Intelligent Transportation Systems

TxDOT uses intelligent transportation systems to increase safety and travel efficiency on Texas roads. Scroll down to learn more.
Intelligent Transportation Systems

From adaptive traffic signals to dynamic message signs (DMS) informing drivers of lane closures, Intelligent Transportation Systems (ITS) makes traveling in Texas safer and more reliable. TxDOT deploys ITS to improve transportation and provide innovative solutions to transportation challenges.

Cover Photo: An electronic message sign on IH 30 in Dallas.
Other common ITS devices include:

- Closed-circuit television that can locate crashes and other disruptions
- Vehicle detection (loops, microwave, video, Bluetooth, etc.) that measure speed, vehicle counts, and lane occupancy
- Weather stations that warn travelers about ice or fog
- Computer-aided dispatch to expedite information to transit and emergency vehicles
- Traffic signal preemption to give emergency vehicles the right-of-way
- Wired (including fiber), cellular 4G routers, and wireless broadband radio
- Communications tools to send travelers alerts about travel conditions and emergencies, including e-mail, text, and “reverse-911,” which can deliver mass emergency notifications

Video (non-mobile only): An overview of ITS components including electronic message boards, transportation monitoring centers and toll gantries. Photo (mobile only): Detail of a digital message sign (DMS).
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**ITS Program Areas**

Transporation is not new to using technology to make travel safer, faster, and more reliable. Since 2001, TxDOT districts have identified ITS-related needs in their regions. Each region of Texas has unique transportation conditions, so each has different ITS needs. These fall under program areas such as Traffic Management (see photo to the left), with several types of ITS infrastructure supporting each area.

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Photo: A view of the Dallas Traffic Management Center (TMC), DaTrans.
- TxDOT operates 14 Traffic Management Centers (TMCs) overseeing transportation throughout the state. TMC operators monitor traffic using nearly 2,000 closed circuit cameras and communicate with drivers through more than 1,000 dynamic message signs. (1)

- Federal research has found that highway emergency responder programs—which use ITS devices such as vehicle detection and traffic cameras—reduce congestion and allow crashes to be cleared more quickly. (2)

- Dynamic message signs display information that update according to travel conditions. Federal research has found that 94% of travelers take alternate routes when longer-than-normal travel times are displayed on dynamic message signs.

Photo: A DMS displays an Amber Alert Message.

Emerging transportation technologies, such as connected and autonomous vehicles (CV/AV), may require significant infrastructure investment. Moreover, "smart cities" technologies that collect data will increase the amount of data that must be stored. These new technologies may require TxDOT to invest even more in ITS infrastructure.

Photo: An autonomous vehicle in downtown Austin.
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Partnering for the Future

TxDOT works with partners to implement new technology to help reduce congestion and crashes. In one example TxDOT partnered with the Texas A&M Transportation Institute (TTI) and ITS device vendors to install detection and communication devices for a signalized intersection at TTI. As the bus approaches the intersection, the smart system detects if the bus will be making a right turn based on its route. If the bus will be turning, accessible pedestrian signals notify pedestrians through LED bus notification signal heads and a smartphone app.

TxDOT strives to increase safety and reduce traffic congestion across the state through innovation and use of the latest technology. Click here to read about other ITS pilot projects and initiatives in Texas.

Photo: Testing of a smart intersection at the Texas A&M Transportation Institute.