

# Talking Transportation Technology (T3) Webinars



Tuesday, July 18, 2023 – 1:00PM

## ***Traveler Information and Traffic Incident Management (TIM)***

***Part 3 of 5 in the Crowdsourcing for Operations Course via Webinar***

***Course developed by the Federal Highway Administration (FHWA) Every Day Counts (EDC)***

***Crowdsourcing for Operations***



U.S. Department of Transportation



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Intelligent Transportation Systems (ITS)  
Professional Capacity Building (PCB)  
Program of the U.S. Department of  
Transportation's (USDOT) ITS Joint  
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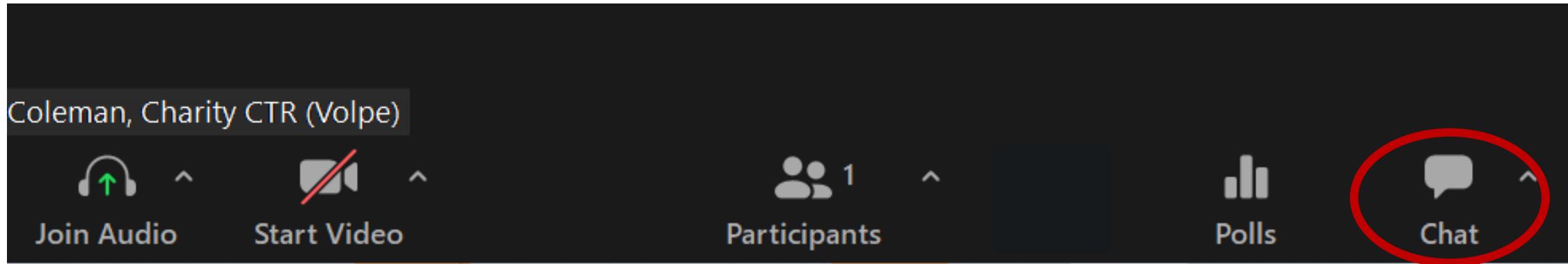
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# Ask a Question / Make a Comment

## Use the Chat Pod

- Click on Chat icon on your screen
- Submit your question or comments in the Chat window



**Questions/comments will be addressed after the last presentation, as time permits**

Intelligent Transportation Systems Joint Program Office (ITS JPO)  
Professional Capacity Building (PCB) Program Presents

***Traffic Incident Management (TIM)  
and Traveler Information***  
***Part 3 of 5 in the Crowdsourcing for Operations  
Course via Webinar***

July 18, 2023

Course developed by the Federal Highway Administration (FHWA)  
Every Day Counts (EDC) Crowdsourcing for Operations Innovation,  
and delivered by the FHWA Office of Operations



U.S. Department of Transportation  
**Federal Highway Administration**



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# Today's Host and Presenters



Source: FHWA.

**Ralph Volpe, Host**  
EDC-6 Crowdsourcing Colead  
FHWA Resource Center  
Operations Technical Service Team



Source: NJDOT.

**Sal Cowan**  
Senior Director of Mobility  
New Jersey Department of  
Transportation (NJDOT)



Source: Vaishali Shah.

**Vaishali Shah**  
Senior Director of  
Transportation Systems  
AEM Corporation



Source: PTC.

**John Parker**  
Senior Traffic Operations  
Project Manager  
Pennsylvania Turnpike  
Commission (PTC)

# Webinar Agenda

- 1:05 p.m. Crowdsourcing Innovation and Course Background
- 1:10 p.m. Traveler Information Module
- 1:35 p.m. TIM Module
- 1:55 p.m. TIM and Traveler Information at PTC
- 2:10 p.m. Question and Answer

\*EDT Time Zone



Source: Unsplash.

# What Is Every Day Counts?

State-based innovation  
deployment model

Proven but underutilized  
innovations

2-year cycles

[http://www.fhwa.dot.gov/innovation/  
everydaycounts/](http://www.fhwa.dot.gov/innovation/everydaycounts/)

# EDC-6: Deepen Crowdsourcing Roots for a Bountiful Suite of Benefits

Adding data sources  
and applications

Improving data  
management

Improving archived  
data usage

Sharing and  
integrating data



Source: FHWA.

# Crowdsourcing Course-in-a-Box

## Course Goals:

- Broaden understanding and knowledge about how crowdsourced data can improve transportation operations
- Help participants consider whether specific applications of crowdsourcing may meet their organizations' needs

## Course Tools:

- Editable instructor templates
- Instructor materials
- Course slide decks
- Student materials



Source: Pixabay.

# Whom Is the Course Targeting?

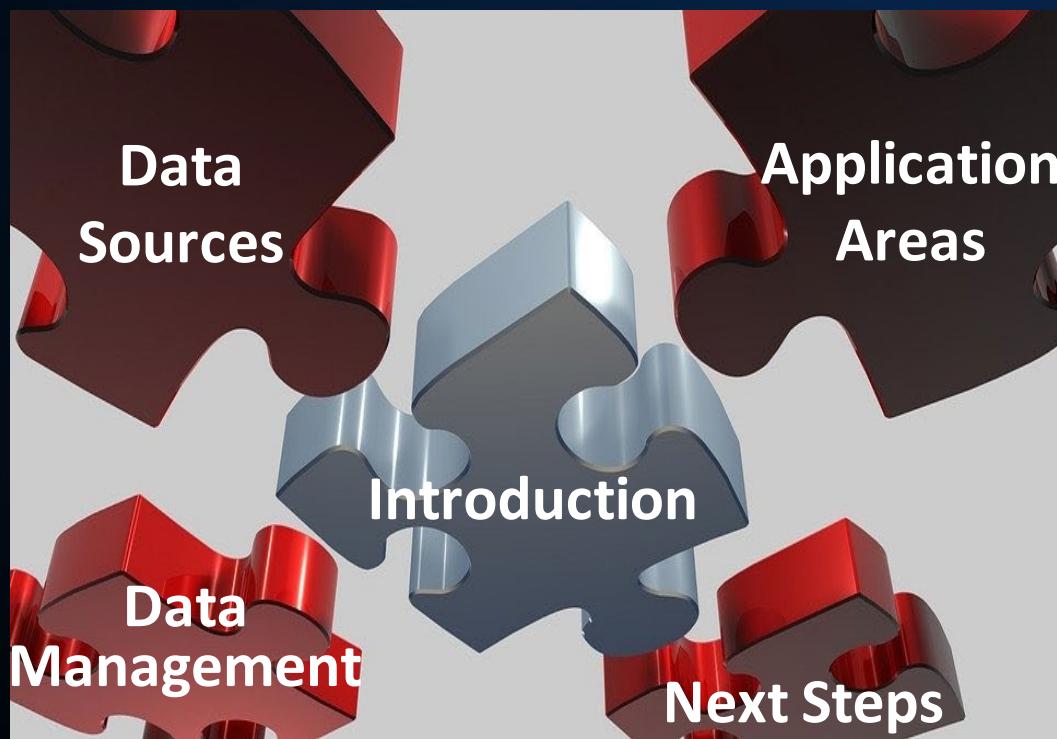
## Transportation Groups

- Traffic management centers (TMCs)
- Traffic signal systems administrators
- Operations
- Maintenance
- Public works departments
- Emergency planning
- Work zone managers
- Safety and planning

**Consider nontraditional invitees such as policymakers, locally elected officials, administrators, or other leaders.**

# Course Is Modular by Design

## Five Lessons:



Source: Adapted from Pixabay

## Six Application Modules:

- Traffic Incident Management
- Traveler Information
- Arterial Management
- Work Zone Management
- Road Weather Management
- Emergency Management

# Crowdsourcing Course Delivery by Webinar

Webinar	Date	Course Lessons and Modules
1	May 16	<a href="#"><u>Crowdsourcing Introduction and Applications Lessons</u></a>
2	June 20	Data Sources and Management Lessons (recording coming soon)
<b>3</b>	<b>July 18</b>	<b>Traveler Information and Traffic Incident Management Modules</b>
4	August 15	Road Weather and Arterial Management Modules
5	September 19	Emergency and Work Zone Management Modules and Next Steps Lesson

# Summary of Webinar 2 Lessons

## Data Sources

- Common crowdsourced data for use in Traffic System Management and Operations (TSMO) include vehicle probe; navigation, 311, and 511 applications; social media; connected vehicle; and multimodal data.
- Data vendors may integrate multiple data sources using a proprietary process.
- Accuracy depends on and varies with market penetration.

## Data Management

- Data management keeps data organized, safe, and usable. It involves the entire lifecycle of data and supporting systems.
- Some crowdsourced data uses require storage and processing capabilities beyond traditional, on-premise data management systems.

# Introductions

Please enter your name, agency, and job title in the chat window.



# LESSON: Traveler Information

## INSTRUCTOR: Sal Cowan, NJDOT



Source: Unsplash.

# Lesson Objective

1. Understand how crowdsourcing data can enhance traveler information.
2. Learn about the different platforms for communicating traveler information.



Source: Colorado DOT

# Traveler Information Challenges

- Infrastructure and staffing cost to generate traveler information.
- Timeliness of information.
- Accuracy of information.
- Jurisdictional stovepipes.
- Reaching travelers on their preferred information platform.



Source: FHWA

# Crowdsourcing Applications for Traveler Information

*“Citizen-supplied data will add to the eyes and ears of Oregon Department of Transportation staff already out on the roads and highways ... it greatly enhances our ability to provide up to the minute and accurate traffic data to the public.”*

Oregon DOT ITS Manager

- ✓ Expand geographic coverage
- ✓ Quantitative predictive travel time
- ✓ Detailed information on issues impacting the roadway
- ✓ Improves the timeliness of traveler information

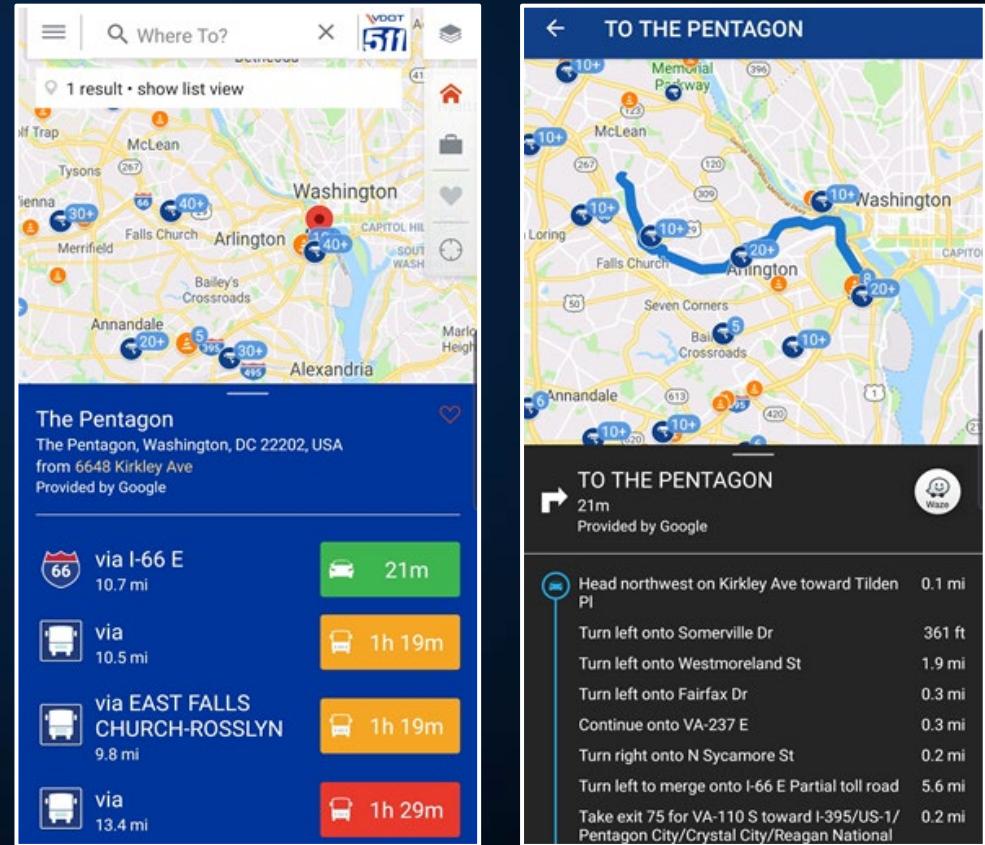
# Traveler Information Crowdsourcing Examples

Agency	How Data is Used	Crowdsourced Data
Virginia DOT	Reaching traveler on preferred platforms, timely and accurate info	INRIX®, Waze®, Google®, Twitter
Arizona DOT	Expand geography and accuracy	INRIX®, HERE®
Kentucky Transportation Cabinet	Geographic coverage, timeliness, accuracy, and cost savings	Waze®
Pennsylvania DOT	Detailed, localized communication	INRIX®

[https://www.fhwa.dot.gov/innovation/everydaycounts/edc\\_5/docs/crowdsourcing\\_applications.pdf](https://www.fhwa.dot.gov/innovation/everydaycounts/edc_5/docs/crowdsourcing_applications.pdf)

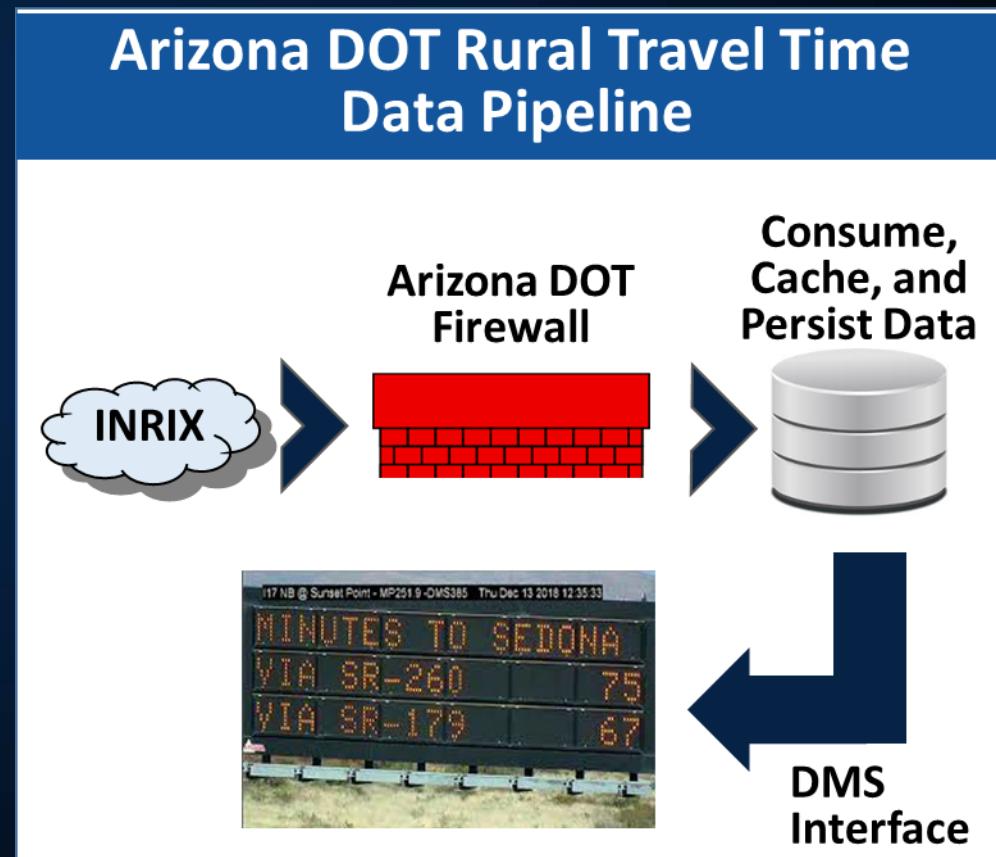
# Example: Virginia DOT Integrates 511 Mobile, Web, and Navigation

- Virginia DOT App and Web use Waze®, INRIX®, Google®, and State DOT data.
  - Push notifications and alerts
  - Transit and parking information
  - Turn-by-turn navigation and travel times
- Virginia DOT notifies traveling public of road closures using Twitter.



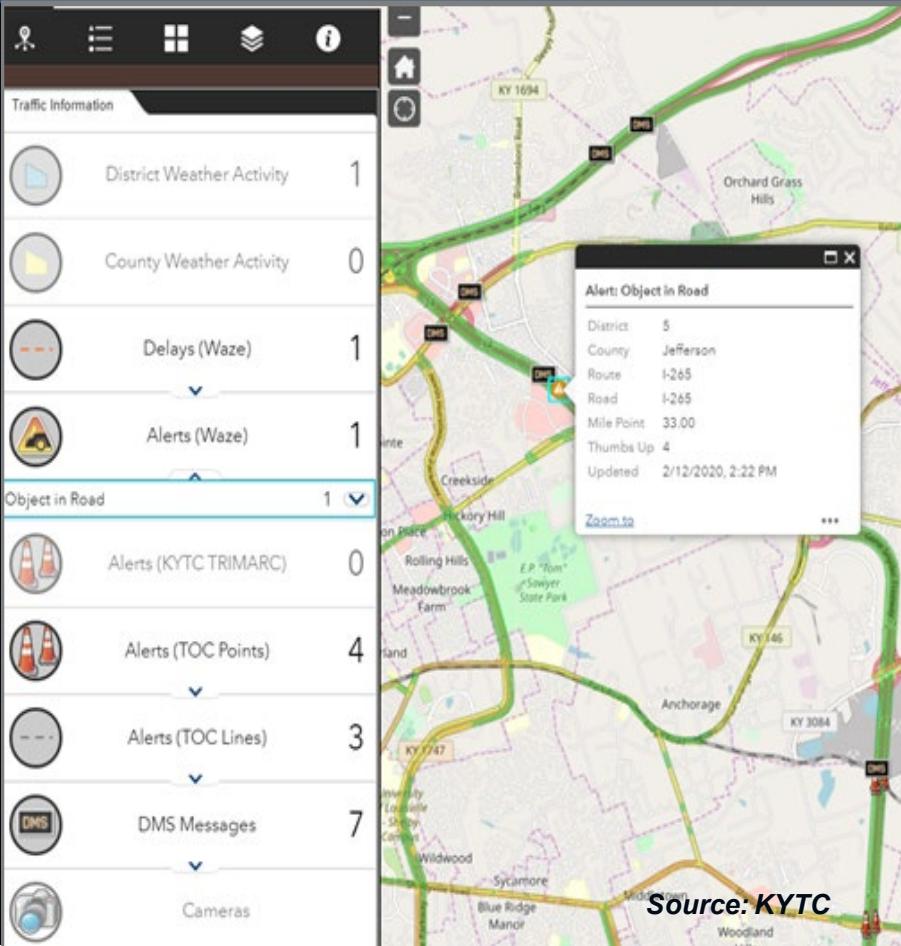
# Example: Arizona DOT Traveler Information

- INRIX® data to post rural road travel times.
- HERE® Traffic Tiles for color-coded speed maps for AZ511.
- Data is accessible to any Arizona public agency and university.
- Data applied to adaptive ramp meter analysis and back of queue management.



Source: Arizona Department of Transportation

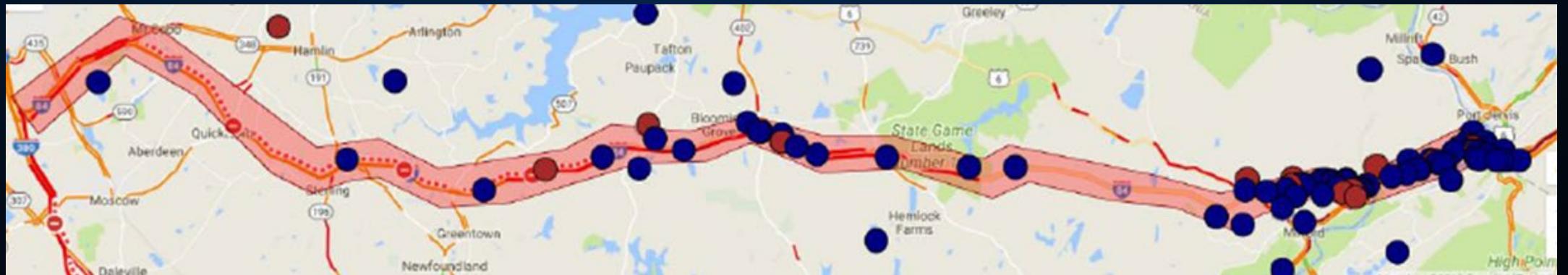
# Example: Kentucky Transportation Cabinet (KYTC) 511 Website



- In-house staff replaced legacy 511 system with GoKY website.
  - System integrates crowdsourced, agency, and other data in real-time.
  - KYTC shares events with Waze®.
- RESULT: more timely, complete information with greater public reach at lower cost.

# Example: Pennsylvania DOT Localized Traveler Push Notifications

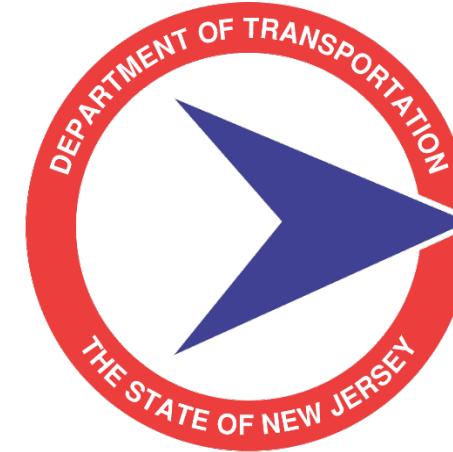
- Uses Highway Emergency Link Platform (HELP) by iLog® enables to notify all cell users via wide-area emergency broadcast system (like an Amber Alert).
- Uses INRIX® data to identify queues and set geofenced area to send alert.



Source: Pennsylvania Department of Transportation



New Jersey  
Traveler Information Systems



# New Jersey Traveler Information Systems



# How Should Agencies Communicate With Their Customers?



One to One



Mass Communication

Every Way Possible!



# New Jersey Traveler Information

Commercial Vehicle Notifications

511 Platforms and Voice Assistant Systems

Crowdsourced Data



# Commercial Vehicle Notifications

## Who Are We Working With?



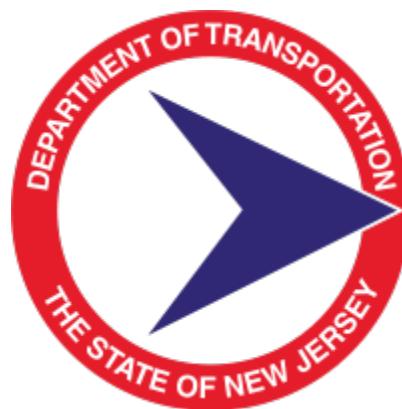
Provider of North America's largest weigh station bypass system (Drivewyze PreClear)



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
I-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

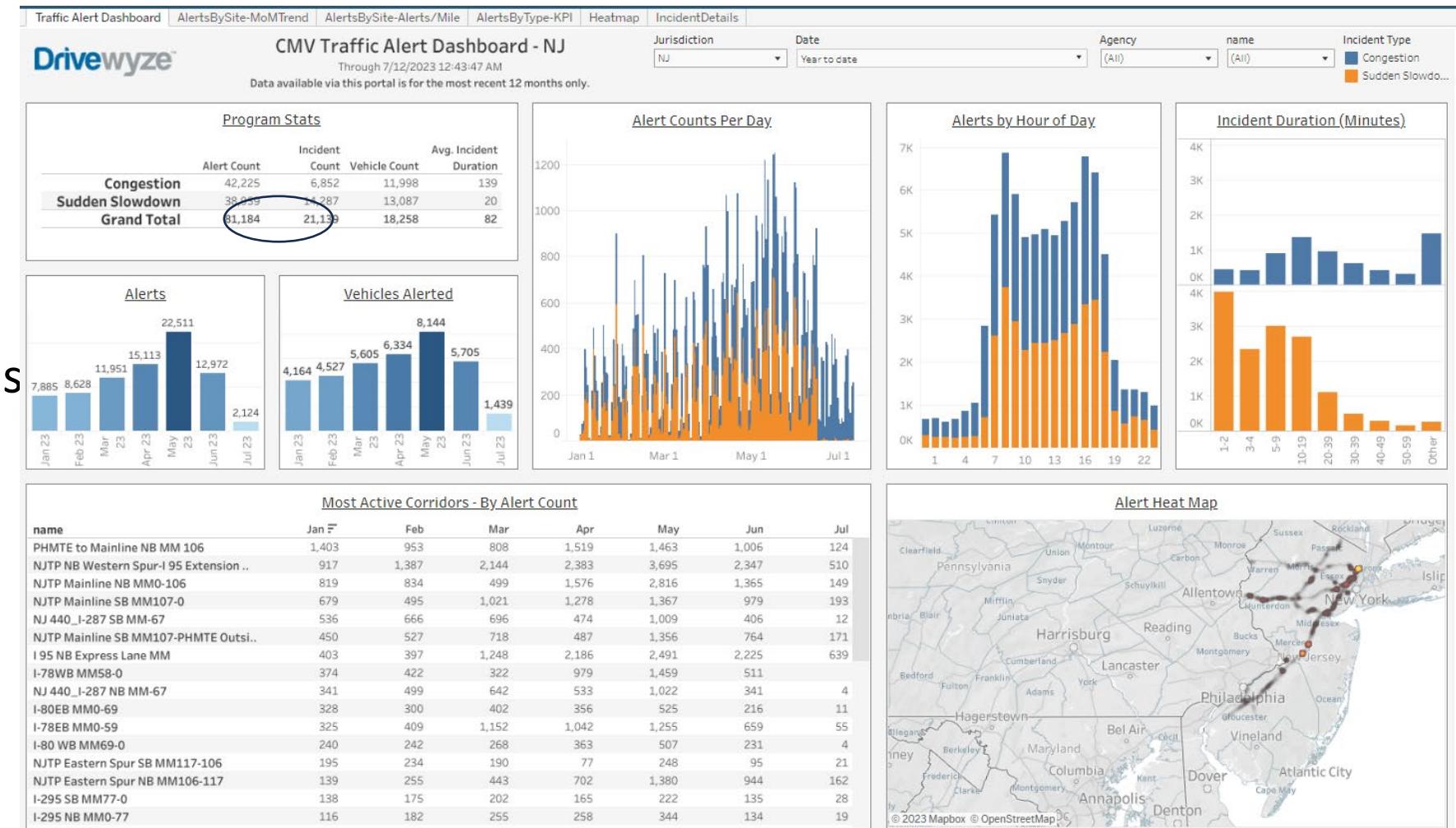
- INRIX Traffic Intelligence -- Real-time monitoring of nationwide road network
- Detects and characterizes closures, queues, and slowdowns
- Updates every 60-seconds - includes location and severity



# What Are We Getting?

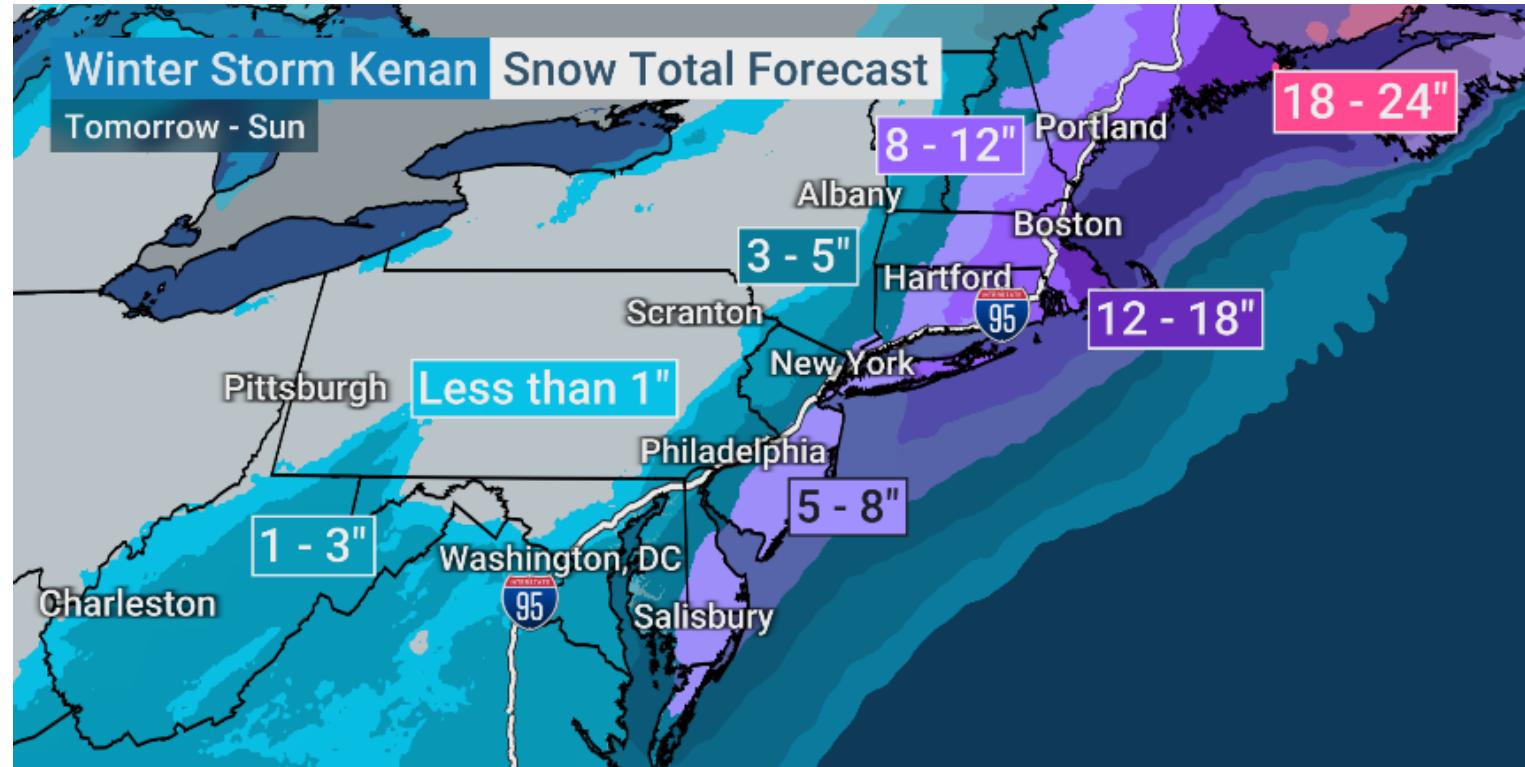
Web-based dashboard  
showing # of alerts and  
vehicles alerted in NJ

81,000 alerts in 12 months  
along 13 limited access  
highways and toll roads





# Using Technology to “Spread the Word”



January 29, 2022 – Winter Storm Kenan



# New Jersey Traveler Information Systems



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

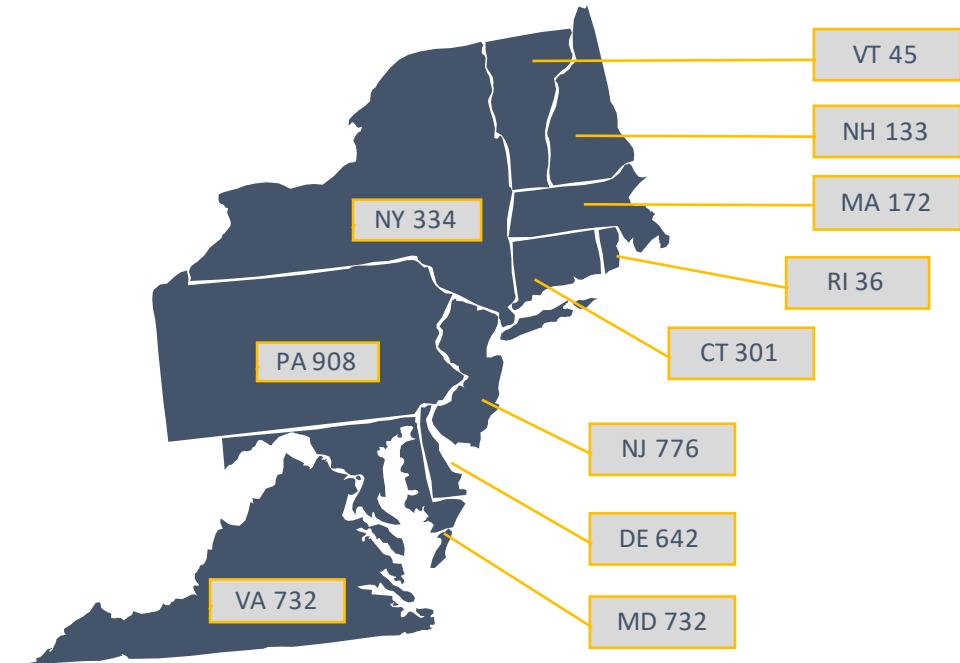


- 11 State agencies
- 1956 NB interstate road miles



- 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 I95 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 I95 NB	732
Total Number of Trucks Altered		4811



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



# Using Technology to “Spread the Word”



June 11, 2023 - I-95 Philadelphia



# Standardized TSMO Response



**TRANSCOM<sup>SM</sup>**  
TRANSPORTATION OPERATIONS COORDINATING COMMITTEE

93 Variable Message Signs on 19 multi-agency roadways

511 system reporting the closure

Coordination with public and private partners (statewide & regional)



# Standardized TSMO Response



# “Spread the Word Further!”



We need to communicate to as many of the  
160,000 daily vehicles we can



# GeoFenced Alerts To Trucks

Site ID	Site Name	Alerts 6/25 - 6/26	Trucks 6/25 - 6/26	Alerts Total	Trucks Total
21049	PA I-95 Bridge Collapse Road Closure NB	147	125	1151	899
21050	PA I-95 Bridge Collapse Road Closure SB	113	96	942	862
21051	PA I-95 Bridge Collapse Road Closure Border Alert NB	318	302	4373	3385
21052	PA I-95 Bridge Collapse Road Closure Border Alert SB	37	35	704	589
21053	PA I-95 Bridge Collapse Road Closure Bridge Border Alert WB	439	399	7728	5235
21056	NJ I-95 Bridge Collapse SB I-295 at Exit 62 SB	53	49	969	713
21057	NJ I-95 Bridge Collapse WB 76 at I-676 WB	121	112	1806	1282
21058	NJ I-95 Bridge Collapse SB I-295 at Exit 40 SB	158	154	3357	2319
21059	NJ I-95 Bridge Collapse NB I-295 at Exit 23 NB	458	381	5015	4346
21060	NJ I-95 Bridge Collapse SB I-295 at Exit 28 SB	218	208	4050	2812
21061	NJ I-95 Bridge Collapse NB I-295 at Exit 28 NB	254	239	4738	3244
21062	NJ I-95 Bridge Collapse EB I-195 at Exit 7 EB	130	127	1759	1379
21063	MD I-95 Bridge Collapse NB I-95 at Maryland/DE border NB	826	774	10819	7874
21064	CT I-95 Bridge Collapse SB I-95 at the CT/RI border SB	97	94	2009	1597
21065	RI I-95 Bridge Collapse SB I-95 at the RI/MA border SB	52	50	1122	866
21066	NJ I-95 Bridge Collapse SB I-95 at the NJ/NY border WB	651	595	11147	7636
21067	NY I-95 Bridge Collapse SB I-95 at the NY/CT border SB	3778	2,468	12581	8684
Total		7,850	6,208	74,270	53,722

53,722 commercial vehicles alerted  
between June 12<sup>th</sup> and June 26<sup>th</sup>



# Traditional Traveler Information Platforms



Phone System  
**3 million calls**  
(2017-2022)

Website  
**Over 45 million visits**  
(2017-2022)

Social Media  
**17 Twitter Handles**  
**Avg 7,700 tweets/mo**



## Intelligent Voice Assistant Platforms

In 2019, NJDOT coined the phrases...

“Alexa...talk to New Jersey Traffic”

“Hey Google...talk to New Jersey Traffic”

First State DOT in the country to  
use Alexa and Google Home to  
provide 511 information



# Intelligent Voice Assistant Platforms

Why should DOT's provide traffic through these devices?



500,000,000  
Alexa-enabled devices



52,000,000  
Google Home devices

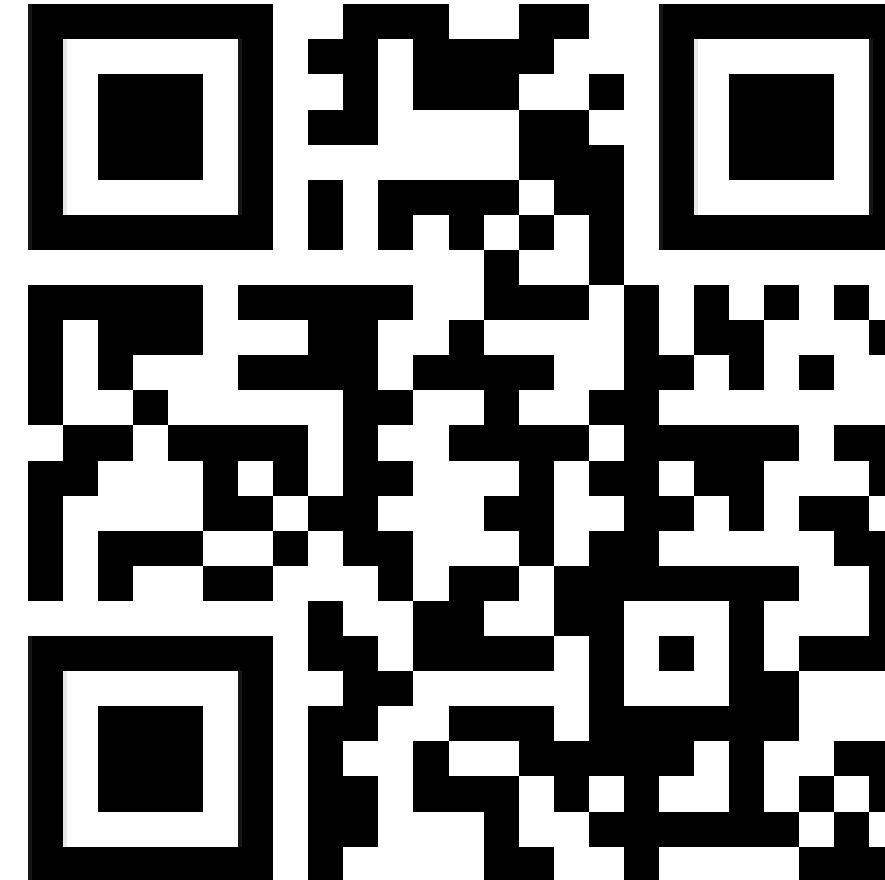


# What Is Crowdsourcing?

Collecting information from a group  
via the internet



# New Jersey Traveler Information Systems





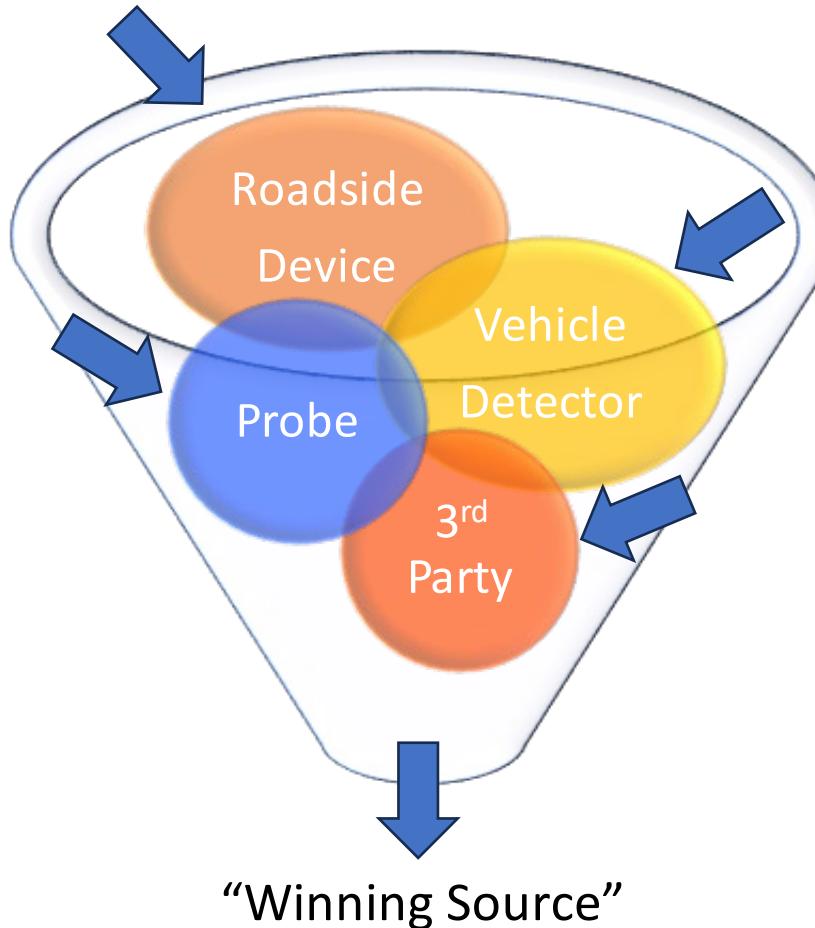
## Does NJDOT Use Crowdsource Data to Manage Mobility?

Yes...for more than 15 years

**INRIX**

here

## TRANSCOM Data Fusion Engine (DFE)



- Identify all possible data sources
- Integrate and map data sources
- Develop “Business Rules” for data source
- Winning Source generated by DFE
- Results updated every minute
- Data Archived for future analysis



# NJDOT uses of Crowdsourced Data Public Use

511 Get connected and go!

Phil Murphy, Governor | Sheila Oliver, Lieutenant Governor  
Diane Gutierrez-Saccoccetti, Commissioner | Follow Us | Trenton, NJ | 44°F | LOGIN

New Jersey Truck Parking Locations information can be found [here](#)

Manage Layout | Reset Layout

Popular Travel Routes

Driving times for...

- Toll Roads
- NJ Turnpike Southbound

GW Bridge to Interchange 18W via express lanes (9 mi.) :32

GW Bridge to Interchange 18W via local lanes (9 mi.) :36

Int 18W to Int 14 (7 mi.) :1:29

Int 14 to Int 8A (32 mi.) :31

Int 8A to Int 6 (22 mi.) :20

Int 6 to Int 1 (50 mi.) :47

Arterial Travel Routes

Driving times for...

Roadway	County
US Route	
US 22	
22	Eastbound from Country Club Rd. to I-287 (4.4 mi.) :05
22	Eastbound from N. Gaston Ave. to US 1&9 (25.1 mi.) :39
22	Eastbound from North Dr. to GSP (10.0 mi.) :19
22	Westbound from Glenside Ave. to I-287 (12.1 mi.) :19
22	Westbound from NJ 28 to CR 523 (6.5 mi.) :08
22	Westbound N. Gaston Ave. to CR 523 (10.3 mi.) :12

Map

North Central South

Current Incidents

NJ NY CT

North Central South

Select County

Go Clear

Mega Projects

Map Tiles © 2023 HERE



# NJDOT uses of Crowdsourced Data

## Agency Analytics Use

**TRANSCOM™ OPERATIONS DASHBOARD**

Trip Data

Facility/Roadway Trips by Congestion

As of 07/12/2023 03:30 PM | Applied Threshold - 0%

Trip Description	Realtime	Historical	Trip Length	Calculated TT	Historical TT	Incident Delay	Total Delay	Free Flow TT	Calculated Speed	Historical Speed
US 1 Northbound from Raymond Rd to New Rd - Radar	100	0	1.69	02:56	02:24	00:32	01:05	01:51	35	42
US 1 Southbound from New Rd to Raymond Rd - Radar	100	0	1.69	02:53	02:24	00:29	01:02	01:51	35	42
US 1 Northbound from College Road (MP 13.7) to Promenade Boulevard/CR 522 (MP 16.47)	100	0	2.77	03:48	03:22	00:26	00:47	03:01	44	49
US 1 Northbound from Independence Way to Raymond Rd - Radar	100	0	1.72	02:22	02:06	00:16	00:29	01:53	44	49
US 1 Southbound from Promenade Boulevard/CR 522 (MP 16.47) to College Road (MP 13.7)	100	0	2.77	03:35	03:19	00:16	00:34	03:01	46	50
US 1 Southbound from Raymond Rd to Independence Way - Radar	100	0	1.72	02:13	02:04	00:09	00:20	01:53	47	50

All travel time in mm:ss, speed in mph, length in miles and quality in %, \*Mega Trips

Page 1 of 2

View 1 - 6 of 8



# Is NJDOT “Part of the Crowd”?

Yes.....we've done it before!





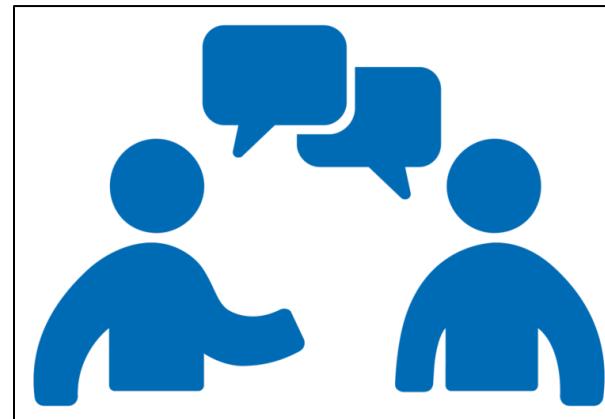
# Is NJDOT “Part of the Crowd”?

And we're doing it again!





# One more time.... How Should Agencies Communicate With Their Customers?



One to One



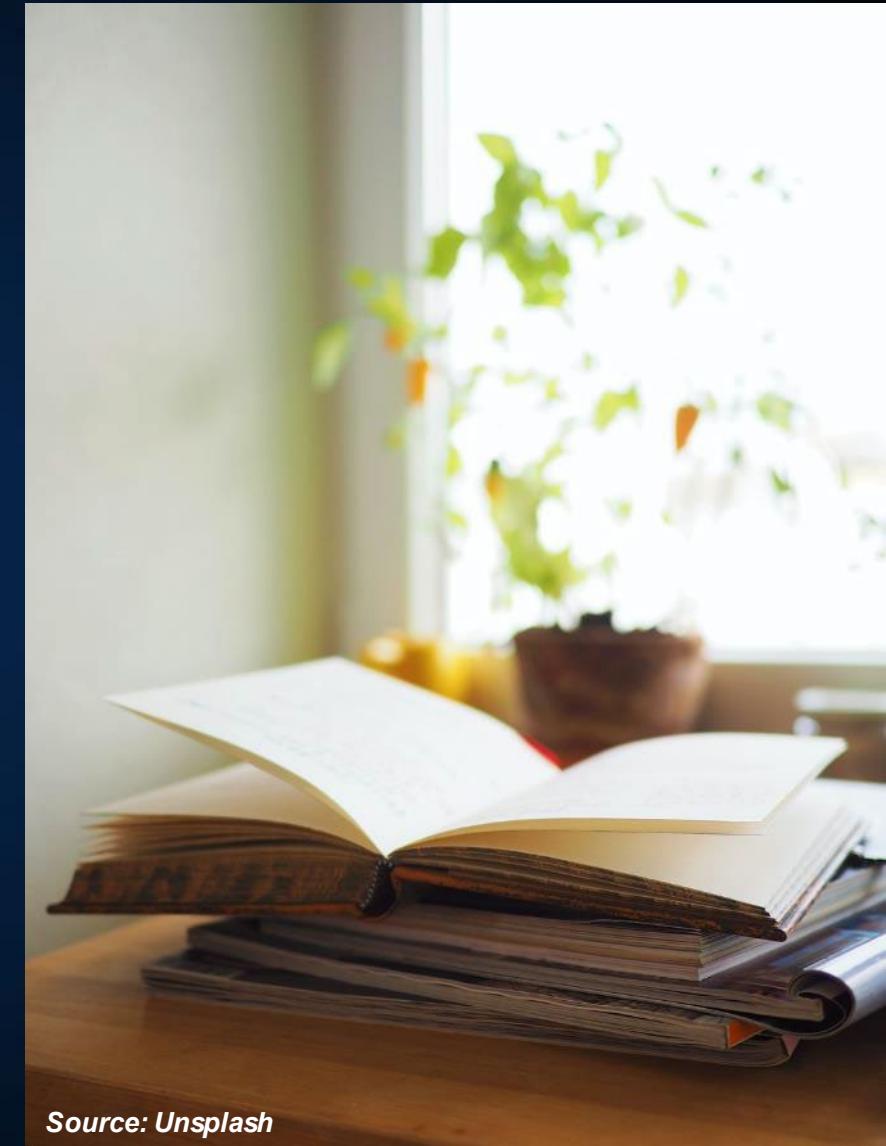
Mass Communication

**Every Way Possible!**

# Knowledge Check

How can crowdsourcing data enhance traveler information?

- A. Improves timeliness
- B. Provides better accuracy
- C. Can be delivered to preferred platforms
- D. All of the above**

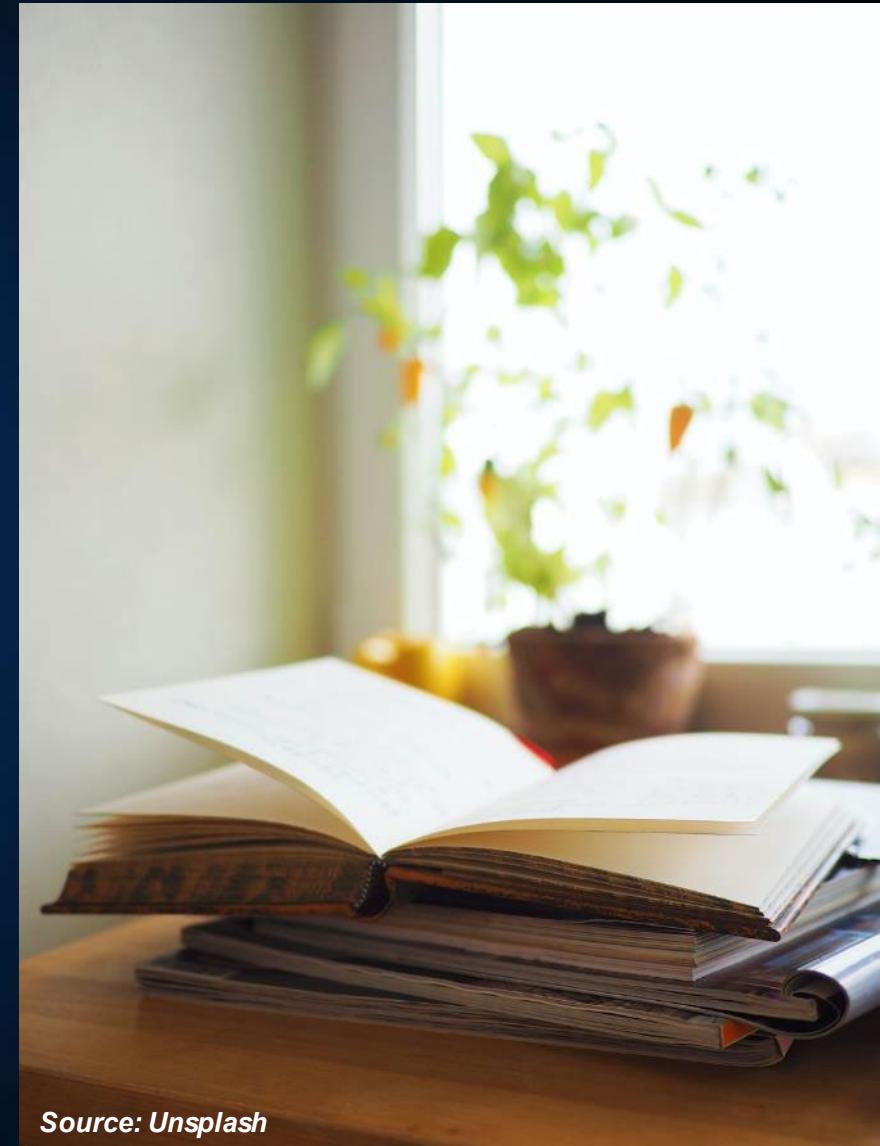


Source: Unsplash

# Knowledge Check

**What platforms can be used to acquire data and communicate traveler information?**

- A. Twitter
- B. 511 mobile app
- C. Third-party mobile app
- D. All of the above**



*Source: Unsplash*

# Traveler Information Crowdsourcing Resources

Adventures in Crowdsourcing webinars  
with Traveler Information content:

- Using Crowdsourced Data for Traveler Information
- Social Media for Improved Operations
- Business Case for Crowdsourced Data - Missouri Personalized Traveler Information Improves Responder Safety



The screenshot shows a navigation bar with links to CAI Home, Every Day Counts, STIC Network, AID Demonstration, AMR Program, and Resources. Below the navigation bar are three images: a highway scene with signal icons, a control room with multiple monitors, and a traffic map. The main content area has a title "Crowdsourcing for Advancing Operations" and a paragraph about integrating data from multiple streams. It also includes sections for "Contacts" listing James Colyar, Greg Jones, and Ralph Volpe, and a "Public Agencies" section.

FHWA Home / OIPO / Accelerating Innovation / Every Day Counts / EDC-6: Crowdsourcing for Advancing Operations

CAI Home Every Day Counts STIC Network AID Demonstration AMR Program Resources

## Crowdsourcing for Advancing Operations

Crowdsourced data from multiple streams can be integrated and used in real time for improved operations.

State and local transportation systems management and operations (TSMO) programs strive to optimize the use of existing roadway facilities through traveler information, incident management, road weather management, arterial management, and other strategies targeting the causes of congestion. TSMO programs require real-time, high-quality, and wide-ranging roadway information. However, gaps in geographic coverage, lags in information timeliness, and life-cycle costs for field equipment can limit agencies' ability to operate the system proactively.

Public agencies at all levels are increasing both their situational awareness and the quality and quantity of operations data using crowdsourcing, which enables staff to apply proactive strategies cost effectively and make better decisions that lead to safer and more reliable travel while protecting privacy and security of individual user data.

**Contacts**

**James Colyar**  
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[James.Colyar@dot.gov](mailto:James.Colyar@dot.gov)

**Greg Jones**  
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(404) 895-6220  
[Greg.M.Jones@dot.gov](mailto:Greg.M.Jones@dot.gov)

**Ralph Volpe**  
FHWA Resource Center  
(404) 985-1268  
[Ralph.Volpe@dot.gov](mailto:Ralph.Volpe@dot.gov)

**FHWA EDC-6 Crowdsourcing for Advancing Operation Resource Site ([bit.ly/CS4Ops](http://bit.ly/CS4Ops))**

# LESSON: Traffic Incident Management

## INSTRUCTOR: Vaishali Shah, AEM Corporation



Source: Unsplash.

# Lesson Objective

Understand how crowdsourcing data can enhance Traffic Incident Management (TIM)



*Source: Maryland DOT*

# What is Traffic Incident Management (TIM)

TIM consists of a planned and coordinated multidisciplinary process to detect, respond to, and clear traffic incidents so that traffic flow may be restored as safely and quickly as possible.



Many Disciplines - One Goal

Source: *Enforcement Engineering, Inc.*

# Traffic Incidents and Secondary Crashes

*"A traffic incident is an emergency road user occurrence, a natural disaster, or other unplanned event that affects or impedes the normal flow of traffic."*

Manual on Uniform Traffic Control Devices 6l.01, P02

*"A secondary crash is a crash that occurs within the incident scene, queue, or backup, including the opposite direction, resulting from an original traffic incident."*

FHWA Focus States Initiative

# TIM Timeline

Incident duration and the time it takes to clear roadways affects travel reliability, incident responder and motorist safety, and the likelihood of a secondary crashes.



# Traffic Incident Management Challenges

- Incident detection
- Queue formation and detection
- Operator workload
- The safety of responders and approaching motorists
- Managing alternate routes
- After action reviews



*Source: Adapted from Unsplash*



*Source: Nassau County, FL Sheriffs Office*



*Source: Enforcement Engineering, Inc.*



*Source: Florida DOT*

# Crowdsourcing Applications for TIM



Source: FHWA

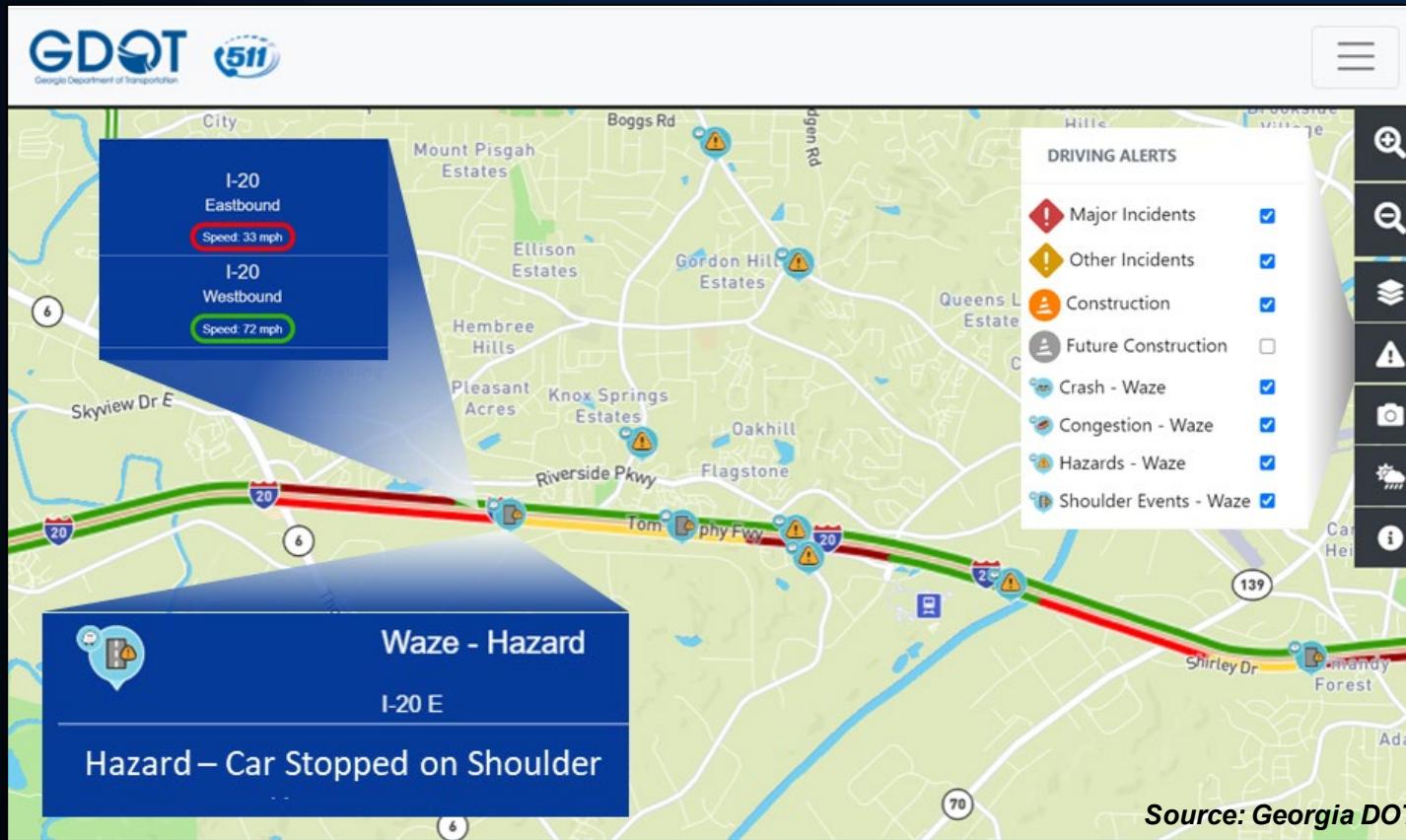
- Quicker incident detection
- Back of queue detection
- Reduces operator workload
- Responder and traveler safety
- Traffic and alternate route management
- After action reviews

# TIM Crowdsourcing Examples

Agency	How Data is Used	Crowdsourced Data
Georgia DOT	Back of queue management	Waze®, INRIX®
Iowa DOT	Quicker incident detection	Waze®, INRIX®, Twitter®
City of Frisco, TX	Quicker incident detection, reduce operator workload, traveler safety	Waze®
Connecticut DOT	Incident detection and response	Waze®, HERE®
St Louis, MO	Responder and traveler safety	Make Way® and Waze®
Lake County, IL	Traffic and alternate route management	Waze®

[https://www.fhwa.dot.gov/innovation/everydaycounts/edc\\_5/docs/crowdsourcing\\_applications.pdf](https://www.fhwa.dot.gov/innovation/everydaycounts/edc_5/docs/crowdsourcing_applications.pdf)

# Example: Georgia DOT Manages Back of Queue Using Crowdsourced Data

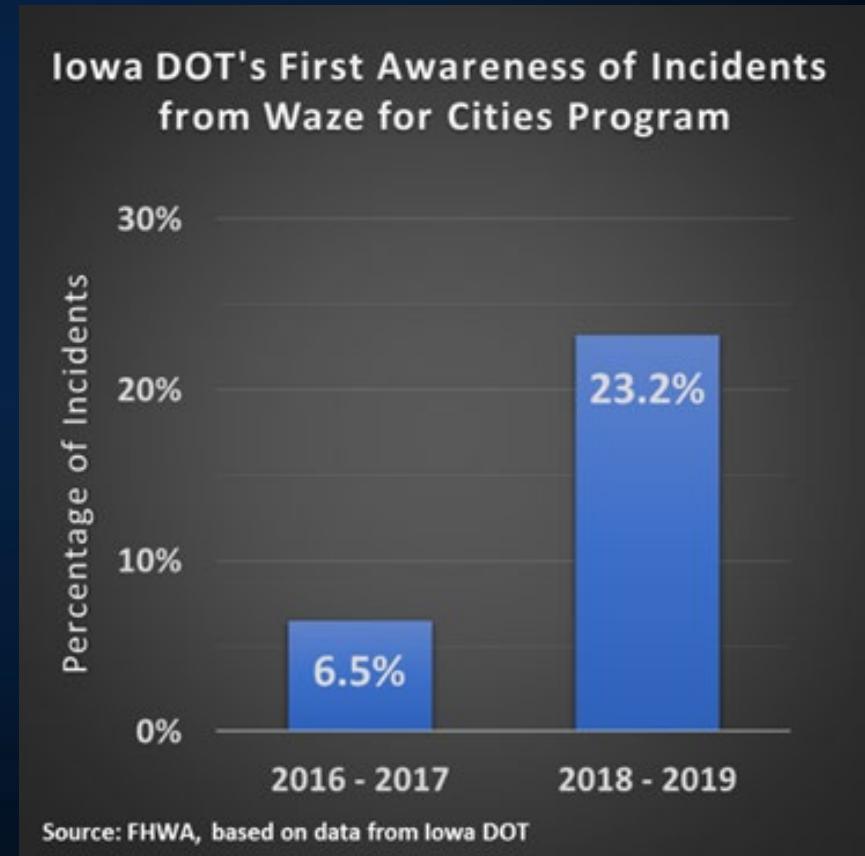


Georgia DOT Safety Service Patrol uses Waze® and color-coded speed maps from their public-facing 511 site to position mobile message signs and warn approaching drivers of slow downs.

# Example: Iowa DOT uses Waze to Shorten Incident Detection Time

Waze® data informs traffic management center (TMC) operators of roadway incidents in advance of other sources approximately 25 percent of the time.

Iowa DOT also uses vehicle probe data and social media to detect incidents, in addition to ITS cameras, safety service patrol, and law enforcement computer-aided dispatch.



Source: FHWA using data from Iowa DOT

# Example: City of Frisco, Texas Improves Public Safety Dispatch

The navigation app-reported incidents occur five to seven minutes earlier than 10 percent of 911 phone calls.<sup>1</sup>

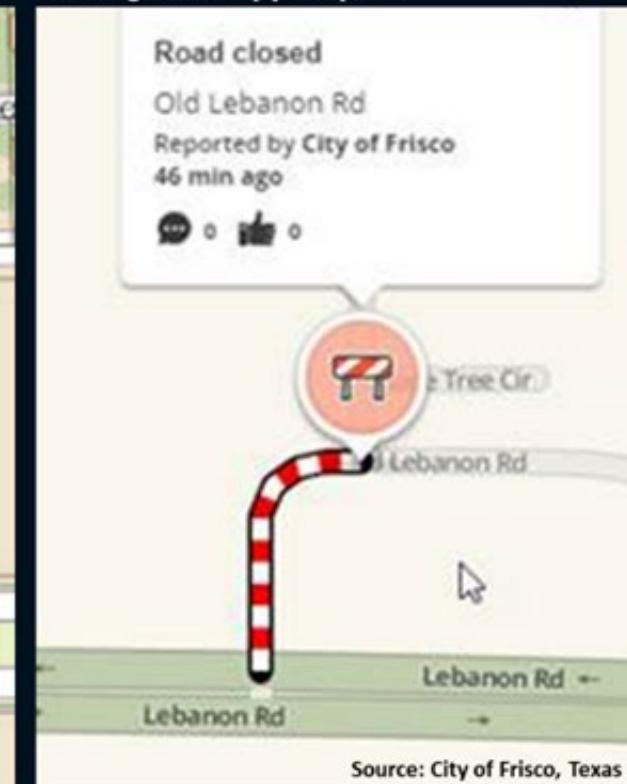
When dispatch officers define emergency road closures in their GIS system, they are automatically sent to the navigation app provider and appear on the app interface.

<sup>1</sup>Preliminary analysis by City of Frisco, Texas

Situational Awareness for Emergency Response (SAFER) GIS Application

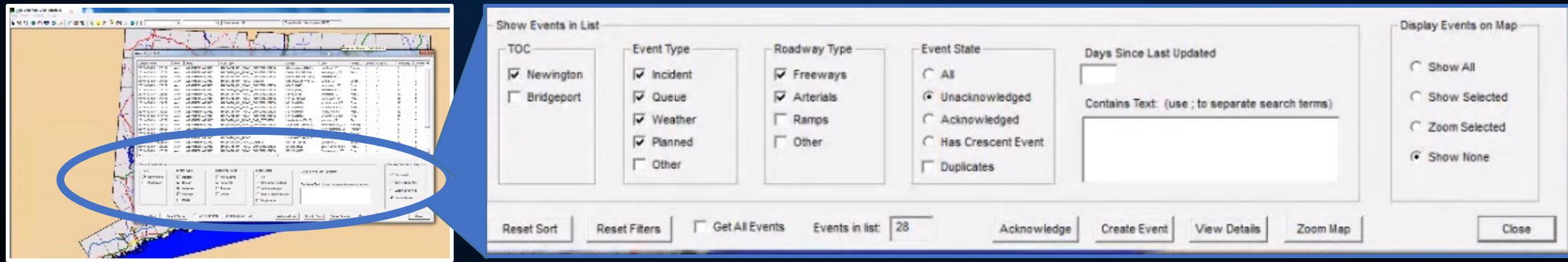


Navigation App Report



# Example: Connecticut DOT Waze Interface Improves Detection and Response

- Connecticut DOT developed a Graphics User Interface (GUI) for viewing Waze data.
- This simplifies the workload for their operators and expedites incident detection and response strategies.



Source: Connecticut DOT

# Example: St. Louis, Missouri Improved Incident Responder Safety through Crowdsourcing

Emergency response vehicle collisions with third parties declined by 40 percent in St. Louis when alerting motorists of responder activity.

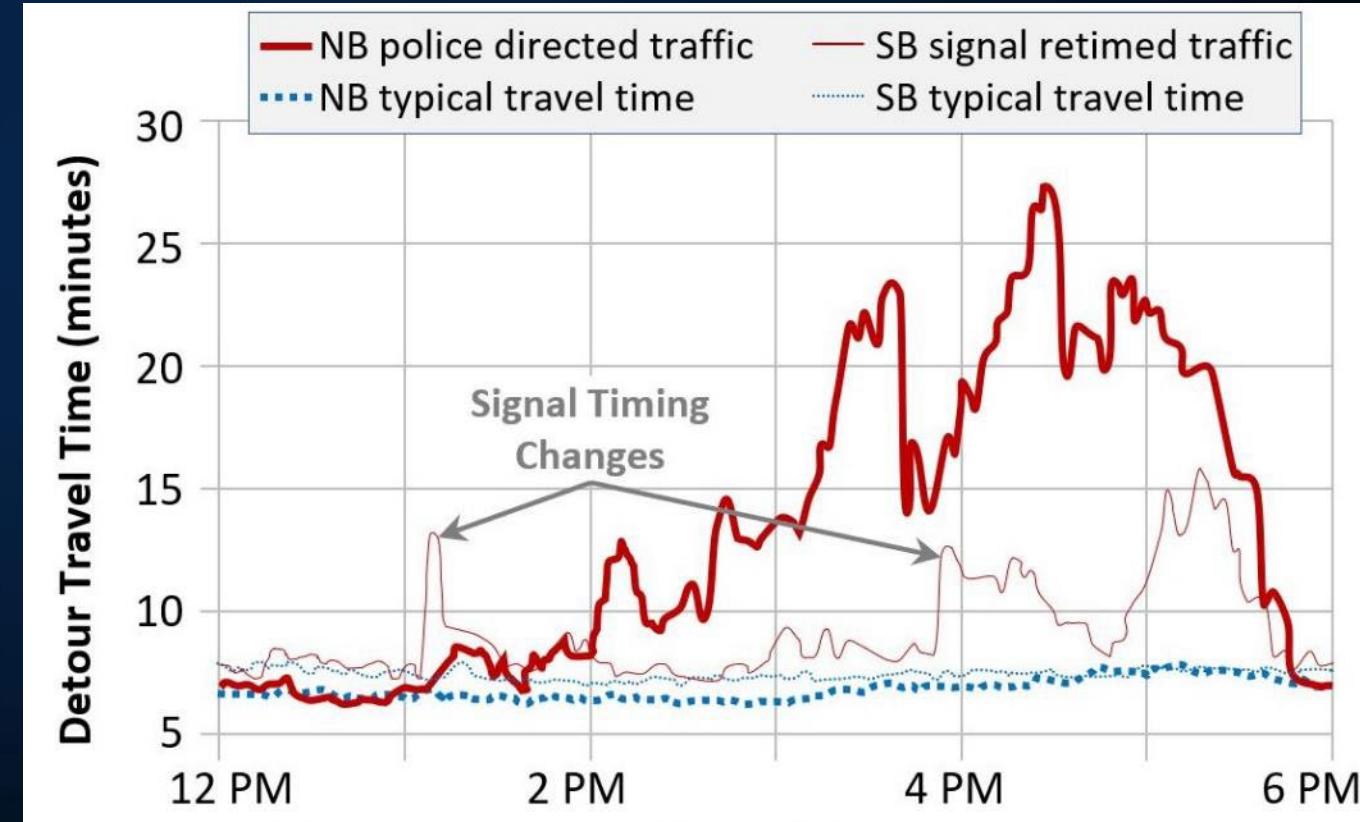
## Real Time Digital Warning



# Example: Lake County Real-Time Signal Plans for Arterial Incidents

Signals north of a major crash are switched to two different timing plans using crowdsourced travel time data.

Vehicles approaching the crash, headed southbound, experience far lower travel time compared to police directed northbound traffic.

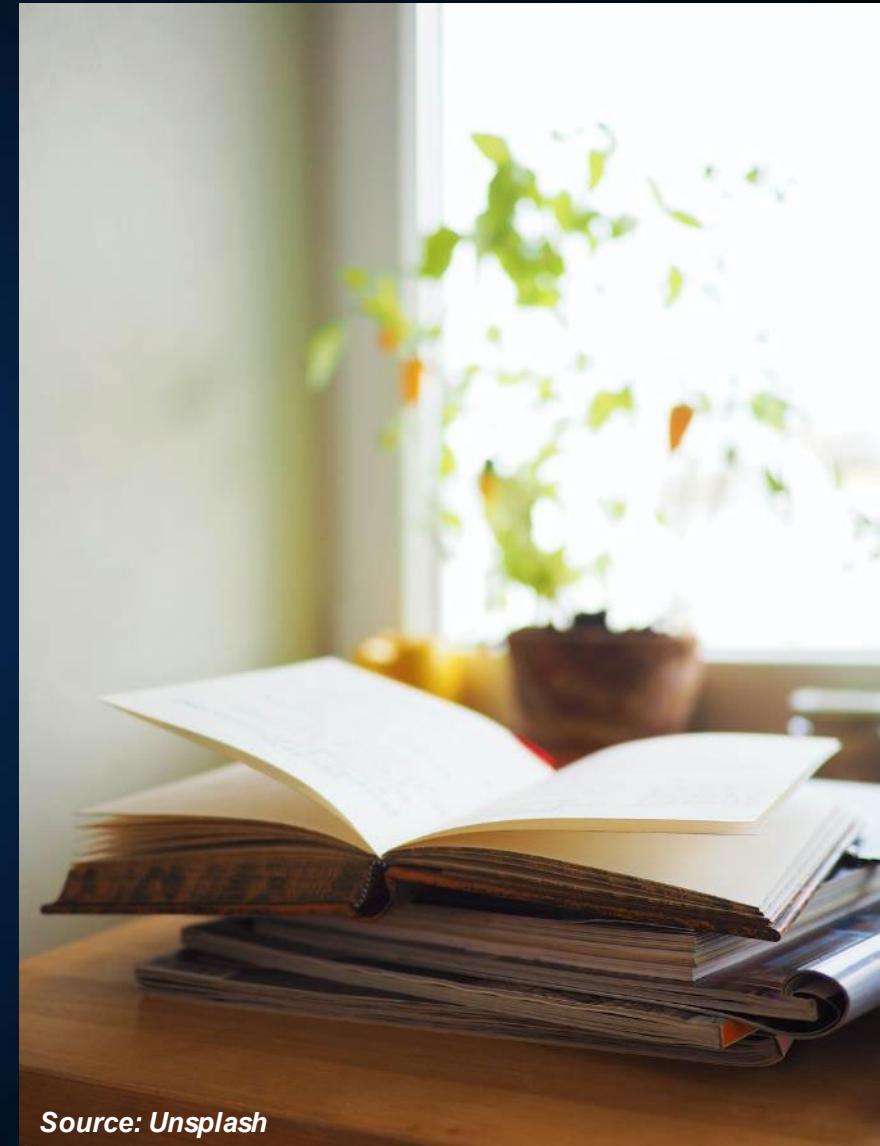


Source: Lake County DOT

# Knowledge Check

How can crowdsourcing data enhance Traffic Incident Management (TIM)?

- A. Faster incident detection.
- B. Identification of back of queues.
- C. Alerting drivers to the presence of roadside responders.
- D. All of the above.**



Source: Unsplash

# TIM Crowdsourcing Resources

## Adventures in Crowdsourcing webinars:

- Incident Management Tools
- Identifying and Managing Back of Queues
- Business Case for Crowdsourced Data

## Talking TIM webinars:

- Innovative Tools for Responder and Road Worker Safety (February 2021)
- Protecting the Queue (October 2020)



The screenshot shows the homepage of the FHWA EDC-6 Crowdsourcing for Advancing Operations website. The top navigation bar includes links for CAI Home, Every Day Counts, STIC Network, AID Demonstration, AMR Program, and Resources. Below the navigation, there are three main images: a highway scene with traffic, a control room with multiple monitors, and an aerial view of a highway. The central content area is titled "Crowdsourcing for Advancing Operations" and contains text about the integration of crowdsourced data for improved operations. It also discusses the challenges of TSMO programs and the benefits of using crowdsourcing for public agencies. On the right side, there is a "Contacts" section listing James Colyar, Greg Jones, and Ralph Volpe with their respective email addresses.

FHWA Home / OIPD / Accelerating Innovation / Every Day Counts / EDC-6: Crowdsourcing for Advancing Operations

CAI Home Every Day Counts STIC Network AID Demonstration AMR Program Resources

### Crowdsourcing for Advancing Operations

Crowdsourced data from multiple streams can be integrated and used in real time for improved operations.

State and local transportation systems management and operations (TSMO) programs strive to optimize the use of existing roadway facilities through traveler information, incident management, road weather management, arterial management, and other strategies targeting the causes of congestion. TSMO programs require real-time, high-quality, and wide-ranging roadway information. However, gaps in geographic coverage, lags in information timeliness, and life-cycle costs for field equipment can limit agencies' ability to operate the system proactively.

Public agencies at all levels are increasing both their situational awareness and the quality and quantity of operations data using crowdsourcing, which enables staff to apply proactive strategies cost effectively and make better decisions that lead to safer and more reliable travel while protecting privacy and security of individual user data.

**Contacts**

**James Colyar**  
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**Ralph Volpe**  
FHWA Resource Center  
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[Ralph.Volpe@dot.gov](mailto:Ralph.Volpe@dot.gov)

**FHWA EDC-6 Crowdsourcing for Advancing Operation Resource Site ([bit.ly/CS4Ops](http://bit.ly/CS4Ops))**

# Crowdsourcing Traffic Incident Management at the New Jersey Turnpike



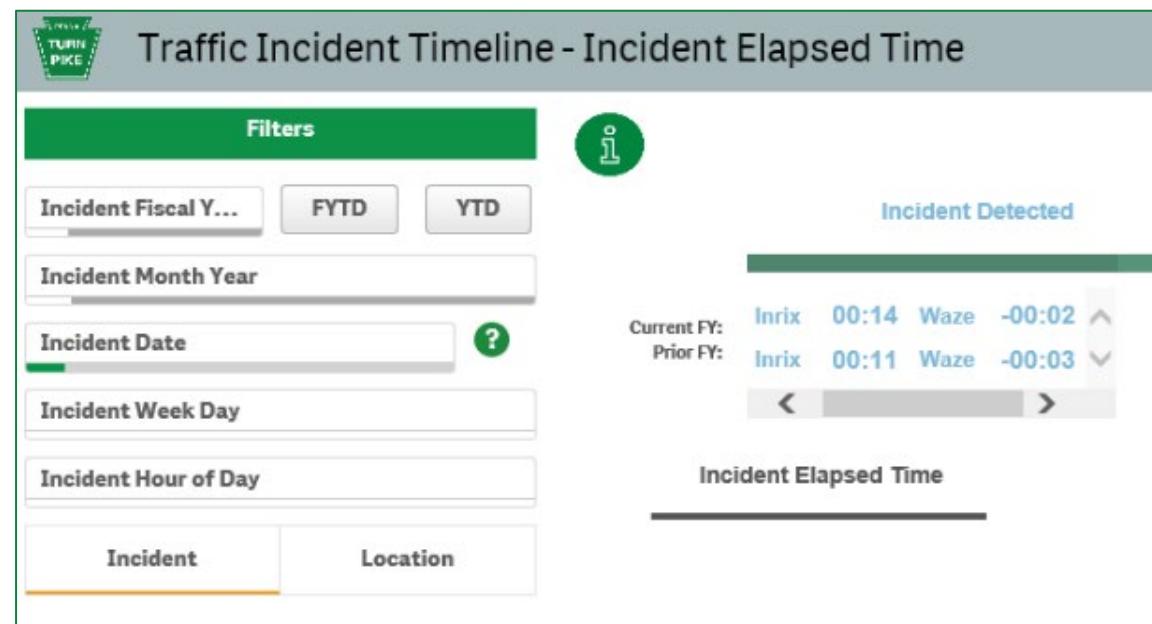
Source: Unsplash.



# **Crowdsourcing for TRAFFIC INCIDENT MANAGEMENT and TRAVELER INFORMATION**

# TIM Timeline

Pennsylvania Turnpike now integrates Waze and INRIX data for quicker incident detection, more targeted incident response, broader traveler information, after action reviews, and performance analysis.



Incident Elapsed Time

First Responder Arrival Time

Roadway Clearance Time

Traffic Conditions Normal

Incident Clearance Time

INCIDENT DURATION  
31,655 Incidents

INRIX: 00:15  
INCIDENT DETECTED



DEVICE ACTIVATED



CAD: 00:13  
FIRST ARRIVAL



ASSESSMENT TIME



CAD: 00:15  
ROADWAY CLEARANCE



INCIDENT CLEARANCE



CAD: 00:41  
TRAFFIC NORMAL

INRIX: 00:29



INCIDENT DURATION  
00:41



# PTC Crowdsource Operations

## Waze Connected Partner

- Share incident and work zone data
- PTC receives Waze data for our roadway
- PTC can close a road in Waze
- PTC can set speed limits and provide other safety messages and planned detours for Waze users
- **PTC will soon start dispatching via Waze**
- **Working to get Waze Speeds for every mile of the Turnpike**

## INRIX Probe Speed Data Consumer

- Pulls speed data from PTC road segments every 2-minutes
- Prioritizes segments with greatest speed differentials



# Early Warning Detection Tool

TollboothDesc  
Exclude Tollbooth

Early Warning Detection

**Last Reloaded On**  
10/27/2021 1:13:00 PM

**58 Active Watch Points**

No	District	Segment	Conditions	Speed Difference	Waze Alert	Visibility	Wind Speed
1	District 5	NE Ext., Southbound : 99.3-99.8	Cloudy (50.18F)	-28	0	11	5.9 (NNW)
2	District 5	NE Ext., Northbound : 104.5-105	Mostly Cloudy (56.3F)	-21	0	11	4.9 (NNW)
3	District 1	Mainline , Westbound : 4.9-5.4	Cloudy (53F)	-19	0	10	4.6 (NW)
4	District 4	Mainline , Westbound : 338.4-338.8	Cloudy (64F)	-17	0	10	10.4 (NNW)
5	District 5	NE Ext., Southbound : 98.7-99.2	Cloudy (50.18F)	-16	0	11	5.9 (NNW)
6	District 5	NE Ext., Northbound : 105.1-105.5	Mostly Cloudy (56.3F)	-15	0	11	4.9 (NNW)
7	District 1	Beaver Valley , Eastbound : 24.4-24.8	Cloudy (53F)	-13	0	10	4.6 (NW)
8	District 1	Mon-Fayette , Southbound : 41.6-42.1	Cloudy (51.08F)	-11	0	11	2.7 (WNW)
9	District 5	NE Ext., Southbound : 99.9-100.4	Cloudy (50.18F)	-11	0	11	5.9 (NNW)
10	District 5	NE Ext., Northbound : 103.9-104.4	Mostly Cloudy (56.3F)	-11	0	11	4.9 (NNW)
11	District 1	Mainline , Westbound : 5.5-6.1	Cloudy (53F)	-10	0	10	4.6 (NW)
12	District 1	Beaver Valley , Westbound : 24.1-24.6	Cloudy (52.7F)	-10	0	10	2.7 (NW)

**JAM (Waze)**

District	Segment	Waze Map
District 4	Mainline , Westbound : 338.9-339.4	>>

**Accident (Waze)**

District	Accid...	Segment	Waze Map

**Event Monitor**

Time	10-Events	T...	Location
00:12:51	2110005552	PD	@A43N
00:13:28	2110005551	PD	@A40N
00:19:59	2110005549	DV	@T264.5E

**Speed (Last Hour)**

PENNA TURN PIKE

# Waze Dashboard

- Real-Time Waze alerts
- Summary report
- Closest camera
- Link to Live map
- Geolocated to MP

Waze Dashboard

Active Waze Traffic Alert Filter Select Incident Subtype(s) / Historic Waze Data

Waze Accidents

Currently there are no accidents.

Last update: a few seconds ago

Waze Traffic Alerts

HAZARD ON SHOULDER CAR STOPPED | I-76 E » Philadelphia | 10/27/2021, 1:36:12 PM WEATHERHAZARD 000.0 on Ramp from I-276 W to Schuylkill Expy Rating: 3 Confidence: 0 Reliability: 5

HAZARD ON SHOULDER CAR STOPPED | I-76 W | 10/27/2021, 1:35:45 PM WEATHERHAZARD 251.2 on TWB Rating: 4 Confidence: 0 Reliability: 5

HAZARD ON SHOULDER CAR STOPPED | I-76 W | 10/27/2021, 1:35:43 PM WEATHERHAZARD 170.3 on TWB Rating: 3 Confidence: 0 Reliability: 5

HAZARD ON SHOULDER CAR STOPPED | I-76 E | 10/27/2021, 1:35:39 PM WEATHERHAZARD 316.0 on TEB Rating: 0 Confidence: 0 Reliability: 5

HAZARD ON SHOULDER CAR STOPPED | I-76 W | 10/27/2021, 1:35:30 PM WEATHERHAZARD 211.9 on TWB Rating: 3 Confidence: 0 Reliability: 5

HAZARD ON SHOULDER CAR STOPPED | I-76 W | 10/27/2021, 1:35:24 PM WEATHERHAZARD 219.4 on TWB Rating: 3 Confidence: 0 Reliability: 5

HAZARD ON SHOULDER CAR STOPPED | I-476 N | 10/27/2021, 1:35:23 PM WEATHERHAZARD

Last update: a few seconds ago

Map showing traffic alerts across the Northeastern US, with a dense concentration along the I-76 corridor in Pennsylvania. Major cities like Detroit, Toledo, Cleveland, Columbus, and Philadelphia are visible.

Waze Reports - Summary

WEATHERHAZARD: 83

ROAD CLOSED: 20

JAM: 1

Last update: a few seconds ago

Traffic Summary Traffic Details

Distance: 0.1 miles Description: CAM TMB W 1076 IWF 2417 WING WEST

Waze Alerts 104

PENNA TURN PIKE

Last update: a few seconds ago

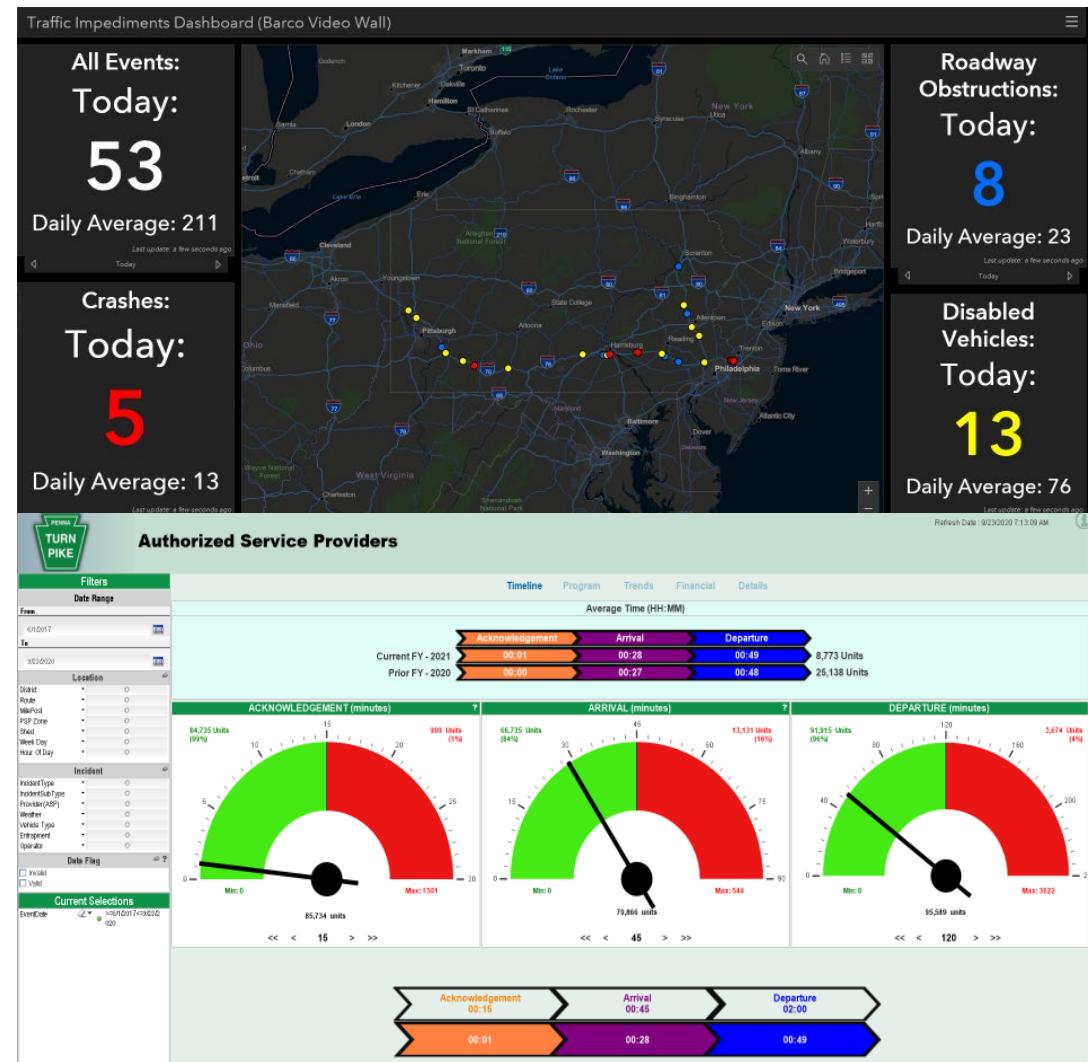
PENNA TURN PIKE

Last update: a few seconds ago

78

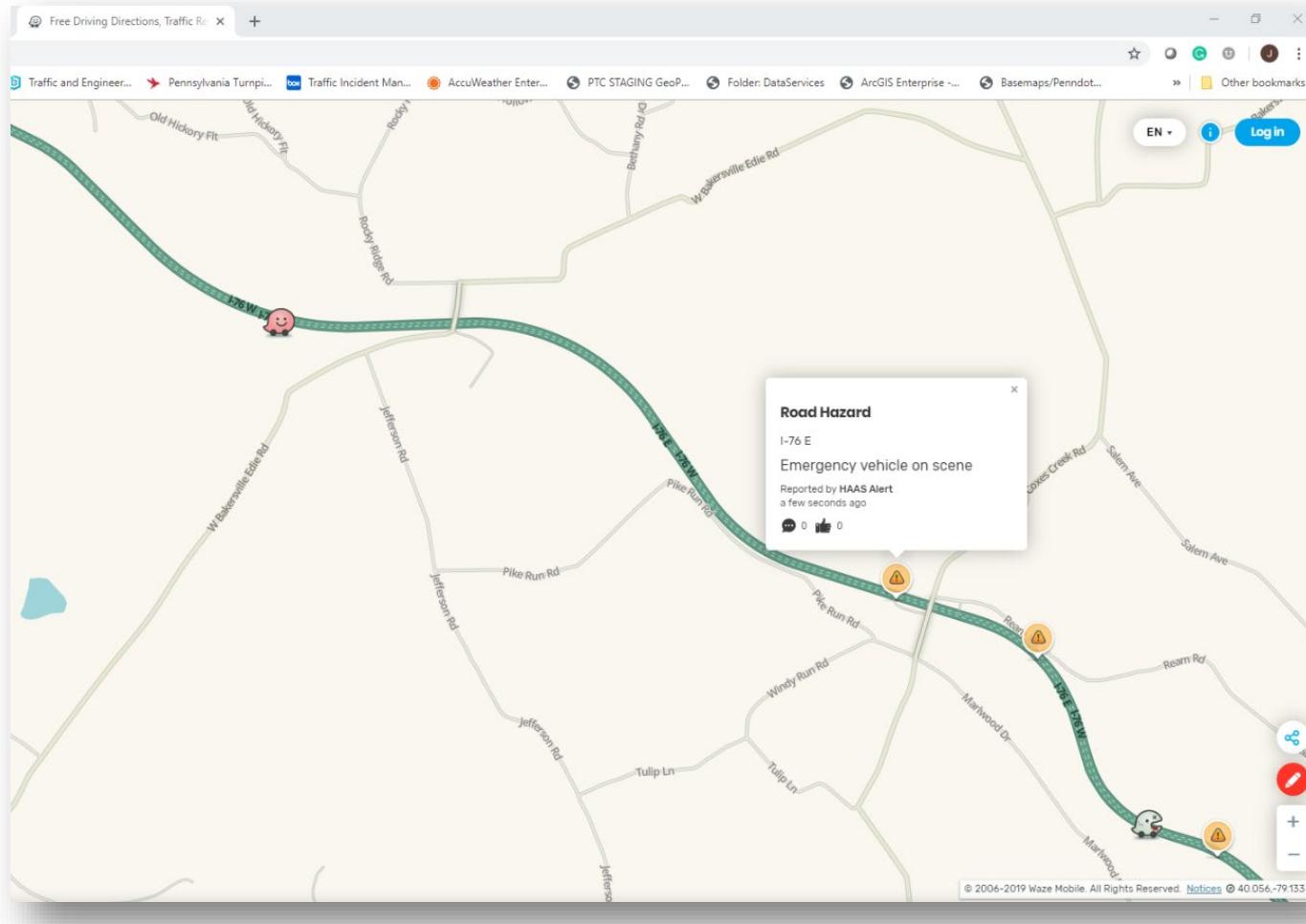
# TEO/Geo Analytics Program – Metrics and Dashboards

- Turnpike Interactive Mobility & Safety (TIMS) v6
- TIMS v4 (Barco Wall)
- Traffic Impediments (Barco Wall)
- Work Zone Dashboard
- Deer Encounters Live
- TIMS Viewer Lite
- Traffic Impediments (Desktop)
- Waze Dashboard
- Deer Encounters Analysis
- ITS Devices for AET
- Early Warning Detection
- Active Incident Summary Window (Barco Wall)
- Incident Timeline
- CADS Reporting
- TEO Mobility Dashboard
- Executive Mobility Dashboard
- ASP Dashboard
- Work Zone Crashes Dashboard
- **Weather Dashboard**
- **Wrong Way Driver Dashboard**



# HAAS Alerts

Digital Alerts that go to Waze to tell drivers to Move Over for emergency vehicles that are on scene on the roadway



- Activated with light bar
- 178 vehicles
- $\frac{1}{2}$  mile alert
- Over 7 million driver alerts in the first half year



# Data Sharing / Partners



Advanced Traffic  
Management  
System (ATMS)

APIs SHARE INFORMATION WITH 3RD PARTY  
DATA PARTNERS



# Passenger Vehicle Navigation

App name	% of nav app users	PTC agreement	What we Share	US Users (Mil)
WAZE	23%	Yes – Connected Partner	Crash or Work Zone Closures	49.9
Google maps	58%	Yes	Live Road Closure for Crashes Work Zone – Future?	125.8
Apple maps	11%	No – in Process and testing feed	Crash or Work Zone Closures	23.8



# Commercial Vehicle Navigation

App name	PTC agreement	Time Frame
Trimble – In most ELD devices and GPS units	Yes – Starting to test dev API – Accidents/Road Closurex/Work zone	Late 2021
DriveWyze	Yes – Warn Trucks of Dangerous Curves <b>Dangerous Slowdown and Congestion – 11,000 alerts since Oct 2022</b>	Since 2019
Freight Waves	Yes – <ul style="list-style-type: none"><li>• Short-term use for research</li><li>• Long-term adding Accident/Road Closures/Work Zones it to Sonar Map</li></ul>	2021/22
Trucker Path - #1	Yes	2022
OnStar	Yes	2022
TOM TOM	Yes	2022

# Future Connections



- MapQuest - Working with contacts
- GM – thru SDX (Situational Data Exchange)
- FED EX – In conversation with them – They are in process of re-platforming FEDEX ground/air and freight
- Amazon Fleet and AWS – to distribute feed

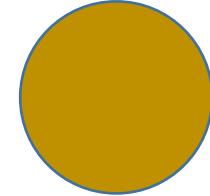
# Future State of TETC Engagement With Mapping Companies:

## Ticketing and Automated Handling

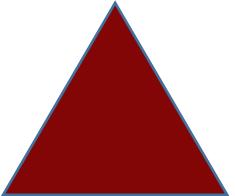
### TETC Members



Member A

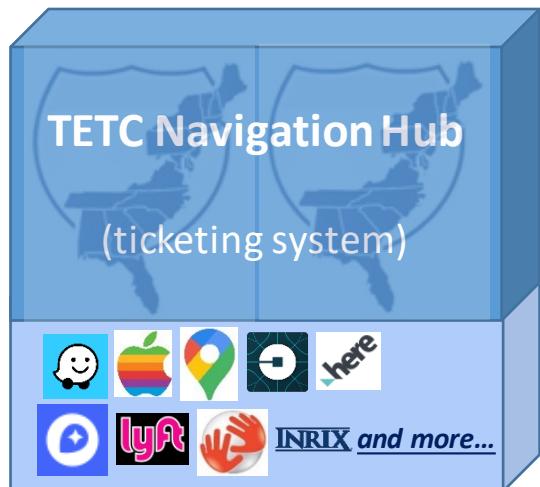


Member B



Member C

### TETC Intake and Delivery



### Member Needs

Immediate  
Needs

Long Term  
Needs

New  
Features

Reports  
by  
App

Reports  
by  
Member

Relationship  
Management

Trouble  
Shooting

Reports  
by  
Activity

Case  
Studies

App  
Backlog

Technical  
Advice

Reports  
by  
Region

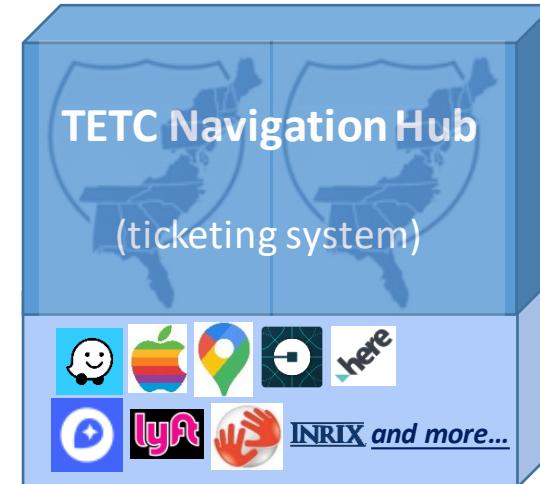
Training  
Sessions

Backlog  
Progress

# Travel Information Navigation Ticketing Hub



- Design completed March 2023
- Beta Testing completed April 2023
- Project launch held May 11 in Burlington, VT
- Coalition training sessions scheduled for June 16 and June 29



May 25, 2023

tetcoalition.org



# Thank You!

PENNA  
**TURN  
PIKE**

**John Parker**  
*Senior Traffic Operations Project Manager*  
**Pennsylvania Turnpike Commission**  
Phone: 717-686-8059  
[cparker@paturnpike.com](mailto:cparker@paturnpike.com)

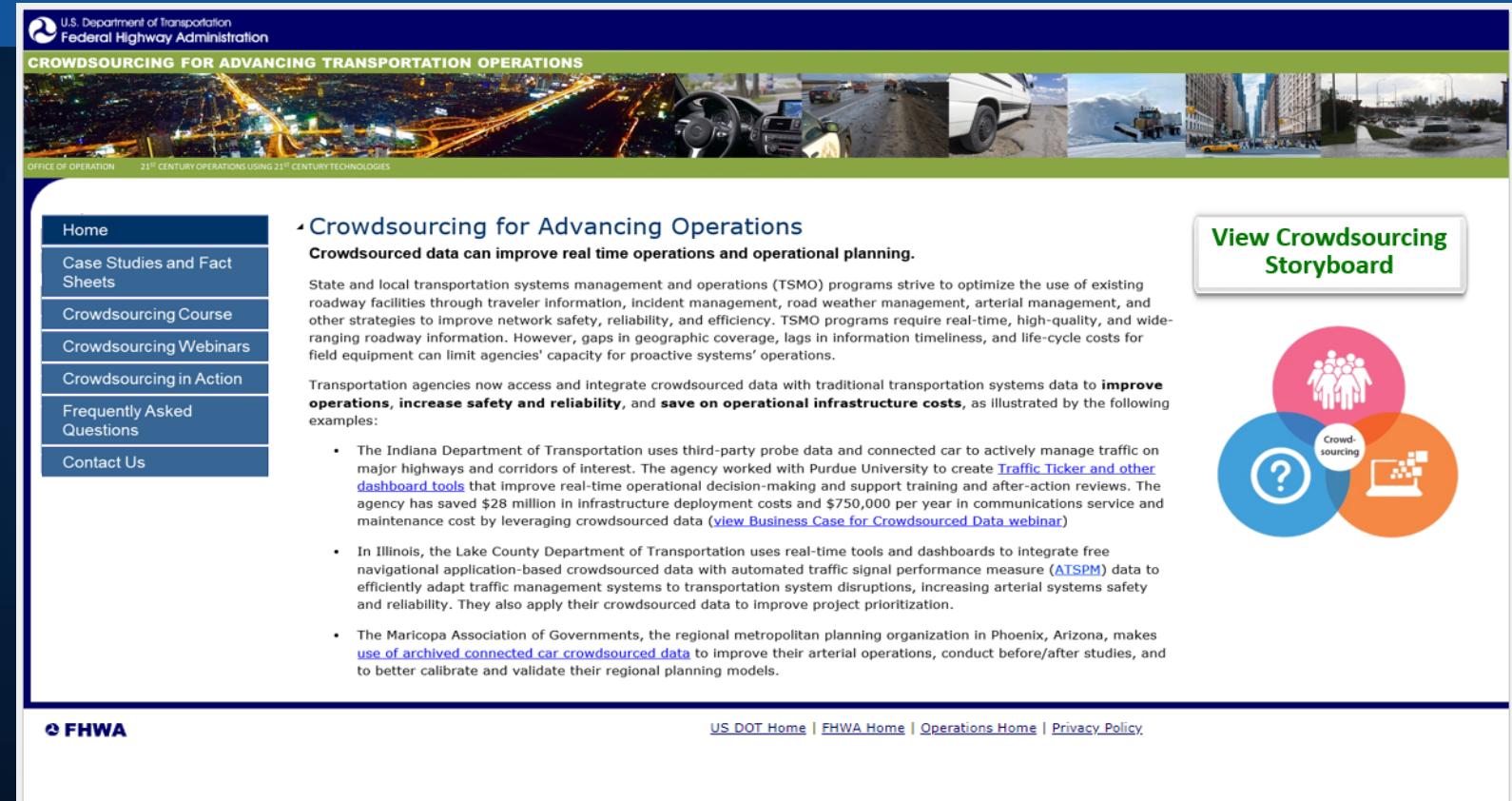


Source: Pixabay.

# *Question, Answer, and Discussion*

# Crowdsourcing Beyond Every Day Counts Round Six

- New web presence
- Continue course delivery
- Continue technical support
- Continue free access to the EDC-6 Adventures in Crowdsourcing webinar series hosted by the National Operations Center of Excellence



The screenshot shows a concept website for the FHWA Office of Operations. The header features the FHWA logo and the title "CROWDSOURCING FOR ADVANCING TRANSPORTATION OPERATIONS". Below the header is a collage of five images: a city skyline at night, a car's dashboard, a truck on a dirt road, a snowplow, and a city street. A sidebar on the left contains links: Home, Case Studies and Fact Sheets, Crowdsourcing Course, Crowdsourcing Webinars, Crowdsourcing in Action, Frequently Asked Questions, and Contact Us. The main content area discusses crowdsourcing for operations, mentioning its benefits like improved real-time operations and operational planning. It includes examples from Indiana, Illinois, and Maricopa Association of Governments. A "View Crowdsourcing Storyboard" button is located on the right, and a graphic of three overlapping circles (pink, blue, orange) with icons (people, question mark, laptop) is also present.

Concept website in development and intended for FHWA Office of Operations.

Source: FHWA.



# Thank you.

**James Colyar**  
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**Ralph Volpe**  
[ralph.volpe@dot.gov](mailto:ralph.volpe@dot.gov)  
404–985–1268



U.S. Department of Transportation  
**Federal Highway Administration**



# Upcoming T3 Webinars

Webinar	Date	Time
Crowdsourcing for Advancing Operations: Road Weather and Arterial Management	Tuesday, August 15, 2023	1:00 P.M. - 2:30 P.M. ET
Crowdsourcing for Advancing Operations: Emergency and Work Zone Management and Next Steps	Tuesday, September 19, 2023	1:00 P.M. - 2:30 P.M. ET

**Register:** [https://wwwpcb.its.dot.gov/t3\\_webinars.aspx](https://wwwpcb.its.dot.gov/t3_webinars.aspx)

To access the recording and past T3 webinars, visit:

[https://wwwpcb.its.dot.gov/t3\\_archives.aspx](https://wwwpcb.its.dot.gov/t3_archives.aspx)

# Feedback

- A link to a feedback questionnaire is provided in the chat pod. Please take a few minutes to fill it out – we value your input
- To receive notifications of upcoming events, send an email to [T3@dot.gov](mailto:T3@dot.gov) with “Add to mailing list” in the subject line

Thank you!