

# Opportunities To Use Artificial Intelligence and Machine Learning To Perform Traffic Management Systems Functions or Actions

Transportation Management Center (TMC) Pooled Fund Study  
Federal Highway Administration (FHWA)  
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# Background

- What are TMSs:
  - Complex, integrated blend of hardware, software, processes, and people performing a range of functions and actions.
  - Physical elements of a TMS that can be managed, including subsystems, components, devices, support resources, and other items an agency identifies as being needed to manage and operate a TMS.<sup>(1)</sup>
- What are AI and ML:
  - AI is artificial system that performs tasks under varying and unpredictable circumstances without significant human oversight or that can learn from experience and improve performance when exposed to datasets.
  - ML is a branch within AI in which computers use programming as a jumping-off point to create their own processes to analyze a vast amount of data.<sup>(2)</sup>

# Why Use AI and ML in TMS Operations?

- Enhance a wide range of analytics including predictive analytics through model training and pattern recognition through decision support tools (DST). DSTs improve overall timeliness, effectiveness, and consistency in decisionmaking.<sup>(3)</sup>
- Conduct real-time predictive and even prescriptive analytics to support all five phases of traffic incident management.
- Predict vehicle trajectories and impending congestion and bottlenecks to enhance agencies' active traffic management process.
- Improve system efficiency by supporting real-time decisionmaking for multimodal transportation operations.
- Support offline analyses including asset management, performance measurement, and incident response planning through AI-enabled data fusion and data quality and reliability.<sup>(4)</sup>

# Benefits of Using AI and ML in TMSs

- Enhance roadway safety:
  - Enhance incident detection and network monitoring capabilities.
  - Improve intersection safety.
- Enhance mobility:
  - Analyze and modify operational strategies in realtime to optimize traffic flow and reduce congestion and delays.
  - Optimize traffic signal operations for all modes of transportation, including emergency vehicles, freight, pedestrians, and bicyclists.
  - Better manage multiple infrastructure components and devices simultaneously.
- Support decisionmaking for transportation management and operation planning, optimizing programming, and resources allocation.
- Enhance devices monitoring capabilities minimize asset downtime, reducing maintenance costs through targeted maintenance.

# AI and ML in the Context of TMSs (1/2)

- AI and ML for traffic operations and management provides the ability to use data and models to enhance a wide range of analytics, including predictive analytics through model training and pattern recognition.
- DSTs, which are a subset of decision support systems (DSSs), generally provide prediction and forecasting capabilities that assist TMS functions.
- DSTs are computer-based online or offline tools used to improve overall timeliness, effectiveness, and enhance consistency in decisionmaking.
- Three common approaches of DST application, used in combination, support the problem-solving and decisionmaking aspects of the TMS:
  - Data driven.
  - Model driven.
  - Knowledge driven.

# AI and ML in the Context of TMSs (2/2)

| Approach         | Incident Response Plan (Offline) | Decision Trees (Offline) | Performance Measurement Tools (Offline) | Real-Time Traffic Analysis Tools (Online) | Lookup Tables (Online) |
|------------------|----------------------------------|--------------------------|-----------------------------------------|-------------------------------------------|------------------------|
| Knowledge driven | Yes                              | Yes                      | No                                      | Yes                                       | Yes                    |
| Data driven      | No                               | Yes                      | Yes                                     | Yes                                       | Yes                    |
| Model driven     | No                               | No                       | Yes                                     | Yes                                       | No                     |

# AI and ML in Traffic Operations (1/2)

Day-to-day TMS operations:

- Proactive management:
  - Incident management.
  - Short-term traffic prediction.
- Active traffic management:
  - Adaptive ramp metering
  - Dynamic part-time shoulder use.
  - Variable speed limits.
  - Real-time multimodal decision support systems.
  - Real-time data fusion.

# AI and ML in Traffic Operations (2/2)

## Offline Analyses

DSTs support short-term and long-term activities related to:

- Winter maintenance.
- Transportation Systems Management and Operations planning, programming, resource allocation, and policy.
- Asset management and maintenance.
- Performance measurement.
- Incident response planning.



# Roadmap for Developing AI and ML Capabilities (1/2)

| Step                      | Description                               | Key Activities                                                                                                                                                                                              |
|---------------------------|-------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Develop understanding. | Familiarize with AI and ML in TMS.        | <ul style="list-style-type: none"> <li>Highlight differences between AI, ML, and traditional methods.</li> <li>Understand current and emerging AI and ML applications in TMSs.</li> </ul>                   |
| 2. Identify use cases.    | Explore and identify AI and ML use cases. | <ul style="list-style-type: none"> <li>Discuss specific AI and ML capabilities.</li> <li>Use checklist for documenting decisions.</li> <li>Assess feasibility based on suitability and maturity.</li> </ul> |
| 3. Build business case.   | Generate leadership support for AI pilot. | <ul style="list-style-type: none"> <li>Develop business cases outlining costs, benefits, ROI, risks.</li> <li>Explore in-house or third-party solutions.</li> </ul>                                         |
| 4. Assess gaps.           | Assess resources and identify gaps.       | Review data availability, storage, computing power, staffing, funding, and policy modifications needed for AI and ML integration.                                                                           |
| 5. Plan pilot.            | Plan for AI systems pilot.                | <ul style="list-style-type: none"> <li>Develop comprehensive plan.</li> <li>Include scope, schedule, and budget.</li> </ul>                                                                                 |

ROI = return on investment.

# Framework for Developing AI and ML Capabilities (2/2)

| Step                               | Description                                | Key Activities                                                                                                                                                                                   |
|------------------------------------|--------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 6. Execute pilot.                  | Execute AI systems pilot.                  | <ul style="list-style-type: none"> <li>Revisit use cases as needed.</li> <li>Reevaluate gaps and address additional capabilities.</li> </ul>                                                     |
| 7. Communicate results.            | Review and share pilot results.            | <ul style="list-style-type: none"> <li>Document and share results.</li> <li>Include TMSs performance measurements.</li> <li>Foster buy-in.</li> </ul>                                            |
| 8. Scale deployment.               | Decide on scaling up deployment.           | <ul style="list-style-type: none"> <li>Consider pilot location, duration, user base, scope based on outcomes.</li> </ul>                                                                         |
| 9. Operations and maintenance.     | Oversee system operations and maintenance. | <ul style="list-style-type: none"> <li>Assign staff responsibility.</li> <li>Monitor performance, data inputs, and outcomes.</li> <li>Secure funding for maintenance and replacement.</li> </ul> |
| 10. Expand AI and ML capabilities. | Expand and standardize AI and ML use.      | <ul style="list-style-type: none"> <li>Develop a robust strategy.</li> <li>Build workforce capability.</li> <li>Provide training in advanced techniques.</li> </ul>                              |

# Framework for Developing AI and ML Capabilities—Best Practices<sup>(6)</sup> (1/4)

## Governance:

- Establish clearly defined goals, objectives, roles, and responsibilities for integrating the AI systems into TMSs.
- Develop detailed technical specifications to ensure the system aligns with its intended objectives and complies with relevant laws, regulations, standards, and guidance.

# Framework for Developing AI and ML Capabilities—Best Practices<sup>(6)</sup> (2/4)

## Data:

- Ensure data sources feeding into the AI systems are well documented.
- Document the process to assess the data attributes and dependencies for quality, reliability, and security risks.
- Establish comprehensive protocols for data privacy.

# Framework for Developing AI and ML Capabilities—Best Practices<sup>(6)</sup> (3/4)

## Performance:

- Document methodology for assessing the performance of AI-based systems, including:
  - Performance metrics.
  - Methods for identifying potential biases in data.
  - Procedures for human supervision of the system.
  - Methods for documenting and reporting performance outcomes.
- Document components of the TMSs where AI and ML techniques are being used.

# Framework for Developing AI and ML Capabilities—Best Practices<sup>(6)</sup> (4/4)

## Monitoring:

- Document a plan for monitoring AI systems, including any corrective actions that may need to be taken.
- Monitor ongoing use of the techniques to ensure they remain aligned with intended operational purposes.
- Document the conditions under which the system is used outside its original intent, if the system used in that way.

## Potential Challenges (1/2)

- Maintenance of AI and ML in TMS: potential need for frequent hardware upgrades to enhance computational capacity.
- Limited digital infrastructure:
  - Lack of proper digital infrastructure and network capabilities.
  - Inability to incorporate new services, functions, data storage, and computational capacity into existing TMS.
  - Lack of quality data.

Note: Information from WSP USA.

## Potential Challenges (2/2)

Limited experience in AI and ML:

- Limited in-house experience and ability to modify AI and ML algorithms when needed.
- Algorithms are often not easily understandable.

Note: Information from WSP USA.

# Case Study: Dallas Integrated Corridor Management Demonstration Project

- Goals were to:
  - Improve operational responses.
  - Divert traffic from freeways to arterials.
- DSTs were:
  - Knowledge driven.
  - Model driven.
- Ongoing performance was reviewed monthly.
- DST was retired due to funding issues.

# Case Study: Maryland Department of Transportation (DOT) Coordinated Highways Action Response Team Program

- Uses an incident clearance time prediction model.
- Is based on historical crash data.
- Used a combination of:
  - Traditional regression analysis.
  - AI-based classification techniques.
- Achieved >80 percent confidence level.
- Needs improved integration of the user interface with the advanced traffic management system (ATMS).

# Case Study: Niagara International Transportation Technology Coalition AllRoads

- AllRoads is a cloud-based, centralized DSS.
- Is powered by AI and microsimulation.
- Assesses and responds to traffic conditions through:
  - Real-time traffic prediction.
  - Generation of traffic management strategies.
- Includes the following TMS functions:
  - Traffic signal coordination.
  - Vehicle detection.
  - Automated incident detection.
  - Truck parking management.
- Collects and fuses data from 16 different data sources.
- Uses a performance measurement dashboard.



# Case Study: Tennessee DOT Predictive Analytics for Resource Allocation<sup>(7)</sup>

- Crash Reduction Analyzing Statistical History (CRASH).
- Predictive analytics tool.
- Goal to enhance:
  - Resource allocation.
  - Emergency response planning.
- Historical crash data, weather data, and special events.
- Crash likelihood forecasting.
- Weekly enforcement plans development.
- 70-percent accuracy rate identifying crash-involved incidents.
- Response time improvement of 19 percent.



# Case Study: Tennessee DOT I-24 AI-Powered Smart Corridor (1/2)

- AI DSS.
- Goal to reduce incidents and improve travel time reliability.
- Active transportation and demand management strategy based.
- Video cameras with 4K resolution and computer vision algorithms.
- Driver behavior monitor.
- Traffic waves predictor, including upstream propagation.

# Case Study: Tennessee DOT I-24 AI-Powered Smart Corridor (2/2)

- Measures of effectiveness:
  - Incident reduction of 14 percent.
  - Secondary crash reduction of 50 percent.
  - Incident warning 9 min faster than operator self detection.
  - Travel time reliability improvement of 5 percent.
- Lessons learned:
  - Ensure device readiness before data collection.
  - Develop the performance dashboard early.

# Case Study: Delaware DOT AI-Enhanced Integrated Transportation Management System (AI-ITMS)<sup>(8)</sup>

- Leverages both AI and ML.
- Fuses and analyzes data:
  - Freeways.
  - Arterials.
  - Connected vehicles.
- ML monitors systems.
- AI enables:
  - Real-time traffic flow prediction.
  - Proactive incident management (incident response planning and evaluation).
  - Automated signal optimization.

## Case Study: Delaware DOT AI-ITMS

- Upgraded sensor resolution.
- Invested in digital infrastructure.
- Prioritized AI strategic planning.

# Conclusions (1/2)

The AI and ML model:

- Enhances the following:
  - Day-to-day TMS real-time operations.
  - Offline analytics.
- Provides advanced capabilities in:
  - Data processing.
  - Predictive analytics.
  - Automated decisionmaking.
- Achieves better and faster results.
- Delivers greater efficiency.

## Conclusions (2/2)

- Complexity necessitates continuous monitoring and validation.
- Success relies on:
  - Solid use cases of technology.
  - Operational needs assessment.
  - Gap identification.
- An organizational structure that embraces technology should be fostered.

# Additional Information on TMS Practices

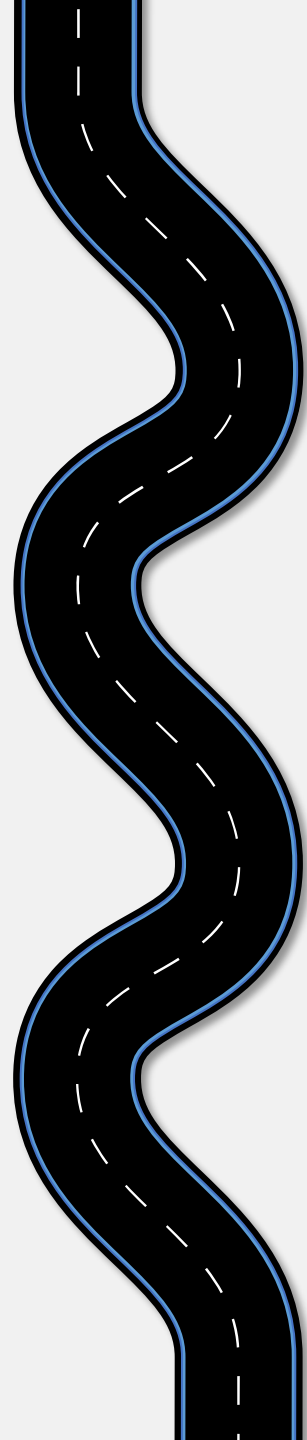
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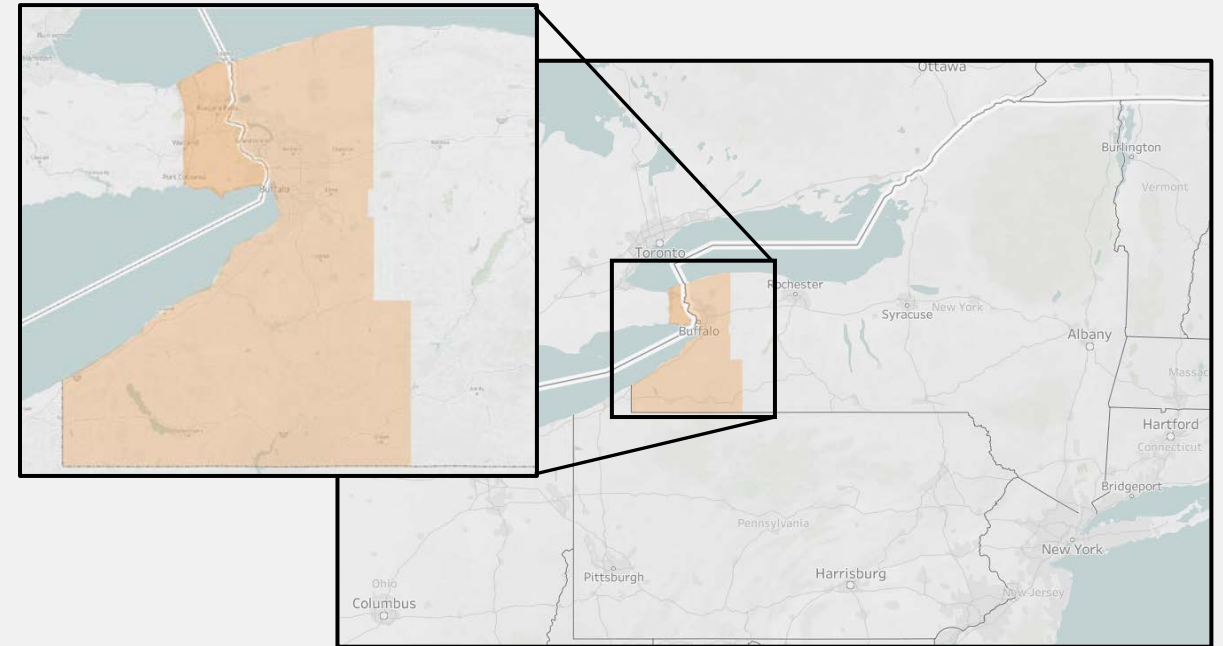
# Niagara International Transportation Technology Coalition



**nittec**  
*Travel Smart.*

*Mission: To improve mobility, reliability and safety on the regional bi-national multimodal transportation network through information sharing and coordinated management of operations.*

- Established in 1995 with a Federal Mobility Grant
- Multi-Agency Transportation Operations Coalition
  - 5 Policy Members, 9 General Members, 30 Affiliate Members
    - ✓ Transportation Agencies
    - ✓ Public Safety and Border Enforcement
    - ✓ Emergency Services and Recovery
- Only Bi-national Coalition of its kind in U.S. / Canada

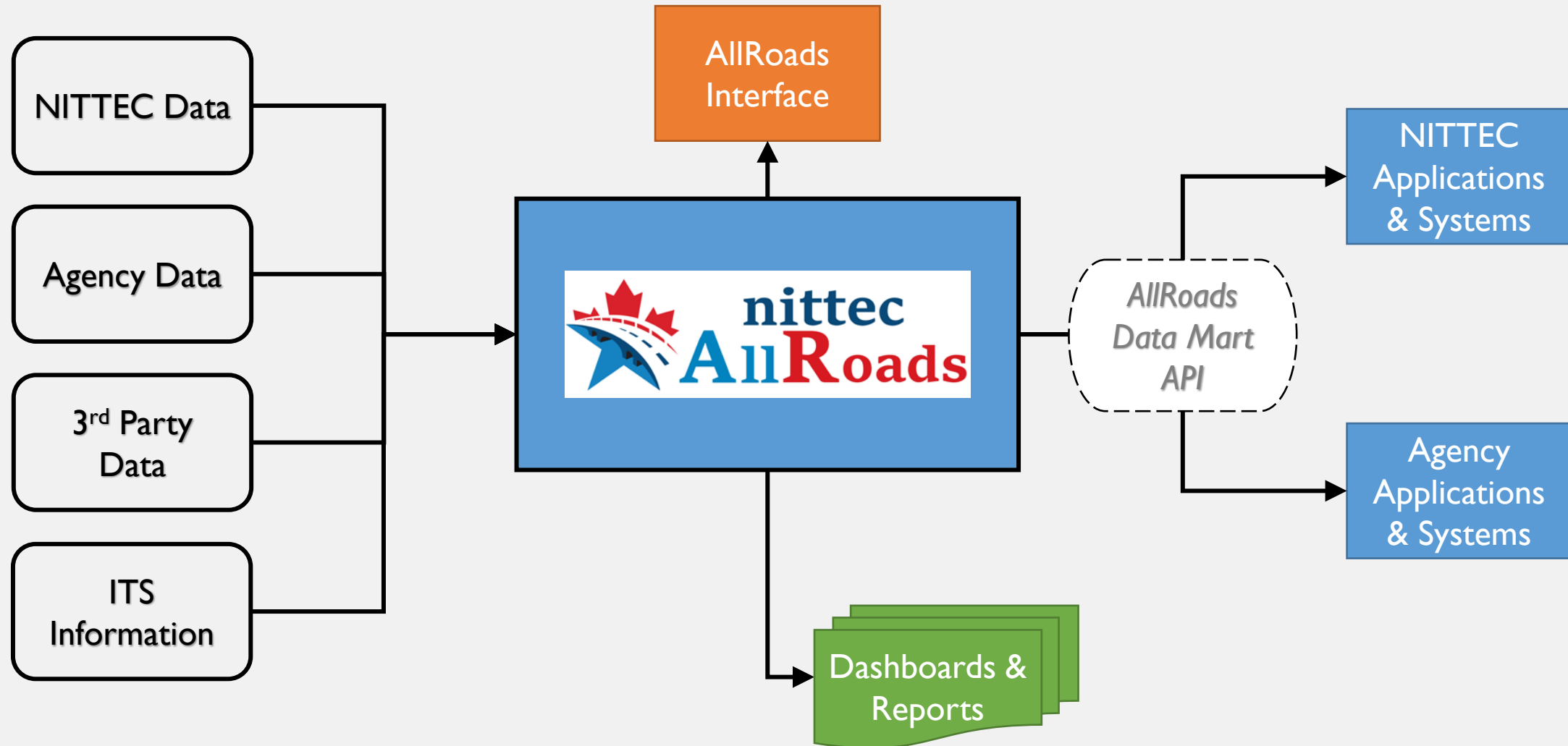


# Regional Collaboration – Traffic Management

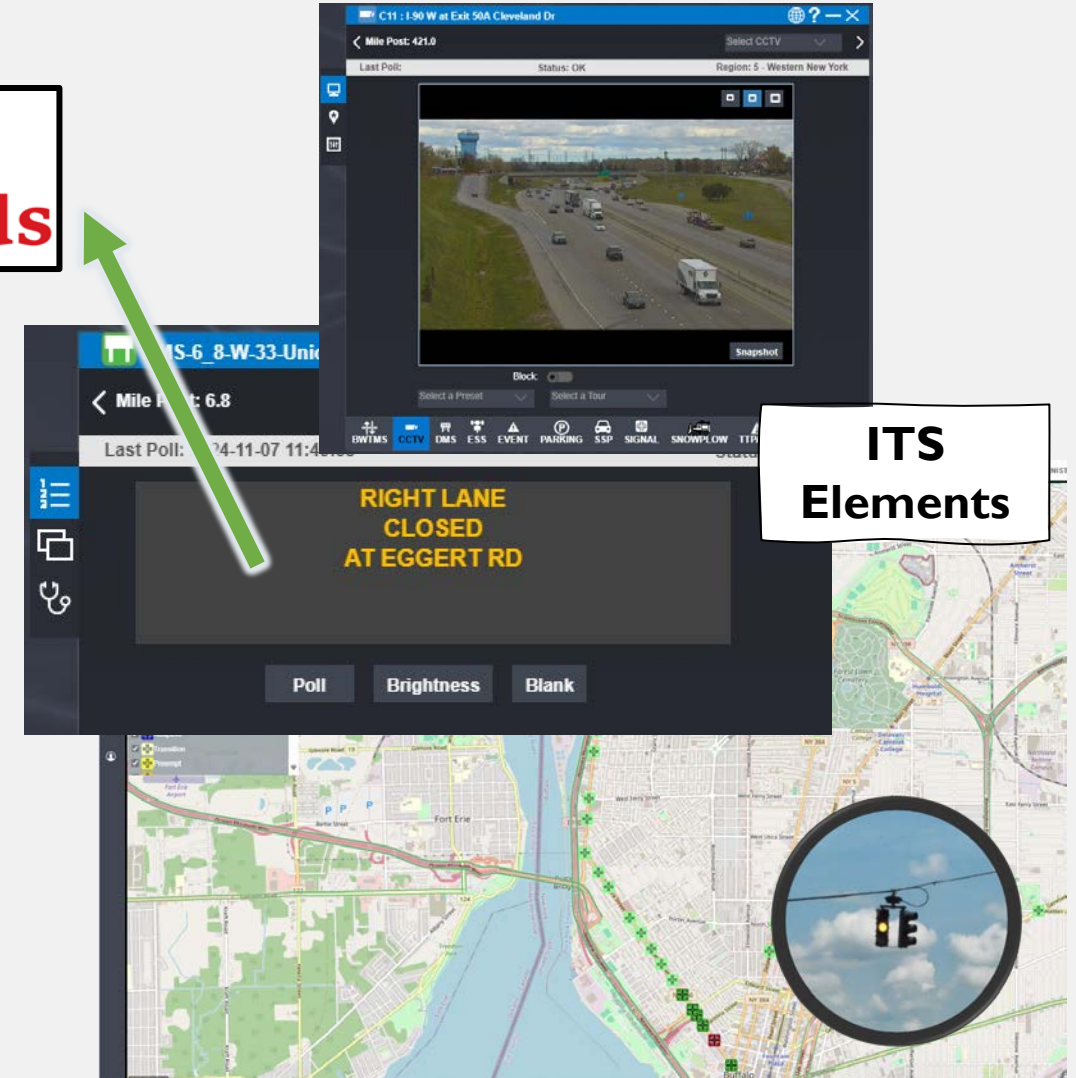
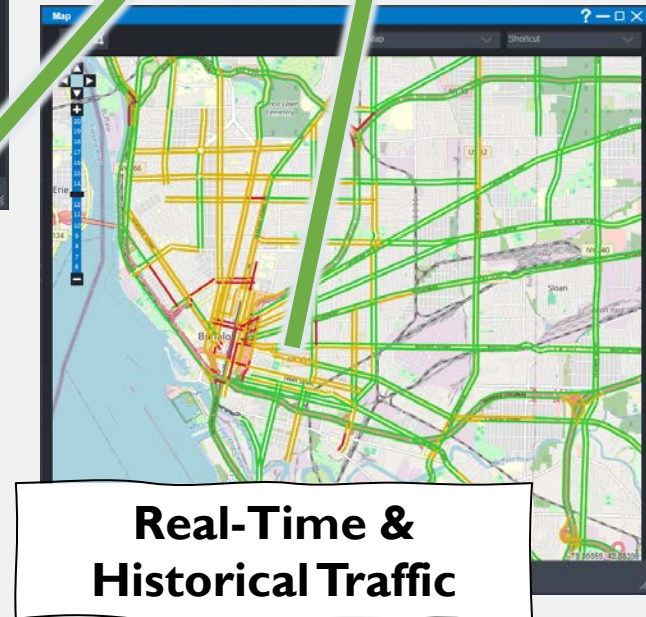
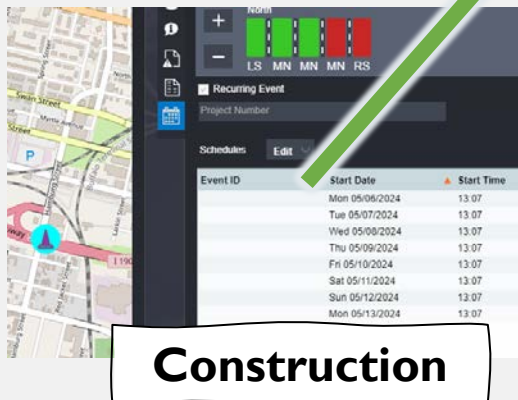
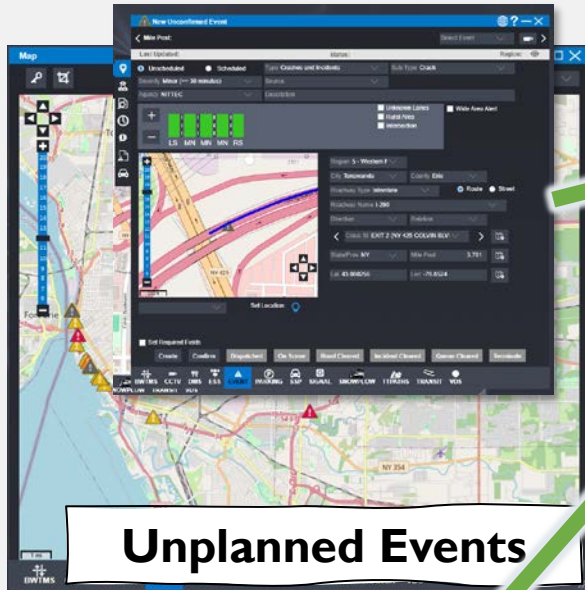
- Centralized 24/7 operations and traffic management services for bi-national region
- Information Clearinghouse
- Standardized Operations
- Multi-Agency Event Planning and Operations
- Multi-Agency ITS Deployment
- Regional Messaging Standards
- Traffic Management Plans

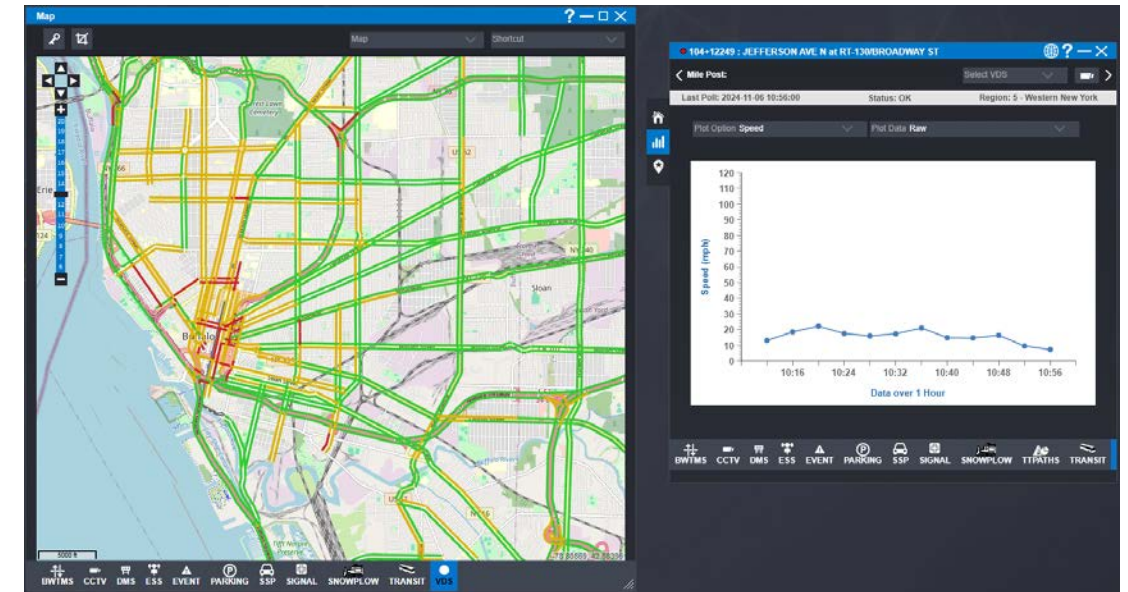


# AllRoads System Design



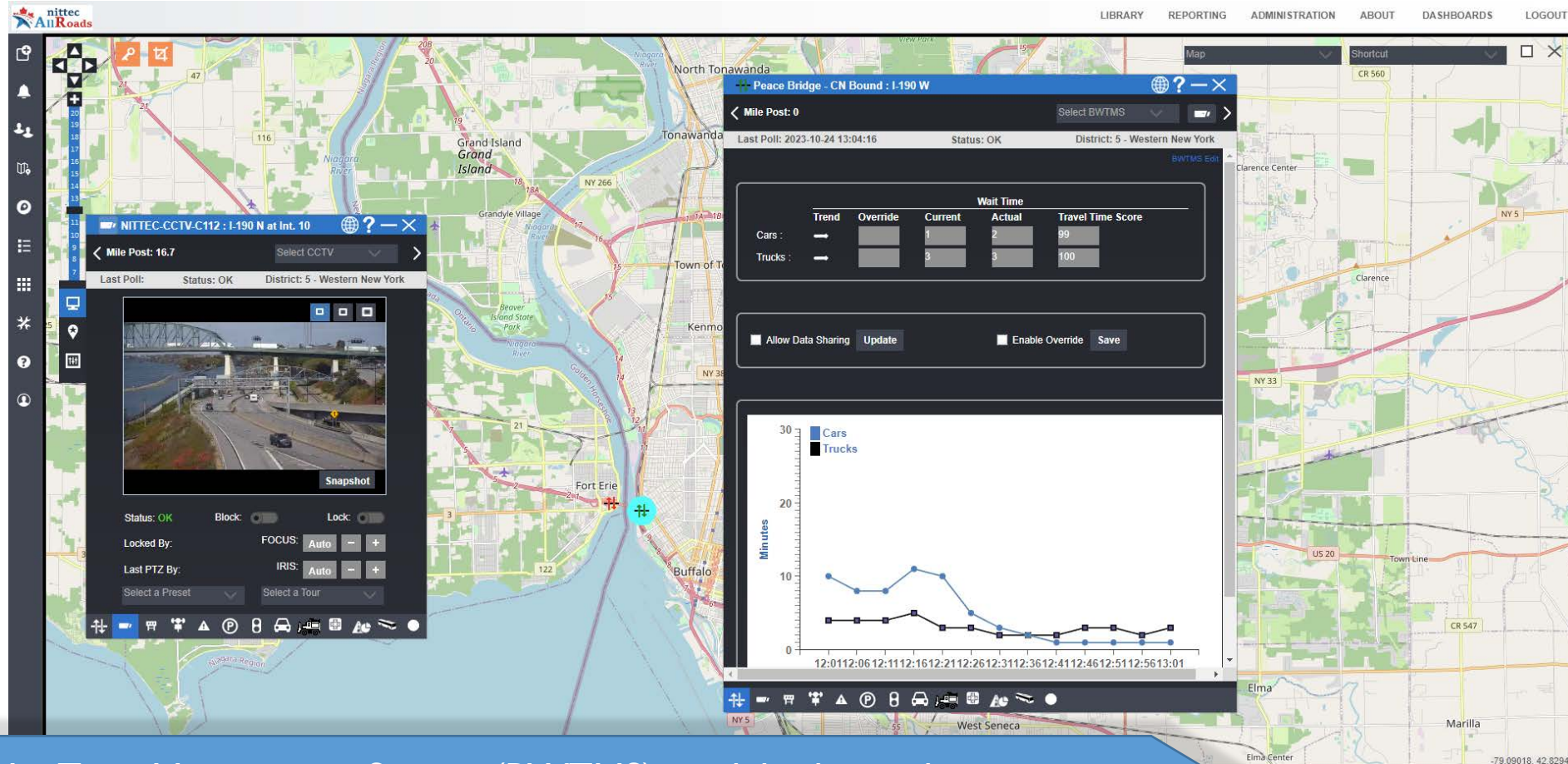
# Incorporation of Data Elements





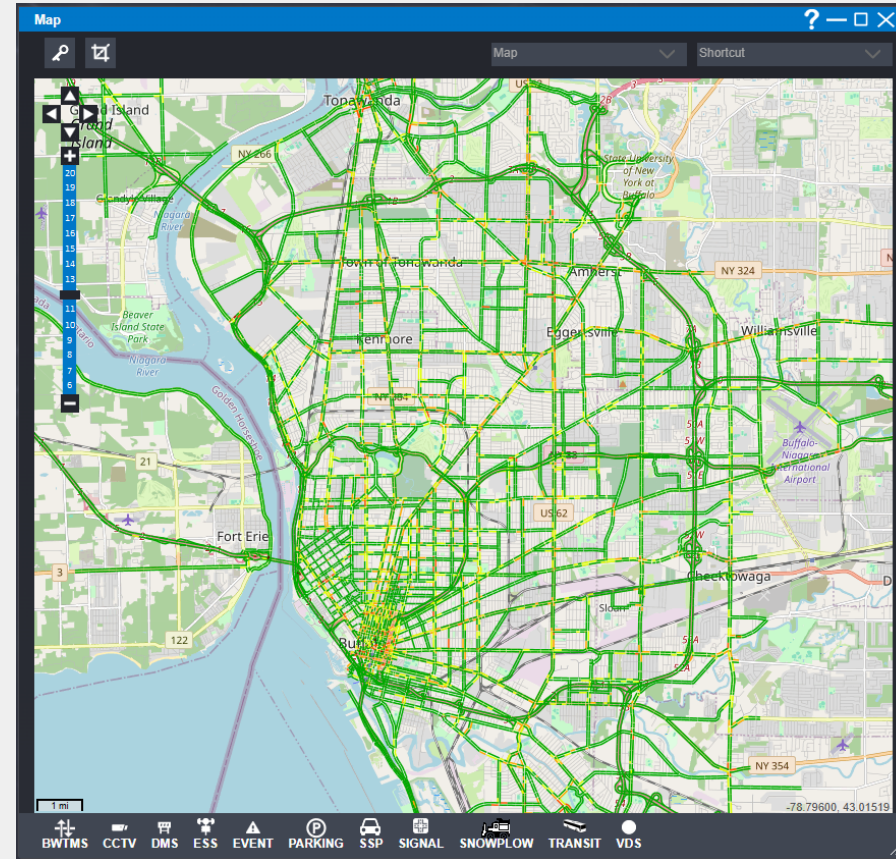
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# Border Crossing Monitoring



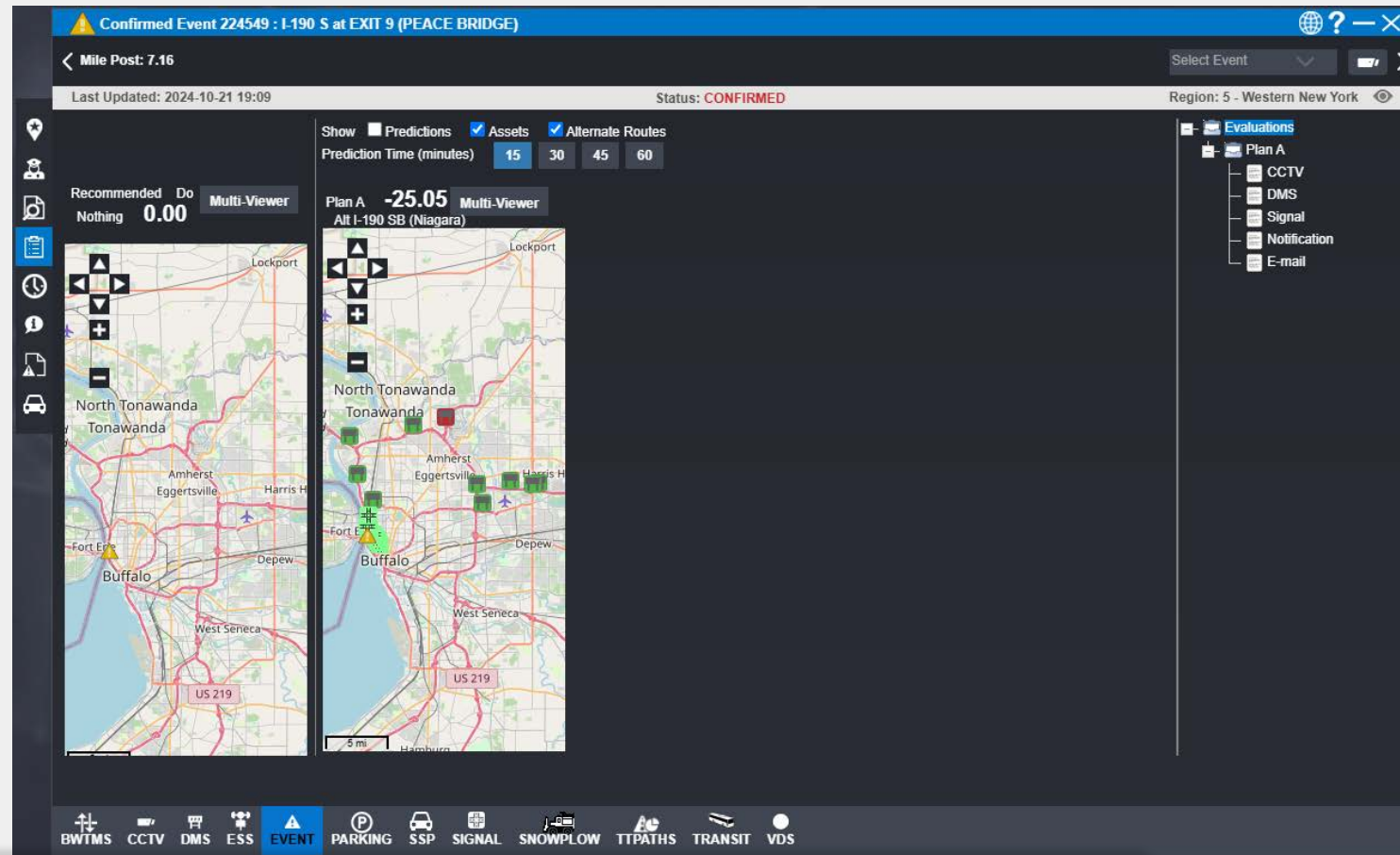
The Border Wait Time Management System (BWTMS) module shows the international border Crossings between the U.S. and Canada with the current delay for cars and trucks, and a graph of delay over the last hour.

# Advanced Regional Model



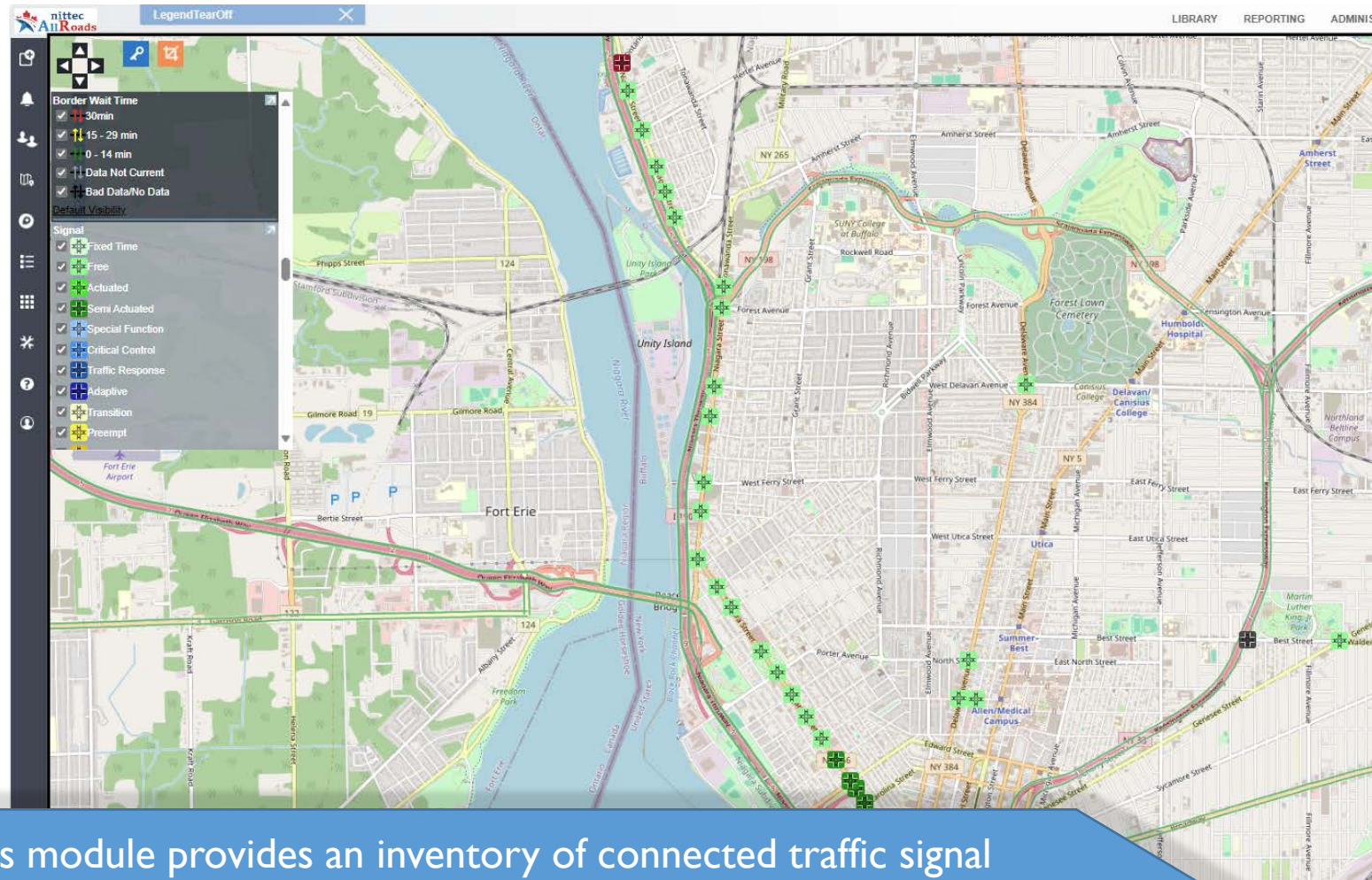
AllRoads incorporates an advanced regional traffic model which runs predictions on conditions every 15 minutes based on current events and historical data.

# Decision Support System



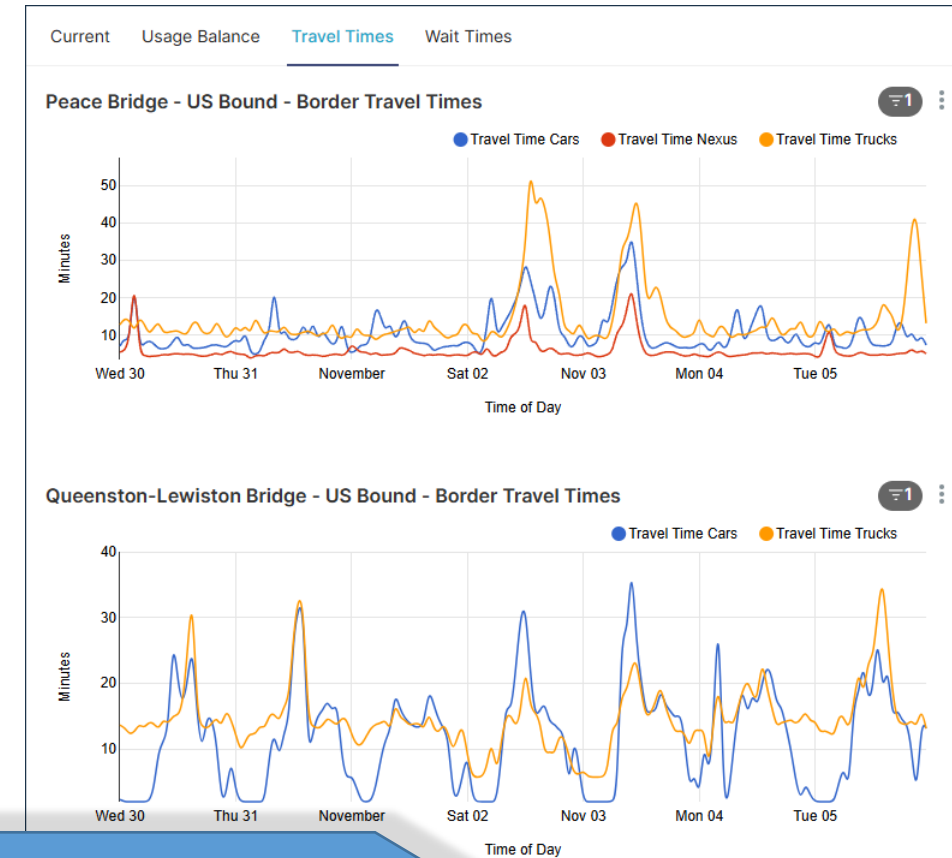
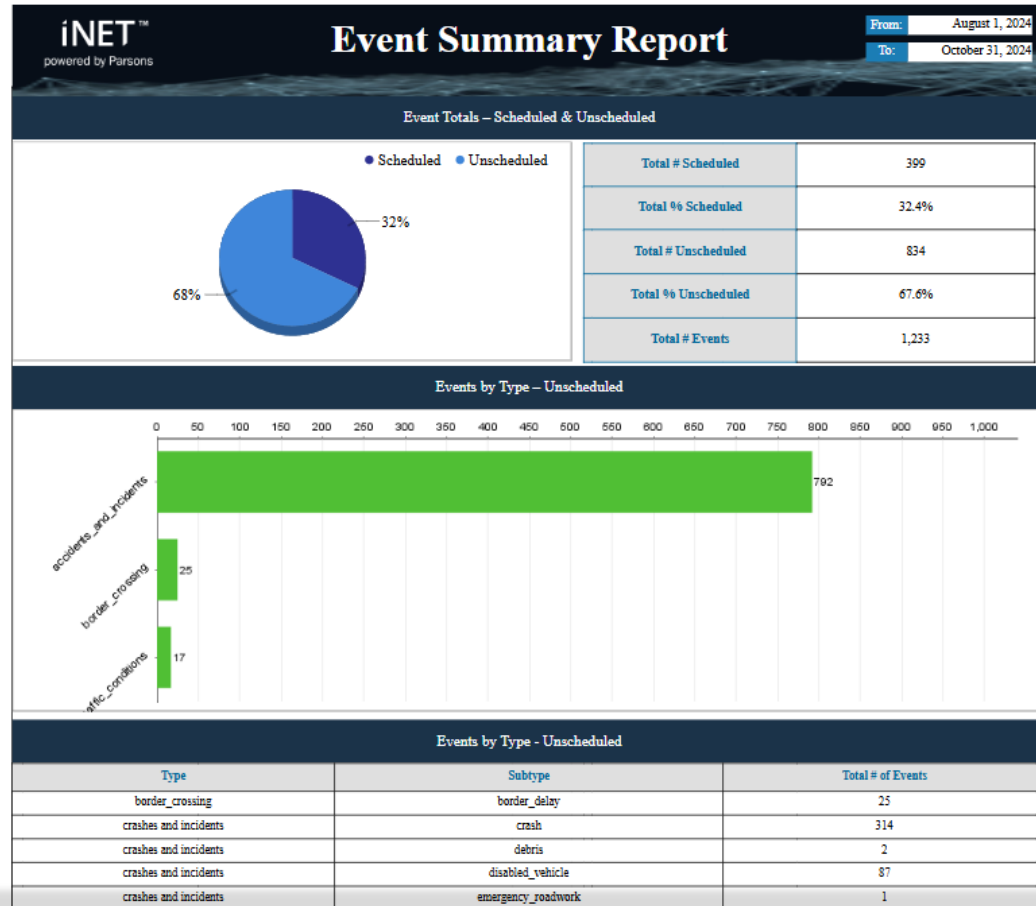
The Decision Support System (DSS) module incorporates event data with the regional traffic model, as well as predetermined response plans. It uses this information to recommend changes to message signs, signal timing, etc.

# Traffic Signal Status



The Traffic Signal Status module provides an inventory of connected traffic signal controllers in the region and includes information on current timing plans and coordination status

# Dashboards & Reporting



AllRoads includes a variety of reports and dashboards for the data feeds incorporated into AllRoads.

# Questions

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8/11/2026

# Opportunities for TMS to Use AI/ML

Lessons learned from AI-powered incident detection, decision support, and TMC workflow applications.

Jianming Ma, Ph.D., P.E., PMP®

Traffic Management Section Director | Texas Department of Transportation

# Why AI/ML Matters for TMS Now

TMCs are moving from more data to better decisions.

| Data volume                                                                           | Response speed                                                                 | Workflow burden                                                                | Consistency                                                             |
|---------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------|-------------------------------------------------------------------------|
| Cameras, sensors, crowdsourced alerts, probe data, weather, V2X, and work zone feeds. | AI/ML can help surface possible events faster when seconds and minutes matter. | Repetitive tasks such as video lookup, log review, and response documentation. | Decision support can help operators apply procedures more consistently. |

**Framing:** Identify day-to-day TMS functions AI/ML can improve, then evaluate capability, resources, constraints, and value added.

**Working principle:** The challenge is no longer data availability. The challenge is turning data into timely operational decisions.

# TxDOT's Current AI/ML TMS Portfolio

The strongest examples are operational, not theoretical.

1

## AI incident detection and event awareness

Rekor Command and Cubic/UrbanLogiq deployments and demos

2

## Predictive and decision support

Machine-learning-based VSL decision support and operator recommendations

3

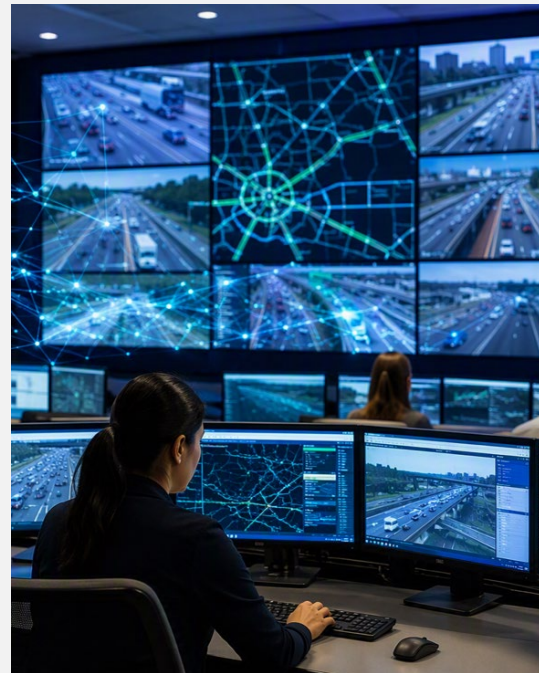
## Crowdsourced and video analytics

Roadway anomaly detection using video and crowdsourced data

4

## Workflow and workforce support

TMC AI chatbot concepts and internal operational AI exploration



| Explore    | Pilot                | Deploy/Evaluate         |
|------------|----------------------|-------------------------|
| AI Chatbot | VSL Decision Support | Rekor, Cubic/UrbanLogiq |

## Example 1: AI incident detection & event awareness

AI platforms can support an existing TMC function: detecting, confirming, and managing roadway events.



Rekor Command and Cubic/UrbanLogiq were presented as platforms to help districts identify and monitor real-time traffic events.

### Input

Real-time, historical, and geospatial data streams

### Detection

Crashes, debris, stalled vehicles, and weather conditions

### Output

Early alerts through a map interface

### Integration

Integration with Lonestar for improved event awareness

# What It Takes to Operationalize AI

Deployment is a program effort, not just a product demo.



## Executive Sponsorship

Establish a clear operational need and leadership support



## Stakeholder Buy-In

Engage TMC operators, IT, cybersecurity, procurement, and district staff early



## Procurement/Contracting Path

Identify approved purchasing and contracting mechanisms



## System Integration

Connect AI outputs to existing ATMS and TMC workflows



## Operator Acceptance

Build trust through testing, training, and measurable performance improvements

**Key message: Successful AI deployment is as much about people, process, and integration as it is about technology.**

**TxDOT Lesson Learned:** The technical deployment was often easier than achieving integration, governance alignment, and operator acceptance.

# Integration is Where the Real Work Happens

A correct detection is not enough if operators cannot use it in the normal workflow.

## Lesson 1: AI must fit the operator workflow

Alerts need to fit normal TMC actions, not create another disconnected screen.

## Lesson 2: Alert quality determines trust

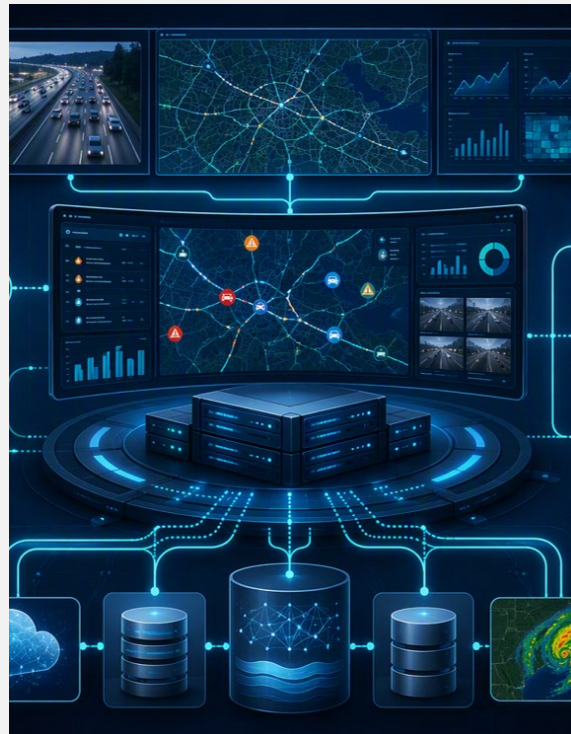
False alarms and clutter reduce operator confidence and add workload.

## Lesson 3: Integration details matter

Timestamp handling, data formatting, and system-to-system connections affect value.

## Lesson 4: Avoid disconnected dashboards

AI outputs should become part of the TMS ecosystem, not a separate tool to monitor.



# Crowdsourced & Video Data Can Extend Awareness

Research & data-sharing can help determine where AI provides measurable operational value beyond traditional TMC coverage.

## Crowdsourced alerts

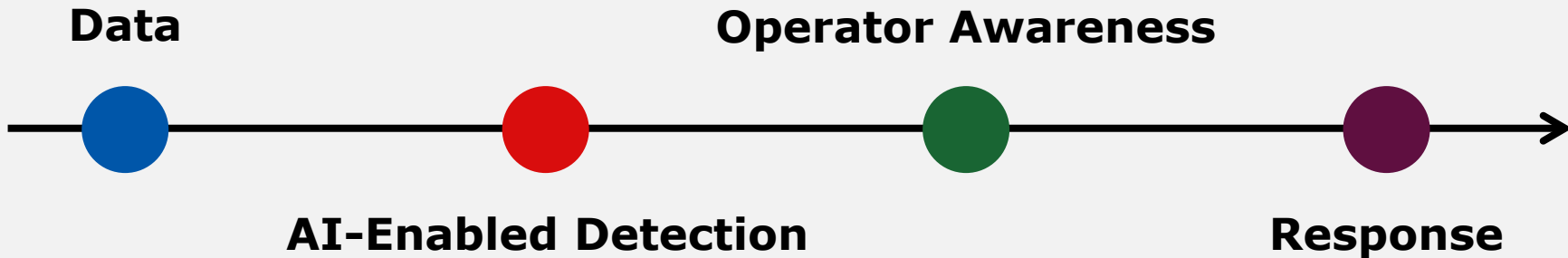
Supplemental source for roadway hazards and anomalies, especially where CCTV coverage is limited.

## Video data

Research agreement allows TTI to receive video data from up to three districts through API connection.

## Operational goal

Improve detection, awareness, and response for debris, roadway hazards, and other anomalies.



# Decision support and workflow support

AI should support trained people, not bypass them.

## Decision support

- ☐ ML-based variable speed limit decision support recommendation
- ☐ Human-AI collaboration for TMC freeway operations
- ☐ AI surfaces options and patterns
- ☐ Operators remain accountable for decisions

## Workflow support

- ☐ TMC AI chatbot concept
- ☐ Faster retrieval of procedures, logs, and guidance
- ☐ Support for onboarding and consistent responses
- ☐ Potential automation of repeatable internal processes

**Human-in-the-loop: AI provides input, recommendations, or predictions; people evaluate and act.**

# What Good Looks Like

## Measuring AI Success in Traffic Management Operations

- **Faster Detection**
  - Improves incident awareness and verification time
  - Identifies events earlier than current methods
- **Reduced Operator Workload**
  - Automates repetitive tasks
  - Reduces time spent searching, reviewing, and documenting
- **Improved Awareness**
  - Expands coverage beyond traditional sensors and cameras
  - Provides actionable information, not just additional data
- **Increased Consistency**
  - Supports standardized responses across operators and districts
  - Reduces variability in decision-making
- **Trusted Integration**
  - Works within existing TMS workflows
  - Produces alerts operators trust and use
- **Demonstrated Operational Value**
  - Demonstrates benefits compared to current practice
  - Supports business case for scaling and investment

# Evaluation, governance, and risk



## Value measurement

Compare AI performance and workload impact against current practice.

## Procurement & governance

Require focus up front, not after deployment.

## Cybersecurity & privacy

Review data, access, cloud, and operational technology risks.

## Data sharing & ownership

Define what is shared, with whom, and for what purpose.

## Training & accountability

Help staff understand appropriate AI use and responsibility.

## Transparency

Plan for explainability, modifiability, proprietary limitations, and vendor dependency risks.

# Key Takeaways

AI is most valuable when it improves real TMS work.

- 1 Start with operator needs** Begin with the operational problem, not the technology feature.
- 2 Integrate into existing workflows** Avoid isolated dashboards; connect outputs to systems operators already use.
- 3 Evaluate signal-to-noise** Measure trusted alerts, workload impact, and value added versus current practice.
- 4 Address governance early** Procurement, cybersecurity, training, and data sharing shape deployment success.
- 5 Keep humans accountable** AI supports faster, more consistent decisions; people remain responsible.

**The future of TMS AI is human-centered, data-driven operations that improve safety, mobility, and operational efficiency.**

## Questions?

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# **GDOT and Artificial Intelligence**

**John Hibbard**  
**Deputy Chief Engineer**

## *GDOT's Entry to AI From Various Perspectives:*

Starting “high” – with Policy

And

Starting “low” – with Pilots

and

Acknowledging reality



**gta** | GEORGIA  
TECHN/ AUTHC

Working with GTA Service

Technology Building

|                                                                                   |  |                                                         |                                |
|-----------------------------------------------------------------------------------|--|---------------------------------------------------------|--------------------------------|
|  |  | <b>Georgia Technology Authority</b>                     |                                |
| <b>Title:</b>                                                                     |  | <b>Artificial Intelligence Responsible Use</b>          |                                |
| <b>PSG Number:</b>                                                                |  | <b>SS-23-002</b>                                        |                                |
| <b>Effective Date:</b>                                                            |  | 12/12/2023                                              | <b>Review Date:</b> 12/01/2024 |
| <b>Synopsis:</b>                                                                  |  | Establishes requirements for the use of AI tools within |                                |

**gta** | GEORGIA  
TECHNOLOGY  
AUTHORITY



|                                                                                   |  |                                                                               |                     |
|-----------------------------------------------------------------------------------|--|-------------------------------------------------------------------------------|---------------------|
|  |  | <b>Georgia Technology Authority</b>                                           |                     |
| <b>Title:</b>                                                                     |  | <b>Enterprise Artificial Intelligence Responsible Use</b>                     |                     |
| <b>PSG Number:</b>                                                                |  | <b>PS-23-001</b>                                                              |                     |
| <b>Effective Date:</b>                                                            |  | 08/01/2023                                                                    | <b>Review Date:</b> |
| <b>Synopsis:</b>                                                                  |  | Establishes requirement for Enterprise Artificial Intelligence Acceptable Use |                     |

## PURPOSE

As artificial intelligence (AI) technology continues to advance and become an integral part of everyday business operations, it is increasingly important for the State to establish clear AI usage policies. This policy is designed to promote the innovative use of AI tools, while also minimizing the potential for intentional or unintentional misuse, unethical outcomes, potential biases, inaccuracies, and

capabilities –  
empowers  
right in  
fairness, and  
policy (PS-23-

## Starting “High”: GDOT AI Policy

- Part A - General Provisions (governing principles and definitions)
- Data Accuracy
- Data Privacy
- Fairness and Non-discrimination
- Mitigation of Security Risks
- Compliance with State and Federal laws
- Transparency and Accountability

## And at the same time . . . Starting “Low” with Examples: Customized AI Project: TMC-React

- TMC SOP's are 600 pages and not well organized
- TMC Incident Management requires quick decisions
- Will benefit management of infrequent incident types
- Goal: Provide consistent, comprehensive information to TMC Operators



34.046895, -84.029658 tractor trailer overturned

☐ SOP Question
 ☒ Incident Checklist
 ☐ Find a Contact
 ☐ RAVE Alerts
 ☐ TRIP/HERO/CHAMP

Submit

**TMC-React**  
POWERED BY ORACLE

New Chat

**TODAY**  
Tractor trailer crash at 34.046895, -84.029658

**EARLIER**  
TRIP group for 32.6728...  
Sift on sheriff  
Small aircraft landed a...  
example of a rare long...  
How do I create a Web...  
Hazardous material SOP...  
Do I need to call HCC...  
How do I create a Web...

**Location**  
Map showing the location of the incident at 34.046895, -84.029658. The map includes labels for Sprouts Farmers Market, Rock Springs Park, and various roads.

Is this location correct? Type "yes" or drag the pin to adjust.

yes

**Responder**  
RESPONDER: HERO 204  
ROUTE: 204

**TRIP Group**  
COMPANY: Willard  
PHONE: 770-614-8131

First, you should enter the event into the NavGator system. This ensures that the incident is properly documented and tracked.  
Every event worked by HERO is to be documented in the advanced transportation management system (ATMS).

Visually confirm the incident using a camera. If available. If a camera is not available, make a note of it in the event details. This helps to verify the situation and assess the severity.

## Another Use Case: Customized AI Project: Engineering Estimation

- A very manual, resource-intensive process
- Concept is to have AI generate a first draft of estimates of time needed, based on GDOT's historic data
- Goal is to save time and have more consistent estimates.



## Other Traffic Ops Use Cases

- **AI Signal Permitting Application (GCP/BigQuery):** A query that previously took two weeks of engineer time now takes two seconds via natural language over BigQuery
- **Crash AI:** Reviews all 400,000 annual crash reports; flags likely officer errors by comparing narrative against metadata, with a human review gate before any correction is committed
- **Signal Database AI (in development):** Natural language queries across all 9,000+ signals

## **“Non-Customized” AI Tools?**

- The AI tools known by name – the Large Language Models (LLM’s)
- Readily available
- They’re being used as we speak
  - “Office Efficiency”
  - Quick Answers
  - Quick Assistance

## Stay Connected



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# Thank You

**John Hibbard**

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