FOUNDATION FOR TRAFFIC SAFETY

Piloting a Reporting System for Roadside Safety Incidents

The safety of roadside responders is often placed in jeopardy by the potential dangers posed by passing vehicles. To develop and implement effective protection measures for roadside responders, comprehensive safety data is essential. Previous studies have examined existing data sources to document the characteristics of incidents in which roadside responders were killed while working at the roadside (Tefft et al., 2024). However, examining only fatalities provides a very limited perspective. Although the death of a roadside responder is never acceptable, they are (statistically) rare, which makes it difficult to discern trends or evaluate progress. In addition, responder fatalities often entail idiosyncratic constellations of circumstances, which often makes it difficult to draw broadly-applicable lessons from them. Thus, it is important to capture information regarding other less-severe incidents, including near misses, which occur far too often. The lack of reliable information on the frequency and characteristics of such incidents hinders efforts to understand the working environment of roadside responders and protect them while they assist other road users.

Reporting systems are invaluable tools for collecting this crucial data and such systems have been implemented in other domains. A recent AAA Foundation for Traffic Safety (AAAFTS) report sought to glean information about the elements required for a successful reporting system specifically designed for roadside responders (Liu et al., 2024). The aim of the current project was to develop and implement a system to capture key information about near misses experienced by service technicians working on the roadside and to conduct a pilot test in the field in cooperation with a towing organization.

METHOD

Survey

The survey included different categories of information, including the following:

- Daily Log—A short daily reporting requirement to was used to gauge uptake and responsiveness among the technicians. Responses ensured staff that the technicians were accessing the survey, even if they did not experience an incident on that day.
- Incident Details—Information related to the time, location, conditions, and surrounding environment was gathered to give an idea of the context for the incident.
- Activities and Protective Countermeasures—Information about what the technician was doing at the time and where they were standing or working, along with details about what protective countermeasures were in use at the time of the incident.
- Open Text—Technicians could offer any additional details about the incident.

A listing of specific elements and response options is shown in Table 1. No personally identifiable information (PII) was gathered in the survey.

Table 1. Summary of data elements gathered through the reporting survey

Item	Description
Daily log	Gathered # of service calls responded to during their shift. Used to monitor participation in reporting process
Incident details	These data were gathered if technician indicated that they experienced a near miss sometime during their shift*
Date/time	
State	
Type of road	e.g., interstate, major/minor road, parking lot, etc.
Type of environment	e.g., city, suburban, rural, etc.
Service type	e.g., battery, winch out, tow, fuel, etc.
Vehicle type	e.g., flatbed, battery vehicle, etc.
Who was nearly struck	e.g., technician, customer, vehicle, etc.
Location of vehicle	e.g., shoulder, median, travel lane, etc.
Lighting conditions	Asked if time was not provided
Weather/road conditions	e.g., rain, snow, glare, etc.
Other responders on scene	e.g., EMS, law enforcement, etc.
Location of customer vehicle in relation to service vehicle	In front / behind
Safety measures used	e.g., emergency lighting, cones/flares, VMS, high vis apparel, etc.
Technician activity when incident occurred	e.g., working inside vehicle, setting up traffic control devices, working on customer's vehicle, loading vehicle, etc.
Technician location	Depending on activity noted; e.g., traffic side, non-traffic side
Open ended response	Technician could describe incident in their own words

*Technicians could also report similar information for struck-by incidents; however, these were rare and universally related to driving incidents. Thus, the remaining focus is on near-miss incidents.

The survey was administered using Qualtrics. Service technicians accessed the survey via QR-codes inside the service vehicles (window clings) or on notices posted at different locations in the depot (e.g., breakroom, near the time clock, etc.).

Pilot Test

The main purpose of the pilot was to field the reporting system in a limited footprint and monitor its performance while identifying potential hurdles and areas for improvement.

The pilot began with two initial locations. The first location had roughly 90 service vehicles and the second location had approximately 100 service vehicles. Both locations consisted of a mix of battery vehicles, flatbeds, and wreckers. (Note that the first location withdrew from the pilot after approximately 2 months so that efforts could be focused on the second location.)

Materials were provided with the towing organization, including window clings, posters, and information sheets for safety managers. These materials were posted in various locations around the depot and inside service vehicles. Local safety managers socialized the program with the service technicians and provided continuous encouragement for their participation throughout the pilot.

The pilot ran for approximately 6 months. Participants met regularly to discuss progress and note areas for improvement.

DATA INSIGHTS

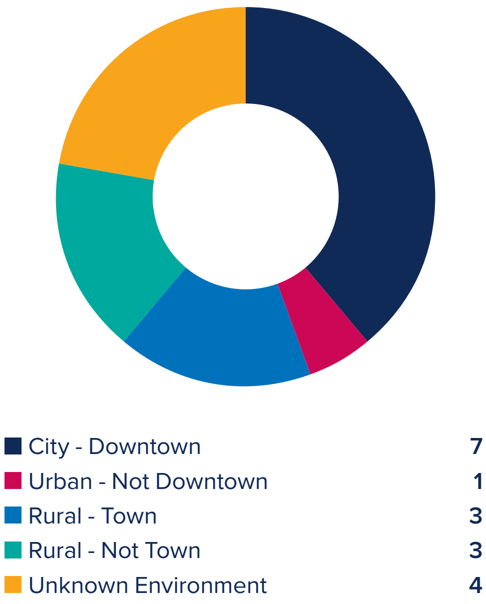
While the pilot project was aimed more at the development and refinement of the process of gathering information about roadside incidents, a selected number of insights from data gathered are shared below. It is important to note that these data should be interpreted with caution given the small number and limited sample. The main purpose of including them is to illustrate potential insights that can be gleaned from this system as it is scaled up.

Through the pilot, over 4,000 daily logs were completed, representing over 22,000 service calls. In all, 44 near misses were reported. Upon closer examination, 18 of these events reportedly involved an incident that occurred while the roadside service technician was driving (i.e., these were not roadside incidents), 18 incidents occurred while the technician was working on the roadside, and 8 were indeterminate.

As shown in Figure 1, approximately 33% of the near-miss incidents occurred on minor roads, involving low speed and low traffic. Approximately 44% occurred on interstates or on other major roads (high speed, high traffic). For comparison, nearly 90% of fatal crashes involving roadside technicians occurred at locations with speed limits of 55 miles per hour or higher and nearly all of these were on Interstates or other limited-access highways (Tefft et al., 2024). Figure 2 shows the breakdown of urban versus rural locations.

Figure 1. Near-miss incident by road type

Figure 2. Near-miss incident by environment



Approximately 44% of the reported incidents occurred in dark and 33% occurred in daylight conditions (see Figure 3). In contrast, in AAAFTS's previous work on responder fatalities, 63% occurred dark conditions (Tefft et al., 2024). Ten of the incidents (56%) occurred without any reported adverse weather or road conditions (Figure 4); similarly, Tefft et al. (2024) reported that 84% of fatal crashes occurred with no indication of precipitation nor slippery road conditions.

The most reported safety measures employed at the time of the incident were traffic cones, emergency vehicle lighting, and high-visibility apparel (see Figure 5). These data also illustrate that some common measures were not deployed at the time of the incident and could therefore help to inform future training efforts or best practices. Figure 6 illustrates the technician activities when the incident occurred; the predominant activity in the pilot data was loading or securing the customer vehicle.

Figure 3. Near-miss incident by lighting conditions

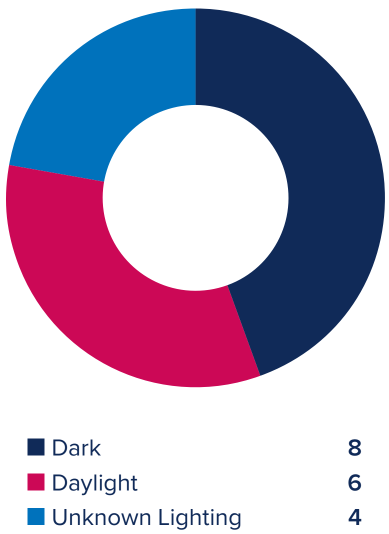


Figure 4. Near-miss incident by weather conditions.

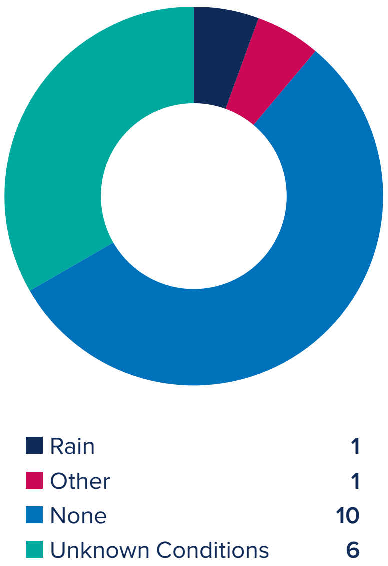


Figure 5. Safety countermeasures deployed at time of near-miss incident

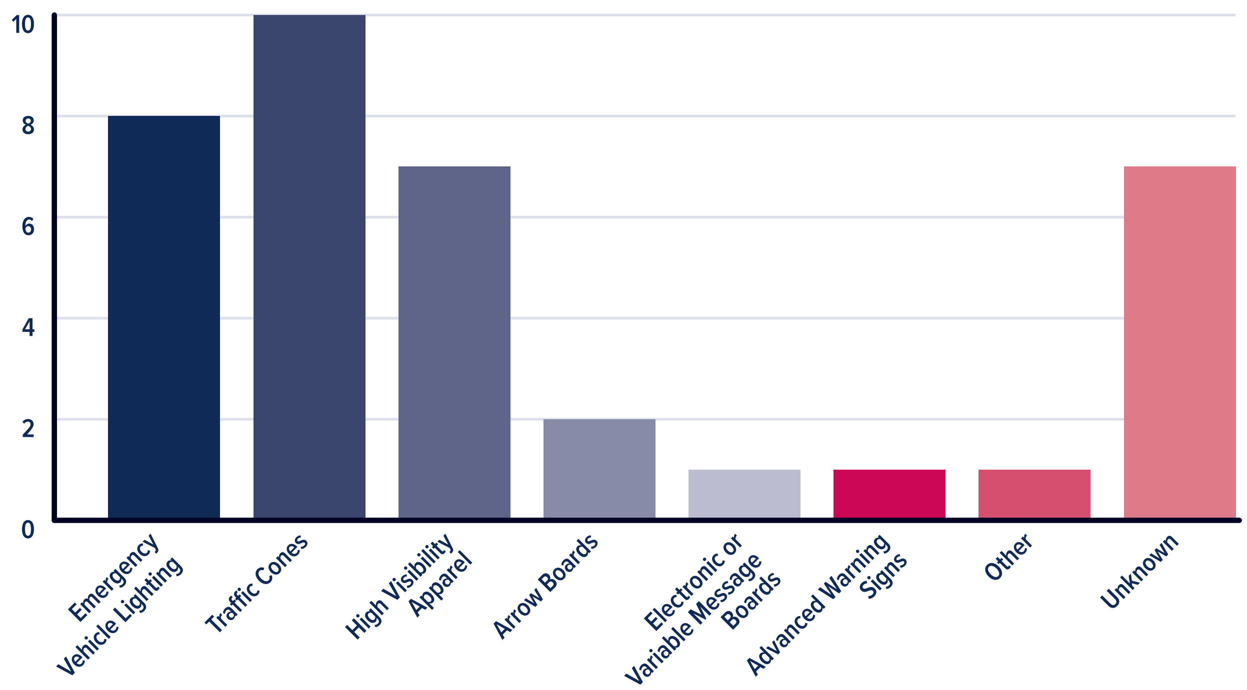
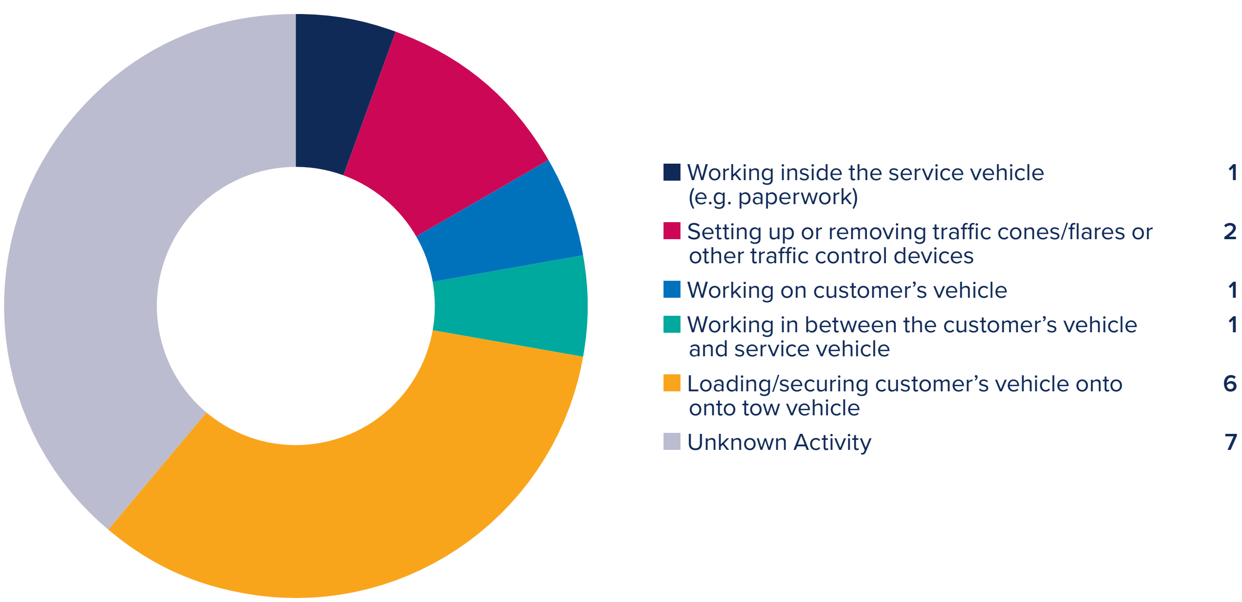


Figure 6. Activity performed at the time of the near-miss incident



CHALLENGES & OPPORTUNITIES

Reporting Rate:

It was evident early on that the rate of reporting by technicians was low, relative to the fleet size and known call volume. Steps were taken to increase promotion of the system and encourage technicians to report. For example, the survey link was also embedded into one of their post-shift reports to make it more accessible. These efforts helped to increase daily reporting by a factor of 4, although reporting remained well below the ceiling. It is important to note that a high response rate is not necessary for such a reporting system; useful insights can be gleaned with sufficient responses gathered from a diverse set of regions.

Definition of Near Miss:

What constitutes a near miss was a question that was explored in past AAAFTS work and a recommended approach was to allow the technician to decide for themselves (Liu et al., 2024). As noted above, during the pilot, technicians often reported near misses that occurred while they were driving, though the intended focus was on situations where they were working on the roadside. While technicians using the system to report driving incidents is not itself a problem, it is important to ensure that all technicians understand that the system intended to be used to report roadside incidents (i.e., that it is not only for driving incidents). To increase clarity, additional instructions will be added to the survey as well as the supporting materials.

Ease of Reporting:

The survey was designed to be brief (e.g., 90th percentile response for daily log was 35 seconds [mean = 30 seconds] and for reporting near miss was 6.3 min [mean = 4.5 min]). Even so, having technicians fill out additional information during or at the end of a shift adds to their workload. One avenue is to explore the possibility of leveraging similar data that is already gathered in other operational systems. This could further reduce the amount of unique information required of technicians (see also Data Integration below).

Safety Conversations:

One unanticipated benefit of the pilot program was the safety leaders were able to leverage the promotion and use of the system to increase the frequency and quality of conversations with their technicians about safety and to help demonstrate their commitment. It is anticipated that a program of this form could become part of a toolkit aimed at increasing safety culture within an organization or fleet.

Quicker Insights:

The towing organization expressed a desire to receive more immediate feedback when near misses occurred so that they could take action to improve safety. The format of the survey and the weekly reporting presents challenges for this. Discussions are underway to modify the approach in order to find ways to prompt safety managers in a timely manner while also gathering the requisite data. Receiving frequent updates also helped reinforce the usefulness of the platform with technicians (i.e., showing that their engagement and efforts were being considered by their safety leaders.)

Incident Location:

The Qualtrics survey was designed to capture the GPS location from which the report was filed, however, this had limited utility. Examination of the data revealed that the location data was likely sufficient to determine location at the level of city and state, but was not precise enough to determine precise incident location. Moreover, surveys were not necessarily completed at the incident scene, many were likely completed later at a different location.

Data Integration:

The survey was intentionally developed to be self-contained, gathering all of the requisite information itself. However, towing providers often leverage other dispatch and data systems that are gathering some of the same information. As such, an important opportunity is in connecting some of these information sources so that the researchers can obtain the necessary information while reducing the number of things that need to be addressed by the technicians. Improved integration with other systems will also reduce the need to have the technicians complete daily logs. That is, they would only need to report incidents because the reporting system becomes part of their digital routine.

A second phase of this project is underway in order to build upon some of the lessons learned in the current pilot and to expand its breadth. The new phase will improve upon and update the survey items and format and consider alternative approaches to gathering the desired data (e.g., augmenting or connecting with other relevant data streams). As the platform is expanded and more data is gathered, the ultimate goal is to gain and leverage new insight about safety on the roadside and to identify new opportunities to reduce risks.

REFERENCES

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Tefft, B.C., Wei, A., & Steinbach, R. (2024). *Roadside Assistance Providers Fatally Struck by Vehicles at the Roadside: Incidence and Characteristics* (Technical Report). Washington, D.C.: AAA Foundation for Traffic Safety.

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