Every Day Counts
a Nation on the Move

STIC
State Transportation Innovation Councils

DEPARTMENT OF TRANSPORTATION
UNITED STATES OF AMERICA

DEPARTMENT OF TRANSPORTATION
THE STATE OF NEW JERSEY

3rd Triannual Meeting
December 10, 2025

NEW JERSEY DEPARTMENT OF TRANSPORTATION

Welcome

Eric Powers

Assistant Commissioner

Capital Investment Planning & Development

FHWA Updates

Christopher Paige

Innovation Coordinator, FHWA NJ

Feature Presentation

Advancing Innovation: NJDOT Mobility Research and Planning

Konstantinos Kyros

Mobility Planning & Research

Core Innovation Area Team Leads

SAFETY

NJDOT – Jeevanjot Singh

FHWA – Alan Huff

PLANNING & ENVIRONMENT

NJDOT – Simon Nwachukwu

FHWA – Christopher Paige

INFRASTRUCTURE PRESERVATION

NJDOT – Bob Signora

FHWA – Paul Cardie

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
December 10, 2025

NEW JERSEY DEPARTMENT OF TRANSPORTATION

Pedestrian Scale Lighting Research & Guide

- NJDOT Bicycle and Pedestrian Resource Center
  - At Voorhees Transportation Center at Rutgers
  - Partnered with Rowan University
- Provide guidance to local, county, state, regional planners
  - Summary of best practices, technical considerations, and recommendations for safe design of pedestrian-scale lighting
  - Guidance to planners on identifying, scoping, and assessing safety and community needs for pedestrian-scale lighting projects
  - Guidance on streetlight jurisdiction and working with utilities

- **Final Deliverable: Pedestrian Scale Lighting Resource for Planners**
  - **Status: Draft under revisions**

NIGHTTIME VISIBILITY FOR SAFETY

- In collaboration with other NJDOT review units, Division of Traffic Engineering is finalizing the details for traffic signal poles and mast arms at signalized intersection installations
- Includes backplates with retroreflective tape on signal indications

CIA Team Updates: Planning & Environment

Presented by Simon Nwachukwu

December 10, 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.

Strategic Programs – CMAQ & CRP

- **CMAQ Program:**
  - **Objective:** Fund projects to mitigate congestion, reduce emissions, and improve air quality in non-attainment areas.
  - **Target Development:** Set quantifiable targets for NOx, PM2.5, VOC, and CO emissions, guiding project selection and funding.
  - **Project Types:** ITS, intersection modernization, public transit expansion, and low-emission vehicle incentives.
  - **Expected Outcomes:** Significant reductions in air pollutants and greenhouse gases

Strategic Programs – CMAQ & CRP

- **CRP Program:**
  - **Objective:** Systematically reduce carbon emissions in transportation through sustainable technologies.
  - **Implementation Status:** Transitioned from planning to full-scale implementation.
  - **Strategic Advancements:** Battery-electric buses, complete streets initiatives, green fleet transitions.
  - **Impact Assessment:** Achieving CO reductions through electrification and mode shifts

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.

Performance Metrics & Stakeholder Collaborations

- **Quantifying Program Success:** Use data-driven approaches for emission reduction tracking, congestion relief metrics, and GHG benchmarks.
- **Key Performance Indicators (KPIs):** NOx, PM2.5, VOC, CO, CO2 reductions; increased transit ridership; improved air quality.
- **Geospatial Analysis:** Assess spatial effectiveness to direct investments where needed most.
- **Stakeholder Engagement:** Collaborate with MPOs, local municipalities, transit agencies, and private sector partners for coordinated delivery.
- **Scalable Funding Mechanisms:** Leverage diverse funding streams for scalability and sustainability

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 & Support:**
  - **Align Policies:** Ensure state transportation policies meet federal goals.
  - **Legislative Action:** Secure sustained funding emphasizing long-term benefits.
- **Call to Action:** Continue collaboration among public agencies, industry leaders, and research institutions to drive transformative changes.

Conclusion

Recap: Review strategic initiatives and innovation areas.

Importance of Collaboration: Highlight ongoing collaboration and transparency to achieve decarbonization goals.

Next Steps: Encourage stakeholder engagement and active participation in future projects.

Thank you !

Contact:

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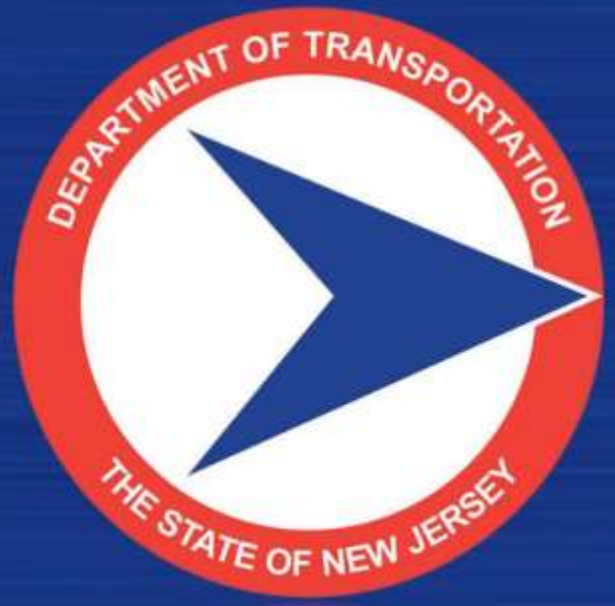
CIA Team Updates: Infrastructure Preservation



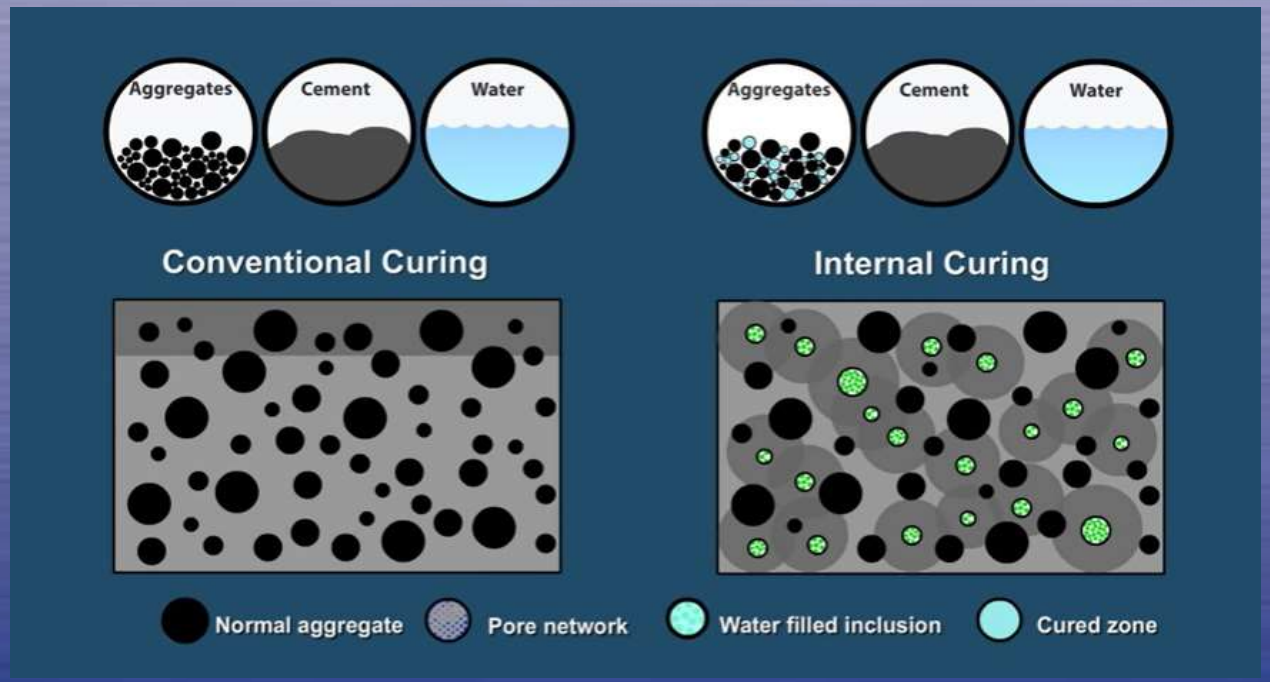
Presented by Bob Signora
December 10, 2025

NEW JERSEY DEPARTMENT OF TRANSPORTATION

EDC-7 EPIC²

Innovation Purpose:

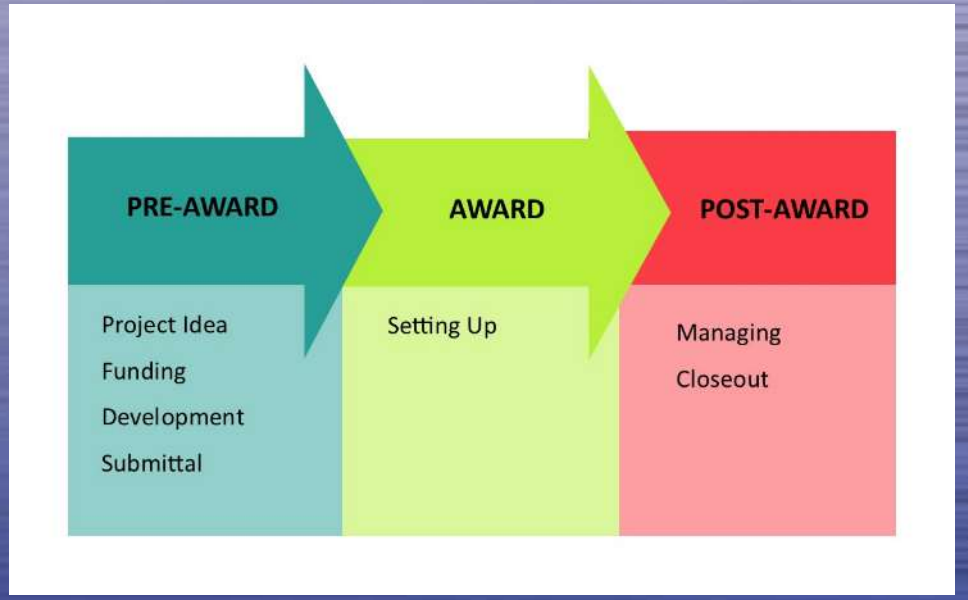
To implement the use of internally cured concrete to reduce shrinkage cracking and achieve long-term performance in concrete bridges, roads and repairs.



EDC-7 EPIC²

Accomplished since last update:

- **2 additional bridge projects awarded to construction**
  - CR 507 (Maple Ave), Bridge over Rt 208
  - Hanover Ave (CR650), Bridge over I-287



EDC-7 EPIC²

Currently Working on:

- **Logistics for conducting:**
  - fundamentals of internal curing workshop (January 2026)
  - regional materials engineers & technician training (February 2026)

- **Incorporating HPIC specifications**

  (projects in the Design phases)

EDC-7 EPIC²

Next Quarter:

- **Construction HPIC casting of the trail slabs** (North Munn Ave. project)

- **Concrete verification testing** (other 2 projects)

EDC-7 EPIC²

Innovation Challenge:

- **Concrete suppliers' willingness to produce HPIC**
  - Only 1 supplier
  - Concerns regarding NJDOT's relatively stringent HPC acceptance testing requirements

- **How is NJDOT addressing the issue?**
  - Developing a strategic industry outreach plan targeting concrete suppliers
    - ➢ conducting meetings & technical discussions
    - ➢ highlight case studies of successful implementations

EDC-7 EPIC²

Questions?

CIA Team Updates: Mobility/ OPS

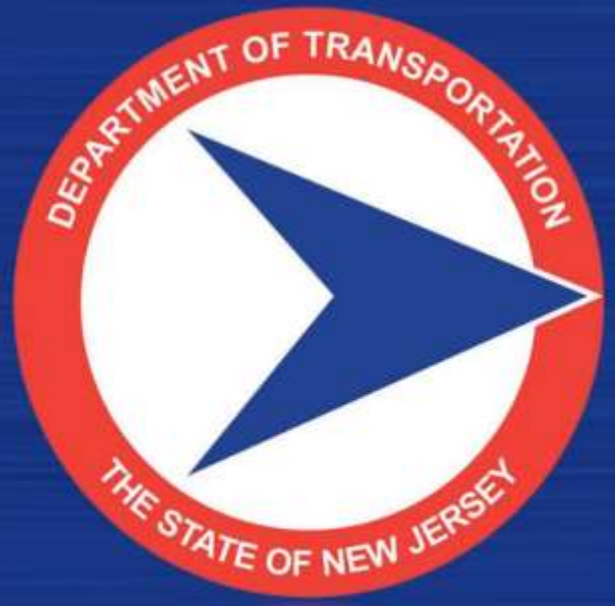
Presented by Ek Phomsavath
December 10, 2025

NEW JERSEY DEPARTMENT OF TRANSPORTATION

NextGen TIM – Technology for Saving Lives

- Deployment of TIM Technologies:
  - Light towers are installed on NJDOT Incident Management Response Trucks (IMRT) to provide lighting at incident scenes.
  - LED flares are utilized at incident scenes.
  - DriveWyze provides real-time notifications to truck drivers about stopped queues and slowdowns.
- Institutionalized Stage:
  - Integrate activities into the NJDOT ITS/Traffic Operations work programs, including dedicated funding.
  - Provide TIM emergency responder training:
    - Website - https://www.njtim.org/NJTIM/
    - Supports a Safe System Approach
  - Conduct ITS research on emerging operations topics.

CIA Team Updates: Organizational Support & Improvement



Presented by Kristal Walker
December 10, 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 related constraints.

It has been recommended that we procure professional services internally through our Division of Procurement and/or through the NJ Department of Labor and Workforce Development's Office of Apprenticeship (NJDOL). We are also exploring the opportunity to engage our current consultant to help support the delivery of outreach activities and related services.

Partnerships

We will continue to engage and/or partner with the NJ Department of Labor and Workforce Development's Office of Apprenticeship.

Advantages: NJDOL procures state-funded training services, helps to prepare individuals to succeed in apprenticeship programs, and can customize training to include counseling and pre-screening candidates for pre-apprenticeship and apprenticeship training programs aimed at the highway construction industry.

Our partnership with the Construction Contracting Industry and contractors is paramount to these efforts and will continue.

Contractor Compliance unit collaboration efforts continue:

- The last Construction Contracting Industry meeting was held in August 2025. Topics continue to focus on:
  - ✓ Federal Final Rules' Impacts on Projects and Opportunities for Small Businesses
  - ✓ Workforce Opportunities and Union Membership
  - ✓ Increasing awareness of opportunities for employment and advancement with the highway construction industry (i.e., in the skilled trades)
  - ✓ Hosting a dual open house and informational sessions for individuals interested in working on NJDOT's construction projects internally with NJDOT or externally with our construction contractors.
- The next Construction Contracting Industry meeting will be scheduled to specifically discuss the Dual Open House anticipated to be held in early 2026.

Thank you!

Feature Presentation

Advancing Innovation: NJDOT Mobility Research and Planning

Konstantinos Kyros

Mobility Planning & Research

NJDOT Weather Savvy Roads Pilot

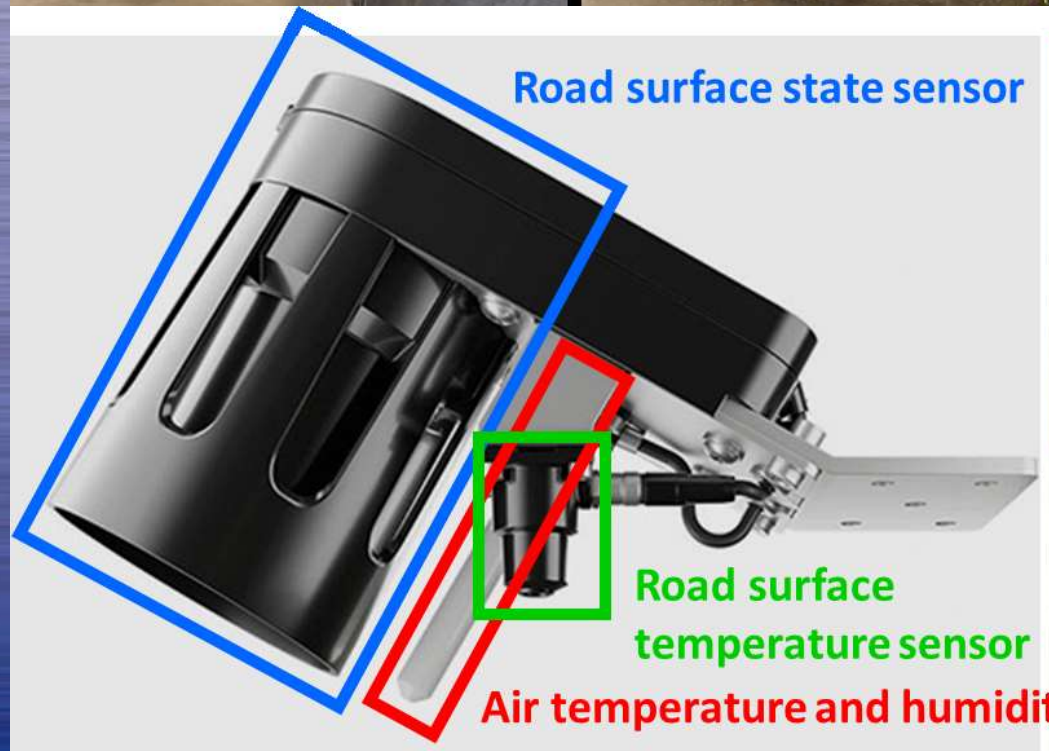
- **Objective:** Deploy IoT and CV technology to assist in road weather management:
  - Collect road weather and condition data in real time.
  - Provide data visualization to operators, for situational awareness and decision support.
  - Assist in analysis and planning of road weather management.

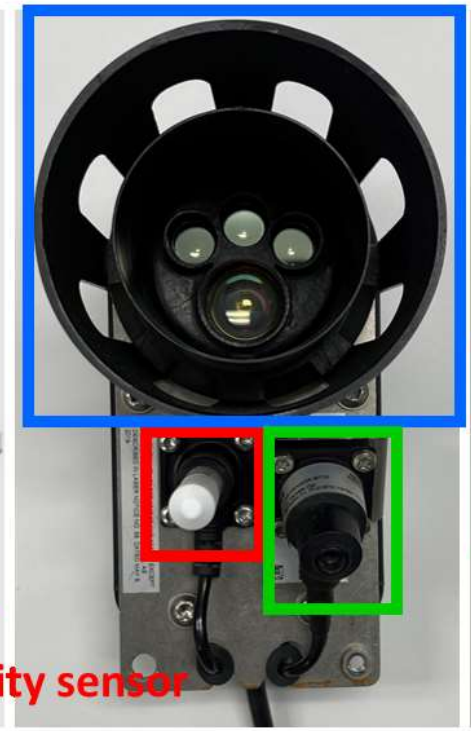
EXPANSION OF WEATHER-SAVVY- COMPLETE!

- Installations started in December 2023
- Expanded from 24 to 45 vehicles
- Increased the focus on plows- during a weather event these trucks stay on the road.

Operations			Mobility	
North (13)	Central (11)	South (12)	North (5)	South (4)
7 plows 6 pickups	8 plows 3 pickups	10 plows 2 pickups	3 SSP 2 IMRT	3 SSP 1 IMRT

Mobile Road Weather Information System- Sensors





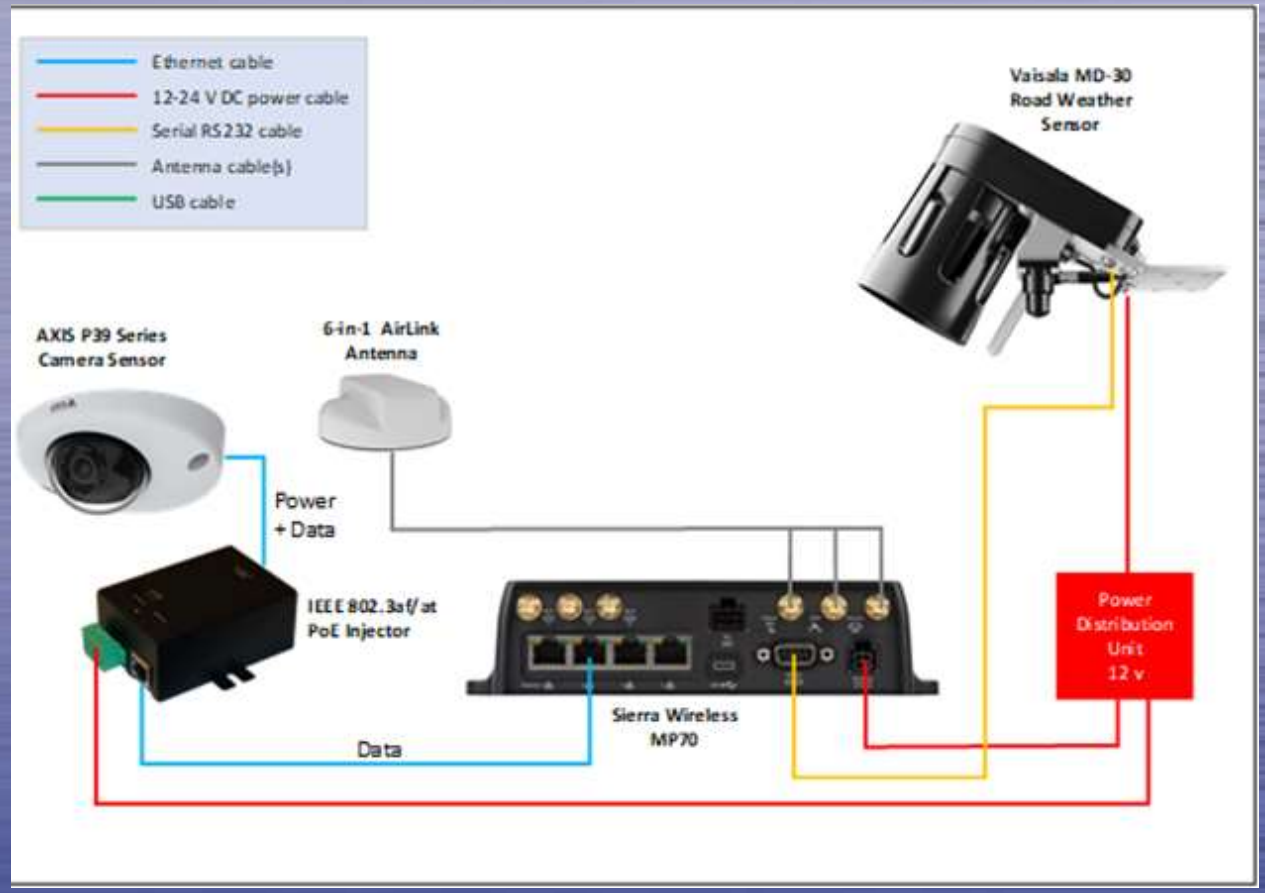
Mobile Road Weather Information System- Internal View

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.

Weather Savvy Improvements

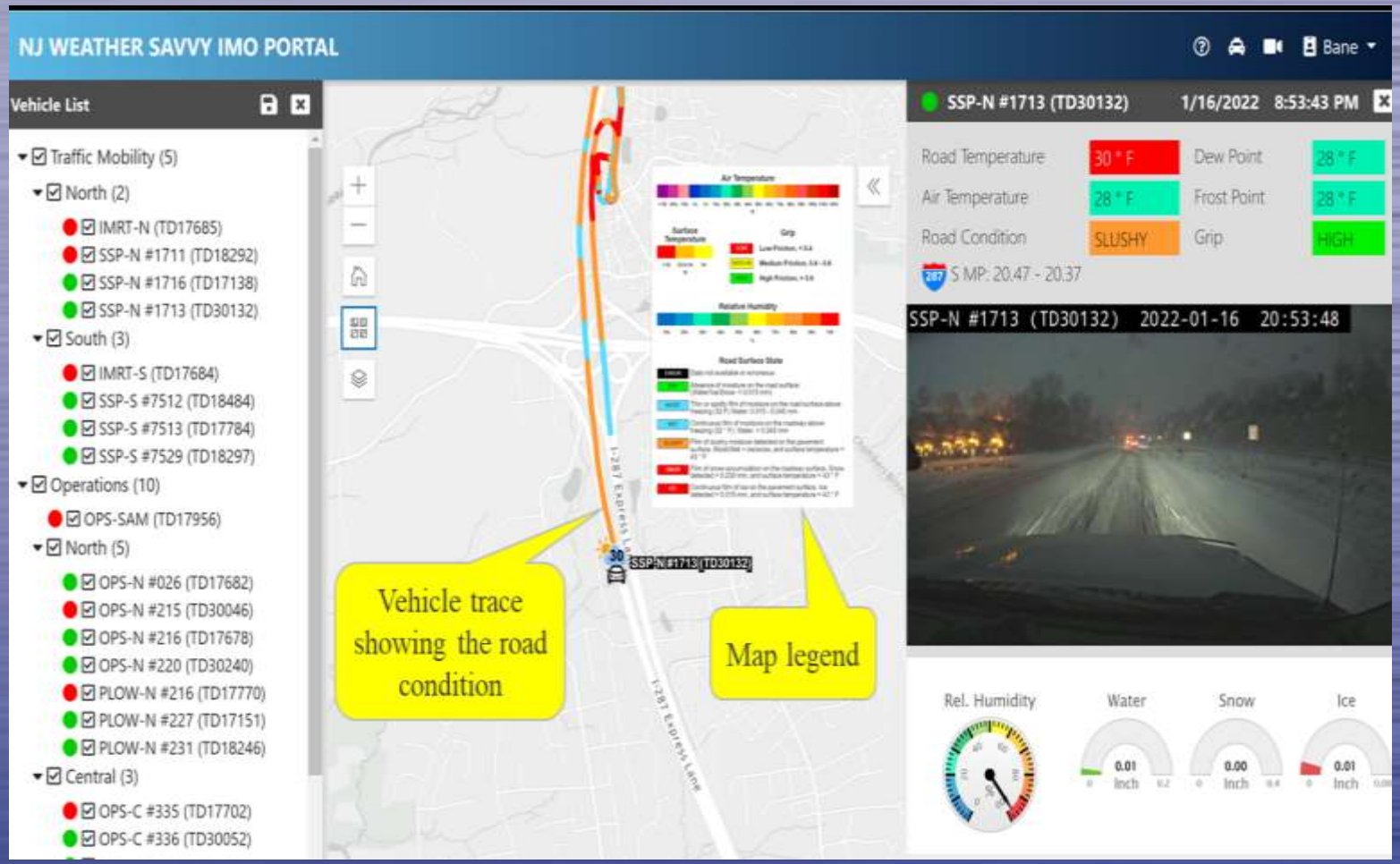
- The Weather-Savvy system has been rewired to splice the data feed between the tablets and the modem, allowing for a direct data feed and a secondary feed to the tablets.
- This rewiring prevents the loss of data while bypassing the possible point of failure due to tablet issues.
- Sierra Wireless router now plays a larger role.



Weather Savvy IMO Portal

Portal View includes:

- Road Temperature
- Air Temperature
- Road Condition
- Dew Point
- Frost Point
- Grip



Mobile Road Weather Information System- Camera View

GROUNDCAST

- New generation of Weather Sensors.
- Pilot Deployment of Vaisala GroundCast
- Wireless, no cables or powering required with built-in wireless communication and battery.
  - Battery life of about 3 years.
- Transmits data using cellular communication.
  - Data is visualized on Weather Savvy Portal
- Relatively quick and easy installation, but it requires drilling the pavement (lane closure during installation)

GROUNDCAST

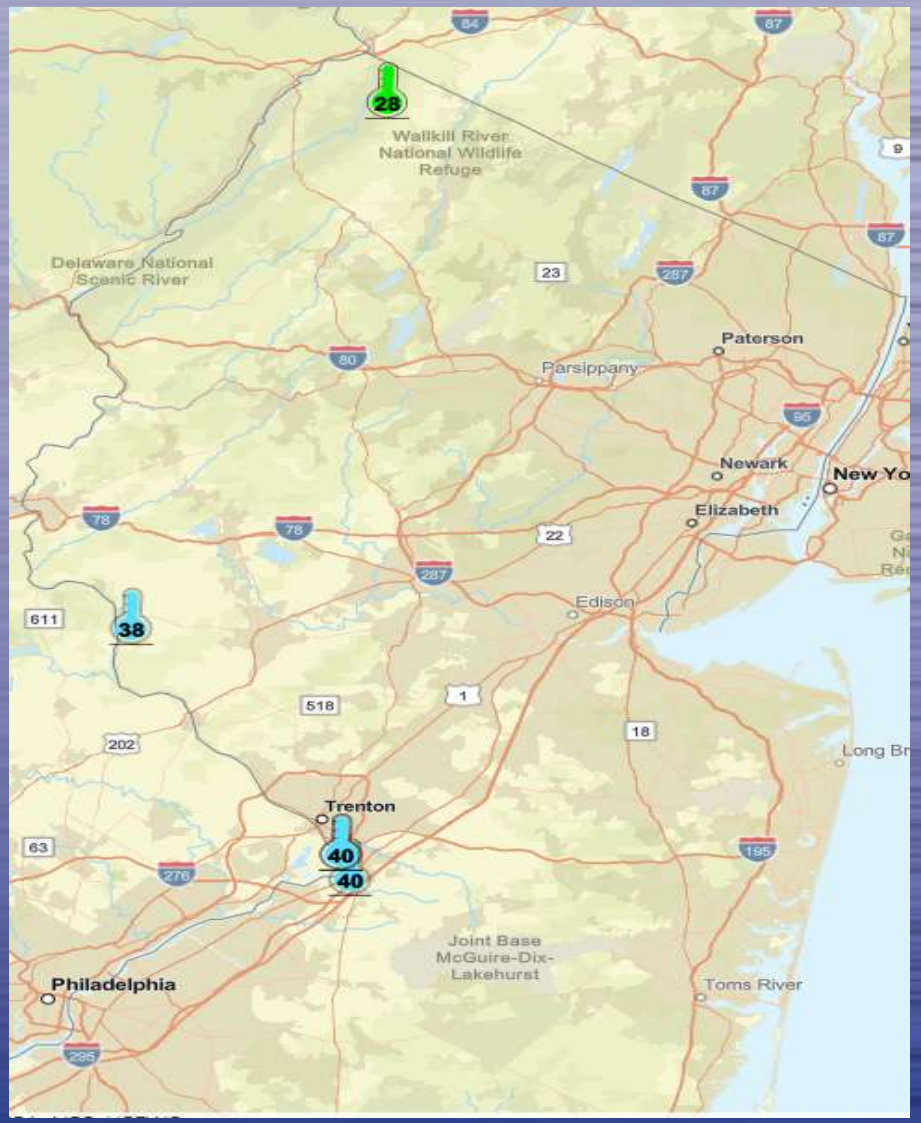
WHAT DOES IT DO?

Measures:

- Surface temperature
- Surface state: dry / not dry
- Amount of treatment material on the road surface
- Temperature at -6 cm / 2.4 in
- Temperature at -30 cm / 1 ft

Groundcast Locations

- **Groundcast Locations:**
  - NJ 29 Westbound MP 0.4
  - NJ 12 Eastbound MP 1.5
  - NJ 23 Northbound MP 47.7
  - I-295 Northbound MP 57.6



TRUCK PARKING PILOT

- Pilot began in 2021 at Harding NJ to provide truck drivers with info on available parking spaces at public rest areas
  - Goal is to reduce dangerous parking practices along shoulders, entrance and exit ramps.
- 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.
- Installed a portable DMS signs approx. 5 miles from Harding on I-287 and I-78 to alert truckers to the number of available spots
- Next Steps:
  - Complete Installation of technology at Knowlton Rest Area on I-80

Harding Truck Rest Area

- In 2021, ITS technologies deployed at the Harding Truck Rest Area:
  - 2 Traffic Microwave Sensors
  - 9 CCTV Cameras
  - 44 In-Pavement Sensors

Mobile Trailer with traffic microwave sensor

Camera Coverage

In-Pavement Microwave Sensors

DEEPWATER TRUCK REST AREA

- In 2023, instrumentation of the Deepwater Truck Rest Area are:
  - Two traffic microwave sensors (entrance and exit),
  - One CCTV camera (wide-angle), and
  - 68 in-pavement magneto-resistive sensors.

Knowlton Welcome Center – Truck Rest Area

- Installation commenced in 2025:
  - Two traffic microwave sensors (entrance and exit),
  - 4 CCTV cameras, and
  - 46 in-pavement magneto-resistive sensors

TRUCK PARKING DASHBOARD

TRUCK REST AREA

Select below for more information

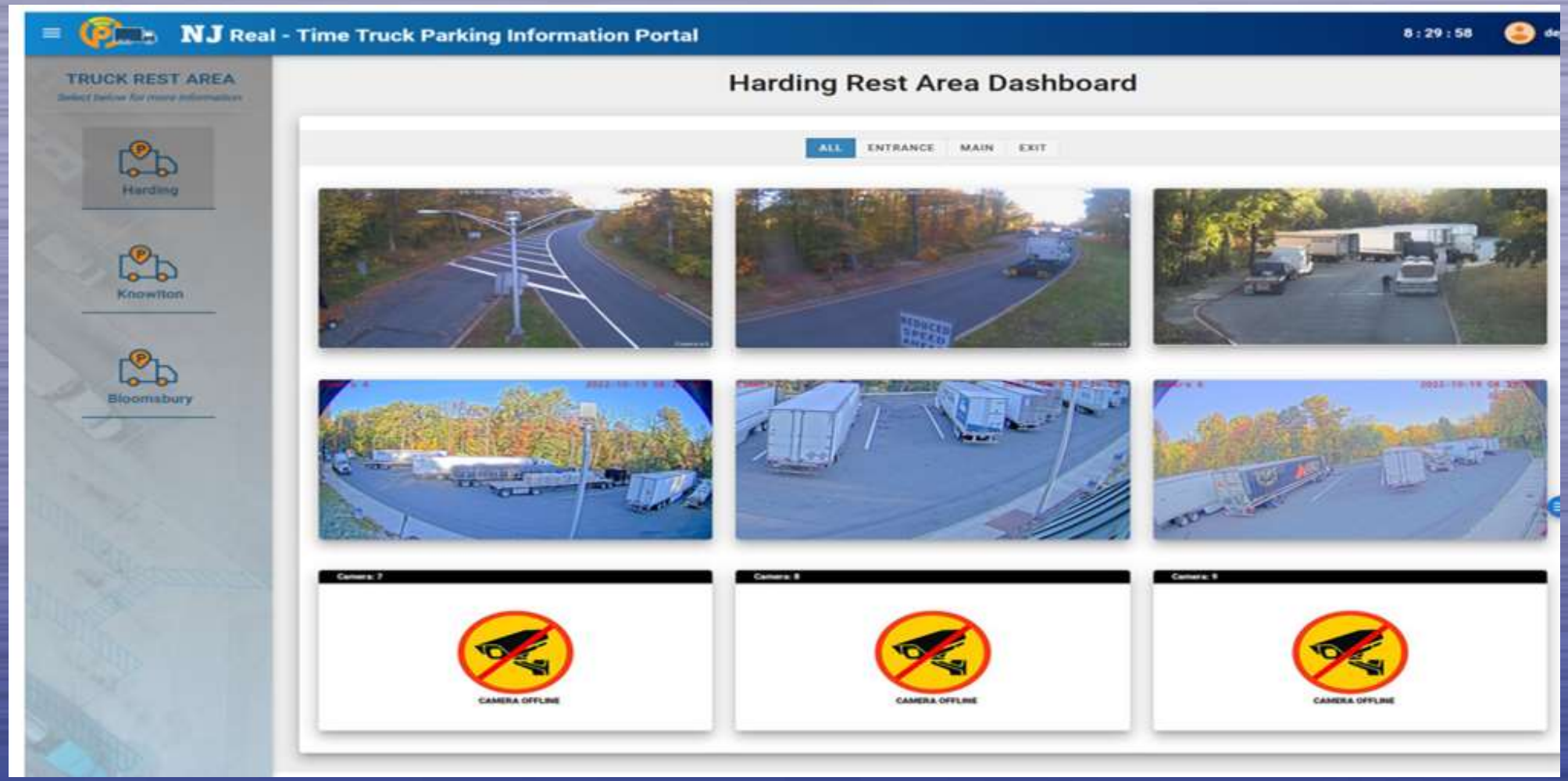
Harding

Deepwater

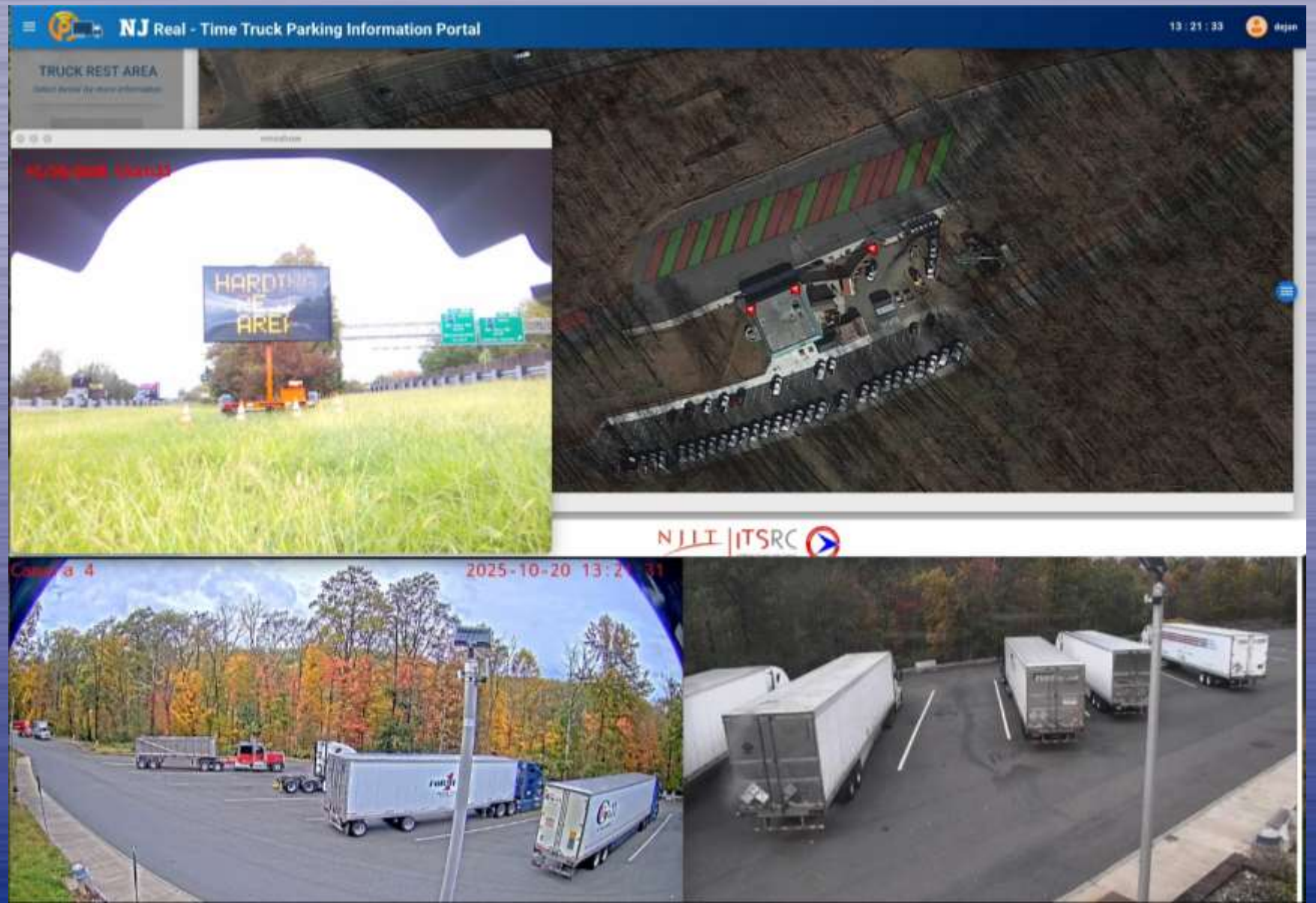
Harding Rest Area Dashboard

Entrance		Main Lot		Exit	
Total Number of Vehicles Entered	Total Number of Trucks Entered	Total Occupied Parking Spots	Average Occupancy	Total Number of Vehicles Exited	Total Number of Trucks Exited
1203	517	22 of 22	03:51:57	1203	493

HARDING REST AREA DASHBOARD- Camera View



HARDING REST AREA- DMS VIDEO



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

HAAS- Digital Alerts

- HAAS is installed in all NJDOT SSP vehicles
- Used to monitor active status and location of vehicles
- Provides advanced warning to motorists through third party navigational apps about SSP employees working on the road.
- Moving to expand to IMRT vehicles

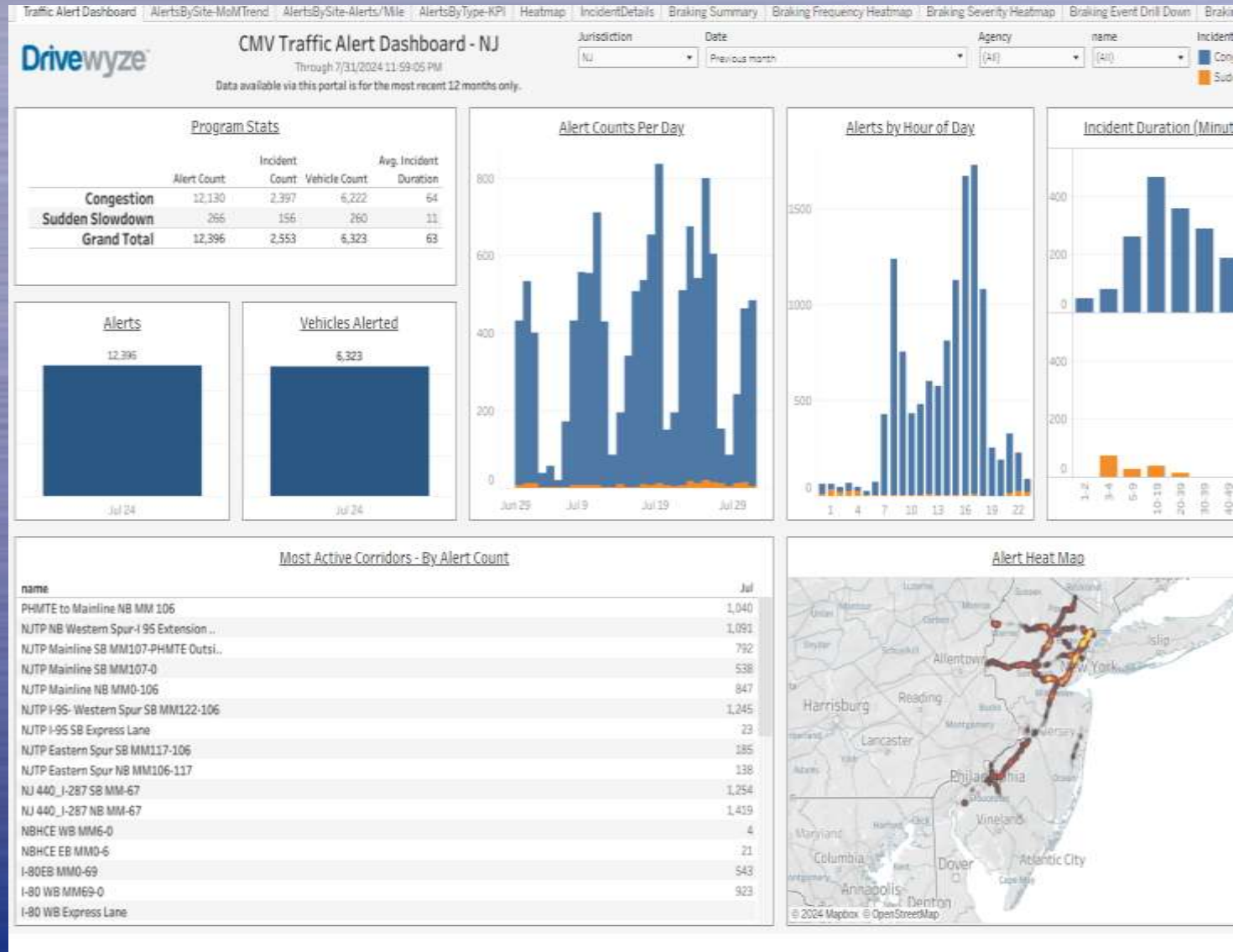
LIDAR

- LiDAR stands for Light Detection and Ranging. It's a remote sensing technology that uses laser light to measure distances and create highly accurate 3D maps of environments.
  - A LiDAR system emits pulses of laser light toward a target.
  - These pulses bounce off surfaces and return to the sensor.
  - By measuring the time it takes for the light to return, the system calculates the distance to each point.
  - Repeating this process rapidly across a wide area builds a detailed 3D model of the surroundings.
- NJDOT has recently installed LiDAR on one SSP vehicle to monitor compliance of the "Move Over" law

DriveWyze

DRIVEWYZE ALERTS

- Provides free safety alerts to commercial vehicle drivers
  - Utilized in I-80 Sinkhole closure
    - Sudden Slowdown Alerts
    - Congestion Alerts
- Alerts show up directly on the driver's Electronic Logging Device (ELD)
- We can view when and where alerts were sent trough the Tableau dashboard



THANK YOU!

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Next Meeting

2026 Meeting Dates TBD

NEXT CIA TEAM
FEATURE PRESENTATION

PLANNING & ENVIRONMENT

Thank you