TxDOT Innovations and Technology Deployment Briefs
Emergency Evacuation Surveillance for Efficiency

PROBLEM

Hurricanes are one example of a well-known weather threat to the Texas Gulf Coast. In certain storms, it may become necessary to evacuate the public which can cause significant congestion and traffic issues. Numerous other situations may also require evacuations or large-scale traffic control (such as hosting a Super Bowl). For safe and efficient traffic operations to take place, a clear understanding of current roadway conditions is necessary. This roadway assessment requires a multi-faceted approach of both observation from people on the ground as well as remote monitoring.

SOLUTION

To address the needs the Houston District installed remote surveillance, closed-circuit television cameras (CCTV) to gain an understanding of traffic flows and conditions at choke points. This provides information to support traffic control via emergency personnel and law enforcement on-the-ground. In addition to the cameras. Bluetooth devices readers have been installed throughout the Houston District and adjacent Districts. The Bluetooth system detects Bluetooth signals, which may come from vehicles, phones, or other computing devices within a vehicle. The system works by detecting a unique identifier (i.e., media access control [MAC] address) and transmits the time and location of the device to the host processing system at Houston TranStar. As vehicles are detected at successive device readers, the host system merges travel time readings to calculate average travel times and speeds for a roadway segment.

The equipment was installed both within the Houston District and in neighboring Districts to provide a complete picture of an important evacuation and/or traffic route. A variety of connection options were used, including wireless cellular modems and fiber. Additionally, a mix of solar power and permanent power was used depending on the available infrastructure.

BENEFITS

In a situation requiring extensive roadway information, such as an evacuation, these technology deployments are instrumental in providing an accurate representation

PROJECT DELIVERY

CUSTOMER FOCUS

FOSTER STEWARDSHIP

PRESERVE ASSETS

OPTIMIZE PERFORMANCE

PROMOTE SAFETY

VALUE EMPLOYEES

of traffic conditions in Houston and along rural areas of major highways outside the District. With this data, decision makers can make informed decisions, such as whether to deploy contraflow, or more efficiently deploy needed forces to assist in safety and continuous traffic flow.

Additional benefits include information for first responders and public information uses in the TranStar app or web applications.

Other important benefits of this technology include a low-cost, low-maintenance way to anonymously collect travel time and speed data. MAC addresses do not contain any personal information and are not directly associated with a specific user.

KEY TASKS

- Install cameras, Bluetooth detectors, and wireless communication technology.
- Integrate into Houston TranStar.
- Coordinate with adjacent Districts along IH 10
- West and East, IH 45 North, and US 290 West for continuous safe service for the traveling public.

DATA SOURCES

The data sources provide real-time traffic conditions in Houston and surrounding rural areas 365 days a year where the systems are installed, providing the traveling public current travel times.

PROACTIVE APPROACH

The Houston District coordinated with and installed equipment in six adjacent Districts to be able to identify potential problems along evacuation routes and ensure consistent service to the traveling public. The Yoakum District helped install in Yoakum as well as other Districts

ADDITIONAL NOTES

During Hurricane Harvey in 2017, Houston's TranStar website got up to 3 million unique users.

Hurricane Rita Evacuation, September 2005.
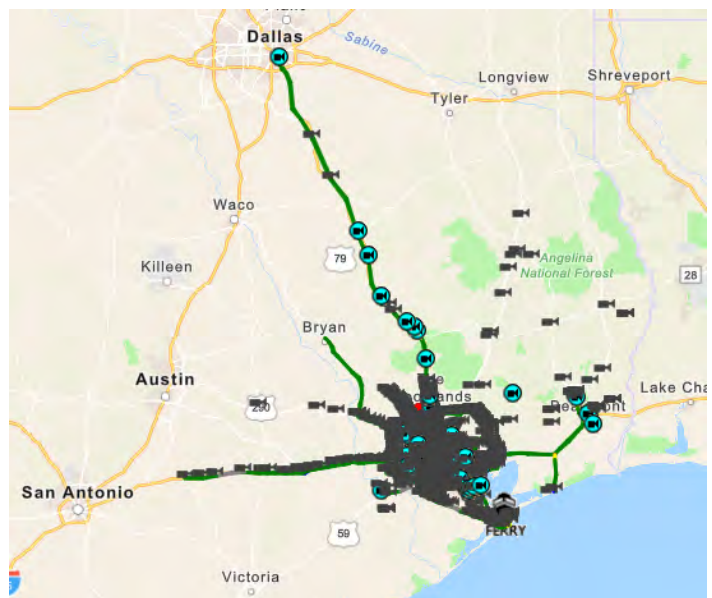
Camera locations continue from Houston to adjacent Districts.

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