



Briefing: Public Safety Answering Point (PSAP) to Transportation Operator Data Integration

Prepared with the assistance of Delcan Corporation and the Regional Transportation Operations Coalition.

Introduction

The transportation agencies in the seven-county Chicago region are committed to the safe and efficient operation of our roadways. Crashes and associated congestion obviously impact all of us in terms of casualties, time, property damage, fuel consumption, and emissions. The delays and congestion created by single incidents can also lead to secondary crashes and further delays.

Chicago Metropolitan Agency for Planning (CMAP) and the Regional Transportation Operations Coalition (RTOC) have recently completed a draft inventory of the public safety answering points (PSAPs) in the Chicago region. CMAP also has begun archiving available traffic incident and traffic congestion information.

The region's transportation agencies utilize technologies such as traffic signal timing, ramp metering, dynamic message signs, media notifications, websites, and highway advisory radio (HAR) to manage the transportation network during major incidents. Transportation agencies also have field operations staff to respond to incidents, including IDOT and Tollway service patrols, highway maintenance crews, and contract services to remove spills and debris, repair damaged pavement, communications, signals, regulatory or warning signs, and safety equipment. The timely and accurate availability of crash or other traffic event data is critical to the effective deployment of these resources and timely communication to the motorist.

The need for incident data will depend greatly on the agency concerned. For agencies with jurisdiction over limited-access highways and principal arterials, information to facilitate quick clearance will be a priority. For other agencies, the goal will be to have accurate information to distribute to motorists and to deploy resources as necessary. Either way, having the right information in a timely way will reduce the likelihood of secondary crashes and the total cost of congestion including fuel, emissions, and wear and tear on vehicles and the roadway itself.

The Need for PSAP-Traffic Operator Communications

Currently, the regional transportation partners use a variety of mechanisms to detect and verify incidents. These include closed-circuit television (CCTV) on parts of the system, and sensing devices that may detect declining system performance. However, these systems do not fully cover the entire region, so communications with public safety agencies that have timely and accurate information, including PSAPs, is necessary. PSAPs have the timeliest and most

accurate information as highway incidents occur, so some transportation agencies are seeking direct communications with computer-aided dispatch (CAD) systems operated by PSAPs.

Current dispatch communications usually work well. However, during the most critical periods, during major incidents when public safety resources are being deployed, transportation communications may be a lower priority. This has resulted in significantly delayed responses to major incidents. As one transportation operations manager put it, “when the system fails, it fails catastrophically.”



Figure 1. Lake County Passage

PSAP-to-Transportation-Operator Integration efforts have been successfully undertaken at a few key locations in the region. These efforts have been mutually beneficial in several regional examples. PSAP CAD data, provided automatically to traffic management centers, has improved incident detection and response times and incident notifications. Collectively, the region’s transportation operators are certain that additional integration efforts will further enhance the safety and mobility of the region.

The benefits to this type of integration include:

- More timely notification and response for the transportation agency.
- Reducing the need for additional phone calls in the midst of major events.
- Ability for emergency response, including dispatchers, to ‘see’ the event often via shared CCTV access.
- Increased coordination between transportation and emergency response in the dispatch of resources.
- Improved safety approaching the scene as transportation operators can quickly use traveler information such as the media and message signs to notify the public, increase awareness, and reduce speeds approaching the event.
- Overall reduction in associated congestion and total clearance time.
- A more consistent and trusted relationship between agencies when addressing traffic event response.

In addition, beginning in 2014, new federal regulations will require the timely and accurate dissemination of traffic incident data.

Regional Examples

In 2002, Tollway Maintenance, Traffic, Dispatch and Illinois State Police District 15 Staff collaborated to develop and deploy a two-way data exchange between the new Traffic Operations Center- Traffic and Incident Management system (TIMS) and the Tollway Central Dispatch – Computer Aided Dispatch (CAD) system, This innovated approach built upon the unique agency dispatch operation that already handled State Police and Tollway maintenance and operations from a single CAD system (Figures 2-4).

The deployment became recognized in the transportation industry as the first of its kind.

Since that time, Lake County Division of Transportation has established several connections to PSAP operators within the county (as part of Lake County Passage, Figure 1). Some of these have included LCDOT camera and congestion data in return for PSAP highway incident dispatch data. While not all of the Lake County integration efforts include a two-way component, the benefits remain.

At the time of this writing, the City of Chicago Department of Transportation and the Kane County Division of Transportation have begun the early efforts to develop these same connected systems.

Challenges and Solutions

PSAP-to-transportation operator information exchanges typically require development of formal operational policies and agreements. Before those can occur, participants must understand the information to be shared, when it will be shared, and with whom it will be shared. Once the stakeholders agree on the needs and benefits, answers to the following questions will drive those policies and agreements.

The information exchanged within these systems is private and sensitive. How do we ensure it stays that way? With today's computer hardware and software systems, the network connections between the transportation and CAD system invariably include firewalls and secure account access. Regularly, these connections utilize agencies' dedicated communications services. Beyond the connectivity of the hardware, these integration efforts always include a detailed design that addresses exactly which information is to be exchanged and when.

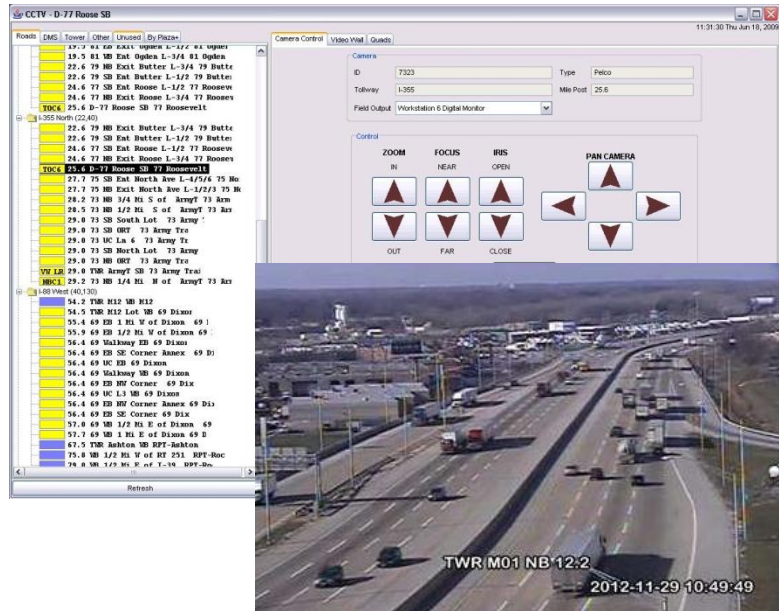


Figure 2. Illinois Tollway TIMS CCTV Control

Information regarding non-traffic events, names of those involved, license plate information and more sensitive law enforcement data can be readily filtered out of the exchanges.

Dispatch centers have a lot of data. What does the transportation agency need?

Event type, detailed location including route, direction, cross street, mile post, or street address, and lane blockage patterns are ideal. Access to CAD system notes is also helpful in painting the complete picture of the event, which in turn influences the efficiency of responses.

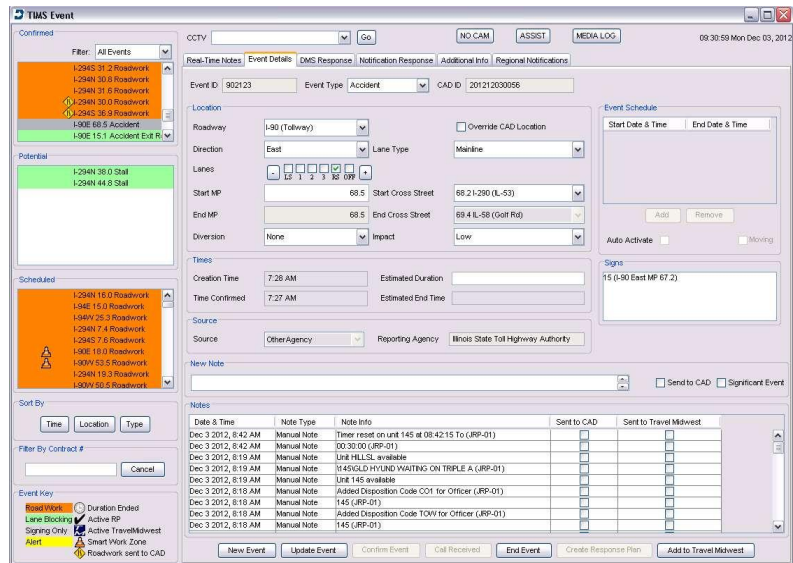


Figure 3. Illinois Tollway TIMS Event Management

Once this information is available, the transportation agencies can dispatch their own resources to assist with spills, debris, and roadway infrastructure repairs such as pavement repair, traffic signal repairs, and other required support such as guardrail and bridge repairs or inspections.

What does the transportation operations side have to offer to the PSAPs, Police, Fire and EMS?

In addition to supporting resources, shared access to CCTV video, including control, is common in these arrangements (Figure 2). The traveler information components can alter and improve driver performance approaching an incident, thus contributing to a safer scene. Traditional congestion data, travel times, and even construction information likely support the efficiency of event responses.

The use of traffic signal timing and ramp metering can be used to formally reroute traffic, reducing traffic congestion at the scene, which reduces incident response times.

Often, these efforts spawn more refined relationships between the responding agencies, which, at a minimum, contribute to improved understanding and trust for the next event response.

As part of the outreach efforts, CMAP and RTOC anticipate additional benefits to the PSAP and responder communities. In other words, we need your input to help drive the integration possibilities and maximize the benefits for all of us.

What information moves to the public as traveler information? Typically, the public gains benefit from knowing the location and severity of the event combined with estimates of impact

and clearance times. As events progress, timely updates allow roadway users to adjust routing choices, departure times, and sometimes mode choice (example: diversion to transit).

What are the technical hurdles to sharing this data? There are multiple CAD vendors in use in the region, each requiring a different interface to the DOT. Also, where the agencies are sharing video, network bandwidth needs to be considered. In addition, command and control hierarchies for CCTV control are needed. Regionally, these hurdles have already been successfully crossed; the successes are repeatable.

Next Steps

CMAP and RTOC have recently completed a draft inventory of the PSAPs in the seven-county Chicago region. CMAP and RTOC are requesting comments and corrections on this inventory. Comments will be sought from each county's Emergency Telephone System Board, county and suburban police chiefs' associations, and other groups as appropriate.

In addition, CMAP is now archiving available traffic incident and congestion data. This information is anticipated to be available for use over the next several years.

These datasets will allow the region to identify key corridor opportunities, where additional transportation to responder data integration efforts may improve safety and mobility in the region. RTOC partner transportation agencies can identify and propose projects where federal, state, and local transportation funding can produce successful outcomes, similar to those of the Illinois Tollway and Lake County.

Transportation agencies, in utilizing these datasets, will be providing outreach and demonstrations of these successes to the PSAP community upon request and are seeking input from the PSAP and responder community in considering and engaging in these types of projects.

The transportation operations community looks forward to identifying these opportunities to improve safety and mobility with PSAPs and other public safety agencies.

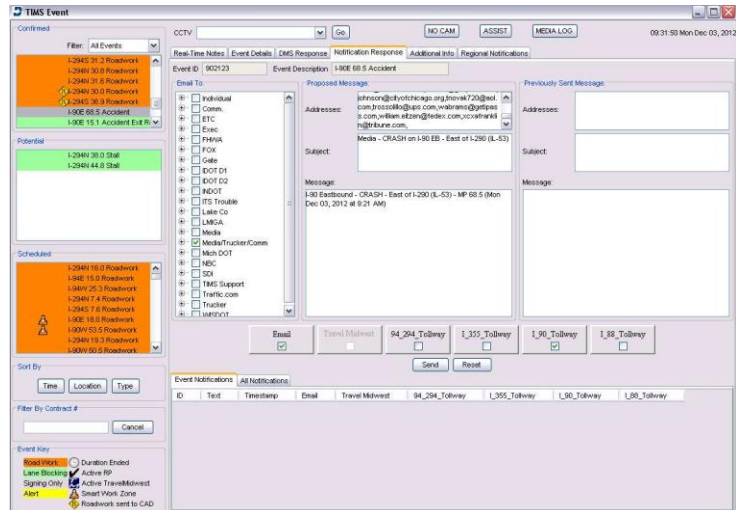


Figure 4. Illinois Tollway TIMS Event Notification System