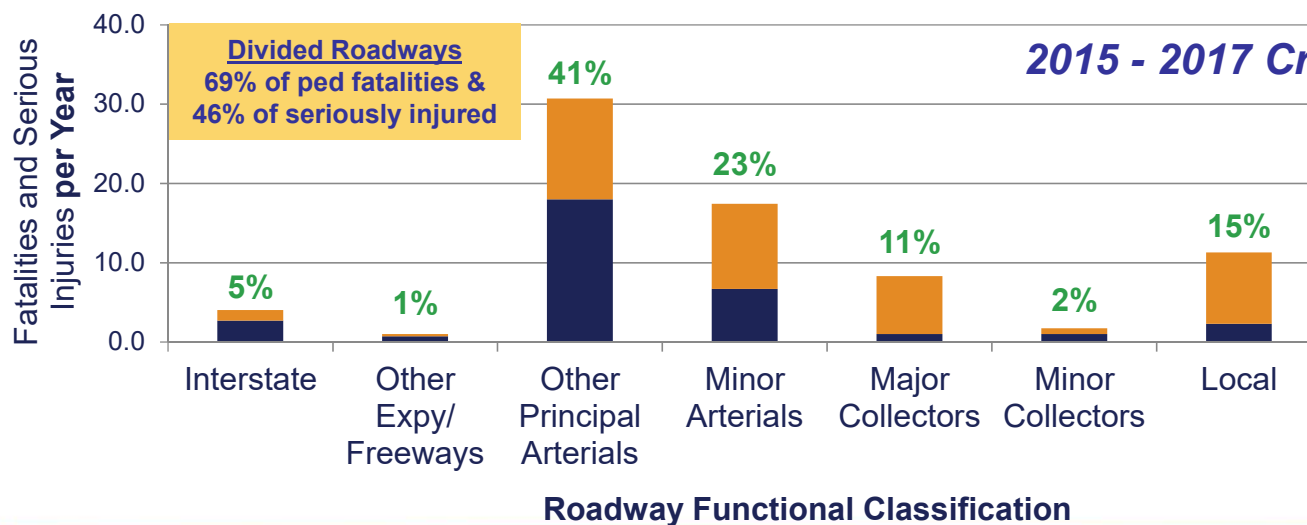
Data Review



Pedestrians Crashes by Functional Class



Fatalities + Serious Injuries per Year	2007-2014	2015-2017
Interstate	1.6	4.0
Other Expy/Freeways	0.2	1.0
Other Principal Arterials	28.1	30.7
Minor Arterials	13.9	17.4
Major Collectors	7.7	8.3
Minor Collectors	1.1	1.7
Local	17.7	11.3
Unknown	7.0	-
TOTAL	77.3	74.4



■ Fatalities
■ Serious Injuries
% of Total Pedestrian Fatalities & Serious Injuries



Pedestrian Fatalities by County

Nationwide Comparison

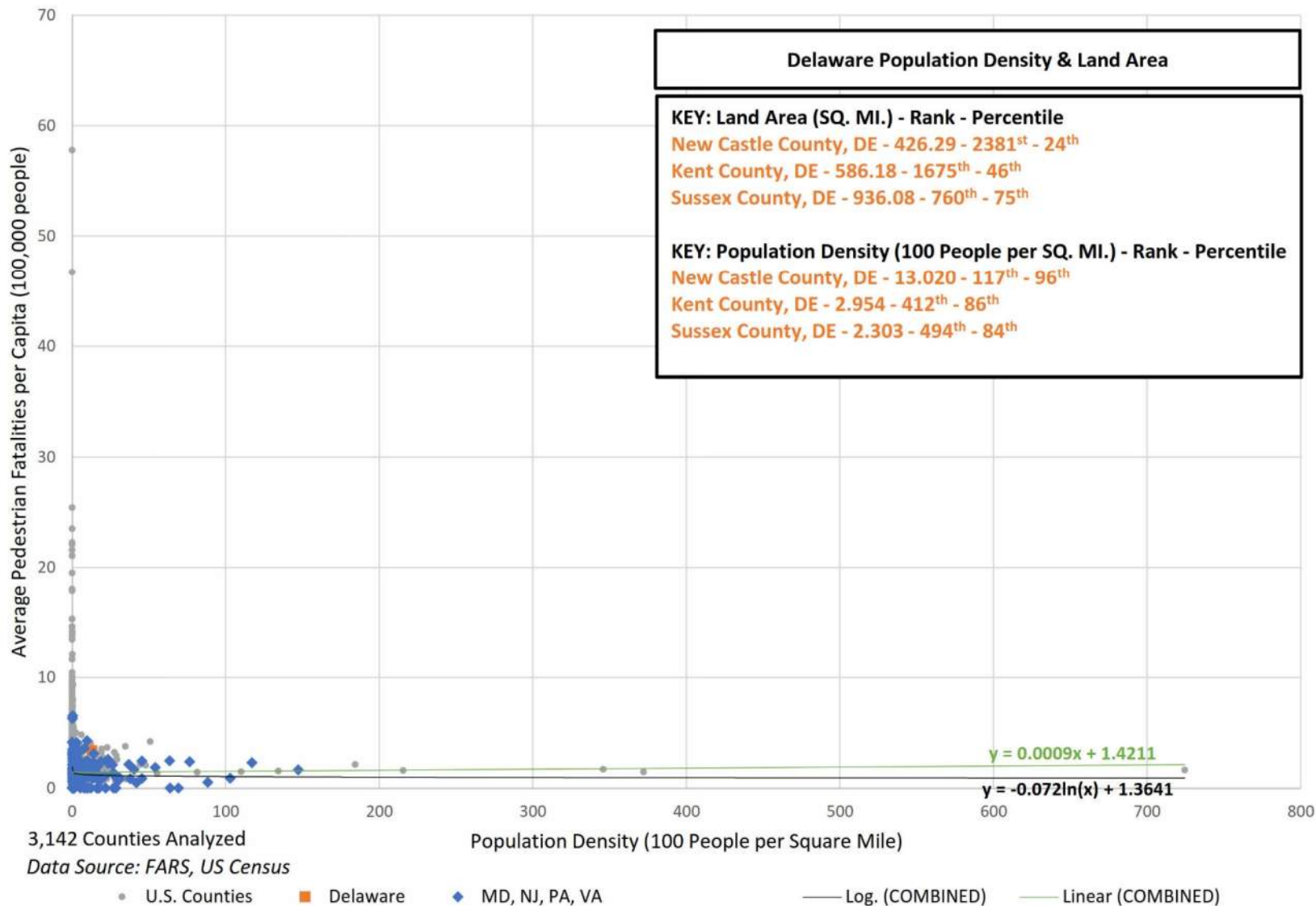
- Pedestrian fatalities per capita vs. population density
- Data Sources
 - Crashes: FARS Data (2013 – 2017)
 - Population: US Census
- Conclusions
 - When compared to counties nationwide with similar population densities, all 3 DE counties rank high
 - Statistically, not a strong correlation between variables



Pedestrian Fatalities by County

Nationwide Comparison

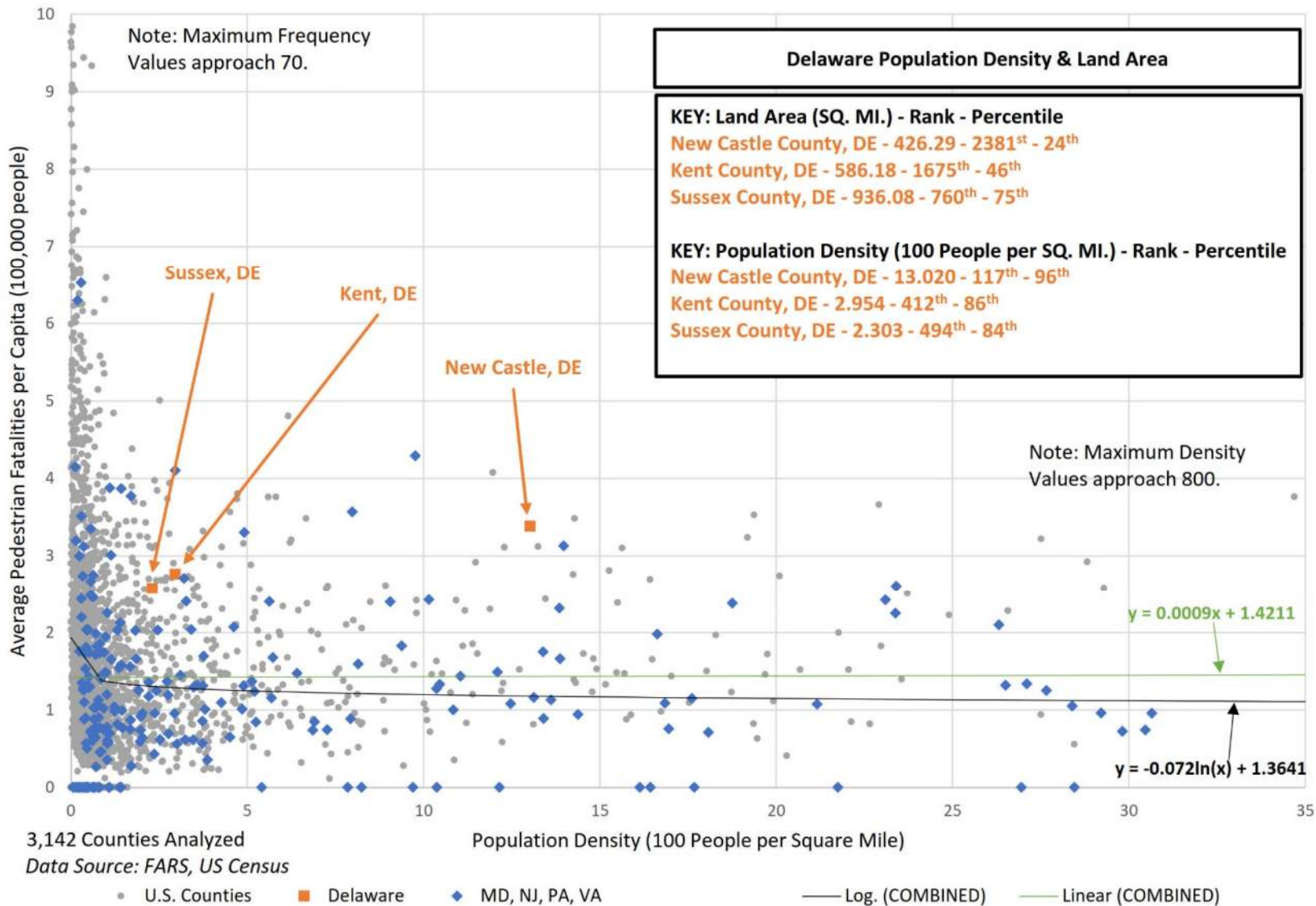
Average Pedestrian Fatalities per Capita by County versus Population Density (2013-2017)



Pedestrian Fatalities by County

Nationwide Comparison

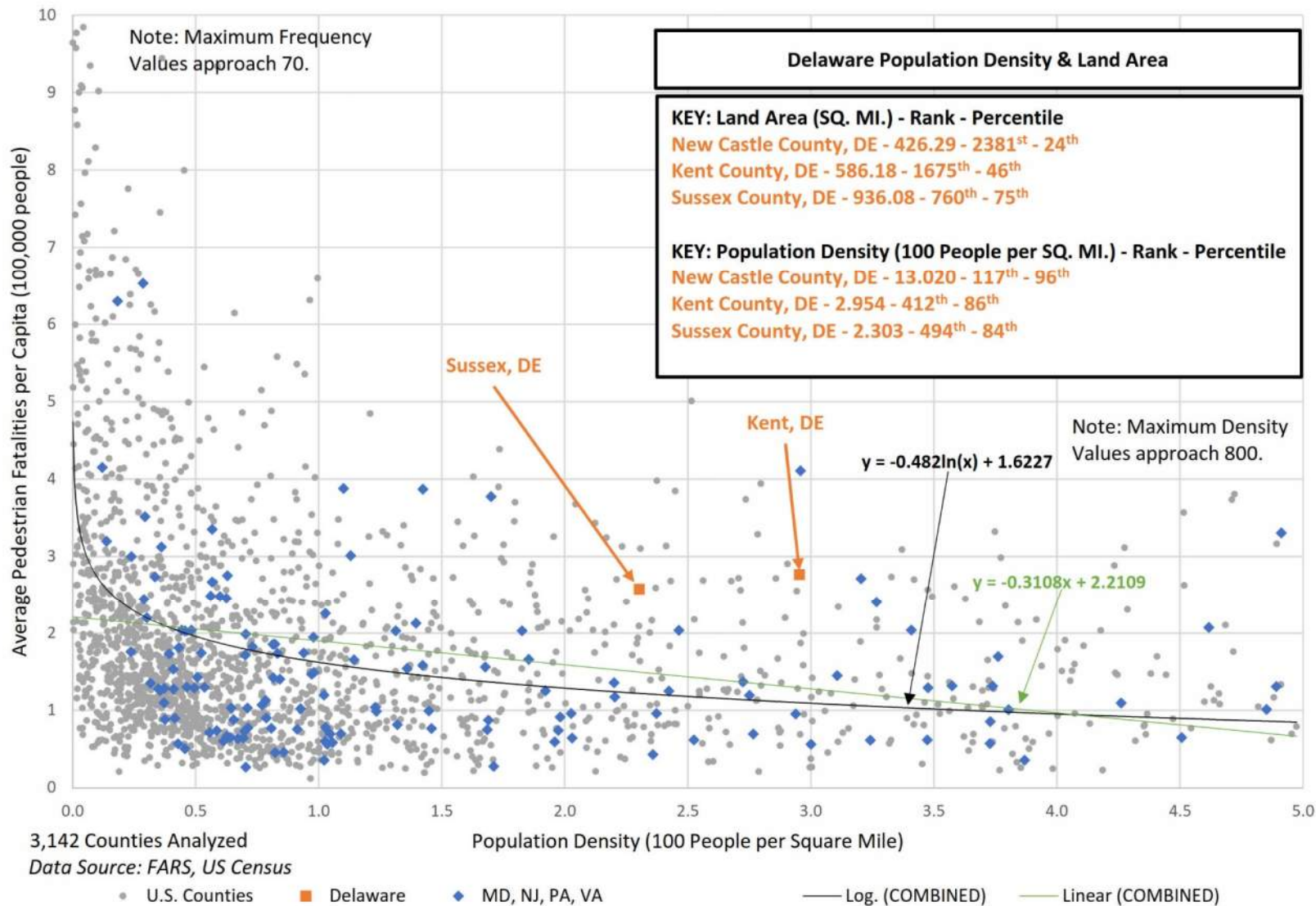
Average Pedestrian Fatalities per Capita by County versus Population Density (2013-2017)



Pedestrian Fatalities by County

Nationwide Comparison

Average Pedestrian Fatalities per Capita by County versus Population Density (2013-2017)



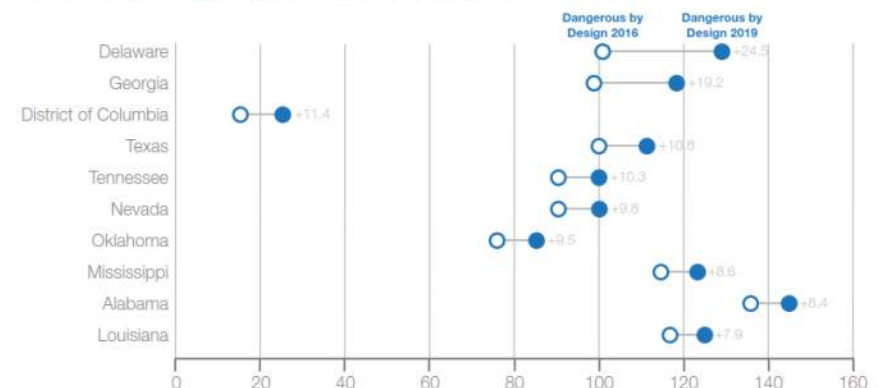
Dangerous by Design Publications

- Published by Smart Growth America and National Complete Streets Coalition
- Pedestrian Danger Index
- DE had largest increase in PDI between 2016 & 2019 publications

$$\frac{\text{Average annual pedestrian fatalities (2009-2014) / total population (in 2014)} \times 100,000}{\text{Percentage of commuters who walk to work}}$$

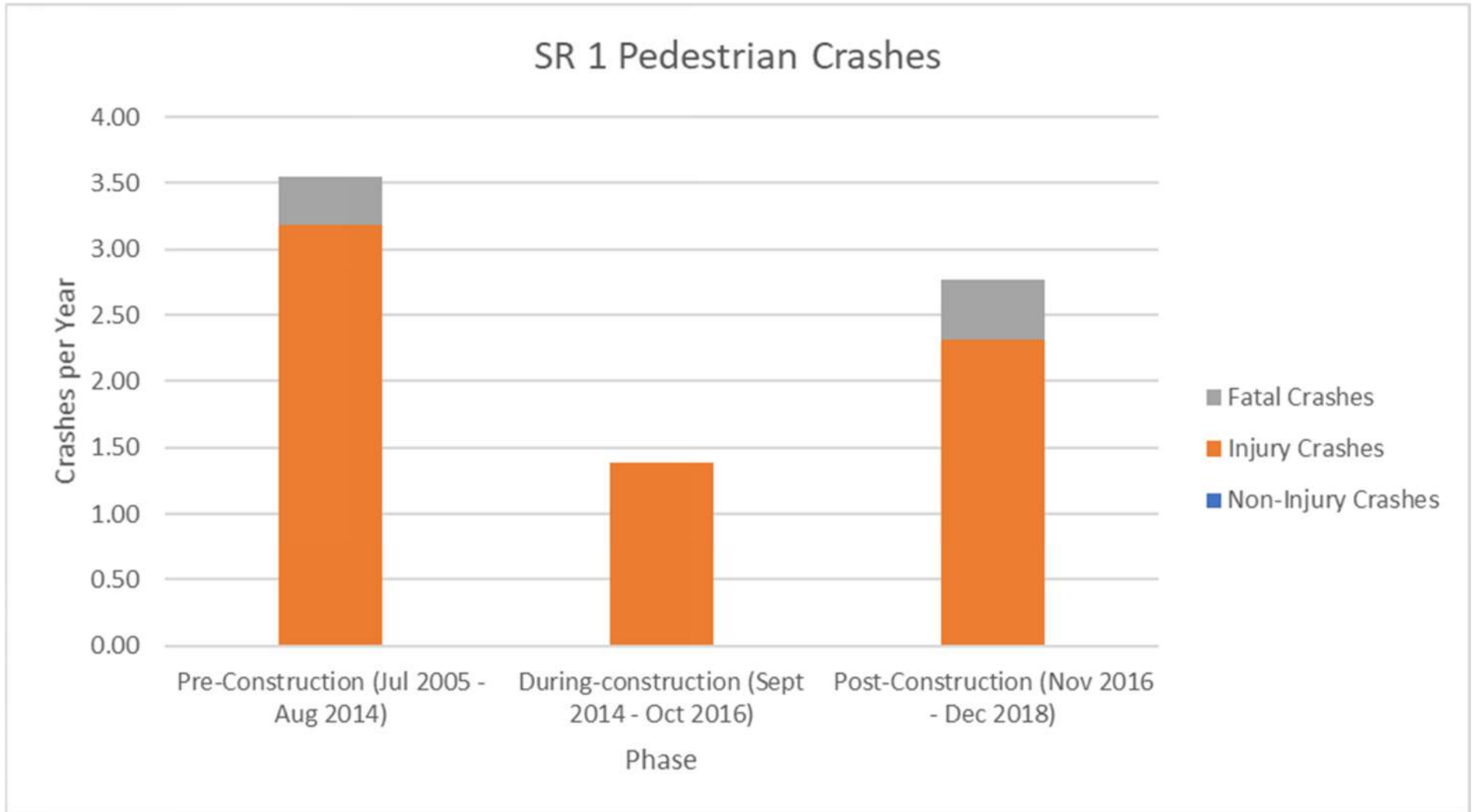
- Increase driven by increase in ped fatalities

States with Largest Increases in 10-Year PDI Scores



Pedestrian Safety Audits

Before-After Data Example



Status of Existing Efforts



Pedestrian Improvement Matrix

US 13 Pedestrian Safety Study: Improvement Matrix						
#	Location	Timeframe	Priority	Recommendation	Status	Done?
1	General	Short-Term	n/a	Coordinate with Delaware State Police to create a "cheat sheet" for the types of information to include in a pedestrian crash report and incorporate this information into DELJIS E-Crash training	DeIDOT and DSP have held several training sessions and guidances on the topic of improving pedestrian crash data. Notably, the following: - 2015 DE Highway Safety Conference - 10/10/18 Memo from Ray Sammons (DeJIS Training Administrator)	Ongoing
2	General	Short-Term	n/a	Establish a working group (including a DeIDOT Traffic Safety Engineer) to coordinate aspects of both new and old bus stop locations (<i>requires coordination with DTC</i>)		
3	General	Short-Term	n/a	Enhance the current <i>Bus Stop and Passenger Facilities Policy</i> (DTC-05) to incorporate and improve pedestrian safety (<i>requires coordination with DTC</i>)	Complete. Revised bus stop policy effective as of May 4, 2018	Yes
4	General	Short-Term	n/a	Develop pedestrian safety advertisements to install at bus stop shelters, specifically at high ridership locations (<i>requires coordination with DTC</i>)	Only one safety advertisement spotted (at the new southbound bus stop shelter at Bacon Avenue) as per field investigation on 6/20/18	No
5	General	Short-Term	n/a	Develop and distribute questionnaires to transit riders along the US 13 study corridor to gather feedback about pedestrian safety and facilities to better identify the topics needing further public outreach (<i>requires coordination with DTC</i>)	Survey conducted by Delaware Office of Highway Safety in 2016. Surveyed riders along various transit routes including Routes 22 and 25 along US 13.	Yes
6	General	Short-Term	n/a	Investigate the feasibility of providing prerecorded audio messages on buses directing pedestrians to cross at designated crosswalks (<i>requires further discussion with DTC</i>)		
7	General	Short-Term	n/a	Consider utilizing audible messages on DART buses along the corridor to emphasize safe crossing (<i>requires coordination with DTC</i>)		
8	Corridor-Wide	Short-Term	n/a	Replace / install directional arrows on pedestrian pushbuttons where missing	Incomplete as per field investigation on 6/20/18	No
9	Corridor-Wide	Short-Term	n/a	Replace/install pedestrian pushbutton signs with existing pedestrian signal throughout the corridor	Incomplete as per field investigation on 6/20/18	No



Pedestrian Improvement Matrix

- Current status
 - Reviewed; combined all studies
 - Need to post to SHSP webpage
- Path forward on outstanding items
 - Majority of location-specific improvements are tied to other projects
 - Corridor-wide and “big picture” items need further discussion
 - Meeting scheduled with Peter to discuss next steps
 - Suggest posting regular updates to webpage

Pedestrian O-D Data Review

- Crash report updated in 2017 with two new data fields
 - Originating Destination
 - Arriving Destination
- OHS reviewed compliance with data fields
- WRA reviewed 48 fatal pedestrian crashes from 2017 and 2018
 - Origin and destination provided in 20 records
 - Data found to be “useful” in 7 crash records
 - Origin only was provided in 16 records
 - No information provided in 12 records
- Examples of “useful” origin and destination data inputs
 - *Origin – “Parking lot of Fairfax Shopping Center (area of Walgreens)”*
 - *Origin – “Pedestrian exited a DART bus on Philadelphia Pike northbound just south of Holly Hill Road”*
 - *Origin – “Sidewalk on the south side of Walker Road across the street from 767 Walker Rd, Dover, DE 19904”*
 - *Destination – “Walking to Christina Meadows to pick up vehicle from family member”*
 - *Destination – “Pedestrian ran across roadway to catch another DART bus on Philadelphia Pike southbound just south of Holly Hill Road when pedestrian was struck”*
 - *Destination – “Home Instead Senior Care, located at 755 Walker Rd Suite A, Dover, DE 19904”*



Pedestrian O-D Data Review

- Plotted crash location, origin and destination in Google Earth
 - Purpose – determine if conclusions could be drawn from the data



Crash 3

Complaint: 01-17-134121

Crash Location: Philadelphia Pike, south of Holly Hill Road

Origin: Pedestrian exited a DART bus on Philadelphia Pike northbound just south of Holly Hill Road

Destination: Pedestrian ran across roadway to catch another DART bus on Philadelphia Pike southbound just south of Holly Hill Road when pedestrian was struck.

Conclusion: Good information from origin and destination. Analyst now knows why pedestrian crossed midblock and that a DART bus stop was involved. Countermeasures could focus on information about crossing locations at the bus stop and/or information messages about crossing safely when alighting bus. Could consider bus stop relocation with this data as well.

Pedestrian O-D Data Review

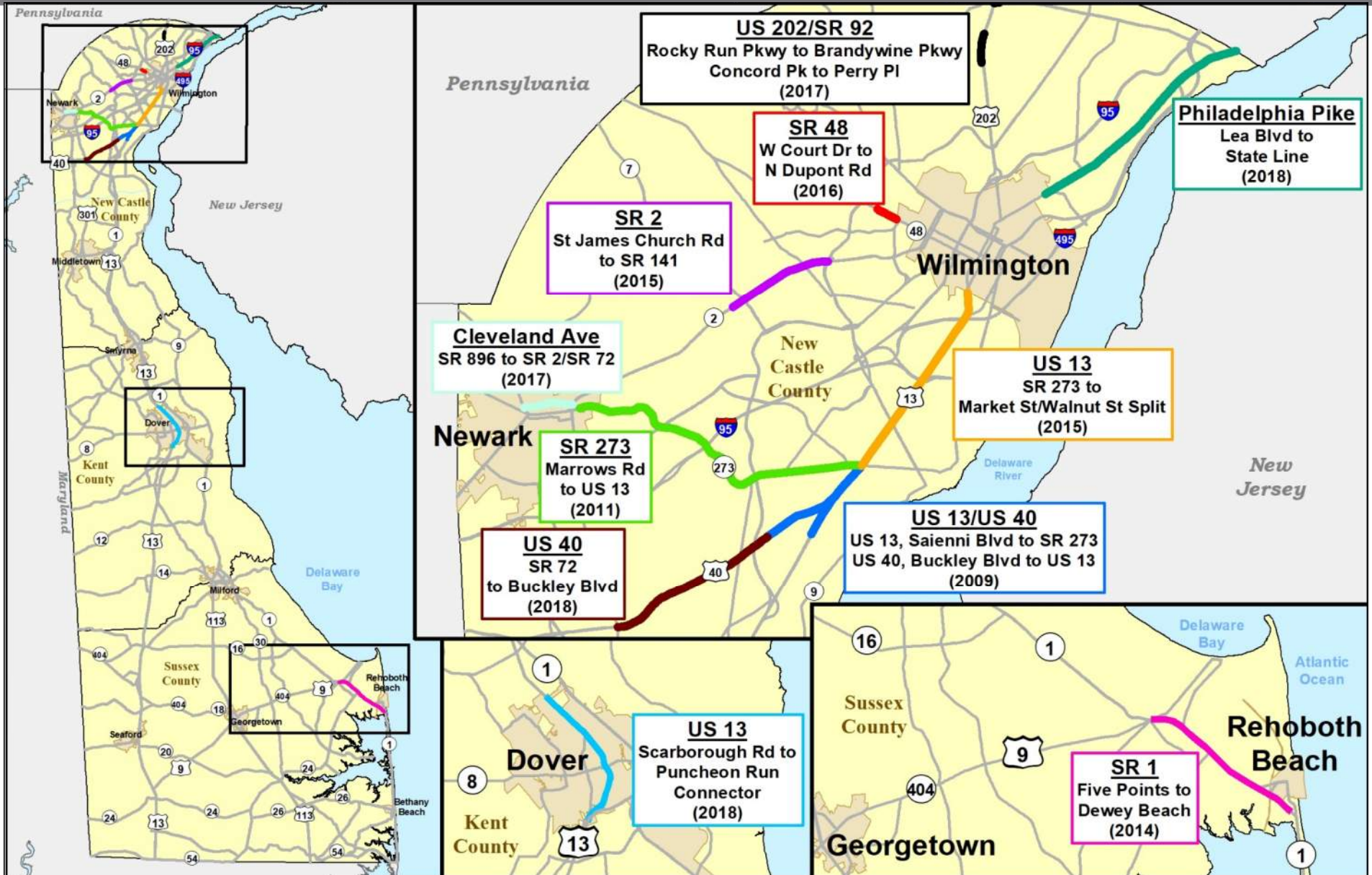
- Conclusions
 - Data fields not being used as intended
 - Likely reasons:
 - Lack of witnesses to provide information
 - Need for increased training regarding use of data fields
 - Time required to complete crash reports along with other competing priorities
- Recommendations
 - Continue use of data fields and improve compliance/data reliability
 - Change the name of the data fields to “Origin” and “Apparent Destination”
 - Provide Tool Tip within E-Crash for each field
 - Additional law enforcement training, especially locals
 - Prepare one-page “training” handout to officers
 - Continue reviewing data trends and monitoring data quality



Future Efforts



Completed Pedestrian Safety Audit Locations



Selection of Next Pedestrian Study Location

- Plotted 2007-2018 crash data to identify areas with high concentration of ped crashes
- Using GIS, each crash assigned to a geographic grid
 - State and County Maps: ½ mi x ½ mi grid size
 - Municipality Maps: 100 m x 100 m grid
 - Dover, Newark, and Wilmington maps developed based on visual inspection of state and county maps
- Each grid assigned a score based on the number of crashes
 - Unweighted: Crash severity not considered
 - Weighted: Utilize a weighting factor based on crash severity
 - Fatal = 40
 - Injury = 4.5
 - PDO = 1.0
- Grids plotted with a color scale to highlight “hot spots”
- Recommend **systemic** pedestrian study for City of Wilmington
 - Evaluate pedestrian crashes in City and determine trends
 - Identify systemic countermeasures
 - Network screening analysis to determine prioritization of countermeasures



Pedestrian Barriers

- US 13 barrier design underway
- Prioritization of next locations for pedestrian barriers
 - US 40 – recommendations from pedestrian safety audit

- Moderate to heavy mid-block pedestrian crossings
- Documented crash history
- Wider medians

Segment		Length (miles)	# of Ped Crashes Potentially Correctable with Barrier Installation*
From	To		
SR 72	Scotland Drive	0.64	8
Scotland Drive	Becks Woods Drive	0.34	0
Becks Woods Drive	Porter Rd/Salem Church Rd	0.39	2
Porter Rd/Salem Church Rd	Glasgow Drive	0.22	3
Glasgow Drive	Brookmont Drive	0.24	0
Brookmont Drive	Church Rd/Wellington Dr	0.17	2
Church Rd/Wellington Dr	Glendale Blvd/Walther Rd	0.79	4
Glendale Blvd/Walther Rd	Geissler Park/Governors Square	0.50	9
Geissler Park/Governors Square	SR 7	0.18	1
SR 7	Eden Square	0.10	0
Eden Square	SR 1 SB Ramps	0.27	0
SR 1 SB Ramps	SR 1 NB Ramps	0.17	0
SR 1 NB Ramps	Buckley Boulevard	0.28	2

Priority Segment for Barrier Treatments



Policy Discussion

- Ped crossings on all 4 legs vs. one crossing of mainline (e.g., US 13 at DSU)
- Diagonal crossings (e.g., US 13 at Rustic Lane)
- Speed limits
- Lane widths
- Complete Streets
- Land use



New Technologies and Approaches

- Predictive Method – multiple research efforts currently underway
 - NCHRP 17-84: Pedestrian and Bicycle SPFs for HSM
 - NCHRP 17-87: Enhancing Pedestrians Volume Estimation and Developing HCM Pedestrian Methods
- Others?



Next Steps

- Prioritize remaining corridor-wide initiatives from Pedestrian Improvement Matrices
- Begin design work on prioritized pedestrian barrier projects
- Systemic pedestrian study for City of Wilmington
- Before/after analyses for pedestrian safety audit corridors

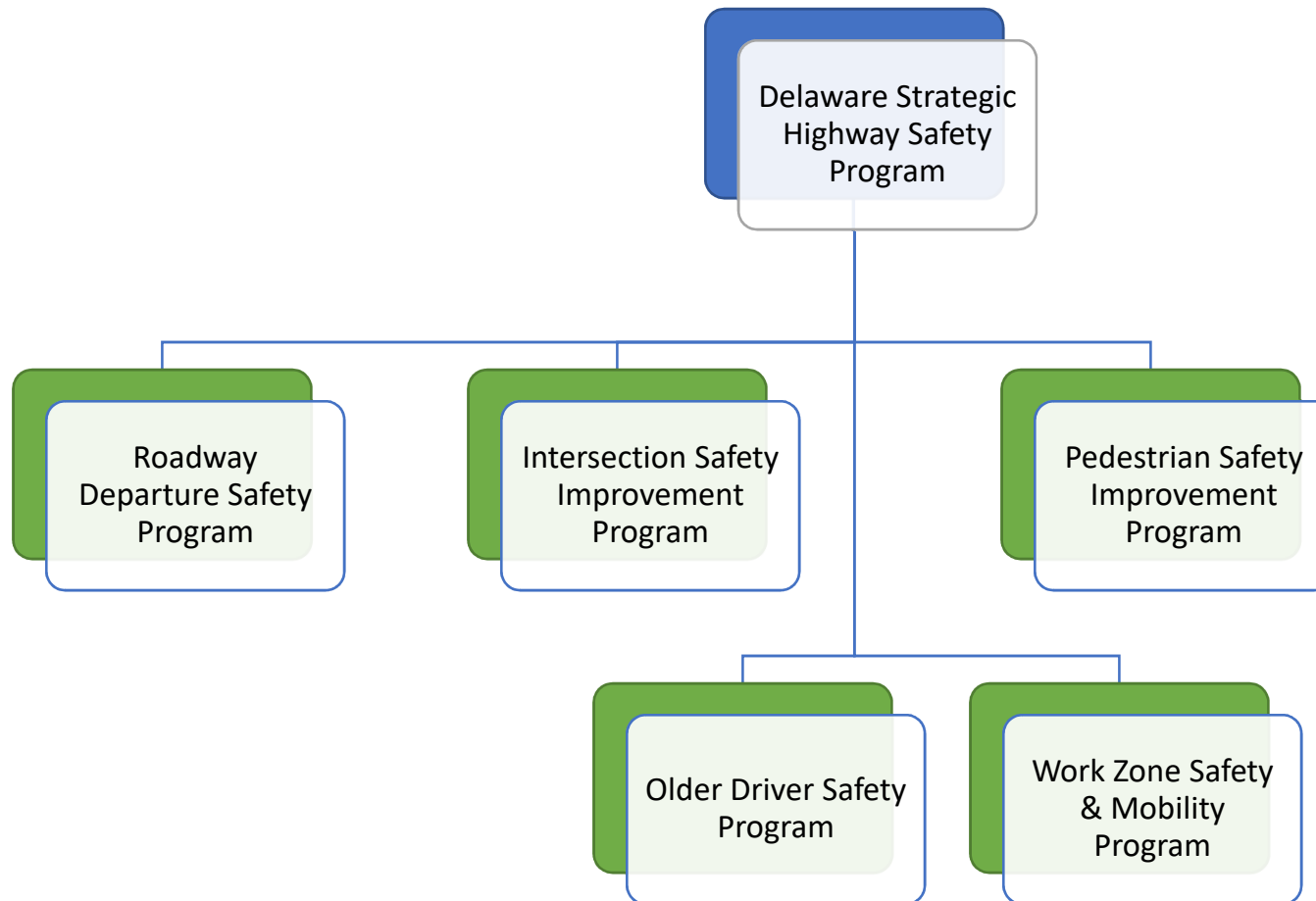


DeIDOT's HSIP

- New program structure (changes based on MAP-21)
 - Incorporating a systemic program



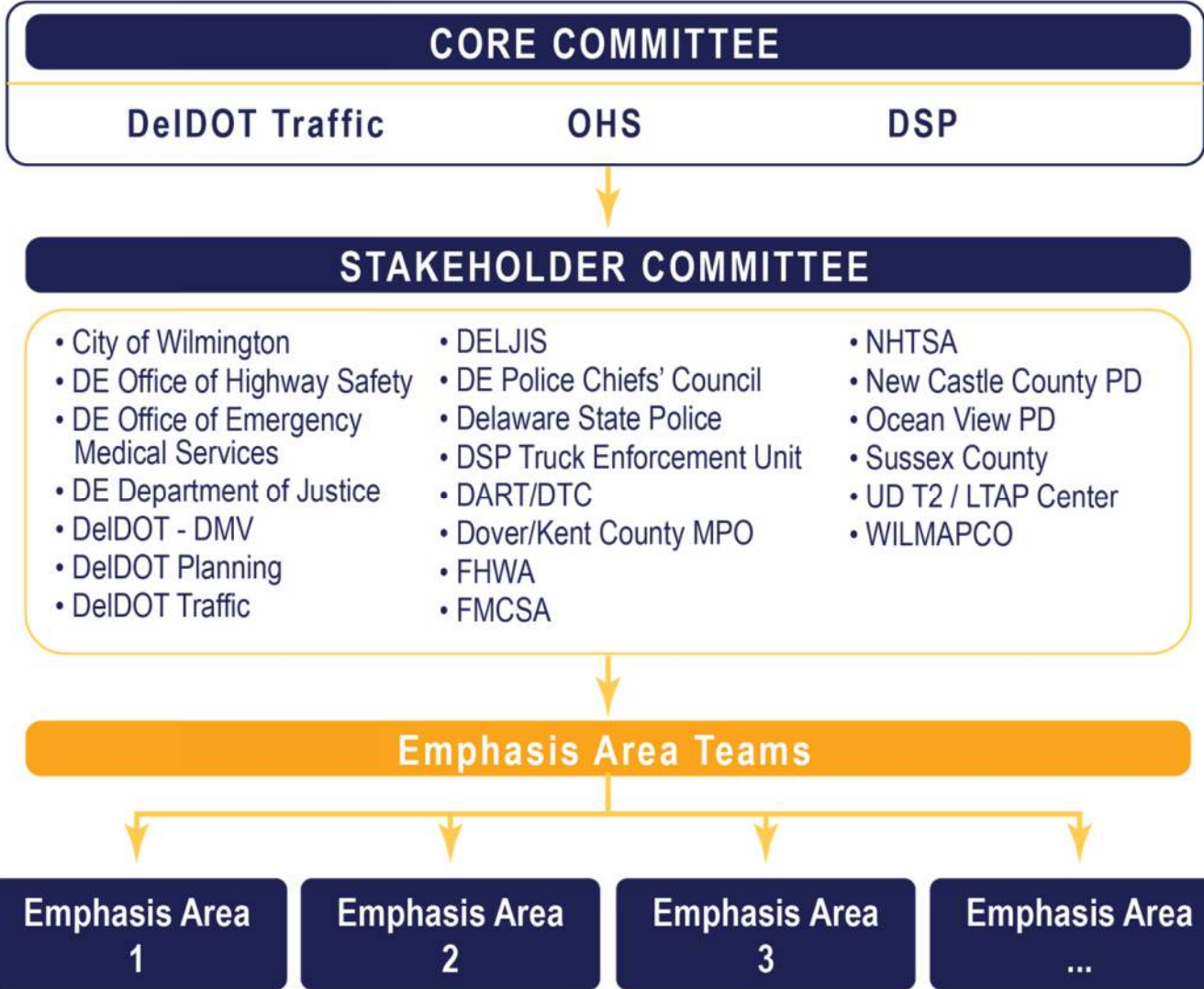
DeIDOT's HSIP



Delaware's SHSP History



Stakeholder Input



SHSP Next Steps

- **Oct. 2019:** SHSP Core Agencies (DeIDOT, OHS, DSP) initiate 2020 SHSP development discussions
- **Late 2019/Early 2020:** Crash Data Analysis
- **March 2020:** Stakeholder Committee Kick-Off Meeting
- **April – July 2020:**
 - Emphasis Area Team Meetings
 - Draft 2020 SHSP
- **August 2020:** Present Draft Plan to Stakeholders
- **Sept 2020:** Adopt 2020 SHSP

