

1st Triannual Meeting
April 30, 2025

NEW JERSEY DEPARTMENT OF TRANSPORTATION



Welcome

Eric Powers

Assistant Commissioner

NJDOT Statewide Planning, Safety & Capital Investment



Feature Presentation

High Performance Internally Cured Concrete (HPIC)

Jess Mendenhall & Samer Rabie
Structural Engineering Services &
NJDOT Project Management



FHWA Updates



Christopher Paige

Innovation Coordinator & Community Planner

FHWA, NJ Division Office



FHWA Updates

- **Progress Reporting – Due May 9th**
 - EDC-7 Final Progress Reports
 - STIC Incentive Project Report
- **FY25 STIC Incentive Funding Requests** opened on October 1, 2024, and closes on July 1, 2025,



STIC Incentive Applications

For more information on the STIC Incentive Program, please visit <http://www.fhwa.dot.gov/stic>

- **Overview of Application Process**

- Describe proposed work, project schedule and budget
- Comply with the program requirements
- Each STIC has up to \$125,000 per year
- Please send applications by **7/1/25**
(Giri.Venkiteela@dot.nj.gov) (christopher.paige@dot.gov)



Mentimeter Engagement Activity

Join at menti.com | use code **9353 0397**



NJ STIC

Go to

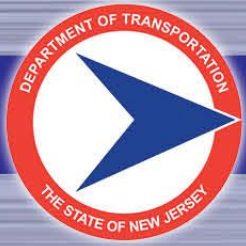
www.menti.com

Enter the code

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Or use QR code



Core Innovation Area Team Leads

SAFETY

NJDOT – Jeevanjot Singh
FHWA – Alan Huff

PLANNING & ENVIRONMENT

NJDOT – Simon Nwachukwu
FHWA – Christopher Paige

INFRASTRUCTURE PRESERVATION

NJDOT – Shivani Patel
FHWA – Christopher Paige

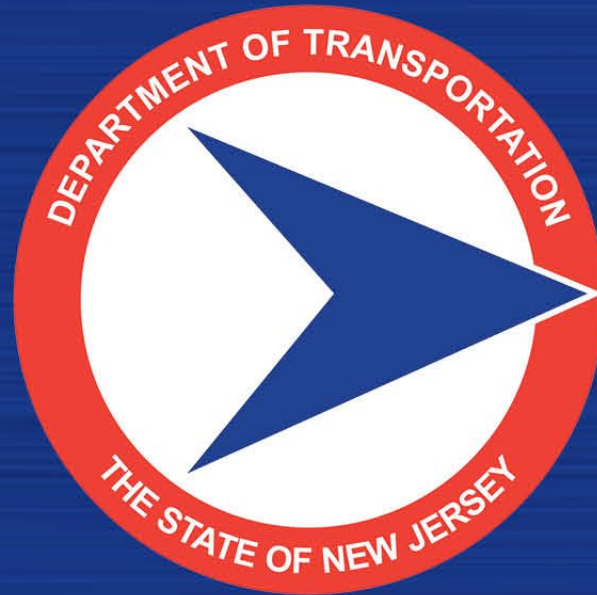
MOBILITY & OPERATIONS

NJDOT – Vandana Mathur
FHWA – Ek Phomsavath

ORGANIZATIONAL SUPPORT & IMPROVEMENT

NJDOT – Kristal Walker
FHWA – Christopher Paige

CIA Team Updates: Safety



Presented by Jeevanjot Singh, Alan Huff
April 30, 2025

NEW JERSEY DEPARTMENT OF TRANSPORTATION



Task	Status
Literature review of relationship between quality of streetlighting on pedestrian safety, fatalities, and serious injuries.	Complete
Summary of best practices and recommendations in design guidance for pedestrian-scale lighting, defining specifications of minimum and maximum luminance, illuminance, color-corrected temperature, and fixture spacing, positioning, and height.	Drafted
Draft Pedestrian Scale Lighting resource content outline.	Complete
Final Pedestrian Scale Lighting resource synthesizing best practices in the types of lighting, luminaire placement, and ways to reduce fatalities and serious injuries.	In progress

Pedestrian Scale Lighting Research & Resource



RUTGERS-NEW BRUNSWICK
Edward J. Bloustein School
of Planning and Public Policy
Alan M. Voorhees Transportation Center



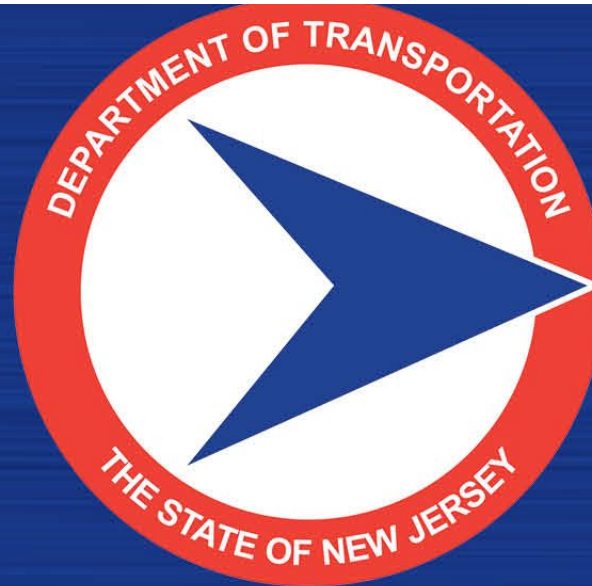


NIGHTTIME VISIBILITY FOR SAFETY

- Developing traffic signal pole and mast arm details for signalized intersection installations
- Includes backplates with retroreflective tape on signal indications

CIA Team Updates: Strategic Implementation of CMAQ & CRP

Driving Innovation and Emission Reduction in New Jersey's Transportation Sector



Presented by Simon Nwachukwu
April 30, 2025

NEW JERSEY DEPARTMENT OF TRANSPORTATION



Strategic Overview – CMAQ & CRP

- **Congestion Mitigation and Air Quality Improvement Program (CMAQ):** A federally administered program designed to fund projects that mitigate congestion, reduce emissions, and improve air quality in designated non-attainment areas. It is instrumental in addressing the interrelated challenges of traffic congestion and air pollution.
- **Carbon Reduction Program (CRP):** A targeted initiative aimed at systematically reducing carbon emissions in the transportation sector through the deployment of sustainable technologies and low-carbon transportation solutions.
- **NJDOT's Mandate:** NJDOT is strategically aligning both the CMAQ and CRP program with state and federal climate action goals. Our objective is to leverage the program to not only meet regulatory mandates but to drive transformational change in New Jersey's transportation infrastructure, advancing climate resilience and sustainability.



CMAQ – Target Development & New Project Approvals

- **CMAQ Target Development:** The CMAQ program has developed specific, quantifiable emissions reduction targets, which guide the identification, selection, and funding of eligible projects. These targets are aligned with federal air quality standards and state-level sustainability initiatives, with a focus on reducing NOx, PM2.5, VOC, and CO emissions.
- **Active Project Approval Process:** NJDOT is actively approving new projects based on their alignment with CMAQ's defined targets. These projects must demonstrate their potential to significantly reduce congestion, mitigate environmental impacts, and advance the adoption of low-emission technologies.



CMAQ – Target Development & New Project Approvals

➤ Project Types:

- Intelligent Transportation Systems (ITS) for real-time traffic management and congestion alleviation.
- Intersection modernization for improved traffic flow and reduced vehicle idling.
- Public transit expansion to promote multimodal transportation and reduce single-occupancy vehicle use.
- Low-emission vehicle incentives to accelerate the adoption of zero-emission transportation options.
- Expected Outcomes: Projects funded under CMAQ are expected to lead to reductions in air pollutants and greenhouse gas emissions, specifically targeting high-priority non-attainment areas.



CRP – Full-Scale Implementation and Achievement

- **Current Implementation Status:** The CRP has successfully transitioned from planning to full-scale implementation.

- **Key Strategic Advancements:**
 - Deployment of battery-electric buses in urban transit systems, contributing to a significant reduction in CO emissions.
 - Development of complete streets initiatives designed to enhance pedestrian and cycling infrastructure, thereby promoting active transportation and reducing car dependency.
 - Partnerships with municipalities for the transition to green fleets and the adoption of alternative fuels

- **Impact Assessment:**
 - The program is delivering significant reductions in CO emissions through the electrification of transport modes, mode shifts from single-occupancy vehicles to public transit, and the increased use of zero-emission vehicles.



Performance Metrics & Stakeholder Collaboration

- **Quantifying Program Success:** A robust, data-driven approach is used to evaluate the effectiveness of both CMAQ and CRP projects. This includes quantitative emission reduction tracking, congestion relief metrics, and GHG reduction benchmarks.
 - ❖ **Key Performance Indicators (KPIs) include:**
 - Reductions in NOx, PM2.5, VOC, and CO and CO2
 - Increased transit ridership and modal shift from single-occupancy vehicles.
 - Improved air quality in non-attainment areas.
- **Geospatial Analysis:** Utilization of geospatial tools to assess the spatial effectiveness of projects in targeted regions, ensuring that investments are directed toward areas with the greatest need.
- **Stakeholder Engagement:** NJDOT continues to collaborate with Metropolitan Planning Organizations (MPOs), local municipalities, transit agencies, and the private sector to ensure coordinated project delivery and stakeholder buy-in. Strong partnerships with technology firms will facilitate the integration of smart infrastructure.
- **Scalable Funding Mechanisms:** Leveraging federal, state, and local funding streams to ensure project scalability and financial sustainability over the long term.



Next Steps & Strategic Vision

➤ **Scaling Sustainable Mobility Initiatives:**

- Expanding CMAQ-funded projects such as ITS, transit service expansion, and the promotion of low-emission vehicles.
- Accelerating CRP-backed CMAQ projects, including the expansion of electric public transit options.
- Integration of AI-based traffic management systems to further optimize traffic flow, reduce congestion, and lower emissions.

➤ **Policy Alignment & Legislative Support:**

- Ensuring alignment of state transportation policies with federal emission reduction goals and sustainability targets.
- Pursuing legislative action to secure sustained funding for sustainable mobility projects, with an emphasis on long-term environmental and economic benefits.

➤ **Call to Action:** Continued collaboration among public agencies, industry leaders, and research institutions is essential to drive transformative change in New Jersey's transportation sector, ensuring a sustainable and resilient future.



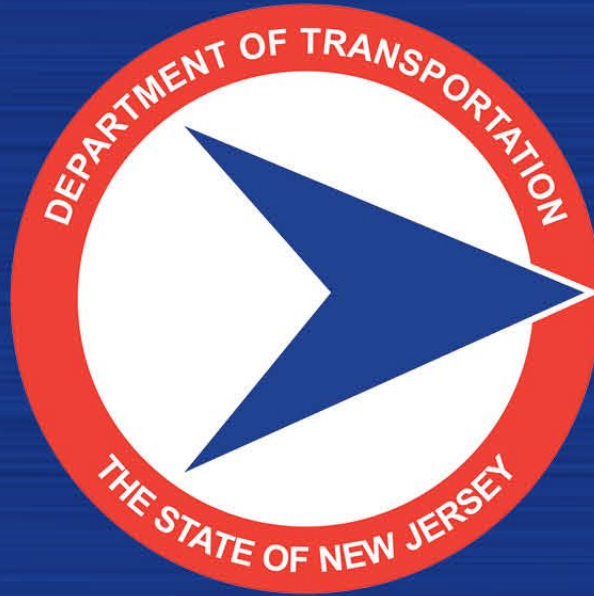
Thank you !

Contact:

Simon Nwachukwu – simon.nwachukwu@dot.nj.gov

Sushant A. Darji – Sushant.Darji@dot.nj.gov

CIA Team Updates: Infrastructure Preservation

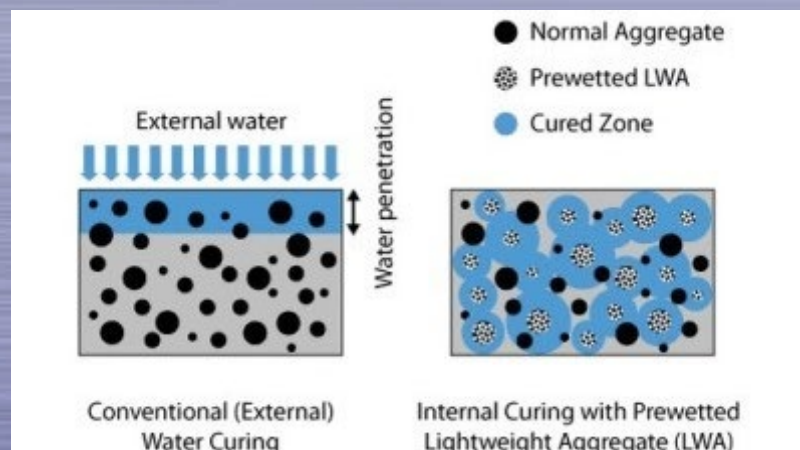


Presented by Shivani Patel, Christopher Paige
April 30, 2025

NEW JERSEY DEPARTMENT OF TRANSPORTATION



Enhancing Performance with Internally Cured Concrete (EPIC²)



Purpose:

To implement the use of internally cured concrete to reduce shrinkage cracking and achieve long-term performance in concrete bridges, roads and repairs.





Enhancing Performance with Internally Cured Concrete (EPIC²)

Status:

- RFP for centrifuge apparatus posted online

REQUEST FOR QUOTATION

Centrifuge Apparatus and Accessories

STATE OF NEW JERSEY

Honorable Philip D. Murphy, Governor
Honorable Sheila Y. Oliver, Lt. Governor

DEPARTMENT OF TRANSPORTATION

Francis K. O'Connor, Commissioner

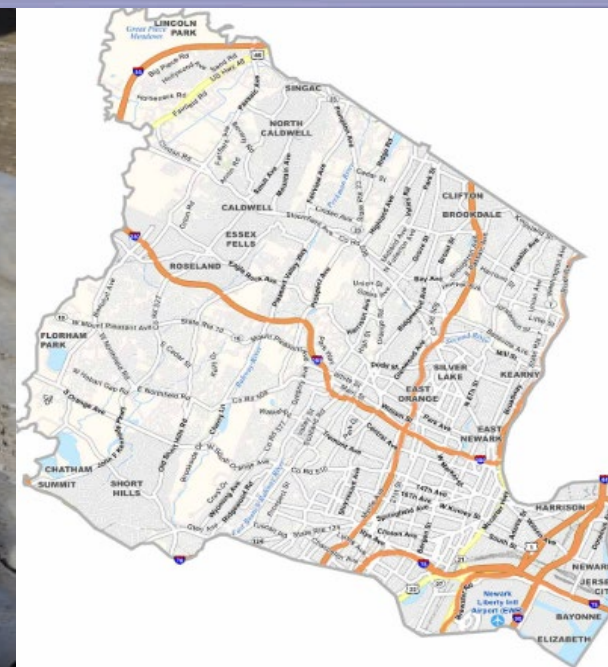




Enhancing Performance with Internally Cured Concrete (EPIC²)

Status:

- HPIC mix verification testing underway
 - North Munn Ave, Bridge over Rt. 280, City of East Orange, Essex County, NJ

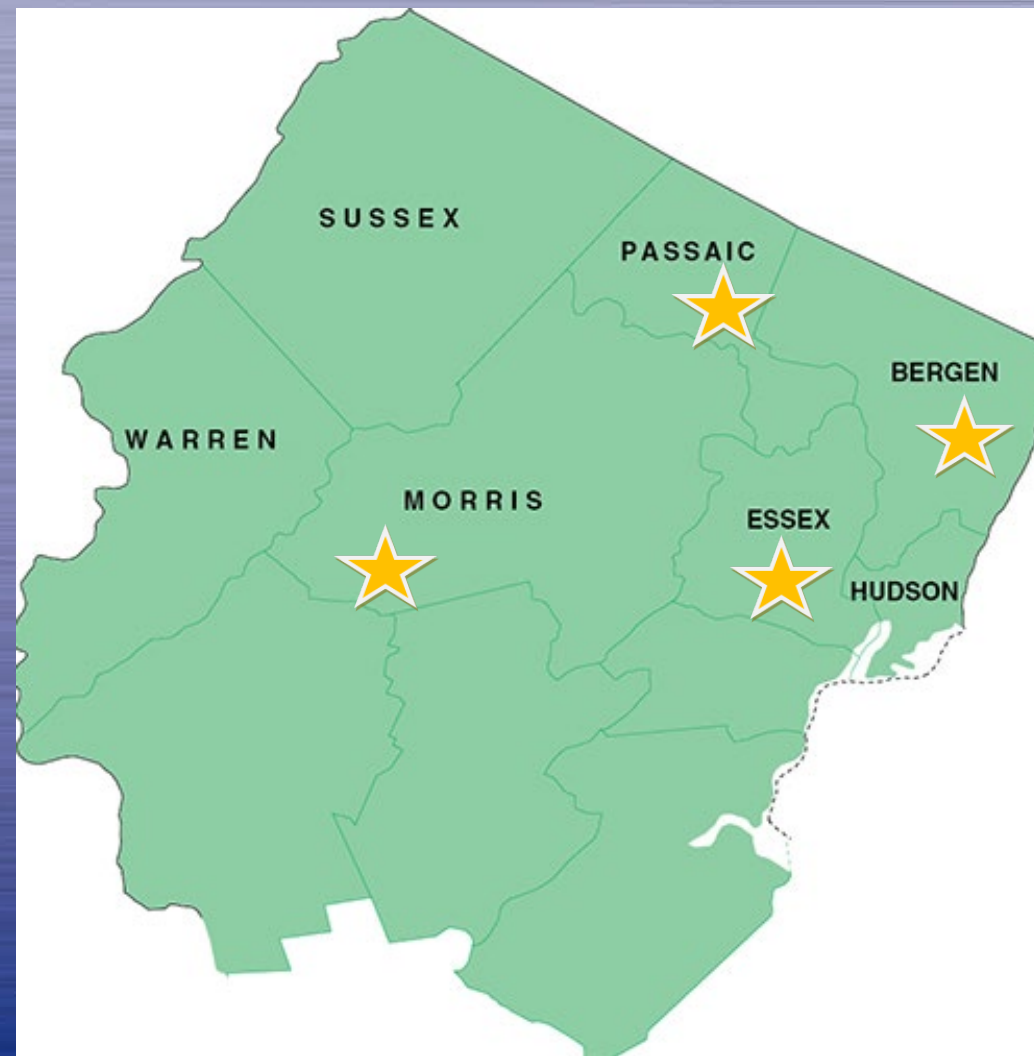




Enhancing Performance with Internally Cured Concrete (EPIC²)

Status:

- Additional projects in FD being advanced:
 - Hanover Ave (CR 650), Bridge over I-287 in Hanover Twp., Morris County
 - CR 507 (Maple Ave), Bridge over Rt. 208 in Fair Lawn Borough, Bergen County
 - 23 SB Bridge over NYS&W RR in West Milford Twp., Passaic County
 - Rt. 202, Bridge over North Branch of Raritan River
 - Rt. 124, Bridges over Passaic River
 - Prince Rodgers Ave, Bridges over Rt. 287 in Bridgewater, Somerset County





Enhancing Performance with Internally Cured Concrete (EPIC²)

Currently Working On:

- Preparing for the Final Design Submission of candidate bridges
- Scoping additional projects
- Purchasing centrifuge apparatuses and other testing equipment

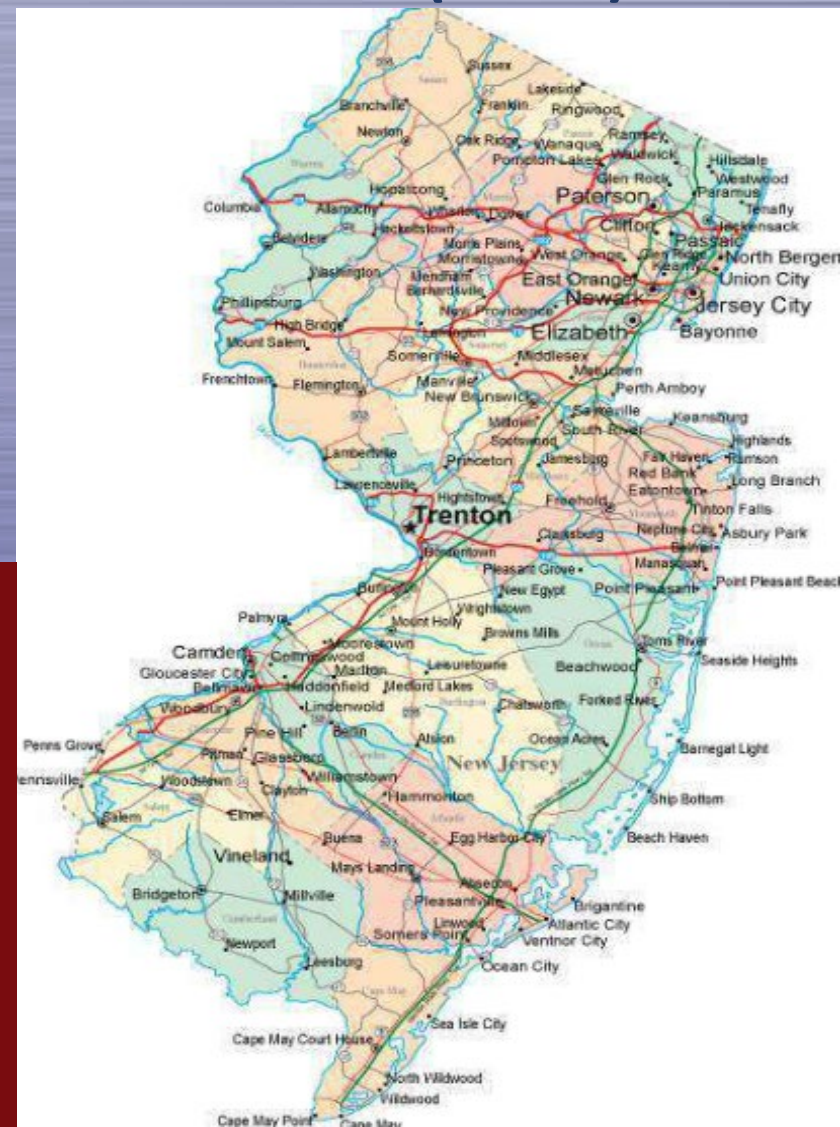




Enhancing Performance with Internally Cured Concrete (EPIC²)

Next Quarter:

- Coordinating with concrete suppliers in other regions of the state
- Updates to HPIC Specifications





Enhancing Performance with Internally Cured Concrete (EPIC²)

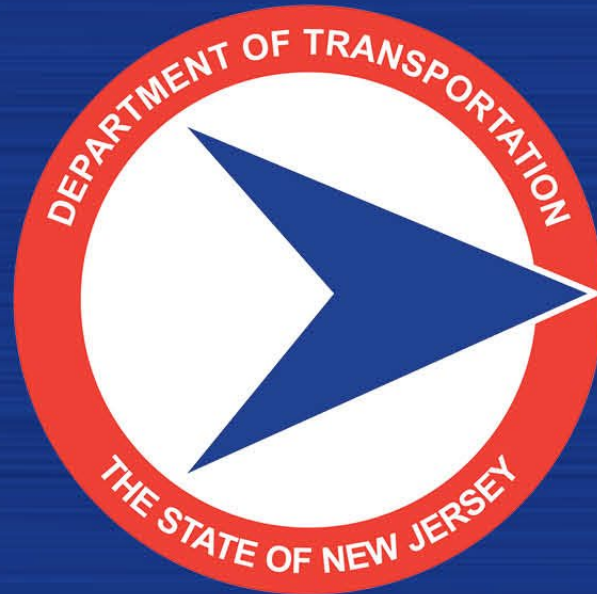


Updates and Coming Soon:

- EPIC² Workshop-TBD
- SME team interviewed by Alan M. Voorhees Transportation Center (VTC)
- EPIC² Webinar-NJDOT Implementation of Internal Curing

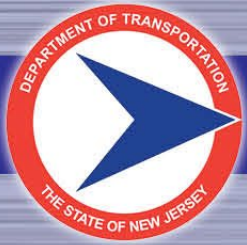


CIA Team Updates: Mobility/OPS



Presented by Konstantinos Kyros
April 30, 2025

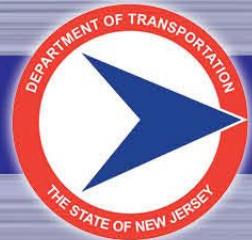
NEW JERSEY DEPARTMENT OF TRANSPORTATION



EXPANSION OF WEATHER-SAVVY- COMPLETE!

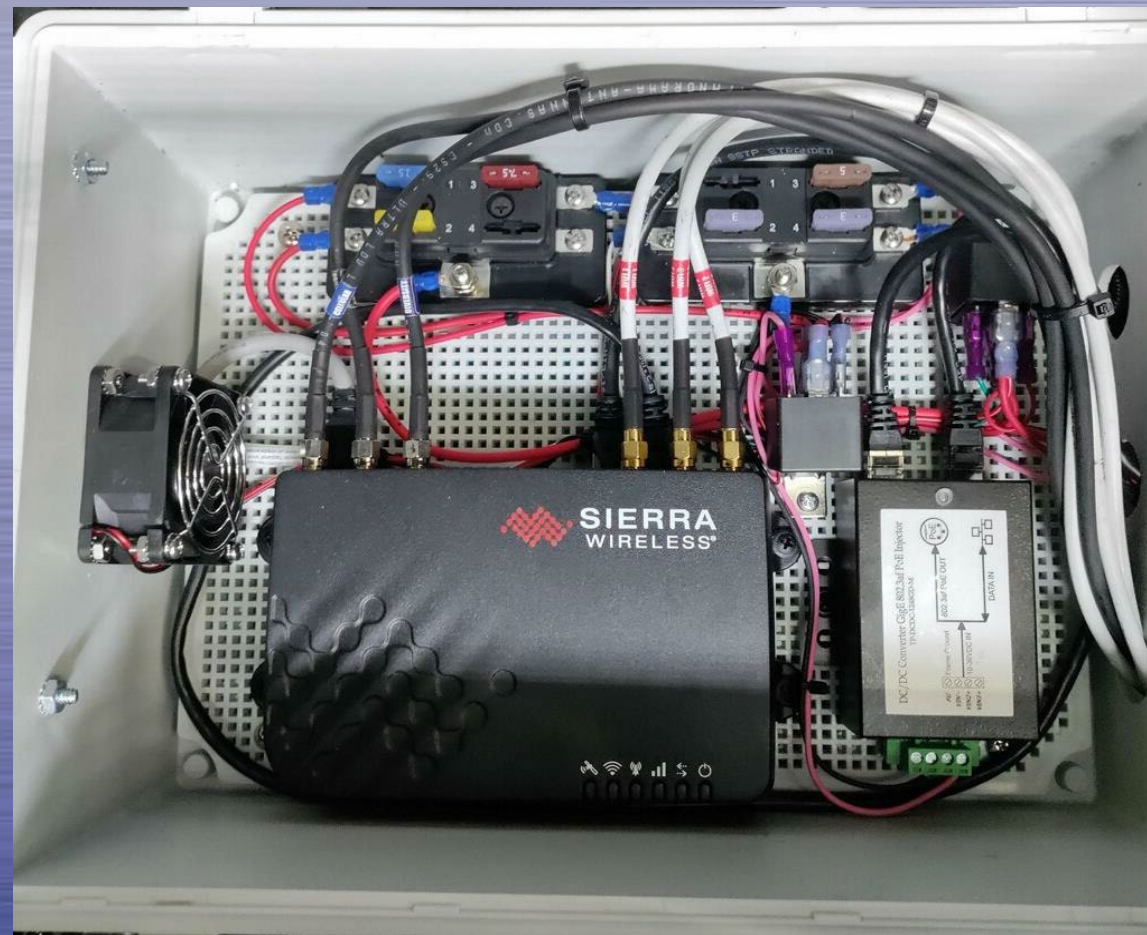
- Installations started in December 2023
- Expanded from 24 to 45 vehicles, (one currently out of service).
- Increased the focus on plows- during a weather event these trucks stay on the road.

Mobility		
North		South
2 IMRT		1 IMRT
3 SSP		3 SSP
Operations		
North	Central	South
7 Plows	8 Plows	10 Plows
6 Pickups	2 Pickups	2 Pickups



WEATHER-SAVVY IMPROVEMENTS

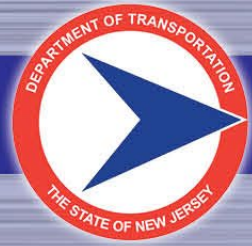
- Previously components were installed on the floor of the cab under the seats.
- Components were susceptible to damage from water, dirt, misc. items in the cab and tampering.
- Now components are installed in a junction box with a plexiglass lid.





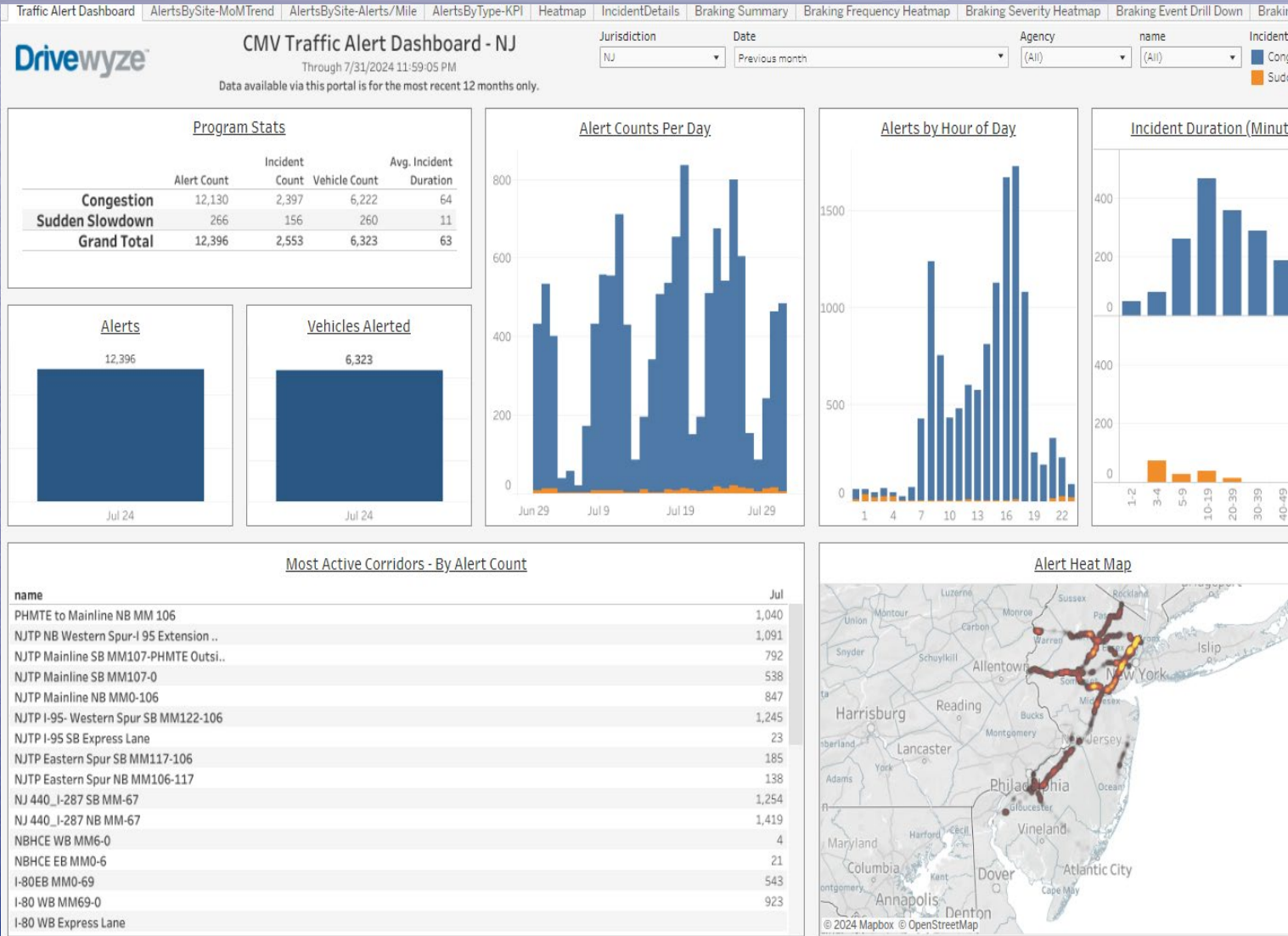
TRUCK PARKING PILOT

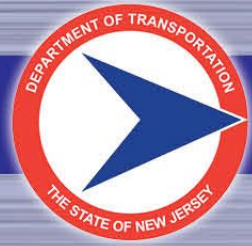
- Started in 2021 at Harding
- Expanded to Carney's Point in the summer of 2023.
- Data gathered from cameras, remote traffic microwave sensors, and in-pavement micro radar sensors (a.k.a., Pucks) is visible on the web portal.
- Next Steps:
 - Install a portable DMS signs approx. 5 miles from Harding on I-287 and I-78 to alert truckers to the number of available spots
 - Currently, in the process of installing at Knowlton



DRIVEWYZE ALERTS

- Provides free safety alerts to commercial vehicle drivers
- Alerts show up directly on the driver's Electronic Logging Device (ELD)
- We can view when and where alerts were sent through the Tableau dashboard
- However, we wanted to verify the accuracy of the alerts





OBJECTIVES & METHODOLOGY



Alert Accuracy

The objective was to verify if Drivewyze accurately identified known static alert locations, ensuring drivers receive timely notifications.



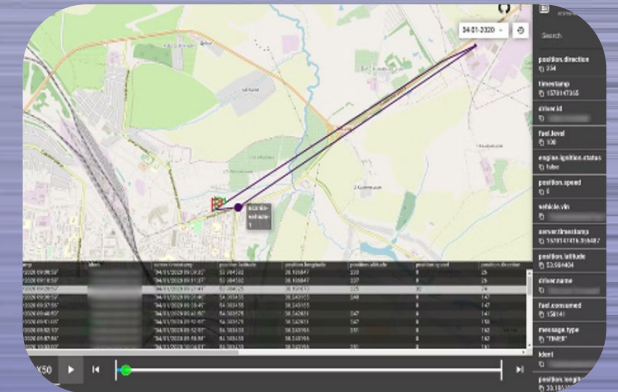
Real-time Environment

The system's ability to detect real-time environmental alerts, such as congestion and standstill traffic, was assessed.



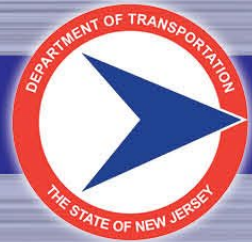
Testing Hours

Four days of testing were conducted during AM Peak Rush hours, between 6 AM and 10 AM, to capture the most challenging traffic conditions.



Data Collection

GPS logging applications were used alongside Drivewyze to record precise location data and real-time traffic conditions



STREETLIGHT

- Streetlight InSight is a data web platform that harnesses connected devices and IoT data to measure vehicles, transit, bike, and foot traffic virtually anywhere.
- What can streetlight do:
 - Create analysis
 - Deliver metrics from browser
 - All roads in NJ are accessible
 - Can choose analytic types



VAISALA GROUNDCAST

- New generation of Weather Sensors.
- GroundCast is self- powered.
- Wireless, no cables or powering required with built-in wireless communication and battery.
- GroundCast measures road surface temperature and the amount of residual treatment material providing you with reference grade observations and location- specific forecasts.

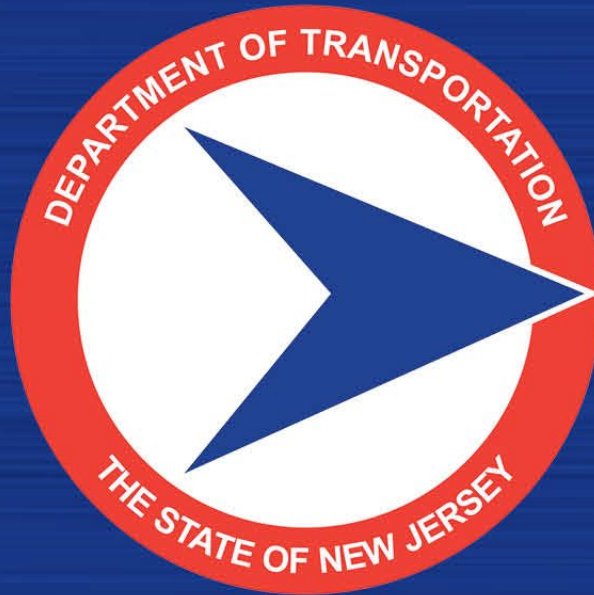




NEW JERSEY DEPLOYMENT

- For the initial pilot deployment, several critical locations have been identified where Vaisala GroundCast sensors are so far installed and will be installed:
 - NJ 29 MP 0.5 (two sensors installed)
 - NJ 12 MP 1.5 (1 sensor installed)
- We are in the process of finalizing a location for installing the third GroundCast sensor

CIA Team Updates: Organizational Support & Improvement



Presented by Christopher Paige
April 30, 2025

NEW JERSEY DEPARTMENT OF TRANSPORTATION



Implementation Plans

Development Stage Updates:

Funding:

Although funding approvals were confirmed by FHWA , the release of additional funding has been limited due to the pause in funding and other constraints.

It has been recommended that we procure professional (training) services internally through our Division of Procurement and/or through the NJ Department of Labor and Workforce Development (NJDOL).

Partnerships:

We will be partnering with the NJDOL's Workforce Development Services.

Advantages: NJDOL's business includes procuring training services and preparing individuals for apprenticeship programs; and can customize transportation related training to include counseling and pre-screening services for NJDOT. NOTE: The Office of Federal Contract Compliance Programs (OFCCP) no longer has oversight of transportation mega projects; therefore, NJDOT will be working independently on outreach and other related activities.





Contractor Compliance unit collaboration efforts continues :

- The last Construction Contracting Industry meeting was held in March 2025. Topics continue to focus on:
 - ✓ Unions & Apprenticeship Programs
 - ✓ Aging of the workforce and union members
 - ✓ Methodologies to increase membership: Spreading awareness on the opportunities for employment and advancement with the highway construction industry
 - ✓ Hosting a dual open house for individuals interested in working on NJDOT's construction projects internally with NJDOT or externally with NJDOT's construction contractors.
- The next scheduled Construction Contracting Industry meeting will be held on May 9, 2025



Thank you!





Feature Presentation

High Performance Internally Cured Concrete (HPIC)

Jess Mendenhall & Samer Rabie
Structural Engineering Services &
NJDOT Project Management



Reminders & Announcements

Progress Reporting – Due May 9th

NJDOT Tech Transfer Website

www.njdottechtransfer.net

NJ STIC Website

www.njdottechtransfer.net/nj-stic/



Submit your research or innovative idea!

Email submissions to BRIIT's Manager –
Pragna Shah - pragna.shah@dot.nj.gov





Next Meeting

NJ STIC 2025 2nd Triannual Meeting – August 6th 10:00am - 12:00pm

NEXT CIA TEAM
FEATURE PRESENTATION

**ORGANIZATIONAL SUPPORT
& IMPROVEMENT**



Thank you