Next-Generation Traffic Incident Management

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TRAFFIC INCIDENT MANAGEMENT DATA

Next-Generation (NextGen) traffic incident management (TIM) data focuses on advancing the collection, analysis, and use of incident data to better understand the effectiveness of current TIM strategies. TIM planning and response efforts promote safer, more reliable roadway operations.

With improved roadway monitoring and data collection, agencies can gather metrics such as incident response time, time to return to normal flow, lane-specific closures, responder-specific on-scene times, and roadway conditions. With better data and analytics, agencies can then quantify program performance, demonstrate program effectiveness, and improve TIM planning and resource management.

TIM Data Collection

TIM data can come from public safety computer-aided dispatch (CAD) system time stamps, law enforcement traffic crash reports, safety service patrol logs, transportation management centers (TMCs), or other sources. Crowdsourced data are a relatively new source for TIM data, and may originate from mobile apps, vehicle probes, or third-party data providers. Crowdsourced data can be passively or actively transmitted, and might include traveler speed, travel time, or incident presence.

Because crowdsourced data are obtained whenever and wherever people travel, agencies can capture what happens in rural areas or along arterials, where roadway cameras and other traffic detection instruments might not be present.

Agencies are encouraged to collect data to support four key TIM performance measures.

Roadway Clearance Time	The time between the first recordable awareness of an incident by a responsible agency and first confirmation that all travel lanes are open.
Incident Clearance Time	The time between the first recordable awareness and the time at which the last responder has left the scene.
Number of Secondary Crashes	The number of crashes that occur within the incident scene or within the queue, including the opposite direction, resulting from an original incident.
Number of Responders Struck	The number of responders working a roadway incident struck by a motor vehicle.

Analysis and Sharing

The essence of analyzing TIM data is looking at how effectively organizations manage incidents. Time underlies TIM performance because it represents an element of exposure for both responders on the scene and drivers in queues approaching incidents. Data analysis can range from a simple review of incident frequency or type to predictive modeling that helps allocate resources and plan countermeasures.

Providing stakeholders with information about response time, roadway clearance time, and incident clearance time has proven effective in focusing attention on incident clearance objectives. Monthly, quarterly, and annual reports can feed into performance reviews within organizations that help managers assess the effectiveness of policies and strategies.

Scorecards and dashboards are compatible with the presentation of aggregate measures of time and activity TIM data. Scorecards and dashboards can also provide visual comparisons of like units of measure across variables, such as periods of time, type, or location. Ultimately, data can help provide a basis for funding, resource allocation, strategic priorities, strategic planning, and program evaluation.

Additionally, software tools that often accompany crowdsourced data can detect the formation of queues in real-time. The end of a traffic queue can sometimes be miles away from the incident, causing a dangerous situation for motorists. To mitigate the risks of secondary crashes, agencies can use real-time data to implement countermeasures that warn approaching motorists of slowed or stopped traffic.

State of the Practice

- The Model Minimum Uniform Crash Criteria (MMUCC) now includes *roadway clearance time* and *number of secondary crashes* as recommended data elements for State crash report forms.
- Puerto Rico deployed a mobile app for safety service patrols to augment the exchange of incident data and accurate reporting.
- Utah doubled their incident management team from 12 to 24 employees using TIM performance measures that showed the benefit of their efforts.[1]

- Data collected by Georgia showed that their Towing and Recovery Incentive Program (TRIP) reduced clearance times by approximately 80 percent for commercial vehicle crashes.[2]
- The Arizona Department of Public Safety used TIM data to illustrate that the implementation of TIM strategies increased unobligated patrol time by 3 percent, saving 44,000 hours of patrol time, or 25 full-time equivalent staff.[3]
- A number of States, including California (Bay Area), Florida, Kentucky and Oregon, are now moving toward web-based dashboards that present TIM data in ways that are more easily understood by stakeholders.
- The Ft. Lauderdale, Florida TMC has integrated TIM performance measures into the dashboard they display on the TMC video wall.
- The Maryland Department of Transportation used TIM data to identify a 31 percent reduction in incident clearance time when their service patrols were on the scene.[4]
- The Tennessee Department of Transportation uses real-time Waze data to estimate the end of traffic queues at incidents and target response activities to warn motorists.

Resources

FHWA EDC-6 Next-Generation TIM

[1] Coulam, C. (2018, July). Presentation at the EDC-4 TIM Data Peer Exchange. Lexington, KY: Utah Department of Transportation.

[2] Georgia TIME Task Force. (2018, May). Towing & Recovery Incentive Program (TRIP), https://timetaskforce.com/wp-content/uploads/2018/05/TRIP_May_2018.pdf.

[3] King, J. (2012). Traffic Incident Management (TIM) Performance Measurement and Reducing Secondary Collisions. Arizona Department of Public Safety.

[4] University of Maryland. (2018, August). Performance Evaluation and Benefit Analysis for CHART in Year 2017 (draft). Annapolis, MD: Maryland Department of Transportation, http://chartinput.umd.edu/reports/CHART_2017_Performance_Report_final_Nov2018-r.pdf.

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