

Using Text Messaging to Locate and Verify Incidents Outside of Traffic Management System Coverage Areas

Traffic management systems (TMSs) and State departments of transportation (DOTs) frequently use cameras, vehicle detection, and field reports to detect, locate, and verify incidents. However, for incidents outside of TMS coverage areas, DOTs may have difficulty in accurately locating and quickly verifying these incidents. This inevitably delays incident response, which impacts traveler safety and mobility. Citizen reporting, social media services, automatic crash notification systems, and unmanned aircraft are examples of newer technologies that some DOTs are now using to supplement their TMS monitoring capabilities. Beyond these methods, lesser-known technologies offer promise in detecting or verifying incidents outside of TMS coverage areas. These technologies include direct text messaging that allows operators to text directly with callers, request permission to access their device's Global Positioning System (GPS) coordinates, and quickly and accurately locate the caller. In many cases, the applications (apps) also provide the added benefit of viewing and recording camera images and video from the caller's phone.

TRAVELER DIRECT TEXT MESSAGING SOFTWARE

To use traveler direct text messaging, a traffic management center (TMC) or 911 center must purchase a proprietary software platform. A direct text messaging software toolbar (figure 1) overlays the center's existing computer-aided dispatch (CAD) or call-handling platforms. The software sits idle until an operator receives a call and clicks on the toolbar. When a call from a smartphone is received, the operator enters the caller's phone number into a field within the text messaging platform, which then sends the caller a text message containing a hyperlink. When the smartphone caller taps the link, a browser opens requesting the caller's permission to access their location (see message in text box on the following page). When permission is received, the browser displays the caller's location on a map. Depending on the vendor and software used, the operator may have access to the following information from within the software platform:

- Caller's geographic coordinates.
- Caller's speed.
- Real-time video from the caller's phone.
- Closest estimated building address.

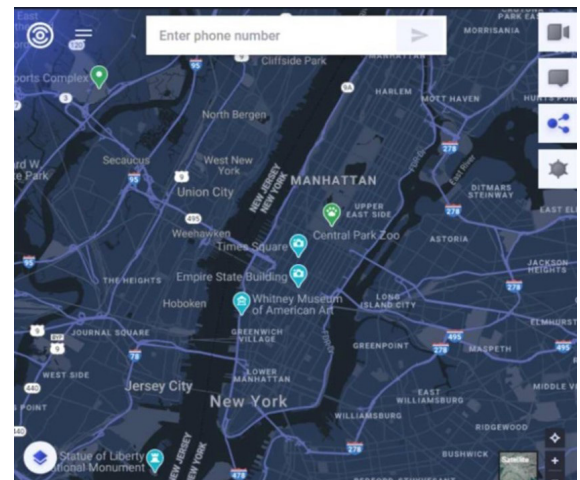
The software saves the time and effort required for the operator to manually determine and verify the caller's location, a process that can take several minutes. This system is particularly beneficial for incidents and events where callers don't know or are unable to provide their exact location. In addition, since the software allows the operator to request permission to receive visual information from the caller's phone, the images and photos can be saved and shared with other emergency responders. The New Jersey Turnpike Authority and Georgia DOT have piloted different versions of this technology.

DESIRED OUTCOMES

This fact sheet focuses on traveler direct text messaging applications. Readers will understand how direct text messaging allows operators to do the following:

- Identify incidents more quickly.
- Verify incident details and location.
- Share incident information to facilitate incident response.

Readers will also be able to identify the range of considerations when evaluating, planning, designing, or implementing direct text messaging systems.



Original map © 2023 Google® Maps™.
Carbyne user interface screenshot © 2023 Carbyne.

FIGURE 1. Illustration. Example of the operator software interface.

KEY ISSUES TO CONSIDER

When planning to implement traveler direct text messaging systems, potential issues include the following:

- Travel direct text messaging requires action on the part of a smartphone user to benefit from the technology. It also requires a caller to provide permission for an operator to remotely access images and video from their smartphone.
- The TMC must have the ability to receive calls from travelers.
- Software should be easy to install and operational within 2–4 weeks to provide immediate benefits.
- Images and videos can be saved and shared (depending on the DOT's policies), but this may require close coordination with information technology and legal staff to ensure that personal or sensitive information is not saved or shared.

Example text message requesting permission to access a caller's phone

In order to collect your location to assist you, your browser may require you to allow access to your location. Please tap the button to collect your location now and allow permission to location prompts that appear.

BENEFITS

- Improves operational performance by reducing the time and effort needed for an operator to locate a caller.
- Leverages traveler-owned smartphone devices, reducing agency need for point-based technologies.
- Can provide images and video (after caller consent) at the incident scene to improve the dispatch of resources.
- Does not require most callers to download an app to permit an operator to retrieve their location or text message with callers.
- Requires minimal operator training to use the software.
- Requires minimal bandwidth, adding value for areas with poor cellular network connectivity.

LESSONS LEARNED

- The transmission of images and video from the caller's phone may be impeded by cellular network connectivity.
- System relies on callers' willingness to grant permissions to share their information.
- Images and video from the user's phone can provide actionable insights to assist incident response particularly if the incident is difficult to reach.

AVAILABLE RESOURCES

- The Eastern Transportation Coalition. 2019. "Travel Information Web Roundtable." *TIS Roundtable Corridor Wide Web Update*. https://tetcoalition.org/wp-content/uploads/2019/12/TETC-TIS_Roundtable-Nov2020-TIS_Agency_Update-FINAL.pdf, last accessed June 13, 2023.
- American Association of State Highway and Transportation Officials. 2020. Georgia DOT project nomination in *AASHTO Innovation Initiative*. http://web.transportation.org/tig_solicitation/uploads/AASHTO%20All%20Nomination%20Form%202020%20-%20Carbyne.pdf, last accessed June 13, 2023.
- New Jersey Turnpike Authority. 2023. "SafeTrip NJ" (web page). <https://www.njta.com/travel-resources/safetrip-nj>, last accessed June 13, 2023.

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FOR MORE INFORMATION on other practices or the TMC Pooled-Fund Study:

Traffic Management System Portal (NOCoE): <https://transportationops.org/traffic-management-systems-and-centers>.

TMC PFS website: <https://tmcdfs.ops.fhwa.dot.gov>.