



DELAWARE

Highway Safety Improvement Program



Presented By:

Scott Neidert, P.E., PTOE, RSP1

Delaware Department of Transportation
HSIP Manager/Traffic Resource Engineer

Delaware Highway Safety Summit
April 17, 2024



Excellence in Transportation **Every Trip.**

We strive to make every trip taken in Delaware safe, reliable and convenient for people and commerce.

Every Mode.

We provide safe choices for travelers in Delaware to access roads, rails, buses, airways, waterways, bike trails and walking paths.

Every Dollar.

We seek the best value for every dollar spent for the benefit of all.

Everyone.

We engage our customers and employees with respect and courtesy as we deliver our services.

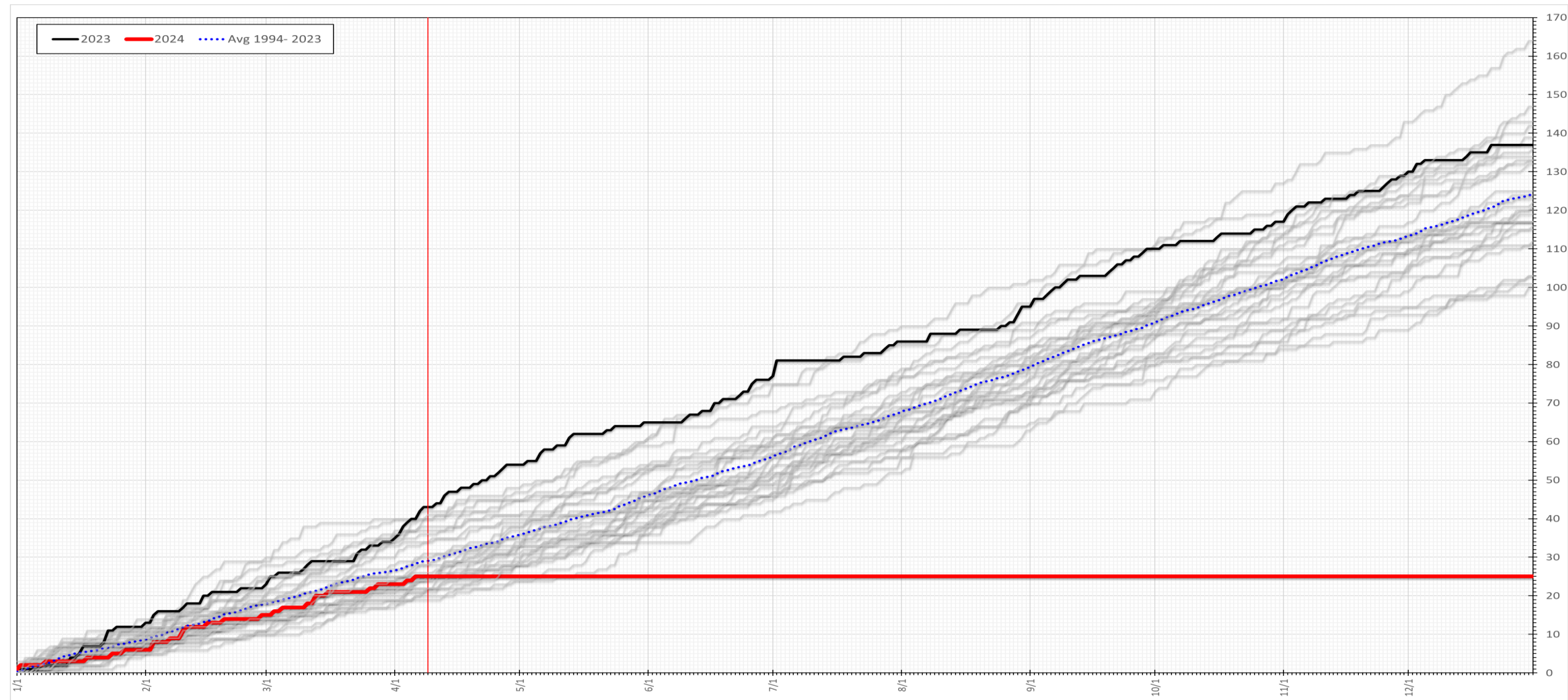


Current Traffic Fatality Statistics

2024 Delaware Traffic Fatalities as of 4/15/2024							
	2024	2023			2022		
		Year-to-Date		Totals	Year-to-Date	Totals	
Fatalities	30	47	↓ -36%	137	42	↓ -29%	164
Delaware Residents	26	37	↓ -30%	110	32	↓ -19%	122
Person Types							
Vehicle Occupant	20	33	↓ -39%	89	29	↓ -31%	103
Pedestrian	6	9	↓ -33%	28	9	↓ -33%	32
Bicyclist	1	2	↓ -50%	5	1	0%	7
Motorcyclist	3	3	0%	15	3	0%	22
Crash Types							
Curve Related	3	8	↓ -63%	28	6	↓ -50%	19
Roadway Departure	11	23	↓ -52%	69	14	↓ -21%	55
Intersection Related	10	14	↓ -29%	37	14	↓ -29%	50
Median Crossover	0	3	↓ -100%	8	2	↓ -100%	8
Wrong Way	1	0	↑ N/A	1	2	↓ -50%	7
Work Zone	2	3	↓ -33%	9	0	↑ N/A	4



Delaware Fatality Trendlines (1994-2024)





Presentation Overview

- What is the Highway Safety Improvement Program (HSIP)?
- Overview of Delaware's HSIP
 - Strategic Highway Safety Plan (SHSP)
 - Hazard Elimination Program (HEP)
 - High Risk Rural Roads Program (HRRRP)
 - Highway Rail Grade Crossing Safety Program (HRGX)
 - Special Rules
 - Section 154 Program
 - Systemic Safety Programs
 - Automated Safety Enforcement Program
 - Traffic Records / Crash Data Program





Highway Safety Improvement Program

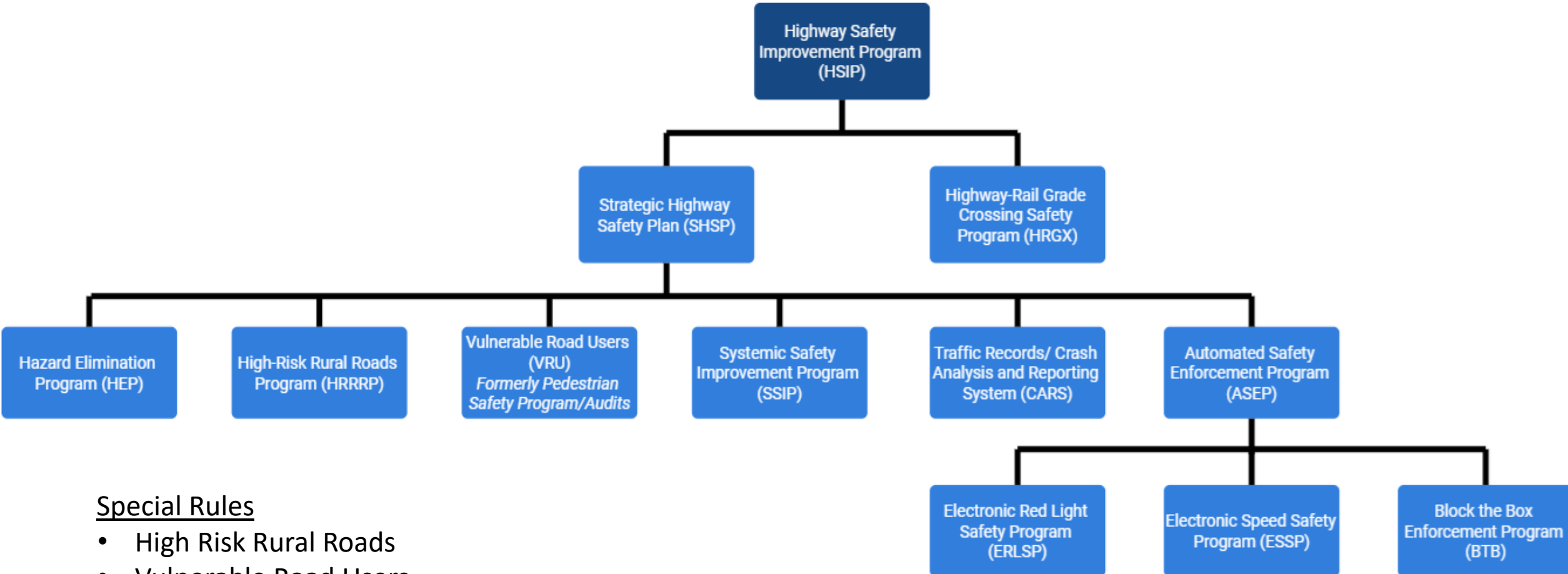
- Federal-aid program with the purpose of achieving a significant reduction in fatalities and serious injuries on all public roads.
 - 23 U.S.C. 148 and 23 CFR Part 924
- Data-driven program
- Consists of two main components
 - Strategic Highway Safety Plan
 - Railway-Highway Crossing Program

Delaware's HSIP Apportionment

FFY2024 = \$12,900,000



Overview of Delaware HSIP



Special Rules

- High Risk Rural Roads
- Vulnerable Road Users
- Older Driver/Pedestrians



Strategic Highway Safety Plan

- Comprehensive, multi-year, data driven transportation safety plan with a goal of reducing highway fatalities and serious injuries on all public roads
- Establishes consistent statewide goals, objectives, emphasis areas, priorities, and countermeasures with stakeholders and other transportation plans
- Addresses the 4 E's of Highway Safety
 - Engineering
 - Education
 - Enforcement
 - Emergency Medical Services

GOAL

The Delaware Strategic Highway Safety Plan: **Towards 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.

2021-2025 SHSP EMPHASIS AREAS

1. Intersections
2. Distracted Driving
3. Impaired Driving
4. Roadway Departure
5. Pedestrians
6. Motorcycles
7. Unrestrained Motorists
8. Speeding
9. Traffic Records

OVERALL OBJECTIVE

Delaware's 2021-2025 SHSP objective is to **reduce fatalities and serious injuries by 15% over the next five years** to ultimately reach the goal of zero fatalities and serious injuries on Delaware's roadways.

Scan for more information



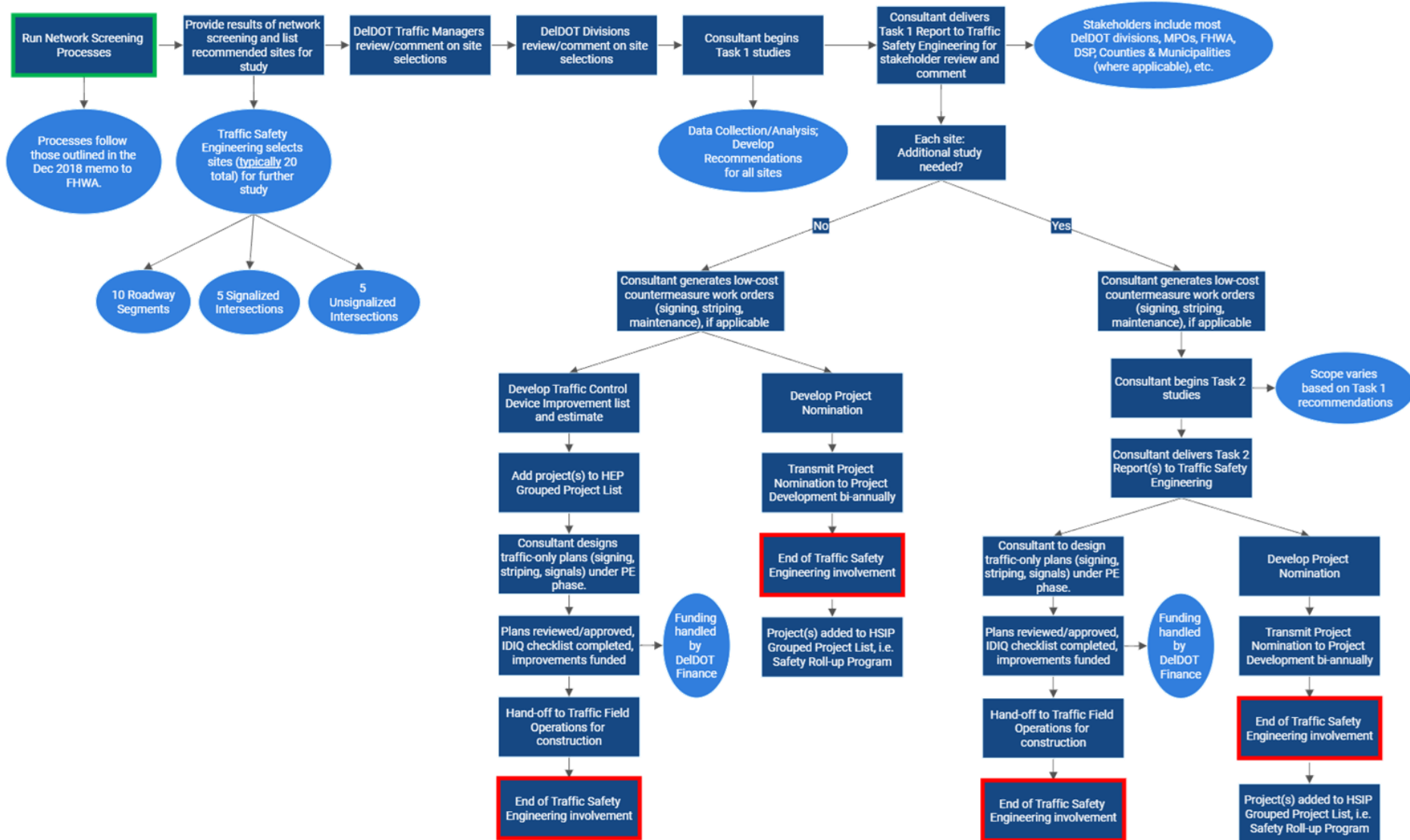


Hazard Elimination Program (HEP)

- Annual safety program addressing identified high crash locations (hot-spots)
 - Identification of sites is based on 3-year crash history and a mathematical ranking process
 - Roadway segments – identifies sites based on crash rates using a 0.1-mile sliding scale
 - Signalized and unsignalized intersections – identifies sites based on crash frequency and severity
 - Candidate lists are reviewed to identify recent, current, ongoing, and future projects being conducted by sections of DelDOT
 - Selected sites move forward for study, analysis and determination of recommendations
 - Recommendations implemented through various projects and programs, some become standalone capital projects

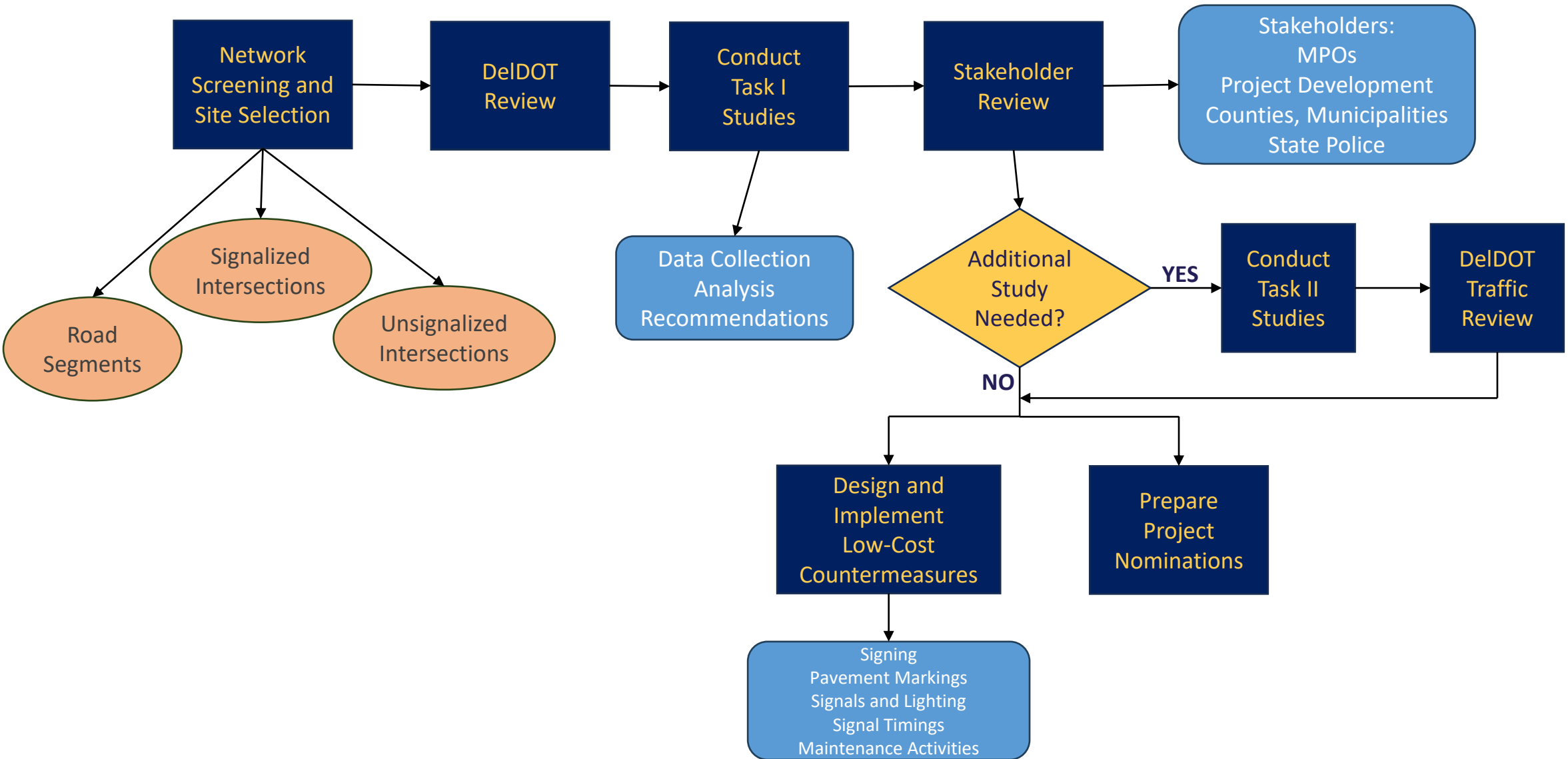


Hazard Elimination Program (HEP)





Hazard Elimination Program (HEP)





Hazard Elimination Program (HEP)

Notable projects



SR 1 and SR 16 Grade Separated Intersection



SR 10 @ SR 15, Roundabout



Hazard Elimination Program (HEP)

Notable projects



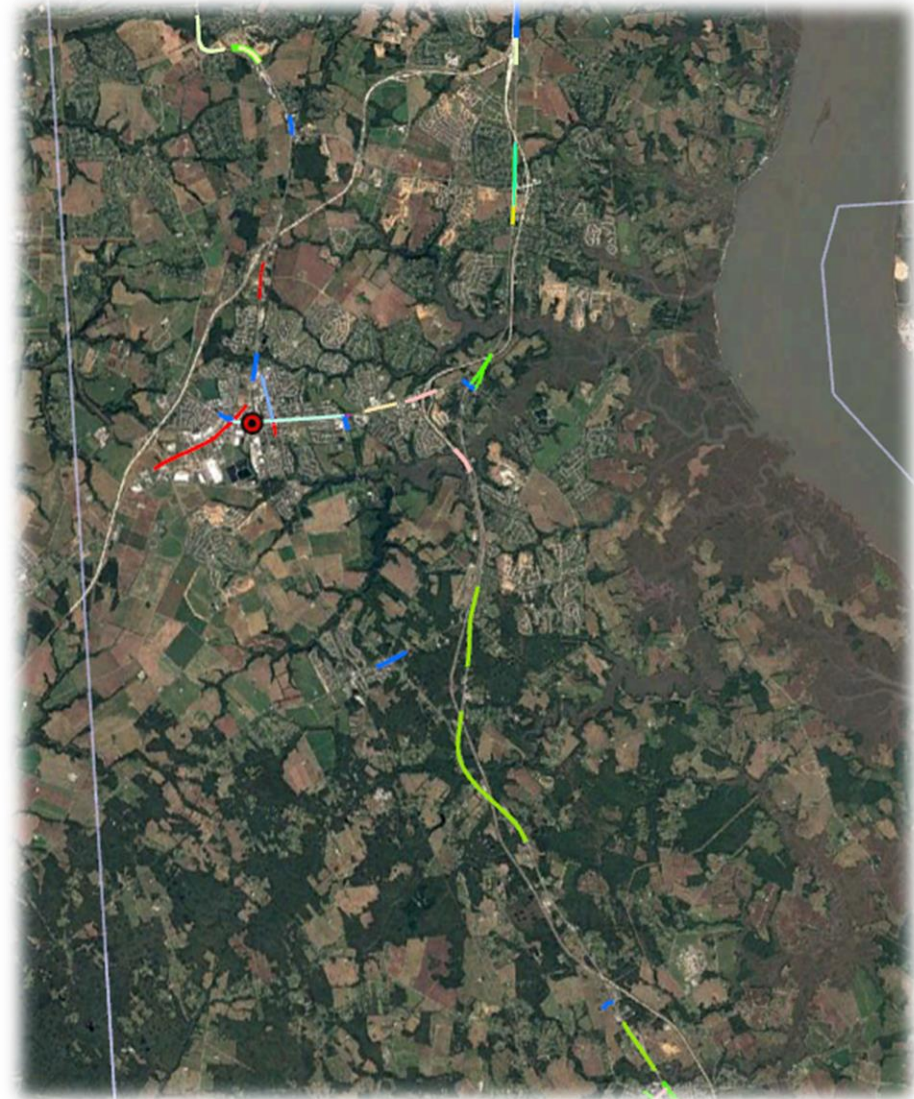
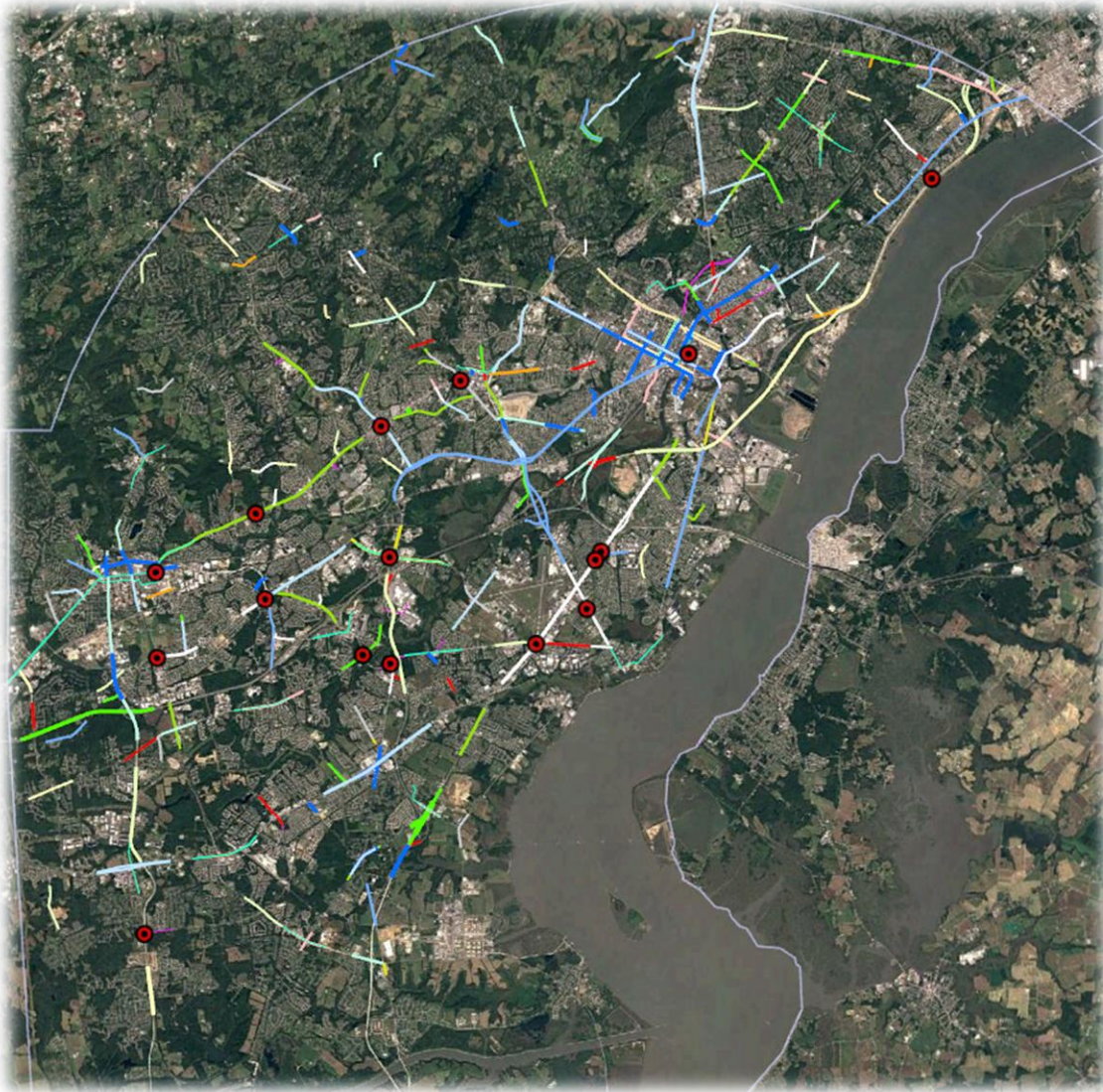
Cleveland Avenue Road Diet



SR 273 @ Red Mill Road Intersection Improvements

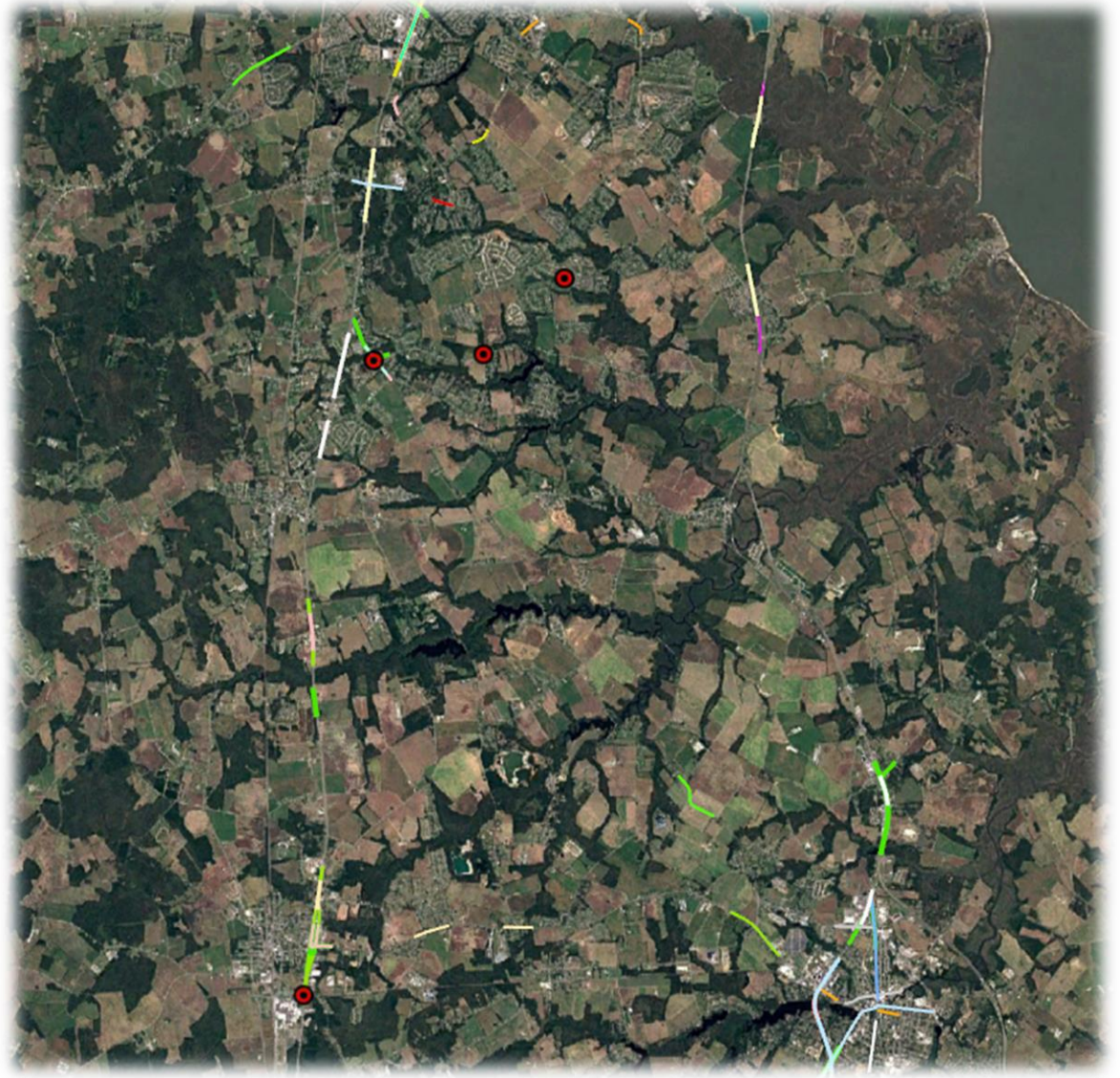


HEP Sites – New Castle County – 1996-2022





HEP Sites – Kent County – 1996-2022





HEP Sites – Sussex County – 1996-2022





HSIP Special Rules

- Special rules established as part of federal transportation bills
 - High Risk Rural Roads
 - Established under MAP-21
 - If applicable, requires states with an increase in fatality rates on rural roads to obligate a specified amount of HSIP funds to high-risk rural roads
 - DE would need to obligate \$900,000.
 - Special rule applied to Delaware most recently in FFY2020
 - Older Drivers and Pedestrians
 - Established under MAP-21
 - If applicable, requires states to include strategies in their next SHSP to improve safety for older drivers and pedestrians (65+)
 - Special rule has not been applied to Delaware since its inception
 - Vulnerable Road User Safety
 - Established under the Infrastructure and Investment Jobs Act (IIJA)
 - States must obligate not less than 15 percent of the State's HSIP funds for the next fiscal year toward HSIP projects that address the safety of vulnerable road users if the **total annual fatalities of vulnerable road users in the state represents 15 percent or more of the total annual crash fatalities**
 - Special rule has applied to Delaware every year since its inception



High-Risk Rural Roads Program (HRRRP)

- Until 2012, was an annual program identifying and evaluating hotspot crashes on rural collector and rural local roadways and intersections
- Is now considered a Special Rule
- Roadway Segment network screening
 - Consistent with the HEP site selection process except:
 - Minimum number of fatal and injury crashes is reduced from five to two
- Intersection network screening
 - Utilizes HEP intersection site selection process, except:
 - Minimum of five fatal, personal injury, and/or property damage only crashes during a three-year period (no minimum was established for HEP)
- Studies generally result in signing and pavement marking improvements, AWSC conversions, roadside maintenance improvements, high-friction surface treatments and other low-cost countermeasures



*All-Way Stop Control
Beaver Dam Road at Dairy Farm Road*

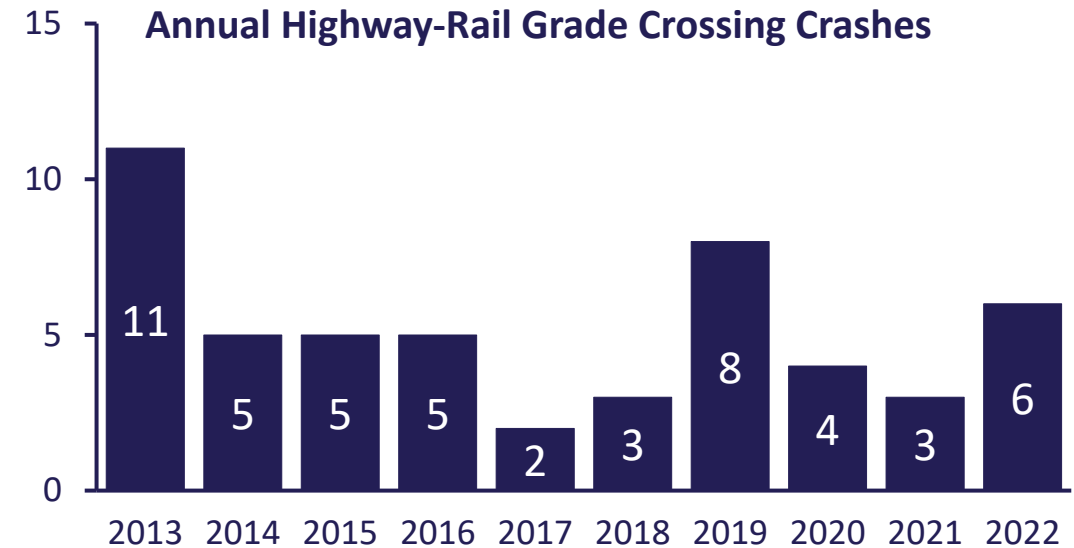


High-Friction Surface Treatment – Gravel Hill Road



Highway-Rail Grade Crossing Program (HRGX)

- Annual safety program identifying potential improvements to highway-rail grade crossings
 - Federal safety program, Section 130 Rail-Highway Crossing Program funds
- Utilizes FRA's GradeDec.NET software to calculate benefit/cost ratios for all of Delaware's public highway-rail grade crossings
 - B/C ratios take into account:
 - Most recent five years of crash data,
 - Train speeds,
 - Number of trains per day,
 - AADT
- B/C ratios are calculated at each crossing for the upgrade alternatives shown in the table at bottom right
- All at-grade crossings statewide are ranked according to their benefit/cost ratios to identify candidate locations for safety upgrades



Base Case	Upgrade Alternatives
Passive	→Flashing lights →Flashing lights and gates
Flashing lights	→Flashing lights and gates
Flashing lights and gates	→Flashing lights and gates with supplementary measures →New technologies



Section 154 Penalty Transfer Program

- Section 154 Requires states to enact and enforce a law that prohibits the possession of any open alcohol beverage container, or the consumption of any alcoholic beverage, in the passenger area of any motor vehicle
 - States that fail to comply have a portion of their highway funds reserved
 - Noncompliant states may elect to use all or a portion of their reserved funds for alcohol-impaired driving programs under the Section 402 program and for HSIP activities under Section 148
- Delaware is not in compliance with the Open Container Provision
 - 2.5% of the National Highway System Performance Plan and Surface Transportation Program funds are reserved each year
 - 35% of those funds are transferred to OHS for their 402 impaired driving prevention program
 - 65% of the funds are transferred to DelDOT's HSIP for HSIP-eligible activities

HSIP-Eligible Activities funded with 154 Penalty Transfer Funds

- Intersection improvements
- Guardrail improvements
- High-tension median cable barrier on SR 1 and I-495
 - Currently funding the median cable barrier project on SR 1 between SR 30 and SR 9
- Pedestrian safety initiatives
- Work zone safety initiatives
- Purchase of NOVICE DRIVER decals for Teen Driver awareness
- High-friction surface treatment
- Rumble strips



Vulnerable Road Users

- Vulnerable Road User Safety Assessment completed November 2023
 - High-risk areas identified in Assessment:
 - New Castle County – all areas and road types
 - Arterial roadways in Kent and Sussex Counties
 - Arterial roadways without roadway lighting statewide
 - Black/African American population identified as a high-risk population
- Annual pedestrian safety audit program
 - Primarily focus on multilane divided arterials
 - Multi-disciplined team reviews pedestrian (and bicycle) infrastructure and makes recommendations
 - Recommendations implemented through various programs and projects
 - Some notable projects, including US 13 median barrier improvements are in construction currently

Pedestrian Safety Audit Corridors

- US 13 (Llangollen Blvd to A Street)
- US 40 (SR 72 to US 13)
- US 13 (Scarborough Road to Puncheon Run Connector, Dover)
- SR 273
- Philadelphia Pike
- SR 4 (Elkton Road to SR 7)
- SR 1 (Nassau Bridge to Dewey Beach)
- Kirkwood Highway (St. James Church Road to SR 141)
- City of Wilmington
- SR 141 (Commons Blvd. to SR 273)
- Salem Church Road
- US 113 (Cypress Hall Blvd to SR 1) *in progress*



Systemic Safety Improvement Program (SSIP)

- Program introduced in 2014
- Identify safety concerns based on system-wide data
 - Identification of risk factors
 - Crash types
 - Roadway geometry
 - Roadway type
 - Lighting conditions
 - Weather conditions
 - Many others
 - Once risk factors are identified, evaluate countermeasures to address risk factors
 - Site selection is based on a combination of observed crash data and assessment of risk factors

APRIL 2015

DeIDOT's SYSTEMIC SAFETY PROGRAM

Delaware Department of Transportation

Addressing Delaware's Strategic Highway Safety Plan (SHSP) Roadway Departure Emphasis Area by targeting the reduction of fatal and serious injuries resulting from roadway departure crashes

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

43 PERCENT OF FATALITIES AND 24 PERCENT OF SERIOUS INJURIES INVOLVED A ROADWAY DEPARTURE (2007 - 2014 CRASH DATA)

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 Safety Improvement Program (SSIP)

- Systemic Safety Programs include:
 - Statewide Safety Countermeasures
 - All-Way Stop Control (AWSC) conversions
 - Rectangular Rapid Flashing Beacons (RRFB)
 - Roadway Lighting
 - High Friction Surface Treatment (HFST)
 - Rumble Strips
 - Median Barrier
 - Pedestrian Safety Audits
 - DE MUTCD Compliance
 - Horizontal Curve Signing and Pavement Markings
 - Standardized fluorescent yellow for curve warning signs
 - School Zones
 - Wrong Way Driving Prevention





Systemic Safety Improvement Program (SSIP)



High-Tension Cable Barrier



Dynamic Chevrons



Wrong Way Detection



High Friction Surface Treatment



Sinusoidal Rumble Strips



Automated Safety Enforcement Program (ASEP)

- Electronic Red Light Safety Program (ERLSP)
 - Operational since 2004
 - 102 cameras at 46 intersections across the state
 - Operating agreements with City of Dover, City of Newark, City of Seaford and Town of Elsmere
 - DeIDOT does not operate red light cameras within the City of Wilmington
 - Site selection utilizes an engineering-based criteria and the analysis of the most recent crash data
 - New locations are planned for implementation in 2024/2025
- Based on the CY2023 Annual Report:
 - Angle crashes reduced by 41% in the “after” period
 - Red light running crashes reduced by 25% in the “after” period
 - Rear end crashes increased by 10% in the “after” period



*Scan for
more
information*





Automated Safety Enforcement Program (ASEP)

- Electronic Speed Safety Program (ESSP)
 - Pilot ESSP during the I-95 Restore the Corridor project
 - 46% reduction in total crashes
 - 38% reduction in injury crashes
- Pilot ESSP signed into law by Governor Carney on June 30, 2023
 - Establishes automated speed enforcement in a work zone, or in a residence district in either New Castle County or a municipality of the state
 - ESSP in work zones enforced by Delaware State Police
 - ESSP in residence districts in New Castle County or a municipality will be enforced by the police agency with jurisdiction over the road
- Current program status
 - Finalizing enforcement location(s)
 - Drafting MOUs with New Castle County and municipalities

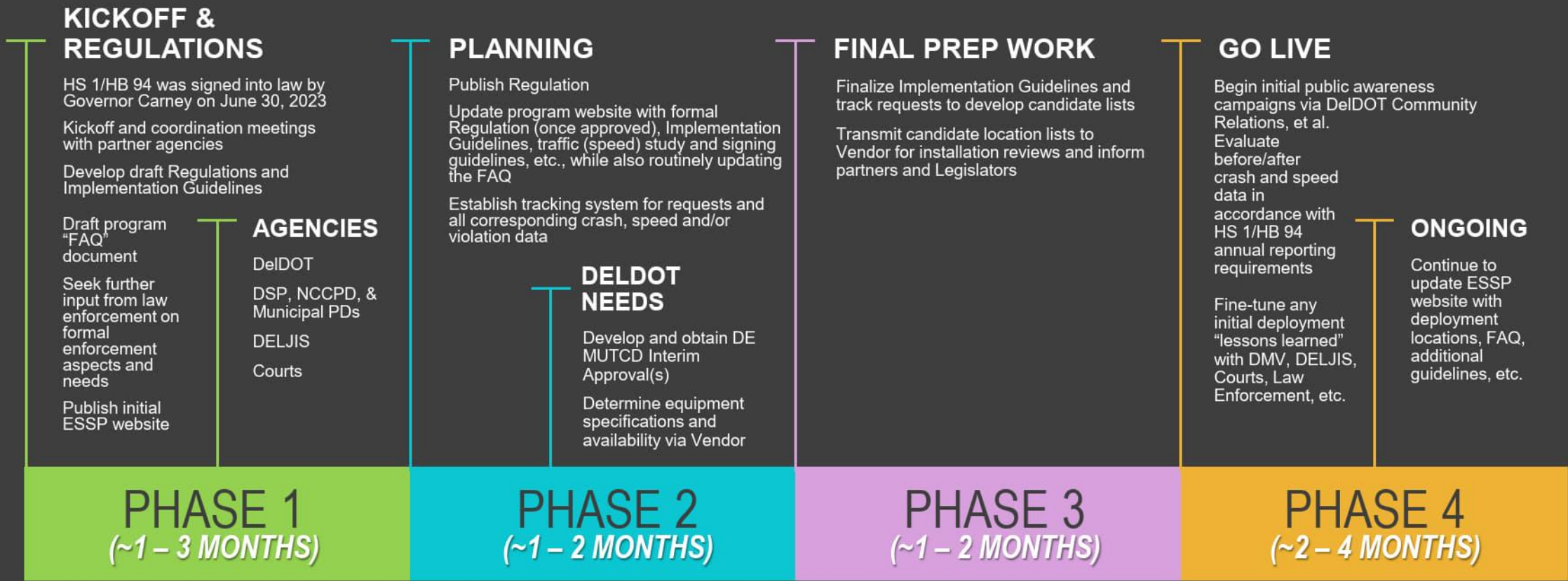
Daily Average Speeds		
	NB	SB
<i>Before Cameras</i>	54.3	49.0
<i>After Cameras</i>	49.0	43.1
Difference (mph)	-5.4	-5.9
<i>% Difference</i>	-9.9%	-12.1%

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ELECTRONIC SPEED SAFETY PROGRAM (ESSP)

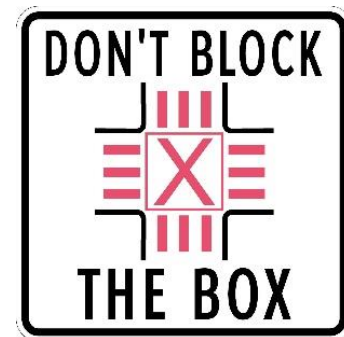
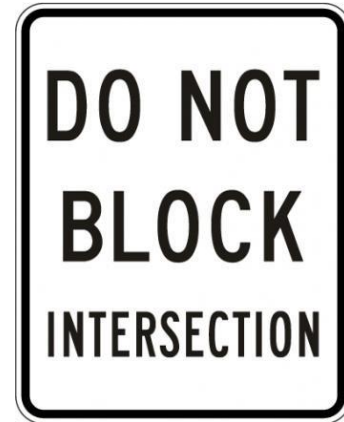
TENTATIVE TIMELINE – AS OF JANUARY 2024, SUBJECT TO CHANGE





Automated Enforcement Safety Program

- Block the Box
 - House Bill 490 of the 151st General Assembly
 - Passed on June 30, 2022
 - Signed into law by Governor Carney on October 21, 2022
 - Enables state and municipal authorities to enforce right-of-way regulations in identified areas more effectively using an electronic traffic monitoring for vehicle obstructions system
 - For a violation to occur, a motor vehicle must be located within a conflicting left-turn or through vehicle's path of travel following the termination of the violating vehicle's **right-of-way** and subsequent **all-red clearance** interval
 - Applies only to signalized intersections on principal arterial or other arterial functional classifications as defined by DeIDOT
 - Current program status:
 - Drafting proposed regulation
 - Drafting site selection guidelines
 - Coordinating with law enforcement and courts





Traffic Records / Crash Data Program

- DeIDOT maintains a GIS-based crash data system
 - CARS – Crash Analysis Reporting System
 - Data is updated nightly via electronic data transfer from DELJIS/E-Crash
- Crash data is used for a variety of tasks including the data analysis components of the safety programs discussed previously
- DeIDOT responds to requests for data from various entities
 - 300+ data requests in 2023
- CARS program is being upgraded to meet current data analysis needs
- DeIDOT is a member of the state's Traffic Records Coordinating Committee (TRCC)



Crash Analysis Reporting System

Advanced Query Search

Crash Identification

Complaint Number: Classification: 1 Items Selected

Crash Types: Pedalcycle Motorcycle Pedestrian

Alcohol Involved: No Items Selected

Nature of Crash: Primary Contrib Circumstances: Location of First Harmful Event:

Primary Contrib Circumstances: No Items Selected Manner of Impact: No Items Selected

State Property Damage: Clustering Visibility:

Records Returned: **Submit Query**

Crash Buffer Tools

Point Buffer Intersection Buffer Road Segment Dual Highway

Buffer Size: 0.1 miles

Clustering Visibility:

Clear/Reset:

Map not ready for point selection, click 'Clear/Reset'.

Click a point on the map

Advanced Query Search

Date/Time

Start Date: 1/1/20 End Date: 1/31/20

Single Time Sunday Monday Tuesday Wednesday Thursday Friday Saturday

Clustering Visibility:

Records Returned: **Submit Query**

Crash Buffer Tools

Point Buffer Intersection Buffer Road Segment Dual Highway

Beginning Point: 0.61 Ending Point: 1.30

Buffer Size: 100 feet

Enable Manual Mispoint Entry:

Clear/Reset:

Clustering Visibility:

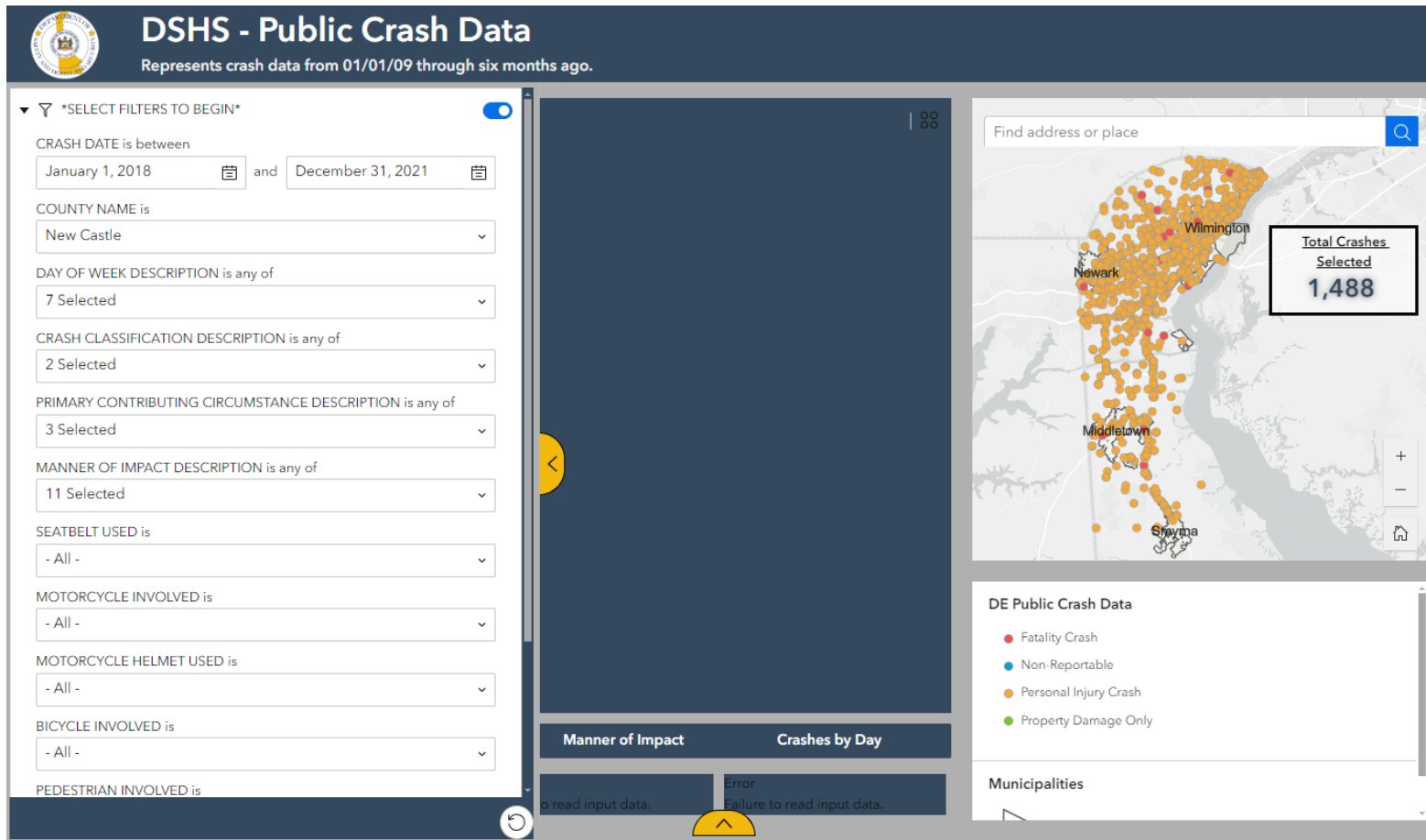
Map not ready for point selection, click 'Clear/Reset'.

Click a point on the map



Delaware Public Crash Data Dashboard

- Allows users to filter crash data and visualize the data in charts and on a map
- Provides public crash data without personal identifying information



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Thank You!

View the SHSP Here: deldot.gov/Programs/DSHSP/

GOAL

The Delaware Strategic Highway Safety Plan: **Towards 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.

Thank you for your time and interest in safety on Delaware's roadways.

*Scott Neidert, P.E., PTOE, RSP1
HSIP Manager
Scott.Neidert@delaware.gov
(302) 659-4075*

OVERALL OBJECTIVE

Delaware's 2021-2025 SHSP objective is to **reduce fatalities and serious injuries by 15% over the next five years** to ultimately reach the goal of zero fatalities and serious injuries on Delaware's roadways.

To Report a Road Condition: <https://deldot.gov/Traffic/ReportRoadCondition/index.shtml>