



NEW JERSEY STATE TRANSPORTATION INNOVATION COUNCIL

www.NJDOTtechtransfer.net/NJ-STIC

1ST Quarterly Meeting March 16, 2022

INTERACTIVE POLL

Have your cell phone
handy or open a
browser window

Log onto
www.menti.com

Stay tuned for code!



WELCOME

Andrew Swords
Director

NJDOT Division of Statewide Planning
FOR

Mike Russo
Assistant Commissioner
NJDOT Planning, Multimodal & Grant Administration



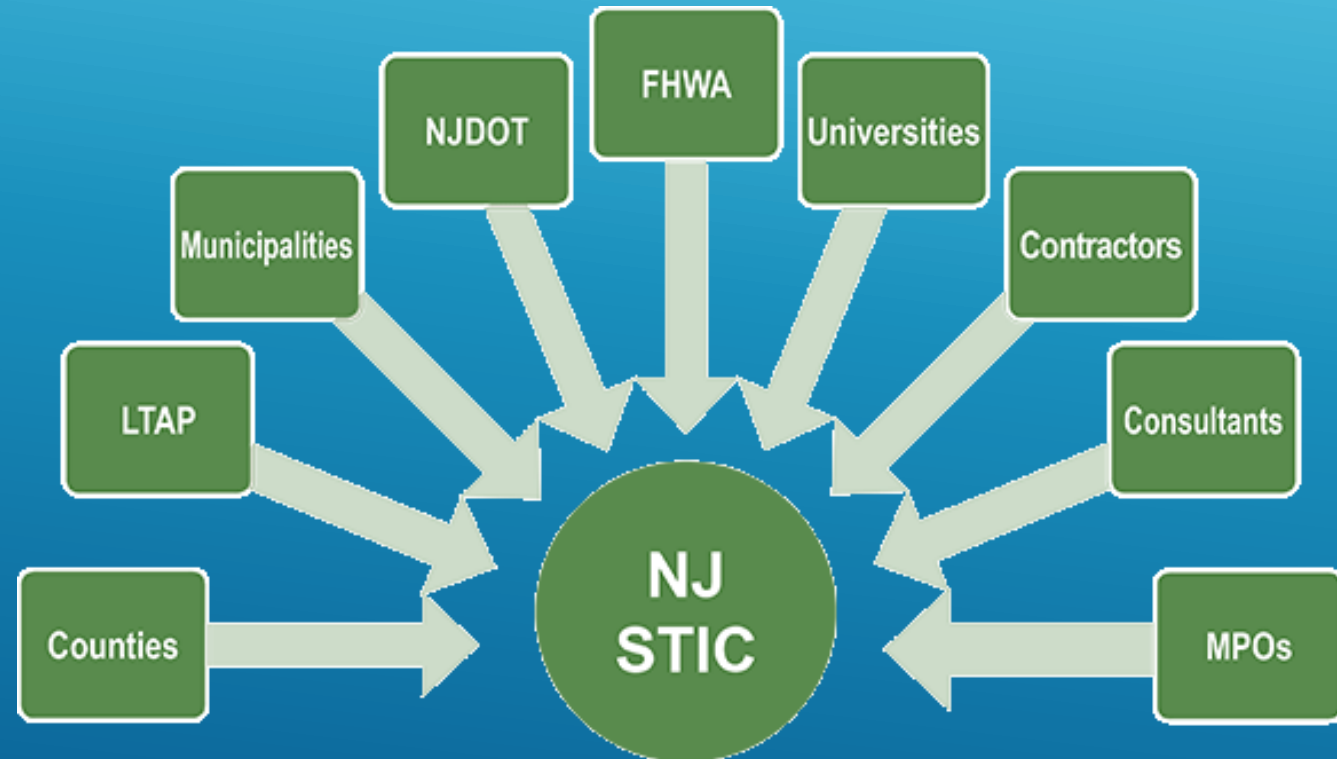
WELCOME ATTENDEES & SPECIAL GUESTS

NJ Commercial Vehicle Alerts

- Sal Cowan, NJDOT
- Amy Lopez, INRIX
- Marc Nichols, Drivewyze

Trenton Moves: Autonomous Vehicle-Based Urban Transit System Project

- Assistant Commissioner Andrew Tunnard





Brandee Chapman

Innovation Coordinator

brandee.chapman@dot.nj.gov

NJDOT Division of Statewide Planning
Bureau of Research





FHWA UPDATES



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



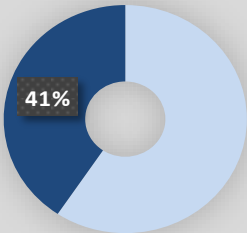
SPRING 2022 STIC MEETING

FHWA UPDATES

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

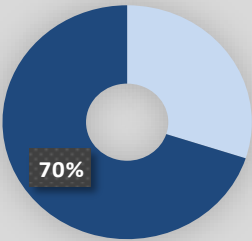
New Jersey

STIC Incentive Projects



\$436,940
Funds Allocated

\$177,470
Funds Expended



10
Projects Awarded

7
Projects Completed

Accelerated Innovation Deployment (AID) Demonstration Projects

\$322,462
Funds Allocated

1
Projects Awarded

Increased Federal-share for Project Level Innovations Usage

\$0.00
Additional Federal Share

0
Projects Authorized

EDC-6 Innovations

PROGRESS DURING TWO-YEAR DEPLOYMENT

	Baseline Jan. 2021	Progress June 2021	Progress Dec 2021	Progress June 2022	Final Report Dec 2022	2-Year Goal for Dec 2022	Goal Met?	Highlights / Challenges
Crowdsourcing for Advancing Operations	Development	Development	Development			Institutionalized	0%	
e-Ticketing	Development	Development	Development			Demonstration	0%	
Digital As-Builts	Not implemented	Development	Development			Demonstration	50%	
Next-Generation TIM	Development	Development	Development			Demonstration	0%	
Strategic Workforce Development	Assessment	Assessment	Assessment			Institutionalized	0%	
Targeted Overlay Pavement Solutions (TOPS)	Institutionalized	Institutionalized	Institutionalized			Institutionalized		
UHPC for Bridge Preservation and Repair	Assessment	Assessment	Assessment			Institutionalized	0%	
Virtual Public Involvement (VPI)	Demonstration	Demonstration	Demonstration			Institutionalized	0%	

Legend:

Not Implemented	not planned for implementation of the innovation.
Development	participating in webinars and peer exchanges, collecting guidance and best practices, developing an implementation process, and building support.
Demonstration	testing and piloting the innovation
Assessment	assessing the performance of the innovation and adjusting any processes for full deployment
Institutionalized	adopted the innovation as a standard practice and uses it regularly on projects

Every Day Counts Call for Ideas

Identify proven, market-ready and underutilized innovations for accelerated deployment in EDC in 2023-2024.

Deadline: April 11, 2022

Learn more >



Responses should be submitted by April 11, 2022.

Submit responses to: EDCsuggestions@dot.gov

Additional information about the EDC Program is available at <http://www.fhwa.dot.gov/everydaycounts/>.

For questions, contact Julie Zirlin FHWA Center for Accelerating Innovation at (202) 366-9105 or Julie.Zirlin@dot.gov.

- *National Impact*: How will it benefit the transportation system nationally?
- *Game Changing*: How is it transformative in making our transportation system adaptable, sustainable, resilient, equitable, and safer for all?
- *Urgency and Scale*: How will it positively impact the environment, safety, congestion, freight movement, construction techniques, contracting methods, project costs, maintenance, preservation, or emergency response?
- Whether there are supporting specifications, guidelines, and/or procedures available to support technology transfer and national deployment.
- Locations where the innovation has been deployed.

NEXT NATIONAL STIC NETWORK MEETING

June 1, 2022, at 2 pm

Interactive Survey

Using cell phone or other device

Go to www.Menti.com

Type in Code: 9706 4171

CORE INNOVATION AREA REPORTS

CIA TEAM

SAFETY

NJDOT – Dan LiSanti
FHWA – Keith Skilton

CIA TEAM

INFRASTRUCTURE PRESERVATION

NJDOT – Bob Signora
FHWA – Nunzio Merla

CIA TEAM

MOBILITY & OPERATIONS

NJDOT – Sue Catlett
FHWA – Ek Phomsavath

CIA TEAM

ORGANIZATIONAL IMPROVEMENT & SUPPORT

NJDOT – Zenobia Fields
FHWA – Brian Goodson

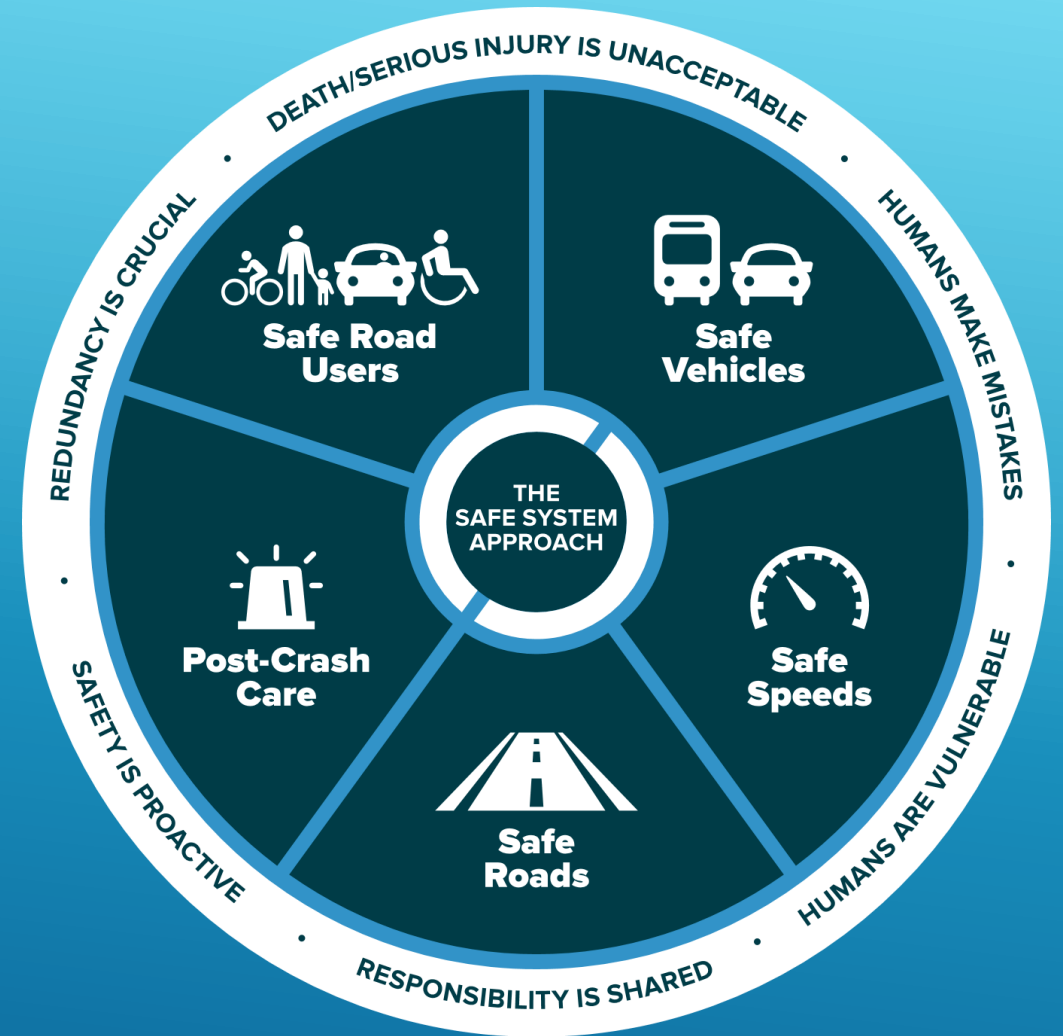
CIA TEAM

SAFETY

NJDOT – Dan LiSanti

FHWA – Keith Skilton

SAFE SYSTEM APPROACH



Source: FHWA

COMPLETE STREETS



Death/serious injury
is unacceptable



Humans make
mistakes



Humans are
vulnerable



Responsibility is
shared



Safety is proactive



Redundancy
is crucial

Source: FHWA

INTERSECTIONS



Source: NJDOT



Source: NJDOT

INTERSECTION DESIGN

ROADWAY DESIGN MANUAL



2015



Source: FHWA

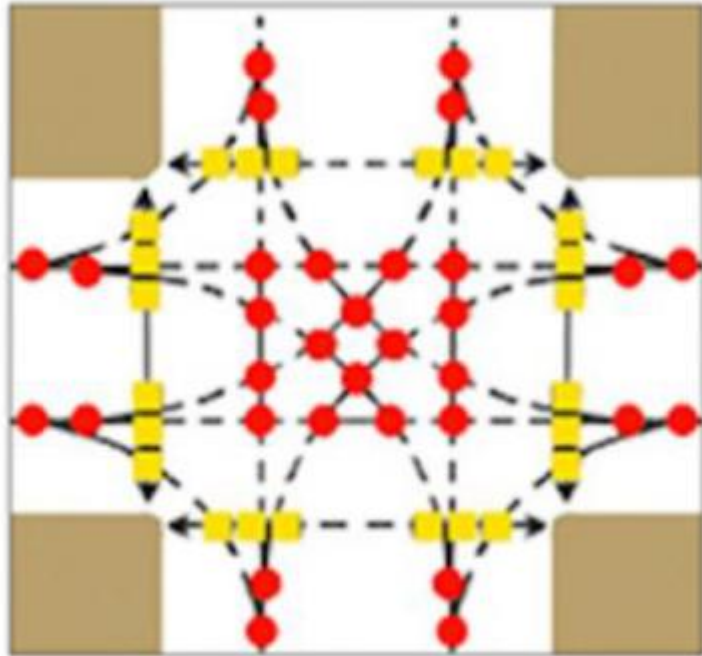
SIMPLIFY

SLOW

SEPARATE

SIMPLIFY

“Conventional” Intersection



● 32 Vehicle conflicts

■ 24 Pedestrian conflicts

Source: FHWA

SPICE
Safety Performance for Intersection Control Evaluation

CAPX
Capacity Analysis for
Planning of Junctions

SLOW

Pedestrian hit
by a vehicle
traveling
at speed...



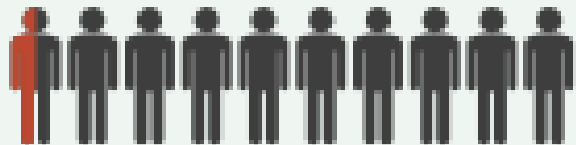
40 MPH



85 % fatality rate



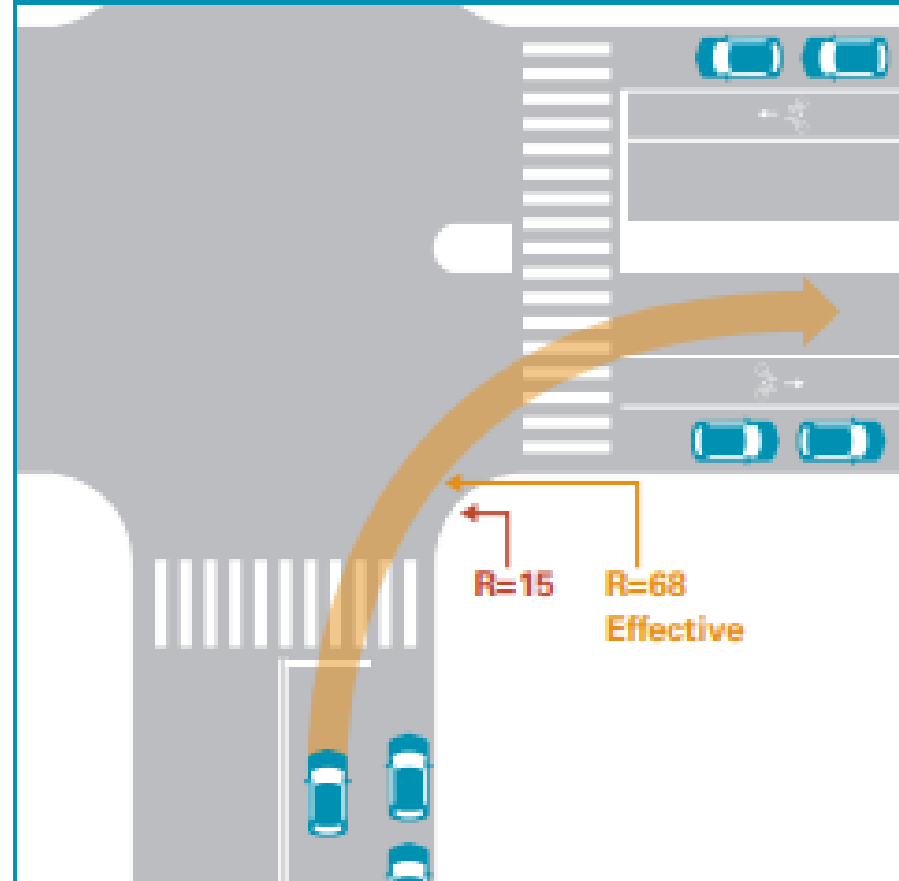
20 MPH



5 % fatality rate

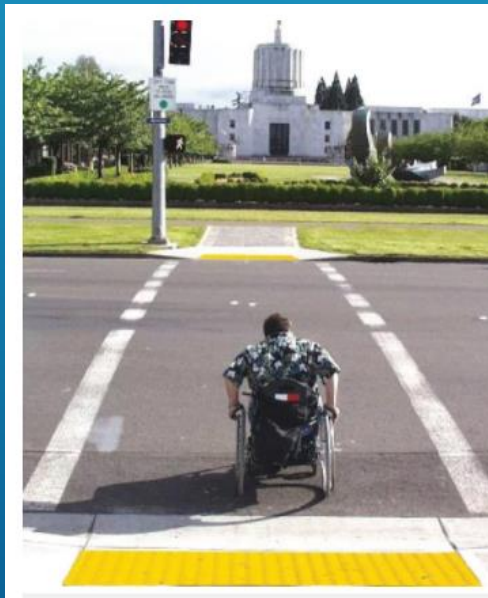
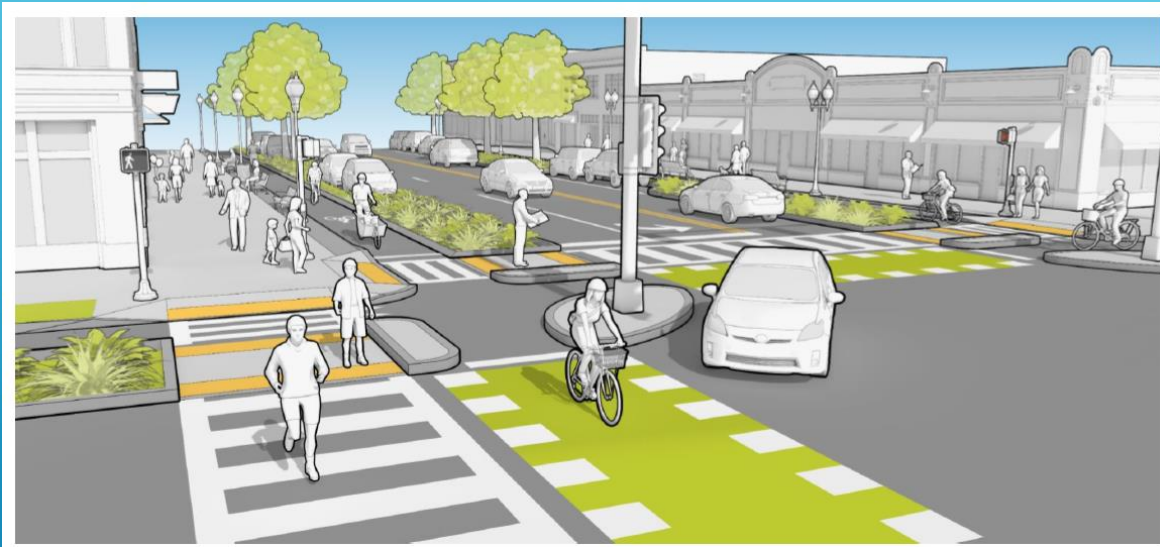
Source: NJDOT

Effective Turning Radius



Source: NJDOT

SEPARATE



Source: FHWA

Source: FHWA

Source: Google

SAFETY FOR ALL



Walk



Bike



Drive



Transit



Mobility Device



QUESTIONS?

CIA TEAM

INFRASTRUCTURE

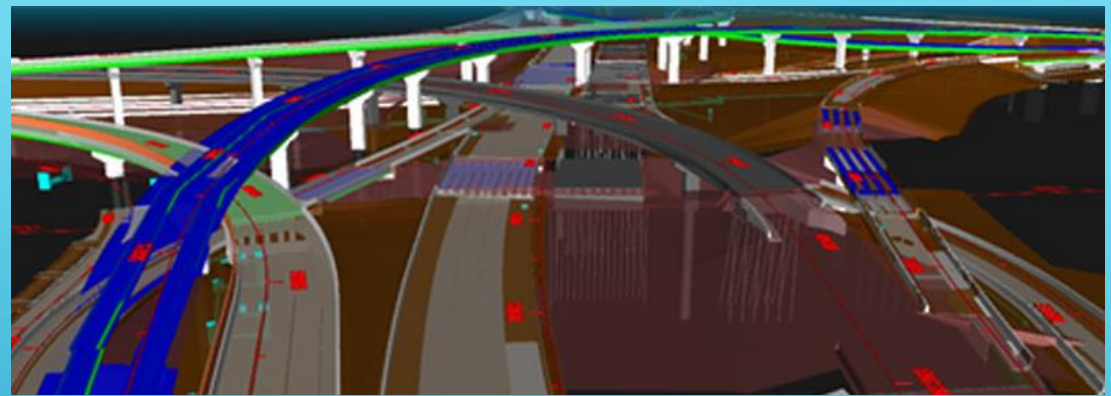
PRESERVATION

NJDOT – Shivani Patel

FHWA – Nunzio Merla

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

Status:

- *There has been a change in leadership for this initiative (Bob Marshall)*
- *The internal team has expanded to include in-house roadway design, traffic engineering, geometric survey, CADD unit, local aid, construction, PMO and the consultant industry.*
- *The team is continuing and prioritizing the advancement of new CADD platform*

EDC – 6

e-Ticketing



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

Status:

- Two additional vendors have provided presentations
- In the next quarter, the team anticipates completing deliberation and selecting a vendor
- A pilot program to begin in Spring 2022

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

Status:

- Ultra High Performance Thin Overlay is included in Route 42 project (UPC 213090)
- The specification has been finalized and item number created
- In the next months, the team will evaluate potential projects for the application of Enhance Friction Overlay (EFO) treatment

EDC – 6

UHPC for Bridge Preservation and Repair



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

Status:

- The testing at location 1 (I-295 NB & US 130 NB over Mantua Creek Bridge) is complete
- The team is preparing for testing at location 2 (I-280 WB over Newark Turnpike (CR 508) Bridge)
- In the next months, the team will complete analysis and report results of phase 1 testing



QUESTIONS?

CIA TEAM

**Organizational
Improvement &
Support**

NJDOT – Zenobia Fields

FHWA – Brian Goodson

Strategic Workforce Development



Let's Go! Pilot Workshop – Succession Planning Efforts

Mission Statement – “To create career opportunities for a diverse workforce in terms of disciplines, demographics, and career levels in order to meet the demands of the transportation skills of tomorrow.”

Priority Actions

- i. Industry Association Outreach – TechTalk Interview
- ii. Goal, Measures, Timeline, Buy-In
- iii. Regular Meetings and Follow-up Actions – Resume in April
- iv. College/University Outreach – TechTalk Interview



Virtual Public Involvement

National Virtual Public Involvement (VPI) Peer Exchange

- ❖ Early Development Conversations Continue
- ❖ 3 to 5 Potential DOT Peers
 - MPO and Other Partner Participation?
- ❖ Engaging Underserved Populations – think outside the box!
- ❖ Information Sharing & Feedback – projects, programs, long range planning efforts, and ongoing initiatives.
- ❖ Aim for early Summer



QUESTIONS?

CIA TEAM

MOBILITY & OPS

NJDOT – Sue Catlett

FHWA – Ek Phomsavath

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.
- NJ State Police has installed new CAD system(Motorola FLEX).

“Development” Stage

- Assembled a team
- In discussions with NJ State Police on access/deployment for DOT



EDC-6: Crowdsourcing for Advancing Operations

NJDOT collaborating with Drivewyze

- Real-time trucking alert system
- Improve mobility and traffic operations
- Reduce commercial vehicle crashes

“Assessment” Stage

- Identified the use case.
- Reviewing the traffic alert data.
- Assessing the performance of the notification system.





QUESTIONS?

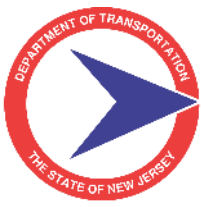
Feature Presentation

NJ Commercial Vehicle Alerts

Sal Cowan, NJDOT

Amy Lopez, INRIX

Marc Nichols, Drivewyze



Presenters



Drivewyze[®]

INRIX



Sal Cowan, Senior
Director – Mobility



Marc Nichols, Director,
Government & Industry
Partnerships



Amy Lopez, Director of
Public Sector Services
and Smart City Strategy



Who Are We Working With?



Provider of North America's
largest weigh station bypass
system (Drivewyze PreClear)

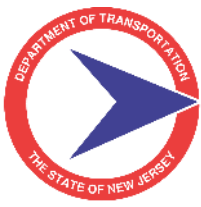


Provider of real time traffic data
and analytics to state agencies,
cities and transportation
authorities worldwide



Which Agencies Are Involved?





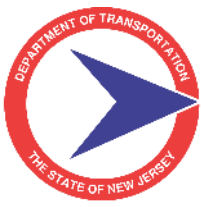
What Roads Are Covered?

Northern New Jersey Commercial Vehicle Alert Sections			
Route	Begin Milepost	End Milepost	Total Miles
1-78	0	58.5	58.5
I-80	0	68.5	68.5
I-280	0	17.85	17.85
I-287	0	67.54	67.54
NJ 440	0	5.15	5.15
Total			217.54
Southern New Jersey Commercial Vehicle Alert Sections			
Route	Begin Milepost	End Milepost	Total Miles
I-195	0	34.2	34.2
I-295	0	76.56	76.56
I-76	0	3.08	3.08
I-676	0	4.75	4.75
NJ 42	6.2	14.3	8.1
Total			126.69
New Jersey Turnpike			
Route	Begin Milepost	End Milepost	Total Miles
PHMTE			6.6
NBHCE			8.4
Mainline			118
Western Spur			10.5
I-95 Extension			5
Total			148.5

Garden State Parkway			
Route	Begin Milepost	End Milepost	Total Miles
	0	106	106
Total			106
Atlantic City Expressway			
Route	Begin Milepost	End Milepost	Total Miles
	0		48
Total			48

Total Centerline Miles
(all three agencies)

647



What Are We Doing?



- Provide commercial drivers with real-time slowdown and congestion alerts.
- Help commercial drivers react before encountering stopped traffic or slowdowns



How Is It Done?

Road Closures



Hazard/Crash - Moderate Impact

ID	160415533
Description	Left lane blocked due to crash on Garden State Pkwy Southbound at I-195.
Where	Southbound Garden State Pkwy at undefined I-195
Status	active
When	02/22/2022 7:02 am - 02/22/2022 10:16 am

API RESPONSE

Congestion/Queues



Description	Severe delays of ten minutes and delays increasing on I-90 Westbound in West Brimfield. Average speed 15 mph.
Where	Westbound I-90 between I-90 Exit 9 / I-84 and I-90
Status	active
When	2020-06-01 2:06 pm - 2020-06-01 5:08 pm
Length	3.70 Miles
Delay from Normal	10.00 minutes

Sudden Slowdowns



Dangerous Slowdown

ID	11120561 1282829538
Where	GARDEN STATE PKWY
Severity	Moderate Impact
Delta	41 mph
Speed At	17 mph
Start	02/22/2022 9:41 am

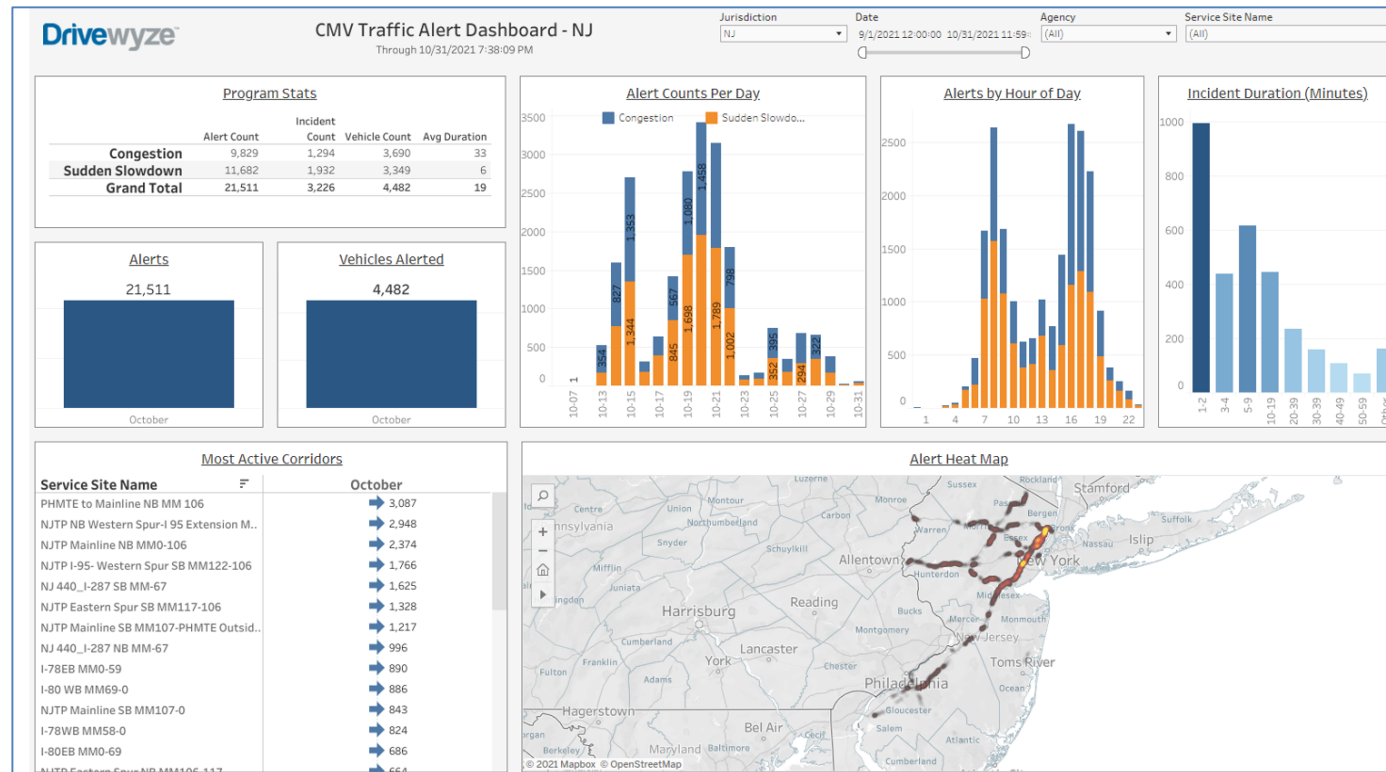
API RESPONSE

- INRIX Traffic Intelligence -- Real-time monitoring of nationwide road network
- Detects and characterizes closures, queues, and slowdowns
- Updates every 60-seconds - includes location and severity

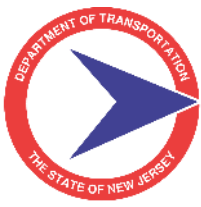


Drivewyze Commercial Vehicle Alerts

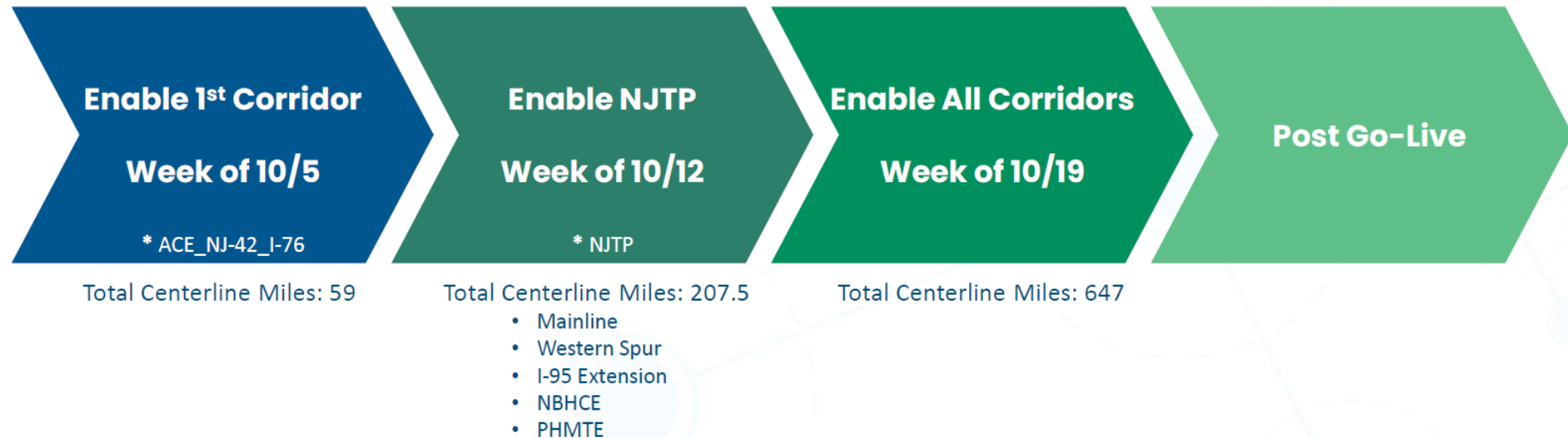
What Are We Getting?

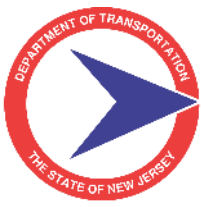


Web-based dashboard showing # of alerts and vehicles alerted in NJ



Deployment Timeline





Short-Term Next Steps

- Provide app to agency field staff for use and evaluation
 - Analyze alerts compared to TMC data
-

Long-Term Next Steps

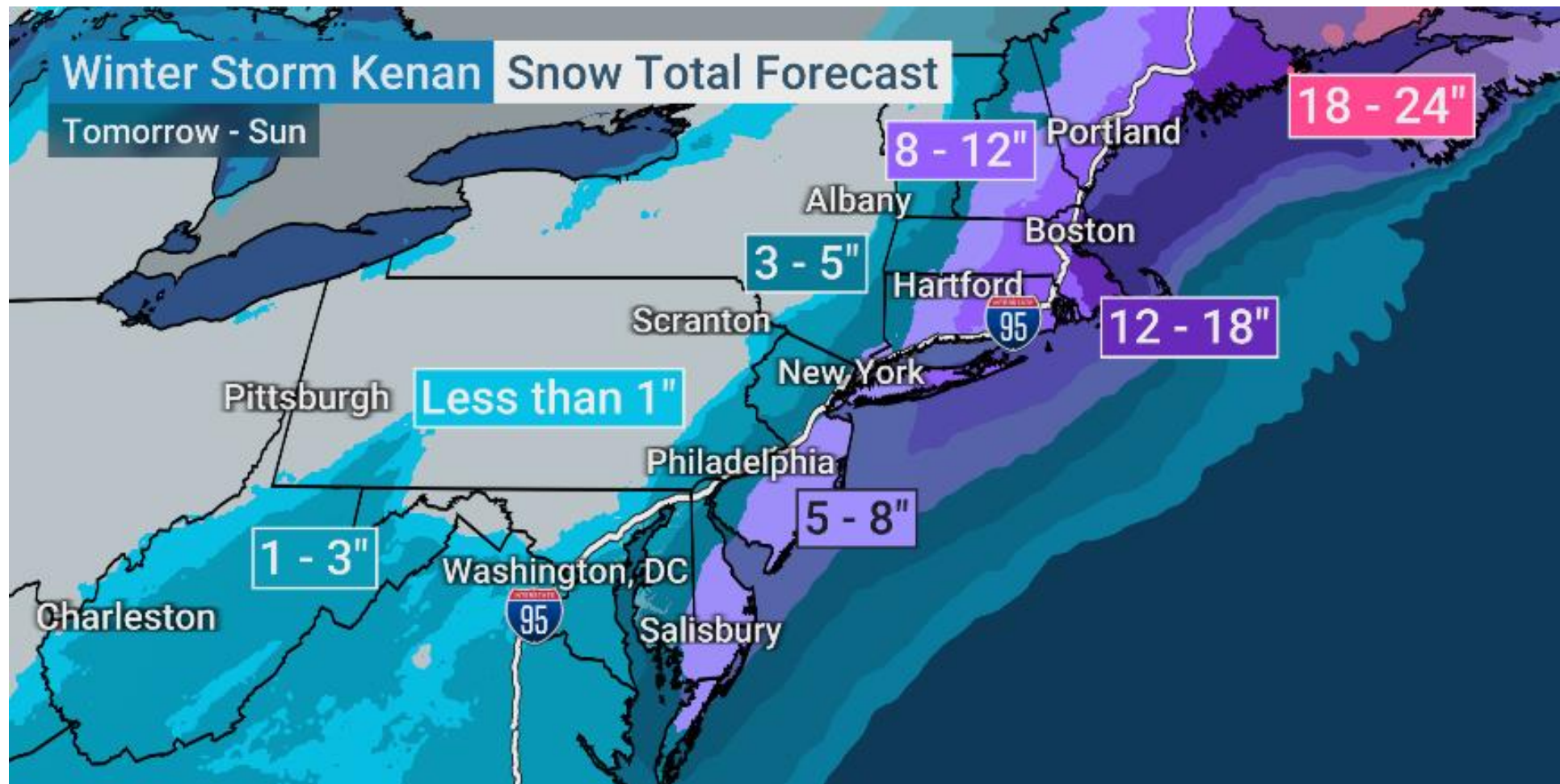
- Reviewing over 300,000 datapoints from SLD and TAMS
- Determine static signage (rollover, low bridge, etc) to send in-cab

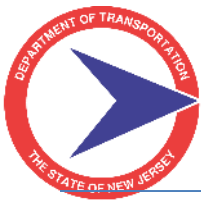




Use Case – Response to Nor'easter

Winter Storm Kenan





Request from NJDOT to Alert the Northeast

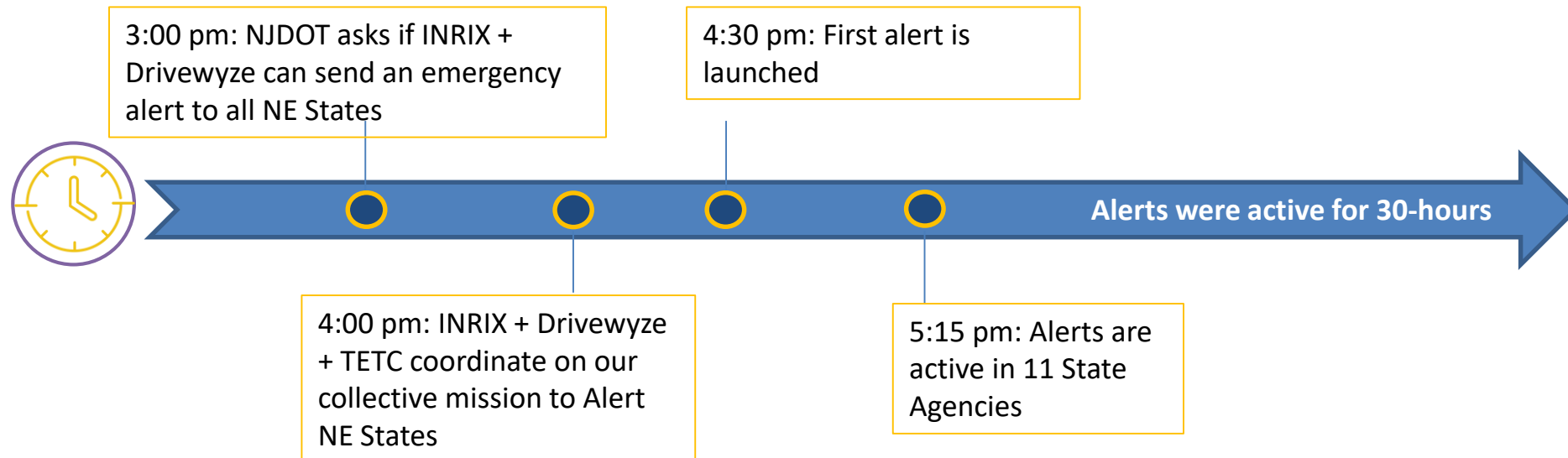
Q - Can INRIX + Drivewyze provide alerts for Truck Restrictions due to the upcoming storm?

A - Yes!

Q – Can you alert the entire Northeast (even though only NJDOT has the service)??

A – Yes – we did!!!....we did because of the NJ request and the concern for the NE states...

It didn't take long to get things movin!





“Major Winter Storm Alert”



- 11 states activated 2 ¼ hours after initial request
- 10 states that do NOT subscribe CMV Alerts

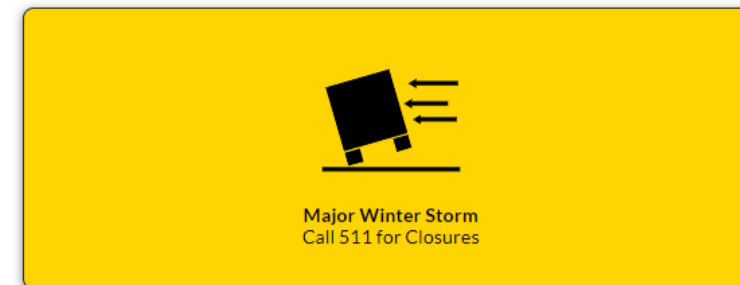
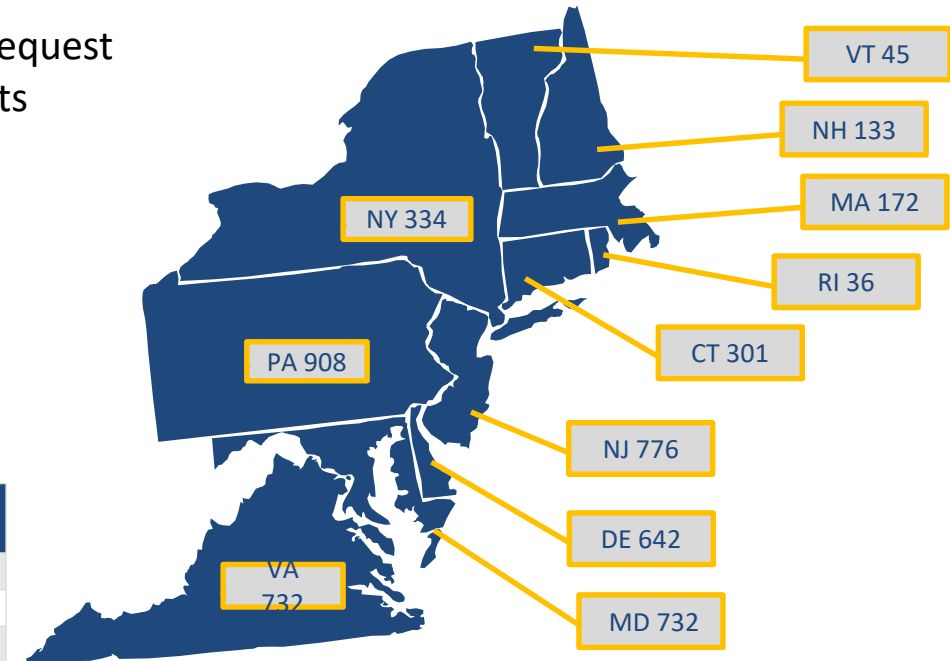


- 11 State agencies
- 1956 NB interstate road miles

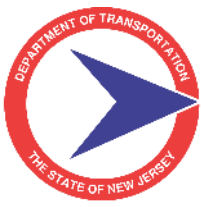


- 4,811 Trucks alerted over 30-hours

State	Location of Alert	Number of Trucks
CT	North I-95 NB	301
DE	North I-95 NB	642
MD	North I-495 NB	732
MA	North I-91 NB	165
MA	North I-495 NB	7
NH	North I-95 NB	133
NJ	North I-95 NB	260
NJ	North I-295 NB	516
NY	North I-87 NB	25
NY	North I-495 NB	4
NY	North I-95 NB	305
PA	I-80 East EB	908
RI	North I-95 NB	36
VT	North I-91 NB	45
VA	North I-95 NB	732
Total Number of Trucks Alerted		4811



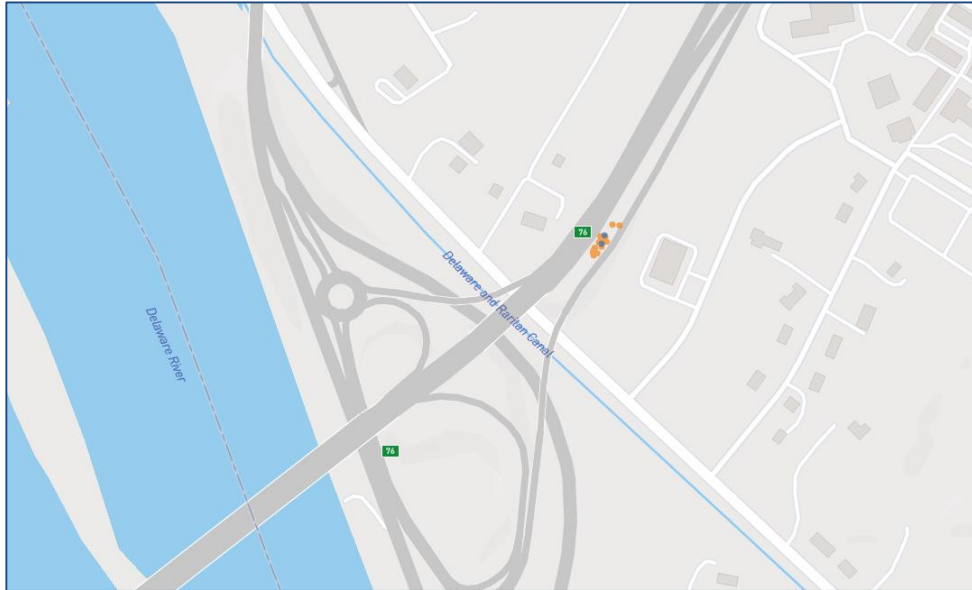
Example of actual ELD alert.
This also goes into any smart device.



“Major Winter Storm Alert”

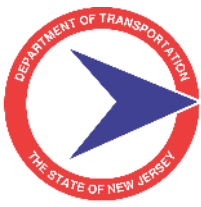
Geo-Fence Alert Example

NJ Major Snowstorm Alert North I-95 NB



- 516 Alerts Sent Out
- Date and Time Site was Activated: 01/28/22 at 5:50 PM EST
- Date and Time Site was Deactivated: 01/30/22 at 9:57 AM EST

State	Location of Alert	Number of Trucks
CT	North I-95 NB	301
DE	North I-95 NB	642
MD	North I-495 NB	732
MA	North I-91 NB	165
MA	North I-495 NB	7
NH	North I-95 NB	133
NJ	North I-95 NB	260
NJ	North I-295 NB	516
NY	North I-87 NB	25
NY	North I-495 NB	4
NY	North I-95 NB	305
PA	I-80 East EB	908
RI	North I-95 NB	36
VT	North I-91 NB	45
VA	North I-95 NB	732
Total Number of Trucks Alerted		4811



Thank you!

Questions?



Drivewyze®

INRIX



Sal Cowan
Sal.Cowan@dot.nj.gov



Marc Nichols
mnichols@drivewyze.com



Amy Lopez
amy.lopez@inrix.com

Feature Presentation

Trenton Moves:

Autonomous Vehicle-Based
Urban Transit System Project

Assistant Commissioner
TOSS

Andrew Tunnard

TRENTON MOVES (MOBILITY & OPPORTUNITY: VEHICLES EQUITY SYSTEM)

Andrew J. Tunnard

Assistant Commissioner, NJDOT

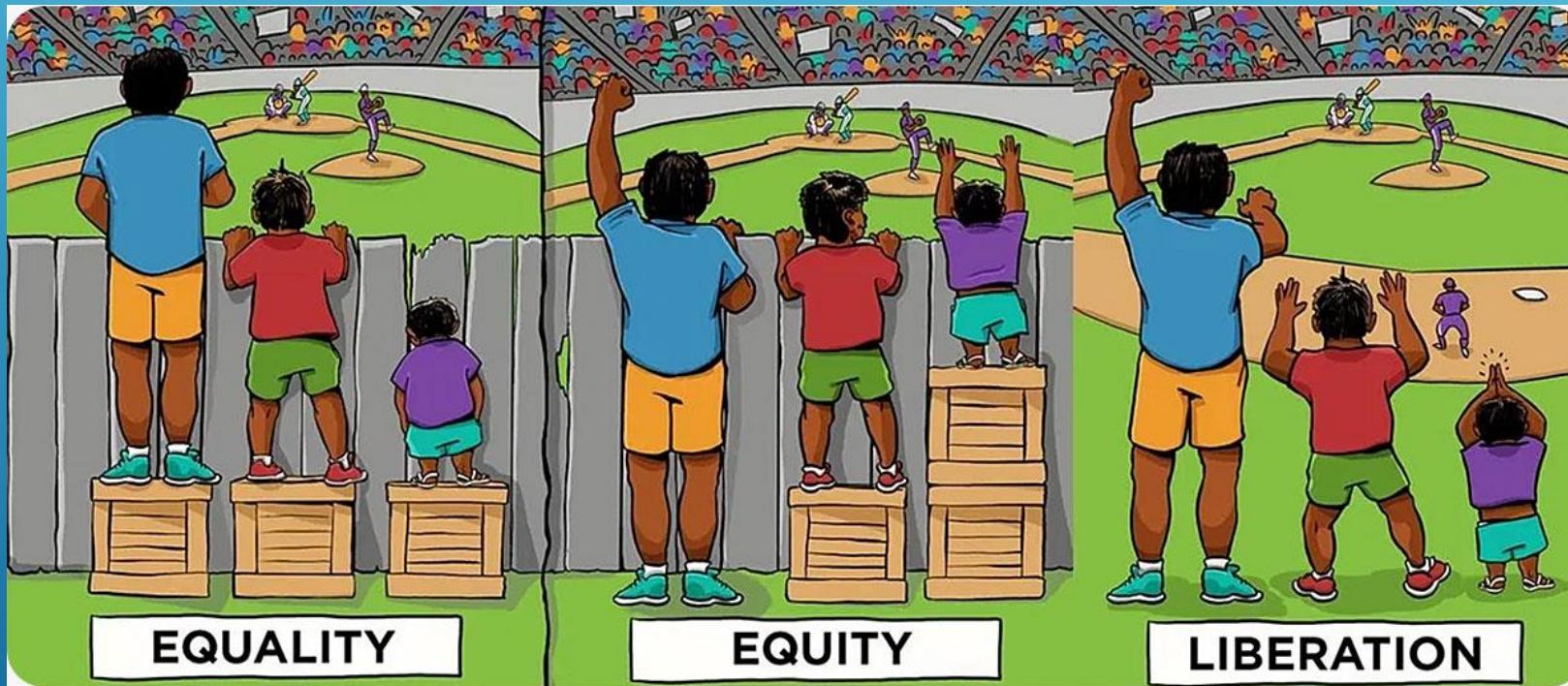
Presented at

NJ STIC 1st Quarterly Meeting 2022

March 16, 2022

TRENTON MOVES

Why?



TRENTON MOVES



- What? Deploy a Safe, Equitable, Affordable, Sustainable, On-Demand Transportation System
- Where? Trenton and then.....
- When? Hopefully early 2024
- Who? Trenton City Government, Mercer County, State (Governor's office & NJDOT), Princeton University

THE HOW

1. Create a Welcoming Environment

- Create a Vision in the communities/neighborhoods
- Build and foster support at the local level

2. Entice technology companies to “Come Play”

- Form a PPP
- **Private:** Contributes IP, expertise and technology/vehicles
- **Public:** Ensures objectives are achieved. Esp. Equity, Safety & High-quality
+ Ensures affordability

3. Up-front / “Infrastructure” Funding

- Start-up \$\$\$
 - Operations Centers
 - Kiosks
 - Curb/Road Improvement
 - **Acclimation of Vehicles & Customers**

1. Create a Welcoming Environment

2. Entice/select a feasible technology company

3. Up-front / “Infrastructure” Funding

90,000 RESIDENTS OF TRENTON, NJ

50 KIOSK NEIGHBORHOODS



Existing
Mobility
Providers

Faith
Community

Business
Community

Senior
Community

Public
Housing

Schools

Public Safety

Local
NGOs

Major
Employers

NJDOT
Commissioner

Mayor &
City Council

NJMVC
Chief

NJ Assembly

NJ
Senate

Governor

1. Create a Welcoming Environment

2. Entice/select a feasible technology company

3. Up-front / “Infrastructure” Funding

Direct Community Engagement

90,000 RESIDENTS OF TRENTON, NJ

50 KIOSK NEIGHBORHOODS

Public Housing

Faith Community

Business Community

Senior Community

Mobility Providers

Schools

Public Safety

Local NGOs

Major Employers

NJDOT Commissioner

Mayor & City Council

NJMVC Chief

NJ Assembly

NJ Senate

Governor



Public Housing



Schools



Senior Community



Community Canvassing

1. Create a Welcoming Environment

2. Entice/select a feasible technology company

3. Up-front / “Infrastructure” Funding

Enthusiastic Government Support

Governor Phil Murphy

Murphy Administration Announces RFEI for Project to Create the First Autonomous Vehicle-Based Urban Transit System in America

12/6/2021

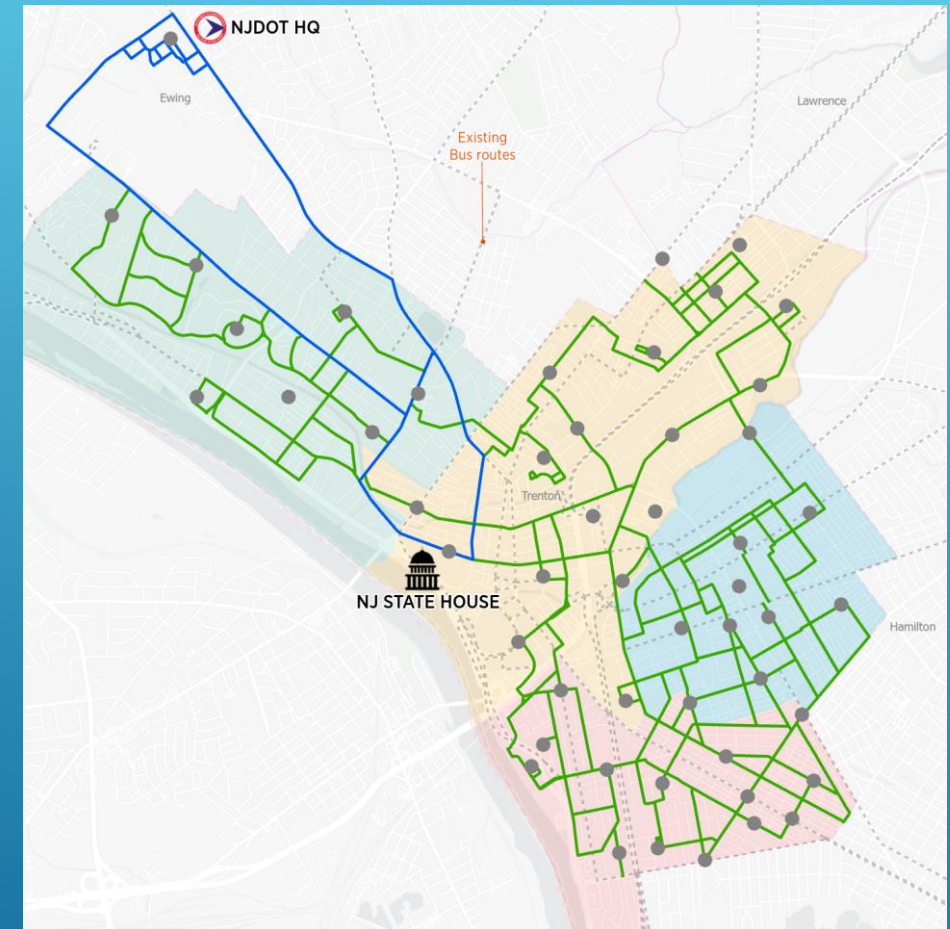
TRENTON – Governor Phil Murphy and New Jersey Department of Transportation (NJDOT) Commissioner Diane Gutierrez-Scaccetti today announced an Request for Expressions of Interest (RFEI) for the Trenton Mobility & Opportunity: Vehicles Equity System (MOVES) Project. Trenton MOVES will act to provide safe, equitable, affordable, and sustainable high-quality mobility through the deployment of 100 Autonomous Vehicles (AVs) throughout the state capital. This on-demand automated transit system will serve 90,000 residents of Trenton.

“Since taking office, we have worked relentlessly towards making New Jersey the innovation center of America,” said **Governor Murphy**. “There is perhaps no initiative that embodies this goal more than the Trenton MOVES project, which will attract tech talent from around the country and the world with the mission of creating an autonomous vehicle-based transit system in our Capitol that will provide a new, affordable transportation solution for underserved areas of Trenton. This is an exciting project with immense potential and I look forward to the day that the first vehicle hits the road.”

“Mobility is about equity and access to opportunity,” said **New Jersey Department of Transportation Commissioner Diane Gutierrez-Scaccetti**. “Trenton MOVES represents an opportunity to utilize innovation to sustainably improve the quality of life of the mobility-constrained in many of our cities. By starting in Trenton, we will have the opportunity to work with a close and effective partner; ultimately our vision is that this effort will ideally scale throughout the state and the region”.

◀ Trenton MOVES, Governor Murphy Press Release, Dec 2021

▶ Trenton MOVES, Planned Operational Design Domain.
© CARTS



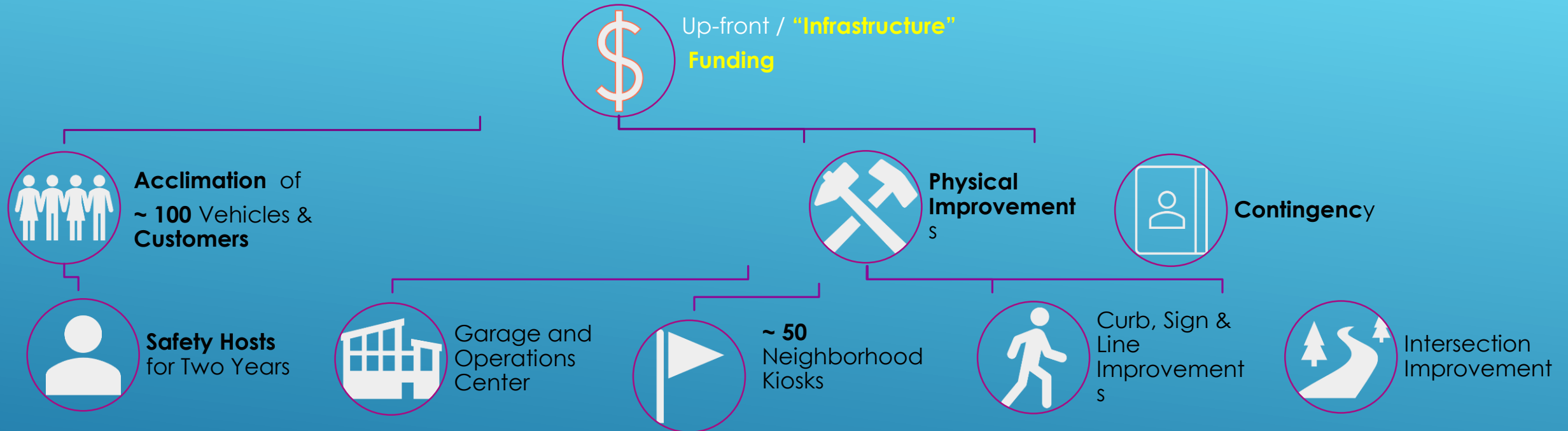
Select, through a competitive procurement process, a capable tech entity to form a PPP, where

- **Private:** Contributes their IP, expertise and technology that is:
 - Safe
 - High-quality (on-demand, 12/7/350 that **can evolve** to 24/7/350)
 - Affordable (Low Cost of **production**)
 - Sustainable (EV, **ride-share**, ...)
- **Public:** Partners with **Private** to formulate an ODD, Service & Pricing Plan that achieves:
 - Equity (Mobility for All)
 - Affordability (Low Pricing where need be, **Market Pricing** elsewhere)
 - Sustainability (**Shared-riding** wherever/whenever feasible)

✓ Create a Welcoming Environment

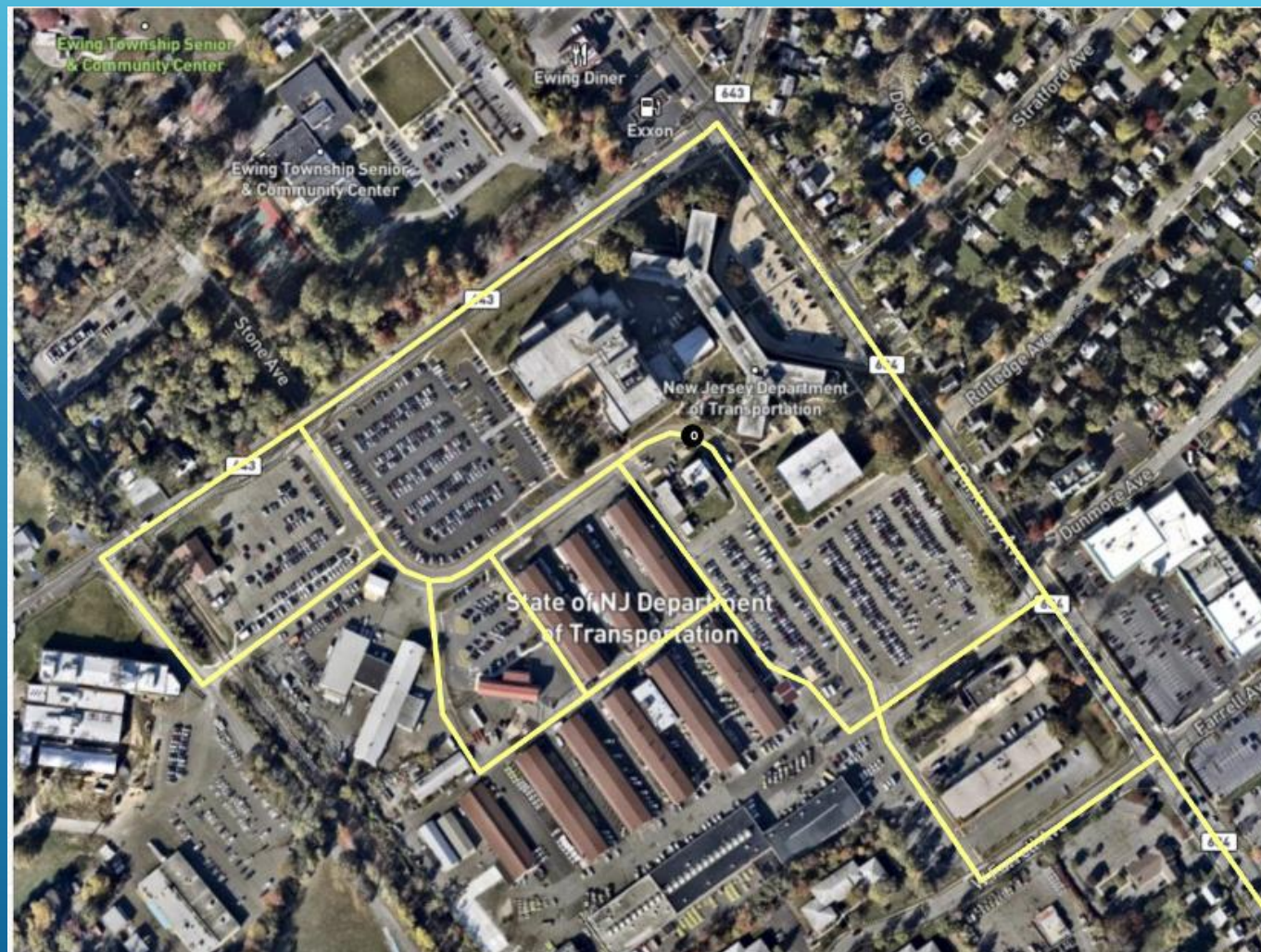
✓ Entice/select a feasible technology company

3. Up-front / “Infrastructure” Funding



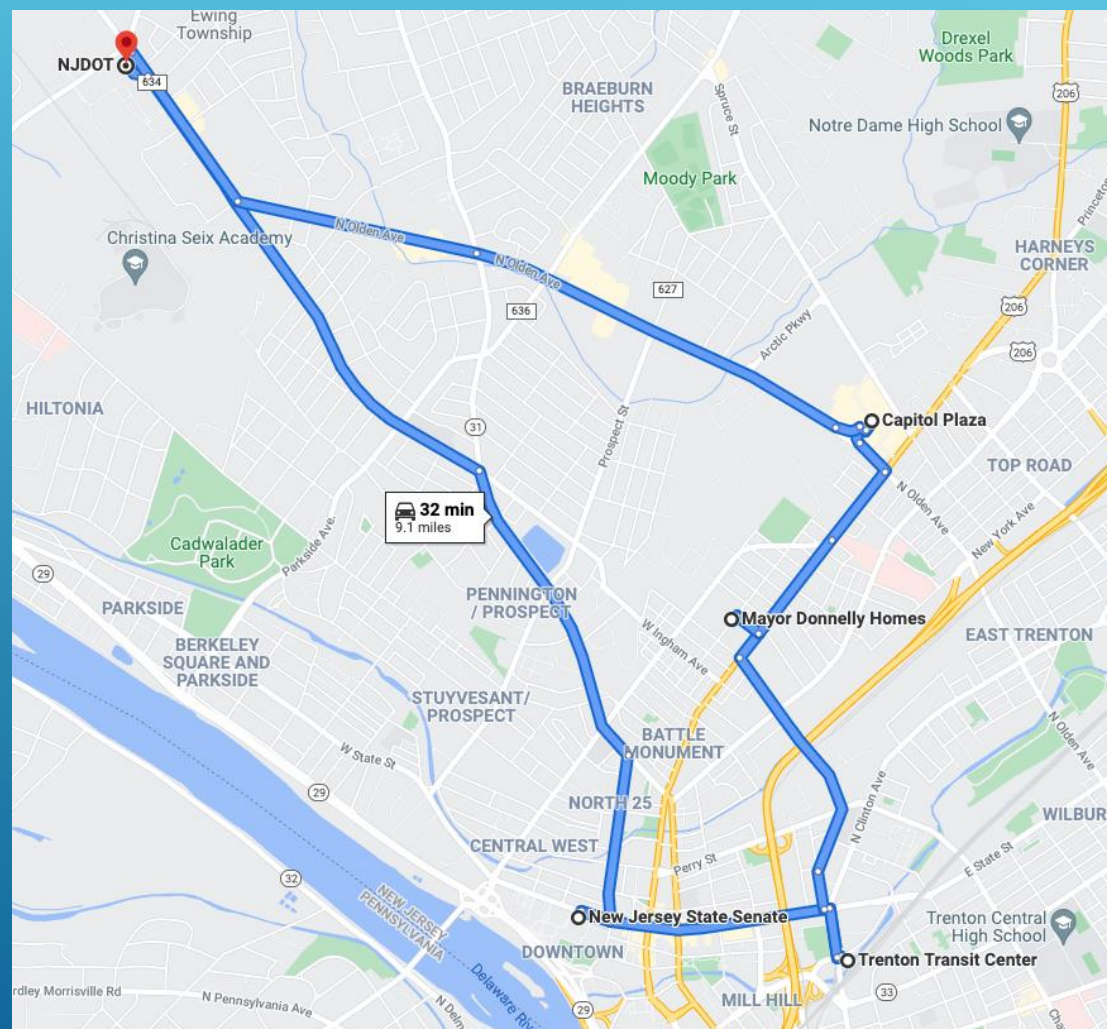
THE EVOLVING ODDS

PHASE I.0 NJ DoT HQ: *Verification* of Concept



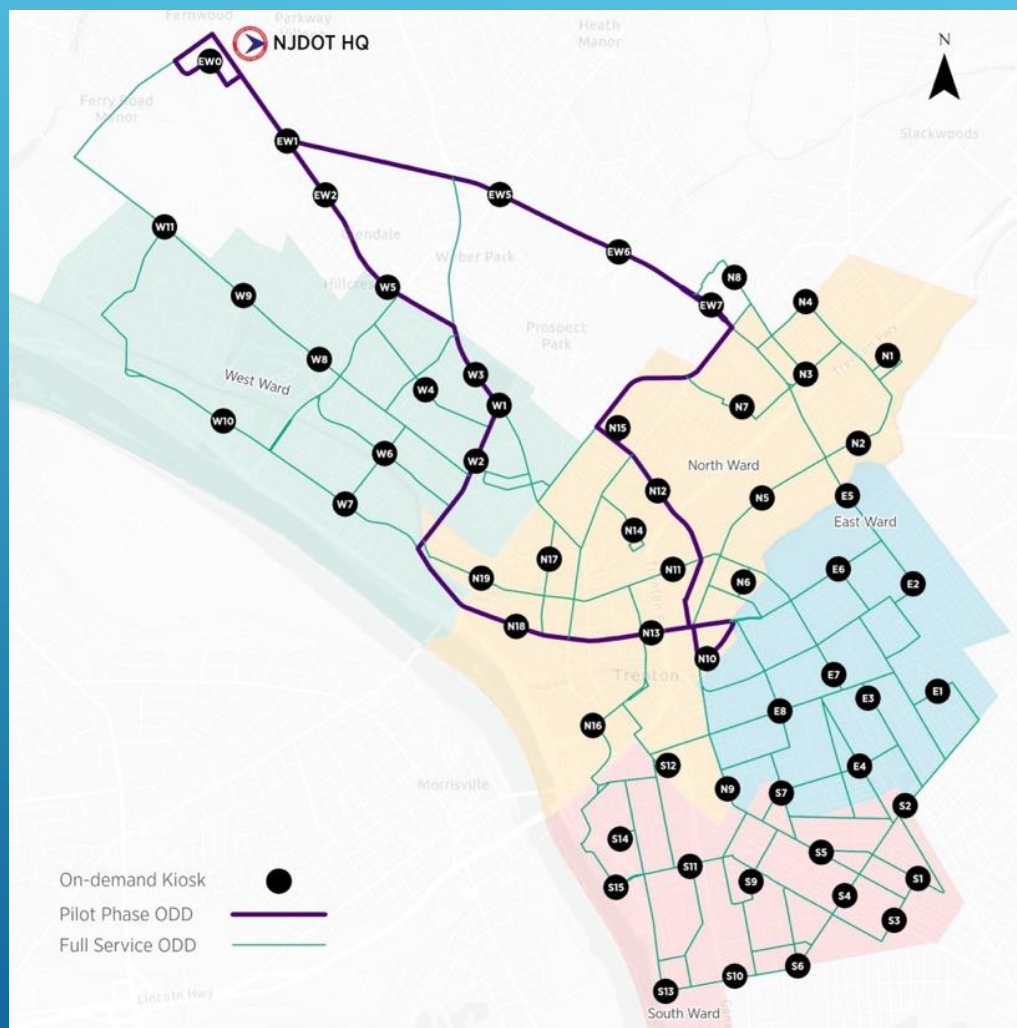
THE EVOLVING ODDS

PHASE I.1 *Initial Pilot ODD: **Proof** of Concept*



THE EVOLVING ODDS

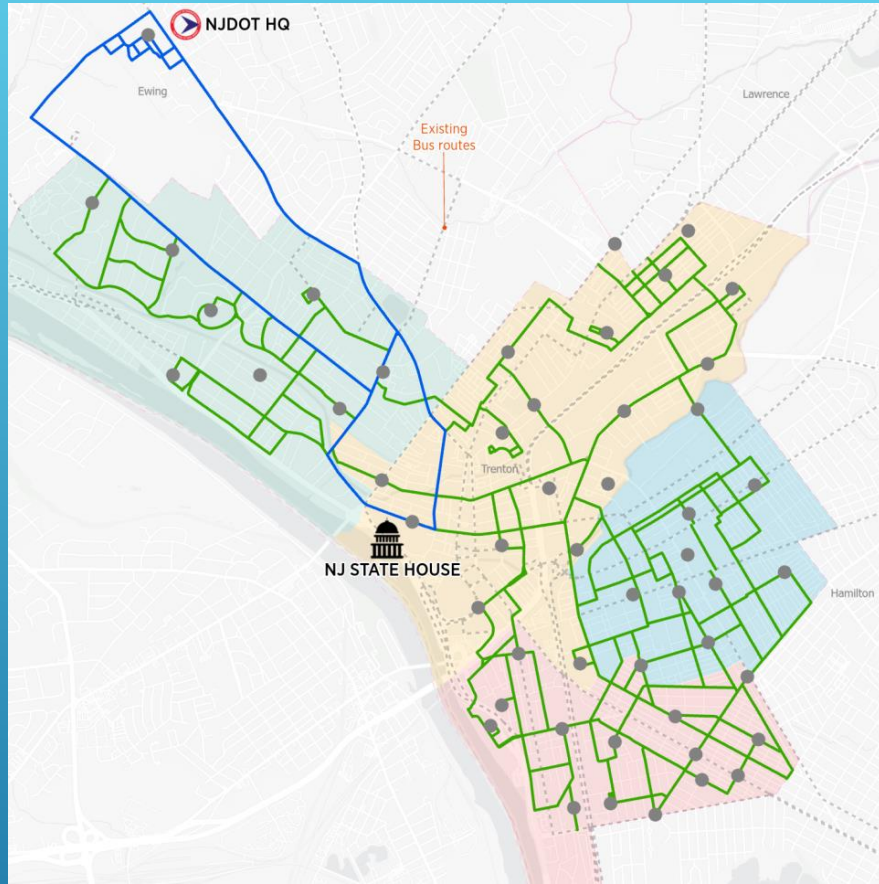
PHASE I.2 *Trenton Area ODD: Proof of Societal Value*



THE EVOLVING ODDS

PHASE IV

Replication Throughput NJ: **Proof of Network-Scale Economics**



THANK YOU!



REMINDERS & ANNOUNCEMENTS

NJDOT Tech Transfer Website

www.njdottechtransfer.net

NJ STIC Website

www.njdottechtransfer.net/nj-stic/

All meeting recordings, presentations, and summary are posted

<https://www.njdottechtransfer.net/nj-stic-meetings/>



STIC INCENTIVE PROGRAM

NJDOT Tech Transfer Website

<https://www.njdottechtransfer.net/new-jersey-stic-requests/>

What is the STIC Incentive Program?

FY22 Selection Criteria

FY22 STIC Fund Eligible Projects/Activities

How to Apply

List of Projects

Online form to electronically submit funding request

2021 Build A Better Mousetrap Winners



Inlet Repair Trailer – Art Villano
Superintendent of Public Works, Montgomery
Township



Tire Centerline Bracket – Marc Franco
Bus Material & Technical Support
NJ Transit

NJLTAP Webinar – Innovating at the Local
Public Works Level: Can you Build a Better
Mousetrap?

March 23, 1:00 p.m. – 2:00 p.m.
<https://cait.rutgers.edu/event/babm/>

<https://cait.rutgers.edu/mousetrap/>



THANK YOU!

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