NEW JERSEY STATE TRANSPORTATION INNOVATION COUNCIL

www.NJDOTtechtransfer.net/NJ-STIC

1st Triannual Meeting
April 17, 2024
10:00am – 12:00pm

Every Day Counts
a Nation on the Move

STIC
State Transportation Innovation Councils

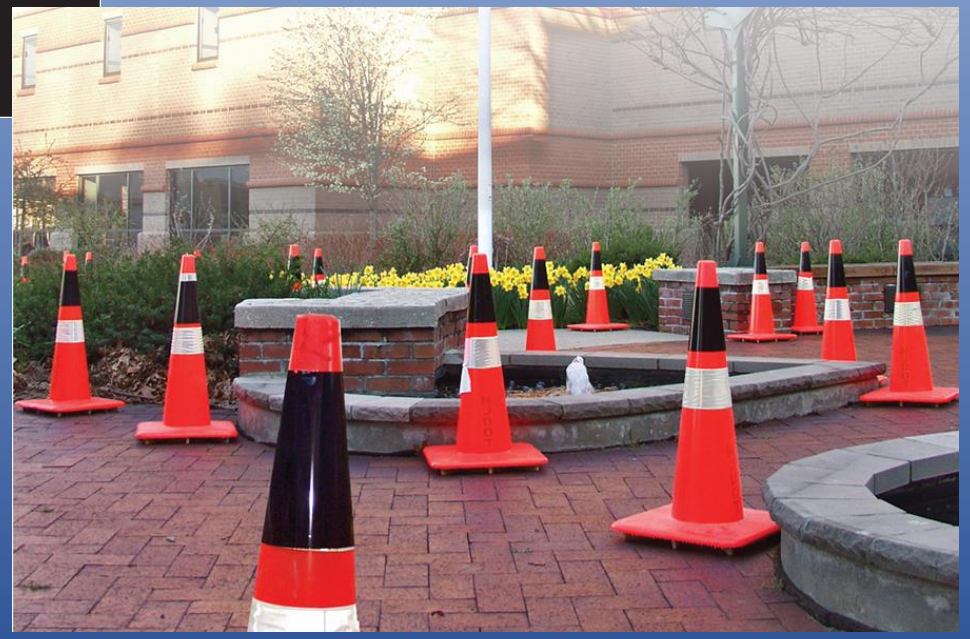
National Work Zone Awareness Week

Monday, April 15 through Friday, April 19, 2024

Work Zones are *temporary.*

Actions behind the wheel can last *forever.*

In remembrance of the tragic loss of lives in highway work zone accidents.



Let us recommit ourselves to increasing safety for both workers and motorists.

WELCOME

Eric Powers

Assistant Commissioner

NJDOT Statewide Planning, Safety & Capital Investment

Megan Fackler

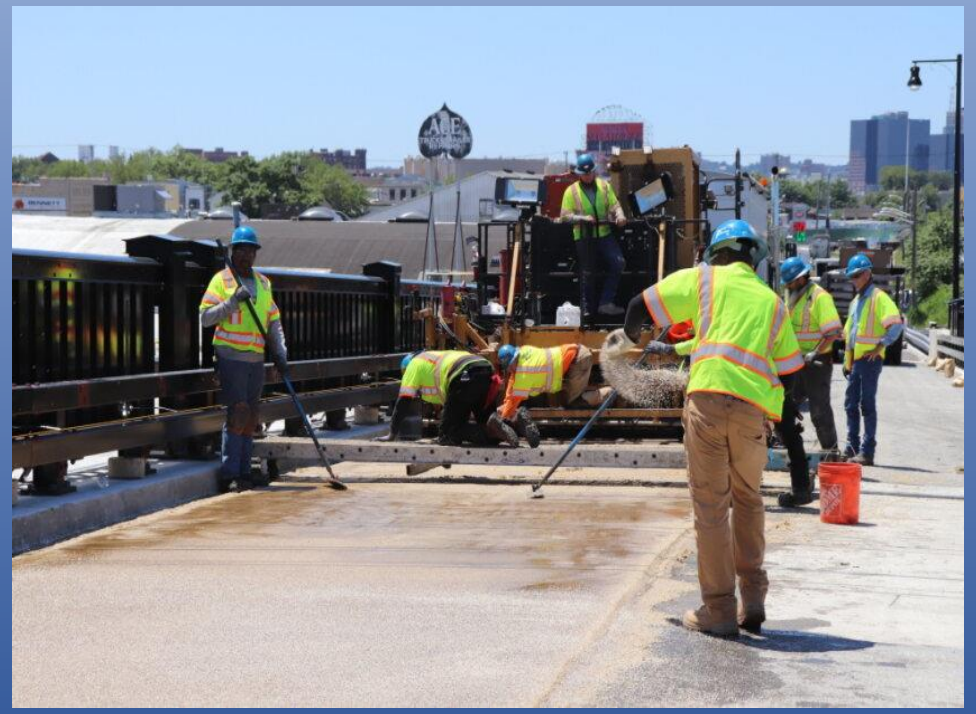
Director

Division of Statewide Planning

WELCOME
SPECIAL GUEST

Construction & Maintenance Technician Apprenticeship Training Program

Kelly Hutchinson
NJDOT Assistant Commissioner



FHWA UPDATES

Christopher Paige

Innovation Coordinator & Community Planner

FHWA, NJ Division Office

CIA TEAM

SAFETY

NJDOT – Dan LiSanti

FHWA – Alan Huff

CIA TEAM

PLANNING & ENVIRONMENT

NJDOT – Sudhir Joshi

FHWA – Sutapa Bandyopadhyay

CIA TEAM

INFRASTRUCTURE PRESERVATION

NJDOT – Shivani Patel

FHWA – Nunzio Merla

CIA TEAM

MOBILITY & OPERATIONS

NJDOT – Vandana Mathur

FHWA – Ek Phomsavath

CIA TEAM

ORGANIZATIONAL SUPPORT & IMPROVEMENT

NJDOT – Kristal Walker

FHWA – Christopher Paige

CIA TEAM

SAFETY

NJDOT – Dan LiSanti

FHWA – Alan Huff

Task	Status
Literature review of relationship between lighting and safety of vulnerable road users	Complete
Literature review summarizing best practice in design guidance for pedestrian-scale lighting	Draft literature undergoing further revision
Draft Pedestrian Scale Lighting Guide content outline and guide layout	In progress
Final Pedestrian Scale Lighting Guide synthesizing best practices in the types of lighting, luminaire placement, and ways to reduce fatalities and serious injuries	In progress

PEDESTRIAN SCALE LIGHTING RESEARCH & GUIDE

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

Rowan University

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

INFRASTRUCTURE PRESERVATION

NJDOT – Shivani Patel

FHWA – Nunzio Merla

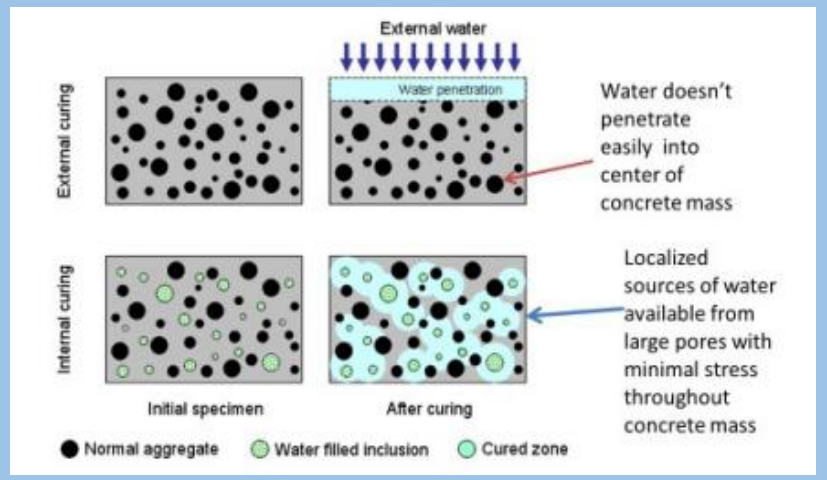
CIA Team
Infrastructure Preservation

Shivani Patel-NJDOT

Nunzio Merla-FHWA

Christopher Paige-FHWA

EDC-7 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.

EDC-7 Enhancing Performance with Internally Cured Concrete (EPIC²)

Status:

- Draft HPIC Specifications circulated for review; comments received

EDC-7 Enhancing Performance with Internally Cured Concrete (EPIC²)

Status:

- Incorporating HPIC specifications into special provisions of 1st pilot project

EDC-7 Enhancing Performance with Internally Cured Concrete (EPIC²)

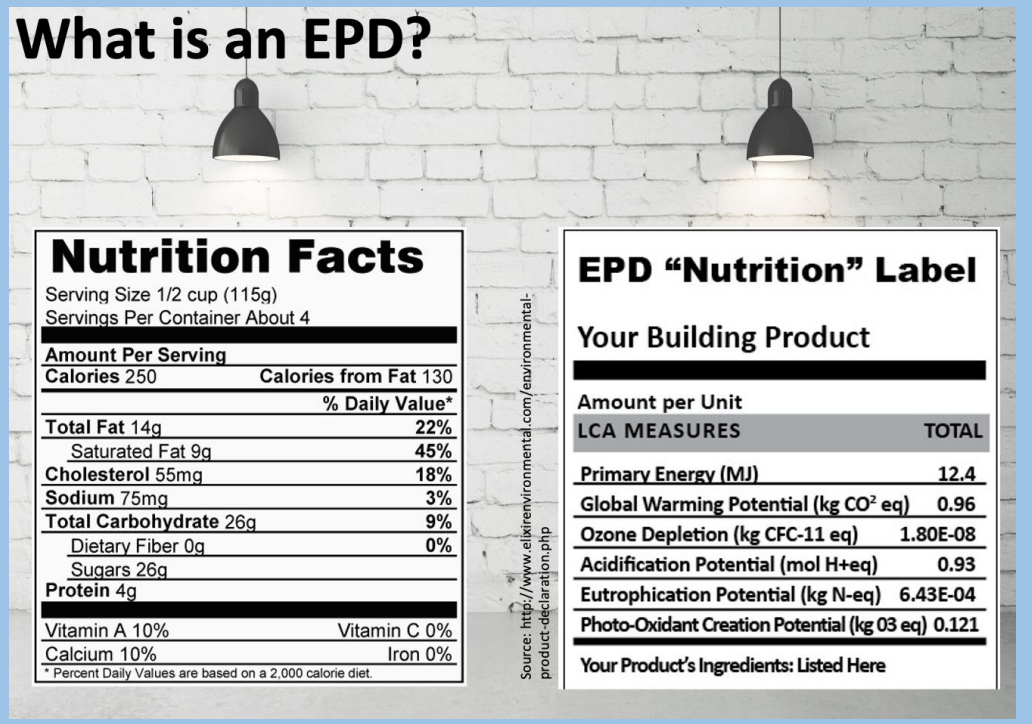
Next Quarter:

- Finalize the Specifications
- Communicate with concrete suppliers
- Communicate with project designers

UPDATE on EDC-6 UHPC Innovation

- The UHPC Overlay Performance Evaluation Program second testing conducted:
  - I-295 NB & US 130 NB over Mantua Creek in Gloucester County
  - NJ 159 WB over Passaic River in Morris County
- Analysis complete and results are favorable
- NJDOT's UHPC overlay pilot projects selected for presentation at the 2024 National Bridge Preservation Partnership Conference

EDC-7 Environmental Product Declarations **(EPDs)** for Sustainable Project Delivery



Purpose:

To identify and understand the environmental impacts from resource use, energy, and emissions in construction and consider alternatives using third party verified reports.

EDC-7 Environmental Product Declarations (EPDs) for Sustainable Project Delivery

Status:

- Participating in FHWA Climate Challenge grant projects which involve use of EPDs

SUSTAINABLE PAVEMENTS PROGRAM

EDC-7 Environmental Product Declarations (EPDs) for Sustainable Project Delivery

Status:

- FHWA Climate Challenge Team provided training to NJDOT staff

EDC-7 Environmental Product Declarations (EPDs) for Sustainable Project Delivery

Next Quarter:

- Continue working on phase 1 efforts
- Work on project tasks related to FHWA's Climate Challenge

Questions?

CIA TEAM

ORGANIZATIONAL SUPPORT & IMPROVEMENT

NJDOT – Kristal Walker

FHWA – Chris Paige

Organization Support & Improvement

Strategic Workforce Development

Presented by Kristal Walker & Christopher Paige

Implementation Plans
Development Stage Updates:

- Funding request sent to FHWA

We redirected our request for funding to FHWA through our On-the-Job Training Supportive Services (OJT/SS) funding allocation process. Currently, the request has not yet been approved.

Implementation Plans
Development Stage Updates:

Contractor Compliance unit collaboration efforts continues:

- Office of Federal Contractor Compliance OFCCP
- US Department of Labor

Developing Workforce Training Goals

Highway Construction Opportunities

- Traditional skilled crafts
- Jobs utilizing technology
  - Line striping systems
  - Intelligent transportation systems
  - Electric vehicle charging stations

CIA TEAM

PLANNING & ENVIRONMENT

NJDOT – Sudhir Joshi

FHWA – Sutapa Bandyopadhyay

CORE INNOVATION AREA UPDATE
PLANNING & ENVIRONMENT

April 17, 2024

Sudhir Joshi & Sutapa Bandyopadhyay

Presentation Prepared by Sushant A. Darji

Update on Greenhouse Gas Emissions Measure

- Initially, the GHG final rule required states to establish beginning decline targets and submit initial reports by March 29, 2024
- NJDOT made a policy decision to set the GHG emissions reduction target value of -1.0% for CY 2025 and submitted their GHG target on February 12, 2024
- As per the GHG final rule, NJDOT would be able to revise the GHG emissions reduction target at the mid-performance period on October 1, 2024; 23 CFR 490.107(b)(2)(i)
- The U.S. District Court of the Northern District of Texas vacated the FHWA final rule for the GHG
- NJDOT is seeking further guidance from FHWA regarding further reporting to FHWA by NJDOT and MPOs

Update on Carbon Reduction Strategy

- On February 20, 2024, FHWA granted approval on the New Jersey Carbon Reduction Strategy (CRS)

- NJDOT has posted the New Jersey Carbon Reduction Strategy Document on the website
  https://www.nj.gov/transportation/works/njcrs/

Highlights - Carbon Reduction Strategy

NJDOT identified five Carbon Reduction Categories of transportation project types that reduce emissions and are already being pursued in New Jersey

- Promote Electric and Zero-Emission Vehicles
- Use of Mass Transit and Active
- Support Efficient Roadway
- Incorporate Efficient Construction and Maintenance
- Enable Innovative Solutions

Implementation Plan – CRS / GHG

- Coordinate with MPOs and Stakeholders to assist with the implementation of the GHG emissions reduction.
- Provide resource and guide for promoting expertise and best practices to MPOs, Counties and Municipalities.
- Continue to Fund and Deliver Projects that Reduce GHG emissions.
- Incorporate Carbon Friendly Elements into Existing Projects.
- Purchase Cleaner Vehicles and Construction Equipment.

Potential Next Steps

- NJDOT is anticipating to rank and score the Carbon Reduction and GHG Emissions reduction projects based on the criteria to be established
- Reducing GHG emissions is a mandatory criteria for the project selection in STIP
- NJDOT anticipates updating the CRS every two years when the STIP is published
- NJDOT anticipates to evaluate CO_2 impacts of CRP funds

Thank you for your Participation

CIA TEAM

MOBILITY & OPERATIONS

NJDOT – Vandana Mathur

FHWA – Ek Phomsavath

1st Tri-Annual STIC Meeting

Transportation Mobility

April 17th 2024

NJIT New Jersey Institute of Technology

ITSRC Intelligent Transportation Systems Resource Center

Expansion of Weather-Savvy

- Initially started with 24 vehicles. 11 new installations and some swaps later:

Mobility	
North	South
2 IMRT	1 IMRT
3 SSP	3 SSP

Operations		
North	Central	South
3 Plows	4 Plows	8 Plows
6 Pickups	3 Pickups	2 Pickups

- Increased Focus on Plows- during a weather event these trucks stay on the road

Expansion of Weather-Savvy

- 10 vehicles left to add (which will bring our total to 45!):

Operations		
North	Central	South
4 Plows	4 Plows	2 Plows

- Increased coverage = increased precision/accuracy of our statewide road surface conditions & increased real-time situational awareness

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.

Vaisala GroundCast (Cont'd)

WHAT DOES IT DO?

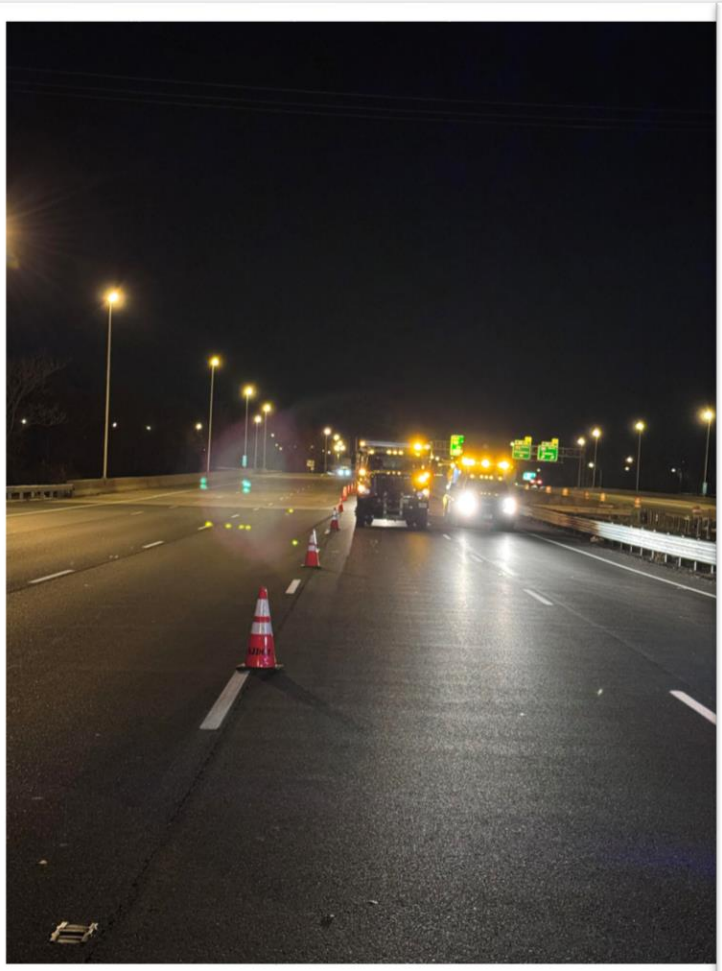
The GroundCast measures:

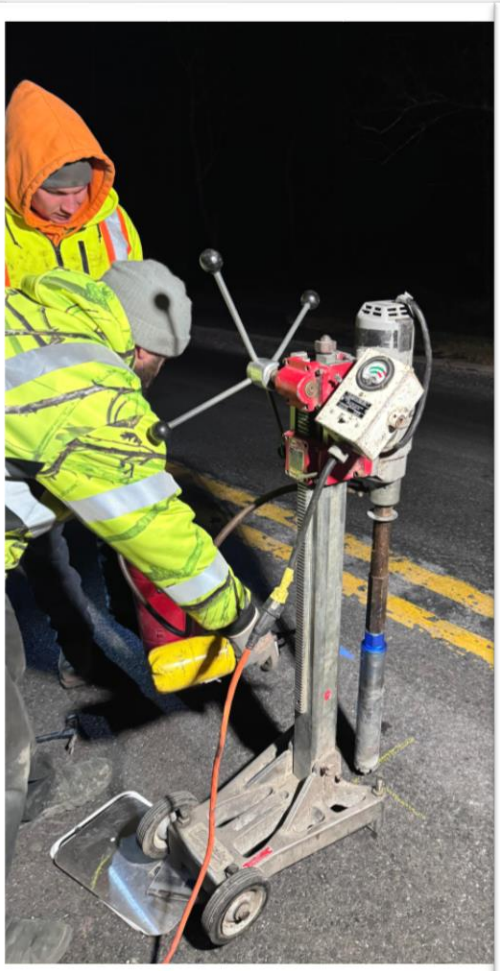
- Surface temperature
- Surface state: dry / not dry
- Amount of treatment material on the road surface
- Temperature at -6 cm / 2.4 in
- Temperature at -30 cm / 1 ft

New Jersey Deployment

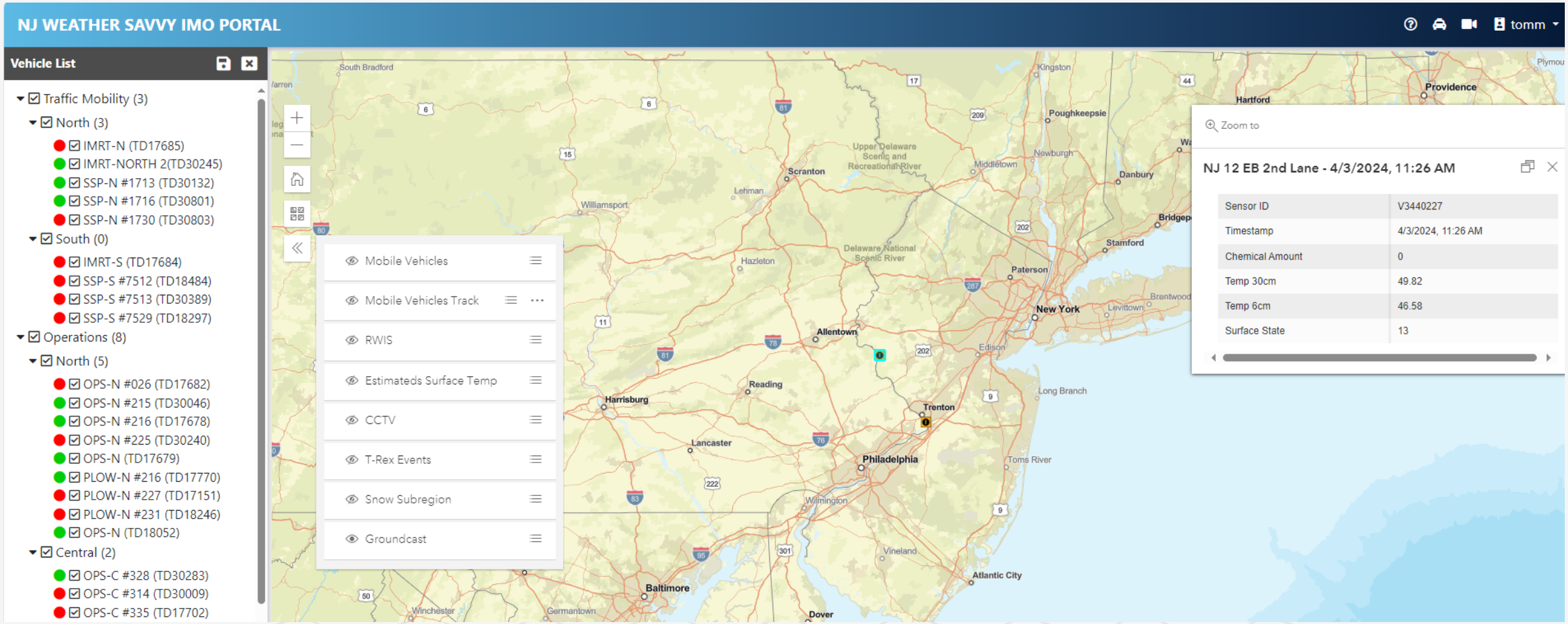
- For the initial pilot deployment, several critical locations have been identified where Vaisala GroundCast sensors are so far installed and will be installed:
  - NJ 29 MP 0.5 (2 sensors installed)
  - NJ 12 MP 1.5 (1 sensor installed)
  - NJ 23 MP 0.4
  - I-295 MP 57.4
  - I-78 MP 10

Installation





Integration into the Weather-Savvy Portal



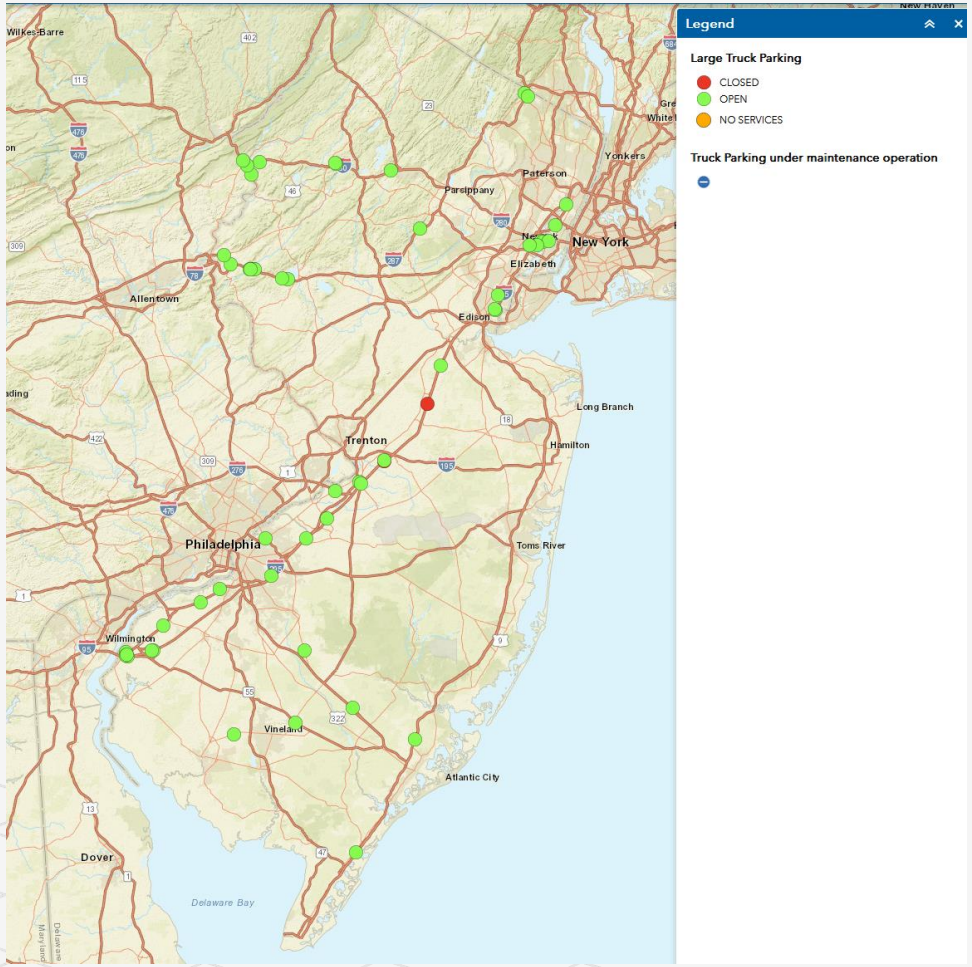
NJDOT Pilot Tests of Truck Parking Information System (TPIS)

New Jersey Institute of Technology

ITSRC Intelligent Transportation Systems Resource Center

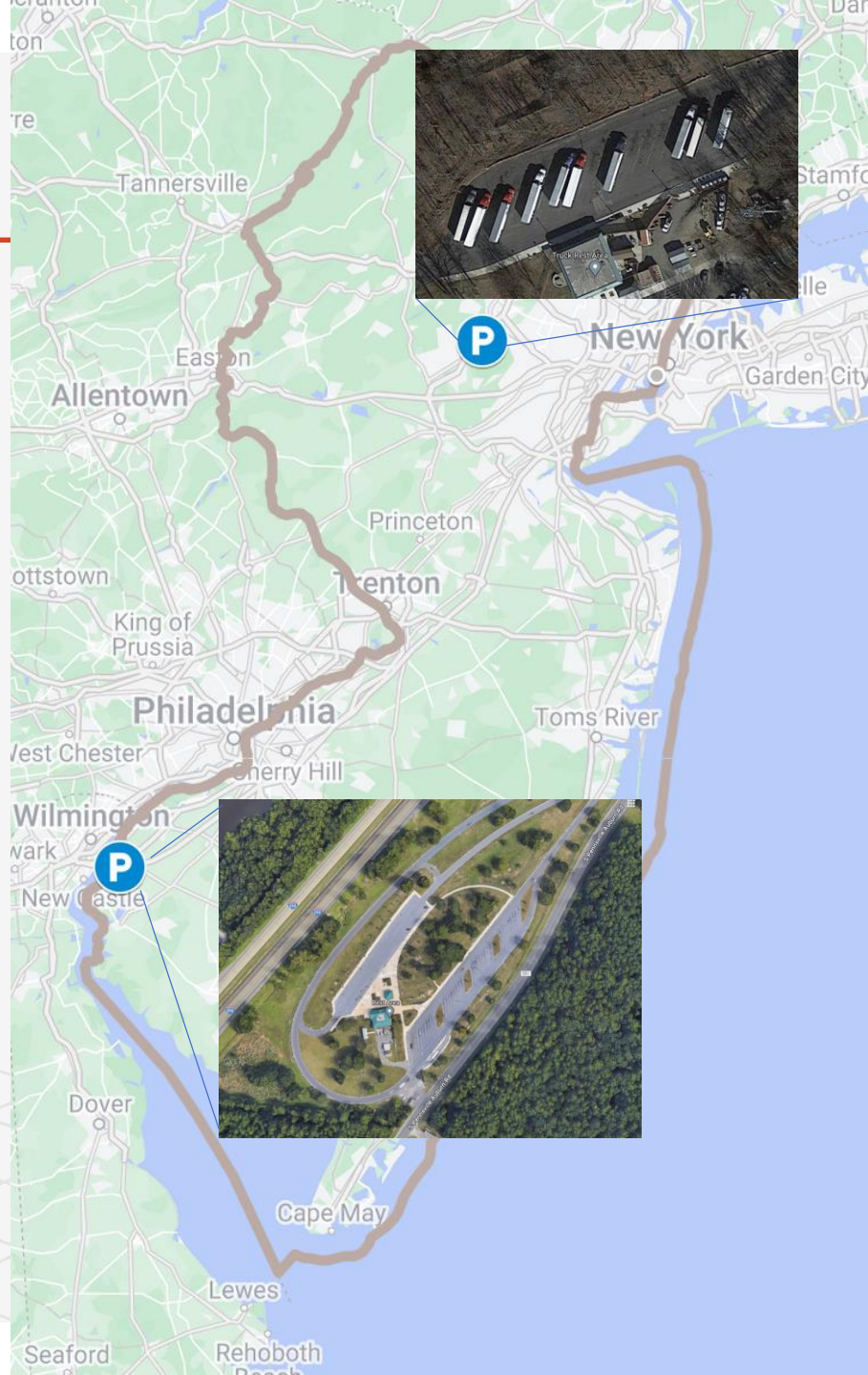
New Jersey Truck Parking

- 2,915 truck parking spaces available in New Jersey, still not enough
- Issues caused by this shortage are exacerbated by the congestion on major New Jersey roadways.
- Coupled with the lack of real-time and accurate information on truck parking availability, the limited truck parking capacity disrupts the truckers' driving plans and routing.



Real-Time Truck Parking Information System (TPIS) Pilot in New Jersey

- NJDOT TM commenced a pilot program to collect and disseminate truck parking availability to commercial vehicle operators.
- The concept of Operation (ConOps) and High-Level System Requirements Specifications for a Pilot Deployment developed in 2019.



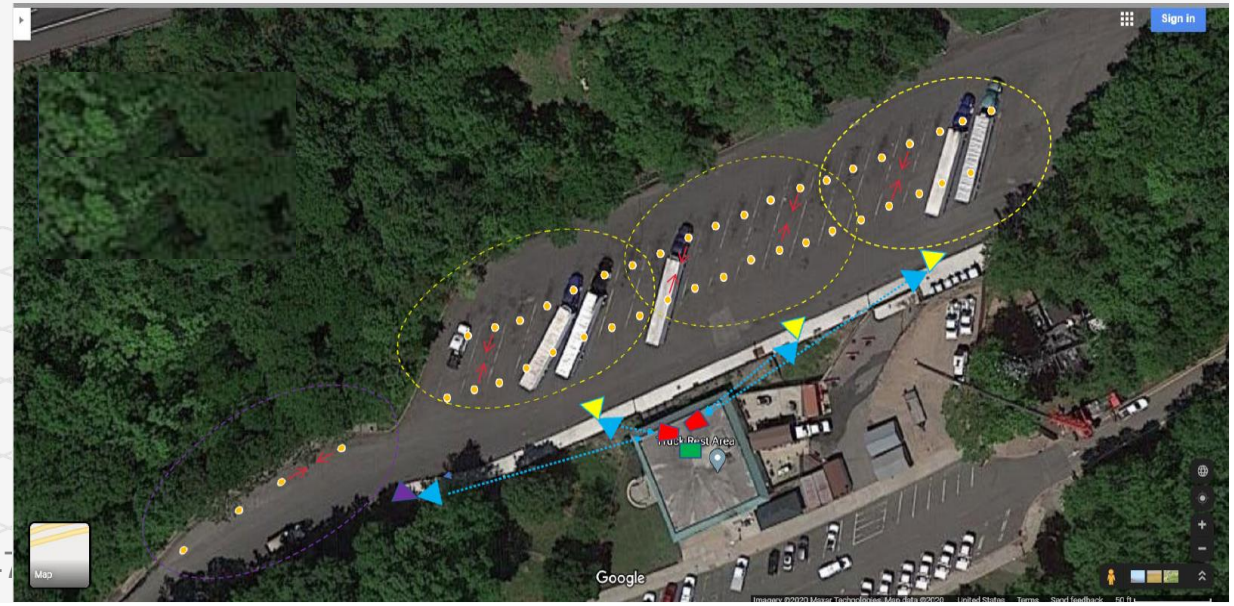
Harding Truck Rest Area

- In 2021, ITS technologies Deployed at the Harding Truck Rest Area are:
  - two traffic microwave sensors,
  - 9 CCTV cameras, and
  - 44 in-pavement sensors.

Mobile Trailer with traffic microwave sensor

Locations of cameras and camera coverages

Locations of in-pavement micro radar sensors

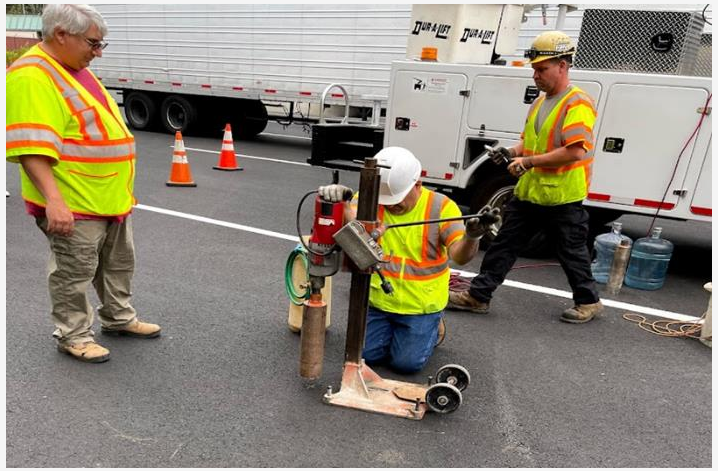


Deepwater Truck Rest Area

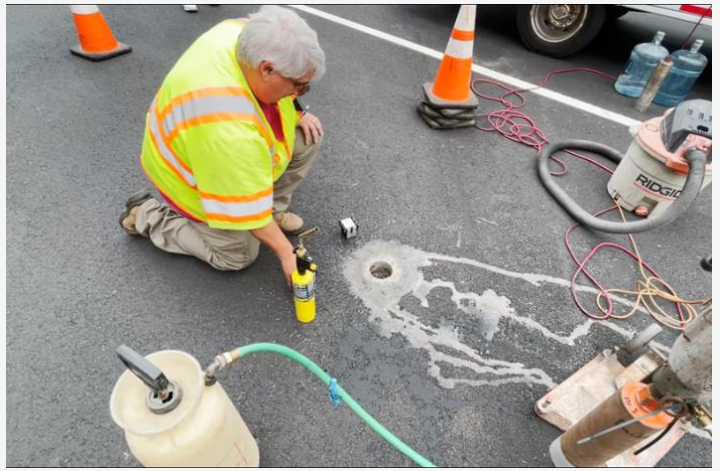
- In 2023, ITS technologies Deployed at the Deepwater Truck Rest Area are:
  - Two traffic microwave sensors,
  - One CCTV cameras, and
  - 68 in-pavement sensors.

In-Pavement Micro Radar Sensor Installation

Measuring the position of a sensor hole

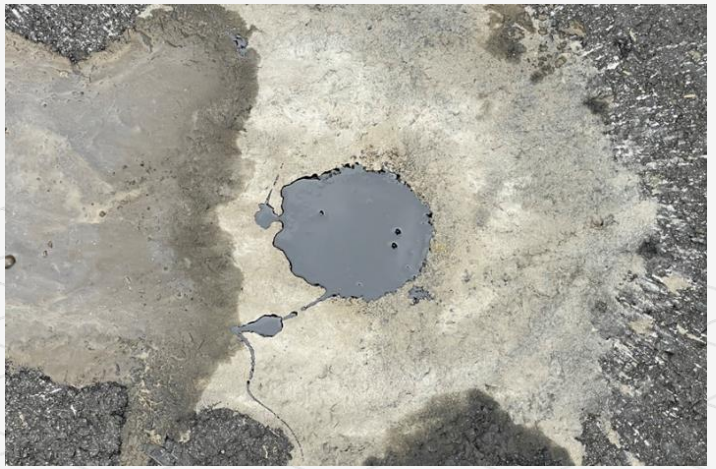


Core a hole



Clean and dry the hole

Sensor in a hole



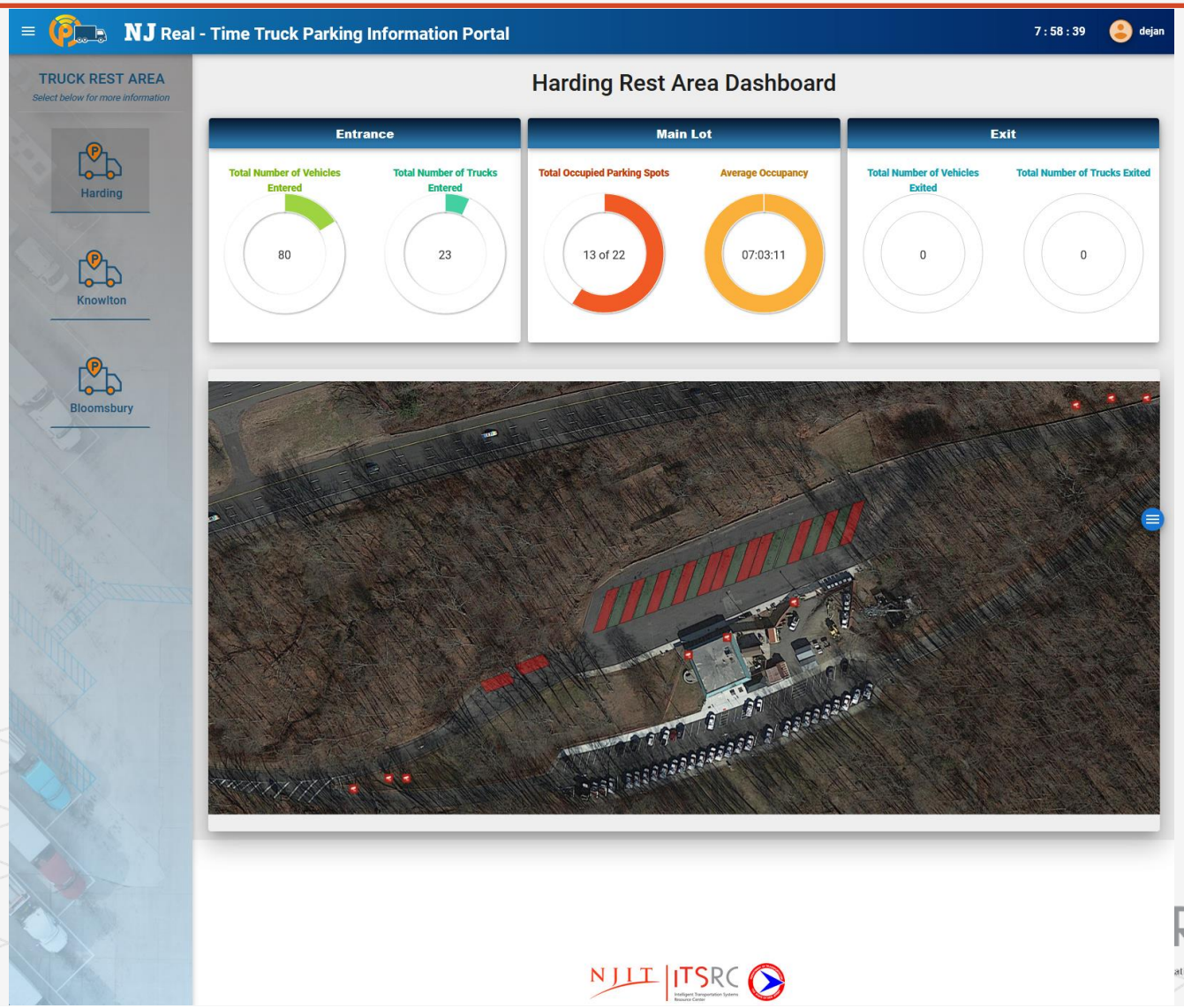
Hole filled with epoxy

NJIT New Jersey Institute of Technology

ITSRC Intelligent Transportation Systems Resource Center

Harding Rest Area Dashboard

- Information collected and displayed:
  - Number of trucks and other vehicles entering
  - Main parking lot utilization and average dwell time of vehicles
  - Number of vehicles left the facility
- Access to every camera feed



Harding Rest Area Dashboard

- Web Portal provides a user to obtain monthly or seasonal statistics of how the facility has been utilized or

Feature Presentation

Construction & Maintenance Technician
Apprenticeship Training Program

Kelly Hutchinson,

NJDOT Assistant Commissioner

Construction & Maintenance Technician

Apprenticeship Training Program

Why an Apprenticeship?

Construction and Maintenance Technician

1. Former entry point to the title series required candidates to possess related experience
2. Title was Competitive = Candidates and appointees required to take and pass a Civil Service exam

- ❑ Lack of qualified job applicants
- ❑ Applicants selected did not always pass the Civil Service exam
  - Unable to achieve permanent status needed for advancement
  - Displaced by potentially less desirable candidates who passed the exam

Inefficient and disruptive way to do business! Unsustainable!

Why an Apprenticeship?.... Continued

- Inconsistent ….
  - ✓ Skill sets
  - ✓ Training
  - ✓ Use of NJDOT inspectors

- Increased need to augment staffing for inspection work

Change Needed

Change Entry Level Requirements

- No experience
- No Civil Service exam

Change Philosophy

- No longer expect candidates with experience
- Must “grow” our own inspectors

Change Training Format

- Create a consistent training program
- Start with basics and build upon that base
- Measurable achievement factors
- Reasonable, but structured completion timeframe

Title Modification

Construction & Maintenance Technician Apprentice

New Requirements

- ✓ High school diploma
  - ✓ Geometry
  - ✓ Algebra 1 and 2

Experience no longer required

New Title Classification

- ✓ Non-Competitive
  - ✓ No Civil Service Exam

Permanent status and advancement after successfully completing the training period

Added Training Period

- ✓ Two-year apprenticeship
  - ✓ Requires satisfactory performance to advance to the primary (journeyman) title

Training period built into the title's official job specification

Training and Development

Structured and Consistent

- Employees clearly understand the training requirements and timelines
- Employees receive uniform training and better exposure to more diverse hands-on work
- Supervisors have a consistent method of training delivery and clear evaluation standards

Reasonable and Measurable Completion Requirements

- Covering a broad range of topics in a strategic way
- Including differing training methods
- Providing clear and measurable completion requirements

Resulting in More Broadly Knowledgeable Inspectors

- Providing more equitable advancement opportunities
- Providing better cross-training opportunities allowing for employee mobility
- Creating a more diverse knowledge base, increasing effectiveness and efficiency
- Reducing need to augment staffing for inspection work

What the Training Looks Like

SEGMENT 1

Independent study of NJDOT's Standard Specifications for Road and Bridge Construction manual

- ✓ Online, interactive and broken down into easily digestible segments
  - ✓ Regular knowledge checks
  - ✓ Quizzes at the end of each section – 80% pass rate requirement

SEGMENT 2

Completion of a select collection of online training modules designed and delivered by the Transportation Curriculum Coordination Council (TC3)

- ✓ Approximately 70 hours
- ✓ Addressing key construction and inspection topics including work site videos
- ✓ Regular knowledge checks

SEGMENT 3

Completion of select in-person and online Transportation Inspection Certification courses

- ✓ Improve internal Inspection Certification expectations
- ✓ 11 courses/certifications for all Apprentice personnel
- ✓ 3 additional courses/certifications for Apprentice personnel assigned to the Bureau of Materials
- ✓ Obtain and maintain the certifications

SEGMENT 4

Successful completion of field training exercises demonstrating field inspection competency

- ✓ Identified field inspection tasks
  - ✓ Assigned points to each task
  - ✓ Points determined by expected frequency of exposure to the task
- ✓ Developed questions and appropriate responses for each task
  - ✓ Apprentice expected to correctly answer questions selected by the task supervisor
  - ✓ If answered correctly, Apprentice is credited with task's assigned number of points
- ✓ Must achieve 80% of total possible task points to demonstrate full competency

What the Training Looks Like….Continued

Implementation Plan

Date: Fall 2024

Target Group: All non-supervisory C&M Technicians

Completion Timeframe: 18 months

New Apprentice Appointees: Assigned upon hire

REMINDERS & ANNOUNCEMENTS

NJDOT Tech Transfer Website
www.njdottechtransfer.net

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

BUREAU OF RESEARCH

NJDOT Technology Transfer

Home | NJ STIC | Tech Talks! | Share Your Ideas | Research | Library | Resources | Calendars

Share Your Ideas

The NJDOT Bureau of Research promotes innovation and problem-sol
standards and specifications that are used in planning, building, and m
transportation community can come together to create innovative solut

NJ Transportation Ideas Portal

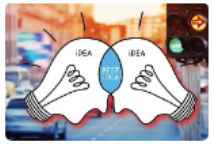
NJ Transportation Ideas Portal

Welcome! The New Jersey Department of Transportation's Bureau of Research uses this website to gather and share ideas from NJDOT's research customers and other transportation stakeholders.

Research Ideas. We seek to fund research that leads to implementation – to the testing and adoption of new materials and technologies, to better specifications and to greater efficiency. We strive to discover and advance feasible solutions for more durable infrastructure, greater environmental protection and resilience, and improved mobility and safety for residents, workers and visitors.

Innovation Ideas. We encourage the deployment of innovations and knowledge transfer. We work with the New Jersey State Transportation Innovation Council (NJ STIC) whose mission is to identify, evaluate, and where possible, rapidly deploy new technologies and process improvements that will accelerate project delivery and improve the quality of NJ's transportation network.

NJDOT Intranet



NJ Transportation Research & Innovation Ideas
SUBMIT YOUR IDEAS NOW!
The NJDOT invites you to share your transportation-related ideas on the NJ Transportation Ideas Portal. The NJDOT seeks RESEARCH IDEAS and INNOVATION IDEAS that lead to implementation or deployment.
Register at: https://njdottechtransfer.ideascale.com/
Learn more at: https://www.njdottechtransfer.net/

njdottechtransfer.ideascale.com

STIC INCENTIVE PROGRAM

NJDOT Tech Transfer Website
https://www.njdottechtransfer.net/new-jersey-stic-requests/

Selection Criteria
Eligible Projects/Activities
How to Apply
List of Projects

https://www.fhwa.dot.gov/innovation/stic/incentive_project/

State	Fiscal Year	STIC Incentive Projects	Funds Allocated
CA	2024	1. Advance modeling for Earth Retaining Structures (continued) ($22,400) 2. Develop a Wrong-Way Driver Prevention Strategic Plan (continued) ($32,000)	$54,400
CT	2024	Develop and pilot Wrong Way Rumble Strips	$ 40,000
ME	2024	1. Create an Equity Outreach Dashboard for Virtual Public Involvement Activities ($40,000) 2. Procurement of safety devices to be used to promote and encourage TIM training in rural areas. ($20,000)	$60,000
AK	2023	Development of an intelligent truck transportation management application for freight and fuel movement through route optimization, scenario analysis, and incident management	$100,000
CA	2023	1. Advance modeling for Earth Retaining Structures ($52,000) 2. Develop a Wrong-Way Driver Prevention Strategic Plan ($48,000)	$100,000
CO	2023	1. Implement Road Weather and Camera imagery in remote areas of the Front Range Colorado foothills ($20,000) 2. Colorado Road & Bridge Institute ($68.080)	$88,080

CT	2023	Pilot and Develop specifications for Ultra High-Performance Concrete (UHPC) for Culvert Lining Repairs	$ 100,000
DE	2023	1. Implement UAS for inspections, survey work and Traffic Incident Management (TIM) ($23,400) 2. Dover Kent MPO Virtual Reality (VR) Experience ($29,856) 3. Pilot a Debris Removal Tool ($34,400)	$ 87,656
FL	2023	Traffic-Related Community Air Quality Monitoring Network in Hillsborough County.	$ 100,000
GA	2023	Leverage Probe Data for Incident Management in Rural Areas	$ 100,000
IA	2023	Advance the use of Bridge Rating software for Local Public Agencies (LPA)	$ 100,000
ID	2023	Pilot Workforce development program for female correctional residents	$ 100,000
IL	2023	Implementation of e-Ticketing Statewide	$ 100,000
IN	2023	Host Midwest Regional Innovation Peer Exchanges (50,000)	$ 50,000
KS	2023	1. Implement road debris removal systems ($49,600) 2. Deploy non-intrusive data collection equipment ($50,400)	$ 100,000
MD	2023	Formalizing asset condition-based corridor/ network assessment procedures for Maryland SHA corridors and highway network.	$ 100,000
ME	2023	Establish a Transportation & Infrastructure Workforce Development Collaborative Pilot Program	$100,000

Every Day Counts
a Nation on the Move

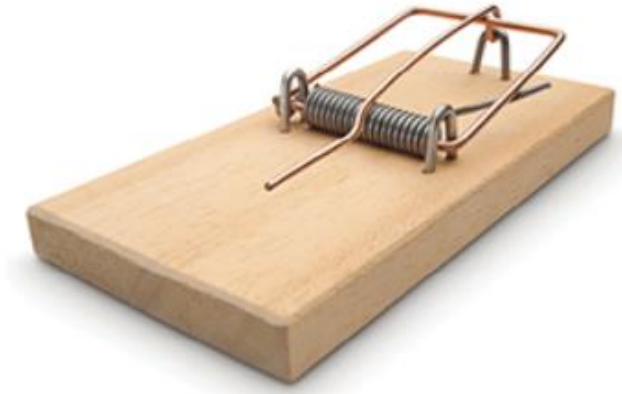
STIC
State Transportation Innovation Councils

ENTER TO WIN

NEW JERSEY BUILD A BETTER MOUSETRAP COMPETITION

We are looking for submissions from employees of local or state public agencies (municipalities, counties, parks commissions, NJ Department of Transportation & NJ TRANSIT) who have come up with innovative problem solutions or found better ways to do certain tasks.

Found a new solution to a problem or a better way to do things?



SUBMIT YOUR ENTRIES!
cait.rutgers.edu/mousetrap/
DEADLINE MAY 1ST

Build a Better MOUSETRAP
National Recognition Program for Transportation Innovation

New Jersey Local Technical Assistance Program

Cait.Rutgers.edu/mousetrap/

Build A Better Mousetrap

New Jersey
Local Technical Assistance Program

NEXT MEETINGS

Executive Team Planning Meetings:
July 17th 10:00am - 11:00am
November 6th 10:00am - 11:00am

NJ STIC Triannual Meetings:
2nd Triannual Meeting - August 7th 10:00am - 12:00pm
3rd Triannual Meeting - December 18th 10:00am - 12:00pm

THANK YOU!

www.NJDOTtechtransfer.net/NJ-STIC

NJDOT Bureau of Research
(609) 963-2242