



Real-time crowdsourced data from motorists supports operations by expediting notification of events such as crashes and unexpected congestion.

Using crowdsourced data from smartphone- and cellular-based data sources and enhanced law enforcement communications through computer-aided dispatch (CAD) systems, public agencies are increasing their situational awareness of traffic conditions including crashes, weather, and work zones. Crowdsourced traffic data provides a new, real-time data source, outside of the boundaries of fixed sensors and cameras, to more proactively operate the transportation system. This enables agency staff to make decisions more quickly and

cover larger geographic areas, leading to improved responses to traffic incidents and other congestion-causing events along with optimization of traffic flow through the system.

Real-time crowdsourced data on traffic movement and traffic flow throughout the transportation network can be integrated with transportation systems management and operations (TSMO) systems that provide real-time traffic monitoring (situational awareness), traveler information (such as 511 systems and travel times on dynamic message signs), and active traffic management (ATM) (such as queue warnings and dynamic lane control systems).

REAL-TIME, HIGH-QUALITY DATA

Current data sources in traffic operations often come from fixed sensors that monitor traffic conditions at fixed locations. The use of crowdsourced data turns transportation system users with smartphones and other mobile data sources into traffic sensors that significantly increase the data volume and geographic coverage. Agencies using crowdsourced data can provide earlier incident notification for quicker responses and integration into traveler information and ATM systems to optimize travel.

Use of crowdsourced data could reduce the need for additional roadside sensors and systems that provide data in only a single location and require installation and maintenance. In addition, crowdsourced data is being collected continuously throughout the system and will not suffer from the local sensor or system outages associated with current systems.

The advertisement features a smartphone displaying the 'UDOT Citizen Report' app interface. The text on the phone screen includes: 'UDOT Citizen Report', 'Where and When: I-15 Farmington South through Salt Lake', 'Report Time: Now', 'Conditions: Road: Wet, Weather: Mixed Rain and Snow', and 'Comments: (Tap to write comments)'. Below the phone, it says 'Submit'. To the right of the phone, it says 'Download the free UDOT Citizen Reporter app.' and features the 'CITIZEN REPORTING A UDOT Program' logo. At the top, it says 'Are the roads slick? Let us know.' and 'BECOME A UDOT CITIZEN REPORTER'. At the bottom, a blue banner contains the text: 'The Utah DOT's Citizen Reporting app allows trained volunteers to report road and weather conditions directly to the agency's Traffic Operations Center. Source: Utah DOT'.



BENEFITS

- ▶ **Increased Safety.** Crowdsourced data enables agency staff to identify problems more quickly and more confidently, leading to faster and more accurate responses to traffic incidents and other congestion-causing events.
- ▶ **Improved Operations.** Crowdsourced data enables agency staff to provide better traveler information and more proactive and effective operations strategies that can lead to reduced traffic congestion and improved reliability.
- ▶ **Cost Savings.** Crowdsourced data is cost-effective and could reduce the need for additional roadside sensors and systems that require installation and maintenance. In addition, crowdsourced data allows agencies to leverage and more effectively use their existing Intelligent Transportation Systems infrastructure.

STATE OF THE PRACTICE

An increasing number of State and local agencies are using crowdsourced data in traffic operations. Several agencies are detecting incidents through crowdsourcing much faster than notifications from 911 centers, thus enabling a faster response to the incident.

Waze, a community-based traffic and navigation app, reports to have hundreds of State and local agency partners participating in their Connected Citizens Program, which provides Waze-crowdsourced data to agencies to increase understanding of their system performance and improve operations. The Iowa, Ohio, and Pennsylvania Departments of Transportation (DOTs) and other DOTs are working with INRIX® to provide real-time traffic and road conditions to measure and manage the transportation network.

Examples of using crowdsourced data for traffic management include:

- ▶ Florida DOT is using crowdsourced data in combination with CAD to improve the response for crashes and road closures.
- ▶ Iowa DOT receives crowdsourced data from multiple sources in its traffic management centers for detecting incidents on urban and rural roads in real time.
- ▶ Michigan DOT receives minute-by-minute crowdsourced data that goes directly into its traffic management centers for posting travel time messages on dynamic message signs.
- ▶ The District DOT (Washington, DC) is using minute-by-minute crowdsourced data to assess the performance of arterials and signals and produce web performance measure dashboards (performance at a glance) so that signals are retimed more proactively.
- ▶ The Metropolitan Transportation Commission, the metropolitan planning organization for the San Francisco Bay Area, is using real-time crowdsourced data to monitor live traffic conditions and increase the coverage area and accuracy of its 511 traveler information system.
- ▶ The City of Austin, TX, is using crowdsourced data to evaluate the effectiveness of signal timing improvements and the capabilities of its traffic management center to monitor and respond in real-time to non-recurring congestion.
- ▶ Utah DOT developed a smartphone app that provides a conduit for the traveling public to report road and weather conditions in real time directly to the agency's Traffic Operations Center.

RESOURCES

FHWA EDC-5 Use of Crowdsourcing to Advance Operations https://www.fhwa.dot.gov/innovation/everydaycounts/edc_5/crowdsourcing.cfm



U.S. Department of Transportation
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