Crash Reporting

ES 3

Photo: Courtesy of Neil Hetherington, WTI

Description: Electronic crash reporting assists officers with completing a standardized crash report form. Electronic crash reporting is typically completed either on an in-vehicle or hand-held computer. As law enforcement officer completes their crash investigation, information about the crash is entered into the appropriate data field on the standardized crash report form. Electronic reporting systems can reduce the time to complete the report and improve the data accuracy and consistency if the crash reporting system has data edits and validations to detect incorrect or inconsistent information. Some electronic reporting systems can greatly improve the officer's ability to locate crashes with either built-in Global Positioning System (GPS) or "smart-maps" which allow the officer to pinpoint to the precise location of the crash on a map and download the coordinates just by hitting the "enter" button. Precise crash location is especially important for data analysts and traffic safety engineers.

Rural Transportation Critical Needs

- ☑ Crash Countermeasures
- ☑ Emergency Services
- ☐ Operations & Maintenance
- ☐ Rural Transit & Mobility
- ☐ Surface Transportation & Weather
- ☐ Tourism & Travel Information
- ☐ Traffic Management

Issues Addressed

- ☐ Emergency service notification time
- ☐ Emergency service response time
- ☑ Communications between multi-jurisdictional/multi-agency emergency service personnel

Strategies Achieved

- ☑ Road User
- ☐ Road
- ☑ Vehicle
- ☐ Safety Culture
- ☑ Engineering
- ☑ Emergency Response
- ☑ Enforcement
- ☐ Education

Applicability

- Even if an officer is in a remote location when recording traffic information, some systems are capable of connecting when service is available to upload the information collected from a crash. Being able to streamline crash reporting reduces the amount of time an officer is exposed to traffic. In addition, the reduced time between crash reporting and the availbility for analysis can assist researchers and policy makers with reducing the turn-around time for addressing locations where a high number of crashes may be occurring. Even in rural locations, being able to better locate crashes through GPS units or "smart maps" can provide more detailed information, which may help to identify a safety problem.

Partnerships

- Applications benefit from collaboration among numerous agencies, which may include:
  - Departments of transportation (local, state, federal)
  - Law enforcement (state, local)
  - Research entities (universities)
  - State motor vehicle agency

Key Components

- Tablet
- Mobile laptop computers
- Bar code readers
- Magnetic strip readers/chip card
- Mobile printers
- Host workstations
- Statewide data communications
- Database (e.g. DB2, Oracle)
- Computer
- Software
- Ability to collect the geocode of the crash
- Ability to upload the data

Examples of Implementation

- **Illinois Mobile Capture and Reporting (MCR) System**

MCR is an electronic system used to capture and submit crash records. This system reportedly reduces the submission of crash reports from 45 days on average for paper reports to hours for the electronic submission.

- **North Carolina State Highway Patrol, GPS Tracking and Event Capture to Document Enforcement Activities**

A study found a correlation between higher percentages of truck-involved crashes and lower percentages of commercial motor vehicle enforcement, which researchers were able to document with GPS tracking and event capture of enforcement activities. (Note: It is unclear as to whether truck-involved crashes include more than just commercial vehicles.)

- **ReportWISE (Ohio)**

The Field Reporting System (ReportWISE) allows for data validation and auto population of incident reports. The software allows officers to electronically create and submit incident reports. This information is sent to the Northwest Ohio Regional Information System (NORIS), which provides this support for twenty-two Ohio and Michigan counties. NORIS was formed by local governments to improve coordination within the criminal justice system.

Implementation Considerations (Pro)
•The number of erroneous elements is reduced with electronic crash reporting. •Electronic crash reporting systems can provide feedback to the officers and use the computer to identify errors. •Reduces duplication of data. •Reduces time between occurrence of incident and availability of crash report to state. •Reduces time required to complete crash report. •Reduces stoppage time for issuing of ticket, thereby increasing safety for offender and officers. •Facilitates compliance with state and federal requirements. •Increases the responsiveness of the agency to the public (by reduced turn-around time for crash reports needed for insurance claims). •Provides more detailed information. •Crash information does not have to be recalled at a later point in time. •Provides the geocode of the crash.

Implementation Considerations (Con)
•Law enforcement agencies have different records management systems and needs. •Agencies may have different processes and procedures for data collection. •GPS can have errors as a result of signal blockage, start-up errors, and multipath errors; they may not be detectable by a user. •Technology is currently moving away from bar code technology to chip cards; however, most driver's licenses still have bar codes. •There are concerns with privacy issues related to magnetic/bar code driver's licenses. •Officers must be trained to use the software program. •Agencies have concerns about what happens if data does not save.

Opportunities for Future Expansion

- The 2007 NCHRP Synthesis 367 discusses how diagrams can be developed within the software. However, computer technology now allows one to draw directly on a tablet. Therefore, in the future, this may allow more flexibility for officers to either completely draw the crash diagram on their own, or to use some combination.
- Future technology may negate the need to type in the information. Instead, an officer may dictate to the computer the information and the computer will populate the crash report. The computer could identify any missing information and request it.
- Many police vehicles still utilize computers. In the future, more portable devices, like tablets, or touch-based systems may be available.
- In the future, with connected vehicles (see #CC4), crash data could more rapidly be uploaded and subsequently analyzed.

Additional Resources

- National Cooperative Highway Research Program, *Synthesis 367, Technologies for Improving Safety Data,* found here: http://www.trb.org/Publications/Blurbs/159135.aspx
- *A Summary of Rural Intelligent Transportation Systems (ITS) Benefits as applied to ODOT Region 1,* found here: https://westerntransportationinstitute.org/wp-content/uploads/2016/08/4W0291_Final_Benefits_Memo.pdf
- National Cooperative Highway Research Program, *Synthesis 350, Crash Records Systems*, found here: http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_syn_350.pdf
- Local Police Departments, 2013: Equipment and Technology, found here: https://www.bjs.gov/content/pub/pdf/lpd13et.pdf

Useful Tips

GPS systems can enable agencies to better locate crashes, which can assist with identifying locations where geometric improvements or educational campaigns can be targeted to improve traffic safety (see example on commercial truck enforcement). Secondly, the information or data could be useful in a connected vehicle or autonomous vehicle environment. For example, once a police officer enters the information (e.g., number of lanes closed or length of delay) into the crash reporting system, it will be sent to the public, potentially through a Traffic Management Center.

Cost Range

(Cost/financial information, where noted, is based on 2016 dollars (unless otherwise specified). Cost/financial information is estimated, and will vary based on size and scope of project, number of units, etc. In general, capital costs include initial purchase costs of hardware, software, and other required equipment. Maintenance and operations costs include staff time to operate, monitor and maintain systems; data collection; system upgrades; evaluation; etc.)

Capital Costs: The total capital cost for this tool range from low (Less than $50,000) to higher (above $250,000). A police vehicle can be equipped to enable officers to enter the data into a computer for $11,000 to $14,000. The total cost to an agency would depend on the number of police vehicles. The Illinois Department of Transportation's Mobile Capture and Reporting System cost $1,739,448[1]. It appears as if these costs also include implementation of the system into 1,100 Illinois State Police trooper vehicles and within county and municipal law enforcement vehicles. Handheld GPS receivers, which can be used to capture crash location information within 3 to 5 meters of accuracy, cost approximately $116-$175 per device.

Operations Costs: The operations and maintenance costs for this tool may range from low (Less than $50,000) to higher (above $250,000). Depending on the tool (in-vehicle systems, handheld GPS receivers, total stations), the costs for operations and maintenance can vary from low to higher. Costs will typically include replacement of the technologies if they are broken and upgrading the software and computers as technology advances over time.

This material is based upon work supported by the U.S. Department of Transportation under Cooperative Agreement No. DTFH6114H00021. Any opinions, findings, and conclusions or recommendations expressed in this publication are those of the Author(s) and do not necessarily reflect the view of the U.S. Department of Transportation.