



INNOVATION / TECHNOLOGY DEPLOYMENT SUMMARY

# Enhanced Notification of Speed Reductions and Collisions Using Third-Party Data

## CHALLENGE

Permanent intelligent transportation system infrastructure is limited in rural areas, so it can be challenging for TxDOT districts, such as the Atlanta (ATL) and Bryan (BRY) Districts, to monitor speeds and travel times or detect occurrences of traffic congestion on I-30 (ATL) and I-45 (BRY). This limitation constrains districts' ability to quickly notify upstream motorists of lane closures or potential slowdowns that occur as a result of traffic incidents or in the vicinity of work zones.

## SOLUTION

The Atlanta and Bryan Districts identified third-party probe-based speed data as a solution for detecting congestion and better utilizing permanent dynamic message signs (DMSs) to provide advance warning of traffic slowdowns on their interstates.

This innovation uses the personal alert feature in the Regional Integrated Traffic Information System (RITIS) to detect when travel speeds on segments drop below an established threshold

for more than 15 minutes – below 25 mph on I-45 in the Bryan District (Figure 1) and below 30 mph in the Atlanta District. These conditions trigger a RITIS email alert notifying the districts of when and where congestion is occurring. These alerts are also set to automatically generate messages on the permanent dynamic message signs (DMSs) along the corridor, warning drivers of potential slowdowns ahead. As conditions change, various criteria are used to automatically update or remove the DMS messages. For the Atlanta District, a future enhancement will be coordinating message posting on permanent DMSs owned and operated by the Arkansas Department of Transportation.

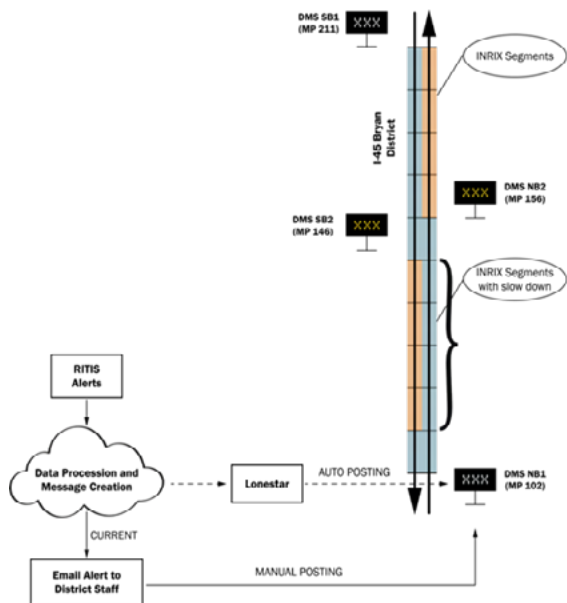


Figure 1. Roadway segments associated with the Bryan District's permanent DMS's on I-45.

**TxDOT GOALS**



Deliver the right projects



Focus on the customer



Foster stewardship



Optimize system performance



Preserve our assets



Promote safety



Value our employees

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## PROACTIVE APPROACH

Automating message alerts using third-party probe data is both a proactive and cost effective approach to addressing a common challenge in a large state. Using the RITIS personal alert feature, the team set up monitoring links on I-30 (ATL) and I-45 (BRY). Significant speed reductions typically indicate anomalies related to crashes, disabled vehicles, or construction. Alerts triggered when travel speeds drop below a certain threshold for more than 15 minutes (Figure 3) allow timely warnings of slowdowns at the estimated queue locations to be posted to DMS signs, improving safety. Messages are removed once speeds return to normal. Figure 2 illustrates the concept of assigning alert segments to specific permanent DMSs.

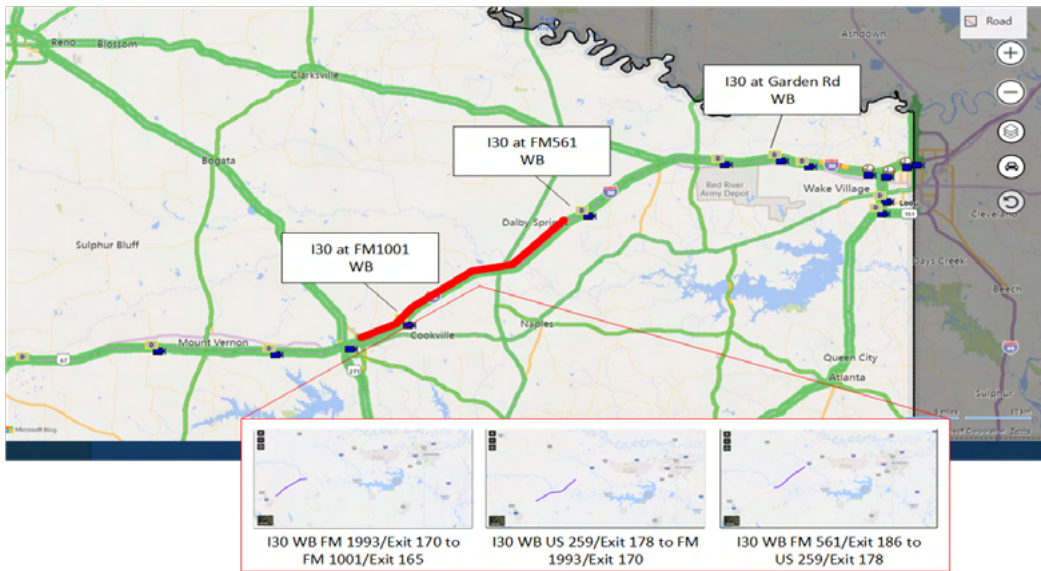


Figure 2. Alert segments assigned to permanent DMS, I-30 at FM 562 westbound, in the Atlanta District.

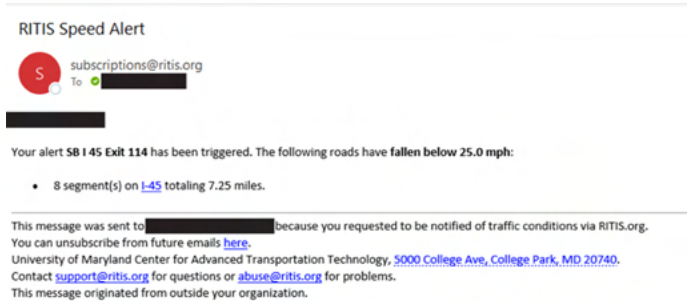


Figure 3. Sample congestion alert email from RITIS.

## Resources

[Atlanta District \(txdot.gov\)](https://www.txdot.gov/atlanta-district)

[ITS Map: Atlanta District \(its.gov\)](https://its.txdot.gov/atlanta-district)

[Bryan District \(txdot.gov\)](https://www.txdot.gov/bryan-district)

[ITS Map: Bryan District dynamic message signs \(its.gov\)](https://its.txdot.gov/bryan-district)

[Crash Data and Analysis: CRIS Query Tool \(txdot.gov\)](https://www.txdot.gov/crash-data-analysis)

[Highway Conditions: DriveTexas.org](https://www.drive-texas.org/highway-conditions)

[Regional Integrated Traffic Information System \(RITIS\)](https://www.ritis.org)

## Contacts

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## BENEFITS

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- **Enhanced DMS Utilization:** The project makes better use of existing DMSs to provide timely congestion information.
- **Advance Warning of Slowdowns:** Earlier warnings of traffic congestion enable motorists to adjust their speed or travel route.
- **Reduced Delays and Congestion:** Timely alerts help minimize delays, potentially reducing overall congestion and improving safety on rural interstate roadways.

## KEY TASKS

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- **Technology Assessment:**
  - Assess the ability of third-party data (INRIX/connected vehicle data) to identify congestion and sudden speed reductions on rural freeways.
  - Evaluate existing speed detection systems if available.
  - Explore additional sensor deployments, if cost-effective.
- **Congestion Detection Analysis:**
  - Conduct a detailed analysis of probe-based speed and travel time data to identify locations experiencing congestion.
  - Develop an algorithm to automatically trigger messages on dynamic message signs notifying drivers of downstream congestion.
- **DMS Messaging Standard Operating Procedures (SOPs):**
  - Establish thresholds for receiving alerts when speeds drop below predefined thresholds.
  - Establish protocols for automatically removing messages once congestion dissipates.

## DATA SOURCES

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The RITIS data used for this innovation delivers comprehensive, near-real-time information on travel-times and traffic speeds, and is aggregated from two sources:

- **Infrastructure-based Systems:** These provide traditional measurements of traffic conditions on major freeways.
- **Third-party Probe Data:** Anonymized data provided by INRIX, HERE, and TomTom, and sourced from GPS-enabled devices, provides traffic flow insights.

Access to near real-time speed and travel time data through the RITIS personal alerts feature offers the ability to measure travel conditions, even in rural areas with limited infrastructure-based measuring systems.