

Alerting Commercial Motor Vehicles



By North Carolina Department of Transportation

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Benefits Statement

North Carolina's real-time in-truck alerts for Commercial Motor Vehicles (CMVs) by the INRIX/Drivewyze system have proven vital in saving lives, time, and money. By alerting CMV drivers to urgent road conditions, these alerts reduce crashes and save lives. They also save time by providing direct information to drivers, helping them avoid traffic congestion. Furthermore, by keeping CMVs off restricted mountainous roads and enhancing highway safety, the system helps save money on property damage, medical costs, and infrastructure maintenance. Overall, this system improves road safety, saves travel time, and cuts costs.

In this case study you will learn:

1. How NCDOT introduced real-time alerts for Commercial Motor Vehicles (CMVs) to address traffic incidents and work zones, partnering with INRIX and Drivewyze.
2. How the system covers selected corridors, provides alerts directly to CMVs, and has positively influenced driver behavior, reducing speeds by 8 to 11 mph.
3. How communication efforts and data analysis indicate the system's effectiveness in improving traffic management, safety, and reducing congestion-related issues in North Carolina.

BACKGROUND

The North Carolina Department of Transportation (NCDOT) operates and maintains over 80,000 miles of roadway, of which 2,500 miles are fully access controlled highways. When there is an incident like a crash or when a work zone causes traffic to slow down or stop, NCDOT alerts traffic using Dynamic Message Signs (DMS). With only about 300 DMS statewide, there are many locations where DMS are not available to inform motorists about traffic anomalies. Providing real-time information to trucks is especially crucial since they need more time to stop or slow down. In 2021, there were 15,557 Commercial Motor Vehicle (CMV) involved crashes in North Carolina.

In 2021, NCDOT began providing real-time in-truck alerts of urgent road conditions. The system is a partnership between INRIX, a probe speed data provider, and Drivewyze, who provides in-cab communications to CMV's via Electronic Logging Devices (ELD). The in-cab Slowdown and Congestion alerts allow trucks more time to react to stopped traffic or major slowdowns.

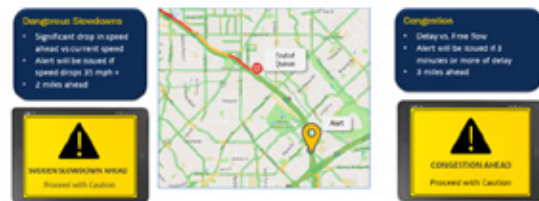


TSMO PLANNING, STRATEGIES AND DEPLOYMENT

Traditionally, NCDOT manages traffic slowdowns with awareness of congestion through speed maps, traffic cameras, or law enforcement. A traffic management center (TMC) alerts drivers through DMS, a traveler information website, and a 511 phone system. In these scenarios, it takes time for the information to get to the driver. Information on a website or a 511 phone system requires the driver to take an action to search out

the information. Drivewyze is a faster and more direct way to get information to truck drivers without intervention from the TMC or the driver having to find the information.

In 2020, NCDOT contracted with INRIX to provide dynamic slow traffic alerts to trucks using Drivewyze. The contract covered 500 miles of rural Interstates for one year. NCDOT selected I-95 and rural portions of I-40 as the initial locations for these alerts. Drivewyze monitors INRIX speed data for sudden slowdown and congestion events and distributes the alerts to Drivewyze users. An interstate, I-77, north of Statesville was added as an alerting corridor in late 2021. In 2022 the service was expanded to cover almost all freeways in the state (2,200 miles).



To summarize the process, first, NCDOT defined the corridors. Next, Drivewyze receives alerts from INRIX and displays the alerts onto ELDs in the trucks. The service also includes a dashboard that allows NCDOT to see where and when alerts were issued.

Drivewyze also offers "Free Agency Safety Messages", and NCDOT use these messages during specific situations.



1) Work Zone Awareness: NCDOT is replacing several bridges on I-40 in Western North Carolina between Asheville and Tennessee over several years, and traffic will be heavily impact-

ed by the construction. Queues are often more than five miles on Fridays and Sundays. Since this is a corridor through the mountains, alternate routes are very limited. Alerts about the work zones and the availability of an alternate route are issued to trucks approaching I-40 from either direction: eastbound coming from Tennessee and westbound after entering from South Carolina. Once trucks have passed the logical and truck-friendly alternate route, notifications are issued to discourage trucks from taking truck-restricted mountainous roads as diversion routes and to stay on I-40 through the work zone.

2) Restricted Road Alerts: In mountainous areas, CMVs sometimes use truck-restricted roads that creates issues for CMV drivers, property owners, and emergency responders when they are forced to turn around, cannot navigate through steep grades, narrow lanes, or sharp turns, or they crash. NO TRUCK alerts were issued on 6 of the most frequently used truck-restricted roads. To date, Drivewyze maintains that no trucks receiving alerts have traveled onto the truck-restricted roads.

COMMUNICATIONS PLANNING AND EXECUTION

NCDOT issued a press release to notify the public, trucking companies, and private CMV owners about Drivewyze. In addition, NCDOT is working with the North Carolina Trucking Association to improve awareness of this free-to-trucks service. Drivewyze connected NCDOT to an NC trucking company, Cargo Transporters, who was pleased with the service. NCDOT is planning an information session for NC Trucking Association members and has shared information about this project to peer groups numerous times through conferences, webinars, and peer exchanges.

OUTCOME, BENEFITS AND LEARNINGS

The number of alerts issued in North Carolina since 2021 are:

- 150,000 dynamic traffic alerts sudden slow down and congestion notifications using INRIX data
- 384,000 work zone alerts on the bridge that was most recently replaced
- 24,000 restricted route alerts

A case study of a work zone along I-95 in NC found that alerts positively impacted truck driver behavior. The results showed 70% of alerted drivers slowed down when they received an alert. Their speeds dropped between 8 and 11 mph depending on which alert they received.



Texas A&M's Texas Transportation Institute (TTI) also evaluated Drivewyze data in North Carolina to review traffic delays due to a crash and the corresponding alerts issued to trucks. Freeflow traffic is green. The colors change from yellow to orange to red as speeds slow down. Grey indicates that no traffic was moving at that time and location. The small black boxes represent the alerts that were issued. The location of the alerts is shown on the vertical axis and the time of the alerts is shown on the horizontal axis. The alerts were issued where and when expected to notify trucks of this unexpected condition.

Providing CMVs with advanced notification of slowdowns and congestion allows them more time to slow down and/or move over, which can reduce secondary crashes. The INRIX/Drive-

wyze system is cause agnostic – regardless of the reason for the stopped or slow traffic the driver will get an alert. These alerts are always due to actual slow traffic, not just a general vague message such as “Road Work Ahead” or “Expect Delays”. NCDOT has enhanced highway safety by providing proactive alerts to trucker drivers about conditions ahead and also used the system to keep trucks off of restricted mountainous roads.