

# South Carolina Department of Transportation Uses Analytics Tools To Maximize Crowdsourced Data



Source: Federal Highway Administration (FHWA).

## Introduction

The South Carolina Department of Transportation (SCDOT) uses crowdsourced data for daily transportation operations as well as for planned and unplanned events like road work and emergency management. SCDOT procures both real-time and historical crowdsourced data from a third-party provider, HERE. The agency found that crowdsourcing provides low-cost, high-quality data to improve operations.

## Automated Travel Time Alerts

Sharing real-time traveler information with the public is an important role for agencies like SCDOT. With better information, road users can make better decisions about routes and modes and also have a greater degree of confidence about their trip. Posting real-time travel times on changeable message signs (CMS) is part of the standard operating procedure for SCDOT.

Crowdsourced data, both historical and realtime, helps the SCDOT understand and share State roadway travel times. HERE datamaps interface with the agency's advanced traffic management system (ATMS) so managers can define specific routes. Historical travel time data support default time estimates that CMS shares with the public. When real-time HERE data indicates that travel times differ from the historical norm, the ATMS automatically generates and updates CMS travel times to reflect the current condition.

## Understanding Crowdsourced Data

Agencies can use various tools to better understand their crowdsourced probe data to support operations decisions. SCDOT uses ClearGuide® to understand its crowdsourced probe data. This tool's user interface empowers users to

explore both historical and real-time data and transform it into visualizations. ClearGuide® provides SCDOT users a way to identify traffic issues as they occur.

The tool's "live maps" feature has a rewind capability that shows historical speeds and travel times over time. An "anomalies map" shows current conditions versus historical averages for specific days and times. The tool also displays average traffic delays over time complete with a monetary estimate of cost savings associated with delay reductions.



Source: South Carolina Department of Transportation

Figure 1. Photo. Example of travel time alerts posted on roadway signs.

The tool's bottleneck analysis capability calculates and displays how often location-specific congestion occurs and how long the congestion lasts. Based on the crowdsourced data, this function also quantifies the congestion's impact on users. Users can set up route alerts to automatically email designated individuals with location-specific information about bottlenecks, slowdowns, or other traffic conditions derived from crowdsourced data.

## Crowdsourcing Work Zone Example

Interstate 77 (I-77) crosses the Catawba River about 18 miles from downtown Charlotte, NC. With four travel lanes in each direction, the bridge is an important commuter route for the suburbs in South Carolina. Rehabilitation of the bridge and replacement of the bridge deck on the southbound lanes created a unique opportunity for SCDOT to leverage crowdsourced data in the summer of 2021.

The full deck replacement on the southbound lanes of I-77 meant that both travel directions would be reduced from four to two lanes and that all traffic would be shifted onto the northbound side of the roadway. Entrance ramps near the location were closed, and extra law enforcement patrols and staged tow trucks were positioned to quickly resolve any incidents in the work zone.

Before construction began, SCDOT project planners used ClearGuide® to create a clear understanding of baseline travel times for the roadway. Detour route email alerts kept management informed of detour performance. The alerts provided real-time travel times, speed, and when performance thresholds were reached. Congestion maps associated with the location that accompanied the alerts facilitated understanding and quick assessments.

Traffic signal engineers made work zone adjustments at interchanges, using real-time crowdsourced data. The ability to change signal timing and to make other adjustments reduced delay on I-77 each day in the early project stages.

SCDOT viewed quantifying travel times as important so that the effect of traffic signals and other changes could be measured. Detour routes were established using the ClearGuide® mobile application and shared with all project team members and SCDOT stakeholders. The resulting unified messaging benefited SCDOT public outreach by pushing data to social media, news media, and mapping navigation providers.

Using crowdsourced data helped the SCDOT implement critical changes early in the I-77 bridge replacement project that improved travel time reliability and reduced delay. SCDOT found that crowdsourcing was integral to the planning and execution of the work zone project.

## Hurricane Evacuation

Like much of the southeast United States, South Carolina is at risk for hurricane emergencies. Evacuation of coastal and other vulnerable locations is of paramount importance when a potential storm approaches. The surge of tens of thousands of vehicles can have a crippling effect on roadway networks. The SCDOT uses evacuation plans and models to move people away from affected areas. Past trends are analyzed to better prepare for future evacuations.

During coastal evacuations, real-time traffic data help the SCDOT adjust evacuation plans. In addition to traffic sensor data, the agency relies heavily on real-time crowdsourced data to understand travel times and congestion on evacuation routes. The various features of ClearGuide® again help the SCDOT understand crowdsourced data from HERE to identify slowdowns, bottlenecks, potential incidents, and other issues. The agency also works with local partners on problematic signal timing issues to alleviate choke points and improve the efficiency of the overall network.

Crowdsourced data and analytical tools enable the SCDOT to better plan and execute emergency evacuation orders, making challenging situations manageable.

## Acknowledgment

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For additional information, please contact:

**James Colyar**  
FHWA Office of Operations  
360-753-9408  
[James.Colyar@dot.gov](mailto:James.Colyar@dot.gov)

**Greg Jones**  
FHWA Office of Operations  
404-895-6220  
[GregM.Jones@dot.gov](mailto:GregM.Jones@dot.gov)

**Ralph Volpe**  
FHWA Resource Center  
(404) 985-1268  
[Ralph.Volpe@dot.gov](mailto:Ralph.Volpe@dot.gov)