Panel Discussion

How is New Jersey Department of Transportation Addressing Safety?

Today's Panelists

Andrew Swords, Director
NJDOT Division of Statewide Planning

Syed Kazmi, Section Chief
NJDOT Division of Traffic Engineering

Kurt McCoy, Supervising Engineer
NJDOT Division of Operations Support

Sangaran Vijayakumar, Project Management Specialist 3
NJDOT Division of Project Management

Hirenkumar Patel, Principal Engineer
NJDOT Division of Transportation Mobility

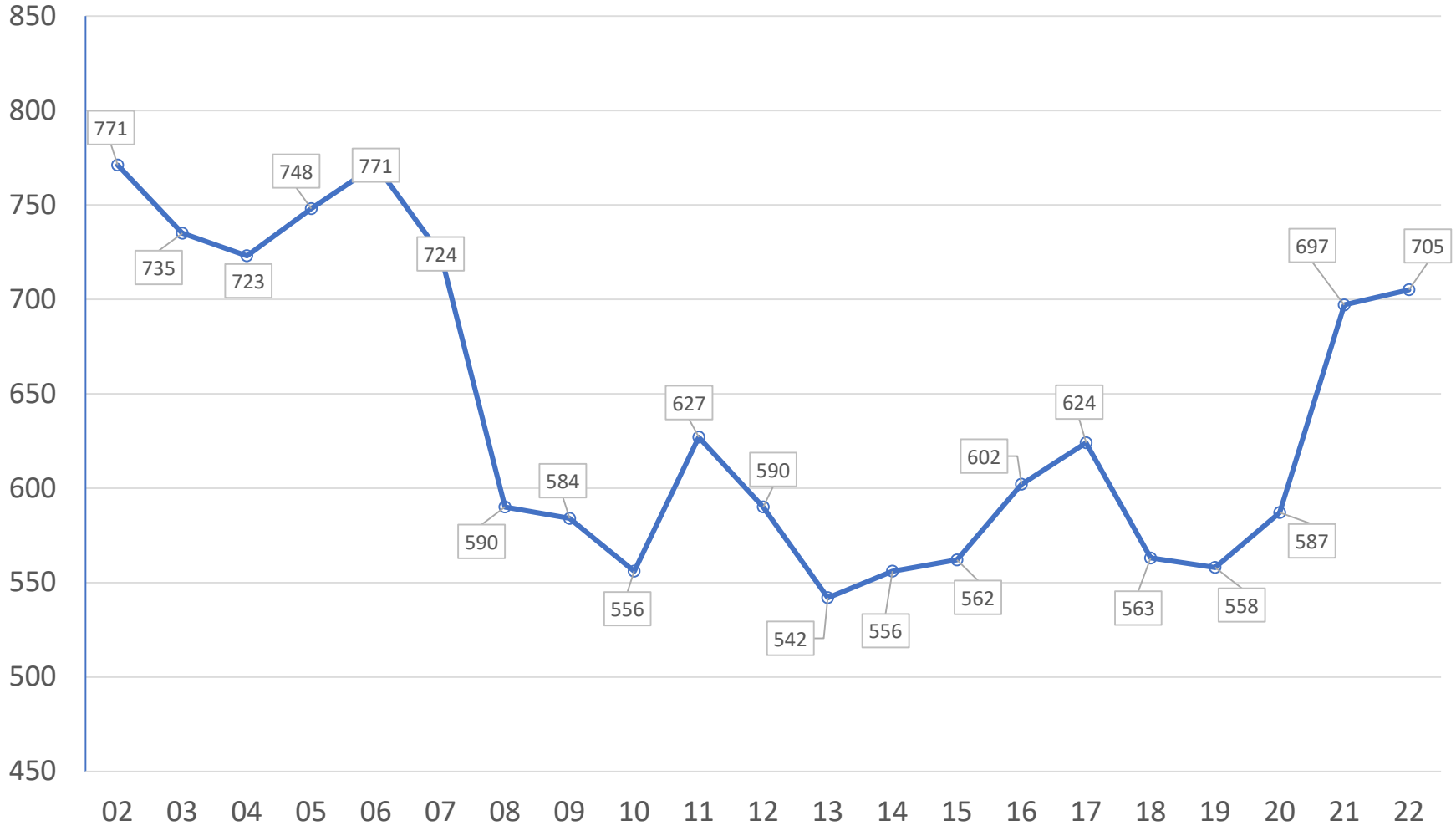
Andrew Swords

Director

NJDOT Division of Statewide Planning

Trends in Fatalities

20 Year Trend



Source: New Jersey State Police – Fatal Accident Investigation Unit

FATAL ACCIDENT INVESTIGATION UNIT
YEAR TO DATE - STATEWIDE FATAL CRASH STATISTICS
FOR OCTOBER 15, 2023

FATAL CRASHES		FATALITIES	
2023 -	430	2023 -	452
2022 -	521	2022 -	558
2021 -	499	2021 -	521

FATALITIES FROM 2022 TO 2023	-106
PERCENTAGE CHANGE 2022 TO 2023	-19.0%
FATALITIES FROM 2021 TO 2022	37
PERCENTAGE CHANGE 2021 TO 2022	7.1%

VICTIM CLASSIFICATION

	2021	2022	2023
DRIVER	288	319	260
PASSENGER	63	84	62
PEDALCYCLIST	20	15	20
PEDESTRIAN	150	140	110
TOTAL	**521**	**558**	**452**

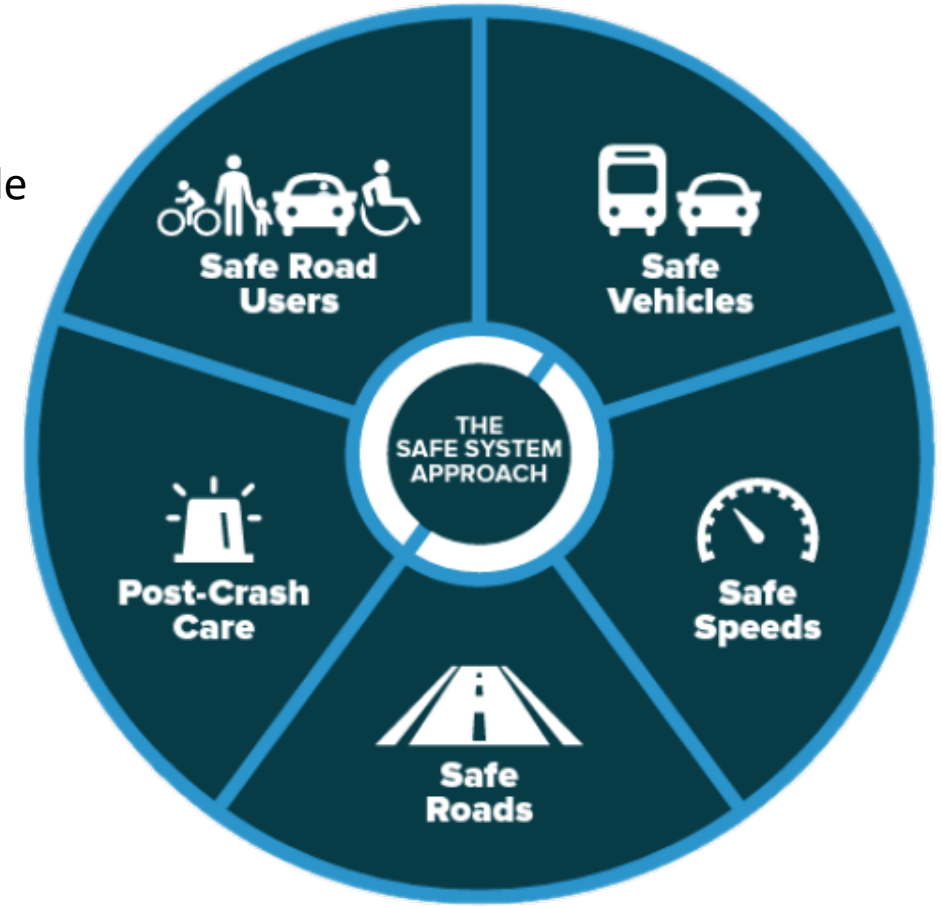
THIS REPORT CONTAINS STATISTICS OF FATAL MOTOR VEHICLE CRASHES THAT HAVE BEEN REPORTED TO THE NEW JERSEY STATE POLICE FATAL ACCIDENT INVESTIGATION UNIT. THE STATISTICS LISTED FOR PRIOR YEARS CORRESPOND TO THE CURRENT YEAR MONTH AND DAY. THE STATISTICS CONTAINED IN THIS REPORT ARE PRELIMINARY AND ARE SUBJECT TO CHANGE

Report Run: 15-OCT-23 10:00 AM

Safe Systems Approach

Principles

- Death and Serious Injuries are Unacceptable
- Humans Make Mistakes
- Humans Are Vulnerable
- Responsibility is Shared
- Safety is Proactive
- Redundancy is Crucial



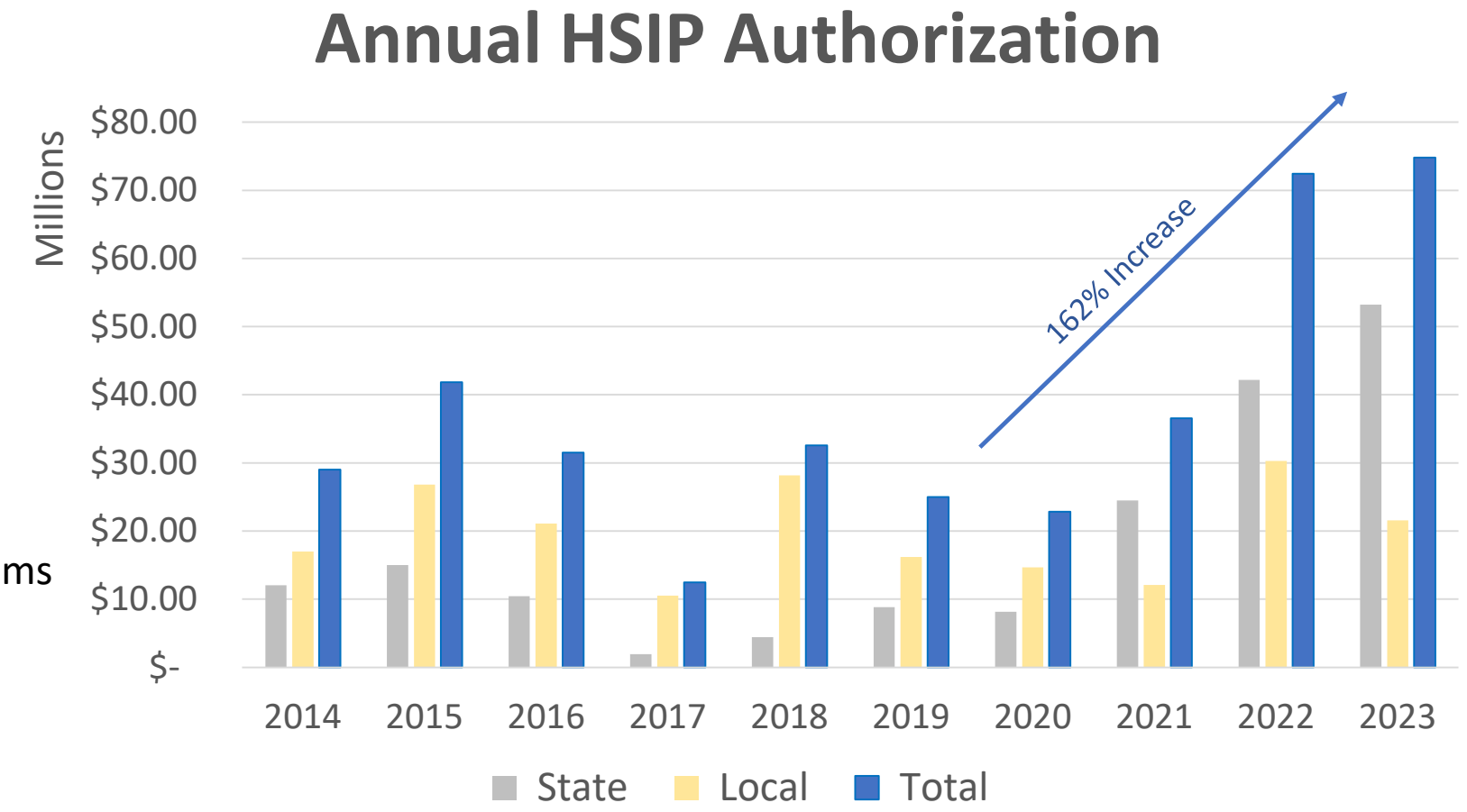
Source: FHWA-DOT

HSIP Programs

Growth and Evolution

Project Type Diversity

- Systemic & Systematic Projects
- Maintenance Type Projects
  - Vegetation Safety Management
- Technology
  - Wrong Way Driving Warning Systems
  - Pedestrian Detection Systems
  - Lead Pedestrian Intervals
- Communications/Special Projects
- PSAs/Public Outreach



*Note: Graph does not account for change orders, supplementals and/or releases

Constructed HSIP Projects

2014 (23) vs. **2022 (54)**

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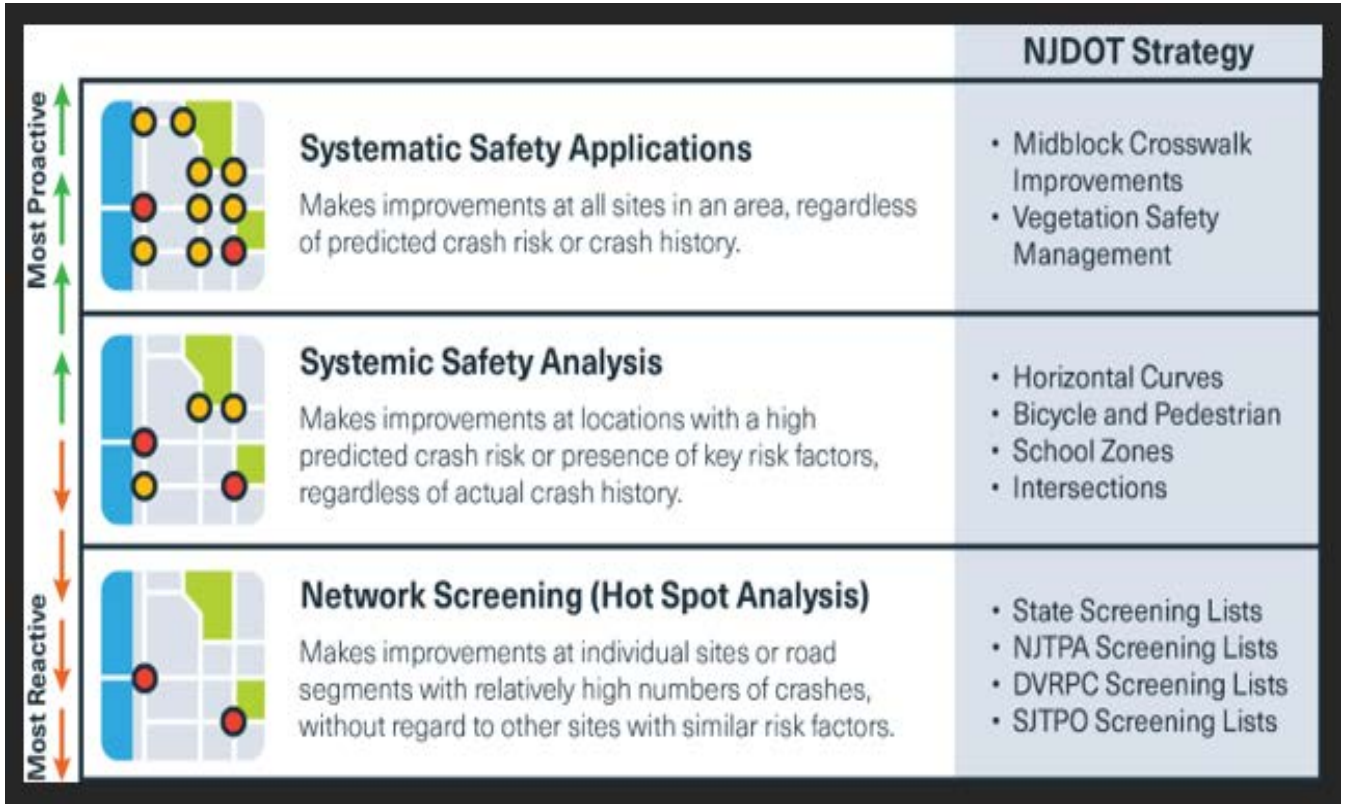
HSIP Programs

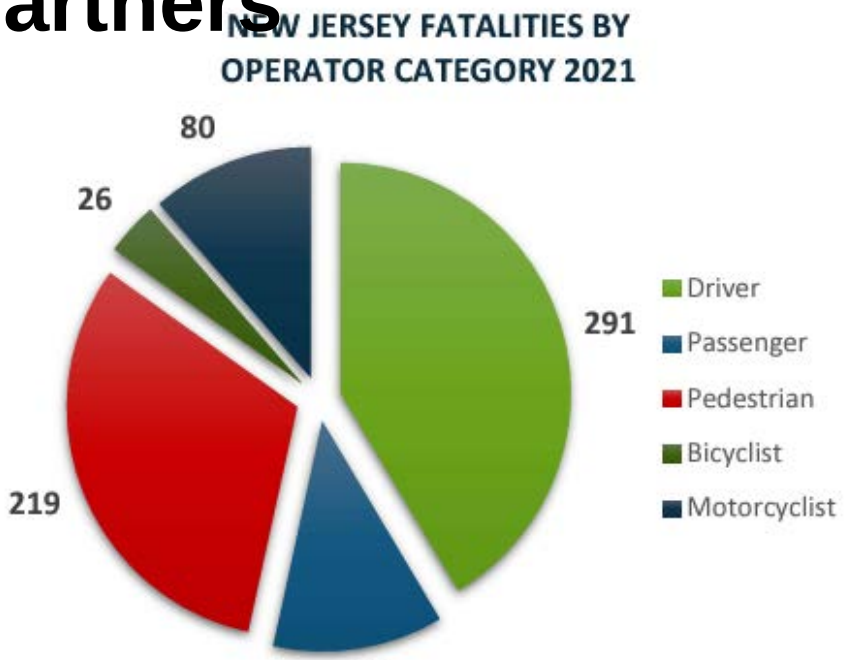
Systematic & Systemic Projects

- Systematic
  - Centerline Rumble Strips
  - Vegetation Safety Management
  - Midblock Crosswalk Improvements
- Systemic
  - High Friction Surface Treatment
  - Roundabouts
  - Horizontal Curve Safety Sign Program
  - Wrong Way Program
  - *(I-80 WWD, I-295 WWD, Arterial (NJ 73, U.S. 22)*



Focus Area

Data, Vulnerable Road Users, and Partners



Year	New Jersey	
	Pedestrians	Bicyclists
2018	31.1%	3.0%
2019	31.5%	2.2%
2020	30.5%	3.1%

DOT-Safety.ResourceCenter@dot.nj.gov

The Safety Resource Center (SRC) is your one-stop destination

PARTNERS

Federal:
Federal Highway Administration
National Highway Traffic Safety Administration

State:
New Jersey Department of Transportation
Division of Highway Traffic Safety
Towards Zero Deaths NJ
NJ Bicycle & Pedestrian Resource Center
New Jersey Safe Routes
NJDOT LOCAL AID Resource Center

Metropolitan Planning Organizations:
North Jersey Transportation Planning Authority
Delaware Valley Regional Planning Commission
South Jersey Transportation Planning Organization

Transportation Management Associations:
Cross County Connection TMA
Greater Mercer TMA
Hudson TMA
Keep Middlesex Moving – KMM
EZ Ride
RideWise
goHunterdon
Avenues in Motion

We Need Your Help

- ***Data Driven Research is Key***

Proven Safety Countermeasures

Medians and Pedestrian Refuge Islands in Urban and Suburban Areas

Walkways

Road Safety Audit

Enhanced Delineation for Horizontal Curves

Backplates with Retroreflective Borders

Longitudinal Rumble Strips and Stripes on Two-Lane Roads

Rectangular Rapid Flashing Beacons (RRFB)

Source: FHWA-DOT

Thank You

Andrew Swords

Director

NJDOT Division of Statewide Planning

Syed Kazmi

Section Chief

NJDOT Division of Traffic Engineering

New Jersey Department of Transportation

Commissioner Diane Gutierrez-Scaccetti

Advanced Pedestrian/Intersection Safety Improvements

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Advanced Intersection /Pedestrian Safety Features

- Automatic Red Clearance Extension

  Mitigates:

  - Red light running crashes
  - Vehicle/ pedestrian conflicts
  - Vehicle/ bicycle conflicts

- Passive Pedestrian Detection

  - Accommodates pedestrian with different walking speed
  - Monitors pedestrian presence within crosswalk and sidewalk
  - Touchless Push Buttons

Red Light Running Crash Statistics

In 2021,

- INJURIES ~ 127,000
- FATALITIES ~ 1,109
- FATALITIES PER DAY ~ 3 (On Average)

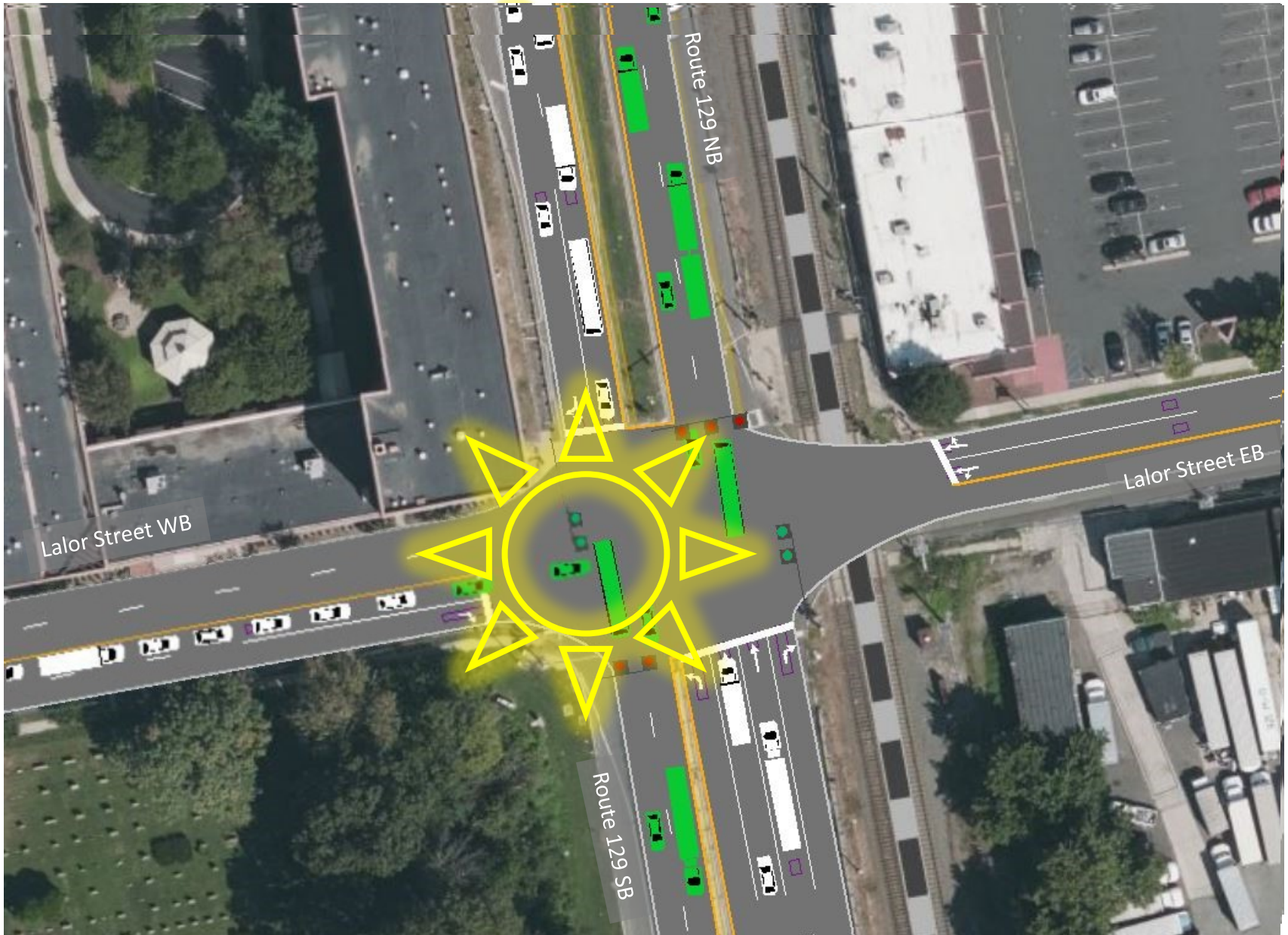
Reference: Insurance Institute for Highway Safety Fatality statistics (iihs.org)

Automatic Red Clearance Extension

NJDOT Division of Traffic Engineering

Vehicle-Vehicle and Vehicle-Pedestrian Conflicts

NJDOT Division of Traffic Engineering



Vehicle-Vehicle and Vehicle-Pedestrian Conflict Prevention
(Red Extension Feature)

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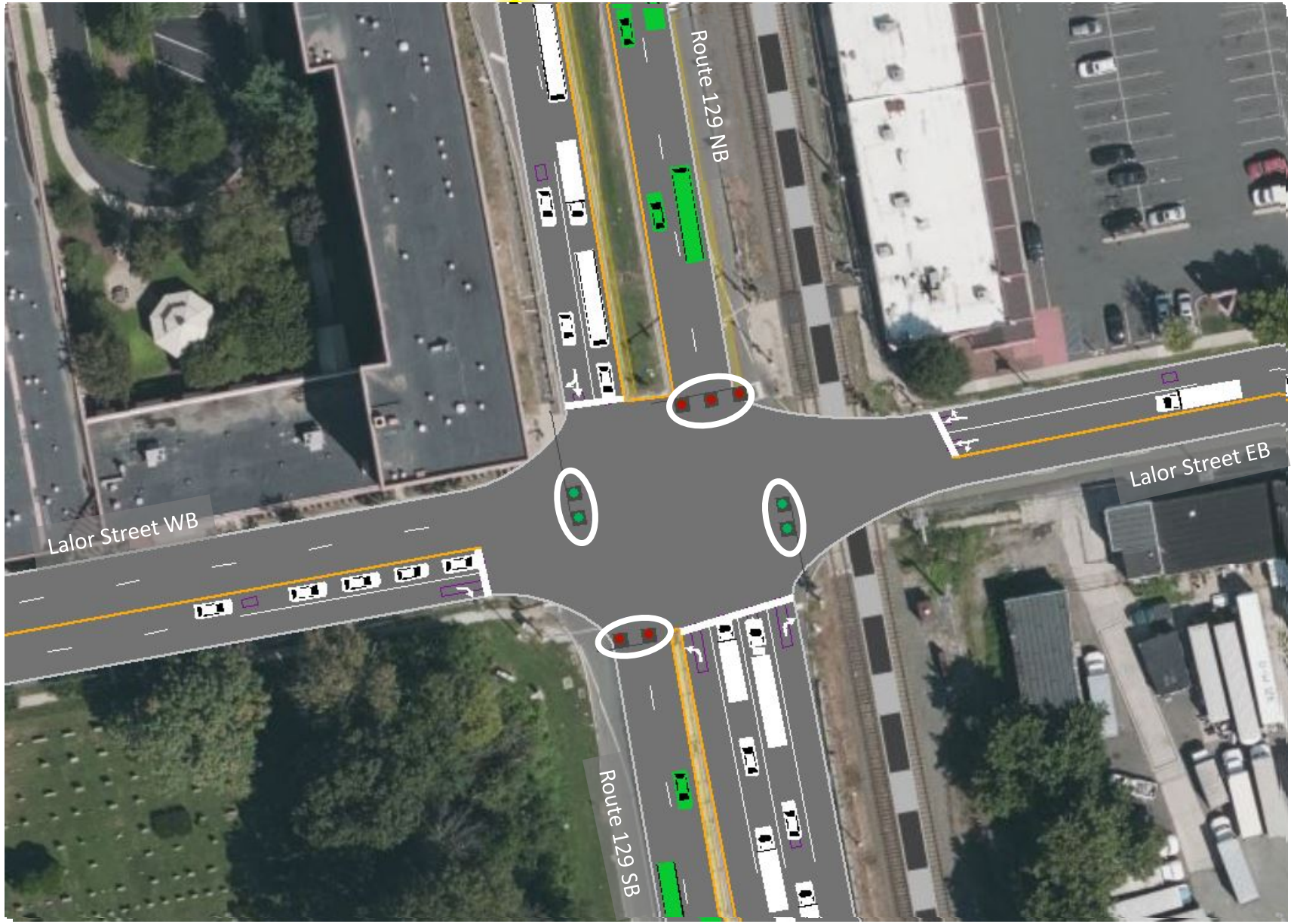
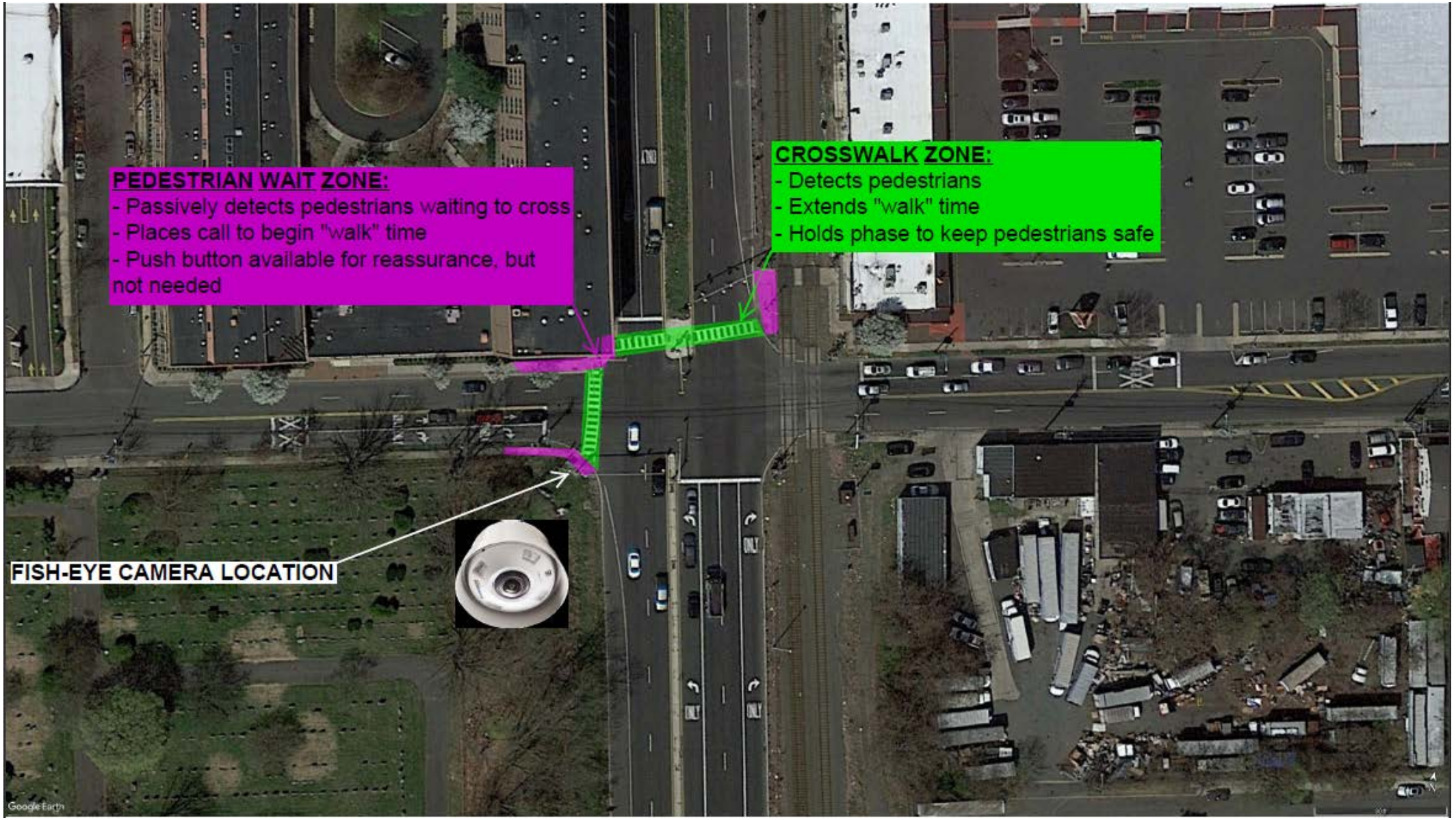


Passive Pedestrian Detection System

NJDOT Division of Traffic Engineering



Traffic Signal Design/Modelling

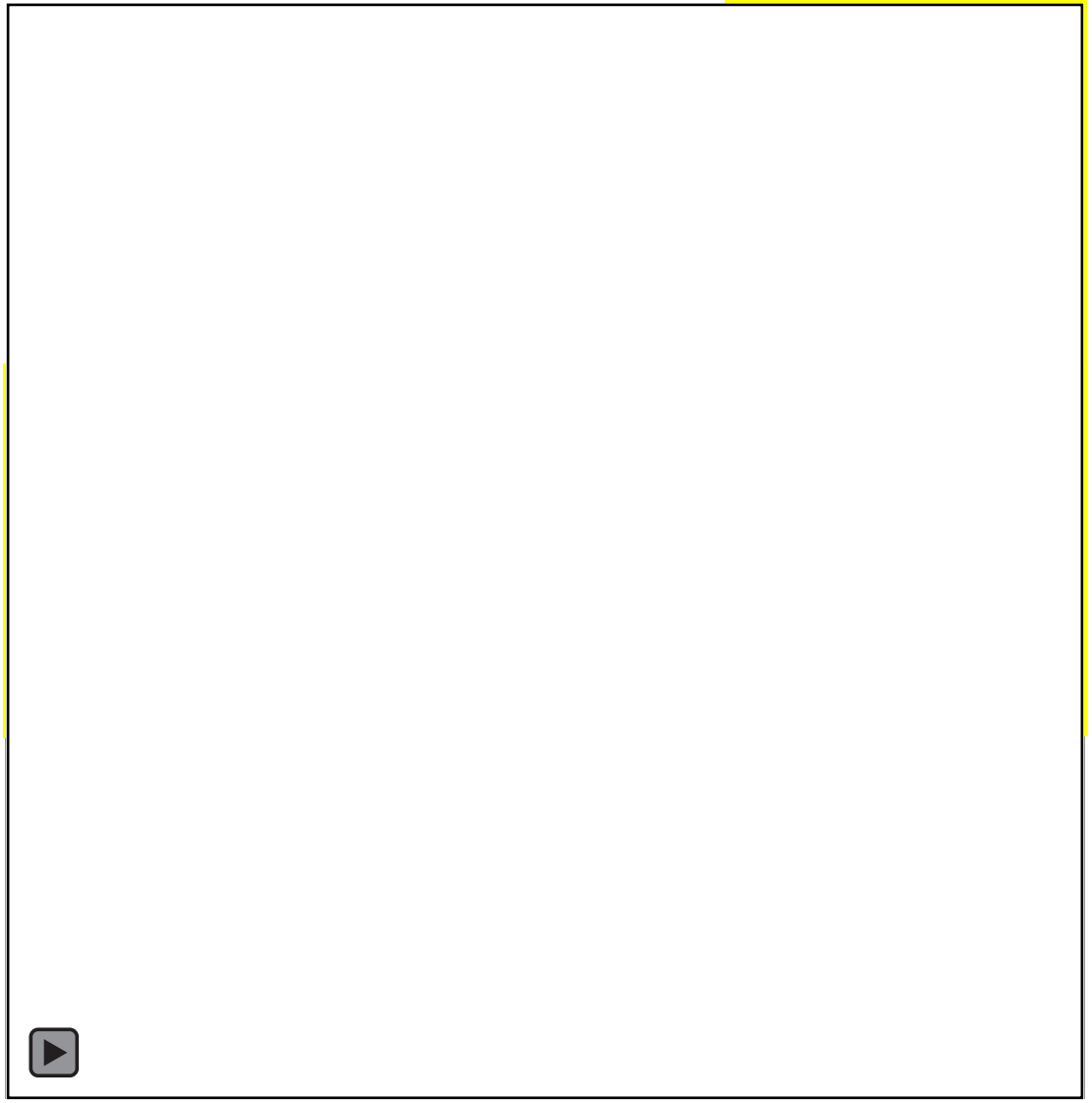
Traffic Data

- Traffic volume
- Vehicle speed
- Vehicle classification
- Peak hour factors
- Roadway Geometry
- Phasing
- Signs
- Lane configurations
- Vehicle Detection

Characteristics of Pedestrians

- Age
- Physical disabilities
- Walking speed
- Cognitive skills
- Steepness of grade
- Driver aggressiveness
- Need for LPI
- Land use (school, shopping centers)
- Compliance with traffic control devices (use of push button)

Passive Pedestrian Detection



Thank You

Syed Kazmi

Section Chief

NJDOT Division of Traffic Engineering

Kurt McCoy

Supervising Engineer

NJDOT Division of Operations Support

What are the major areas that Operations addresses roadway and roadside safety in the work that we do?

- Winter Operations
- Vegetation Management through Highway Safety Improvement Plan (HSIP)
- Emergency Response and Priority Construction Projects
  - Bridge
  - Drainage
  - Roadway
  - Guiderail and Attenuators
  - Long Life Pavement Markings

Vegetation Management

Why and how are we focusing on it?

Vegetation Management

Where are we starting the program?

- Contract 1- Routes 42, 55 (partial), and I-76 (averaged 90 crashes/year with a total 22 fatalities)
- Contract 2- Interstate 80 (averaged 57 crashes/year with a total 13 fatalities)
- Contract 3- Interstate 78 (averaged 57 crashes/year with a total 9 fatalities)

Vegetation Management

The goal is zero tree-related fatalities

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Thank You

Kurt McCoy

Supervising Engineer

NJDOT Division of Operations Support

Sangaran “Vijay” Vijayakumar

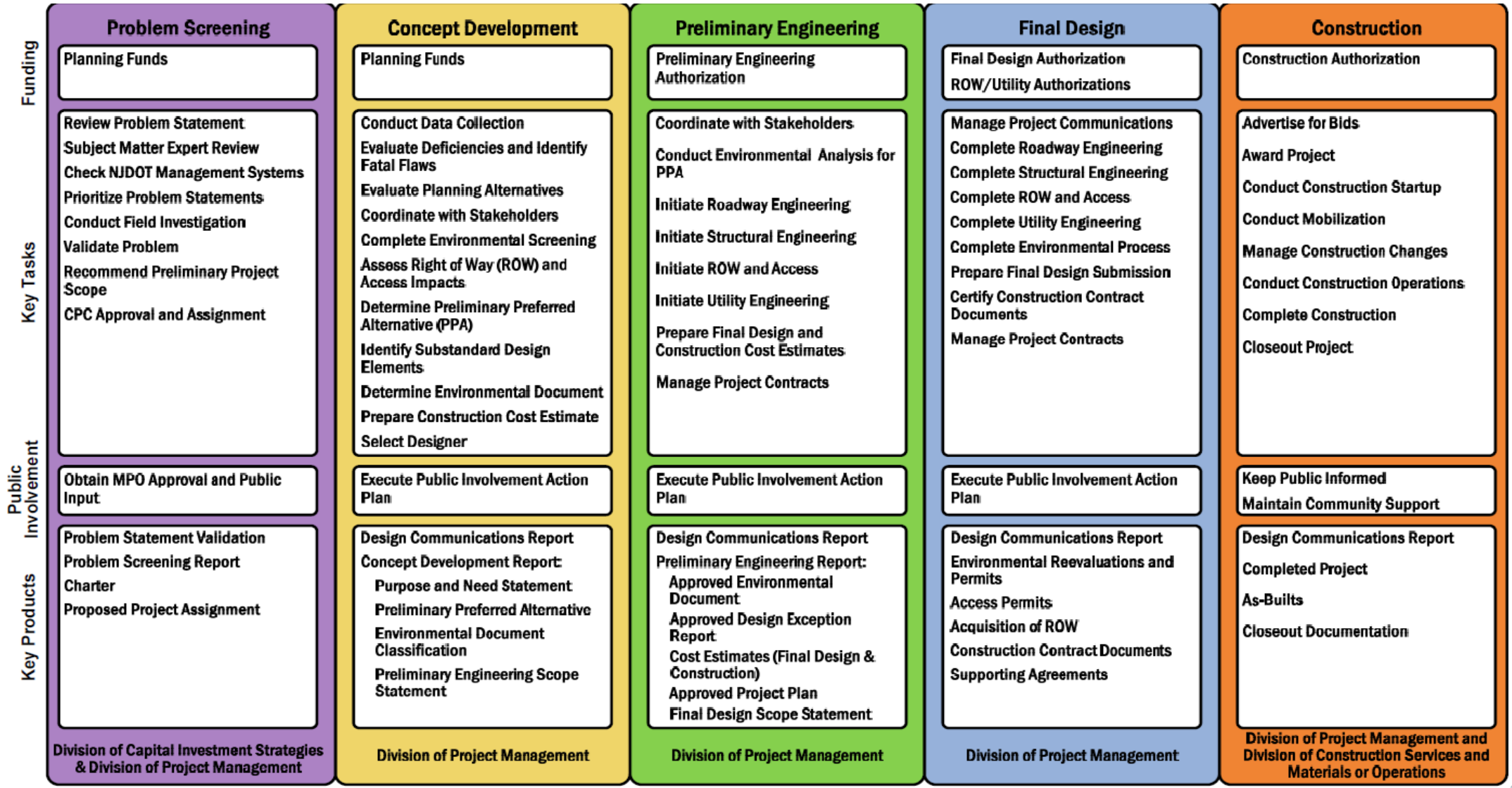
Project Management Specialist 3

NJDOT Division of Project Management

How is NJDOT Addressing Safety in Capital Projects?

- Capital Project Delivery Process
- Safety Improvements Included in Projects with Examples

NJDOT Project Delivery Process



Capital Project Delivery Process – Safety Related Activities

- Review Safety Management Data
- Review Crash Data
- Conduct Crash Analysis/Review Crash Diagrams
- Identify Substandard Design Elements
- Identify Feasible Safety Improvements and Include in Project

Example 1 – Implementation of Road Diet – Initial Condition

Route 26, Cox Road to Nassau Street, New Brunswick/North Brunswick, Middlesex Co.

Example 1 – Implementation of Road Diet – Final Condition

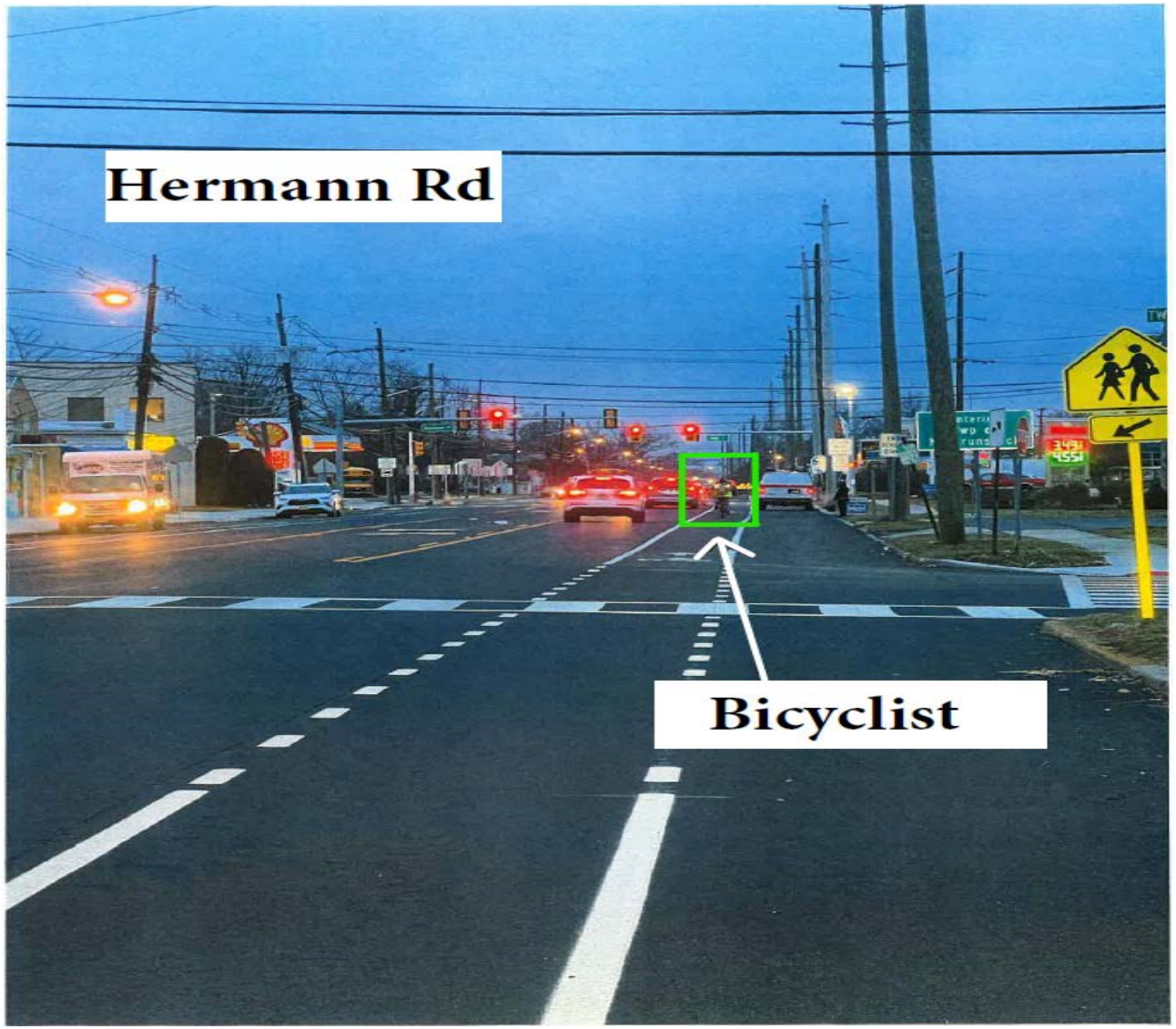
Route 26, Cox Road to Nassau Street

Key Safety Improvements

- Road Diet
- Bike Lanes

Key Benefits

- Turning Vehicles use Center Turning lanes
- Bicycle Accommodation
- Consistent with Livingston Ave CS Project



Example 2 – Construction of a Roundabout – Existing Conditions

Route 66, Jumping Brook Rd. to Bowne Rd./Wayside Rd., Neptune & Ocean TWPs/Monmouth Co.

Example 2 – Construction of a Roundabout – Proposed Conditions

Route 66, Jumping Brook Rd. to Bowne Rd./Wayside Rd.

Key Benefits

- Reduces Conflict Points
- Reduces Crashes
- Improves Traffic Operations

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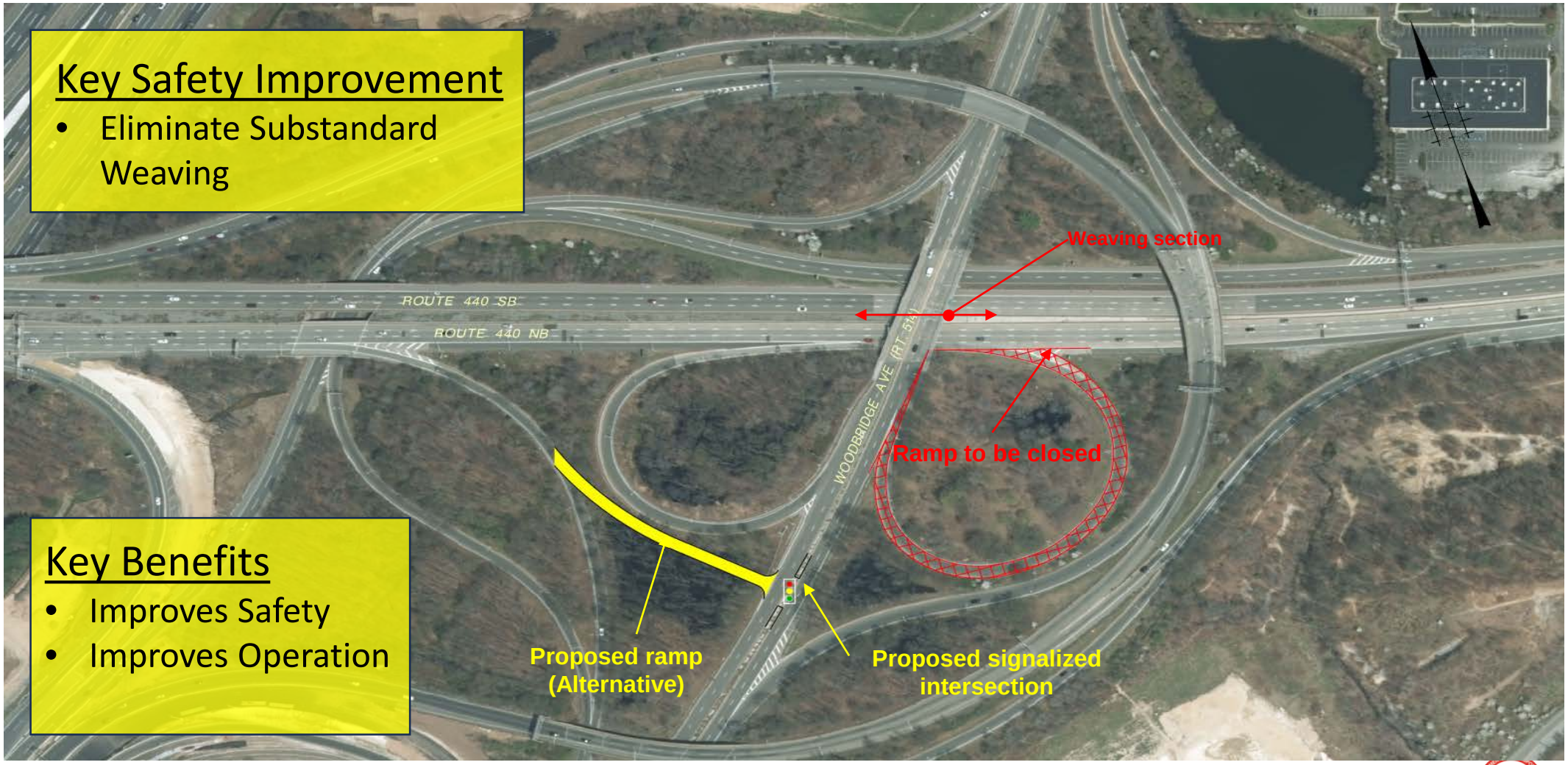
Example 3 – Substandard Weaving Section Elimination

Route 440, Route 95 to Kreil Street - Edison, Woodbridge, Perth Amboy City/ Middlesex Co.



Example 4 – Mid-Block Crosswalk Improvements, Central

Site 13: Route 33, Greenwood Elementary School, Hamilton Twp, Mercer Co. Before Construction

Issue

Limited vehicle
stop compliance
at the crosswalk

Example 4 – Mid-Block Crosswalk Improvements, Central

Site 13: Route 33, Greenwood Elementary School, Hamilton Twp, Mercer Co. After Construction

Key Safety Improvements

- Rectangular Rapid Flashing Beacons
- Signing/Striping

Key Benefits

- Improves Pedestrian Safety
- Improves Vehicle Stop Compliance

Example 5 – Systemic Backplate Pilot Program, Central

RT 27, North Brunswick & South Brunswick TWPs/ Middlesex Co.

Key Safety Improvement

- Traffic signal backplates with retroreflective border

Key Benefit

- Backplates improves traffic signal visibility

Signal backplate framed with a retroreflective border. Source: FHWA

Thank You

Sangaran "Vijay" Vijayakumar

Project Management Specialist 3

NJDOT Division of Project Management

Hirenkumar Patel

Principal Engineer

NJDOT Division of Transportation Mobility

Intelligent Transportation Systems (ITS) Devices

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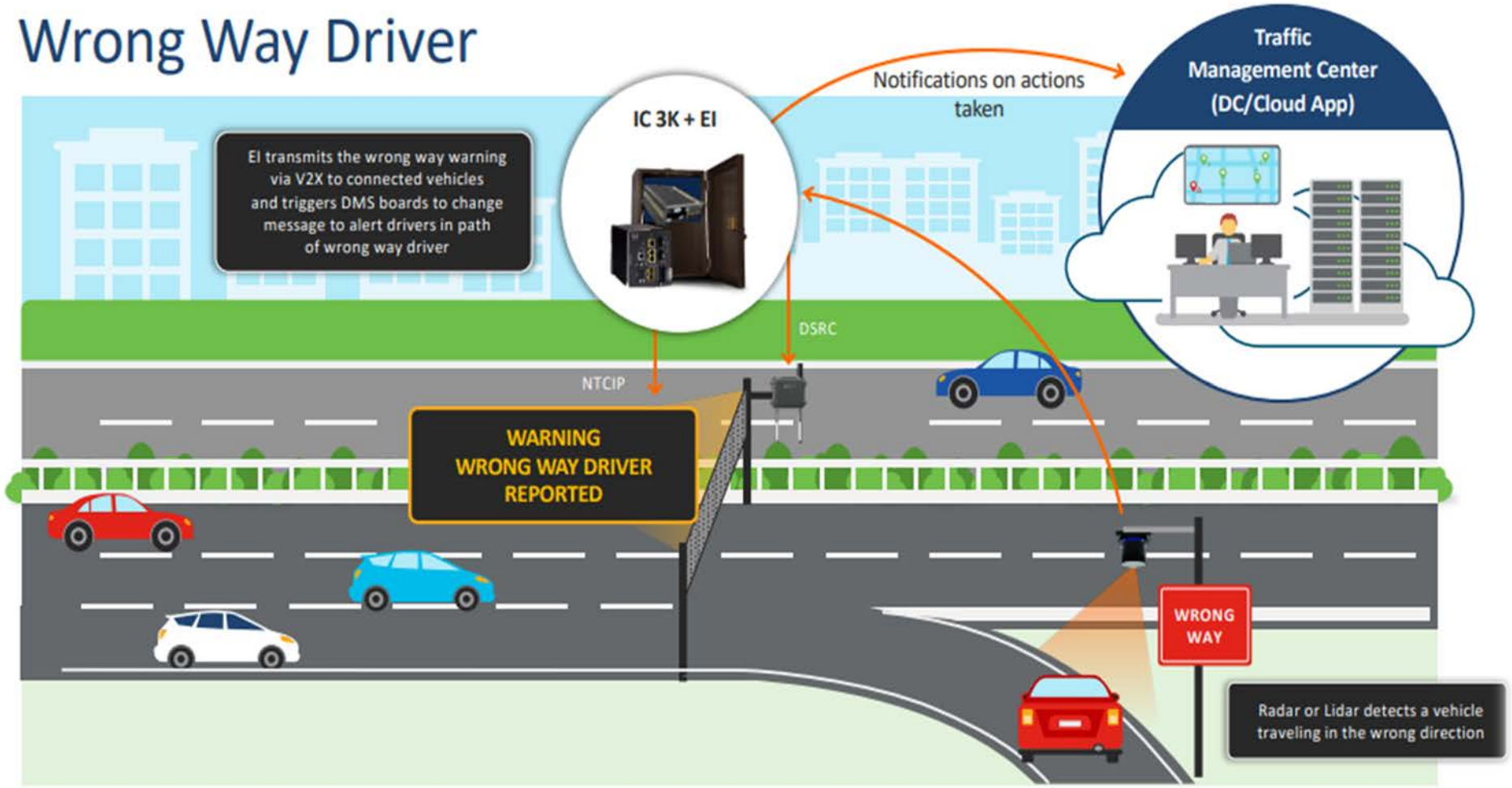
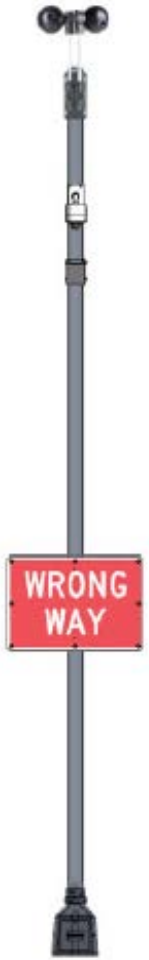
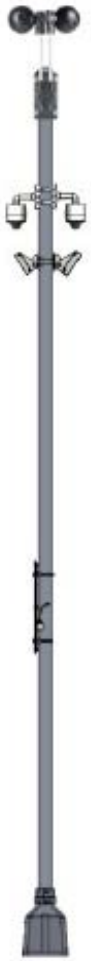
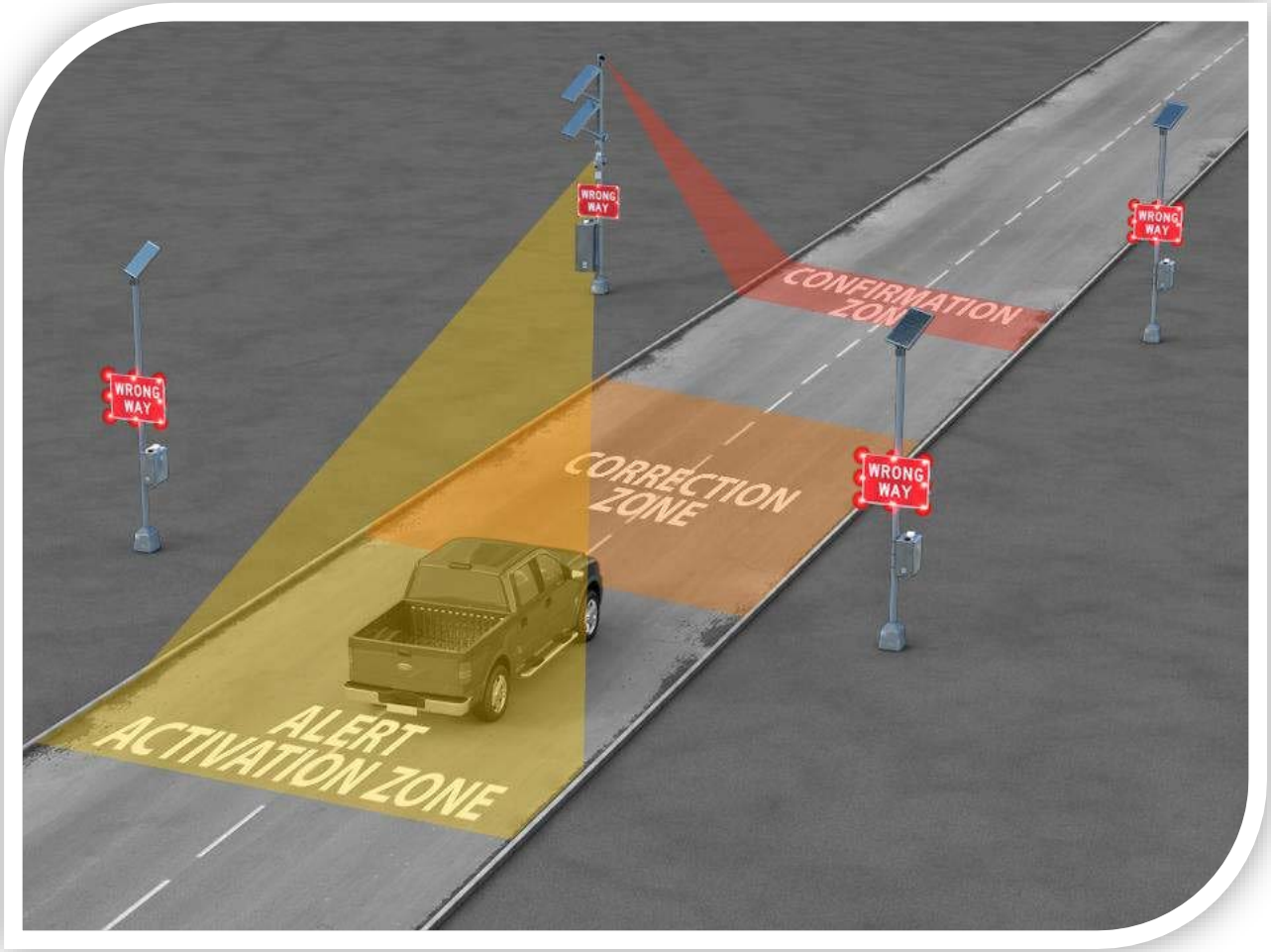
Wrong-Way Driving System



Wrong-Way Driving System & Zone Configuration







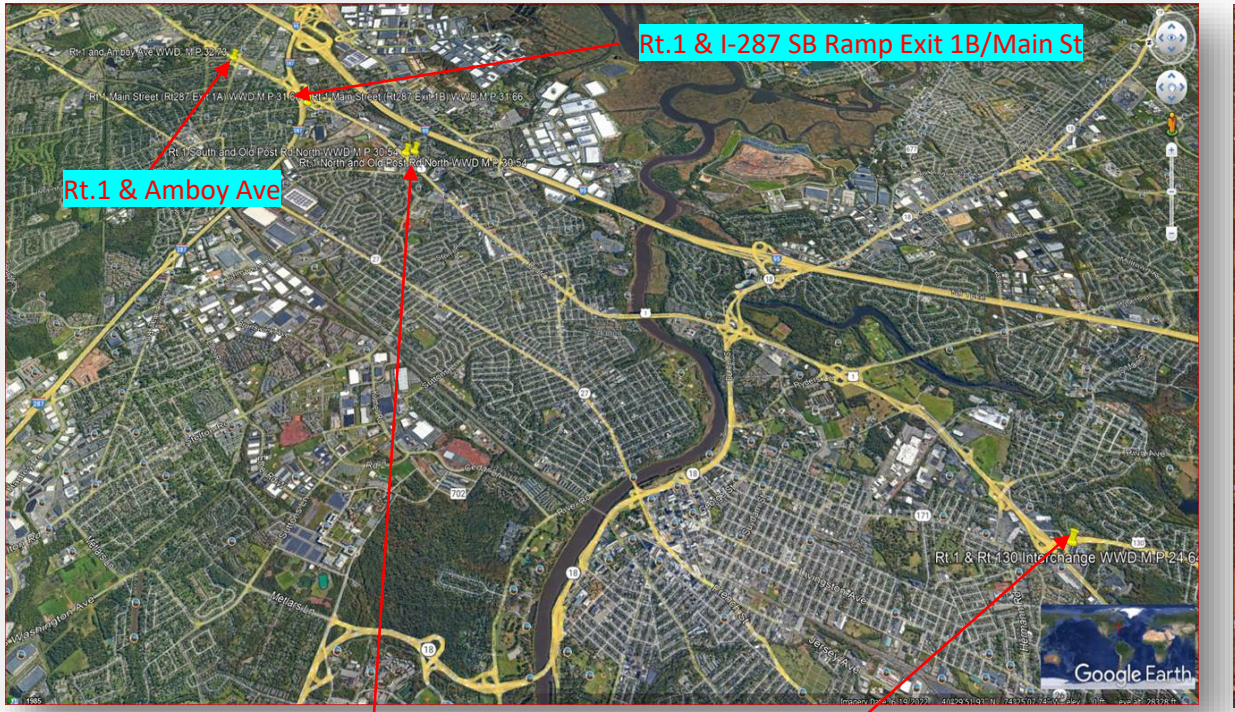
1. **Alert Activation Zone**
   - Initial wrong way detection triggers alerts to flash

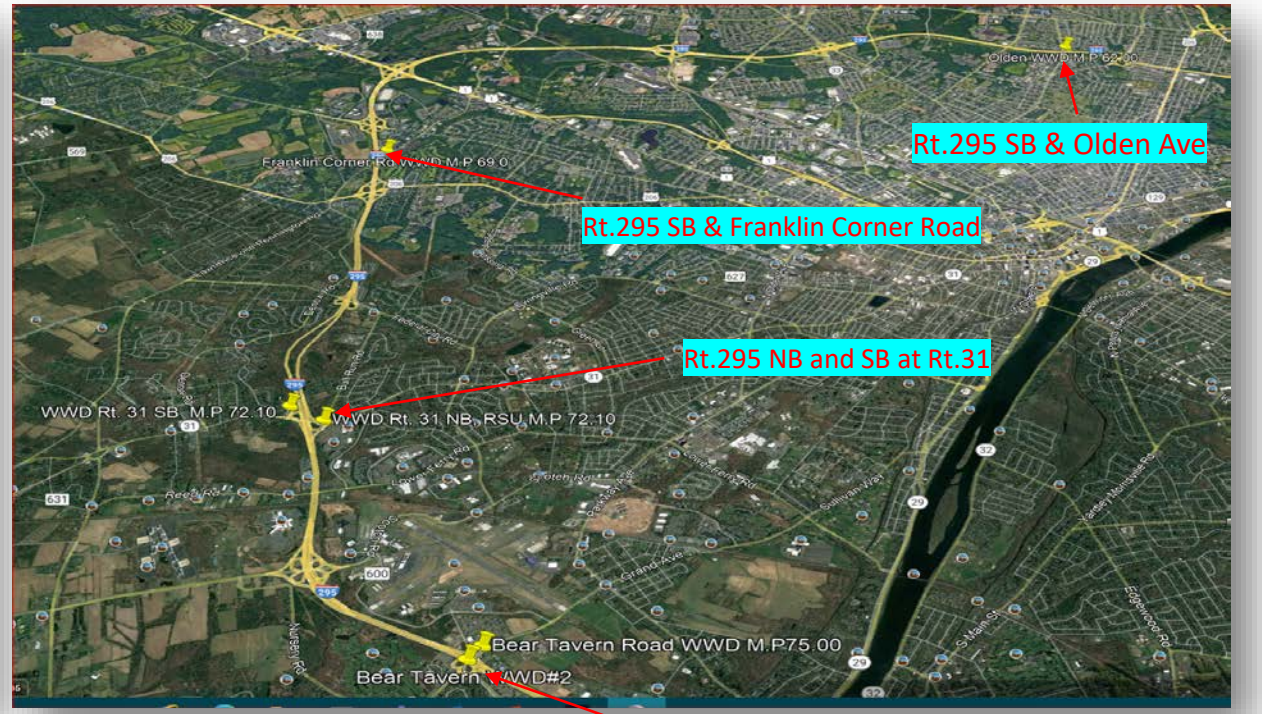
2. **Correction Zone**
   - Opportunity for driver self-correct

3. **Confirmation Zone**
   - Confirming wrong way detection
   - triggers camera and high priority alert sent to the TMC

Wrong Way Driver Detection System- Initial Deployments

Rt 1/Rt.295 Smart & Connected Corridor- 11 WWDS





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NJDOT- SMART RIGHT NOW

STAGE ONE – Planning and Prototyping

PHASE ONE: Programmatic Changes

- Revise project criteria, scoping to include wrong way driving analysis; multi-tiered mitigation strategies
- Create statewide evaluation criteria for deployment location selection
- Develop Systems Engineering documentation for proposed system changes

PHASE TWO: Implementation and Integration

- Implement prototype deployments (e.g., 4-5) with varying technology, conditions
- Integrate systemwide response plan(s) leveraging edge-computing technology

PHASE THREE: Evaluation and Planning

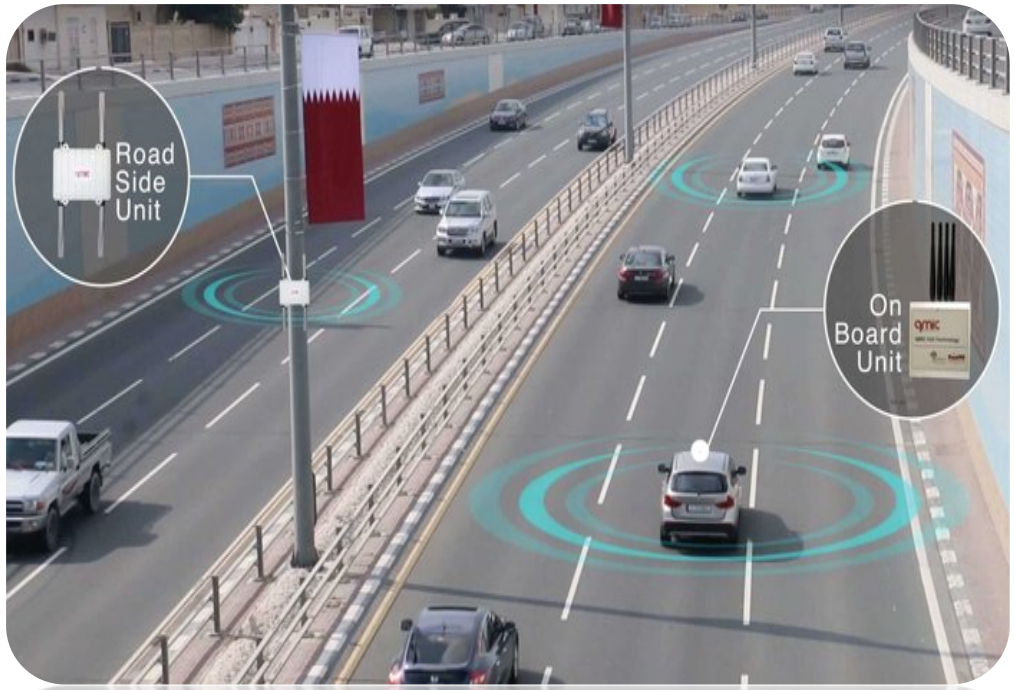
- Evaluate systems, technology for measured effectiveness
- Create technical standards, specifications for future deployments
- Identify funding for implementation; plan next steps

STAGE TWO - Implementation

SMART 2022 | US Department of Transportation

Connected Vehicle

Smart & Connected Corridor



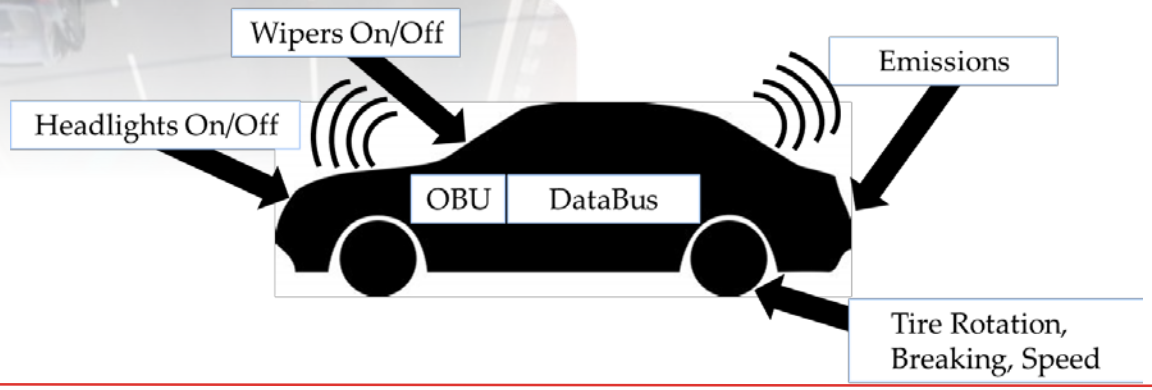
Roadside Unit (RSU):

Broadcasts Omni-directional (360 Deg) Messages at 10x / sec

- +/- 300-meter range
- Signal Phase and Timing (SPaT)
- Traveler Information Messages (TIM)
- MAP

Receives Omni-directional (360 Deg) Messages at 10x / sec from the Vehicle

- Core basic safety messages (BSM)
- SAE J2735 standard for messages
- Position accuracy ~ 1-meter



Current Deployments

Smart & Connected Corridor (Route 1/295) Contract #1 — Total RSUs: **78**

Route-1
- Total 36 Intersections
- Total 27 Midblock Locations
- 5 WWD sites

Route-295
- Total 11 ITS Sites (CSS,DMS)
- 6 WWD sites

Route U.S 40/322ATS, C#1 — Total RSUs: **47**

- Total 27 Intersection
- Total 21 Midblock Location

Route 73, Haddonfield Road to Delaware River, ATS, C#2 — Total RSUs: **9**

- Total 4 Intersection
- Total 5 Midblock Location

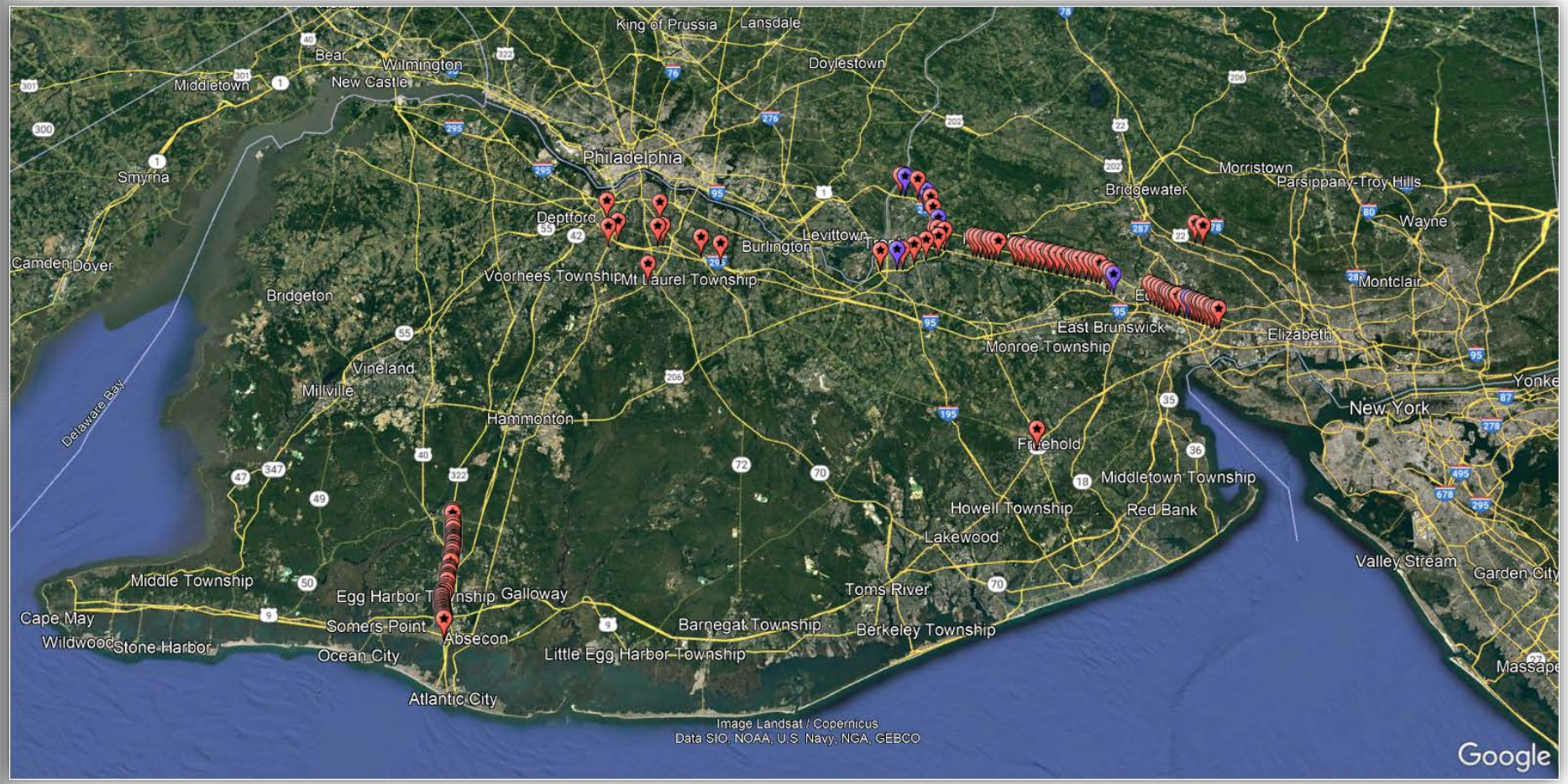
SMART MOVES 2020 SOUTH — Total RSUs: **9**

- Total 9 ITS Sites

UNDER DESIGN — Total RSUs: **191**

Use Cases: **SPaT, MAP, TIM & BSM**

Field Installations



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Thank You

Hirenkumar Patel

Principal Engineer

NJDOT Division of Transportation Mobility

Question & Answer Session

Question #1

How does NJDOT engage with the community and gather feedback on safety concerns and suggestions for improvements?

Question #2

Can you explain NJDOT's approach to ensuring the safety of road construction and maintenance workers, as well as the traveling public during construction projects?

Question #3

In what ways is NJDOT leveraging technology and innovation to not only analyze, but to respond to and enhance safety on the state's roads and highways?

Question #4

With new innovative technologies and data science applications on the horizon, what is your vision for NJDOT in reducing fatalities and serious injuries on our roadways over the next 25 years?

Audience Questions

Thank You

Further Questions?

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