

A Framework for Collecting Emergency Responder/Roadside Worker Struck-by/Near-Miss Data

Requested by:

American Association of State Highway
and Transportation Officials (AASHTO)
Subcommittee on Systems Operation and Management
In Support of
The National Traffic Incident Management Coalition

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Disclaimer

The opinions and conclusions expressed or implied are those of the research agency that performed the research and are not necessarily those of the Transportation Research Board or its sponsors. The information contained in this document was taken directly from the submission of the author(s). This document is not a report of the Transportation Research Board or of the National Research Council.

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2 Acknowledgements

The need to define national terminology for struck-by and near-miss incidents, as well as develop the framework for a national database to be used to address the issue of emergency responder and roadway worker safety, is not a new one. Numerous agencies and individuals have worked tirelessly to bring this issue to the forefront of the transportation industry.

2.1 The National Traffic Incident Management Coalition

As the modern understanding of traffic incident management (TIM) took shape, it was recognized that a national entity was needed to bring together leaders from every discipline involved at the scene of a crash. Together these leaders could tackle the increasing regularity of roadway crashes, the impact to society by the congestion that they cause, and the risk that they pose to emergency responders. It was within this spirit of working together toward common goals that the National Traffic Incident Management Coalition (NTIMC) was created in 2004 as a common coordination point among government, industry, and practitioners. By 2007, the NTIMC had created the National Unified Goal (NUG), and it subsequently created working groups and a strategic plan to achieve nationwide implementation of the NUG. The NUG can be viewed in its entirety at <http://www.transportation.org/sites/ntimc/docs/NUG%20Unified%20Goal-Novo7.pdf>.

The NTIMC Research Working Group convened subject matter experts from every TIM discipline and worked to create the problem statement that led to the funding for this project by the Transportation Research Board's National Cooperative Highway Research Program (NCHRP). NCHRP conducts research in problem areas that affect highway planning, design, construction, operations, and maintenance nationwide.

In 2011, NTIMC launched the TIM Network (<http://timnetwork.org>), which links state, regional, and local TIM practitioners with national level expertise. The goal of the TIM Network is to connect TIM professionals from different disciplines, provide a forum to discuss developing issues of national interest, and provide a way for NTIMC to validate suggested practices.

2.2 Project Panel

Given the NTIMC's pivotal role in advancing multidisciplinary TIM issues and its support of the struck-by/near-miss database, the NTIMC leadership was tasked with convening an oversight panel comprised of members of the following stakeholder groups: law enforcement, fire and rescue, transportation, public works, emergency medical services (EMS), towing and recovery, insurance providers, loss control/risk managers, academics/researchers, and traffic safety services providers. As the desired outcomes of the new database vary slightly by stakeholder group, it was imperative that this multidisciplinary group provide guidance to the database architecture to help identify the nuances and coalesce around the top priorities for the database. In addition, Jack Sullivan, John Woulfe, and Mary Hedges provided insight into the purpose and functioning of several national reporting systems.

Jack Sullivan (Chair), *Emergency Responder Safety Institute*
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2.3 State Experts

Special thanks to TIM professionals and practitioners in Pennsylvania, California, Missouri, and Tennessee who were contacted through the TIM Network for their willingness to contribute information to this project.

3 Summary

No one would argue that emergency and roadside workers should be safer than they are now when they work in and around the highway, and no one would argue that we should do more to help reduce the risks that these individuals face while they work. However, to achieve zero deaths of emergency and roadway workers, there are governance, institutional and technological changes that must occur.

The divergence of data availability is vast. For instance, with regards to emergency responders, struck-by and near-miss data is reported in different places for the fire services, law enforcement, and emergency medical services, as well as towing and recovery operators. The number of roadside workers that are struck or nearly missed is not known or maintained by transportation agencies with any regularity or uniformity.

Through this research effort, agreed upon definitions for struck-by and near-miss events were developed:

Struck-by incident:

Any incident where an emergency responder/roadway worker or emergency or work vehicle is hit by another vehicle or object within a traffic incident management area or work zone resulting in an injury, fatality, or property damage.

Near-miss incident:

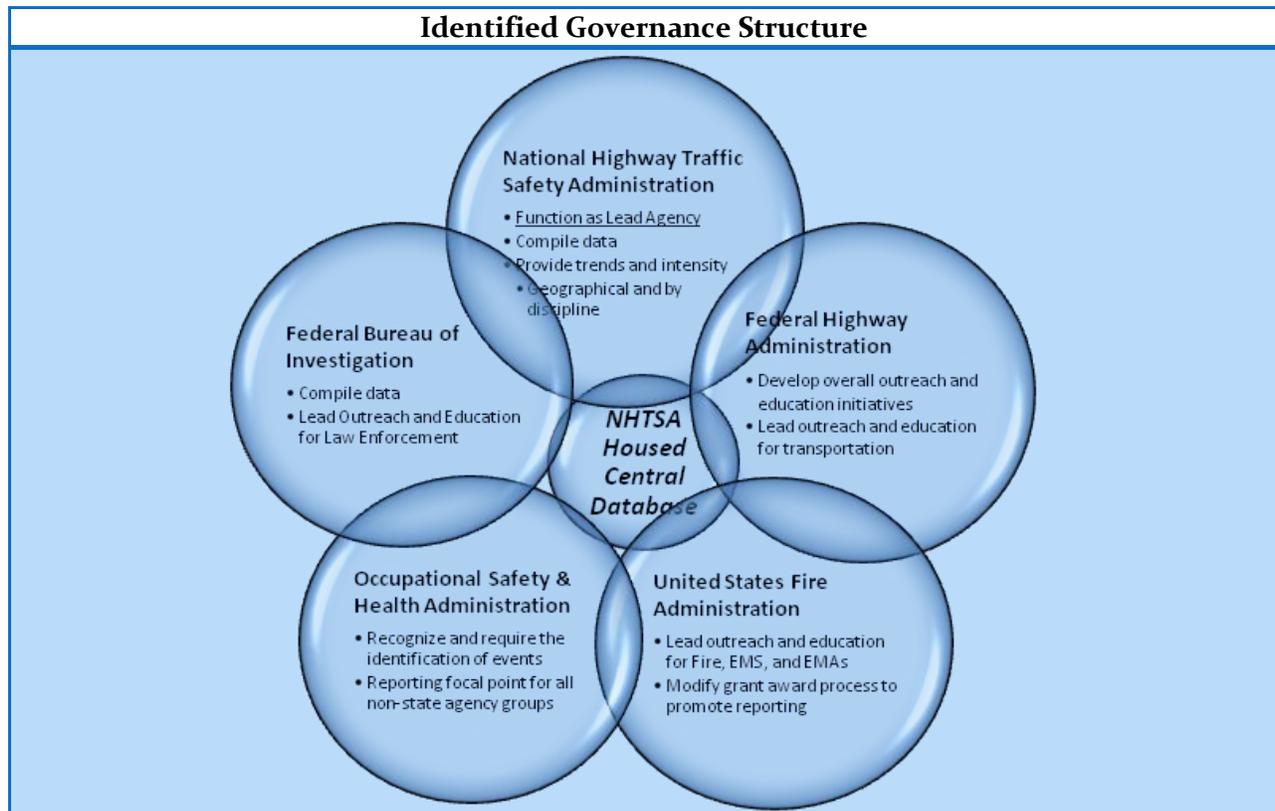
A near-miss incident is defined as an unintentional unsafe occurrence in a traffic incident management area or work zone that could have resulted in an injury, fatality, or property damage. Only a fortunate break in the chain of events prevented an injury, fatality, or damage. An event shall be classified as a near-miss if any traffic control devices near the scene of the crash or work area is struck.

It is acknowledged that near-miss events will be much harder than struck-by events to report; however, as an initial direction, it is recommended that an event be considered near-miss if any traffic control devices near the scene of the crash or work area are struck. This approach helps to define a uniform way of reporting these events.

The core data elements needed for struck-by and near-miss events are shown below. It should be noted that there is no distinction in need between emergency responders and roadside worker groups.

Input Type	Input Required
Location	State County/Town Type of Roadway
Date Data	Date Time
Event Data	Type (struck-by, near-miss) Environmental Factors (Visibility, Weather) Relevant Contributing Factors Short Description
Data from Person struck or nearly struck	Age Years of Experience Discipline Primary Responsibility On Scene Shift Start Time

The struck-by and near-miss framework is shown below.

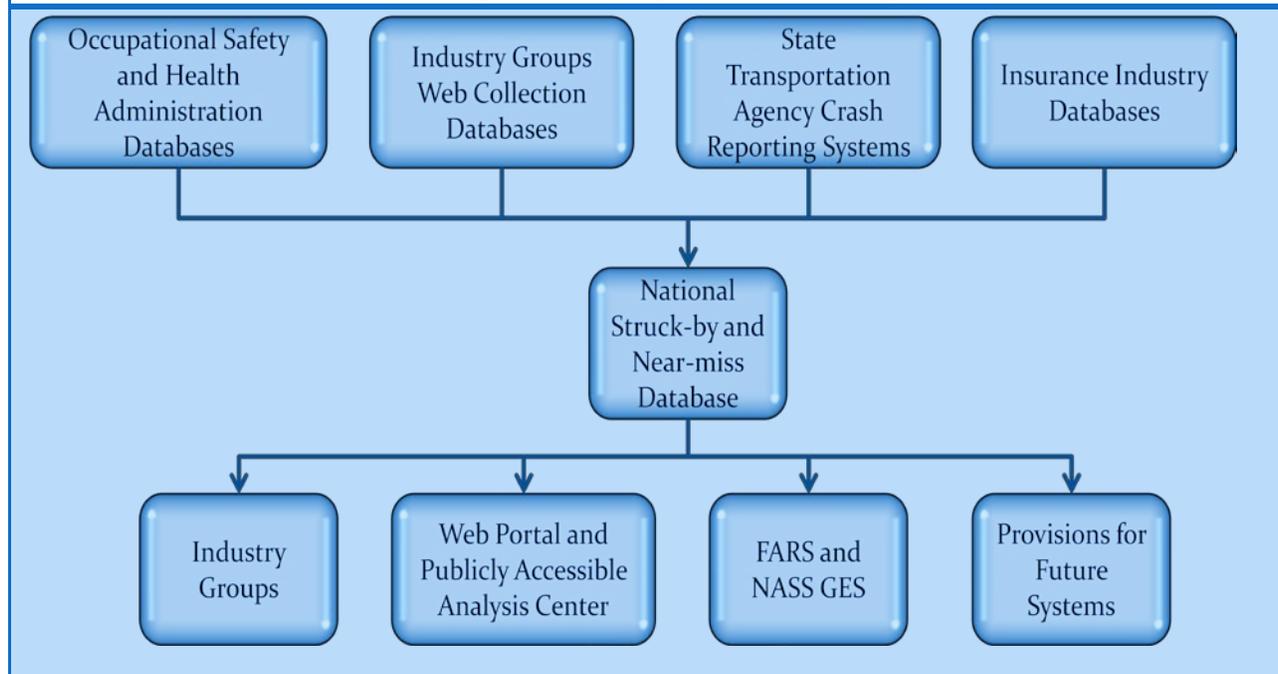


Institutional Change

- **Modify the MMUCC and ANSI D16.1-2007 to include the identified core inputs**
- **Change Perception***
- **Work through Industry Groups to Gain Trust**
- **Modify the Funding Allocation Process**
- **Partner with the Insurance Industry**

*See chart on pages 6-7

Developed and Integrated Technology



The Transportation Research Board can help implement this framework by conducting the following research activities:

- Lead additional research efforts that will define the specifics for the governance structure, such as needed memorandums of understanding, policy and process changes, the need for oversight and quality control
- Work with the partner agencies shown on the next page to sponsor efforts to address the priorities indicated
- Conduct in-depth research regarding insurance policies and the needed conditions for cooperation for data exchange
- Pilot the national struck-by and near-miss database, including the output sources identified above

National Highway Transportation Safety Administration

- Adopt the definitions of struck-by and near-miss events developed as part of this research effort
- Participate in the development of a national outreach campaign for roadside worker and emergency responder safety that is focused on the emergency responder and roadside worker community. The campaign should include raising awareness about the positive reasons to report struck-by and near-miss events.
- Modify existing systems and processes to recognize struck-by and near-miss events and the 15 core inputs needed
- Lead the development of electronic data exchange protocols with state transportation agencies and the Occupational Safety & Health Administration to collect and consolidate struck-by and near-miss information

Federal Highway Administration

- Adopt the definitions of struck-by and near-miss events developed as part of this research effort
- Publish an Annual Emergency Responder/Roadside Worker Struck-by/Near-miss Report
 - The first report should be targeted for the end of fiscal year 2013 and be coordinated with the industry groups cited in this report
- Develop a web portal to consolidate struck-by/near-miss information with outreach materials and training opportunities
- Promote and sustain a continuous dialog with advocacy groups that are concerned with struck-by/near-miss events
- Facilitate a cultural change that progresses the nation's roadside worker and emergency responder attitude from fear of personal liability to community-based safety improvement
- Lead the development of a national outreach campaign for roadside worker and emergency responder safety that is focused on the emergency responder and roadside worker community. The campaign should include raising awareness about the positive reasons to report struck-by and near-miss events.
- Work with the International Association of the Chiefs of Police and other law enforcement organizations to gain acceptance and recognition of the need to report struck-by and near-miss incidents among the nation's law enforcement community.
- Work with the International Association of Fire Chiefs and other fire service organizations to gain acceptance and recognition of the need to report struck-by and near-miss incidents among the nation's fire community.

Occupational Safety and Health Administration

- Adopt the definitions of struck-by and near-miss events developed as part of this research effort
- Work within agency reporting criteria, policies and processes to recognize and implement struck-by and near-miss events
- Participate in the development of a national outreach campaign for roadside worker and emergency responder safety that is focused on the emergency responder and roadside worker community. The campaign should include raising awareness about the positive reasons to report struck-by and near-miss events.
- Facilitate a cultural change that progresses the nation's roadside worker and emergency responder attitude from fear of personal liability to community-based safety improvement

United States Fire Administration

- Adopt the definitions of struck-by and near-miss events developed as part of this research effort
- Lead an “Emergency Responder Administrative Workload Audit” to quantify how much time is spent on administrative tasks due to legacy policies and processes. The Audit should help identify efficiencies that could be introduced that will allow for more focus on reporting struck-by and near-miss events and other traffic incident management activities.
- Participate in the development of a national outreach campaign for roadside worker and emergency responder safety that is focused on the emergency responder and roadside worker community. The campaign should include raising awareness about the positive reasons to report struck-by and near-miss events.
- Facilitate a cultural change that progresses the nation's roadside worker and emergency responder attitude from fear of personal liability to community-based safety improvement
- Provide NFA students to participate in focus groups and serve as subject matter experts during system development.

Federal Bureau of Investigation

- Adopt the definitions of struck-by and near-miss events developed as part of this research effort
- Compile law enforcement struck-by and near-miss events and transmit them to NHTSA
- Participate in the development of a national outreach campaign for roadside worker and emergency responder safety that is focused on the emergency responder and roadside worker community. The campaign should include raising awareness about the positive reasons to report struck-by and near-miss events.
- Facilitate a cultural change that progresses the nation's roadside worker and emergency responder attitude from fear of personal liability to community-based safety improvement

4 Problem Statement¹

Each day emergency responders and roadway workers face workplace hazards from motorists and other responders driving through work zones and roadway construction sites, and driving by traffic incidents. Information on workplace injuries and fatalities sustained by emergency responders and roadway workers are collected in disparate databases with myriad data definitions and limited, if any, standardization. There is no central location for collating and synthesizing the data across responder and worker type.

The dearth of quantifiable data on emergency responder and roadway worker injuries and fatalities across responder/worker type has numerous implications.

- Solutions for mitigating the causes of the emergency responder/roadway worker injuries and fatalities are more challenging to identify absent incident data.
- Resources are less likely to be allocated to addressing the critical safety issues without documentation on the nature and extent of the problem.
- It is difficult, if not impossible, to measure performance and identify trends without data spanning months and years.

Even more challenging is the identification and collection of “near-miss” data documenting those incidents when responders and roadway workers are in harm’s way but narrowly avoid serious injuries and/or fatalities.

The emergency responder community has been advocating for a struck-by/near-miss database to address the challenges above. The cause was championed during the 111th Congress through the introduction of HR 4101 by Indiana Congressman Brad Ellsworth. Entitled the “Emergency Responders Highway Safety Act of 2009,” HR 4101 would establish a highway emergency responder safety grant program to promote awareness of “move over” laws, to train emergency responders to avoid injuries and fatalities while working highway incidents, to establish a multidisciplinary advisory group for the program, and to “establish and administer an incident reporting system to compile information with respect to roadside collisions throughout the United States involving highway emergency responders.” The bill proposed using the incident reporting database to develop an annual report to Congress on progress in improving the safety of incident responders. Congressman Ellsworth’s bill was introduced in November 2009 and referred to the House Transportation and Infrastructure Committee, Subcommittee on Highways and Transit.

In response to HR 4101, the I-95 Corridor Coalition conducted an informal survey of responder agencies and organizations in the member states to gauge interest in a highway emergency responder struck-by/near-miss reporting system, identify what struck-by/near-miss data was being collected, and if the data reporting required by the bill would be burdensome to the states.

¹ Problem Statement Taken from NCHRP 20-7-282

A total of 29 agencies responded, and 23 indicated that they believed the existence of a database would be helpful.

5 Project Panel Participation

As indicated previously, the project panel for this effort represents expertise from every TIM discipline. The project team took advantage of this expertise by engaging the panel early in the project and involving them in critical decision points throughout the project.

- At the Kick-off Meeting, panelists were given the opportunity to provide individual input regarding the true nature of the project and issues that demanded attention. Key points made included:
 - Standard definitions and procedures for collecting information must be identified.
 - A central repository is needed for data.
 - The impact on day-to-day operations for emergency responders must be minimized.
 - Absolutely critical information must be prioritized.
 - An institutional effort to change the culture of reporting will be needed to achieve success – this issue must become a “whole community” effort.
 - Success will include a strong partnership between government and the insurance industry to improve responder safety.
- Members of the panel that report struck-by/near-miss events participated in a virtual meeting that allowed each system to be shown and discussed among the group.
 - Each of these systems collects information in different ways, and the group discussed each as a basis for understanding what the current reporting situation is within the industry. Detailed information and notes from that meeting are included in Appendix A.
 - Overall, the conclusion was that each of the systems in existence has good elements to them but that a clear definition for struck-by and near-miss would help improve their processes. Also, better knowledge of what the critical reporting elements are would make systems more user-friendly and collected data more consistent.
- Members of the panel were also asked to provide input on draft definitions and contributed to review of the final report for this project.

6 Current Institutional Operating Picture

Struck-by incidents are currently reported in an ad-hoc fashion. That is, there are no standards and no consistency in reporting within specific disciplines or across discipline boundaries. Despite the disparity in reporting, many industry groups have recognized the importance of using struck-by and near-miss data to raise awareness of the dangers of working on the roadway. These groups continue to disseminate information to anyone willing to listen with the hope of

preventing more unnecessary injuries and fatalities. As they do this, they continue to also search for ways to expand their coverage and incorporate more data. Unfortunately, due to the lack of national standards for reporting, voluntary or required reporting intervals, and the availability of emergency responders to provide the information, the task for industry groups hoping to gather and disseminate useful information is insurmountable.

The ability to understand where near-misses have occurred is even more difficult. There are no governmental or industry requirements to report these types of events. Any reporting that occurs is completely voluntary and, where it occurs, the information is typically anecdotal and lacks specificity.

6.1 Struck-by/Near-miss Definitions

One of the most significant challenges of achieving institutional change is the fact that different states, agencies, and personnel define struck-by and near-miss differently. For example:

- Various agencies do track when vehicles or equipment are struck, but they do not refer to those events as near-misses; they refer to them as struck-by incidents.
- Near-misses are especially difficult to understand; how can one concretely define an event in which a responder or roadway worker was *nearly* struck?
- Another obstacle is that, while many agencies, regardless of discipline, believe in the benefit of tracking near-misses, there are others who do not fully understand the value in doing so.

Each of these items was considered as the following definitions were developed.

Struck-by incident:

Any incident where an emergency responder/roadway worker or emergency or work vehicle is hit by another vehicle or object within a traffic incident management area or work zone resulting in an injury, fatality, or property damage.

Near-miss incident:

A near-miss incident is defined as an unintentional unsafe occurrence in a traffic incident management area or work zone that *could have* resulted in an injury, fatality, or property damage. Only a fortunate break in the chain of events prevented an injury, fatality, or damage. Any time traffic control devices near the crash scene or work area are struck, a near-miss event should be recorded.

Clearly defining these differences will enable all personnel, regardless of agency, to capture the details in a consistent manner.

It is important to note that a traffic incident management area does include any up-stream activity, even if a distance from the incident scene. Also, enforcement and towing and recovery

activities, such as when an officer has pulled over a driver, are included in the definition of a struck-by or near-miss incident.

Scenario Examples

In order to reinforce the differences between the struck-by and near-miss definitions, the following scenarios have been included.

Struck-by Scenario #1: A firefighter is struck by a passing vehicle while responding to a traffic crash. The firefighter was killed.

Struck-by Scenario #2: A vehicle passing an active work zone drives over a steel cable that breaks, which strikes a DOT staff member, sending her to the hospital.

Near-miss Scenario #1: A vehicle passing an active work zone (where workers are present) runs over a cone; no personnel are struck or injured.

Near-miss Scenario #2: A law enforcement officer conducting a speeding violation stop sees a vehicle approaching them and jumps over the guard rail to avoid being struck.

6.2 Institutional Research

A lot of the information collected as part of the struck-by reporting criteria relates to the physical attributes of vehicles at the time of the crash. Reports that pertain to personnel are typically reported to insurance carriers (personal injury, workers compensation, and liability) and to state agencies that deal with employee health and welfare regulations. One of the key points identified by the project panel that was examined as part of the research effort was the number of sources that information was asked or required to be reported. This section presents the findings of how information flows from the affected responders to the most centralized location possible. The goal of this portion of the research was to see if there were common locations where the information was stored, or where it was one link away from being connected.

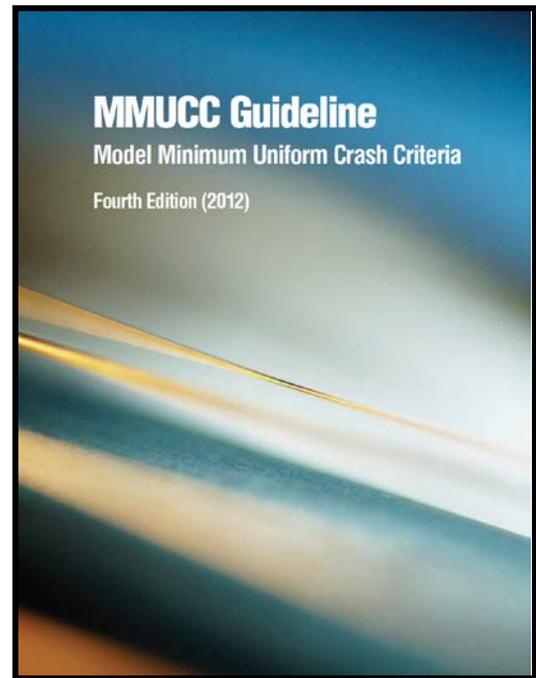
The research showed that there is no Federal law that requires information to be reported. It is the responsibility of individual States to track and improve the safety of their roadways. There are efforts underway to standardize the reporting process through consensus and other ways.

6.2.1 Model Minimum Uniform Crash Criteria (MMUCC)

The fourth edition of the MMUCC was released in 2012. The purpose of the Model Minimum Uniform Crash Criteria (MMUCC) is to provide a dataset for describing crashes of motor vehicles in transport that will generate the information necessary to improve highway safety within each State and nationally. Statewide motor vehicle traffic crash data systems provide the basic information necessary for effective highway and traffic safety efforts at any level of government – local, state, or Federal. State crash data are used to perform problem identification, establish goals and performance measures, allocate resources, determine the progress of specific programs, and support the development and evaluation of highway and vehicle safety countermeasures.

Unfortunately, the use of state crash data is often hindered by the lack of uniformity between and within states.

The MMUCC represents a voluntary and collaborative effort to generate uniform crash data that are accurate, reliable and credible for data-driven highway safety decisions within a state, between states, and at the national level. The MMUCC was originally developed in response to requests by states interested in improving and standardizing their state crash data. Lack of uniform reporting made the sharing and comparison of state crash data difficult. Different elements and definitions resulted in incomplete data and misleading results. The MMUCC recommends voluntary implementation of a “minimum set” of standardized data elements to promote comparability of data within the highway safety community. It serves as a foundation for state crash data systems.²



The MMUCC contains guidance on 110 collected and derived data fields. There are two reporting areas that are applicable to struck-by and near-miss in the vehicle portion of the recommended guidance. These two recommended reporting areas are shown below.

V10. Special Function of Motor Vehicle in Transport

Definition: The type of special function being served by this vehicle regardless of whether the function is marked on the vehicle.

Attributes:

- *No Special Function*
- *Taxi*
- *Vehicle Used as School Bus*
- *Vehicle Used as Other Bus*
- *Military*
- *Police*
- *Ambulance*
- *Fire Truck*
- *Non-Transport Emergency Services Vehicle*
- ***Incident Response***
- *Unknown*

Rationale: Important to evaluate the outcome of vehicles used for special uses that are involved in crashes.

² MMUCC 4th Edition Executive Summary

VII. Emergency Motor Vehicle Use

Definition: Indicates operation of any motor vehicle that is legally authorized by a government authority to respond to emergencies with or without the use of emergency warning equipment, such as a police vehicle, fire truck, or ambulance while actually engaged in such response.

Attributes:

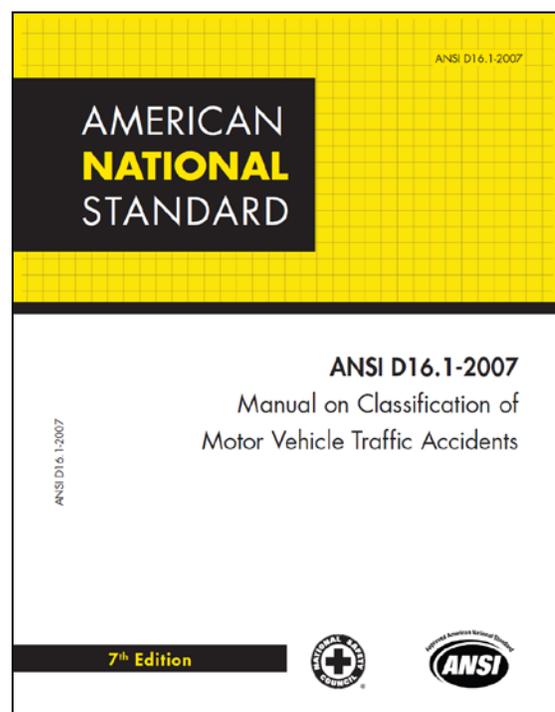
- Not applicable
- Non-Emergency, Non-Transport
- Non-Emergency Transport
- Emergency Operation, Emergency Warning Equipment Not in Use
- Emergency Operation, Emergency Warning Equipment in Use
- Unknown

Rationale: Driver behavior related to emergency vehicle response is an emerging national issue. This is true for both operators of emergency vehicles and operators of vehicles in the vicinity of an emergency vehicle engaged in a response. It is the intent of this element to gather information that will guide development of training or other countermeasures to reduce the number of crashes involving emergency vehicle response.

In some states, injuries on the highway are classified as pedestrians that are involved in these events. However this practice is neither consistent nor defined by the MMUCC.

6.2.2 Classification of Motor Vehicle Traffic Accidents

The primary purpose of the Manual on Classification of Motor Vehicle Traffic Accidents is to promote uniformity and comparability of motor vehicle traffic accident statistics now being developed in Federal, state, and local jurisdictions. The definitions in the Manual are related, but not necessarily identical, to the definitions found in the Uniform Vehicle Code; Manual of the International Statistical Classification of Diseases, Injuries and Causes of Death (ICD); United States Code, Title 23, Highways; the *Manual on Uniform Traffic Control Devices for Streets and Highways*; and the *Manual on Classification of Motor Vehicle Traffic Accidents*, ANSI D16.1-2007. These documents were developed for a variety of purposes. This variety is reflected in the definition of terms; similar terms do not necessarily have similar definitions. The body of the Manual is divided into two sections, one containing definitions and one containing classification instructions. The definitions are presented in an order which avoids



dependence upon special terms not previously defined. In addition, an attempt has been made to make every definition complete; modifications of definitions are not introduced intentionally in subsequent sections or subsections.

The use of the standard does not require the use of all classifications described in the Manual or prohibit the use of additional classifications. Accident report forms and summaries should, however, be compatible with the Manual to permit compilation and comparison of information collected in different jurisdictions. Nothing in the Manual is to be construed as a requirement for accident reporting or investigation.³

There are many references to a police vehicle in various states of use but no definition of the term “emergency vehicle” which is used in several sections. There is an inclusion of an automobile towing another automobile as part of the definition of the term “transport vehicle.” There are several sections that discuss stuck-by classifications.

2.2.7.2 working motor vehicle: A working motor vehicle is a motor vehicle in the act of performing construction, maintenance or utility work related to the trafficway. This "work" may be located within open or closed portions of the trafficway and motor vehicles performing these activities can be within or outside of the trafficway boundaries.

Section 2.2.7.2 specifically identifies the inclusion of stationary law enforcement vehicles in a work zone but specifically excludes law enforcement vehicles involved with a traffic stop, accident investigation, patrolling and traffic control.

2.2.34 In-transport: The term “in-transport” denotes the state or condition of a transport vehicle which is in motion or within the portion of a transport way ordinarily used by similar transport vehicles. When applied to motor vehicles, “in-transport” means on a roadway or in motion within or outside the trafficway. A transport vehicle which is also a working motor vehicle at the time of the unstabilized situation is not “in-transport.” In roadway lanes used for travel during some periods and for parking during other periods, a parked motor vehicle should be considered to be in-transport during periods when parking is forbidden.

Section 2.2.34 includes a police vehicle patrolling or responding to an emergency; a police or emergency vehicle stopped on the roadway at the scene of an accident or traffic stop or other police action, regardless of whether or not the emergency lights have been activated.

6.2.3 Manual on Uniform Traffic Control Devices

The Manual on Uniform Traffic Control Devices (MUTCD) is incorporated into Federal Law and is the primary publication used to establish requirements for signs, pavement markings, and other traffic control devices that drivers encounter on the roadway. The document also contains guidance on emergency responder safety and requirements in and around traffic incident management areas. The publication defines a traffic incident management area:

³ ANSI D16.1-2007 Introduction

A traffic incident management area is an area of a highway where temporary traffic controls are installed, as authorized by a public authority or the official having jurisdiction of the roadway, in response to a road user incident, natural disaster, hazardous material spill, or other unplanned incident. It is a type of [temporary traffic control] zone and extends from the first warning device (such as a sign, light, or cone) to the last [temporary traffic control] device or to a point where vehicles return to the original lane alignment and are clear of the incident.⁴

The publication defines a work zone:

A work zone is an area of a highway with construction, maintenance, or utility work activities. A work zone is typically marked by signs, channelizing devices, barriers, pavement markings, and/or work vehicles. It extends from the first warning sign or high-intensity rotating, flashing, oscillating, or strobe lights on a vehicle to the END ROAD WORK sign or the last [Temporary Traffic Control] device.⁵

The MUTCD does not address struck-by and near-miss reporting, however the definitions of a traffic incident management area and work zone as defined above are important to the overall approach of collecting struck-by and near-miss information.

6.2.4 Data Flows

As part of this effort, a sample data flow was created that shows how information on struck-by incidents flows through the reporting process from its most local point to the most national point possible.

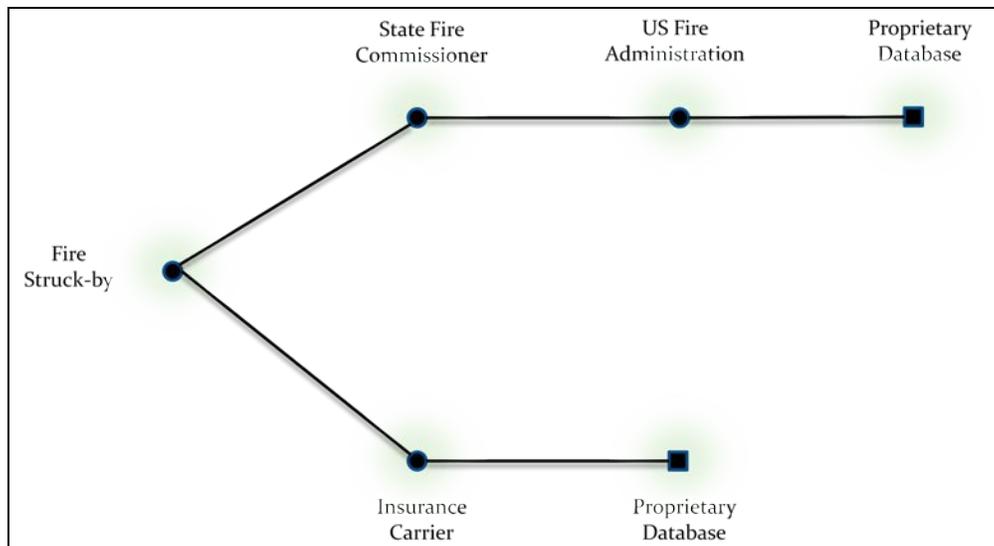


Figure 1: Firefighter Data Flow Diagram

⁴ Manual on Uniform of Traffic Control Devices Revision 2, Page 726, Paragraph 3

⁵ Manual on Uniform of Traffic Control Devices Revision 2, Page 552, Paragraph 2

It is noted that some states do not have a State Fire Commissioner but rather a State Fire Marshal. The proprietary database is the National Fire Incident Reporting System (NFIRS) which is defined in section 7.

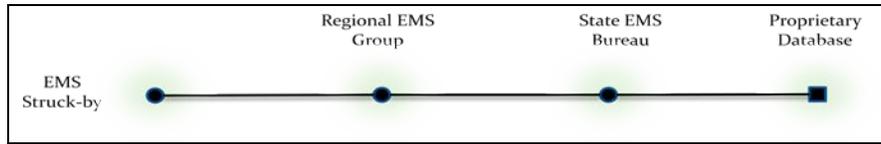


Figure 2: Emergency Medical Services Data Flow Diagram

Only a small number of states require struck-by incidents to be reported to the State level and reporting to the regional level is also rare. However, the Figure above depicts the most detailed process that was discovered during this research effort.

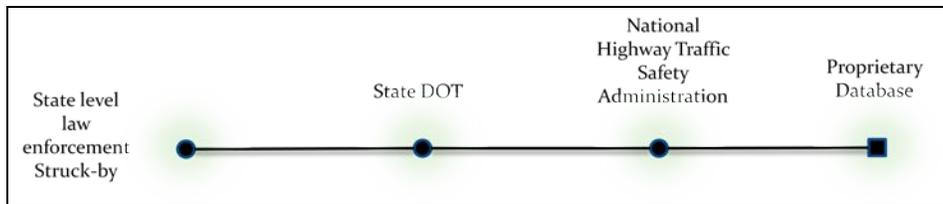


Figure 3: State Law Enforcement Data Flow Diagram

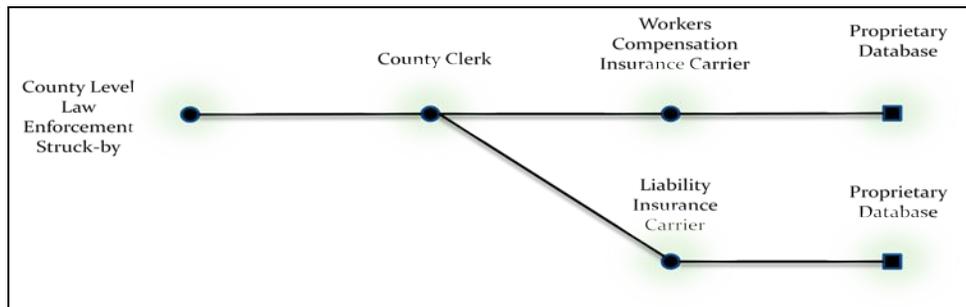


Figure 4: County Law Enforcement Data Flow Diagram

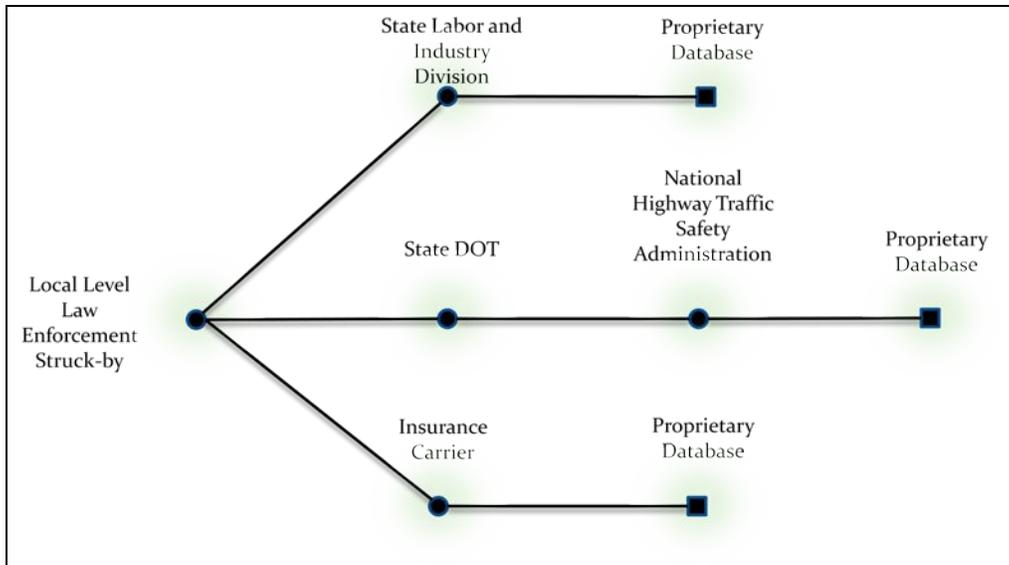


Figure 5: Local Law Enforcement Struck-by Data Flow Diagram

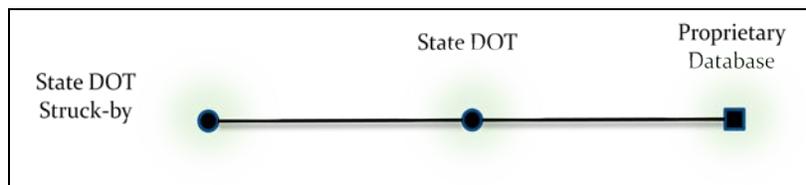


Figure 6: State Department of Transportation Data Flow Diagram

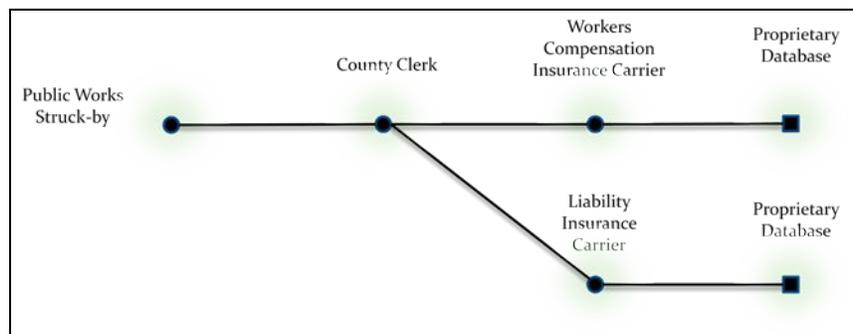


Figure 7: Public Works Data Flow Diagram

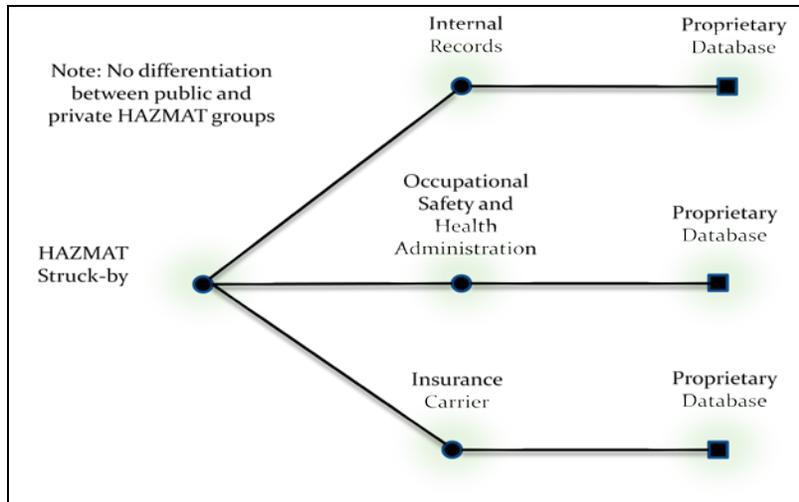


Figure 8: Hazardous Material Response Data Flow Diagram

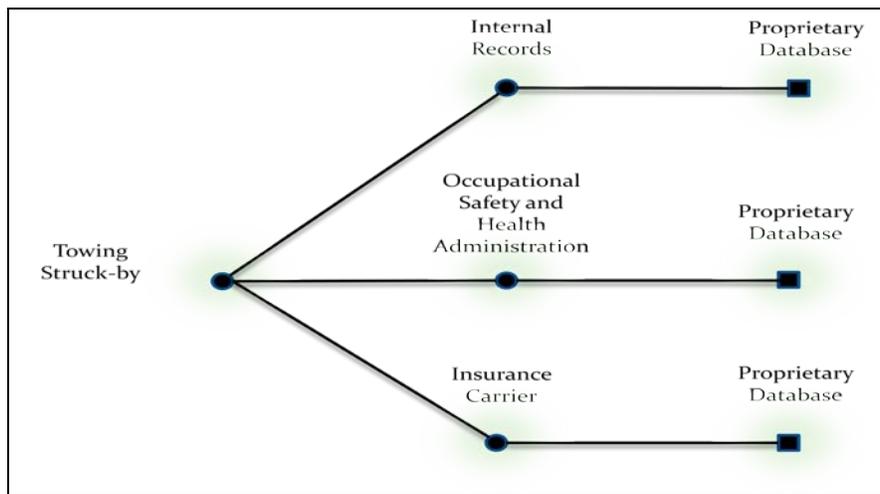


Figure 9: Towing and Recovery Data Flow Diagram

As these figures show, each type of emergency responder has a different path that reported incident information follows. Struck-by is the primary information that is collected. The real problem that these diagrams highlight is how many places first-level reports go. In total, reports go eight different places from responders that are involved at the scene. This highlights the importance of not creating additional reporting requirements for this group of responders; instead the national struck-by/near-miss database needs to focus on linking databases together that already capture the information.

6.2.5 Industry Compliance

Throughout the data collection and interview phase, many individuals conveyed anecdotes regarding the difficulty of obtaining compliance with either struck-by or near-miss reporting. The International Association of Fire Chiefs noted that voluntary reporting has been far more successful than requiring compliance. Although these anecdotes were not able to be documented

or substantiated, many of the systems in place experience low reporting levels. This could either be attributable to a lack of events occurring or a lack of compliance with processes in place. For the latter, a lack of compliance could be attributable to either a process that is too complex, too many redundant reporting locations, lack of resources to accomplish reporting, lack of understanding on how to report, or the feeling that the event is not worthy of being reported.

7 Current Technological Operating Picture

Struck-by, and occasionally near-miss data, is being captured by the Federal Government, state governments, and industry groups. However, significant discrepancies exist.

7.1 Federal Reporting Systems

The National Highway Traffic Safety Administration's (NHTSA) National Center for Statistics and Analysis (NCSA) designed and developed the Fatality Analysis Reporting System and National Automotive Sampling System General Estimates System. Together these systems provide an overall measure of highway safety; help identify traffic safety problems; suggest solutions; and help provide an objective basis on which to evaluate the effectiveness of motor vehicle safety standards and highway safety initiatives. Data from these systems are used to answer requests for information from the international and national highway traffic safety communities, including State and local governments, Congress, Federal agencies, research organizations, industry, the media, and private citizens. Information from these two primary data systems has been combined to create a single source for motor vehicle crash statistics⁶, and both are relevant to the goal of improving emergency responder and roadway worker safety.

7.1.1 Fatality Analysis Reporting System (FARS)

System Goal: To make reliable data regarding fatal injuries suffered in motor vehicle crashes available to NHTSA, Congress, and the American public.

The FARS contains data derived from a census of fatal traffic crashes within the 50 states, the District of Columbia, and Puerto Rico. To be included in FARS, a crash must involve a motor vehicle traveling on a trafficway customarily open to the public and result in the death of a person (occupant of a vehicle or a non-motorist) within 30 days of the crash. FARS was conceived, designed, and developed by NCSA in 1975.⁷

Information is entered into FARS at the state level. Therefore any improvement or expansion of information for struck-by or near-miss information would need to be captured at the state level and adopted for inclusion by NHTSA to become part of the FARS Encyclopedia. This encyclopedia is the output of the compiled information that can be customized by users to display information on a map in a variety of ways.

⁶ USDOT *Traffic Safety Facts 2009*

⁷ Fatality Analysis Reporting System Brochure, DOT HS 809 726 Revised April 2005

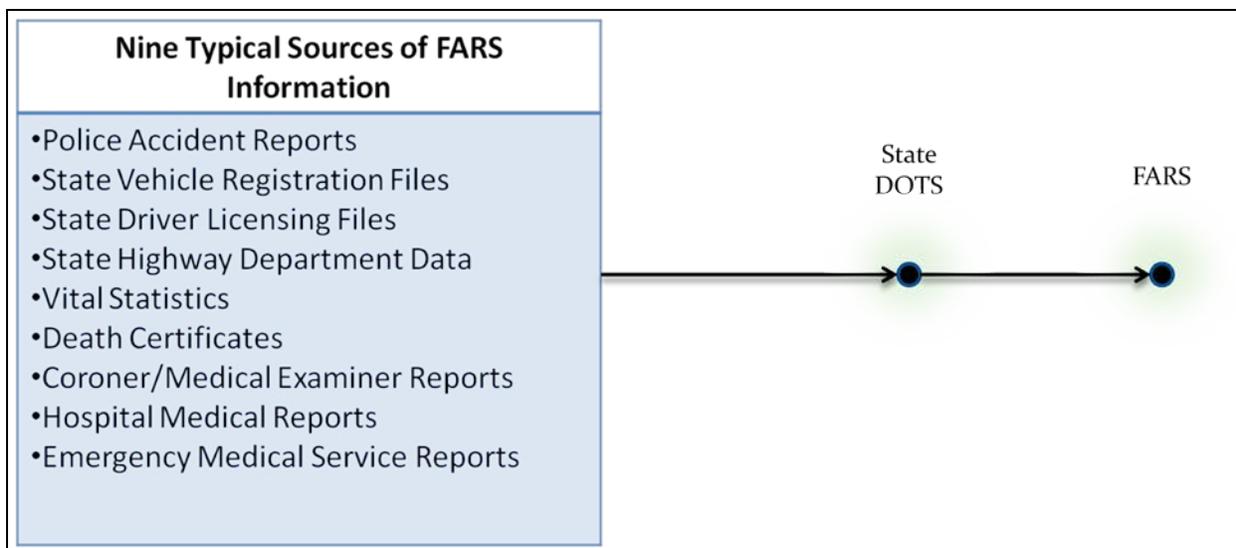


Figure 10: FARS Information Compilation Process

To obtain the data, NHTSA maintains cooperative agreements with each state. The data sources and the process for the information to get from the local level to the FARS database are shown in Figure 10 above. The states and NHTSA are working together to define new uses for the information through the MMUCC development process. For struck-by incidents that result in fatalities, the cooperative agreements and the MMUCC are the central location for analysis and revision.

7.1.2 National Automotive Sampling System General Estimates System⁸

System Goal: To identify traffic safety problem areas, provide a basis for regulatory and consumer initiatives, and form the basis for cost and benefit analysis of traffic safety initiatives.

Data for GES come from a nationally representative sample of police reported motor vehicle crashes of all types, from minor to fatal. The system began operation in 1988 and was created to identify traffic safety problem areas, provide a basis for regulatory and consumer initiatives, and form the basis for cost and benefit analyses of traffic safety initiatives. The information is used to estimate how many motor vehicle crashes of different kinds take place, and what happens when they occur. Although various sources suggest that about half of the motor vehicle crashes in the country are not reported to the police, the majority of these unreported crashes involve only minor property damage and no significant personal injury. By restricting attention to police-reported crashes, GES concentrates on those crashes of greatest concern to the highway safety community and the general public. GES data are used in traffic safety analyses by NHTSA as well as other DOT agencies. GES data are also used to answer motor vehicle safety questions from Congress, lawyers, doctors, students, researchers, and the general public.

⁸ NASS GES program brochure and web content.

In order for a crash to be eligible for the GES sample, a police accident report (PAR) must be completed, it must involve at least one motor vehicle traveling on a traffic way, and the result must be property damage, injury, or death. These accident reports are chosen from 60 areas that reflect the geography, roadway mileage, population, and traffic density of the U.S. GES data collectors make weekly visits to approximately 400 police jurisdictions in the 60 areas across the United States, where they randomly sample about 50,000 PARs each year. The collectors obtain copies of the PARs and send them to a central contractor for coding. No other data are collected beyond the selected PARs.

Trained data entry personnel interpret and code data directly from the PARs into an electronic data file. Approximately 90 data elements are coded into a common format. Some element modification takes place every other year in order to meet the changing needs of the traffic safety community. To protect individual privacy, no personal information, such as names, addresses, or specific crash locations, is coded. During coding, the data are checked electronically for validity and consistency. After the data file is created, further quality checks are performed on the data through computer processing and by the data coding supervisors. A publication, *Traffic Safety Facts*, is produced with GES data for non-fatal crashes, combined with information on fatal crashes from the Fatal Analysis Reporting System.⁹

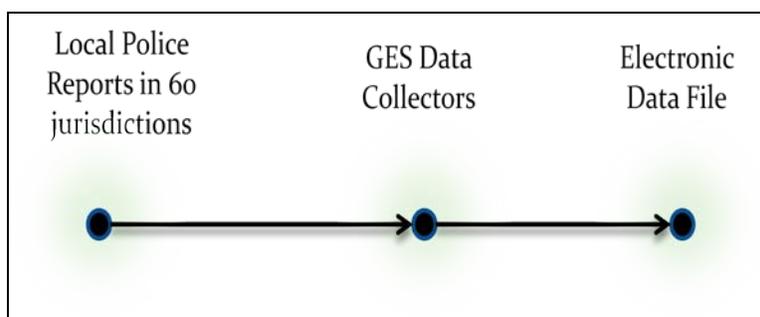


Figure 11: NASS GES Information Compilation Process

Since 2006, the FARS and NASS GES systems have been undergoing substantive changes to merge their processes. Both are being developed for compliance with the MMUCC and, according to published information about this merge, the most notable change will be for the 2011 reporting year, which introduces a new classification system for the case type. The form was split to recognize differences between a motor-vehicle occupant and non-motor vehicle occupant. This is significant for struck-by incident reporting since the definition of a struck-by incident can fall into either of these categories. At this time, NHTSA does not in any way aggregate struck-by or near-miss data once it receives the data.

7.1.3 US Fire Administration Fallen Firefighter Database

The US Fire Administration maintains a fallen firefighter reporting system that can be accessed from the agency's website. This website contains information about on-duty U.S. firefighter

⁹ [http://www.nhtsa.gov/Data/National+Automotive+Sampling+System+\(NASS\)/NASS+General+Estimates+System](http://www.nhtsa.gov/Data/National+Automotive+Sampling+System+(NASS)/NASS+General+Estimates+System)

fatalities. Included are notices of firefighter fatality, a database that allows visitors to search for firefighters honored at the National Fallen Firefighters Memorial, a description of the Memorial, a database that provides statistics related to the circumstances surrounding fatalities, the annual USFA firefighter fatality report, and information about Public Safety Officer Benefits (PSOB). This database does not capture data on non-fire EMS personnel such as those who work on hospital-based or many of the other non-fire ambulance services.

7.1.4 National Fire Incident Reporting System (NFIRS)¹⁰

The Federal Fire Prevention and Control Act of 1974 (P.L. 93-498) authorizes the National Fire Data Center in the United States Fire Administration (USFA) to gather and analyze information on the magnitude of the Nation's fire problem, as well as its detailed characteristics and trends. The Act further authorizes the USFA to develop uniform data reporting methods, and to encourage and assist state agencies in developing and reporting data. In order to carry out the intentions of the Act, the National Fire Data Center has established the National Fire Incident Reporting System (NFIRS).

The NFIRS has two objectives: to help State and local governments develop fire reporting and analysis capability for their own use, and to obtain data that can be used to more accurately assess and subsequently combat the fire problem at a national level. To meet these objectives, the USFA has developed a standard NFIRS package that includes incident and casualty forms, a coding structure for data processing purposes, manuals, computer software and procedures, documentation and a National Fire Academy training course for utilizing the system.

Within the NFIRS states, participating local fire departments fill out Incident, Casualty and optional reports for fires and other incident types as they occur. They forward the completed incidents via paper forms or computer files to their state office where the data are validated and consolidated into a single computerized database. Feedback reports are generated and forwarded to the participating fire departments. Periodically, the aggregated statewide data is sent to the National Fire Data Center at the USFA to be released and included in the National Database. This database is used to answer questions about the nature and causes of injuries, deaths, and property loss resulting from fires. The information is disseminated through a variety of means to states and other organizations. The National Fire Incident Reporting System is a model of successful Federal, State and local partnership. The database constitutes the world's largest, national, annual collection of incident information.

7.2 State Reporting Systems

Sources from various responder agencies in several states were interviewed to determine if and how struck-by/near-miss data is reported by various responding agencies, where the data is ultimately reported/housed, and what type of data is collected. The following provides a summary of four states' reporting systems, while the table that follows provides a succinct summary of a

¹⁰ <http://www.usfa.fema.gov/fireservice/nfirs/about/>

larger number of states and if they report struck-by and near-miss events of any kind. A detailed interview list is included in the Appendix.

7.2.1 California

In California, personnel from the California Highway Patrol (CHP) and the California Department of Transportation (Caltrans) were interviewed to determine how they handle struck-by and near-miss incidents for emergency responders and roadway workers. CHP does not track near-misses. When personnel or vehicles are struck, a traffic collision report form is used. This form is based on California's collision investigation manual, or its highway patrol manual. Other law enforcement agencies in the state can use the form, or one of their own. But whatever form is used, it needs to follow CHP's format. CHP is not required to report property damage, but it is required to report injuries/fatalities.

The form 555 information is entered into SWITRS, the Statewide Integrated Traffic Records System, which is the agency's 10-year database of police traffic collisions. People can visit the agency's web site and run queries from the database, such as victim counts, listings of collisions on roads, and statewide data. If an emergency vehicle was involved, a query can be run by vehicle code. If an officer was involved, he/she would be categorized as a pedestrian, but the fact that he/she was an officer would be captured in the narrative; however, the narrative information cannot be queried.

CHP shares information with the DMV for drivers' records and some information is shared with Caltrans, primarily engineering-type information such as objects struck, crash location, etc. It also has a FARS (fatal analysis reporting system) unit funded by NHTSA.

According to Caltrans personnel, once an incident occurs, an accident investigation report or its Close Call form is completed by the appropriate supervisor, depending on the extent of the incident. If there is vehicle damage, the staff member and supervisor each complete Caltrans' 270 form; there are different versions for staff members and supervisors. Depending if there are any personnel injuries, the supervisor completes the appropriate medical form(s). All of this information, with the exception of the Close Call form data, is entered into its Safety Information Management System (SIMS) database. Also, the District/Headquarters Safety Offices maintain copies of these forms.

SIMS is Caltrans' database of accidents and injuries that the agency uses to track and analyze accident information within the organization. The data can be queried by cost center so, in general terms, the agency can track if roadway workers and/or responders are struck or nearly struck.

If an injury meets the Cal/OSHA requirements, it is also reported there. The information is also shared with workers compensation for injuries and/or liability insurance for vehicle damage. Typically only accidents involving another party are reported to liability insurance. If Cal/OSHA investigates the agency, it will require a Form 300 for the past three years. California employers with more than 10 employees are required to prepare a Form 300. All data is collected each year,

and at the end of the year, a Form 300 is developed from the data based on all injuries and accidents. The SIMS database is how the agency tracks if its Form 300 is accurate.

7.2.2 Pennsylvania

Personnel from the Pennsylvania Department of Transportation (PennDOT), Pennsylvania State Police (PSP), State Labor and Industry Department, several local law enforcement agencies, a hazmat response company, and the Pennsylvania Towing Association were interviewed.

- **Department of Transportation** - collects basic information when an employee is struck, and serious injuries get more detailed information gathering. The only external reporting is annual to the Governor's office, and it is not detailed. Each PennDOT operating unit examines vehicle strikes and injuries in some way through safety officers and safety reviews, but there is no statewide standard for corrective action.
- **State Police** - does not record near-miss incidents. One reason is that issues with not obeying the "Move Over" law can be considered a near-miss. For example, if an officer is sitting along the road with the lights on and a passing car does not move over, the driver could be cited. But this would be recorded as a traffic citation, not a near-miss. For internal training purposes, PSP does track how many times police cars are hit; but the reasons are quite varied and beyond incident response. Also, PSP only recognizes *reportable* accidents – a vehicle must be inoperable or an injury must occur. If a crash is a "fender bender," there is no mandate to report it. PSP uses *ANSI D16.1-2007 Manual on Classification of Motor Vehicle Traffic Accidents*, which outlines what does/does not constitute an accident. If a reportable accident occurs, PSP submits an incident report to PennDOT; PSP property is not distinguished from a motorist's (damage), and an officer is not distinguished from a pedestrian (injury). PennDOT then tabulates this information and submits it to NHTSA.
- **State Labor and Industry Department** - The Bureau of Workers' Compensation collects all workers compensation claims, as well as compiles an annual report, but it is comprised of only broad categories. The Bureau is in the middle of a three-year project to redefine its business process and reporting capabilities. Once the new system is in place (to be launched in the fall of 2013), it will be able to do reporting based on ICS codes. The Bureau follows the standard system for reporting all workers compensation claims, which was put together by the International Association of Industrial Accident Boards and Commissions. A FROI (first report of injury) comes into the EDI. The FROI does capture the type of injury, but the hard copy forms received do not note if a person is an emergency responder or roadway worker. Claims are entered into the department's CIM system, which is its database until 2013 and the new system is in place. The Bureau is currently not required to report to OSHA, but it is considering doing so (BLS rates only). Pennsylvania is one of only seven or eight states that currently do not report BLS data to OSHA. The department will be sending a sampling of data to OSHA in October 2012.

At the local police level, there are differences based on each different agency. This reinforces the inconsistency that leads to the inability to roll up responses.

- **Local Police** – Clinton County does not recognize near-misses. An incident form is completed if either personnel or a vehicle is struck. One copy is filed in the office, and a copy is sent to the County’s Chief Clerk’s office. The Chief Clerk submits the claim to PCORP (property or general liability) or PCOMP (workers compensation).
- **Local Police** - According to the Lower Merion Police Department, the agency reports struck-by incidents internally in unofficial reports, as well as state crash reports. There is no sharing of information with other agencies. Near-misses are documented internally for the purpose of providing added awareness, and they are investigated if workers claim an unsafe environment. It shared that municipalities operate with very different systems of data collection and sharing.
- **Local Police** - The Mechanicsburg Borough Police Department does not formally capture/report near-miss data, but it does on an anecdotal basis. It recognizes a reportable accident in the same manner as does PSP and uses a general incident report for a wide variety of incidents. If there is vehicle damage, then an accident report is also submitted. If only very minor damage occurs and there is no follow up, the information stays with the Chief. If property is damaged, such as traffic cones, then an incident report is completed as criminal mischief. If a person is hit, this is tracked through workers compensation. If there is an injury, an insurance claim and accident report are filed with PennDOT. If there is no injury, the information is kept on file in the department office, but there is no submittal to workers compensation. The personnel can do a manual search of these files, but they are not coded.

Private industry also deals with these events in this state.

- **Private HAZMAT Contractor** - According to Minuteman Environmental Services, which is a private-sector firm that responds to hazardous spills by both private- and public-sector agencies, it reports any injuries to OSHA on a quarterly basis. It does not capture near-miss information, but it would be willing to do so.
- **Towing and Recovery** - The Pennsylvania Towing Association reported that it does not track tower injuries, and it is not sure if/how tower deaths are captured on police reports. It was discussed if this data could be tracked through insurance claims, but at times towers pay claims out of pocket; if they risk their rating, they could end up with the most expensive insurer, which is a significant drawback.

7.2.3 Tennessee

In Tennessee, personnel from the Tennessee Highway Patrol (THP) and the Tennessee Department of Transportation were interviewed. THP does not collect near-miss information;

however there are instances where a near-miss could be recorded as a DUI. While this would not be coded as a near-miss, all details would be captured in the narrative.

When a struck-by incident does occur, the appropriate officer is required to complete an incident report. If a police vehicle is struck or strikes another, dispatch is notified and an incident offense report is completed. If a personnel member is hit, a vehicle is damaged, or both, the supervisor completes a crash report if the incident meets the threshold, which is a minimum of \$400 damage.

All of this data is housed in THP's Tennessee Integrated Traffic Analysis Network (TITAN) database, which is its statewide records management system. According to its website, TITAN is developed and maintained by THP to serve as a portal into Tennessee's repository for traffic crash and surveillance reports completed by Tennessee law enforcement agencies.¹¹ TITAN can be queried to see if emergency responders or roadway workers are involved in incidents. Members of the THP staff pull out information as needed from the system to conduct its own analysis, determine if additional training is needed, etc. The captain plays a significant role in deciding if corrections are needed. Injury information is shared with TOSHA, but is not reported up through NHTSA because this is not required. Injury information is also shared with workers compensation, and damage information is reported to liability insurance.

According to TDOT, when personnel or vehicles are struck, these incidents have been reported through Human Resources because of injuries. It uses two forms when personnel or vehicles are struck, and all injury information is sent to its workers compensation third-party carrier. If a vehicle is struck, the information is housed at the state level, as it is self-insured. "Reportable" incidents, according to OSHA guidelines, are reported to TOSHA.

Near-misses are very hard to report, and the agency is looking at a database to capture the struck-by data within the next year. TDOT is also planning to do more in terms of risk management, such as job-related injuries, prevention, training, etc.

7.2.4 Missouri

In the event that the Missouri DOT (MoDOT) has a serious injury or death, information is reported to several locations, the most accurate of which is OSHA. However, it is unclear how available that information is after it is reported.

Depending upon what reports were taken, and which agency took them, the data is stored with that agency. For example, MoDOT has access to crash report data online, but the data is not collected so that it is accessible by staff. The closest data collection that it maintains is for work zones. If the agency is interested in work zone crashes, it could sort the data by this type of crash and manually look through the reports.

¹¹ <https://titan.safety.state.tn.us/TITAN/Public/Home.aspx>

When there is a close call, or near miss, reports are not normally prepared. In the event that reports are generated, there is no uniformity in the collection of information.

<i>State</i>	<i>Struck-by Reported?</i>	<i>Near-miss Reported?</i>
Pennsylvania	Y	N
Missouri	N	N
California	Y	Y
Tennessee	Y	N
North Carolina	Y	N
Rhode Island	Y	N
Georgia	N	N
Virginia	N	N
Maryland	N	N
Maine	N	N
Florida	Y	N
New Jersey	N	N
New York	Y	N
South Carolina	N	N
Delaware	N	N
Washington, D.C.	Y	N

7.3 Government Agency System Bottom Line

According to the MMUCC, it represents a voluntary and collaborative effort to generate uniform crash data that are accurate, reliable, and credible for data-driven highway safety decisions within a state, between states, and at the national level. MMUCC recommends voluntary implementation of a “minimum set” of standardized data elements to promote comparability of data within the highway safety community.

The MMUCC serves as a foundation for state crash data systems. Efforts to standardize crash data have increased since MMUCC was originally recommended as a voluntary guideline in 1998. More and more states included MMUCC in their data review process as they sought to revise their crash report forms.

While NHTSA recommends that states adopt the MMUCC guidelines, it is not mandatory. However, NHTSA does follow which states adopt these guidelines. Every five years, states go through a traffic records assessment and receive a MMUCC compliance rate. NHTSA maintains this information.

7.4 Industry Systems

There are four national systems for reporting struck-by and near-miss events, and all of the ones identified as part of this effort are aimed at the emergency responder community. Regardless of the system in use and discipline, each of the systems has similarities and differences.

7.4.1 Respondersafety.com (Emergency Responder Safety Institute)¹²

System Goal: To compile information that raises awareness of the dangers of working in the roadway to improve safety.

ERSI does not have a formal reporting process established, however it monitors news reports from around the country and actively searches for news stories about “struck by vehicle” incidents involving emergency services, towing and recovery, and DOT personnel. It reports those incidents through its website (<http://www.respondersafety.com/StruckBy.aspx>) and then it also highlights some cases (up to three a day) on its Facebook page (<https://www.facebook.com/roadwaysafety>). The records it has listed on its website are in a searchable database format and, where possible, point back to the original source of the information.

ERSI has archived news stories of fire and EMS-related “struck by” cases going back to approximately 1998 in chronological order by state and type of incident. This archive is quite comprehensive for law enforcement and firefighter line of duty deaths, as well as for EMS. Recently, towing and recovery events have started to be captured as well. The website has a feature to search struck-by and line of duty deaths. However, a database of the information has not been developed, and this makes it difficult to analyze the data. Below is a success story for this system.

This system’s efforts have boosted awareness of the dangers of working along roadways, which has led to responders seeking out training about TIM and responder safety. ERSI has 3,960 followers on its Facebook page, where it highlights incidents from its struck-by-vehicle news reports. According to its Facebook statistics, it routinely reaches approximately 1,000 followers within a couple of hours of an incident posting. In addition, ERSI’s website’s LODD and News database is currently the only place online where anyone can conduct a search for struck-by incidents that have occurred in a certain area or during a certain time period for all types of agencies. The agency’s educational efforts, driven by the number of reported incidents, have certainly saved numerous lives.

8.4.2 FireFighterNearMiss.com (National Fire Fighter Near-Miss Reporting System)¹³

System Goal: To improve firefighter/EMT safety by providing reports in an anonymous public forum that can be used as a learning tool.

This system, based on the Aviation Safety Reporting System (ASRS) used in the airline industry, gathers reports from members involved in near-miss incidents; it is confidential. The reports do not capture personal identifiable patient information, department, incident location, etc. The

¹² <http://respondersafety.com>

¹³ <http://firefighternearmiss.com>

system is searchable and captures information from any member of the fire and emergency service. The system captures fairly detailed information about the incident through 15 drop-down questions and two open-text narrative sections (event description and lessons learned).

The system was developed in 2005, and more than 5,000 reports have been submitted in the past seven years. The system is not really focused on injury reporting. The system has seven individuals who are available to review the reports; each has a fire background. Two people review each report and de-identify the reports and collect additional data points.

The following outlines several tangible successes that were realized as a result of this system, reiterating the importance of near-miss data to the responder community.

- Seventy-three percent of respondents from a May 2012 survey reported that near-miss reports influenced the way they approach their jobs, and 36 percent of respondents stated that near-miss reports were used to change departmental written policies. Specific changes regarding revisions to highway response practices based on near-miss reports included the increased use of wheel chocks and blocking units.
- A firefighter from an Arizona fire department stated that he had read a near-miss report involving a backing event with a tanker truck, and the spotter moved into an unsafe position behind the vehicle out of site of the driver. Later, this person observed a similar occurrence beginning to happen, stopped it, and was able to prevent a potential injury or fatality. Because of the near-miss report, this person believed that he was more alert during a routine procedure.
- A chief from a Florida fire department used a near-miss report regarding a backing injury to rewrite their department's policy to require a back-up person and, if the truck is picking up equipment after a call, the driver must make a final 360 around the truck before leaving the scene. The new procedure states that two firefighters be on either side behind the truck and an officer in front. All members monitor a local radio channel to give the driver immediate verbal instructions. And no member can re-enter the truck until the parking brake is set, and the truck doesn't move until all personnel are accounted for with their seatbelts on.
- A captain from a Colorado fire department used near-miss reporting monthly training information on roadway safety training to conduct company-level training.

7.4.2 E.V.E.N.T. (EMS Voluntary Event Notification Tool) ¹⁴

System Goal: To improve the safety, quality, and consistent delivery of Emergency Medical Services. To provide information that will be used to develop policies, procedures, and training programs.

This system, a project of the Center for Leadership, Innovation and Research in EMS, St. Cloud, MN, is modeled after the Pennsylvania EMS system, and it is self-described as similar to the airline pilots system and the National Firefighter Near-Miss Reporting System. The system, which was started in 2011, captures information on near-misses, patient safety events, and line of duty deaths; not injuries.

¹⁴ <http://event.clirems.org/>

E.V.E.N.T. is designed to improve the safety, quality, and consistent delivery of EMS. It collects data submitted anonymously by EMS practitioners. The data collected will be used to develop policies, procedures, and training programs to improve the safe delivery of EMS. Any individual who encounters or recognizes a situation in which an EMS safety event occurred, or could have occurred, is strongly encouraged to submit a report by completing the appropriate E.V.E.N.T. Notification Tool. The confidentiality and anonymity of this reporting tool is designed to encourage EMS practitioners to readily report EMS safety events without fear of repercussion. Anonymity is very important to the success of the tool in terms of attracting reports, however very much limiting in that follow up is not possible.

The following success story, as a result of the new E.V.E.N.T. system, was published in the Rural Assistance Center's *Rural Monitor* Summer 2012 issue.

Getting ready to leave the office late one Friday evening, Rowan County Emergency Medical Service (EMS) Paramedic Bradley Dean became alarmed when he read about a medication error that another EMS service had reported on the web-based EMS Voluntary Event Notification Tool (EVENT). Dean, who also oversees safety training for Rowan County EMS in North Carolina, headed directly to the ambulance bay. There he found the same potential for error: two medications with very different purposes packaged very similarly by different manufacturers. They were placed in close proximity in the small ambulance fridge. Dean immediately ordered re-marking and repositioning the meds, preventing a similar incident from happening in Rowan County.

7.4.3 Firefighterclosecalls.com

System Goal: To identify the issues involving injuries or deaths of firefighters and allow others to learn from the events that caused them.

FirefighterCloseCalls.com was an idea born from [The Secret List](#) (TSL), an independent newsletter produced since 1998 in an effort to bring forward the issues involving injury and death to firefighters...often issues that are ignored, quickly forgotten, or just not talked about. Originally started as an e-mail group amongst some close friends in the fire service, it is currently received by thousands of fire service members.

With the attitude that, in order for firefighters to survive the dangers of the job, we must learn how other firefighters have had "[Close Calls](#)" and even been injured or killed, this site and TSL will continue the "No BS" history of bringing forward issues in an effort to enforce that philosophy and get firefighters to refocus on "what's important." The intent is not to "Monday Morning Quarterback" or purposely embarrass anyone, but to provide as factual information as possible as provided by its visitors with commentary to allow the reader to think and decide if, or what, they want to do in order to prevent the bad stuff from occurring again.¹⁵

¹⁵ <http://www.firefighterclosecalls.com/mission.php>

There is an option on this website to “Submit Your Close Call/Near Miss.” It requires basic information. At the bottom of the submit form, users can choose to also have the report sent to the National Fire Fighter Near-Miss Reporting System.

7.4.4 FBI’s Law Enforcement Officers’ Killed and Assaulted Program

Beginning in 2004, the IACP partnered with the FBI to revise the latter’s “Analysis of Officers Feloniously Killed and Assaulted” form, the goal of which was to gather information critical to identifying more precisely those factors that eventually could improve officer safety during traffic stops and other roadside contacts. The new “Analysis of Officers Accidentally Killed” form was implemented in January 2011, so the process of gathering crucial data has begun and eventually should yield the same type of invaluable information that has been available for four decades relative to officers killed feloniously.¹⁶

The FBI already collected for well over a quarter century struck-by-vehicle incidents where law enforcement officers were fatally injured and recorded them in two categories: “directing traffic, assisting motorists, etc.,” and “traffic stop, roadblock, etc.” The FBI’s data is submitted by law enforcement agencies voluntarily participating in its Uniform Crime Reporting program.

7.5 Industry System Bottom Line

Each of the aforementioned reporting systems utilizes online forms to capture the incident data. While there are similarities in common data elements required on the various forms, the required data, in large part, are distinct as the systems have individual purposes.

The most common data elements include: department type, department shift, service area, job/rank, age, experience, state, FEMA region, event type, event participation, contributing factors, event date/time, hours into shift, weather, event description, and lessons learned. However, it varies by system if these elements are required or optional. The Table below shows all of the fields that are available for input from the systems discussed above.

43 Different Types of Information Currently Being Requested by Industry Groups Collecting Struck-by or Near-miss information
<ul style="list-style-type: none"> • Department type • Department shift • Department chief • Service area • Job or rank of person struck • Name/rank of point of contact • Age at time of event • Experience at time of event (in years) • State • FEMA region • Event type

¹⁶ U.S. Department of Justice, FBI, CJIS Link, “UCR Program Continues to Adapt, Evolve,” September 2011, <http://www.fbi.gov/about-us/cjis/cjis-link/september-2011/ucr-program-continues-to-adapt-evolve> (accessed November 28, 2011).

**43 Different Types of Information Currently Being Requested by
Industry Groups Collecting Struck-by or Near-miss information**

- **Event participation**
- **Contributing factors**
- **Event date and time**
- **Hours into shift when event happened**
- **Weather at time of event**
- **Loss potential**
- **Do you think this will happen again?**
- **Event description**
- **Lessons learned**
- **Contact information (optional and confidential)**
- **Level and type of provider organization**
- **Number of annual responses that the near-miss service has**
- **How frequently OT is available with Near-Miss Department**
- **Did event occur following other employment or working additional shifts?**
- **Time off before beginning of shift in which Near-Miss event occurred**
- **Year event occurred?**
- **Month event occurred?**
- **Visibility at time of event**
- **What prevented injury, illness, or damage in this event?**
- **Unusual circumstances**
- **What system changes could be made to reduce the chance of this event reoccurring?**
- **Name of practitioner's EMS Agency**
- **EMS Agency contact name**
- **EMS Agency contact phone number**
- **EMS Agency contact e-mail**
- **City and state or province that line of duty death (LODD) incident took place**
- **Date of LODD incident**
- **Time of LODD incident**
- **Description of LODD incident**
- **Full name**
- **E-mail address**
- **Phone number**

As the Table shows, there is such a wide variety of data currently being requested that the possibility of compiling and analyzing the information is not feasible. The key for a successful database will be to determine which of these 43 input types are the most critical, what they would be used for, and what sources already exist that can be used.

8 Gap Identification

There has been a lot of passion and effort put into gathering struck-by information within the emergency services community and, to a lesser extent, near-miss information. With regards to roadway workers, this type of information is non-existent. To change the direction of understanding the true impact that these types of events have on the transportation system and to target outreach and education efforts more effectively, there are a number of gaps in governance, institutional, and technological changes that must be addressed.

8.1 Gaps in Governance

Governance refers to how well the primary agency or person in charge of an initiative implements the program rules. Overall there is no consistent governance structure in place for struck-by and near-miss events and, with no primary agency at the National level identified, there is no specific agenda in place for reducing the annual number of struck-by and near-miss events. Likewise, within individual states, there is limited evidence of coordination between emergency responders at different levels and cross-coordination among disciplines. These issues are some of the core themes that were examined as part of the governance gap analysis.

8.1.1 Lack of Federal and State Agreed Upon Guidelines

At the Federal level, the topic of struck-by/near-miss reporting can be somewhat comparable to movements that resulted in widespread reporting of seatbelt-related crashes. The comparison is that prior to the reporting of these types of crashes, there was anecdotal information that the lack of seatbelt usage was one of the leading causes of roadway injuries and fatalities for drivers. To change the culture of seatbelt usage, the case had to be made that *not* using the belt increased the chances of mortality, and this meant that consensus had to be reached on creating the dataset. After the dataset was created, targeted outreach and education occurred and, ultimately, Federal funding allocations became tied to individual state performance and efforts to reduce crashes where injuries and fatalities were proven to be attributable to the lack of seatbelt use.

Joint Development of the MMUCC

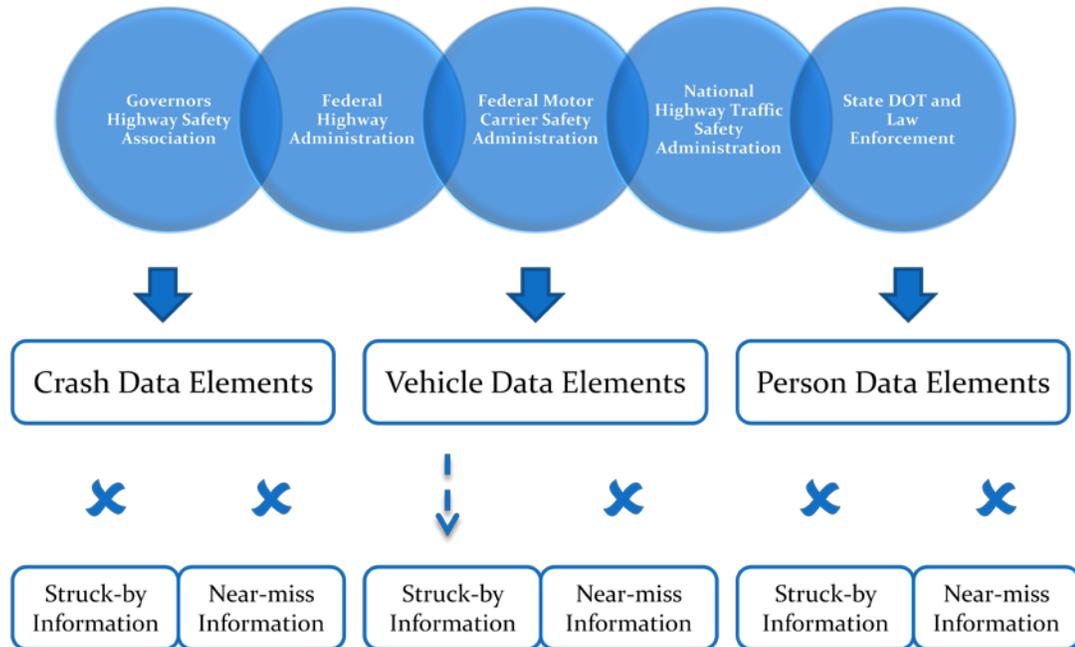


Figure 12: Gap in Federal/State Development of MMUCC Struck-by/Near-Miss Guidelines

Figure 12 shows the gaps that exist in the current MMUCC guidelines for capturing struck-by/near-miss information in state crash systems. As the figure shows, the only information that is partially captured is struck-by information for vehicle data related elements. Crash data elements and person data elements are not being captured in the guidelines. As noted in section 6.2.1, information was included in the fourth edition of the MMUCC based on the recognition that struck-by events are an emerging national issue, particularly within the emergency responder community.

8.1.2 Lack of Consolidation at the State Level

Since struck-by and near-miss information can be generated by many different types of agencies working on the roadway, consolidation typically occurs within the discipline where it occurs. As Figure 13 shows, information is reported to a variety of sources from the local level up to the state level. That information may or may not be passed on to a national source, but there was no evidence that it is consolidated at the state level.

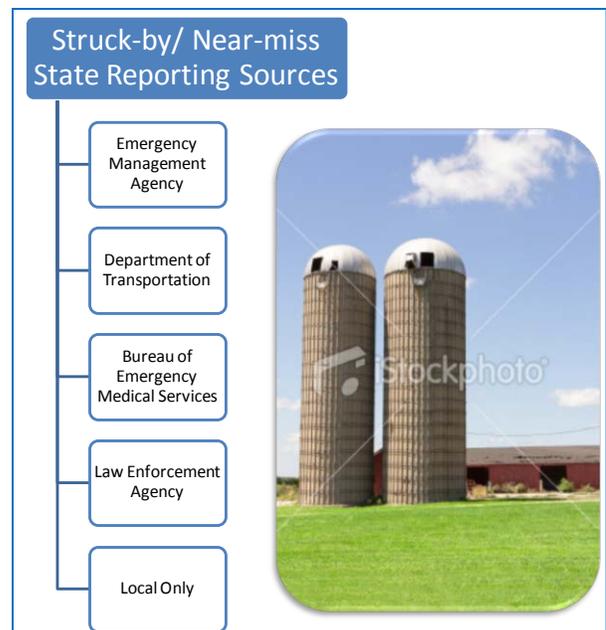


Figure 13: Independent Reporting Processes for Each Type of Emergency Responder/Roadside Worker

This reduces the feasibility of the information ever becoming capable of being summarized at a national level or even at the state level for usage.

This is also true, although not surprising, for industry groups who report these types of events. Each of the industry groups was developed with the discipline they serve in mind. Most have been developed with fellow fallen responders in mind with the goal of avoiding future events and reminding those involved with emergency response about the dangers of working on the roadway.

8.2 Institutional Gaps

Besides the governance gaps that exist, there are also gaps that prohibit/inhibit success under existing conditions. These are institutional gaps. These issue gaps will continue to exist once the governance gaps have been closed unless they are properly addressed. The items included as institutional gaps represent the cultural shift that needs to take place with regards to struck-by and near-miss events.

8.2.1 Inconsistent Terminology

This report provides definitions of struck-by and near-miss events to begin to establish the common parameters for progression. However, there are other terms that will need to be recognized and agreed upon. It is suggested that once developed, these definitions be entered into the Glossary of Regional Transportation Systems Management and Operations Terms maintained by the Transportation Research Board and widely distributed among all groups involved with struck-by and near-miss events.

- **Reportable Incident** – This term has different meanings in each state. This is an important term, especially for delineating the boundary between a struck-by and near-miss event. Currently, this term means different things in some states, and this affects how law enforcement personnel document the event.
- **Close Call** – It is unclear if a close call should be considered the same as a near-miss or not. A decision should be made on whether or not to continue using this terminology once the near-miss definition is adopted.
- **Injury** – Different agencies refer to an injury in different ways. For struck-by and near-miss injuries, the definition should be inclusive of all injury complaints.

8.2.2 Practitioner Acceptance

It is unlikely that mandates, by themselves, will be able to achieve widespread reporting of struck-by/near-miss events. Ultimately, the success of the system will hinge upon the acceptance and use by practitioners.

To achieve widespread usage, the development process will need to consider the time and resources available at the local level to provide information and work to minimize new processes, or ideally, reduce the current burden. Figure 14 shows that emergency responders have nine different destinations that are part of the first reporting level for information. By



Figure 14: Breakdown of Nine Different "First Report" Destinations

comparison, roadway workers that are also department of transportation employees have one reporting source, which is their own organization. For roadway workers, the gap that exists is an understanding of the impact that struck-by incidents have on both mobility and loss in productivity associated with construction/road work delays.

Individuals that were interviewed as part of this research effort all recognized the importance of reporting and the value of being able to demonstrate trends associated with these types of events. However, all of them were skeptical that this type of reporting could be completed successfully if the workload on responders was not considered as part of the implementation plan.

8.2.3 Inconsistent Reporting Processes

Whether examining differences among industry groups or states, it is clear that a wide variety of reporting processes exist. For example, several agencies have a clear reporting path from the local to federal level, while others do not, with information residing primarily at the state level. In addition, the information being collected by the various groups varies widely and is inconsistent.

When examining the various industry systems, such as ResponderSafety.com, each captures different data, and the information resides separately. There is no connection among the systems, making it difficult to analyze the information and draw conclusions about data trends. In addition, EMS only reports to the state level, and the USFA does not have a standard for capturing state data (accept indirectly through NFIRS), nor full reporting compliance from state fire agencies. On the towing side, the towing industry does not track tower injuries.

Furthermore, out of the states that were investigated, only Caltrans captures close call (near-miss) information, but this, unlike its struck-by data, is *not* tracked through its SIMS database. It also varies which states report injury data to the appropriate state OSHA agency.

Both traffic crashes and work zones cause non-recurring congestion, and this type of congestion has a direct effect on the price of goods and services delivered to customers. When an emergency responder at the scene of a crash is struck, the result is a secondary crash. The Federal Highway Administration and the Transportation Research Board have placed an emphasis on reducing secondary crashes. When a roadway worker is struck, this exasperates the congestion that is already being created by the existence of the work zone in the first place. Likewise, a better understanding of where near-misses occur with the most frequency could help develop a proactive approach to preventing injuries and fatalities to emergency responders and roadside workers.

8.2.4 Perception

While the phrase “perception equals reality” might not completely apply to this effort, in many ways perception is a barrier to success. While conducting its various interviews among state experts, the project team learned of the following perceptions:

- This issue is not *that* big of a deal, and it will not happen to me.
- Near-misses are very difficult to define, and the issue is insurmountable.

- It is not worth investing time and resources into addressing near-miss incidents – after all, no one was actually struck.
- Driver behavior is an unknown variable; is there really a way to address and improve poor driver behavior and patterns?
- If my agency reports these types of events, we'll be penalized or portrayed poorly and I will be risking my reputation.
- I already have way too many administrative requirements to deal with yet another reporting requirement.

In order to gain widespread acceptance of this effort, it is imperative that these perceptions be clearly addressed.

8.3 Technological Gaps

In some ways the gaps that exist from an institutional standpoint have also led to the increased gap in technology. As documented in this report, there are many systems in use at government agencies and by industry groups. Although this section documents the gaps that do exist from a technological standpoint, these gaps can be solved by technology that is either available or can be easily developed. The institutional agreements and consensus that will need to be developed to guide the technology implementation will be of utmost importance.

8.3.1 Inputs Captured by Industry Groups and Government Agencies

While there is some consistency among the industry groups, in general, each requires different data inputs. Also, it is not clear if the *most effective* inputs are required. For example, crash location, a key input for analyzing crash trends, is only required by the MMUCC, not by the industry groups. This inconsistency has resulted in the systems not being utilized to their full potential.

Furthermore, at the government level, inconsistencies exist. For example, while FARS contains data derived from a census of fatal traffic crashes within the 50 States, the District of Columbia, and Puerto Rico, data for GES come from a nationally representative sample of police-reported motor vehicle crashes of all types, from minor to fatal. While efforts are being made to merge these processes, and the systems do provide valuable crash information, they are not specific enough to provide valuable data on emergency responder/roadway worker struck-by and near-miss incidents.

In order to develop one industry reporting system that gains nationwide acceptance and compliance for the purpose of addressing responder and roadway worker safety, the most critical data inputs must be utilized for the new database.

8.3.2 Information Security

To establish high frequency struck-by and near-miss locations, it is necessary to collect core information that can be translated into geographical information systems for synthesizing. To accomplish this synthesis, some personally identifying information is required. The gap in this

area is the reluctance by many to provide the information for one primary reason: fear of the consequence related to information release.

There are different types of consequences that could negatively impact the safety and security of individuals or agencies if information is not properly safeguarded by system administrators. First, if information is leaked or hacked it could put responders or others at risk from those who were affected by the incident. If those who were affected felt that responders did not act in good faith and that negligence contributed in part or in whole to the result, the information could be used in litigation against individuals or agencies. At the very least, the information could result in a low public approval rating of the services being provided. Second, some responders fear that the information that they provide will be used to justify reductions in financial support or cause penalties to be levied.

Any breach or misuse of information collected on struck-by and near-miss events will threaten the sustainability of the system. Any implemented system must have a robust security protocol that is adequately known and understood by practitioners and groups that help collect information.

9 Gap Analysis

The research completed as part of this effort has shown that gaps exist in the governance structure, from an institutional standpoint and in the technological solutions that are available. To close the gaps identified, a new top-down approach is needed that identifies solutions to the underlying issues identified in the table below.

Identified Gap	Gap Analysis	Type of Gap
Lack of Federal and State agreed upon guidelines for reporting	The MMUCC offers the opportunity for consistency and partnership between the Federal government and State government. Currently, however, there is no agreement on how struck-by and near-miss events should be dealt with. The MMUCC development committee should include participation from emergency responders in the development of further guidance on this topic.	Governance
Lack of data consolidation at the State level	At the State level, data is collected and forwarded by each discipline separately. This causes redundancy and difficulty in developing and analyzing trends. State transportation agencies should be responsible for consolidating information from all disciplines and forwarding it to the lead Federal agency.	Governance

Identified Gap	Gap Analysis	Type of Gap
Lack of ownership among Federal agencies	Several Federal agencies such as FHWA, the US Fire Administration, and NHTSA are concerned with injuries and fatalities to emergency responders and roadside workers, however none has stepped forward as the lead agency and examined the topic in-depth. A lead agency should be identified to set policy for this topic, provide guidance, and ultimately construct and host the database.	Governance
Lack of consistent guidance on data types and analysis methods	Between the MMUCC, ANSI, FARS and NASS GES criteria, there is no standard for struck-by and near-miss data. A consolidation and rectification of provided guidance needs to be developed.	Institutional
Inconsistent terminology	The definitions provided as part of this research project for struck-by and near-miss were developed by a cross section of individuals that represent personnel working in the roadway. Adoption of these definitions and clarification of associated terms needs to be understood by all.	Institutional
Practitioner acceptance	In many cases, data collection and report submittal place extra burden on agencies. Whether the agency is a volunteer or paid agency, most face a continuing employee deficit that has a negative impact on the availability and ability of the agency to complete reports. The practitioner community will be resistant to struck-by/near-miss reporting if it further burdens them. A process should be developed that either reduces time required or is time neutral.	Institutional
Inconsistent reporting processes	The research showed that reporting on the same event might be required in eight different places and each might have different reporting requirements. The required processes for reporting should be time neutral or have minimal impacts on those responsible for reporting.	Institutional

Identified Gap	Gap Analysis	Type of Gap
Perception	The term “cultural shift” is often used to describe the need for a large population or group to evolve. The success of a struck-by/near-miss database will be linked to the importance level placed on it by users. Section 8.2.4 highlighted six key perceptions that must be addressed. The implementation of a database should focus outreach efforts on addressing these perceptions and making sure to explain the benefit of usage.	Institutional
Inputs captured by industry groups and government agencies	Among government agencies and industry groups there are currently 43 different types of information being requested about struck-by and near-miss events. The data inputs required should be time neutral or require minimal additional time.	Technology
Information security	The protection of personal identification information (PII) is a complex issue and one that if not properly explained, could cause the database to be unusable. The protection of PII should be a priority of the database, and a clear explanation of what PII is collected and how it is used should be included with outreach material. Where necessary, the collection of PII should be minimized as much as possible.	Technology
Lack of data fusion among government agencies	Currently every type of data collected ends with storage in a proprietary database. The database should include a way to fuse the relevant data into one consolidated source that the Federal lead agency will support and maintain. The visualization component of the database should be a key consideration for the implemented system.	Technology

10 Emergency Responder/Roadside Worker Struck-by/Near-miss Data Collection Framework

The ultimate goal is to have a database that has all struck-by and near-miss information contained in it so analysis can be completed to identify trends and intensity. The identified trends will allow targeted education and outreach for the purpose of reducing the risk associated with working on the roadway. This research has shown that there is a lot of work to be completed before the database is ready for use. The governance and institutional issues create barriers to success that exceed any technological barriers.

10.1 Governance Framework

There are five primary Federal agencies that need to be involved with reducing roadside worker and emergency responder struck-by and near-miss incidents to zero. The **National Highway Traffic Safety Administration** is currently the clearing house of information about traffic crashes in the United States and, therefore, it is practical that it should be the lead agency for compiling this data. The **Federal Highway Administration** has a mission of improving work zone safety, and emergency responder safety is identified as one of the key elements of the National Unified Goal for Traffic Incident Management. The **United States Fire Administration** mission is to provide national leadership to foster a solid foundation for our fire and emergency services stakeholders in prevention, preparedness, and response. Through FEMA and the USFA, grants (directly and in conjunction with state emergency management agencies) are available to improve the sustainability of the Fire services, of which safety on the highway is one. The **Occupational Safety & Health Administration** works with state level agencies to improve employee safety in the workplace. These agencies should work together to tackle the issue of struck-by and near-miss events. The **Federal Bureau of Investigation** already collects struck-by-vehicle incidents in which law enforcement officers are killed and may provide more detail with its new data elements. Figure 15 below shows the primary activities of each agency in the governance structure.

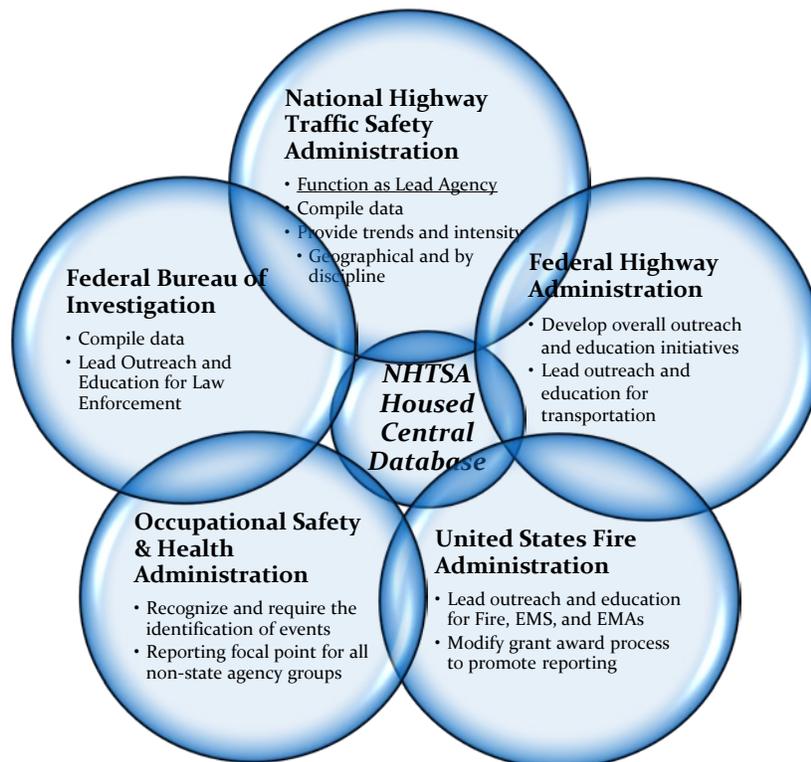


Figure 15: Struck-by/Near-Miss Federal Governance Framework

Getting the data compiled will be an important task, and to accomplish that NHTSA will need to work with state transportation and labor agencies to compile the correct data as shown in Figure 16.

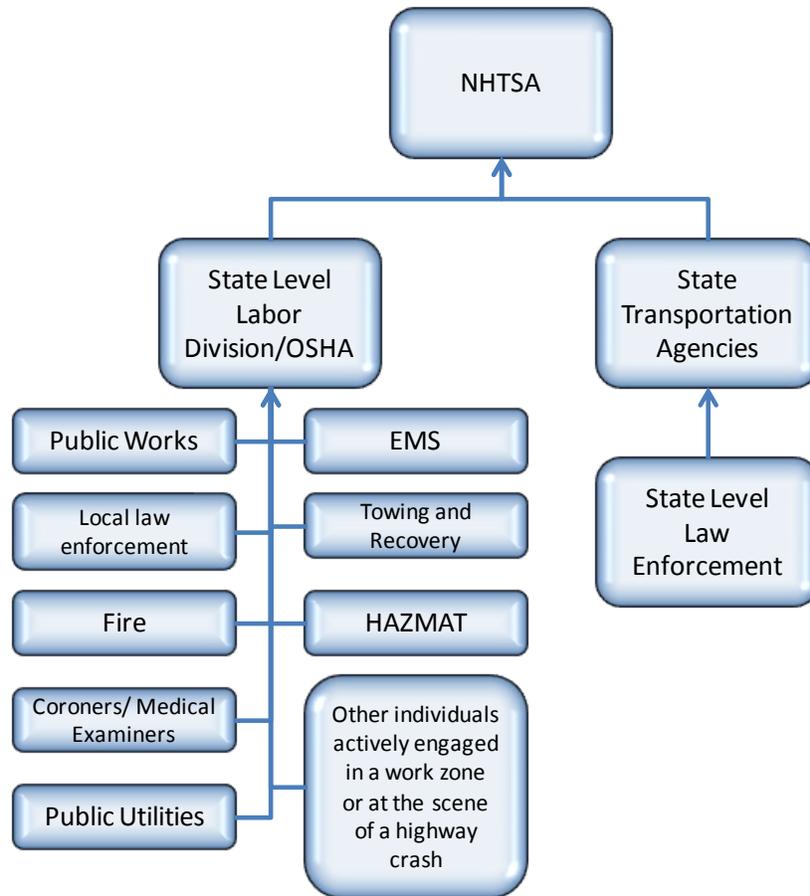


Figure 16: Struck-by/Near-Miss State Governance Framework

From a governance standpoint this will involve the correct reporting agencies and allow for modification of existing processes and policies in lieu of newly established ones.

The reason for the separation of state transportation agencies and labor divisions is because transportation agencies already have robust crash reporting systems that send data to NHTSA and, in some cases, state level law enforcement agencies send this information to transportation agencies as well.

10.2 Institutional Framework

With the adoption of standard definitions for struck-by and near-miss events, the industry will be ready to move toward guidance, policies, and processes that make collection and consolidation possible.

10.2.1 Modify the MMUCC and ANSI D16.1-2007

The first step toward institutional change will be for the adoption and incorporation of struck-by and near-miss events in the MMUCC and ANSI D16.1-2007. Modifying these important documents will provide guidance to state transportation agencies and labor divisions as these types of events are collected and reported. The table below shows the core inputs that should be included in the MMUCC and ANSI D16.1-2007. These core input values were identified by the cross-discipline project panel, which guided this project, from the 43 that were identified from across the industry and governmental online systems that are currently available.

Input Type	Input Required
Location	State County/Town Type of Roadway
Date Data	Date Time
Event Data	Type (Struck-by, near-miss) Visibility Weather Contributing Factors Short Description
Data from Person Affected	Age Years of Experience Discipline Role On Scene Shift Start Time

As the table above shows, there are four attribute categories that should be collected and a total of 15 input values. The existence of a national data set that includes this information will allow for the determination of statistical trends, the identification of intensity (where the largest concentration of events is occurring), the extent to which disciplines are being affected, and many other types of valuable information that can be leveraged.

This dataset also begins to address some of the perception issues that will hinder successful reporting. For example, the person's name and agency are not being requested, which will help address the perception of negative public opinion by maintaining confidentiality of those affected. Additionally, for location information, only the County in which the event occurred will be known (or "town" for states that use that type of system) and the type of roadway. This will provide enough information for researchers, trainers, and those in charge of outreach to be able to identify troublesome areas without risking exposure to the individual agency or person affected.

10.2.2 Change Perception

Major work to be done as part of the institutional framework includes implementing a cultural change among agencies that provide oversight to emergency responders and roadside workers

and the individuals that work in those roles. The gap analysis in Section 9 included perception as an institutional issue, and there are six key perceptions that have been identified through this research effort. The graphic on the next page shows actions that each of the five members of the Federal governance team should take to begin the process of moving toward a national struck-by and near-miss dataset.

National Highway Transportation Safety Administration

- Adopt the definitions of struck-by and near-miss events developed as part of this research effort
- Participate in the development of a national outreach campaign for roadside worker and emergency responder safety that is focused on the emergency responder and roadside worker community. The campaign should include raising awareness about the positive reasons to report struck-by and near-miss events.
- Modify existing systems and processes to recognize struck-by and near-miss events and the 15 core inputs needed
- Lead the development of electronic data exchange protocols with state transportation agencies and the Occupational Safety & Health Administration to collect and consolidate struck-by and near-miss information

Federal Highway Administration

- Adopt the definitions of struck-by and near-miss events developed as part of this research effort
- Publish an Annual Emergency Responder/Roadside Worker Struck-by/Near-miss Report
 - The first report should be targeted for the end of fiscal year 2013 and be coordinated with the industry groups cited in this report
- Develop a web portal to consolidate struck-by/near-miss information with outreach materials and training opportunities
- Promote and sustain a continuous dialog with advocacy groups that are concerned with struck-by/near-miss events
- Facilitate a cultural change that progresses the nation's roadside worker and emergency responder attitude from fear of personal liability to community-based safety improvement
- Lead the development of a national outreach campaign for roadside worker and emergency responder safety that is focused on the emergency responder and roadside worker community. The campaign should include raising awareness about the positive reasons to report struck-by and near-miss events.
- Work with the International Association of the Chiefs of Police and other law enforcement organizations to gain acceptance and recognition of the need to report struck-by and near-miss incidents among the nation's law enforcement community.
- Work with the International Association of Fire Chiefs and other fire service organizations to gain acceptance and recognition of the need to report struck-by and near-miss incidents among the nation's fire community.

Occupational Safety and Health Administration

- Adopt the definitions of struck-by and near-miss events developed as part of this research effort
- Work within agency reporting criteria, policies and processes to recognize and implement struck-by and near-miss events
- Participate in the development of a national outreach campaign for roadside worker and emergency responder safety that is focused on the emergency responder and roadside worker community. The campaign should include raising awareness about the positive reasons to report struck-by and near-miss events.
- Facilitate a cultural change that progresses the nation's roadside worker and emergency responder attitude from fear of personal liability to community-based safety improvement

United States Fire Administration

- Adopt the definitions of struck-by and near-miss events developed as part of this research effort
- Lead an “Emergency Responder Administrative Workload Audit” to quantify how much time is spent on administrative tasks due to legacy policies and processes. The Audit should help identify efficiencies that could be introduced that will allow for more focus on reporting struck-by and near-miss events and other traffic incident management activities.
- Participate in the development of a national outreach campaign for roadside worker and emergency responder safety that is focused on the emergency responder and roadside worker community. The campaign should include raising awareness about the positive reasons to report struck-by and near-miss events.
- Facilitate a cultural change that progresses the nation's roadside worker and emergency responder attitude from fear of personal liability to community-based safety improvement
- Provide NFA students to participate in focus groups and serve as subject matter experts during system development.

Federal Bureau of Investigation

- Adopt the definitions of struck-by and near-miss events developed as part of this research effort
- Compile law enforcement struck-by and near-miss events and transmit them to NHTSA
- Participate in the development of a national outreach campaign for roadside worker and emergency responder safety that is focused on the emergency responder and roadside worker community. The campaign should include raising awareness about the positive reasons to report struck-by and near-miss events.
- Facilitate a cultural change that progresses the nation's roadside worker and emergency responder attitude from fear of personal liability to community-based safety improvement

10.2.3 Work through Industry Groups to Gain Trust

The work that the industry groups identified in Section 7.4 have done should not go unnoticed because, out of necessity and concern for the groups they represent, they have begun the institutional and cultural change needed to bring focus to this issue. Although a central governance structure is needed to maintain consistency, industry groups should continue to be engaged and used as part of the delivery approach. This will improve the chances of acceptance among groups. The trust that is needed to achieve acceptance must come from the ground-up and must be exuded by the leadership to the frontline.

10.2.4 Modify the Funding Allocation Process

Tying the ability to receive funding to this topic is difficult because of the possibilities of what could happen in an individual jurisdiction on any given reporting period:

1. There could be no struck-by or near-miss events
2. There could be struck-by or near-miss events that are unreported
3. There could be struck-by or near-miss events that are reported

Based on these three scenarios, a “funding penalty” program could be problematic because two of the three scenarios above would not be addressed and enforcement of scenario 2 would be practically unenforceable. There are also drawbacks to a “funding reward” program because given the fact that scenario 1 is the target, areas that experience it would essentially be penalized.

In both the funding penalty and funding reward programs there will be drawbacks, however as part of the cultural change discussed earlier, it is recommended that a funding reward system be used for jurisdictions that report. In this case reporting zero would be acceptable. The reward for reporting should be a percentage increase in funding eligibility for equipment and training. Using this approach, the only group that would be penalized would be for those that fall into scenario 2 from above. It is also recommended that eligibility be tied to a three-year rolling period such that if an agency reports for three consecutive years, they become eligible for the percentage increase.

If an agency is not receiving funding allocations, they should become eligible for a safety grant after the three-year period in an amount determined by State and Federal agencies.

This is not a perfect solution because there are drawbacks with each approach; however, as part of the national outreach strategy, jurisdictions that report and receive equipment and training because they report should be highlighted. This will provide an important needed ingredient to changing the perceptions that inhibit reporting now.

10.2.5 Partner with the Insurance Industry

The insurance industry plays a significant role in this topic and should be embraced as a partner. The effort to gain acceptance from the industry should be led by FHWA and supported by NHTSA through additional Transportation Research Board projects. Ultimately a system that includes reporting incentives for insurance companies will likely yield the best opportunity for success. It should be noted that this partnership will need to be crafted carefully because insurance

companies do increase revenue and profit by the occurrence of crashes and injuries. Efforts to engage them in the past have failed when the correct tactics were not used.

10.3 Technological Framework

The information that is collected needs to be focused on outputs that address two primary priorities:

- Determining what the statistical patterns are over time for struck-by and near-miss events
- Determining what the intensity (both frequency and severity) is by geographic location and by discipline

Figure 17 below shows the recommended framework for technology to support the national struck-by and near-miss database.

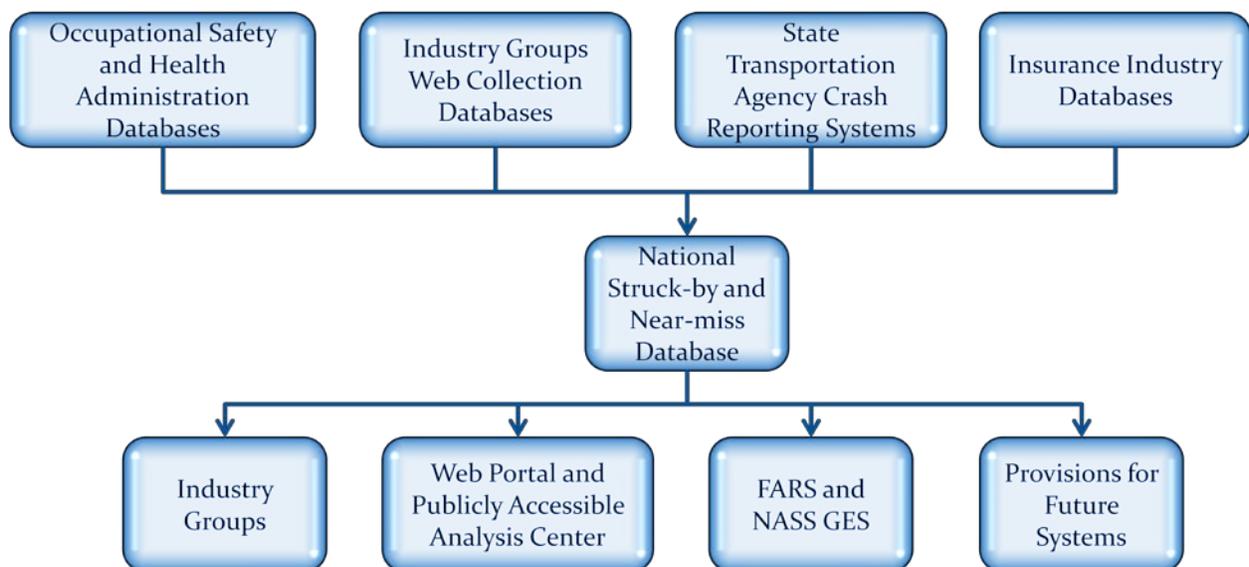


Figure 17: National Struck-by and Near-Miss Database Framework

The Transportation Research Board should commission a research project in conjunction with FHWA, NHTSA and USFA to pilot the national struck-by and near-miss database as shown above that will include the data exchange protocols necessary to exchange information.

Providing a web portal and publicly accessible analysis center will allow a broad variety of practitioners, researchers, trainers, and others to gain information quickly that will help target outreach and training activities. Providing the output to industry groups will be important and will allow for the information to be customized and delivered to individual disciplines in the way that is most meaningful. As noted before, this flexible delivery method will help improve acceptance and integration to yield the most inclusive results.