Member Presentations and Roundtable Discussions

***Presenters:** Please allocate time for Q&A in your 10 minutes.
**A timekeeper will be keeping time.

Presentation Order

1. Nevada
2. Missouri
3. Minnesota
4. Michigan
5. Indiana
6. Florida
7. Delaware
8. Alabama
9. Wisconsin
10. West Virginia
11. Utah
12. Texas
13. Tennessee
14. Pennsylvania
15. Ohio
16. New York
17. New Jersey

Nevada Department of Transportation

Juan Hernandez, PE, PTP, PTOE
TMC PFS Chair & WASHTO TSMO Committee Chair
Assistant Chief – Traffic Operations Division
Nevada Department of Transportation
jchernandez@dot.nv.gov

I-80 Corridor

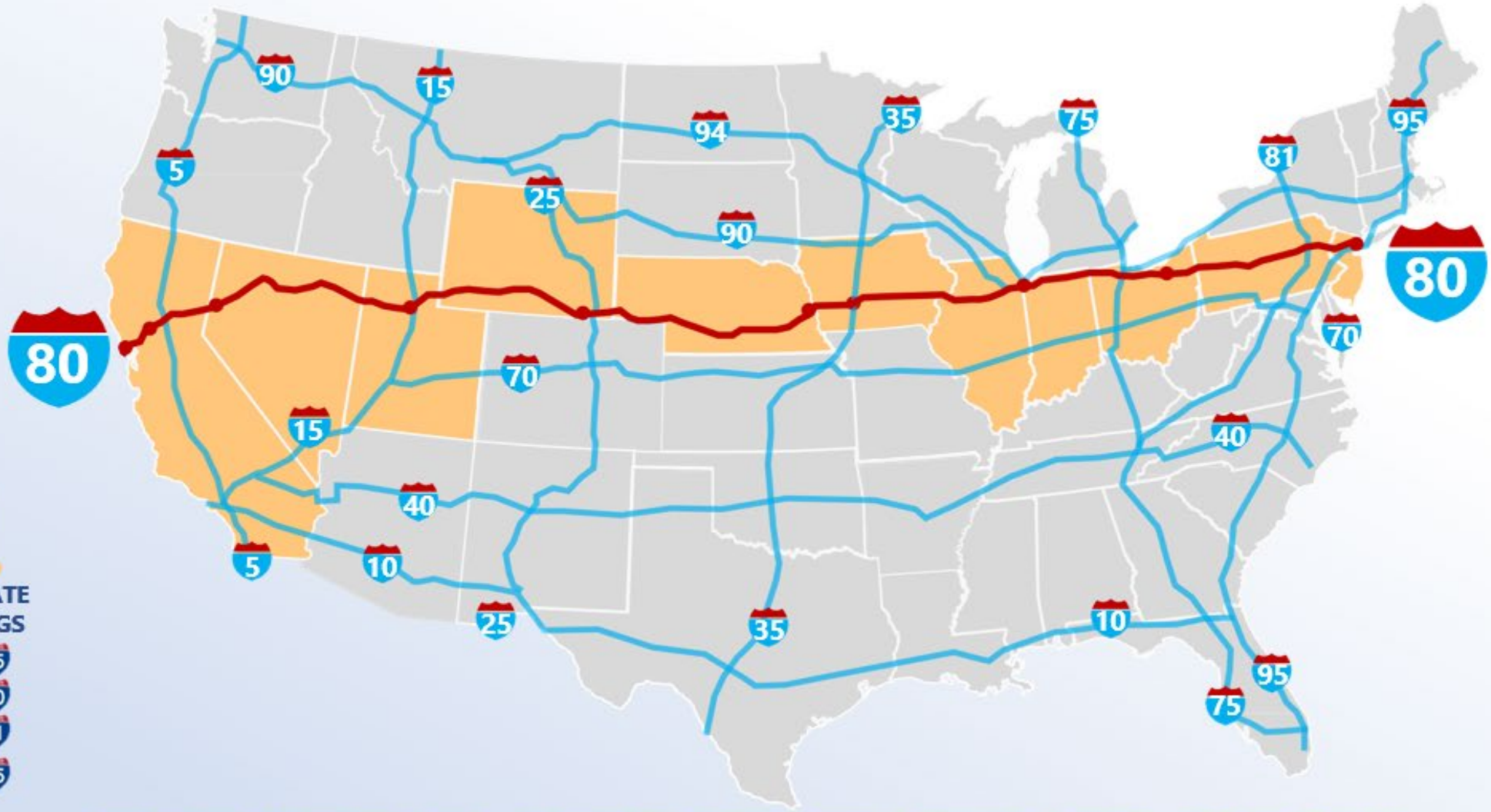
TRACY LARKIN THOMASON
DIRECTOR, NEVADA DOT

I-80 Goal: Next Generation Multi-State Operations & Data Sharing

- All 11 states and 3 tollways
- Focused on 1-3 core efforts to build upon
- Move toward coordinated vision
- Avoiding larger silos of excellence

CONNECTIVITY | INTEROPERABILITY | SCALABILITY

IMPROVE SAFETY | MANAGE FREIGHT MOBILITY | OPTIMIZED NETWORK | EXPIDITED INFORMATION SHARING | OPERATIONAL EFFIENCIES | MOVEMENT OF GOODS & SERVICES | EMERGENCY RESPONSE



11

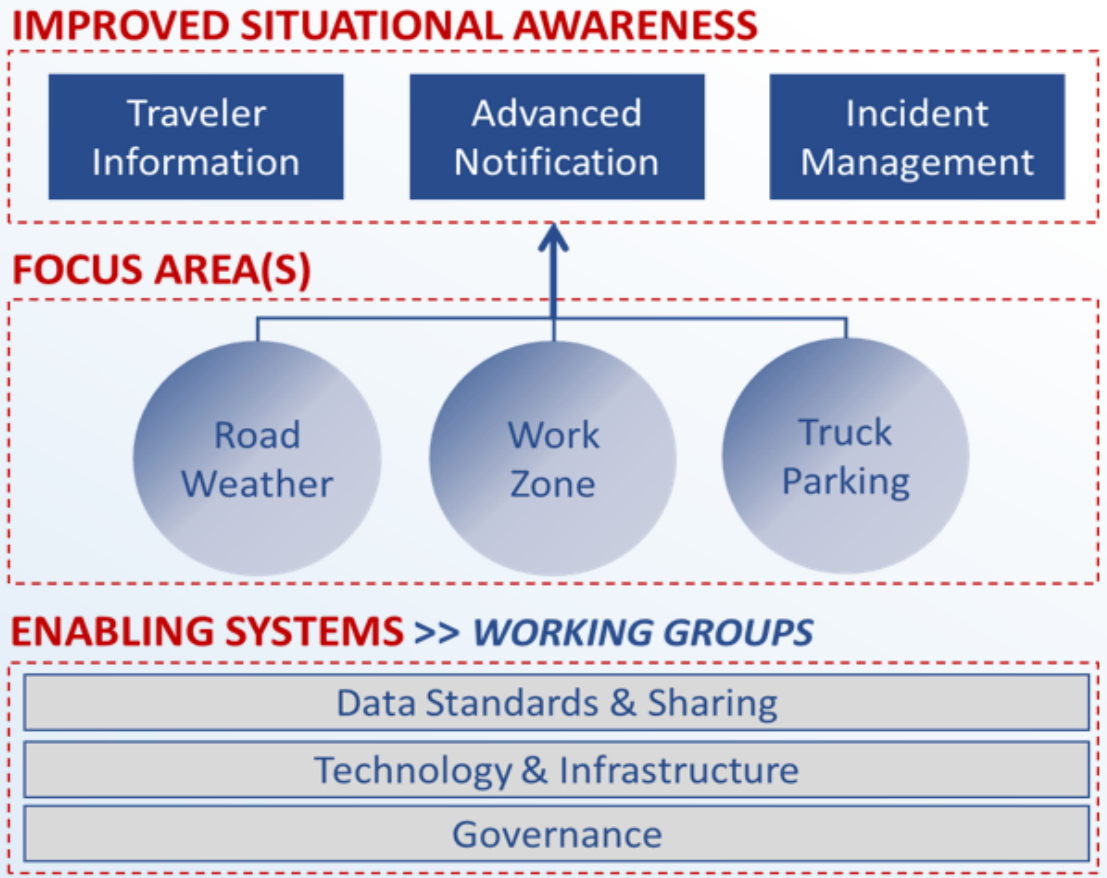
INTERSTATE CROSSINGS

5 55 75
15 65 90
25 94 81
35 95

SAN FRANSISCO SACRAMENTO RENO SALT LAKE CITY CHEYENNE OMAHA DES MOINES CHICAGO CLEVELAND TEANECK

Opportunity Areas and Working Groups

Through facilitated discussion, surveys and DOT interviews, several opportunity areas emerged for the corridor to improve situational awareness



Assessing the Right Approach

STEP 1
Improving consistency in agency-supported data feeds

*This step is essential and a "**must-do**"*

STEP 2
Sharing data (Various options can be explored by the coalition)

POSSIBLE OPTIONS

- **Standardizing Status Quo** — *Make available through websites/511 individually*
- **3rd Party Aggregator** — *Engage 3rd Party vendor for aggregation*
- **One-stop shop (e.g. Corridor-wide 511)** — *Leverage existing university/coalition supported one-stop shops*

Nevada Department of Transportation

- Contact:
  - Juan Hernandez, PE, PTP, PTOE
  - Assistant Chief - Traffic Operations
  - Nevada Department of Transportation
  - jchernandez@dot.nv.gov

Missouri Department of Transportation

Kelly Alvarez
Traffic System Supervisor
MoDOT
kelly.Alvarez@modot.mo.gov

CYBER-ATTACK ON A TMC

LESSONS LEARNED FROM KC SCOUT'S RESPONSE AND RECOVERY

Presentation By :
Kelly Alvarez &
Randy Johnson

ITS Heartland Conference
04/29/2025

SUDDENLY...

KC Scout experienced a cyber attack. From the moment of detection, the following actions were immediately taken:

- **Staff took network offline**
- **Begin to shut down all devices**
- **FBI notififed and onscene**
- **Notifications were made to employees**
- **Manual TMC functions established**

THE FIRST EIGHT HOURS....

NOTIFICATION TO PARTNERS

Determining who would call which partners...made more difficult because no online phone lists were available

EMERGENCY BOARD OF DIRECTORS MEETING

Scheduled Emergency Board of Directors meeting for updates and direction

INTERNAL TEAM HUDDLE

The Scout team met to pause, reflect and regroup from the day's chaotic events, ready to meet the challenges ahead

THE NEXT SEVERAL DAYS:

ESTABLISHING BASIC OPERATIONAL TMC FUNCTIONS

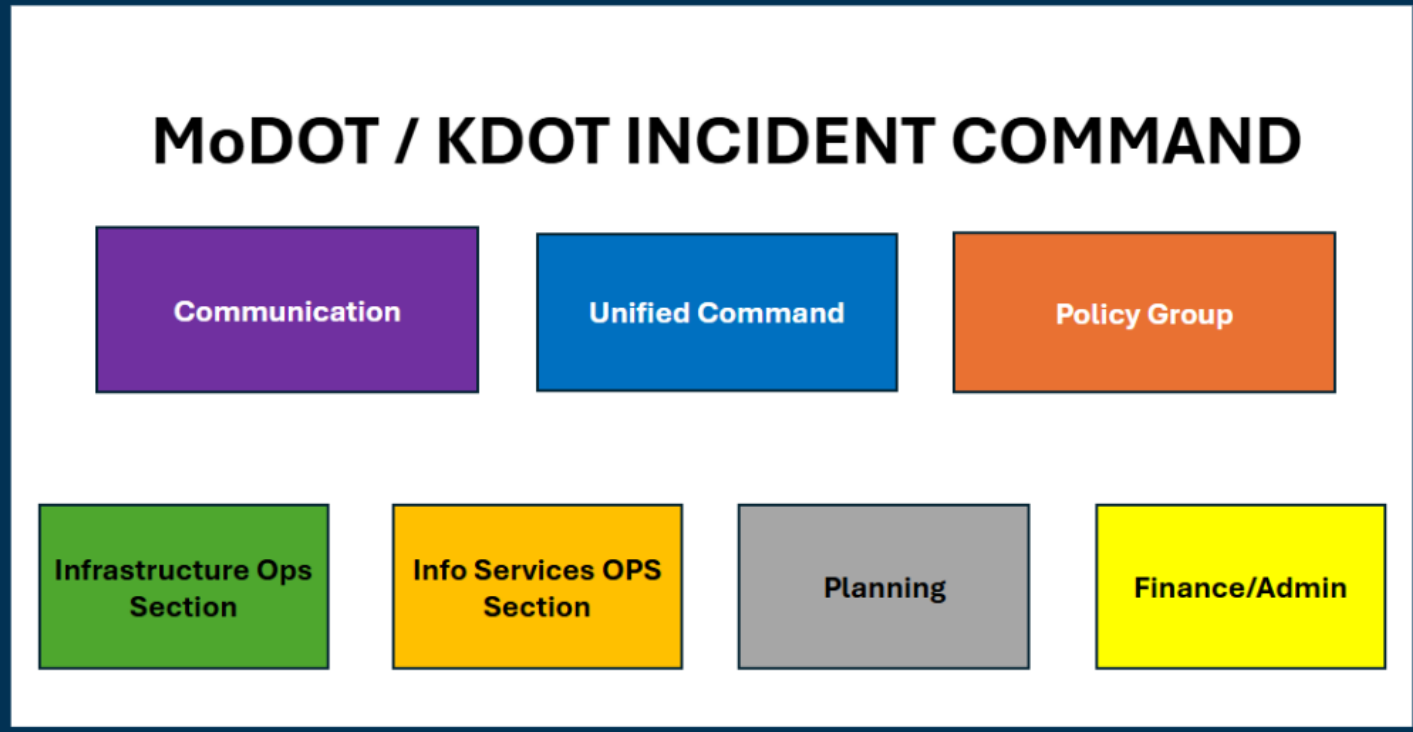
Paper & Hand Held Radios

- New Laptops were reassigned
- Email & Internet access available
- Test ATMS Software loaded

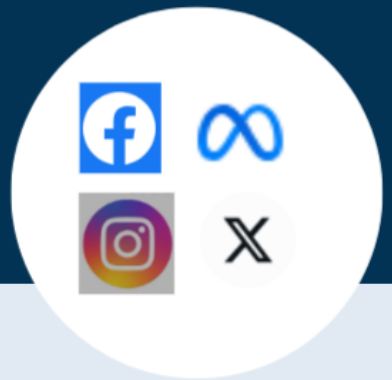
NATIONAL INCIDENT MANAGMENT SYSTEM (NIMS)

The National Incident Management System (NIMS) guides all levels of government, nongovernmental organizations and the private sector to work together to prevent, protect against, mitigate, respond to and recover from incidents.

NATIONAL INCIDENT MANAGMENT SYSTEM (NIMS)



SOCIAL MEDIA AND TV/PRESS OUTREACH



JOINT DOT COORDINATION

Maintain timely updates to both DOT Traveler Information Maps

SOCIAL MEDIA

Importance of all posts regarding Scout's Cyber attack being consistent!

MEDIA UPDATES

Providing the public and press with regular updates

OUR FOCUSED RESPONSE:
ESTABLISHING PRIORITIES

1. **Tier One:** Keeping customers and first responders safe

2. **Tier Two**: Restoring public facing applications (website, mobile app, media connectiivity

3. **Tier Three:** Restoring internal applications and files

LESSONS LEARNED

01 • Too much initial adhoc effort

02 • Value of using NIMS Structure

03 • Benefits of Media outreach

04 • Key Leadership Support

05 • NIST Cybersecurity Framework CSF

NIST CYBERSECRUITY FRAMEWORK

Quick-Start Guide

https://nvlpubs.nist.gov/nistpubs/SpecialPublications/NIST.SP.1300.pdf

Good Starting Point

https://csrc.nist.gov/Projects/cybersecurity-framework/Filters#/csf/filters

Missouri DOT

- Contact:
  - Kelly Alvarez
  - Traffic System Supervisor
  - kelly.Alvarez@modot.mo.gov

Minnesota Department of Transportation

John McClellan
RTMC Freeway Operations Supervisor
Minnesota Department of Transportation
john.mcclellan@state.mn.us

- MNDOT studying color DMS with Mich State U
  - Actual RGB numbers for colors to match static signs
  - Driver behavior study for sign context
  - Loaning them a 30 foot DMS, view tests at 800 feet.

- Pixel pitch for DMS?
  - MNDOT currently using 20mm
  - Testing a LCS at 16 mm
  - What are other states doing?

- What cameras are states using?
  - Cohu out of the biz
  - Bullet cams we are testing: Bosch, Pelco (Espirit & Mini), Axis, I-Pro, Avigilon -- anyone have other recommendations?
  - Any BABA's ?

- How many states are recording their cameras now?
  - February mass public recorder overload
  - Nightcrawlers / Anybody charging?
  - Any new data practices issues?

Michigan Department of Transportation

Suzette Peplinski, PE
Grand Region Traffic Safety & Operations
Michigan Department of Transportation
PeplinskiS@Michigan.gov

Color DMS Messaging Guidelines

- Update DMS Messaging Guidelines:
  - MDOT TOC's have been working on updating DMS Messaging Guidelines to utilize color DMS
  - Guidelines are a shared document among our 4 TOC's statewide
  - Several projects have now installed the full matrix color DMS, and this is our new standard DMS going forward
  - Several workshops to view examples, discuss options
  - Consider both full size and small DMS

  - Created example graphics and text with various colors to field test
    - Coordination with ATMS to ensure graphics are available and GUI shows them
    - A variety of Travel Time options.

Existing graphics and color in use:

- Automated weather messages:

- Lane Control signs:

Field Testing

- Various colors
  - Standard text color – white, yellow, amber, ?
  - Emphasis colors – which get attention but are still legible
  - Using pink for incident management sign messages
- Route Shields
  - Do we need the text on them (ie. “Interstate” on the blue area)?
  - Include the “EAST” or “WEST” on the image, or in the separate text?
- MUTCD Signs
  - Matching exact color has been an issue
- Variable Speed advisory signs
  - Existing, some are yellow on black, some are black on yellow.
- Weather Signs
  - Stick with MUTCD symbols like Slippery Roads, but not the “snowflake”
- Travel Times
  - SO MANY OPTIONS.

INTERSTATE 94

MDOT TEST
MDOT TEST
MDOT TEST

EAST 94

MDOT TEST
MDOT TEST
MDOT TEST

MDOT TEST
MDOT TEST
MDOT TEST

94

MDOT TEST
MDOT TEST
MDOT TEST

INCIDENT AHEAD

LEFT LANE CLOSED
AT M-52

ROAD WORK AHEAD

RIGHT LANE CLOSED
AFTER US-23
MOVING WORK CREW

* *

WRONG WAY DRIVER
REPORTED IN AREA
USE EXTREME CAUTION

* *

Standard MMUTCD sign as symbol

SLIPPERY ROADS
IN AREA
REDUCE SPEEDS

Non-standard symbol option

WINTER WEATHER
ADVISORY
IN EFFECT UNTIL 12 PM

SLOW TRAFFIC AHEAD

RIGHT LANE CLOSED
AFTER SPRINKLE RD

RIGHT LANE CLOSED
AHEAD
BE ALERT FOR WORKERS

60
M.P.H.

Travel Time Options

94	11 MI	10 MIN
U AVE	18 MI	17 MIN

TRAVEL TIME TO		
I-94	11 MI	11 MIN
U AVE	18 MI	18 MIN

TRAVEL TIME TO		
I-94	11 MI	10 MIN
U AVE	18 MI	17 MIN

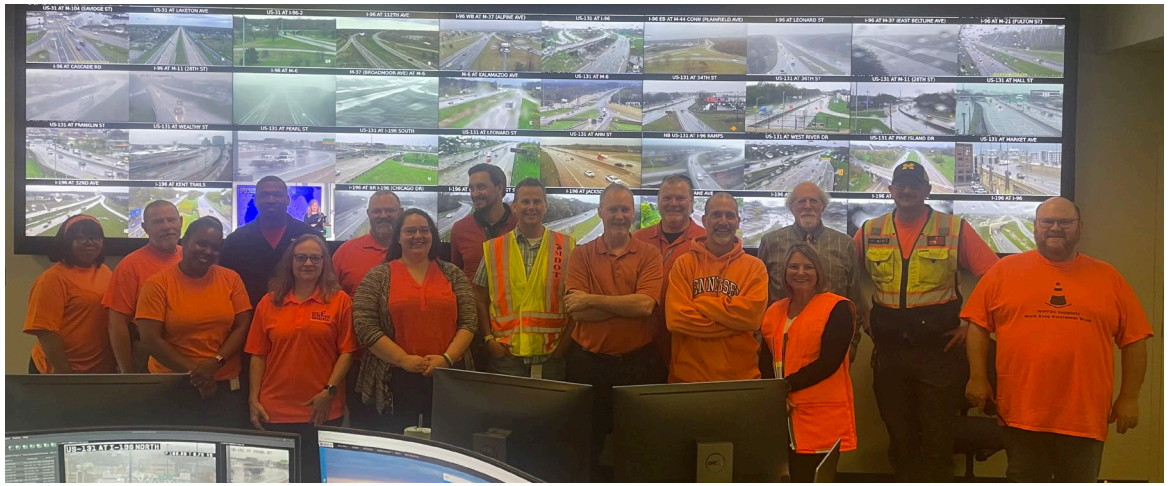
TRAVEL TIME TO		
I-94	11 MI	11 MIN
U AVE	18 MI	18 MIN

Questions for other States:

- Anyone using variable colors or symbols in their Travel Time messages?
- Anyone using non-MUTCD standard symbols or graphics on the DMS?
- Do the colors match MUTCD standards for signs, or are they using different colors and what was there reasoning for using other colors?
- Have any of the states completed any related research studies involving color DMS messages? Such as effectiveness of color fonts vs. amber, or the effectiveness of graphics? Any public feedback gathered?
- Any other lessons learned or best practices that other states may have gathered when using color DMS messages or graphics?

Michigan Department of Transportation

Suzette Peplinski, P.E.
Traffic Safety & Operations Engineer/Manager
MDOT – Grand Region
West Michigan Transportation Operations Center
PeplinskiS@Michigan.gov



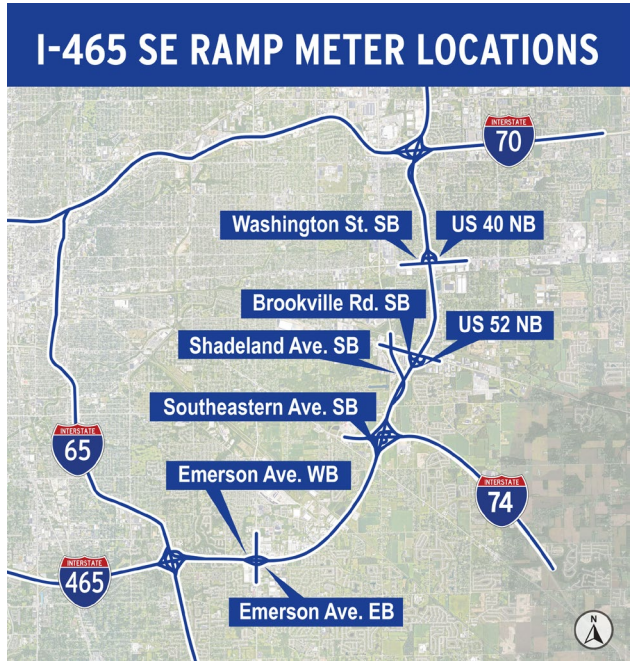
Indiana Department of Transportation

Edward D Cox
ITS Engineering Director
INDOT
ecox@indot.in.gov

INDOT Updates

- INDOT I-465 TSMO
  - Ramp meters, variable speed limits and back of queue detection
  - Early findings on safety
- I-80/94 Upcoming TSMO
  - Ramp meters, variable speed limits, back of queue detection and hard shoulder running
  - Plans and schedule

I-465 Southeast TSMO Project



- 8 Ramp Meters Deployed 5/2024
- 62 Variable Speed Limit Signs 10/2024
- 8 Dynamic Message Signs 10/2024
- Parsons I-net software (Carma)

Overall Reduction in Hard Braking Incidents

I-465 Inner Loop

- Total hard braking events across all ramps

Total Before	Total After	% Reduction
225	91	**59.6%**

Before

May 2023

S	M	T	W	R	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

After

August 2024

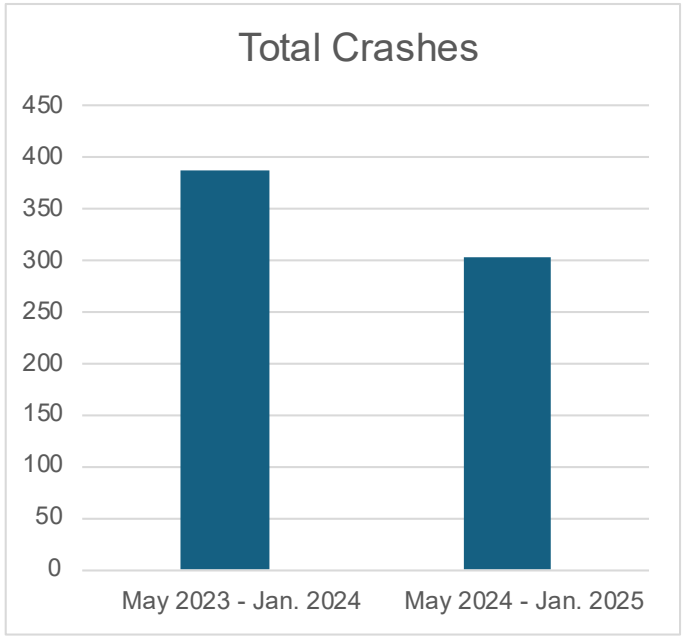
S	M	T	W	R	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

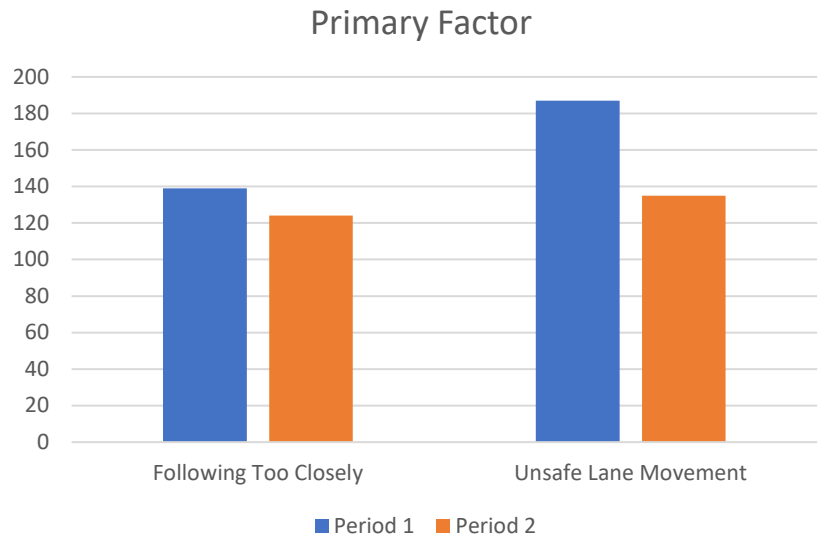
Crash Report Analysis

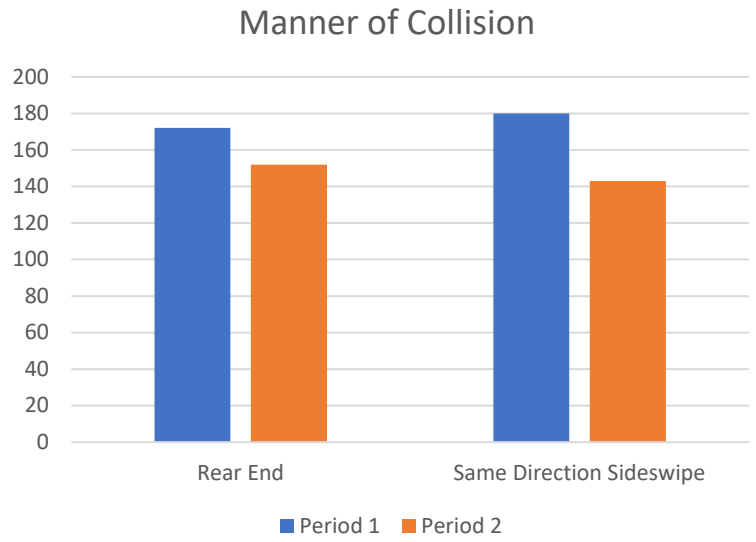
Compared crash reports from May 2023-January 2024 to May 2024-January 2025

- I-465 between mm 48.3 and 53.2 and on service interchange entrance ramps

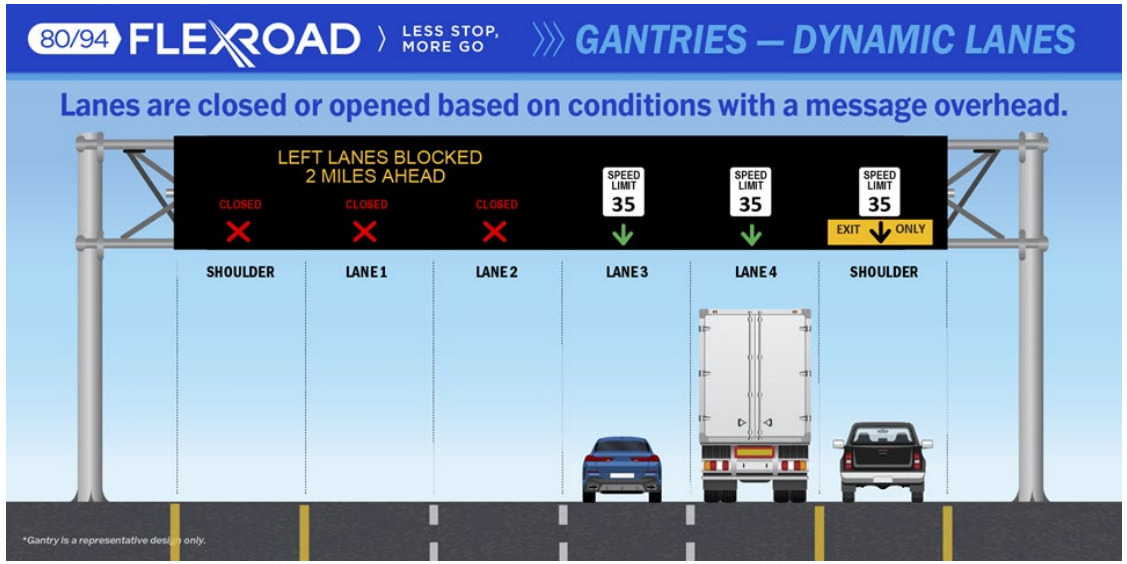
	Before	After	% Change
Total Crashes	387	304	-21.4
Manner of Collision: Rear End	172	152	-11.6
Manner of Collision: Same Direction Sideswipe	180	143	-20.6
Primary Factor: Following Too Closely	139	124	-10.8
Primary Factor: Unsafe Lane Movement	187	135	-27.8

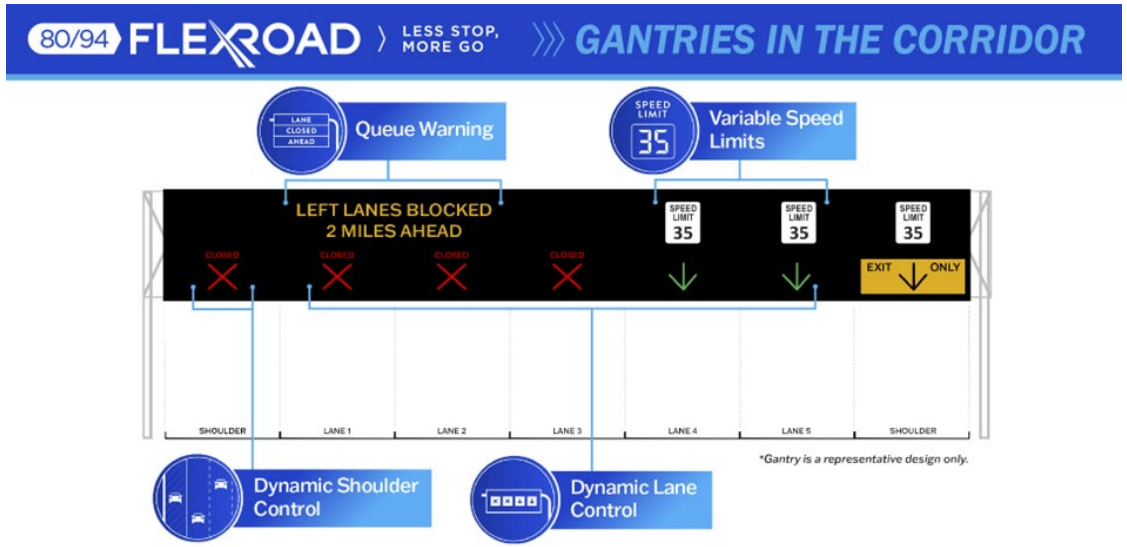


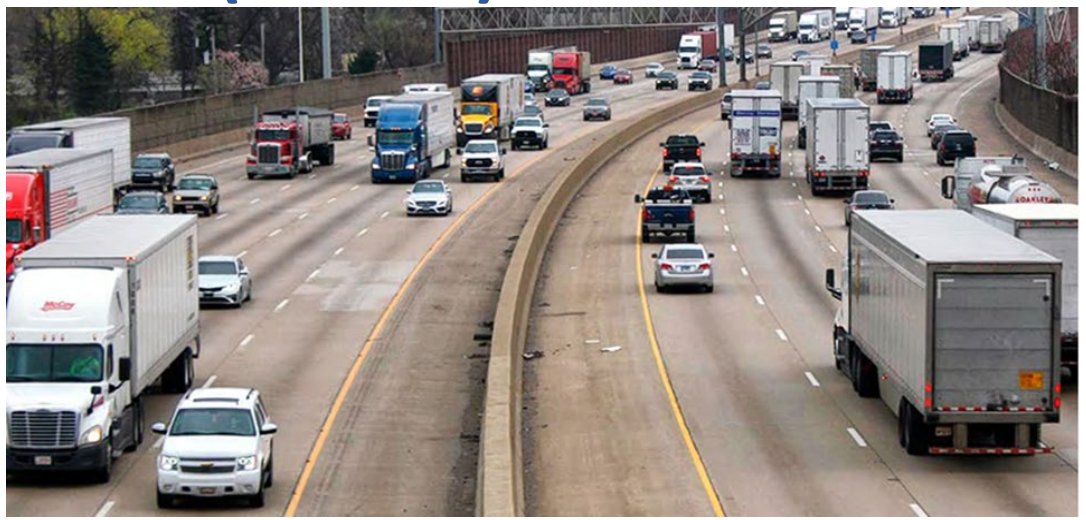




Future TSMO Northwest Indiana (Illinois)

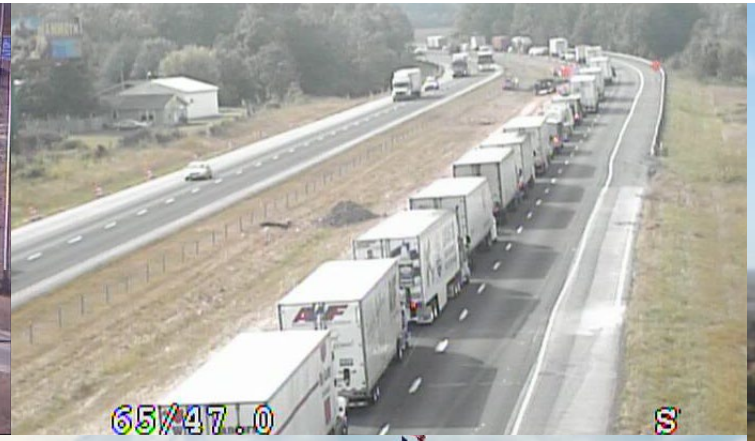






- Indiana's busiest Interstate Corridor
- AADT 170,000 to 200,000
- 30% Truck
- Overnight truck percentages will exceed 50% of traffic
- Contract started. Operational by 2028/2029

Daily Traffic and Special Events



Indiana Department of Transportation

- Contact:
  - Edward D Cox
  - ITS Engineering Director
  - INDOT Traffic Management
  - ecox@indot.in.gov

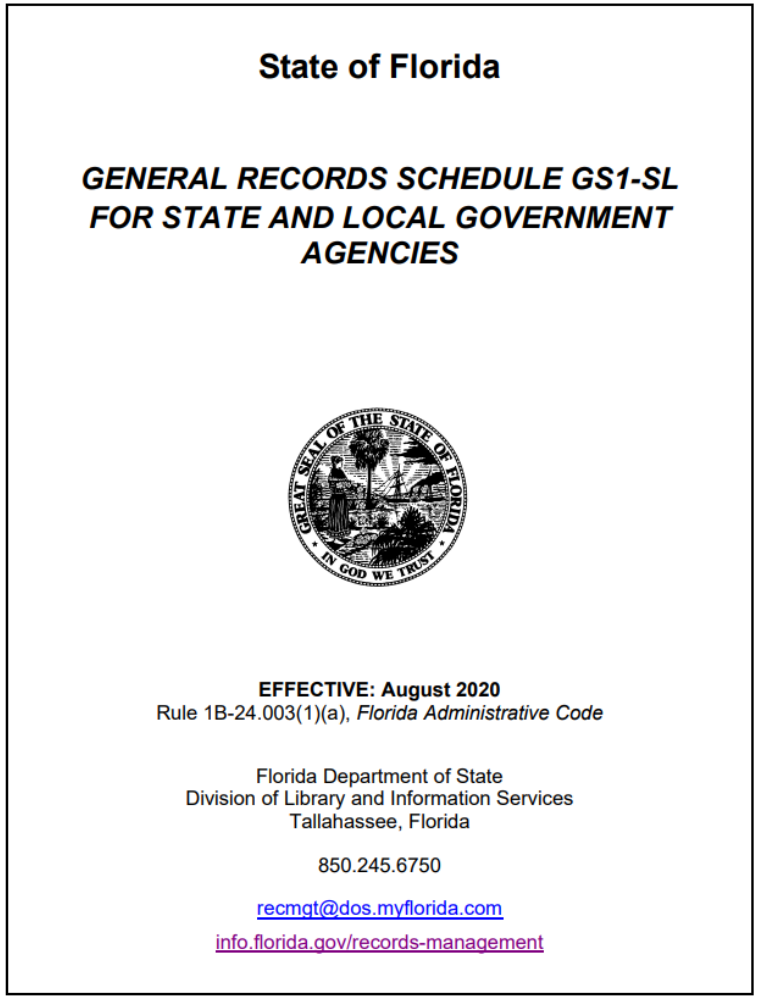
Florida Department of Transportation

James Landini, PE
State TSM&O Program Development Engineer
Florida Department of Transportation
james.landini@dot.state.fl.us

From Compliance to Governance: FDOT's New Procedures for WWVDS and MVDS Data Disposal

Background

- State of Florida retention policy ensures agencies keep records for the correct amount of time.
- Florida's General Records Schedules (GS1, GS2, GS3, etc.) set the minimum retention periods for common records.
- If a specific records isn't covered by a General Schedule, an agency can submit a retention schedule to the Florida Records Management Program for review and approval.
- FDOT developed a repeatable procedure for responsibly handling high-volume ITS Data.



State of Florida

GENERAL RECORDS SCHEDULE GS1-SL FOR STATE AND LOCAL GOVERNMENT AGENCIES

EFFECTIVE: August 2020
Rule 1B-24.003(1)(a), *Florida Administrative Code*

Florida Department of State
Division of Library and Information Services
Tallahassee, Florida

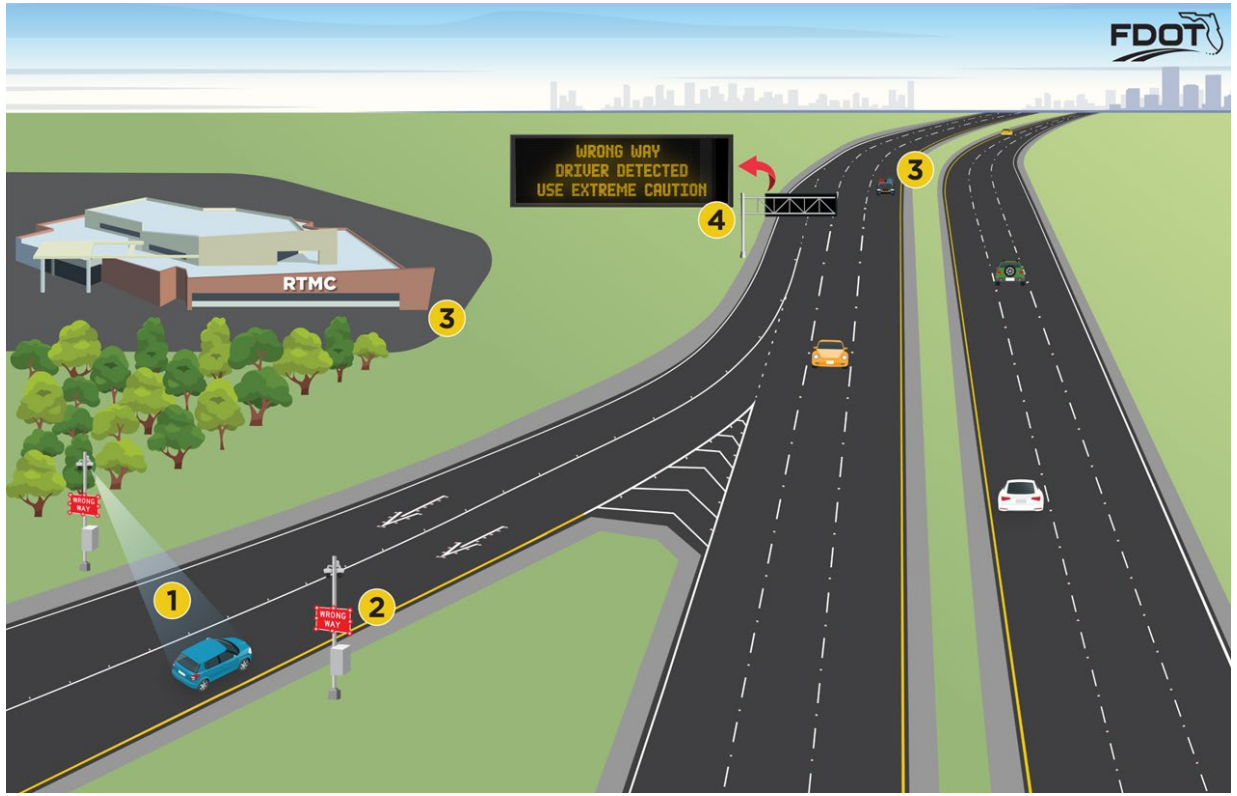
850.245.6750

recmgt@dos.myflorida.com

info.florida.gov/records-management

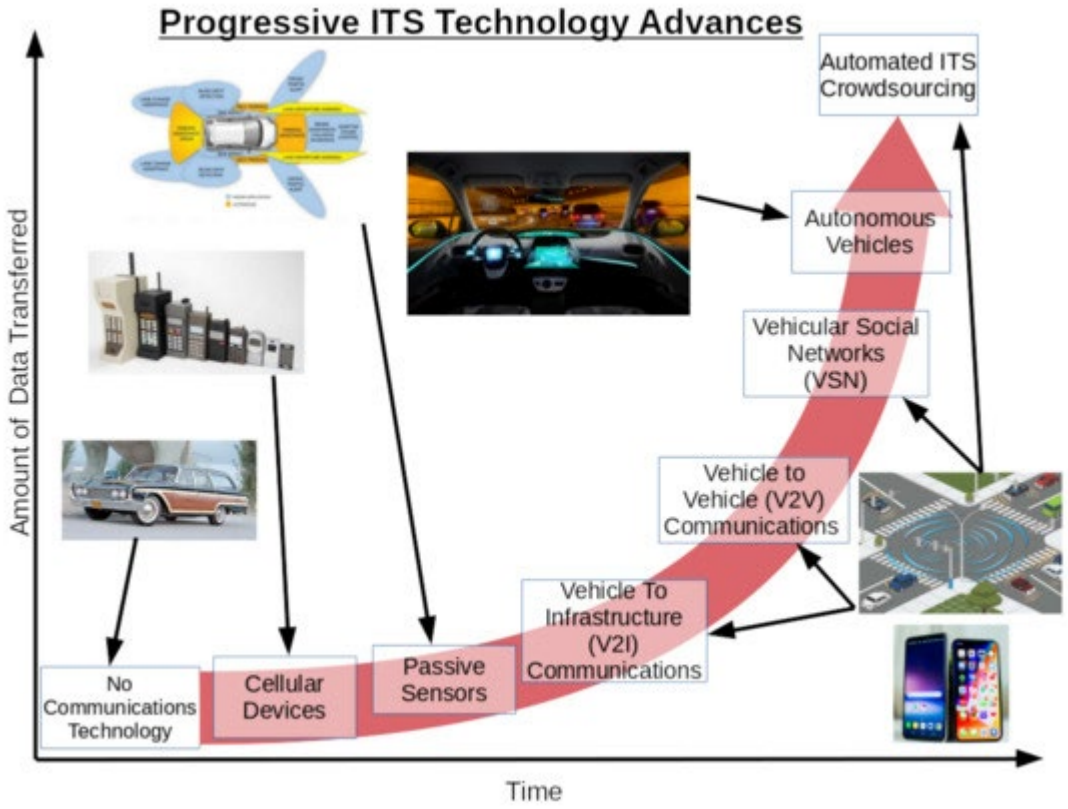
Background

- Florida's Wrong Way Vehicle Detection Sensors may send video clips or still images to the RTMCs for verification.
- The FDOT Districts were unsure of how to dispose of these verification clips since FDOT does not record video.
- FDOT's Central Office TSMO Program was tasked with providing a solution.
- During this time, another need was discovered – MVDS data. Some Districts had over a decade of detector data!

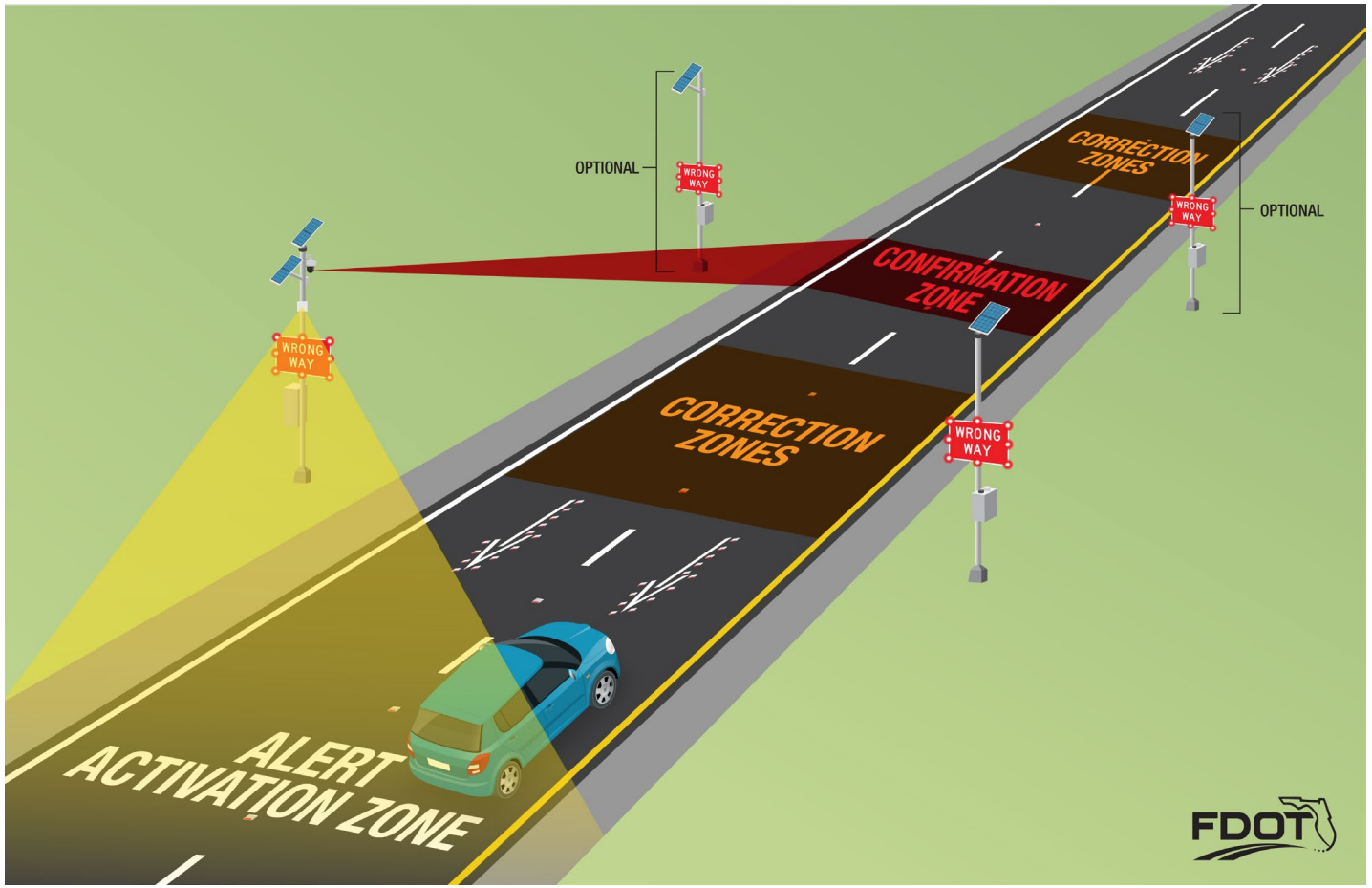


Drowning in Data

- WWVDS and MVDS generate massive amounts of continuous data
  - FDOT has an MVDS at least every half mile
  - Each MVDS sends data every 20 – 30 seconds
- Without disposal procedures, the Agency was at risk of:
  - Storage Bloat – in the Terabytes
  - Security Exposure
  - Policy Violation Risk
    - What's Valuable?
    - What's a Liability?
    - How do we decide?



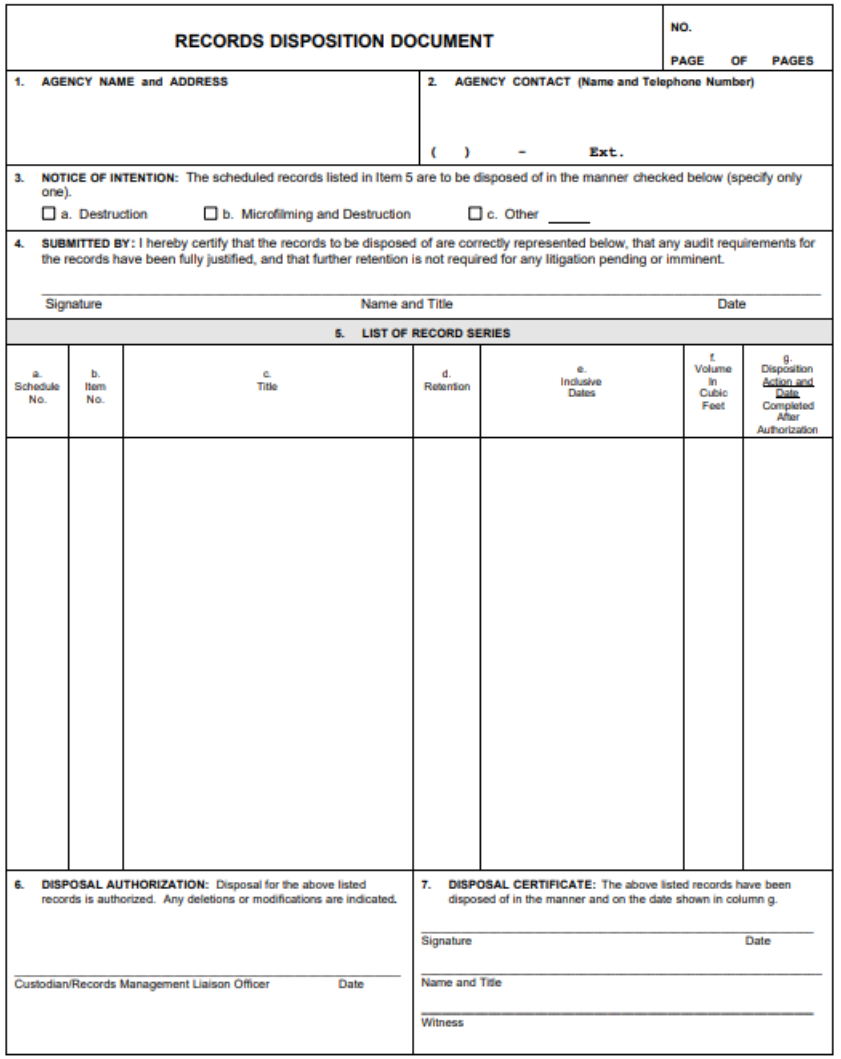
Creating the Procedure



- The TSM&O Group worked with the Offices of FDOT Legal, as well as Records Administration to:
  - Identify all existing schedules pertaining to video
  - Remove those that did not, or could not, apply to WWVDS
  - Check if more than one schedule could apply to WWVDS
    - In this case, the longest schedule would supersede
  - Investigate if an existing schedule could be expanded to include WWVDS video clips

"Not All Data Should Live Forever"

- Sensors are valuable, but their data ages quickly
- Old records can be more risk than benefit
- An existing retention schedule existed, but it wasn't optimized for ITS
  - For recordings by public agencies on "public roadways such as intersections" (GS1-SL(302))
  - The schedule was used to retain red light running footage
  - The retention requirement is 30 days
- We took state-level compliance requirements and operationalized them for transportation technology.
  - Clear, Standardized Workflows
  - Updated RTMC SOGs
  - Trained staff on the "why"
    - "not all data should live forever"



RECORDS DISPOSITION DOCUMENT | NO. | PAGE OF PAGES

1. AGENCY NAME and ADDRESS

2. AGENCY CONTACT (Name and Telephone Number)

( ) - Ext.

3. NOTICE OF INTENTION: The scheduled records listed in Item 5 are to be disposed of in the manner checked below (specify only one).

☐ a. Destruction ☐ b. Microfilming and Destruction ☐ c. Other ____

4. SUBMITTED BY: I hereby certify that the records to be disposed of are correctly represented below, that any audit requirements for the records have been fully justified, and that further retention is not required for any litigation pending or imminent.

Signature | Name and Title | Date

5. LIST OF RECORD SERIES

a. Schedule No.	b. Item No.	c. Title	d. Retention	e. Inclusive Dates	f. Volume in Cubic Feet	g. Disposition Action and Date Completed After Authorization

6. DISPOSAL AUTHORIZATION: Disposal for the above listed records is authorized. Any deletions or modifications are indicated.

Custodian/Records Management Liaison Officer | Date

7. DISPOSAL CERTIFICATE: The above listed records have been disposed of in the manner and on the date shown in column g.

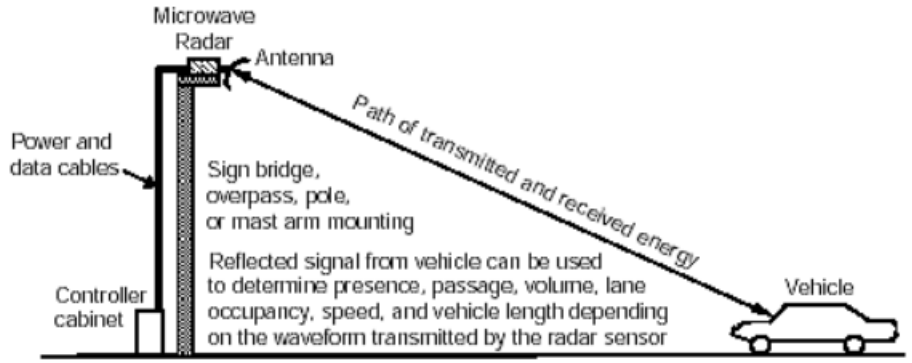
Signature | Date

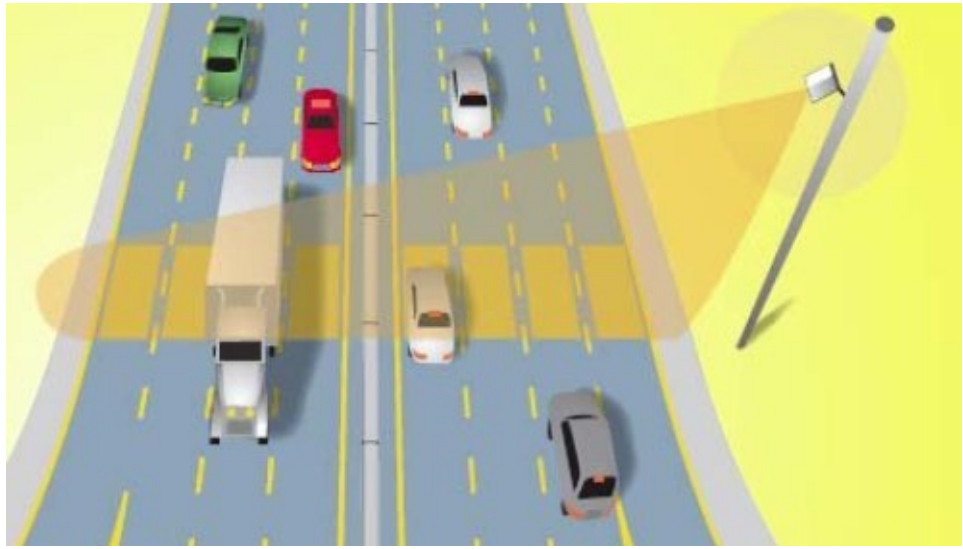
Name and Title

Witness

TSM&O Data Retention Policy and Procedure – MVDS

- We underwent a similar process for MVDS Data:
  - Investigate existing schedules
  - Confirm application to MVDS
    - 5 Year Retention Period
  - Update RTMC Procedures
- FDOT Central Office performed a “Pilot Purge” with FDOT District Six
- We then used the lessons learned from that experience to create a “cheat sheet” for the other Districts





Turning Policy into Procedure

- Developed Workflows
  - Repeatable, documented workflows for data retention and disposal
- Risk Reduction
  - Retention should not be an afterthought, it's core to Operations
- Compliance -> Governance -> Trust -> Scalability
- Scalability
  - We can take the lessons learned from ITS data governance and apply them to emerging technologies such as Connected Vehicle, Smart Work Zone, and Arterial ATSPM data.

Contact

James Landini

State TSM&O Program Development Engineer

Florida Department of Transportation, Traffic Engineering and Operations

James.Landini@dot.state.fl.us

Delaware Department of Transportation

Kerry Yost, PE
State TSMO Engineer
DelDOT Traffic Operations
Kerry.Yost@delaware.gov

Topic: Autonomous vehicles are here, now what?

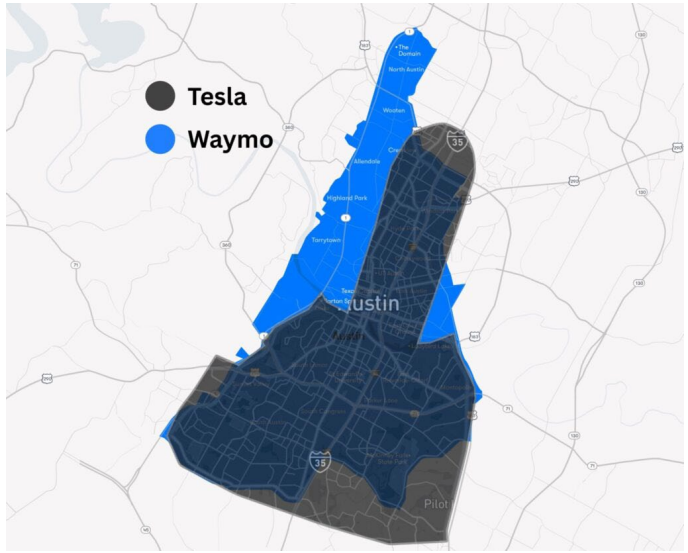
- Connected and Autonomous Vehicles (CAV)
  - Connectivity – communication with vehicles (V2V), infrastructure (V2I), everything (V2X)
  - Automation – self-driving technology and driver assist features

- Let's focus on the "AV" – impacts on Traffic Operations and TMC's
  - More or less crashes? How about severity?
  - Who decides where AV's will route? Will it be predictable?
  - Will TOD travel patterns change?
  - The "mixed fleet" (humans and self-driving)?

"Our role as a TMC evolves from traffic management *to* *mobility orchestration"*

– someone smarter than me

Topic: Autonomous vehicles are here, now what?



- Have we considered?
  - AV's behave predictably, human drivers introduce randomness
  - Autonomous operations should be significantly more efficient
  - Adding today's "non-drivers" – youth, elderly, persons with disabilities
  - Future needs for increased capacity
  - Current TMC staffing challenges vs. future workforce KSA's
  - The "mixed fleet" could be quick or happen over 10/20/30 years
  - Incident management without drivers
  - Ethical dilemmas like prioritizing emergency AV routes, ensuring equitable AV routing for underserved communities, liability resolution, regulatory responsibility
  - Performance metrics

  - So…much…data…, who owns it, how is it shared, what data is needed/wanted

Topic: Autonomous vehicles are here, now what?

- How do we evolve from managing traffic reactively to strategically coordinating a system that includes AV's?

- As AV's change travel behavior and safety dynamics, how should we redefine performance metrics for our TMC's?

"The TMC will grow into a mobility intelligence hub"

– another smarter person

Delaware Department of Transportation

- Contact:

  Kerry Yost, PE
  State TSMO Engineer
  DelDOT Traffic Operations
  Kerry.Yost@delaware.gov

Alabama Department of Transportation

Bryson Moultry, P.E.
Transportation Systems Performance Manager
ALDOT – Central Office
moultryb@dot.state.al.us

South Alabama's Historic January 2025 Snowstorm

From Jan 20-28, 2025, a state of emergency for 39 counties was declared in anticipation of a significant winter storm. At the time snow forecast across southern Alabama was expected to fall between 2-6".

Winter Storm Prep Operations

Roadway treatment began 72 hours prior to predicted start of snowfall.

- Focus for pre-treatment begin on the interstates by treating the inside/left lanes of our interstates and all overpasses and bridges
  - West Central Region (Tuscaloosa): 129 miles
  - Southeast Region (Montgomery): 172
  - Southwest Region (Mobile): 175

Total INT miles to be treated: **476**

- Pretreated major state/US routes with known areas of prior freezing

Materials and Test:12-hour days of salt brine production.

- This moved to 24/7 production to keep up with demand mid event and continued through the duration of both events.

Prep WCR/SER/SWR - Traffic Management Centers

- Assigned additional staff to 2nd shift. (Severe weather began @ 1pm)
- Supplied TMC:
  - ❖ Food/Beverages/Air Mattresses in prep for lock-in.

South Alabama's Historic January 2025 Snowstorm

By Wednesday morning, the National Weather Service recorded ranges of snowfall from 2-11" across south Alabama with temperatures as low as 9 degrees in some areas with a high of mid 30's statewide.

Crash Report Jan 21-24

SERTMC (Montgomery)

- Jan 2025: 1338 crashes 41%> Jan 2024
- 335 Crashes - 25% of Jan total crashes happened during 4-day snow event
- Avg. Crash Duration: 6.5hrs
- Avg. Snowfall: 4.8in

SWRTMC (Mobile)

- 27 crashes during 4-day snow event
- Avg. Crash Duration: 4.7hrs
- Avg. Snowfall: 7.5in

Alabama DOT

- Contact:
  - Bryson Moultry P.E.
  - Transportation Systems Performance Manager
  - ALDOT – Central Office
  - moultryb@dot.state.al.us

Questions?

Wisconsin Department of Transportation

Chris Hager
Traffic Management Unit Supervisor
Wisconsin DOT – Bureau of Traffic Operations
christopher.hager@dot.wi.gov

WisDOT: Topics for Discussion

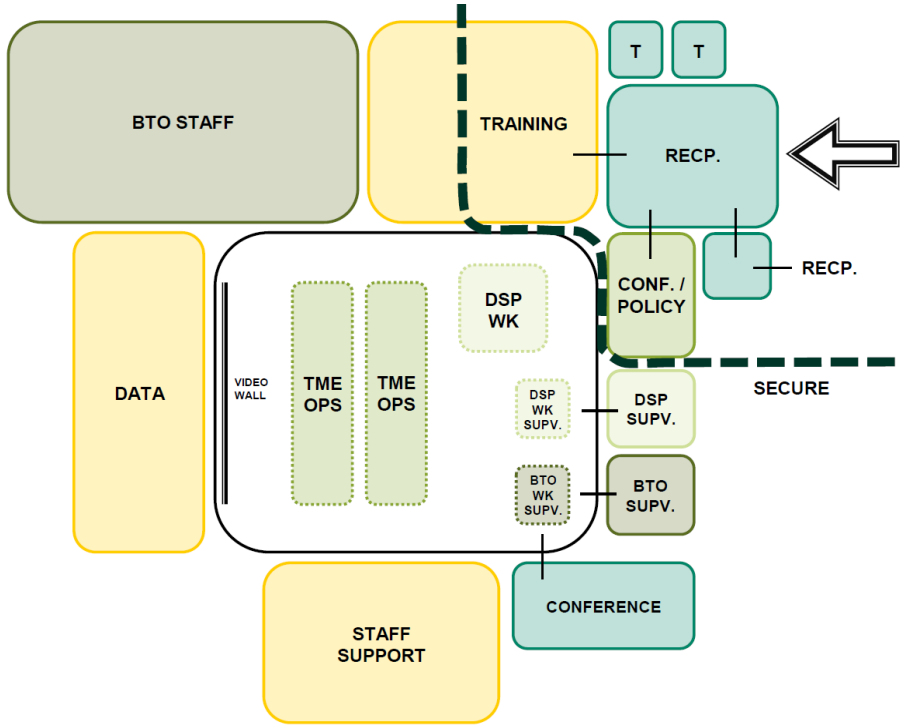
Updates:

- Space and Needs Analysis for the TMC
- Update to 511 Winter Weather Conditions
- Flex Lane
- Freeway Service Teams
- Video Analytics
- Wrong Way Driving
- Audit Program
- WZDx
- Truck Parking
- Coordination with Minnesota DOT for the design/build of Blatnik Bridge Project
- Replacement of back-end video wall projection system
- Large scale events:
  - RNC (Aug 2024)
  - NFL Draft (April 2025)
- 2024 Annual Report

TMC Needs and Space Analysis

- Study began in December 2024 to conceptualize TMC requirements for a new location
  - Concepts with and without State Patrol Dispatch
  - Concept 1 – Repurpose Existing Space
  - Concept 2 – Footprint for a yet to be determined location
  - Concept 3 – Repurpose a state facility in Waukesha
  - Potential for a fourth site under development

Pros	Cons
• Continuous control room operations • Leverages existing restroom spaces • Reorganized, better access to daylight • Technology upgrades • Better office neighborhood layout	• Multiple phases and moves • Less accommodating building • Control room height limitations • Less secure • Parking is challenging • No room for further growth



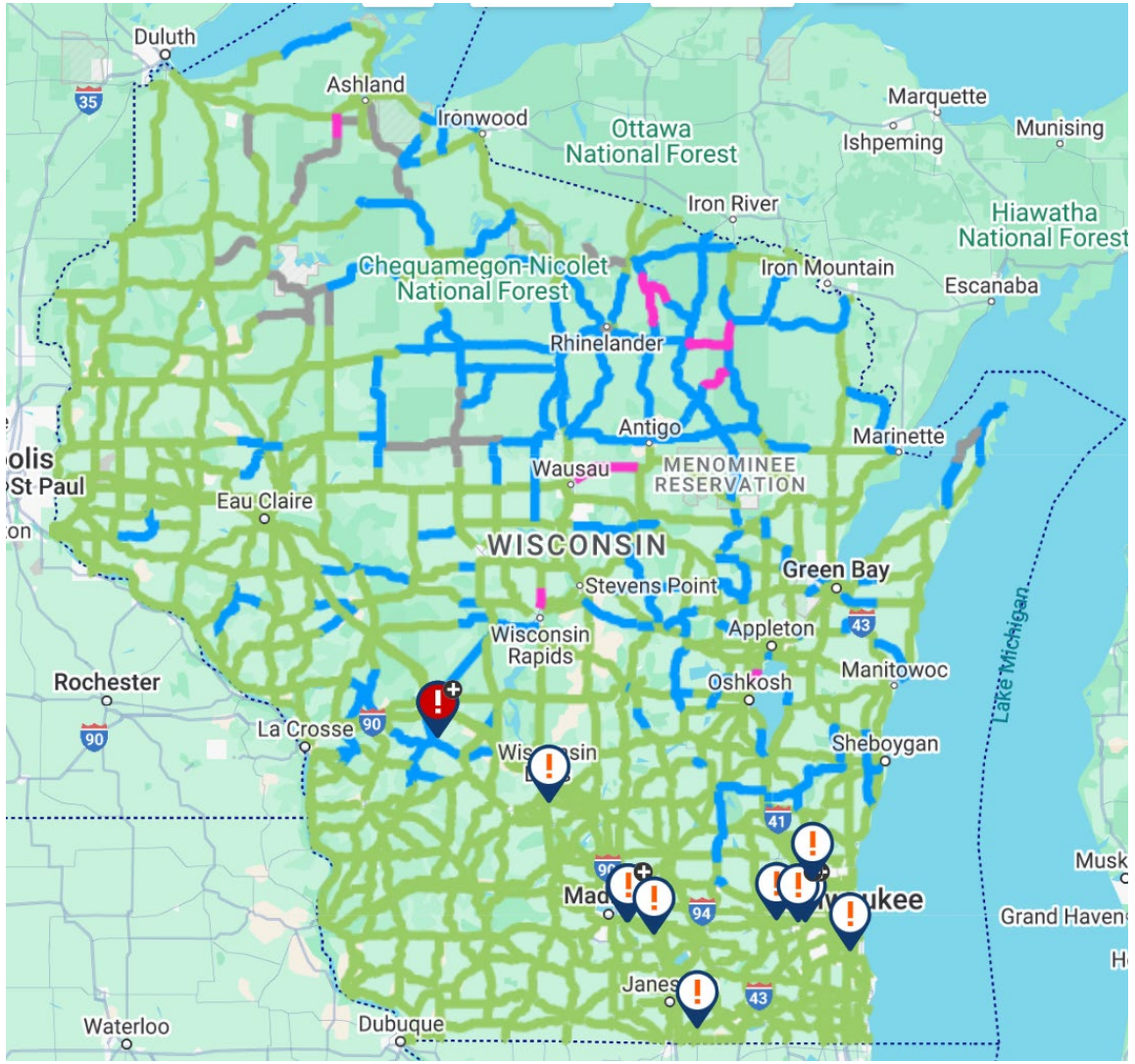
511 Winter Weather Road Conditions Update

511 Layers

- [ ] Traffic Speeds
- [x] Winter Road Conditions

Normal | Partially Covered | Completely Covered

Travel Not Advised | No Report



Flex Lane

In 2024, the Flex Lane continued to be beneficial in alleviating congestion on a daily basis and during these unique situations:

The TMC routinely monitors Flex Lane operations and works with the ITS maintenance contractor to provide timely repairs.

11 Openings for special events (Badger games, UW graduation, dignitary visits)

101 Partial openings in response to crashes, disabled vehicles and maintenance activities

Throughout the year, however, there were some instances that impacted Flex Lane operations, including:

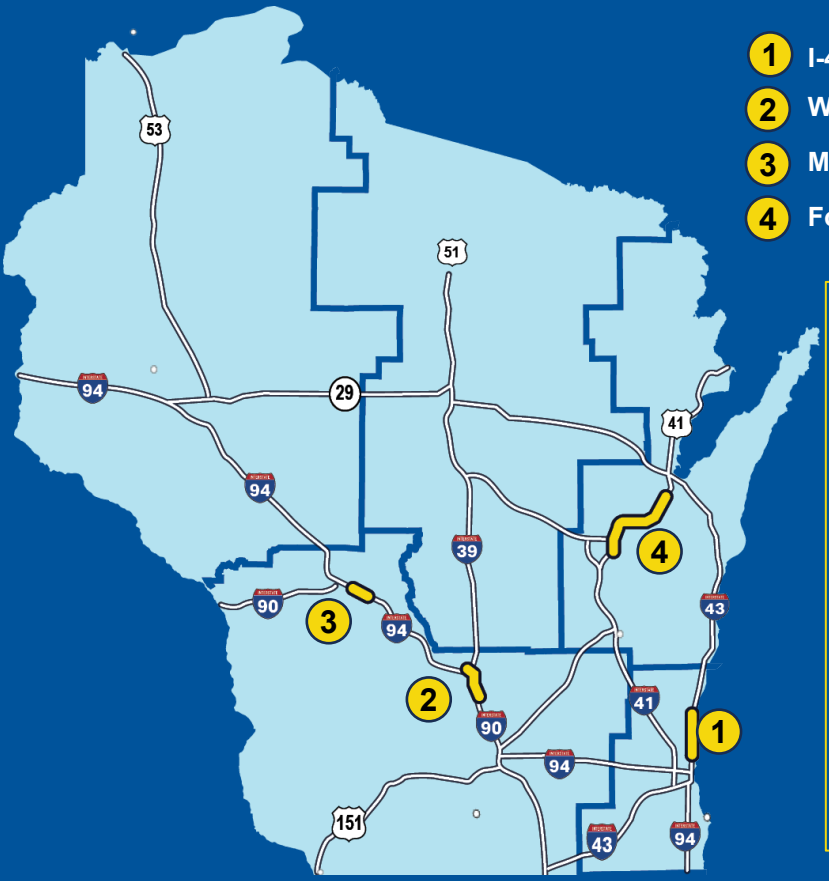
10 Severe weather days

189 Disruptions due to disabled vehicles, crashes, fire, and law enforcement activities

12 System outages, seven of which impacted Flex Lane operations

WisDOT's Freeway Service Team (FST)

Originally initiated in 1998, WisDOT's Freeway Service Team (FST), partially sponsored by GEICO©, provides assistance to motorists in need to improve safety and reduce roadway mobility impacts. These teams patrol designated high-traffic corridors as well as work zones during each construction season.

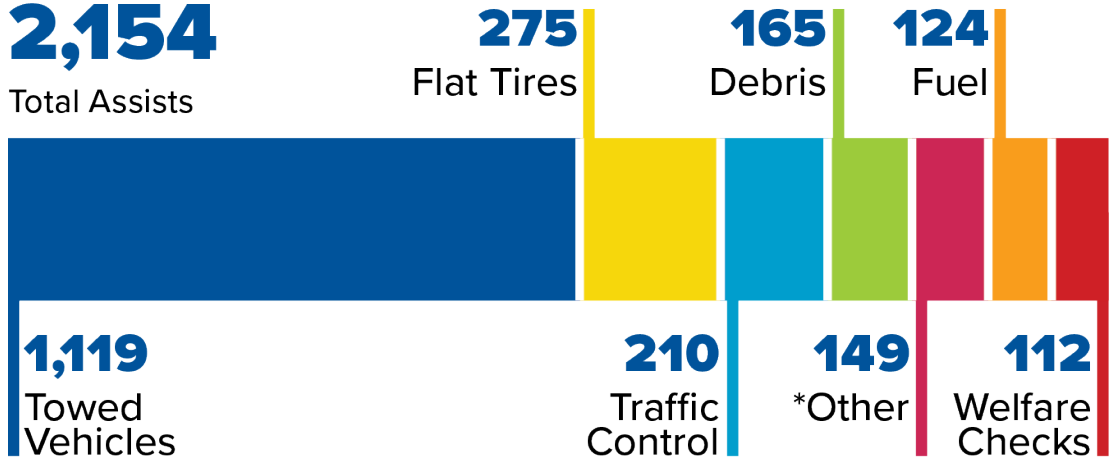


1. I-43 Project
2. Wisconsin River Bridge Project
3. Mauston Interchange Project
4. Fox Cities Routes

The FST helps to relocate disabled vehicles, provide fuel, handle minor repairs, remove roadway debris, and assist with traffic control at crash scenes. The actions of FST drivers are especially effective in work zones due to the reduced capacity and close proximity of traffic and workers that roadway maintenance activities present.

Additionally, WisDOT contracts with the Dane County Sheriff's Office to provide FST coverage on the Madison Beltline throughout the year.

WisDOT FST Patrol Motorist Assists

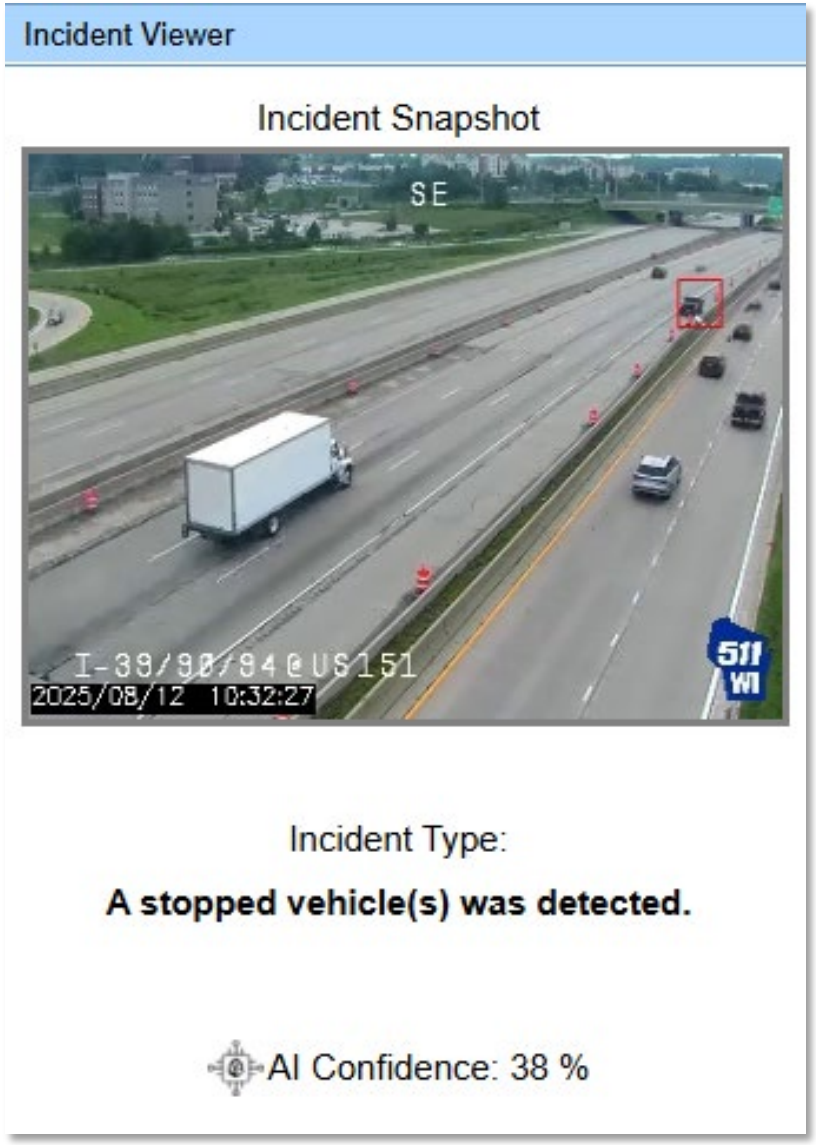


Dane County Sheriff's Office FST Program Adds Debris Removal Device to Trucks

In 2024, the Dane County Sheriff's Office was called to remove roadway debris 993 times and pushed roadway obstructing vehicles 271 times. To increase efficiency and safety while completing these services, they installed a debris removal device on the front of freeway service vehicles.

Video Analytics Pilot

- TrafficVision
- Automated Incident Detection (AID)
- 6-month pilot project
- 75 cameras
  - Locations: higher levels of incidents, recurring congestion, debris, pedestrians, bikes, etc.



Live Camera Video and Data

Camera: < > CCTV-13-0170

AutoLearn: **Active** Presets: **Active** View Quality: 73 Drift: 3

Per Side

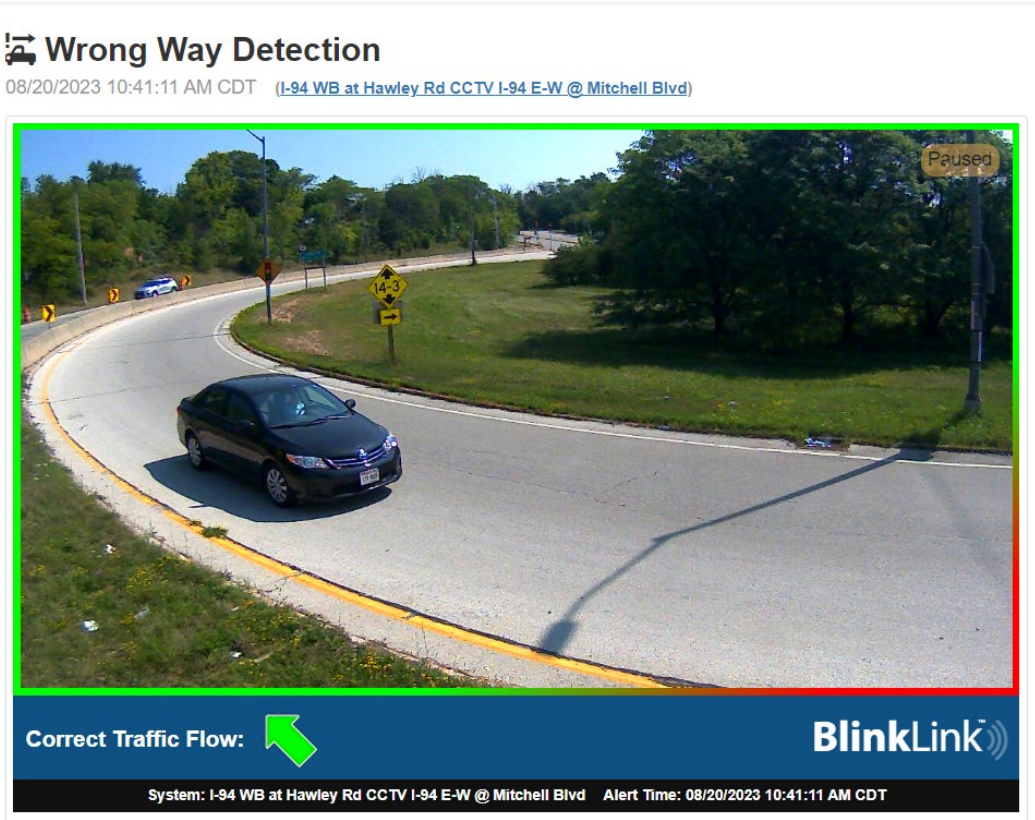
Side	Speed (mph)	Flow Rate (vph)	Occupancy (%)
Far	54	4560	21
Near	62	4440	11

Per Lane

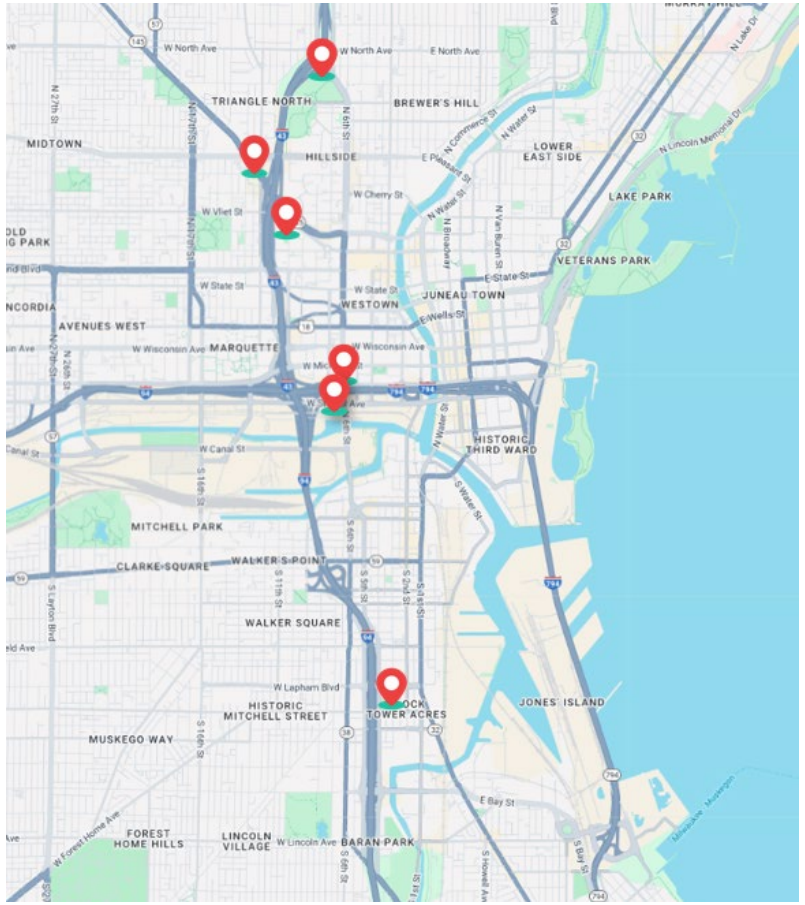
Lane	Speed (mph)	Flow Rate (vph)	Occupancy (%)
1: (NS-1)	57	300	4
2: (NS-2)	62	1320	13
3: (NS-3)	61	1500	16
4: (NS-4)	67	1320	11
5: (NS-5)	78	0	3
6: (FS-1)	79	0	6
7: (FS-2)	54	1980	25
8: (FS-3)	53	1440	20
9: (FS-4)	51	1140	22

New Wrong Way Driver Detection

- 10 new locations
- Milwaukee, Madison, Wausau
- Expected to be online fall 2025
- TMC attending first responder meetings

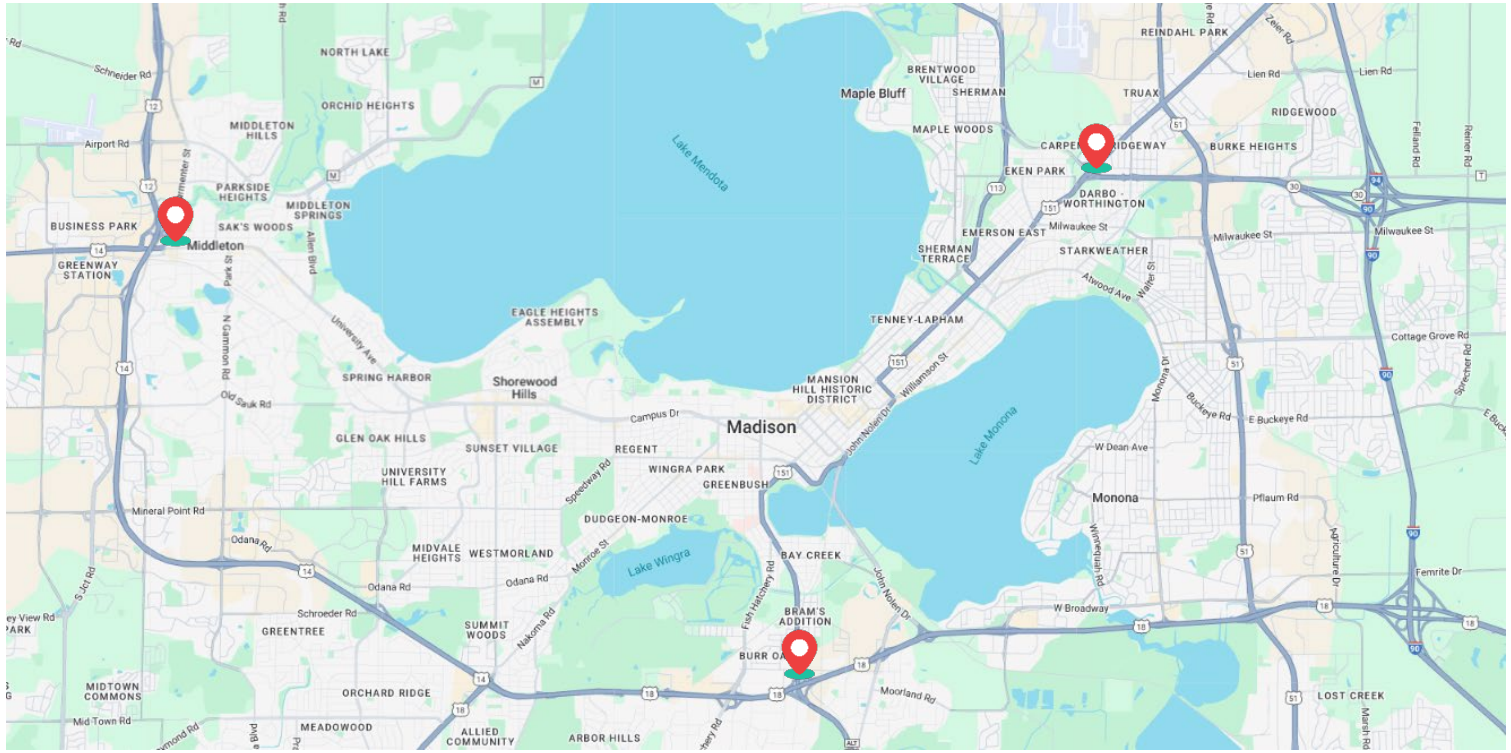


New Wrong Way Driver Detection



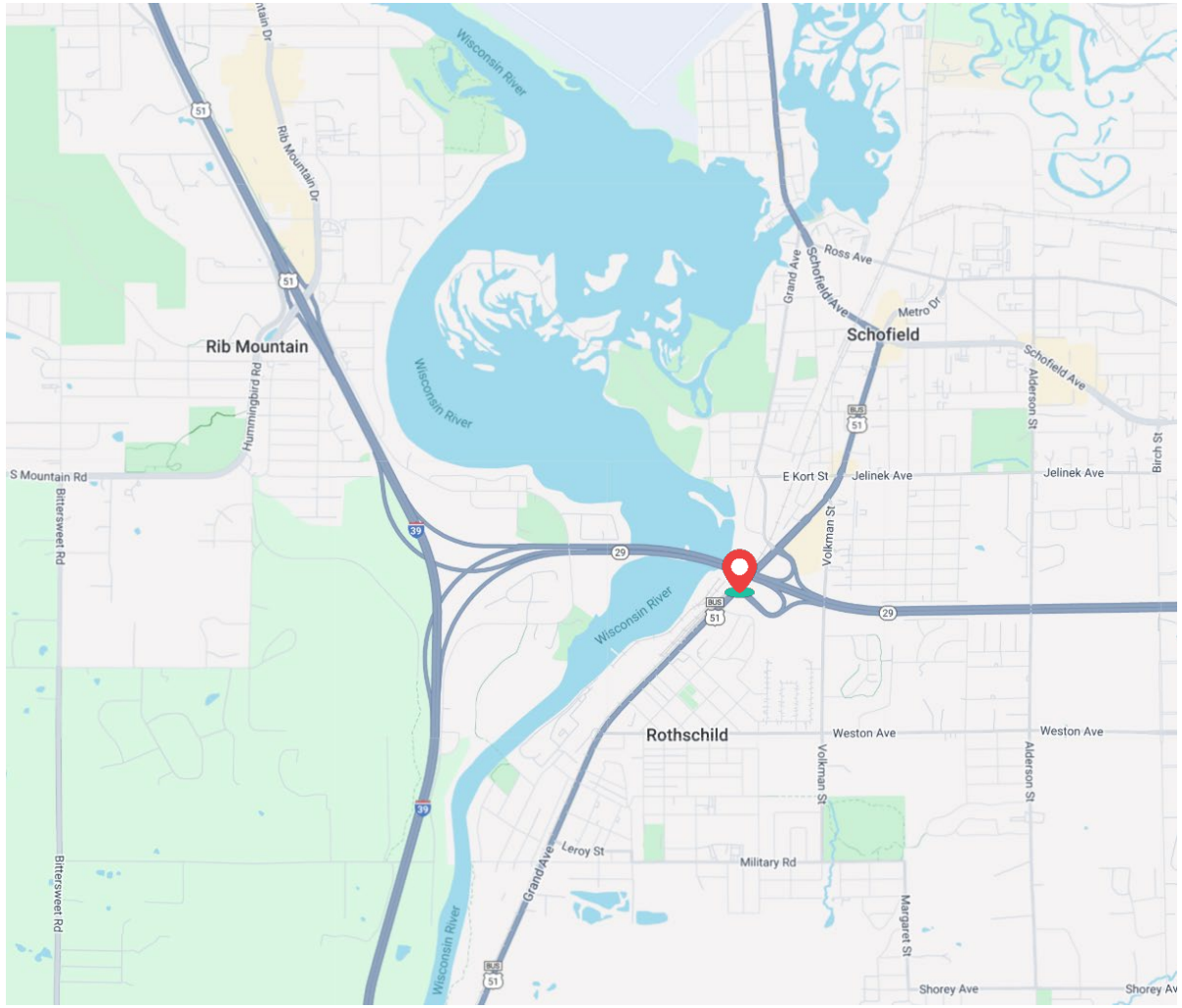
SE Region / Milwaukee County
I-43 NB exit to Lapham Blvd.
I-43 NB exit to WIS 145 / Fond du Lac Ave.
I-43 SB exit to WIS 145 / Fond du Lac Ave.
I-43 NB exit to North Ave.
I-794 EB exit to St. Paul Ave.
I-794 EB exit to James Lovell

New Wrong Way Driver Detection



SW Region / Dane County
US 12/18 WB exit to Park St.
US 12/14 WB exit to University Ave.
WIS 30 WB exit to US 151 / E. Washington

New Wrong Way Driver Detection



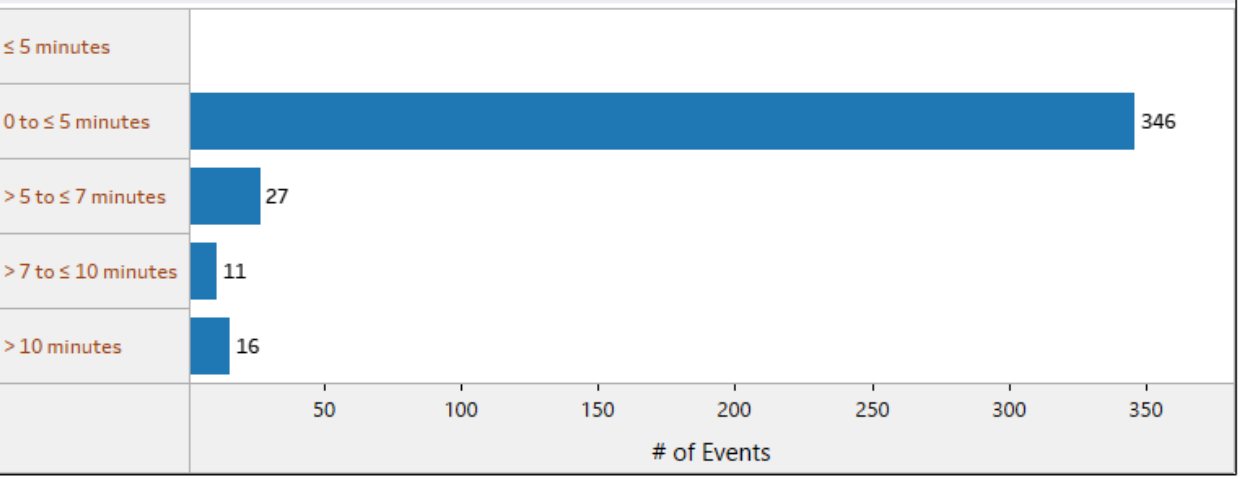
NC Region / Marathon County

WIS 29 EB exit to B51 / Grand Ave.

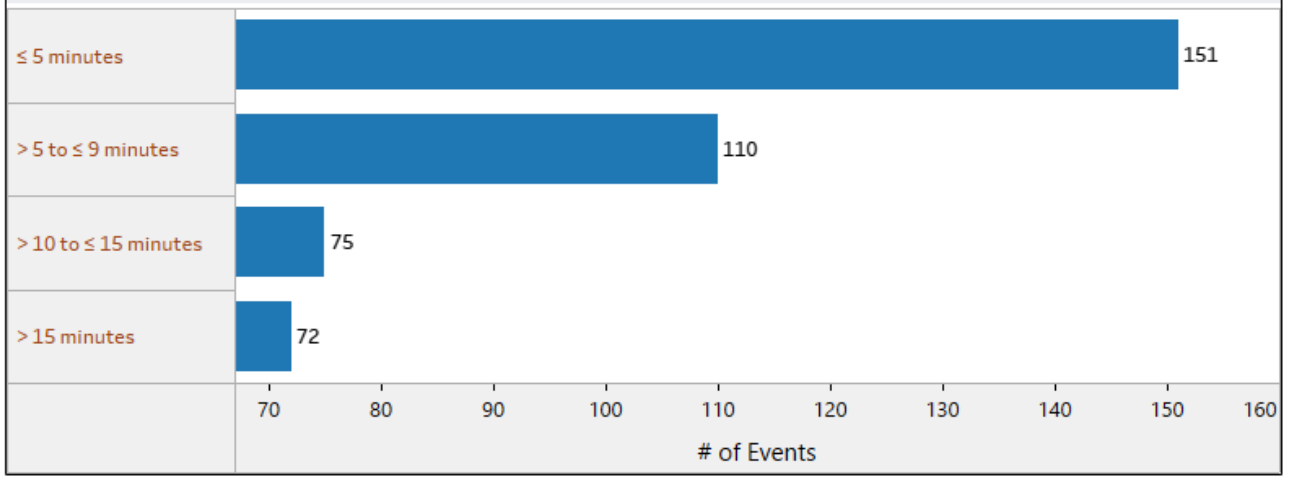
Wisconsin TMC Control Room Audit Report - Response Times

Incident Date	Select Region(s):	Select County(s):	Select Shift(s):	Select Operator(s):
9/18/2023 – 12/3/2024	(All)	(All)	(All)	(All)

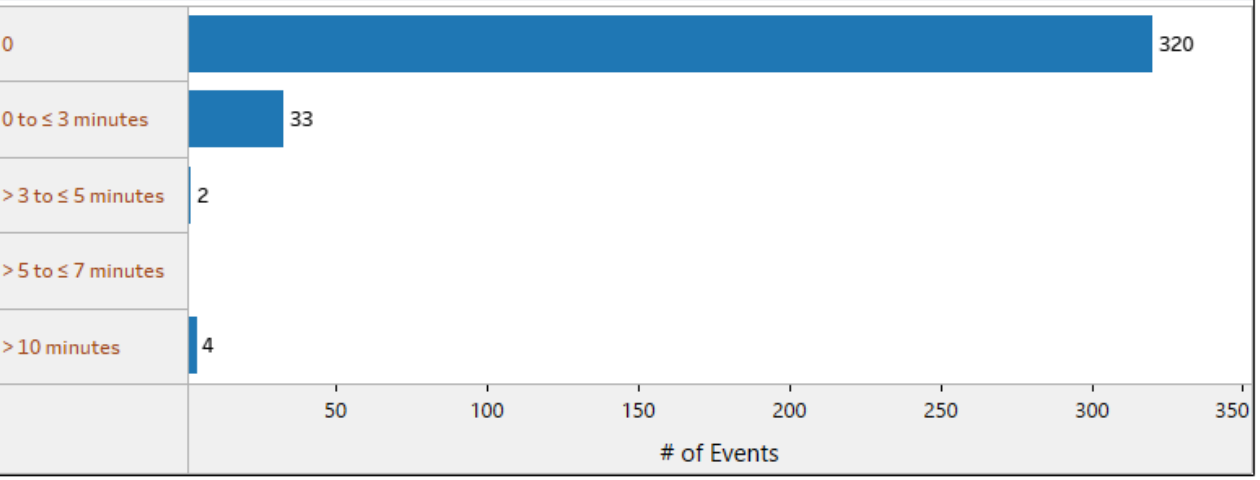
API Response Time from event confirmation to API



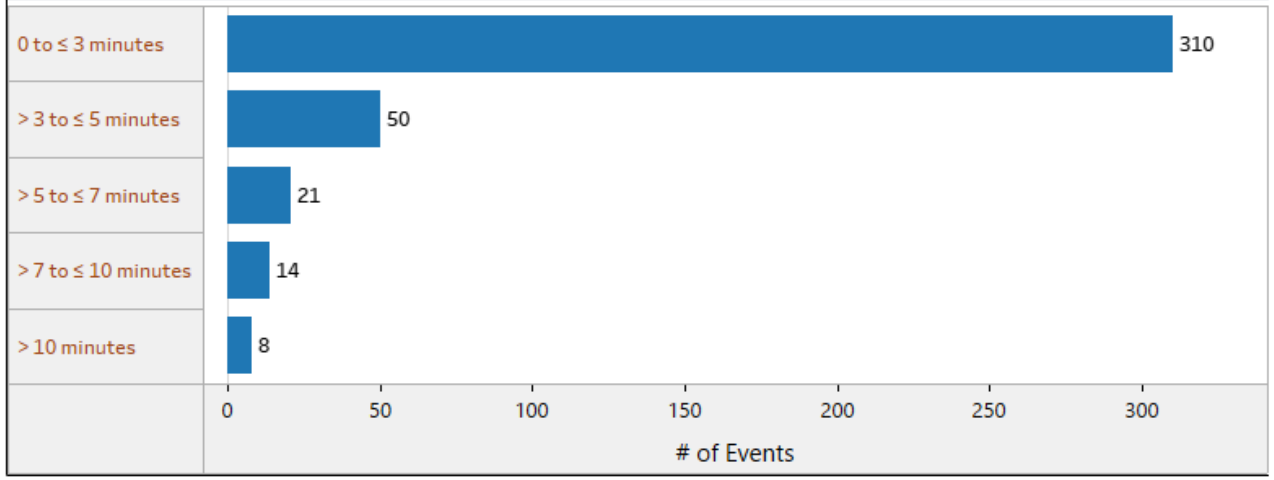
TIA Time from event identified (or severity change) to first TIA sent



DMS Use Time from event notification to first DMS activation



ATMS Event Time from notification to event entered



Wisconsin TMC Control Room Audit Report - Subscores

Incident Date
Sep 2023 — Dec 2024

Select Region(s): (All)

Select County(s): (All)

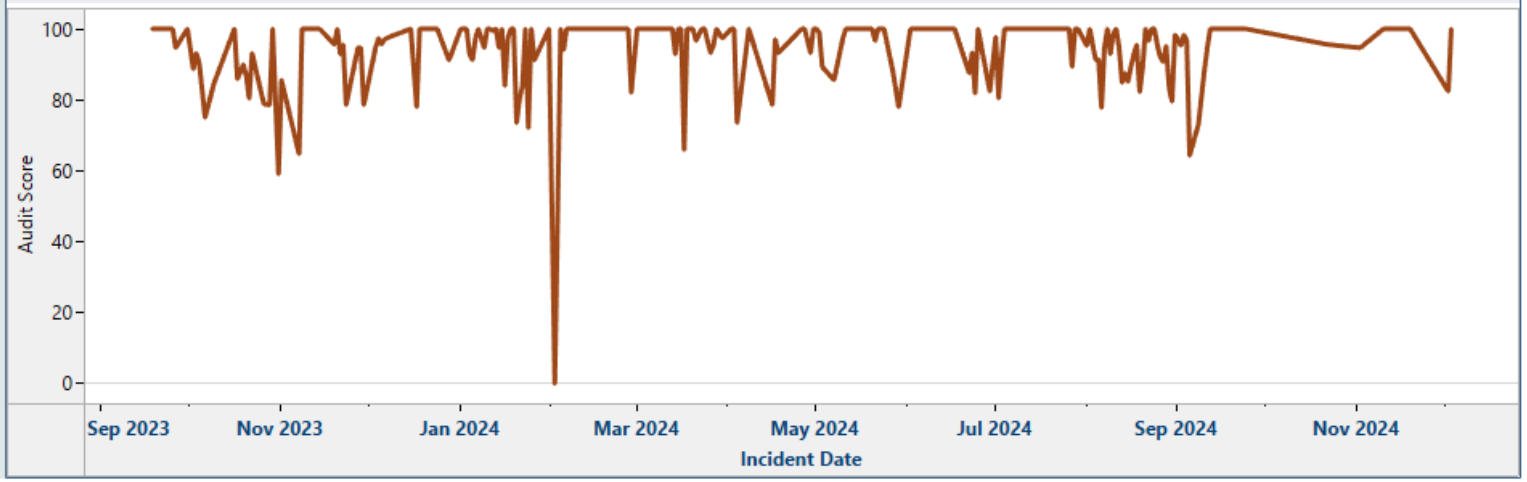
Select Shift(s): (All)

Select Operator(s): (All)

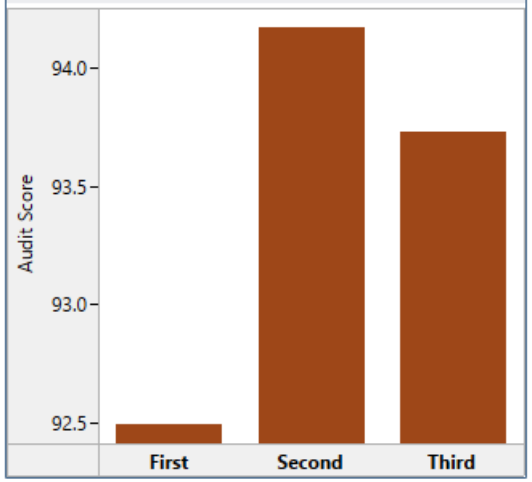
Select an Incident Type to view the Subscores:

- (•) API Response
- ( ) ATMS Event
- ( ) Cross-Shift Data Transfer
- ( ) DMS Use
- ( ) Proper Notification
- ( ) SINS
- ( ) TIA

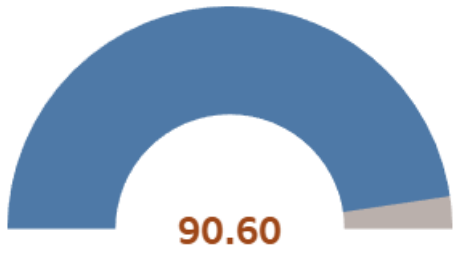
API Response Subscore by Month



API Response Subscore by Shift



Average Audit Score



Average ATMS Score

Average API Score

Average SINS Score

Average DMS Score

Average TIA Score

Average Notification Score

Wisconsin TMC Control Room Audit Report - Response Accuracy

Incident Date	Select Region(s):	Select County(s):	Select Shift(s):	Select Operator(s):
9/18/2023 – 12/3/2024	(All)	(All)	(All)	(All)

Yes
Partial
No

Top 3 most accurate Responses

Email free of spelling / grammar issues?	95%
Location Accuracy	95%
SINS closed out appropriately?	93%

Responses in Need of Improvement

Additional DMS activated based on severity?	58%
Appropriate questions asked? (SINS)	62%
Proper (or sufficient) incident timeline? (SINS)	56%

ATMS EVENT

Location Accuracy

95%

Correct Configuration entered?

15% | 84%

DMS USE

Nearest upstream DMS activated?

9% | 91%

Additional DMS activated based on severity?

34% | 9% | 58%

Proper DMS message(s) used?

19% | 76%

Travel times removed (if full closure)?

10% | 90%

Proper syntax used?

15% | 83%

DMS updated as incident changed?

8% | 11% | 82%

API

API information posted accurately?

11% | 87%

Alternate route included and accurate in API?

21% | 8% | 71%

Proper syntax used?

11% | 87%

API updated accurately and timely?

8% | 88%

TIA

TIA information posted accurately?

15% | 82%

TIA updates sent in a timely manner?

13% | 82%

Proper syntax used?

16% | 82%

Correct information in updates?

14% | 83%

SINS

Correct incident type and category used?

9% | 13% | 78%

Appropriate fields entered?

17% | 81%

Information accuracy?

22% | 75%

Proper (or sufficient) incident timeline?

22% | 21% | 56%

Appropriate questions asked?

10% | 28% | 62%

SINS closed out appropriately?

7% | 93%

Proper Notification

RIMC notified in reasonable time?

16% | 84%

Appropriate groups notified?

16% | 8% | 75%

Significant/Internal notification email sent? (2)

28% | 72%

Email free of spelling / grammar issues?

95%

Cross Shift Data Transfer

Was correct passdown made?

7% | 16% | 77%

Was accurate information included in the passdown?

12% | 17% | 71%

Wisconsin TMC Control Room Audit Report - Overall Scores

Incident Date 9/18/2023 — 12/3/2024

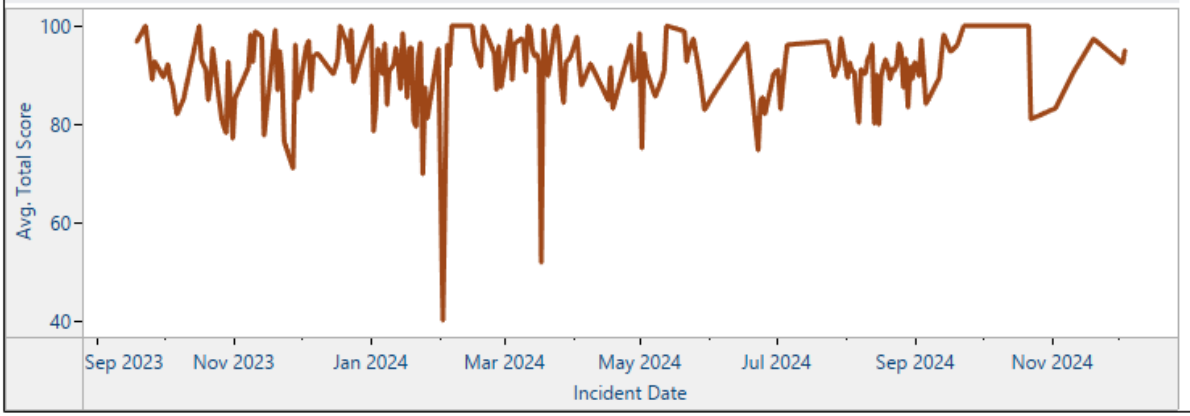
Select Region(s): (All)

Select County(s): (All)

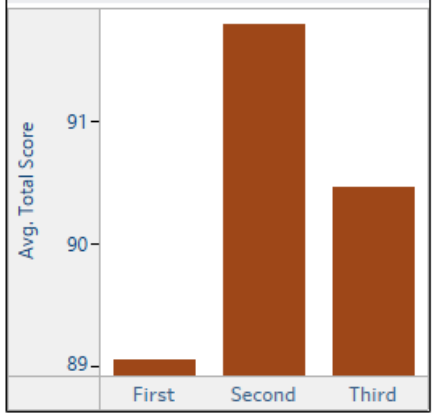
Select Shift(s): (All)

Select Operator(s): (All)

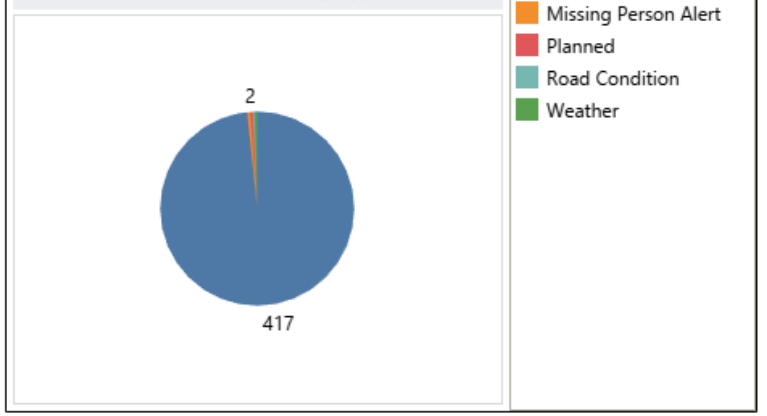
Average of Total Score



Average of Total Score by Shift



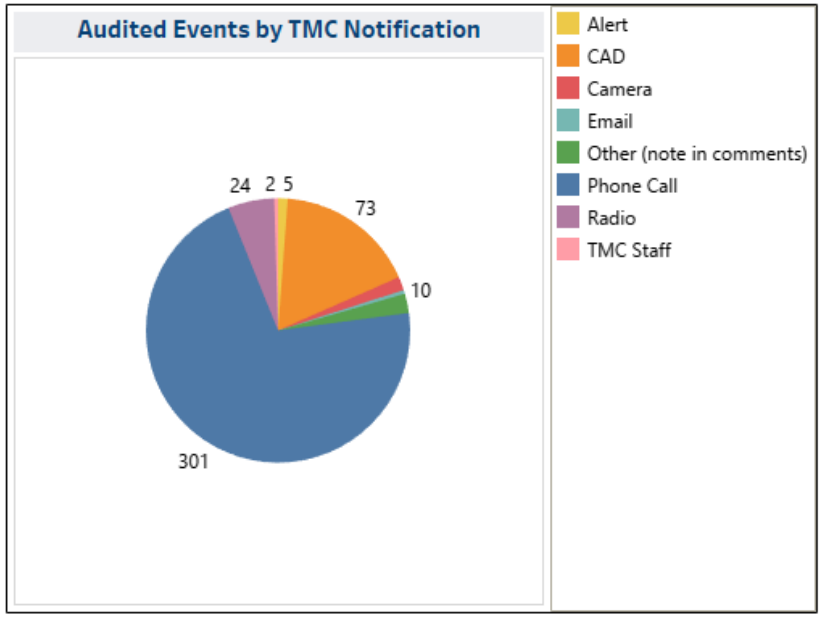
Audited Events by Type



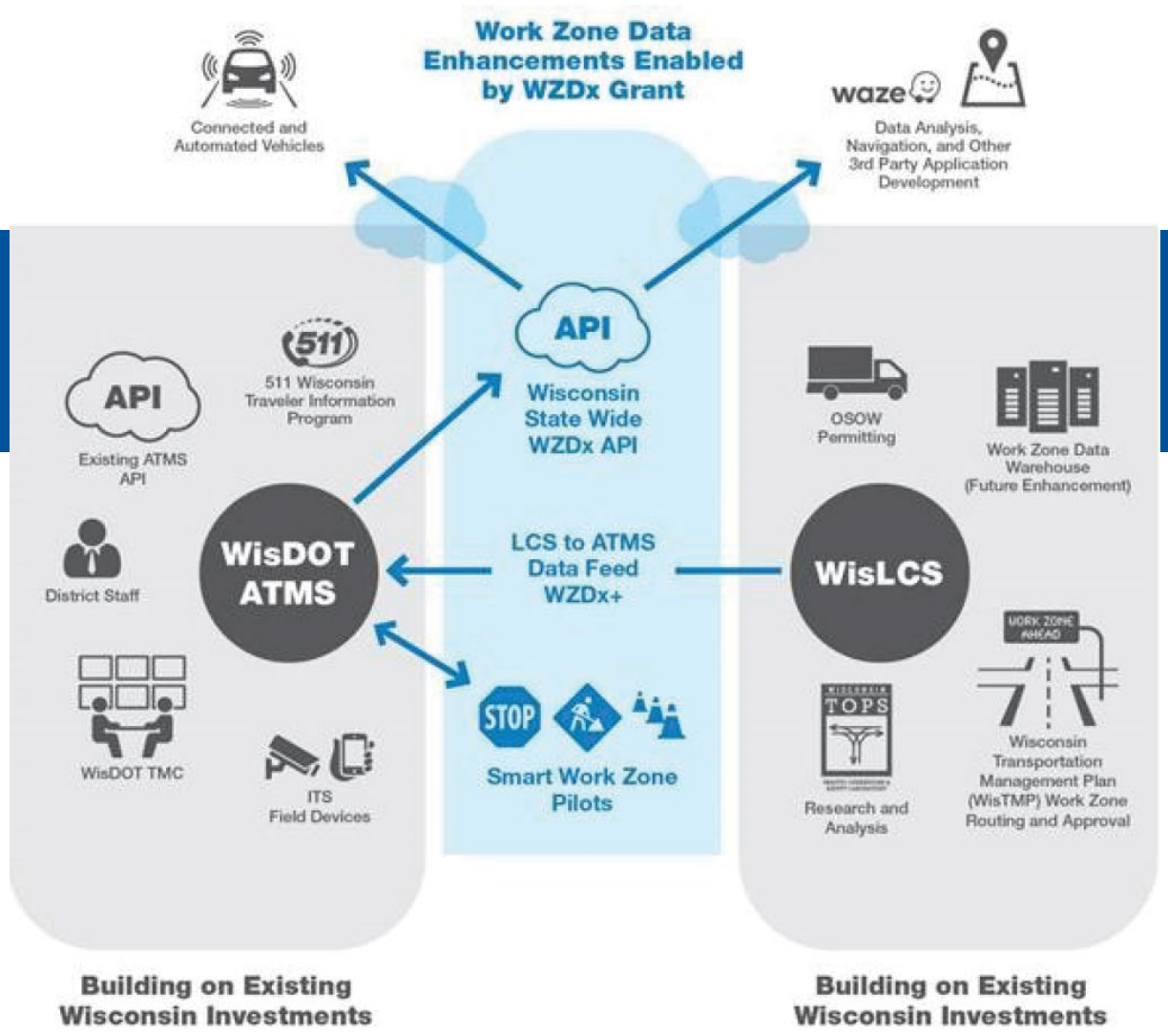
Audit Totals

Initial Operator/ Specialist/Supervisor:	Bowgren, Brent	Carlozzi, Maggie	Krueger, Chris	Lepak, Ashley	Nauman, Scott	Total
Bowgren, Brent				59.85		59.85
Carlozzi, Maggie	89.00		89.84	92.30	83.62	91.06
Castillo, Bernardo			99.11	91.47		94.39
Flanagan, Macy			96.72	93.75		96.20
Hanson-Clope, Jen	90.59			86.75	82.64	86.97
Kehl, Angela			95.38	85.95		87.66
Krueger, Chris			80.52	93.26	95.00	92.35
Lancelle, Kevin	96.26			89.72	89.06	93.07
Lepak, Ashley				95.61		95.61
Losos, Mark			92.16	91.54	90.76	91.68
Lumpkins, Felicia		95.40	96.09	88.93		90.81
McDonald, Robin	87.31	87.50		88.63	51.35	87.33
McLaughlin, Topher	84.69	92.33	95.83	89.18	88.90	87.91
Moreno, Rebecca				92.58		92.58
Nauman, Scott	94.59			88.57		91.58

Audited Events by TMC Notification



Work Zone Data Exchange (WZDx)



WisDOT uses connected devices (arrow boards and work zone start and end location markers) in work zones to gather and share real-time information enhancing safety for the public and workers.

FHWA highlights that improving access to work zone data is crucial for the USDOT's Data for Automated Vehicle Integration (DAVI) initiative, as up-to-date road condition information aids both automated driving systems (ADS) and human navigation.

These systems rely on:

- ✓ Hardware on traffic control devices and communications software to share real-time work zone information via the Work Zone Data Exchange (WZDx) specification.
- ✓ WisDOT uses data from the Wisconsin Lane Closure System (WisLCS) to publish a WZDx feed through the advanced traffic management system (ATMS), updating planned events to real-time status.

WisDOT: Quick Hitters

- Truck Parking
- Coordination with Minnesota DOT for the design/build of Blatnik Bridge Project
- Replacement of back-end video wall projection system
- Large scale events:
  - RNC (Aug 2024)
  - NFL Draft (April 2025)

2024 Annual Report

WisDOT Traffic Management Center

Bureau of
Traffic Operations

West Virginia Department of Transportation

Ashlee Wilson
TMC Supervisor/Assistant 511 Coordinator
Transportation Management Center
Ashlee.D.Wilson@wv.gov

HELP Alerts/Drivewyze

HELP Alerts

- Two-way emergency communications (WEA sound is heard and includes a link to an event-specific website, where motorists can opt-in for ongoing guidance from DOH. When the event is over, everyone is opted out and all personally identifiable information is removed.
- No preregistration required
- Geo-targeted alerts
- Uses WEA (Wireless Emergency Alerts) The alert is heard when inside or entering the geofenced area

Drivewyze

- Used to issue Emergency Alerts that will appear on commercial truck drivers' in-cab equipment.
- Able to quickly disseminate actionable information relevant to CV
- Will issue alerts inside and outside of WV if needed
- Decreases complications caused by CV diverting to routes not suitable for large vehicles

WV is also currently exploring options to include weight/height/restricted route information for CVs on WV511

Road Forecasting

We are hoping to introduce road forecasting soon, does anyone else do this, how is it being done?

Links

- Help Alerts

https://ilogcorp.com/iris/iris_transportation.aspx

WV DOT TMC

- Contact:
  - Ashlee Wilson
  - TMC Supervisor/Assistant 511 Coordinator
  - Transportation Management Center
  - Ashlee.D.Wilson@wv.gov

  - Jim Lambert
  - TMC Manager
  - Transportation Management Center
  - Jim.E.Lambert@wv.gov

Utah Department of Transportation

Chris Siavrakas, P.E., PTOE
Traffic Operations Engineer
Utah Department of Transportation
csiavrakas@utah.gov

Technical enhancements

Technical enhancements

- TMS Software migration complete
  - Southwest Research Institute (SwRI)
  - Mindhop – Data Exchange/Dashboard

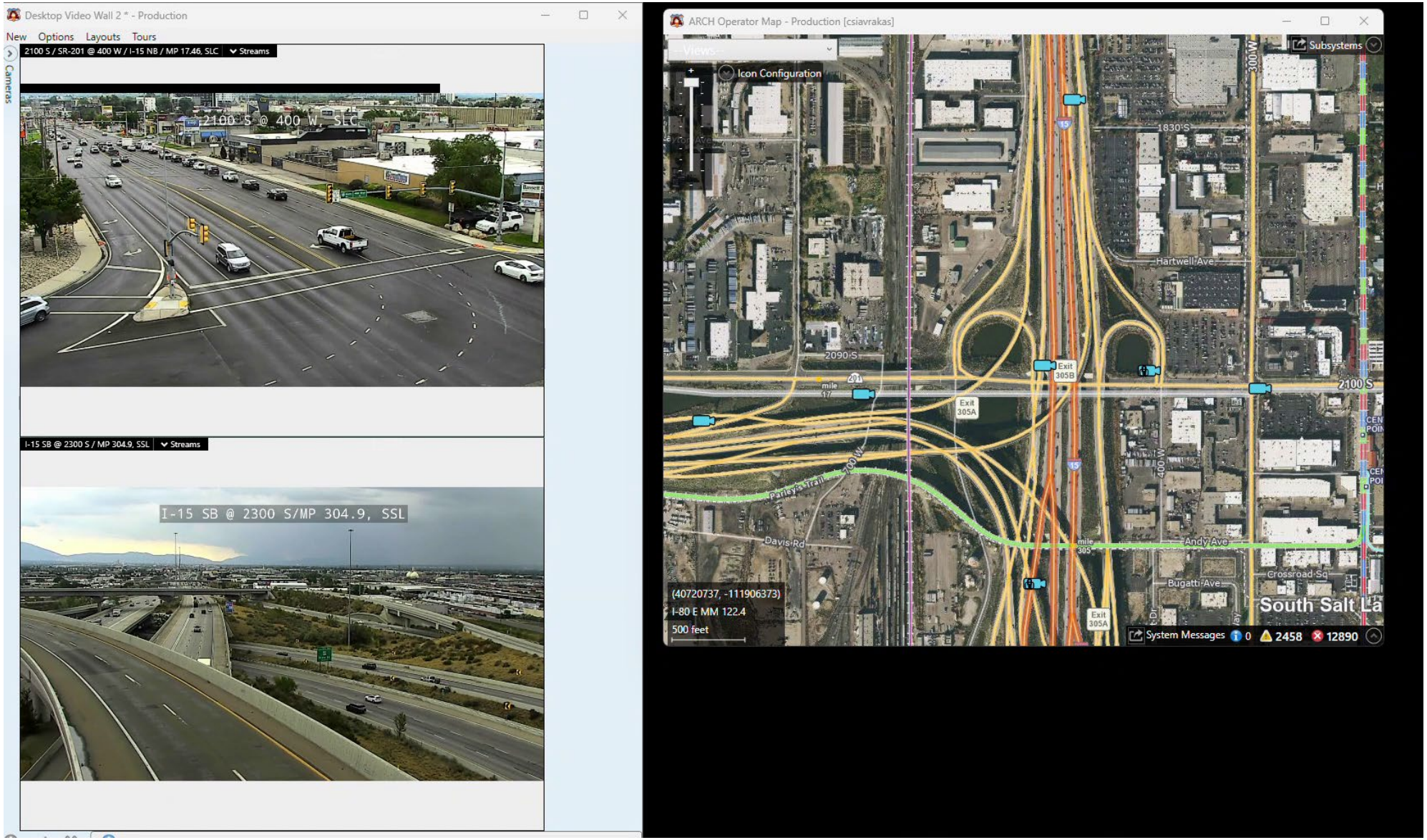
Integration of the Wrong-way Driver alert system into TMS

Public Safety Radio system migration – P25 communication standard

Text Alert System – FCC change of protocol for SMS marketing behavior.

Variable Speed Limit – Research for machine learning model – “Very impressed!”

Technical enhancements



BDX BEEHIVE DATA EXCHANGE

Map | Dashboards

Create Event

Traffic

Events

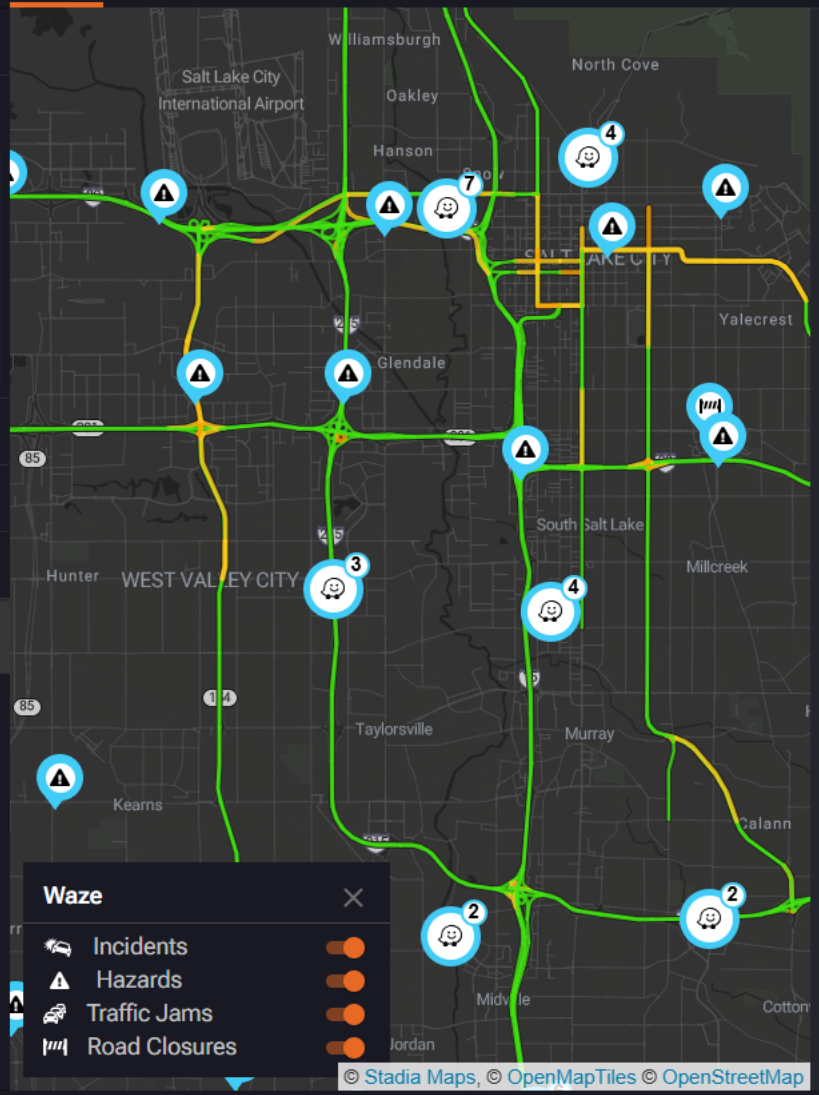
- Incidents
- Construction / Work Zones
- Special Events
- Waze

Weather

Other

Map Styles

Clear All Layers



Current | Historic

Select Columns

Search

Drag a column header and drop it here to group by that column

Event ID	Location	Start	End	C...	Se...	Type	Description	Age...	C.	O...
13988	I-215	09/04/25 09:05 AM	09/04/25 11:07 AM		Minor	Crash	UDOT: Crash on I-215 eastbound at I-215 E MM 8.7. No Lanes Blocked.	UDOT		
13990	US 89	09/04/25 09:23 AM	09/04/25 09:43 AM		Minor	Crash	UDOT: Crash on US 89 southbound at 6903 Highway 89 MM 406.2. No Lanes Blocked.	UDOT		
13989	SR 36	09/04/25 09:08 AM	09/04/25 09:28 AM		Minor	Crash	UDOT: Crash on SR 36 north at N Main St at 1000 N MM 55.8. No Lanes Blocked.	UDOT		
13986	I-15	09/04/25 08:07 AM	09/04/25 09:18 AM		Minor	Crash	UDOT: Crash on I-15 southbound at I-15 S MM 271.2. Right Lane (of 6 Lanes) Blocked, Right Shoulder Blocked.	UDOT		
13981	SR 13	09/04/25 07:18 AM	09/04/25 09:16 AM		Minor	Crash	UDOT: Crash on SR 13 north at 13687 N 5400 W MM 23.4. No Lanes Blocked.	UDOT		
13987	SR 173	09/04/25 08:32 AM	09/04/25 09:00 AM		Minor	Crash	UDOT: Crash on SR 173 eastbound at W 5400 N MM 7.2. No Lanes Blocked.	UDOT		
13985	Hwy 36	09/04/25 07:53 AM	09/04/25 09:00 AM		Minor	Crash	UDOT: Crash on Hwy 36 southbound at Hwy 36 SB @Erda Way. No Lanes Blocked.	UDOT		
13983	SR 130	09/04/25 07:34 AM	09/04/25 08:52 AM		Minor	Crash	UDOT: Crash on SR 130 southbound at Minersville Rd MM 31.5. No Lanes Blocked.	UDOT		
13982	SR 232	09/04/25	09/04/25		Minor	Crash	UDOT: Crash on SR 232 north at 2547 N Hill Field Rd MM 1.8. No	UDOT		

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Professional Development

- Not trying to ‘Retain’ Operators….trying to Develop Operators! We
  - Embrace and support that we have an employment pipeline into other Department positions.
  - Control Room Manager is really adept at screening quality characteristics.
- Invite operators to technical conferences.
- Get dressed up head shots, email ID photo, org chart photos.
- Develop a year-round structured training, not just the job training.
  - Leadership
  - Preparedness
  - Fitness
  - Professional
- Leadership
  - Extreme Ownership - 12 month training cycle
  - Executive Leadership series
  - Department Leadership programs

Social Development

Bridge between Control Room staff other office and field staff.

- Mtn Dew party, 80's rock, dad jokes
- Oktoberfest - Warm Soft Pretzels and 'Beer' (rootbeer)
- Cornhole tournament
- Olympics (summer) - Events around the control room and offices
- Fan week - Wear favorite team gear or concert shirt
- Fantasy sports - Football, college bowl, march madness
- Secret Santa
- Tree of Thanks – less formal internal, but show off area for saying 'Thank you!'

Social Development

Social Development

Social Development

Utah Department of Transportation

- Contact:

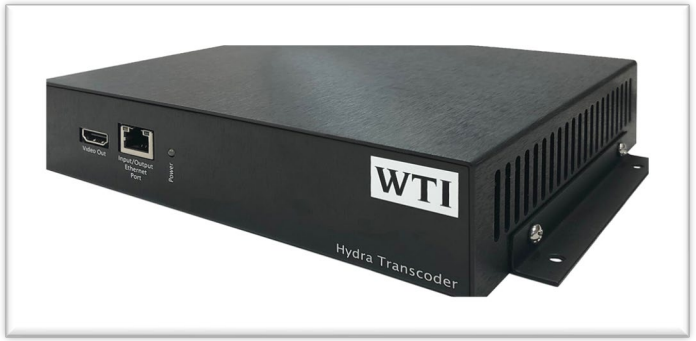
Chris Siavrakas, P.E., PTOE
Traffic Operations Engineer
Utah Department of Transportation
csiavrakas@utah.gov

Texas Department of Transportation

Alberto Aldape
Technical Project Manager
TxDOT Traffic Safety Division (Traffic Management)
alberto.aldape@txdot.gov

Statewide CCTV Video Modernization Update

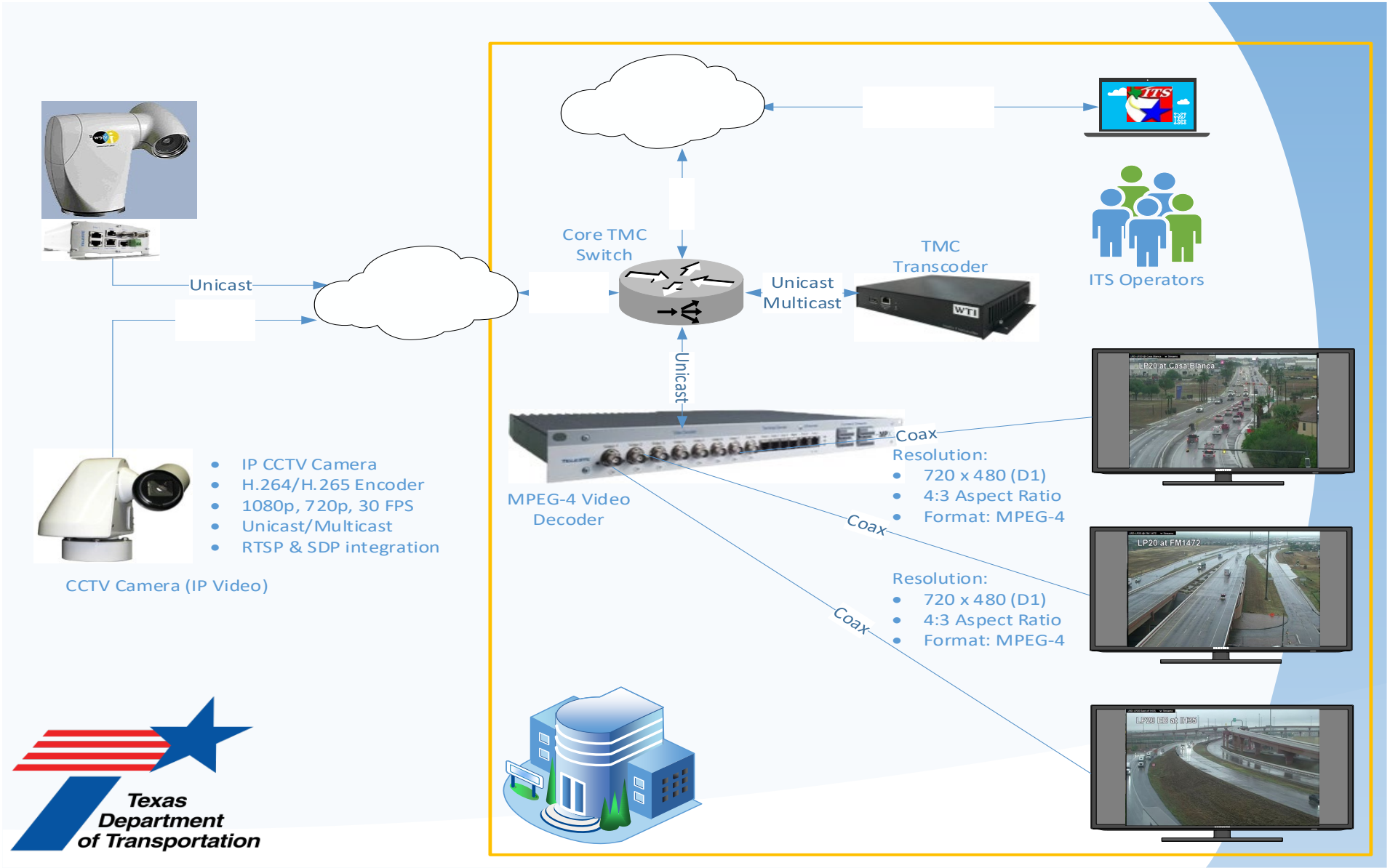
- Solution based on Statewide CCTV Requirements study provided by SwRI in August 2024.
- Study reported on TxDOT's legacy **Teleste analog encoder/decoder systems** reaching end-of-life — hardware no longer supported or available.
- Analog systems limited resolution, had high maintenance costs, and poor interoperability.
- Goal: Replace obsolete analog video infrastructure with **IP-based digital CCTV** to ensure sustainable, scalable video operations.



Statewide CCTV Video Modernization Update

Current State of Deployment

- **Category 1 Districts (AUS, DAL, ELP, FTW, HOU, SAT):** 200+ cameras, mostly fiber connected to TMCs, 50% analog cameras.
- **Category 2 Districts (BRY, CRP, LBB, LRD, ODA, WAC):** 50–200 cameras, mix of wireless Ethernet radios (WER), fiber, and cellular, 20% analog cameras.
- **Category 3 Districts (smaller, rural):** Fewer than 50 cameras, mostly decentralized, heavily reliant on cellular, 100% IP Cameras.


Unicast
Core TMC Switch
Unicast Multicast
TMC Transcoder
ITS Operators
Unicast
MPEG-4 Video Decoder
Coax
Resolution:
720 x 480 (D1)
4:3 Aspect Ratio
Format: MPEG-4
Coax
Resolution:
720 x 480 (D1)
4:3 Aspect Ratio
Format: MPEG-4
Coax
LP20 at Casa Blanca
LP20 at FM1472
LP20 EB at IH35
IP CCTV Camera
H.264/H.265 Encoder
1080p, 720p, 30 FPS
Unicast/Multicast
RTSP & SDP integration
CCTV Camera (IP Video)
Texas Department of Transportation

Statewide CCTV Video Modernization Update

WTI Hydra Solution

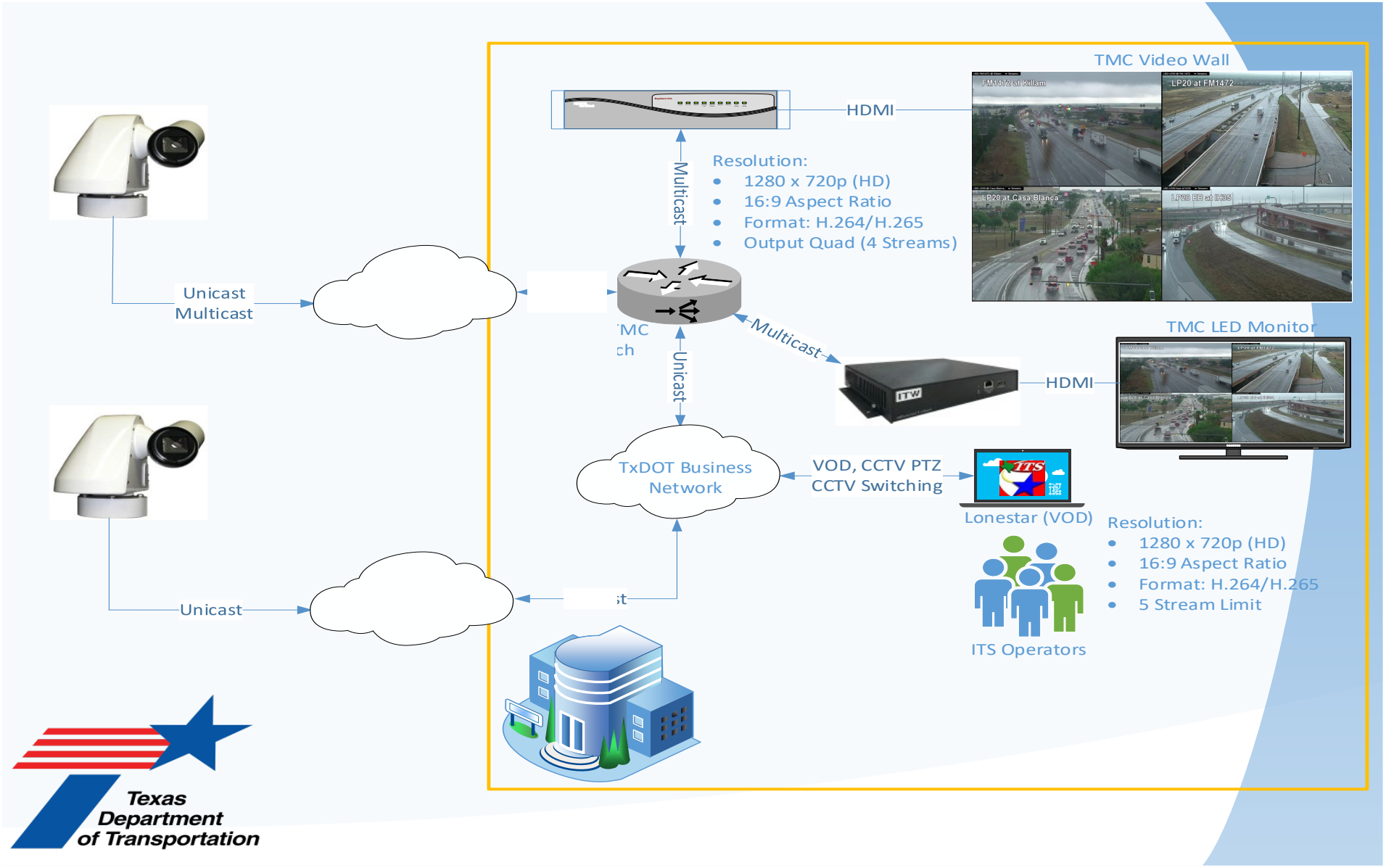
- Developed as a **drop-in replacement** for Teleste decoders.
- Supports MPEG-4, H.264, and H.265 high-quality streams.
- Integrated with Statewide ATMS Lonestar for map-based camera switching.

Key Benefits:

Reduced bandwidth usage, standardized encoder configs, retirement of legacy Teleste hardware, and improved scalability.

Additional Benefits:

- Higher resolution, lower latency video at the TMC.
- Access to full camera controls (PTZ, focus, zoom).
- Long-term maintainability and scalability across metro, urban, and rural districts


TMC Video Wall
HDMI
Resolution:
1280 x 720p (HD)
16:9 Aspect Ratio
Format: H.264/H.265
Output Quad (4 Streams)
Multicast
Unicast
Multicast
Unicast
Multicast
HDMI
TMC LED Monitor
TxDOT Business Network
VOD, CCTV PTZ
CCTV Switching
Lonestar (VOD)
Resolution:
1280 x 720p (HD)
16:9 Aspect Ratio
Format: H.264/H.265
5 Stream Limit
ITS Operators
Unicast
Texas Department of Transportation

Texas Department of Transportation:

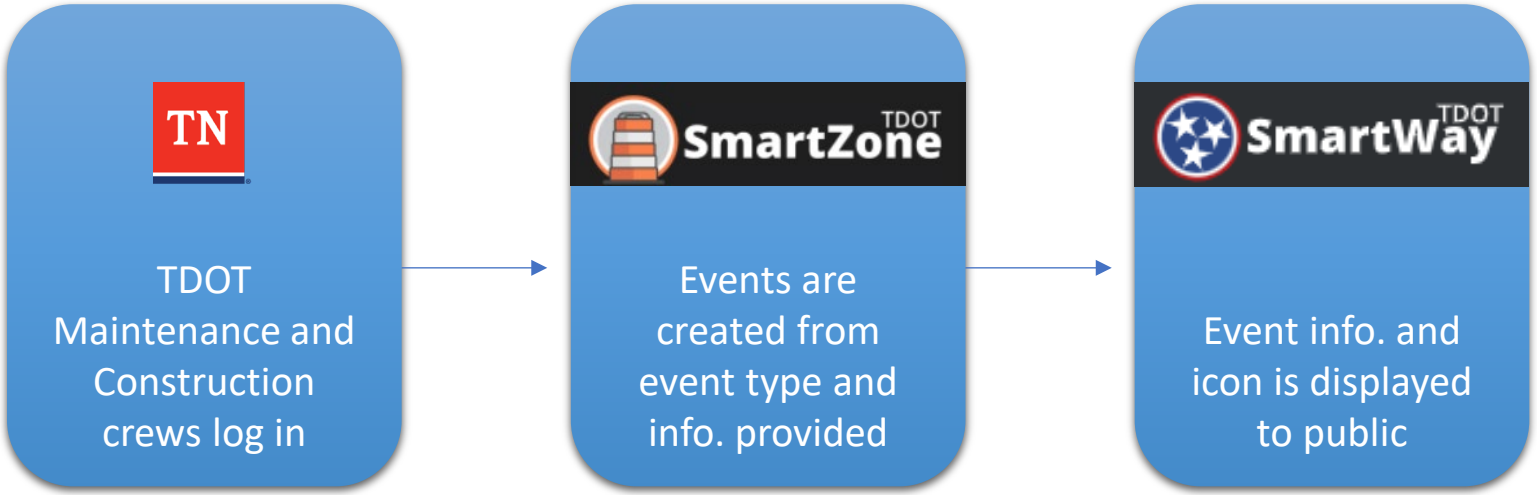
- Contact:
  - Alberto Aldape
  - Technical Project Manager II
  - TxDOT/Traffic Safety Division
  - Alberto.Aldape@txdot.gov

Tennessee Department of Transportation

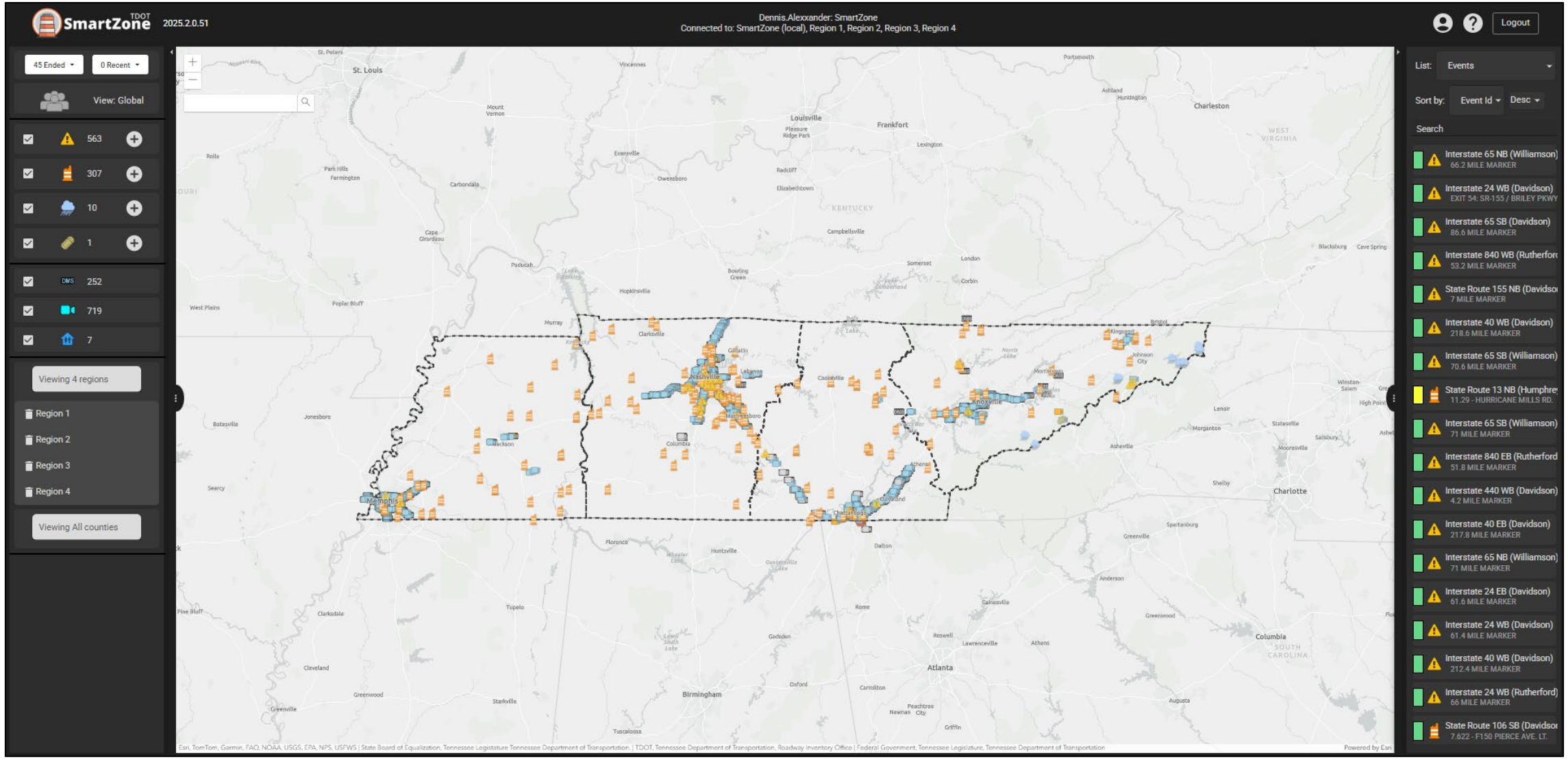
Alexxander Dennis
Senior Technical Specialist
TDOT Headquarters, Traffic Operations Division
Alexxander.Dennis@tn.gov

SmartZone

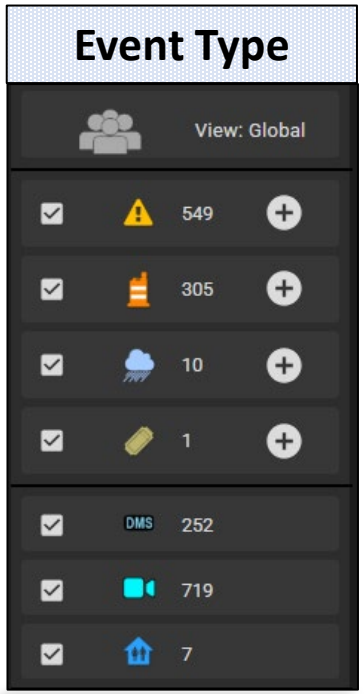
- A website designed for statewide event publication outside of TMC:
  - Primarily project information entered by TDOT Construction and Maintenance crews
  - Web-based & developed by Southwest Research Institute (SwRI)
  - Log in requires only internet and credentials. No state VPN necessary
  - Publishes to public-facing SmartWay map
  - Go-live date: July 31st, 2025
  - Approximately 450 users

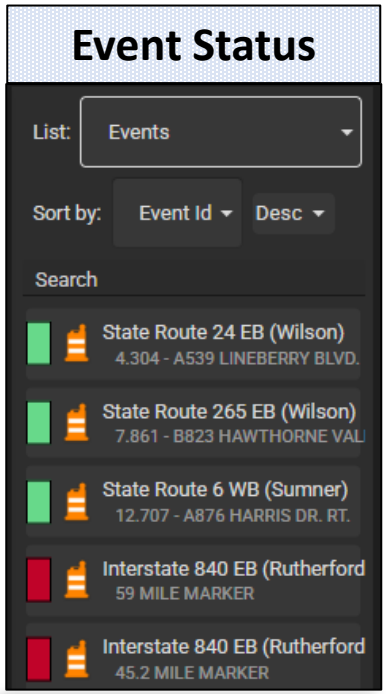


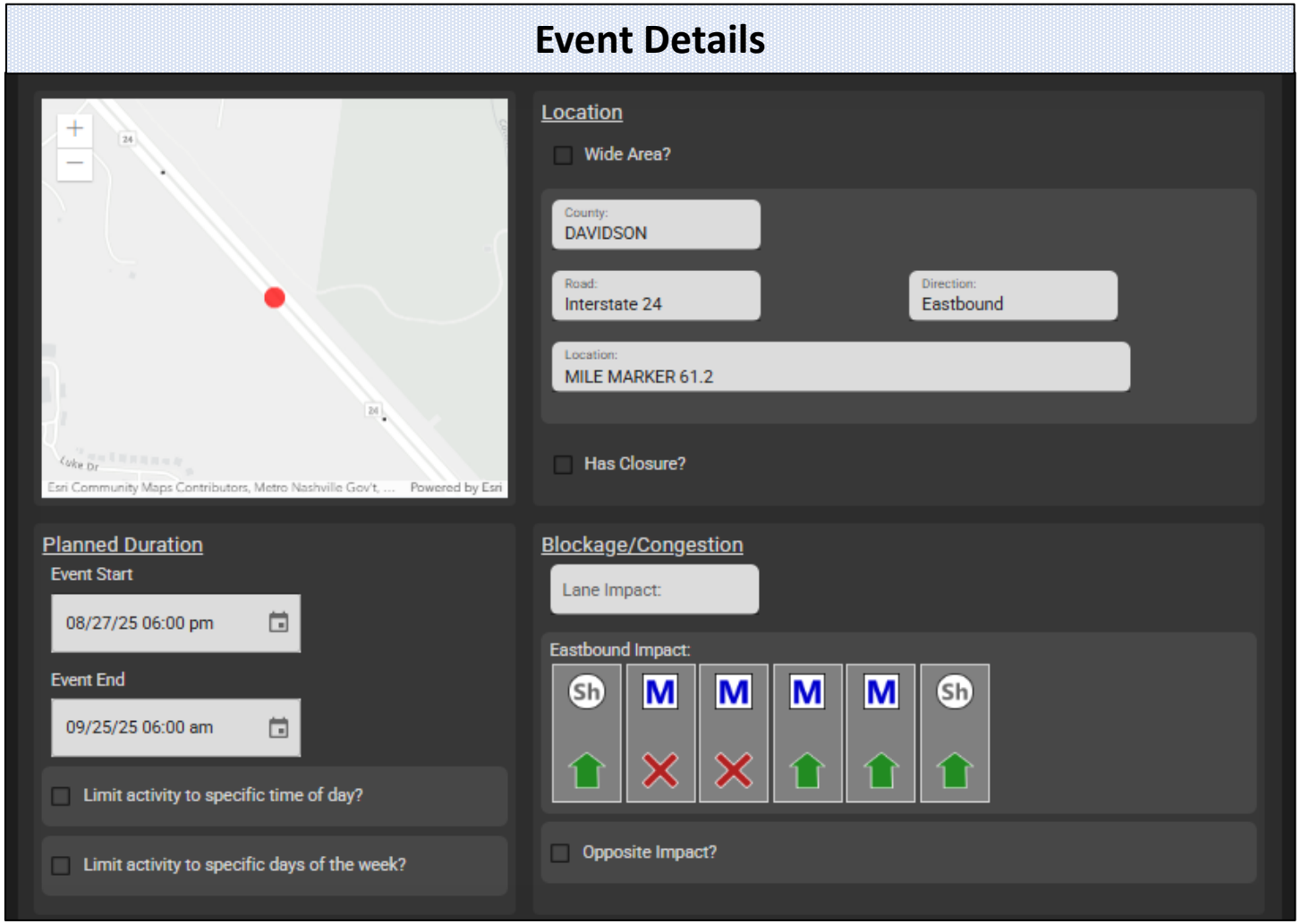
SmartZone Homepage



SmartZone UI



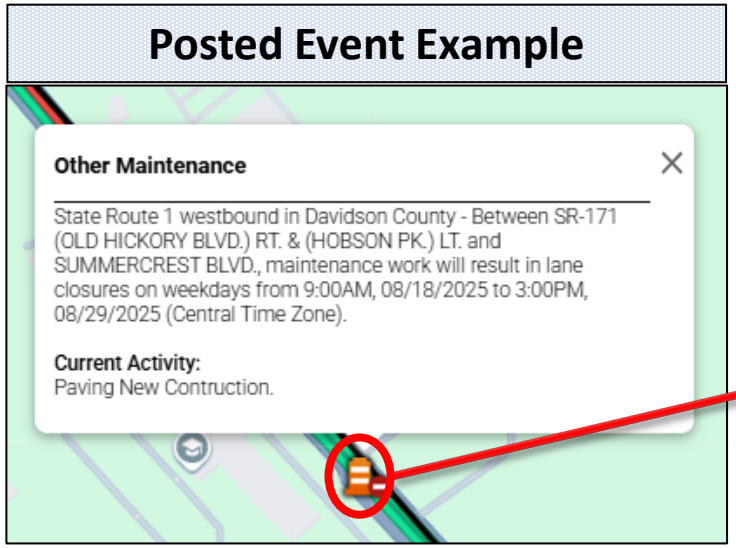


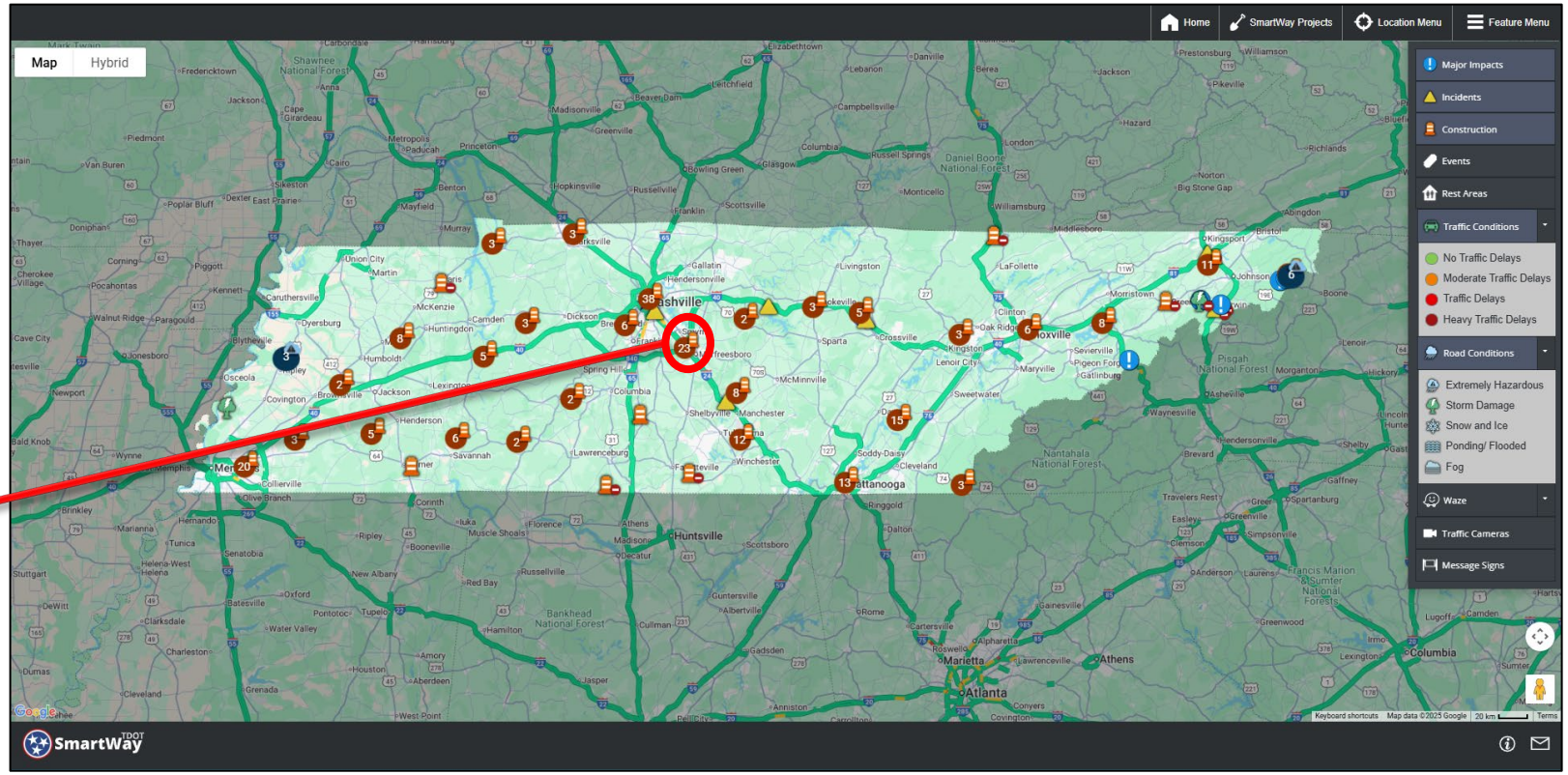


SmartWay: Traffic Map

smartway.tn.gov

Posted Event Example





Challenges

- TDOT IT Turnover (statewide Maintenance and Construction staff going through regional TMC IT)

  Solutions?
  - Very detailed instruction documents for IT regarding user configuration
  - A form for Maintenance and Construction staff to fill out beforehand

- ATMS Dependency (SmartZone and ATMS (SWCS) use the same database)

  Solutions?
  - A backup method for major event entry
  - Displaying a website banner indicating or prewarning for an outage
  - Improved system redundancy across SWCS architecture

- Training (events not being removed after expiration / free form text)

  Solutions?
  - Auto-deactivate feature (has risks)
  - Quality control staff
  - Bi-weekly “office hours” sessions for question, concerns, and suggestions

Tennessee Department of Transportation

- Contact:
  - Alexxander Dennis
  - Senior Technical Specialist
  - TDOT Headquarters, Traffic Operations Division
  - Alexxander.Dennis@tn.gov

Pennsylvania Department of Transportation

David Gaffney

TMC Operations Manager

davgaffney@pa.gov

Scott Benedict

Traffic Systems and TSMO Performance Manager

scbenedict@pa.gov

ITS Devices and QPLs

- PennDOT's QPL list lists only portable devices
  - Working toward a plan for permanent devices as well
  - Purchasing takes two forms:
    - Existing contracts through PennDOT Fleet Management
      - Significant savings over ordering through construction contracts
      - Limited to vendors on contract and the devices listed on the contract
    - ITS Contractors
      - Often the only option for many devices and components
      - Can be quicker

Integrating Devices in ATMS

- Devices on the QPL are required to have NTCIP compliance
  - Vendors often build additional functionality beyond what is in the NTCIP
  - Some code may conflict with the commands sent by ATMS
  - 2 cases:
    - VSL Beacons
      - One beacon above and one below the sign
      - When ATMS beacon activation command is sent, both flash together
      - Per MUTCD, beacons should flash alternate
      - VSLs are using proprietary code to activate the beacons
    - Battery issues
      - Can be challenging to keep batteries charged during winter with hilly and forested terrain
      - Batteries and solar seem undersized for the devices
      - Moving toward permanent solutions

Upcoming Special Events

- NFL Draft Pittsburgh April 23-25, 2026
  - Started planning: 3 day attendance could be over 775,000 with 200,000+ for the first round
  - Ordering new portable CMS and CCTV to deploy during the event
  - Will have a dedicated 511PA page
- FIFA World Cup 2026/USA 250th Anniversary – Philadelphia, Summer 2026
  - Philadelphia is one of the host cities for the World Cup
  - USA 250th Anniversary Celebrations will coincide with the last Philadelphia game
  - Devices deployed for the NFL draft will also be deployed for these events
  - Dedicated 511PA page will be created to cover both events

Pennsylvania DOT

- Contact:

David Gaffney

TMC Operations Manager

davgaffney@pa.gov

Scott Benedict

Traffic Systems and TSMO Performance Manager

scbenedict@pa.gov

Ohio Department of Transportation

Dominic L. DelCol
Statewide TMC Supervisor
dominic.delcol@dot.ohio.gov

StatewideTMC staffing

- TMC staffing issues:
  - ODOT Statewide TMC is 24/7/365
  - All operators are State of Ohio employees
  - 3 shifts (5AM-1PM, 1PM-9PM, 9PM-5AM)
  - 3rd shift position, has been vacant since 2-17-2023
  - Posted 11 separate times
  - 5 accepted position, 3 left after 2 weeks, 1 lasted 1 week, 1 accepted then declined before start date
  - 1st shift with weekends has been vacant since 9-4-2024
  - Posted 4 separate times
  - 1 accepted and never showed up, 1 accepted then declined on start date, 1 accepted then took another position
  - 30-50 applicants per posting on average, 20 meet minimum qualifications
  - Starting pay is $22.96-$27.92

StatewideTMC staffing

Posted positions	Position	PN	Shift	Result
7/1/2025	TMC Operator 1	20050659	1st w/ weekends	Filled with external candidate. Never showed up on date of hire.
6/17/2025	TMC Operator 1	20050625	3rd	Internal candidate declined position due to pay. Hired another candidate. Left after 2 weeks
5/29/2025	TMC Operator 1	20050659	1st w/ weekends	External candidate took another position elsewhere. Had to be reposted
5/8/2025	TMC Operator 1	20050625	3rd	Asked to post May 1. One internal applied and passed the test. We were on board to hire and they declined on 6-3-25. We lost a month of time.
3/27/2025	TMC Operator 1	20050659	1st w/ weekends	External candidate was supposed to start May 19th. Declined that morning. Lost nearly 2 months of time.
2/7/2025	TMC Operator 2	20050640	3rd	Filled with external candidate
12/10/2024	TMC Operator 1	20050625	3rd	Filled with external candidate. They left April 4
9/4/2024	TMC Operator 2	20050625	1st	Not filled. Had to be reposted
5/4/2024	TMC Operator 1	20050625	3rd	1st candidate declined due to schedule. 2nd candidate worked here 1 week and left.
10/12/2023	TMC Operator 1	20050640	3rd	Reposted. Filled with external candidate
8/11/2023	TMC Operator 1	20050640	3rd	External candidate took another position elsewhere. Had to be reposted
6/23/2023	TMC Operator 1	20050647	3rd	Filled with external candidate
4/25/2023	TMC Specialist	20050618	3rd	Reposted
3/10/2023	TMC Specialist	20050618	3rd	Reposted
2/17/2023	TMC Specialist	20050618	3rd	Reposted

StatewideTMC staffing

- TMC staffing issues:
  - In collaboration with Human resources and ODOT public information, a job fair was held on 8-29-2025
  - ODOT had 82 applicants, 63 met minimum qualifications, conducted 31 interviews
  - Panel consisting of TMC staff, HR recommended 2 applicants for hire for the two shifts

StatewideTMC staffing

- Is your State experiencing similar issues?
- Are TMC/TMS staff contracted or state employees?
- Suggestions?

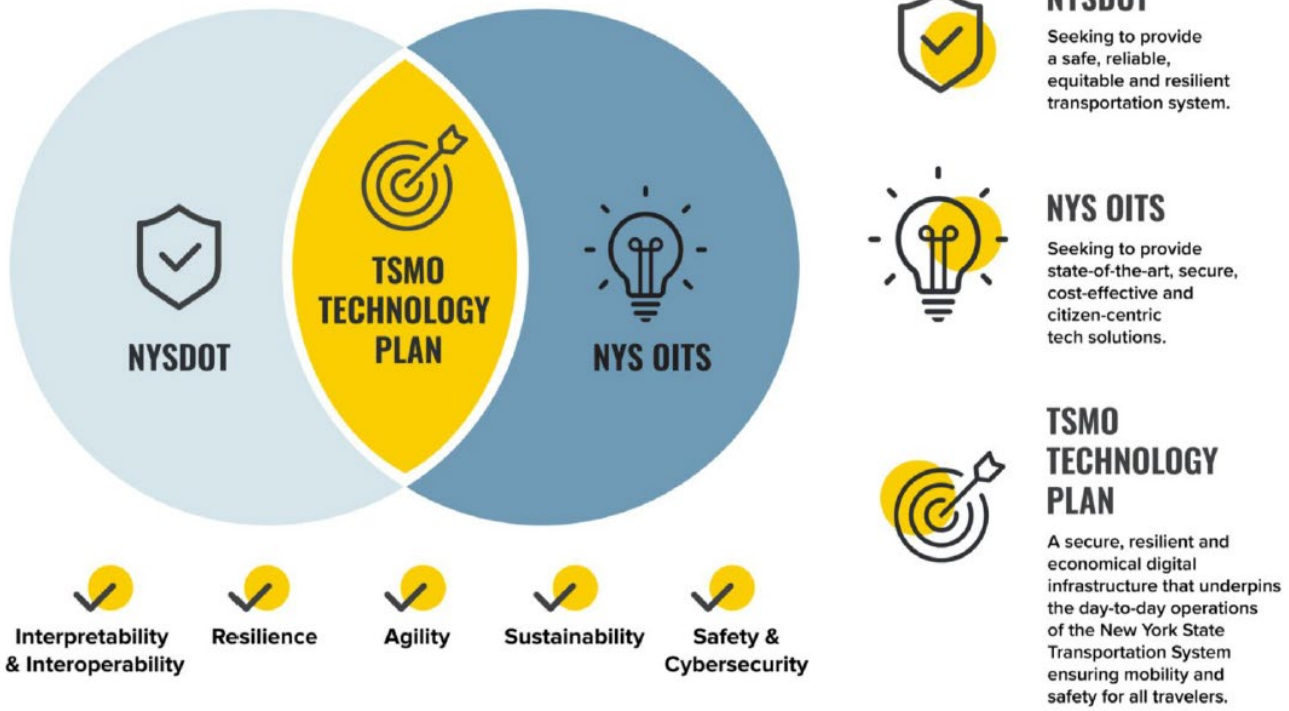
Department of Transportation

Dominic L. DelCol
Statewide TMC Supervisor
Office of TSMO
dominic.delcol@dot.ohio.gov

New York State Department of Transportation

Ryan Meagher
Assistant Regional Traffic Engineer – Region 3
NYSDOT
ryan.meagher@dot.ny.gov

TSMO Technology Plan



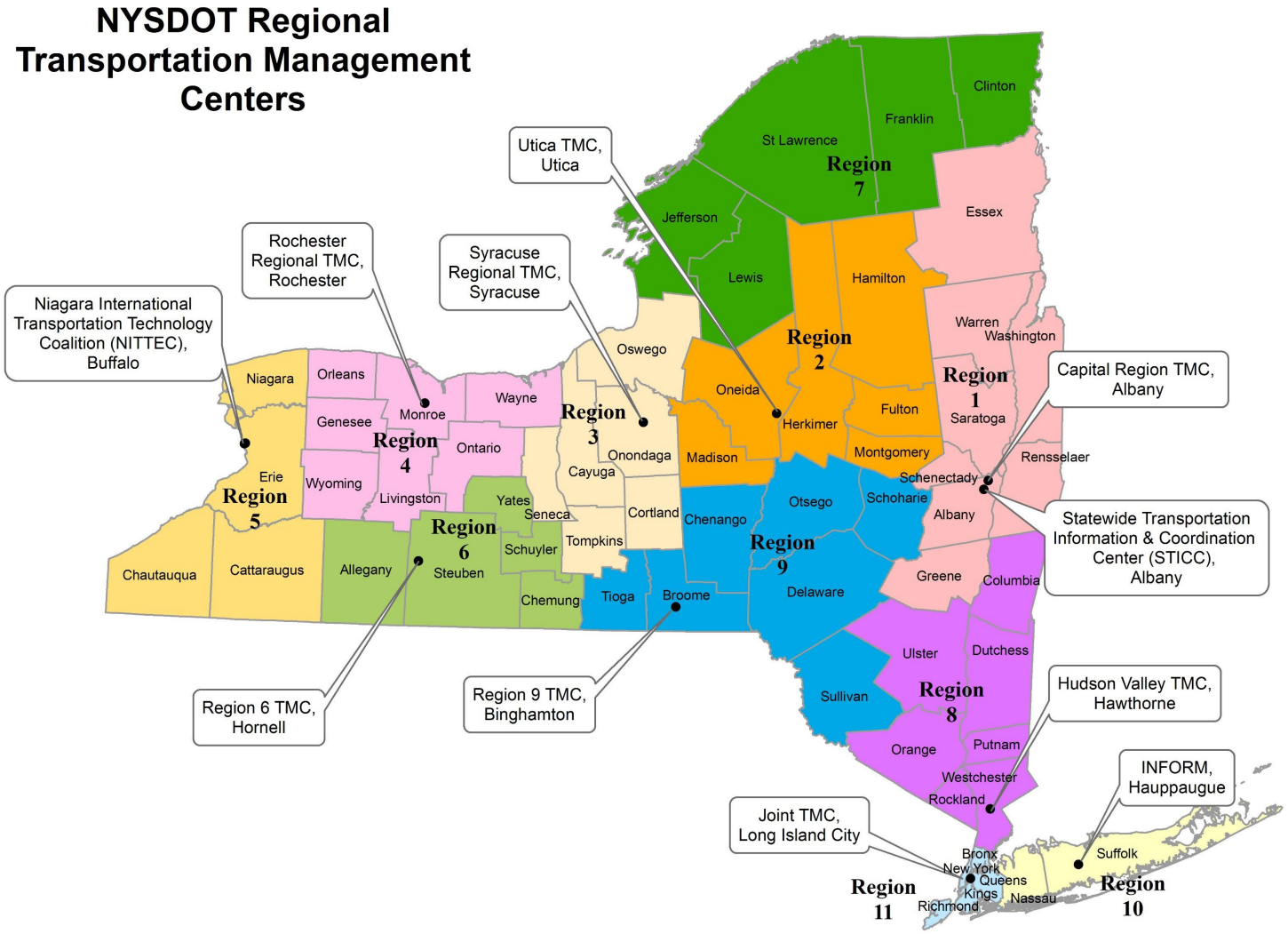
- Maintain and Build Out a Secure, Reliable Digital Infrastructure
  - establish 100% connection to all signals
  - standardize communications and IT networks
- Modernize TMC Functionality and Control Systems to Support Proactive and Integrated Traffic Management
  - upgrade traffic signal controller firmware
  - upgrade TMC control software
- Support a Shared Intelligence Platform that Supports Statewide Operational Objectives and Multimodal Partnerships
  - create a TSMO data integrator
  - upgrade 511NY traveler information system

Transportation Systems Management and Operations Control Software Contract

Ten-Year Contract	• modernize TSMO program at NYSDOT • cohesively manage TMC and signals
Request for Information in August 2023	• 18 responses received and reviewed
Request for Proposals in January 2025	• 7 responses received and reviewed • 3 technical demonstrations and interviews
Anticipated Award in December 2025	• hope to begin in early 2026

NYSDOT TMC Background

- 11 Regions across the State
  - 10 TMCs statewide
- Similar Functions with Varying Priorities and Unique Challenges
  - traffic, weather, special events, seasonal, etc.
- Different Networks, Field Devices, and Hardware
  - no standardized equipment
- Multiple Programs used in TMCs Currently



NYSDOT Traffic Signals Background

- 10 Regional Signal Crews
  - 15 maintenance shops
- Approximately 6300 Three-Color Signals Statewide
- Varying Degrees of Technology Statewide
  - adaptive signal control, transit signal priority, and non-intrusive detection
- Signal Operation and Maintenance Separate from TMC Operations and Infrastructure
- Separate Systems used to Manage Each Group Currently

Goals of TSMO Control Software Contract

Software to Manage Both TMC and Signal Functions

- adjustable for future conditions
- no loss of functionality during roll out
- uniformity across the entire state

Update and Replace Field Equipment at all NYSDOT Traffic Signals

- must support ASC, TSP and NID

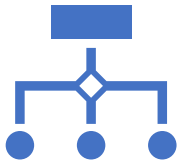
Provide Support Services for Entire Contract

- including project management and training

Greater Situational Awareness and Control Capabilities

- Command and Control Field Assets
- Receive Failure Alerts
- Log Incident Data and Details
- Ingest External Data
- Generate Travel Times and Alerts
- Generate Predetermined Incident Responses
- Maintain Signal Timing Database with Remote Capabilities
- Interactive and Filterable Map of all Field Assets
- Support ATSPMs with Exportable Data and Graphs
- Support Configurable Role Based Authorization Control
- Send Email and Text Alerts to Various Users

Other Projects



Updated Statewide ITS Architecture

document will cover majority of regions

contract to keep document up to date

Field Modem Replacements

address security vulnerabilities

500 replaced in early 2025

600 to be replaced by end of 2025

Automated Work Zone Speed Enforcement

extended 5 more years, thru Oct 2031

additional vehicles added

partnership with Thruway

NYSDOT

- **Contacts:**
  - **Rebecca Gibson-Schott**
  - Director, TSMO Bureau
  - NYSDOT, Office of Traffic Safety and Mobility
  - rebecca.gibson-schott@dot.ny.gov

  - **Ryan Meagher**
  - Assistant Regional Traffic Engineer – Region 3
  - NYSDOT, Office of Traffic Safety and Mobility
  - ryan.meagher@dot.ny.gov

New Jersey Department of Transportation

Christopher John Straniero
Engineering Technician 3 (Shift Supervisor)
NJDOT Mobility Operations North
Christopher.Straniero@dot.nj.gov

iNet

- iNet Year one
  - This year, STMC has implemented our new ATMS software. It's been built from the ground up based on management specifications.
  - In previous iterations, we worked with Trex software which was very similar to its predecessor Openreach (Database).
  - Each iteration showed improvements from the last. Our most recent is no exception with a few caveats.
  - Video feed leaves a lot to be desired as we still heavily rely on our security center software to provide us with timely video feeds and provide playback functionality (recordings).
  - Our previous software for digital message boards was a bit archaic, but our team was exceedingly efficient at running messages in a timely fashion. The new software has shown great promise in a few regards. We can run a response plan. We can run multiple signs in a hurry. We have a multi viewer profile we can set up for weather and events.
  - So far, morale and adaptation to the new software has been mixed, but overall, we are headed in the right direction.

New Jersey Department of Transportation

- Contact:
  - Christopher Straniero
  - Engineering Technician 3 (Shift Supervisor)
  - NJDOT Mobility Operations North
  - Christopher.Straniero@DOT.NJ.Gov