



NEW JERSEY STATE TRANSPORTATION INNOVATION COUNCIL

www.NJDOTtechtransfer.net/NJ-STIC

1ST Quarterly Meeting March 29th, 2021



- Full screen, gallery view, speaker view
- Say “cheese”! Let us see your face if you’re comfortable.
- Mute yourself to avoid unnecessary background noise
- Use chat window for questions and comments
- Use the “reactions” tool for thumbs up, thumbs down

Date: March 29, 2021
Time: 10am –12pm
Location: Zoom Meeting – IMPORTANT Registration Details (see next page)

10:00-10:05 **Welcome & Introductions**
Assistant Commissioner Michael Russo, NJDOT

10:05-10:10 **FHWA Updates**
Helene Roberts, Performance Manager, FHWA NJ/

10:10-10:30 **Core Innovation Area (CIA) Updates** CIA Team Leaders

<u>Safety</u>	<i>Dan LiSanti, NJDOT/Keith Skilton, FHWA NJ</i>
<u>Mobility & Operations</u>	<i>Sue Catlett, NJDOT/Ek Phomsavath, FHWA NJ</i>
<u>Infrastructure Preservation</u>	<i>Bob Signora, NJDOT/John Miller, FHWA NJ</i>

10:30-10:40 **STIC Incentive Grant Project Updates**
Amanda Gendek, Manager, Bureau of Research, NJDOT
Sal Cowan, Senior Director, Transportation Mobility, NJDOT

10:40-10:45 **5 min. Break & Poll Question**

10:45-11:40 **EDC-6 Breakout Session** – each w/ Facilitator & Note Taker

1. Targeted Overlay Pavement Solutions - Infrastructure
2. Ultra High Performance Concrete - Infrastructure
3. E-Ticketing - Infrastructure
4. Digital As-Builts - Infrastructure
5. Virtual Public Involvement – Organizational Support & Improvement
6. Strategic Workforce Development - Organizational Support & Improvement
7. Crowdsourcing for Advancing Operations – Mobility
8. Next Generation TIM – Mobility

11:40-12:00 **Plenary Discussion** – facilitated by Helene Roberts
Breakout Group Facilitators (2-3 min per group max)

12:00 **Reminders & Announcements**

Adjourn



WELCOME

Mike Russo
Assistant Commissioner
NJDOT Planning, Multimodal & Grant Administration

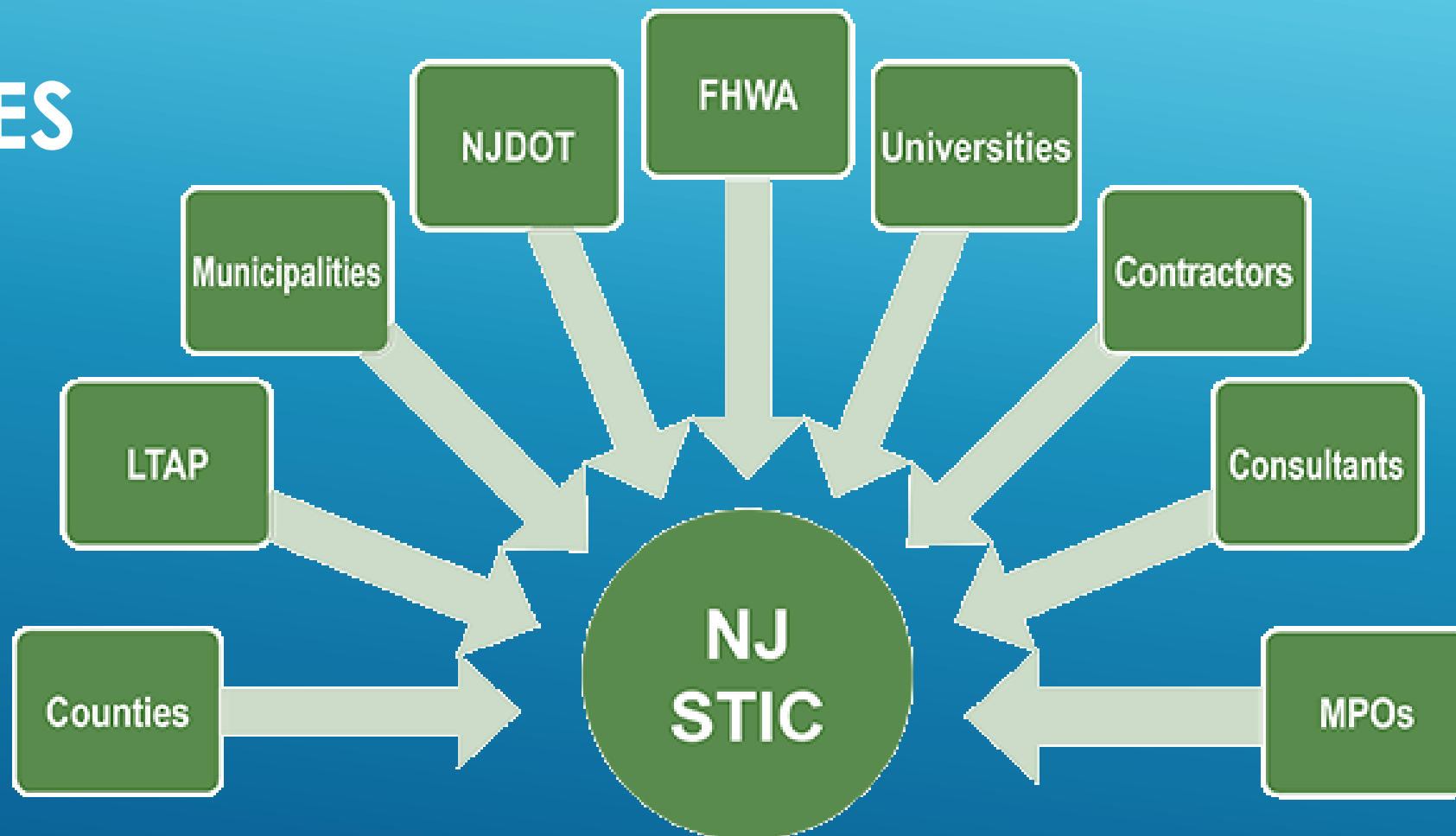


Every Day Counts
a Nation on the Move

STIC
State Transportation Innovation Councils



ATTENDEES





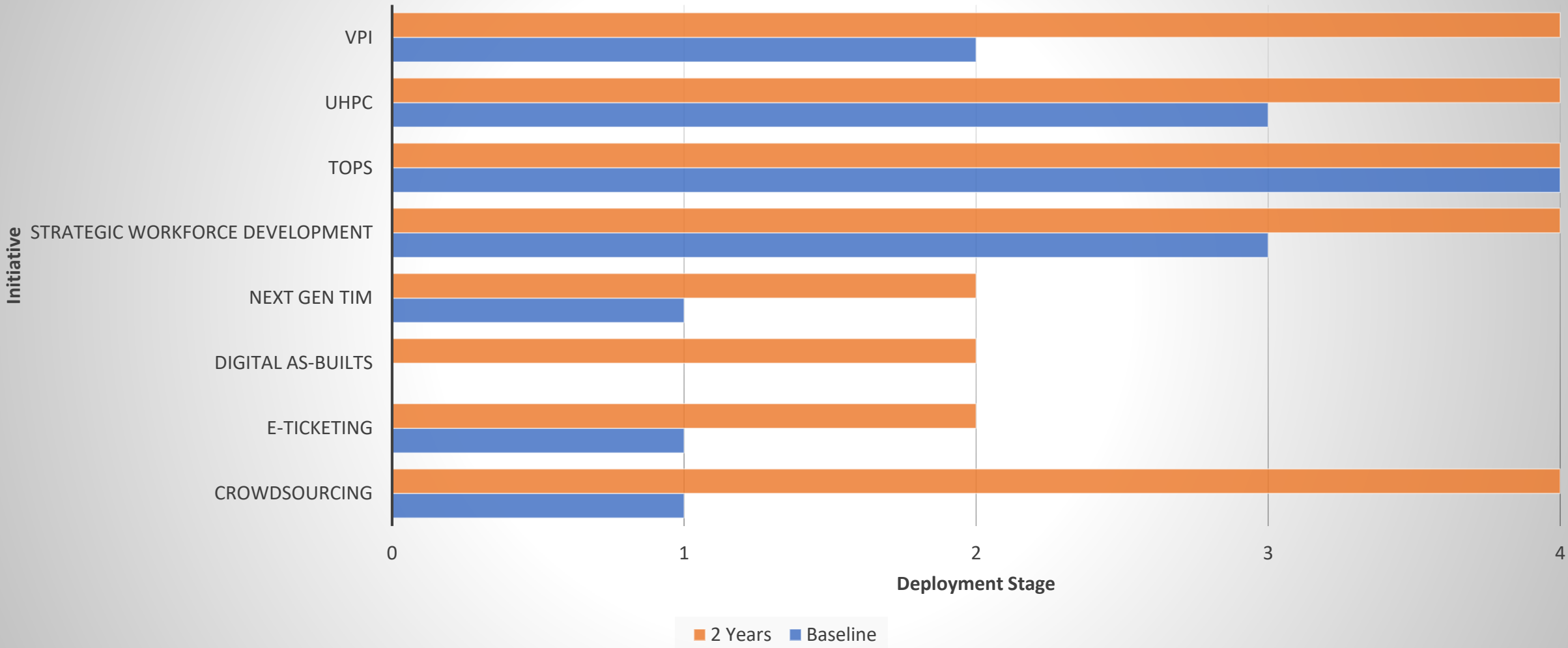
FHWA UPDATES



Helene Roberts, P.E.
Innovation Coordinator & Performance Manager
FHWA, NJ Division Office

EDC-6 Deployment

Deployment Stages for EDC-6 Initiatives



0 = not implementing; 1 = development; 2 = demonstration; 3 = assessment; 4 = institutionalized

CORE INNOVATION AREA REPORTS

CIA TEAM

SAFETY

NJDOT – Dan LiSanti
FHWA – Keith Skilton

CIA TEAM

INFRASTRUCTURE PRESERVATION

NJDOT – Bob Signora
FHWA – John Miller

CIA TEAM

MOBILITY & OPERATIONS

NJDOT – Sue Catlett
FHWA – Ek Phomsavath

CIA TEAM

ORGANIZATIONAL IMPROVEMENT & SUPPORT

NJDOT – Zenobia Fields
FHWA – Brian Goodson

CIA TEAM

SAFETY

NJDOT – Dan LiSanti

FHWA – Keith Skilton

EDC – 5

Reducing Rural Roadway Departures



U.S. Department of Transportation
Federal Highway Administration

Safe Roads for a Safer Future
Research to make our roads safer.
<http://safety.fhwa.dot.gov>

Making Our Roads Safer
ONE COUNTERMEASURE AT A TIME

 Roadside Design Improvement at Curves	 Reduced Left-Turn Conflict Intersections	 Systemic Application of Multiple Low Cost Countermeasures at Stop-Controlled Intersections	 Leading Pedestrian Interval	 Local Road Safety Plan
 USLIMITS2	 Enhanced Delineation and Friction for Horizontal Curves	 Longitudinal Rumble Strips and Stripes on Two-Lane Roads	 Median Barrier	 Safety Edge _{SM}
 Backplates with Retroreflective Borders	 Corridor Access Management	 Dedicated Left- and Right-Turn Lanes at Intersections	 Roundabouts	 Yellow Change Intervals
 Medians and Pedestrian Crossing Islands in Urban and Suburban Areas	 Pedestrian Hybrid Beacon	 Road Diet	 Walkways	 Road Safety Audit

EDC – 5

Reducing Rural Roadway Departures

U.S. Department of Transportation
Federal Highway Administration

Combating Rural Roadway Departures

New Jersey
March 16, 23, & 30, 2021

EDC

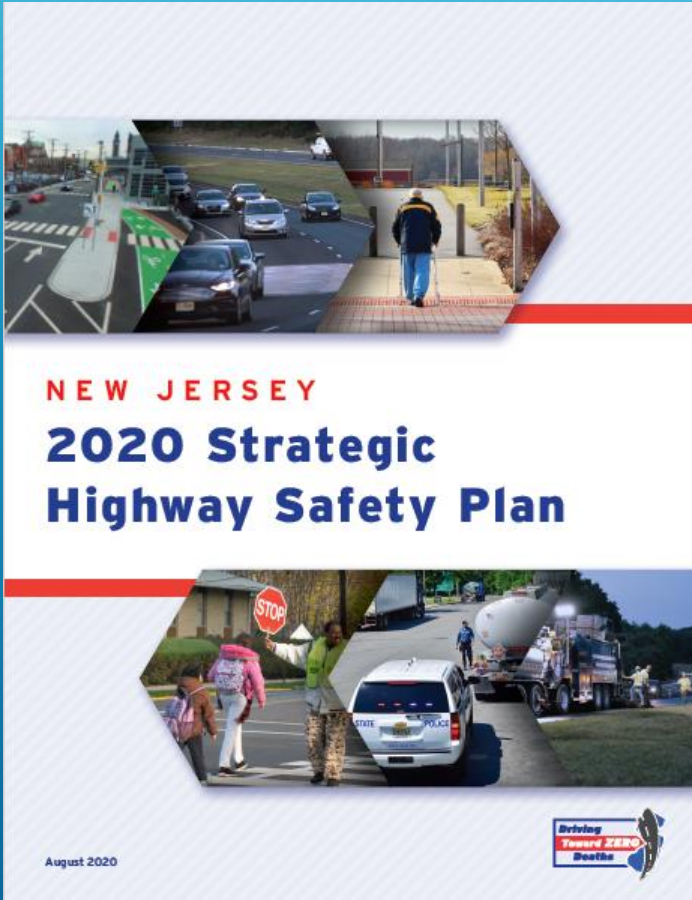
FORRRWD
Focus on Reducing Rural Roadway Departures

Federal Highway Administration 20 YEARS OF SERVICE
RESOURCE CENTER

FSI by Functional Class

Functional Class	<=25 mph	30-45mph	45+ mph
Interstate	1	5	444
Freeways	2	27	388
Principal Arterial	54	416	429
Minor Arterial	135	476	240
Major Collector	68	206	186
Minor Collector	7	19	13
Local	40	50	34
Other	459	395	113

Safe Transportation for Every Pedestrian (STEP)



Goal:
Eliminate pedestrian and bicyclist fatalities and serious injuries on all public roads.

Noteworthy Practice: State of New Jersey Includes Equity in SHSP

As part of its 2020 SHSP, the State of New Jersey included equity as one of the 5 E's of safety in addition to engineering, education, enforcement, and emergency medical services/emergency response. The following is from the New Jersey 2020 SHSP:

"This plan prioritizes equity in highway safety. To this end, and for the first time, we created an emphasis area team that is dedicated to ensuring that all strategies and activities emanating from this plan fairly and equitably consider all users and communities, particularly those that are historically disadvantaged, such as minority populations, economically depressed communities, and those that are differently abled."⁵¹

CIA TEAM

INFRASTRUCTURE

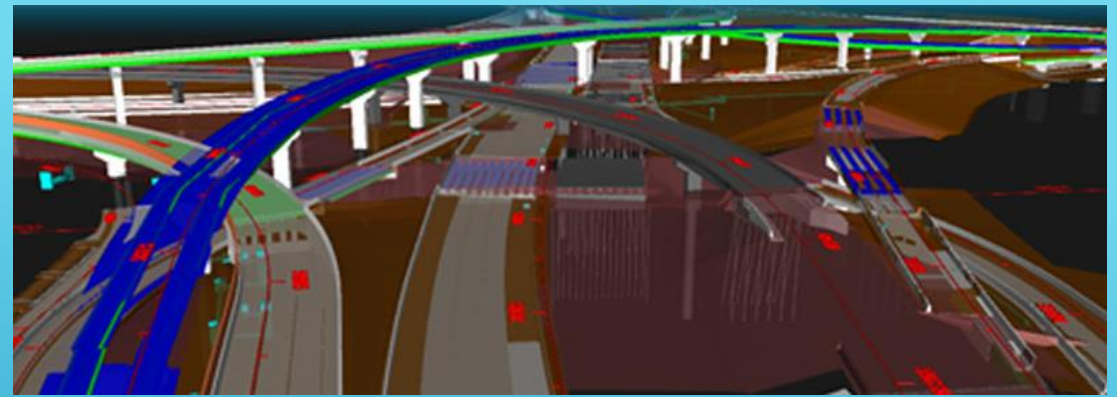
PRESERVATION

NJDOT – Bob Signora

FHWA – John Miller

EDC – 6

Digital As-Builts



Purpose: To explore the use of 3D models to build projects and update that digital information to reflect the project's as-built condition

Benefits:

- Construction using digital information can lead to safer projects
- Digital information streamlines project delivery
- Digital as-builts can provide enhanced historical data

Status:

- Team assembled (NJDOT, FHWA, Industry), Baseline Report completed, Working on prepare a list of required resources and preparing a cost estimate

EDC – 6

e-Ticketing



Purpose: Provide stakeholders with an electronic means to produce, transmit, and track and verify materials deliveries

Benefits:

- *Enhances data collection & reduces exposure to construction equipment*
- *Time Savings - Real-time access*
- *Project documentation is more consistent and efficient using e-Ticketing*

Status:

- *Effort in Development Stage*
- *Assessing vendors for possible use*

EDC – 6 Targeted Overlay Pavement Solutions (TOPS)

Purpose: *To develop and install overlays that provide long-life performance under a wide range of traffic, environmental, & existing pavement conditions*

Benefits:

- Improve surface characteristics, such as smoothness, friction, and noise
- Timely and well-designed overlays are consistently cost-effective
- Targeted solutions to high-traffic areas result in reduced maintenance needs, fewer work zones, and improved safety

Status:

- NJDOT is a lead agency using High-Performance Thin Overlay (HPTO), Binder Rich Intermediate Course (BRIC), & Stone Matrix Asphalt (SMA)
- Asphalt Rubber Gap-Graded (ARGG), Open-Graded Friction Course (OGFC), & Ultra-Thin Bonded Wearing Course (UTBWC) in Standard Specs

EDC – 6

UHPC for Bridge Preservation and Repair



Purpose: To explore the use of UHPC for Bridge Preservation and Repair.

Benefits:

- Versatile & Strong - UHPC is a fiber-reinforced, cementitious composite material with mechanical and durability properties that far exceed those of conventional concrete materials
- UHPC repairs can outlive and outperform their conventional counterparts, resulting in life-cycle cost savings

Status:

- 2 Pilot projects using UHPC completed in 2020. Information being gathered on performance and usability
- Life cycle cost analysis will also be conducted
- Bridge Design Manual will be updated to include UHPC P&R

CIA TEAM

MOBILITY & OPS

NJDOT – Sue Catlett

FHWA – Ek Phomsavath

EDC-6: Crowdsourcing for Advancing Operations

NJDOT partnering with Waycare

- Pilot project
- Support/improve operations of traffic incident management (TIM) and traffic operations centers (TOCs)

“Development” Stage

- Awarded the STIC Incentive funding (\$55,000)
- Assembled a team
- Developed a schedule and deployment plan



EDC-6: Next-Generation TIM: Integrating Technology, Data, and Training

NJDOT collaborating with NJSP

- Computer-Aided Dispatch (CAD) integration project
- CAD integration into traffic operation centers to improve incident response and quicker clearance.
- NJSP selected Motorola to implement the new CAD system.

“Development” Stage

- Assembled a team
- Need to determine the data types/interface format of the new CAD system once deployed by the NJSP.





NEW

CIA TEAM

**Organizational
Improvement &
Support**

NJDOT – Zenobia Fields

FHWA – Brian Goodson

STIC INCENTIVE GRANT PROJECT UPDATES

Innovations	Assistant Commissioner	Lead	Total Project Cost
Federal Fiscal Year 2021			
TBD	Tunnard	TBD	\$45,000
Enhanced Crowdsourcing for Operations	Tunnard	Sal Cowan	\$55,000
			\$100,000
Federal Fiscal Year 2020			
NJ - STIC Communications Plan	Russo	Amanda Gendek	\$60,000
Bluebeam Training for LPAs	Russo	Laine Rankin	\$40,000
			\$100,000
Federal Fiscal Year 2019			
UAS Strategic Plan Implementation	Russo	Nicole Minutoli	\$98,386
			\$98,386
Federal Fiscal Year 2018			
Connected Vehicle: Road Service Safety Messages	Tunnard	Sal Cowan	\$31,680
			\$31,680
Federal Fiscal Year 2017			
Data-Driven Safety Analysis	Russo	Dan LiSanti	\$18,564
Purchase and Eval. of Tablets for e-Construction	Patel	Yogesh Bhavsar	\$32,404
Purchase, Use, and Evaluation of UAS	Russo	Nicole Minutoli	\$47,956
			\$98,924
Federal Fiscal Year 2015			
Data-Driven Safety Analysis	Russo	Dan LiSanti	\$41,600
e-Construction, Stakeholder Partnering	Patel	Snehal Patel	\$21,464
			\$63,064

-  Improve safety
-  Faster construction
-  Reduced congestion
-  Improved quality & user satisfaction

NJ STIC COMMUNICATIONS PLAN (FY20)



- Mission
- STIC Organizational Framework
- Audience
- Identifying Innovative Practices
- Accelerating Innovations through Communications Toolbox
- NJ STIC Communications Tools
 - Tools and Frequency
 - Recent and Proposed Communication



BUREAU OF RESEARCH NJDOT Technology Transfer

Innovative Initiatives

Every five years, the FHWA works with State Departments of Transportation, local governments, tribes, private industry, and other stakeholders to identify a new set of innovative technologies and practices that merit widespread deployment through the Every Day Counts (EDC) program. Selected innovations show common goals: advancing project delivery, enhancing the safety and quality of roads and bridges, saving traffic congestion, and improving governmental sustainability.

NJ DOT has established three Core Innovation Area teams—Safety, Mobility and Operations, and Infrastructure Preservation—for evaluating and advancing innovative ideas, techniques and processes. Learn more about the innovative technologies and practices and the status of their deployment in New Jersey.

Active Signal Control Technology	Advanced Geospatial Vehicle to Infrastructure System	AVLs
Collaborative Hydrologic Modeling to Improve Generation Of Engineering CHANGE	Coordinating For Operations	Data-Driven Safety Audit Tools
Construction & Planning	Highwaywide, Full-Depth, Longitudinal Bridge	Performance Based Design
Intelligent Roadway	Intelligent Roadway	Safe Transportation For Every Pedestrian
Performance Based Design	Performance Based Design	Performance Based Design

NEW JERSEY STIC **SPOTLIGHT ON INNOVATION: UNMANNED AERIAL SYSTEMS (UAS) High Mast Light Pole Inspections Comparative Analysis**

INTRODUCTION

Unmanned Aerial Systems (UAS), or drones, are multi-use aircraft controlled from the ground by a licensed operator. They can be used in nearly all aspects of highway transportation—they replace boots on the ground, increase accuracy, speed up data collection, and provide access to hard-to-reach locations. Here's a look at a NJ DOT research study that compared the relative benefits of using UAS versus visual inspectors methods for the structural inspection of 244 of its high mast light poles.

CRITERIA	BUCKET TRUCKS	TRADITIONAL	UAS
Time (person-hours)	3,312	1,284	1,476
Cost	\$477,022	\$157,600	\$186,025
Safety	\$2,182 per year (including 4 lane closures)	\$2,182 per year (including 4 lane closures)	\$0
Exposure	\$1,736 per year (including 4 lane closures)	\$1,736 per year (including 4 lane closures)	\$0
Total Cost	\$500,410	\$330,988	\$203,025

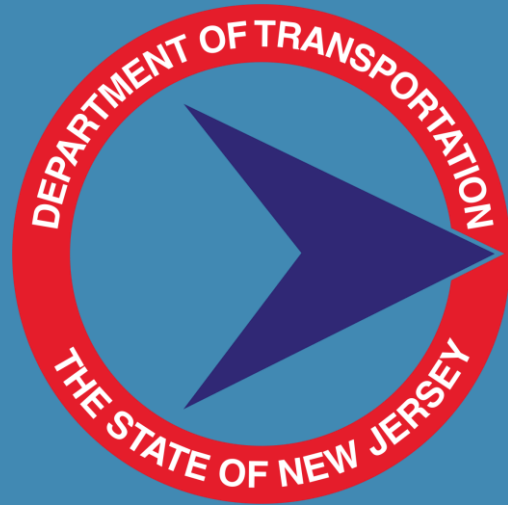
ADDITIONAL BENEFITS

The UAS approach offers additional benefits that could be quantified, such as:

- HIGHER QUALITY PHOTOGRAPHS** for documentation and analysis
- Fewer SAFETY RISKS, lower VEHICLE EMISSIONS,** and less **TIME**—no driving to secondary inspections
- Eliminate safety and traffic impacts of a **SHOULDER CLOSURE**—no secondary inspections
- Reduced **INJURY EXPOSURE** to workers (both in work zones and in bucket trucks)

Learn more about NISTIC & our Innovative Initiatives at: www.njdottechtransfer.nj.gov/stic/

This research was sponsored by:



ENHANCED CROWDSOURCING FOR OPERATIONS IN NEW JERSEY

February 2020

NJDOT MOBILITY OPERATIONS CENTERS

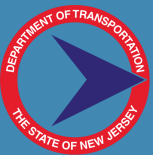
STMC Woodbridge
(24/7)



Cherry Hill
(16/5)



Monitoring conditions on 7,535 lane miles





Deployments

- Nevada
- Central Ohio
- Missouri
- Texas
- North Carolina
- Utah
- San Francisco/Bay Area
- Western Florida

Award Winning Technology



GovTech 100
2021



SXSW Pitch Finalist
2020



SMART 50 Award
2020 & 2019



GovTech 100
2020



ITE Nevada Chapter
Transportation Project of the
Year
2019



Government Innovation Awards
2019



GovTech 100
2018



Ones to Watch
2018



WAYCARE IS A CLOUD-BASED PLATFORM THAT PROVIDES AI SOLUTIONS FOR PROACTIVE TRAFFIC MANAGEMENT



Automated Incident Identification



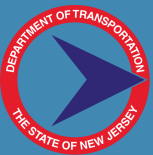
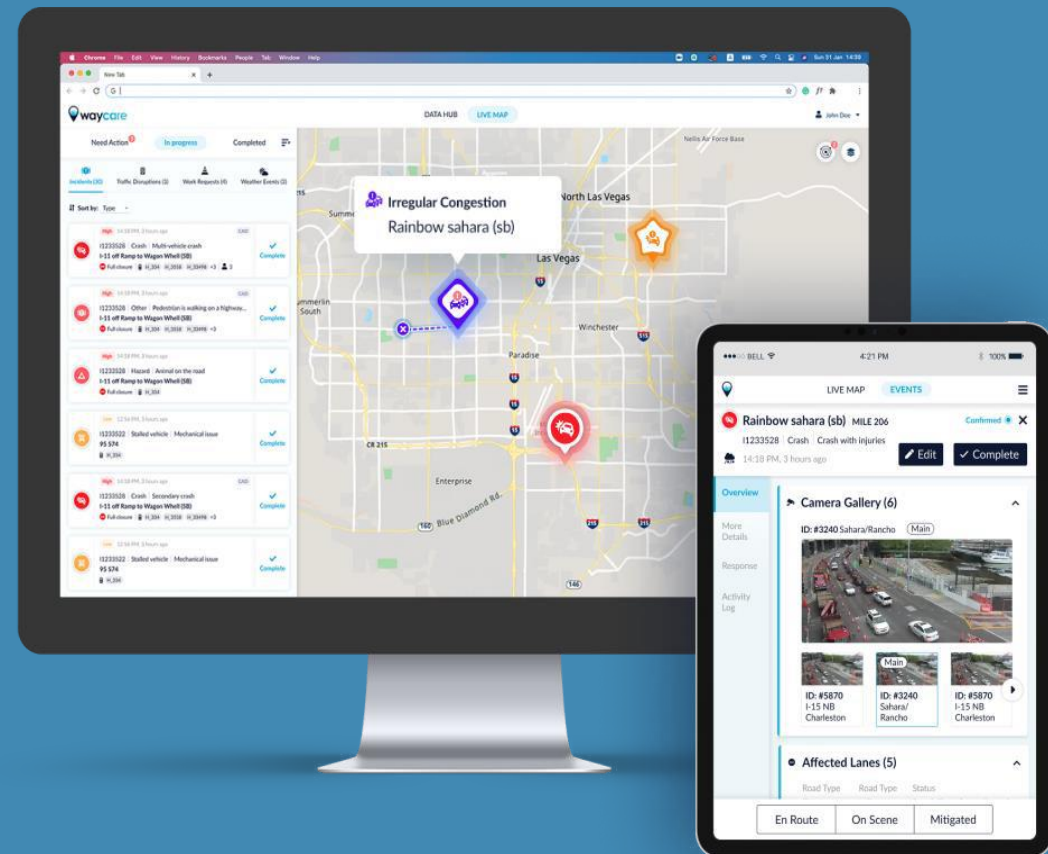
Crash Prediction and Forecasting



Irregular Congestion Detection

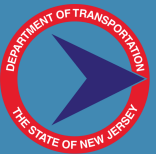


Collaborative Tools for Faster Response



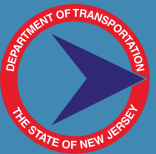
STIC INCENTIVE GRANT PILOT GOALS

- Improve incident detection and roadway system monitoring
- Decrease response times to incidents and incident duration
- Understand value of data provided by crowdsourcing information service (Waycare).
- Compare data to State's NJTR-1 crash records (accuracy of crowdsourced data)



STIC INCENTIVE GRANT PILOT KPI'S

- Number of incidents detected (Waycare vs. other sources)
- Improved internal and external communication channels
- User satisfaction
- Reduction in response times
- Reduction in overall duration of incidents



THE PLATFORM INGESTS DATA FROM A VAST AMOUNT OF SOURCES TO PROVIDE HIGHLY ACCURATE INSIGHTS AND PREDICTIONS

VOLVO



GEOTAB
management by measurement

wejo

otonomo

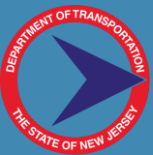


INRIX

SIEMENS



ticketmaster®



DIFFERENT SOURCES OF **IN-VEHICLE DATA** PROVIDE POWERFUL TRAFFIC SAFETY INSIGHTS



Vehicle
sensors



IoT-enabled
devices



Aftermarket
telematics
devices



Crowdsourced Data



Dashboard
camera



Infotainment Systems



DIFFERENT TYPES OF DATA FOR DIFFERENT USE CASES

AGGREGATED

Typically generated through probe data

Example output:

- Traffic flow / Speed
- Travel time
- Queue length
- Delays
- Volume

ANONYMIZED VEHICLE DATA

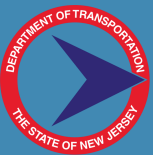
Rich data transmitted through connected vehicle sensors or aftermarket telematics devices

Example Data Points:

- Location (Lat/Long)
- Speed / Heading
- Driving Behavior (Acceleration, Deceleration, Harsh Braking, Automated Emergency Brake, traction control)
- Additional Metadata : (Fuel level, wiper speed, seat belts status,

Example Waycare Output:

- Automated incident detection
- On-road hazard warnings
- Crash predictions
- Dangerous weather driving conditions
- Intersection performance
- Work Zone AI



VEHICLE PENETRATION FOR ROADWAY COVERAGE AND AI BASED INSIGHT



1 IN 50
VEHICLES

1 IN 20
VEHICLES

1 IN 10
VEHICLES

1 IN 5
VEHICLES

SCARCE

ADEQUATE

IDEAL

SURPLUS

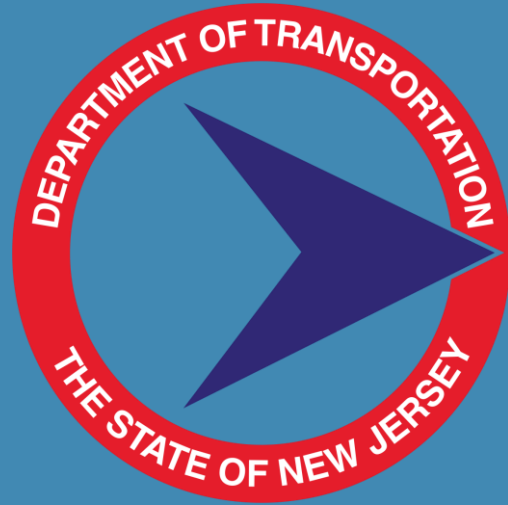
NEXT STEPS

Authorize the pilot funding and finalize the agreement with Waycare

Begin the 3-step process for implementation:

1. Data onboarding and integration (Typically 2-5 months)
2. Test user phases - training and customization (Typically 1-2 months)
3. Full system deployment - including training (Typically 1 month)



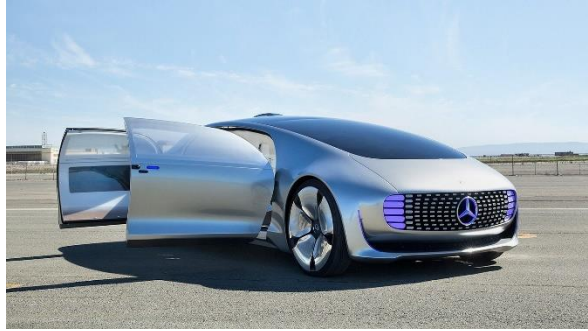


**ENHANCED CROWDSOURCING FOR
OPERATIONS IN NEW JERSEY**

THANK YOU



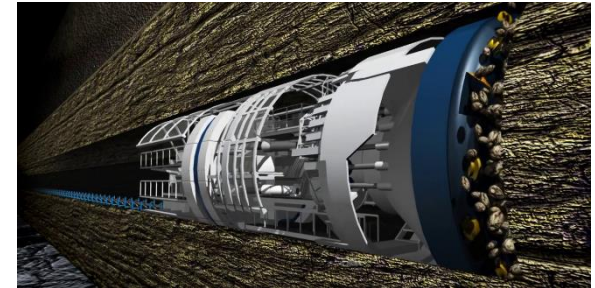
5 min. Break & Poll Question



Which one of these innovations would you like to drive?



- Autonomous Vehicle
- Old Fashion Horse and Buggy
- Hybrid Tesla
- E-Scooter
- Tunneling Machine
- Bullet Train
- Bicycle





EDC-6 BREAKOUT SESSION

BREAKOUT SESSIONS WILL BE RECORDED

- Each of you have been pre-assigned to a Breakout Room
- You will be met in the room by a facilitator and note taker
- They will guide you through several questions
- 55 minutes total, time reminders will be sent to keep us on track
- After the 55 minutes, we will all reconvene to the main meeting room where we'll have a 20 minute plenary discussion about our experiences.

PLENARY DISCUSSION



Moderator: **Helene Roberts**
Performance Manager
FHWA-NJ Division



REMINDERS & ANNOUNCEMENTS

NJDOT Tech Transfer Website
www.njdottechtransfer.net

NJ STIC Website
www.njdottechtransfer.net/nj-stic/

2021 Build A Better Mousetrap Competition

NJDOT Tech Transfer News



THANK YOU!

www.NJDOTtechtransfer.net/NJ-STIC
(609)963-2242 – Bureau of Research