

Law Enforcement Officer Vehicle Struck-by Investigation



Division of Safety Research

1095 Willowdale Road

Morgantown, WV 26505

304.285.5916

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Sergeant Struck by a Motor Vehicle on Interstate Highway— New Mexico

EXECUTIVE SUMMARY

On December 5, 2013, a 47-year-old sheriff's office sergeant was fatally injured when he was struck by a motorist while investigating several motor vehicle crashes on an interstate highway. The sergeant had been dispatched in response to reports of multiple, minor motor vehicle crashes under blizzard conditions. Disabled vehicles were situated on the shoulders of the northbound and southbound interstate lanes, as well as in the median. Officers from state and county law enforcement agencies had responded to the scene. During the response, the sergeant crossed the highway to speak to other officers. He was walking along the northbound shoulder, facing traffic, when a passing motorist lost control of his vehicle and slid onto the shoulder, striking the sergeant. After stabilization by fire and rescue personnel at the scene, the sergeant was transported to a nearby Level 1 trauma center, where he succumbed to his injuries the following day.



**Looking southbound on the interstate;
conditions immediately prior to a vehicle
striking the sergeant.
(dashcam courtesy of the sheriff department)**

CONTRIBUTING FACTORS

Key contributing factors identified in this investigation include:

- **Weather**—*the occurrence of severe weather with little or no warning, causing low visibility and icy road surfaces for motorists*
- **Motorist**—*not moving into the left lane and/or slowing to a speed permitting a complete stop if required*
- **Scene management, traffic control**—*multiple, minor motor vehicle crashes in the same location within a short period of time, limited resources to commit to response*
- **Low-frequency, high-risk event**—*the number and proximity of weather-related crashes in the area was unusual*

KEY RECOMMENDATIONS

NIOSH investigators concluded that, to help prevent similar occurrences:

- Law enforcement agencies should consider employing continuous size-ups by an officer in position to monitor the entire response scene and assess and manage the risks of operating at a highway/roadway incident.
- Law enforcement agencies should consider implementing an incident command system when responding to highway/roadway incidents.
- Law enforcement agencies should ensure that officers are provided with temporary traffic control devices and that additional traffic control resources are available to respond to escalating incidents.
- Law enforcement agencies should ensure that officers wear suitable high-visibility, retro-reflective vests when operating at highway/roadway incidents.
- State, county, and municipal authorities should consider developing pre-incident plans and standard operating procedures for traffic incident management in response to highway/roadway incidents.
- Law enforcement agencies should ensure that all members receive training for conducting emergency operations at highway/roadway incidents.
- State, county and municipal authorities should consider implementing public awareness campaigns to inform motorists of the risks that law enforcement officers face while operating along the roadside and of the need to follow move-over laws.

NIOSH Law Enforcement Officer Investigations

The National Institute for Occupational Safety and Health (NIOSH), an institute within the Centers for Disease Control and Prevention (CDC), is the federal agency responsible for conducting research and making recommendations for the prevention of work-related injury and illness. Through an interagency agreement, the National Institute of Justice funded a NIOSH pilot program to investigate line-of-duty deaths of law enforcement officers resulting from vehicle crashes and being struck by vehicles while responding to roadside emergencies and making traffic stops. These NIOSH investigations are intended to reduce or prevent occupational deaths and are completely separate from the rulemaking, enforcement and inspection activities of any other federal or state agency. NIOSH does not enforce compliance with State or Federal occupational safety and health standards and does not determine fault or assign blame. Participation of law enforcement agencies and individuals in NIOSH investigations is voluntary. Under its program, NIOSH investigators interview persons with knowledge of the incident who agree to be interviewed and review available records to develop a description of the conditions and circumstances leading to the death(s). Interviewees are not asked to sign sworn statements and interviews are not recorded. The agency's reports do not name the deceased officer, the law enforcement agency or those interviewed. The NIOSH report's summary of the conditions and circumstances surrounding the fatality is intended to provide context to the agency's recommendations and is not intended to be definitive for purposes of determining any claim or benefit. The NIOSH report is not intended as a legal statement of facts. This summary, as well as the conclusions and recommendations made by NIOSH, should not be used for the purpose of litigation or the adjudication of any claim.

INTRODUCTION

On December 5, 2013, a sergeant from a county sheriff's office in New Mexico was fatally injured when he was struck by a passing motorist during the response to a vehicle crash scene on an interstate highway. NIOSH learned of this incident in January 2014. After enlisting cooperation from the sheriff's office, an investigation team from the NIOSH Division of Safety Research traveled to New Mexico to review records and conduct interviews from March 3–7, 2014. The NIOSH team reviewed the sergeant's personnel and training files, dispatch recordings and logs, photographs, state police dashcam videos, the state police uniform crash report and crash reconstruction report, witness statements, and sheriff office standard operating procedures. Interviews were conducted with members of law enforcement, fire departments, and emergency medical services that were present at the scene before, during, and/or after the fatal incident. Interviews were also conducted with instructors at the state police academy. The incident site was examined and photographed by the NIOSH investigators.

LAW ENFORCEMENT AGENCY

The sheriff's office serves an area of 3,710 square miles and a population of more than 100,000 [USCB 2015]. As of March 2014, the office consists of an elected sheriff, an undersheriff, two captains, three lieutenants, nine sergeants, and fifty authorized deputies of whom four work full-time on investigations. In addition, seven support staff serve the office. The office is a full-service agency with three staffing shifts for 24/7 coverage.

Each officer is provided an official vehicle that is used exclusively by that officer and driven home, so that officers can respond promptly in an official vehicle to urgent calls during off-hours. At the time of the investigation, the official vehicles are all mid- or full-size sport utility vehicles, typically Ford Explorers or Expeditions. Official vehicles are used solely for travel to and from work and for official duties.

At the time of the investigation, the office had no written standard operating procedure for roadside emergency response and operations.

TRAINING AND EXPERIENCE

The sergeant had been a law enforcement officer for 25 years. He had been with the sheriff's office since 2006; in April 2009 he was promoted to detective. He was promoted to sergeant in November 2013. He had been back in the field for about 2 weeks when the incident occurred.

Basic training for law enforcement officers in New Mexico consists of 22 weeks of academy training, after which recruits pass a certification examination and receive a certification number. New Mexico has nine law enforcement academies; all are overseen by the state academy in Santa Fe. All academies teach a core curriculum, and agency-specific material may be added. Although parts of the curriculum follow national guidelines, each state regulates its own training and certifies its own law enforcement officers. Basic training hours range from 385 to 1,000; the New Mexico law enforcement academy training is 657 hours in length. The curriculum is approved by a board appointed by the governor and consists of representatives of various law enforcement agencies, district attorney offices, and two citizens. The curriculum goes through a public comment and hearing process.

Officers transferring from other jurisdictions take a 40-hour academy program that focuses on state legislation and regulations; they are then permitted to take the certification exam and receive a certification by waiver. The sergeant had 18 years of previous service with another law enforcement agency and was certified in New Mexico via this route, taking a Certification by Waiver of Previous Training Course in 2006. At one time the Certification by Waiver course was 3 weeks long, but has been reduced to 1 week.

The training of recruits in New Mexico includes topics in roadside emergency management as part of crash investigation courses. Recruits are trained to use high-visibility vests when attending roadside emergencies. Recruits also take incident management courses, FEMA ICS100, 200, and 700A, as a requirement for entering the academy. During basic training they participate in practice scenarios including tabletop exercises that involve, for example, HAZMAT incidents, hostage-taking incidents, and motor vehicle crashes with multiple victims. They are required to take command, set up perimeters, secure the scene, and manage critical incidents. There are no academy refresher courses in traffic training or roadside emergency management.

After graduation and certification, new law enforcement officers spend approximately 14 weeks with a field training officer, during which time they are exposed to as many field situations as possible. They continue on probation for 2 full years post-graduation.

Officers in the sheriff's office who are promoted to an assignment significantly different from their recent assignment are usually paired with an experienced officer for 1 to 2 weeks of reorientation; however, this is not a formal requirement. The sergeant, who had spent more than 4 years as an investigator before returning to the field in November 2013, had worked with another officer in the field for the first week after his promotion.

Law enforcement officers in New Mexico must complete 19 hours of continuing education credit every 2 years. The sergeant was up to date in his continuing education credits and had completed numerous advanced courses in Tactical Communications, Defensive Driving, In-car Video Operations, Off-Highway Vehicles, and Police Traffic Radio, among others.

ROAD AND WEATHER CONDITIONS

The roadway was a concrete-surfaced interstate highway with two lanes in each direction, northbound and southbound. A centrally located cable median barrier was situated to prevent vehicles from crossing from one side to the other.

Immediately south of mile marker 254.5, a short bridge spans an arroyo. Guardrails are present along the median side of both directions, extending about 100 yards north of the bridge. The bridge is known to ice over during cold weather conditions.

The highway approaching the crash site in the northbound lanes is a gentle decline approximately 0.5 miles in length, following an incline and crest; the road surface levels out at the bridge and then begins a gentle incline toward the next crest. The speed limit in the area is 70 miles per hour (see Image 1).

A winter storm was moving through the area at the time of the motor vehicle crashes. From archived weather reports, the local temperature was approximately 25 degrees F with winds gusting to 27 miles per hour [Weather Underground 2013]. Snow squalls began approximately 90 minutes prior to the incident, causing icy road surfaces and intermittent low visibility.

INVESTIGATION

On December 5, 2013, at 0851 hours, the dispatch center notified the sergeant (Unit 205) of a motor vehicle crash (MVC) at mile marker 254.5. At that time, the sergeant was assisting at a MVC in the vicinity. At 0903, a call came in for a second MVC at the same location; Unit 227 from the county sheriff's office was diverted from another call and responded to the scene and parked on the shoulder of the right travel lane, southbound upon arrival. The office's animal control officer also responded and parked south of the first MVC which was a disabled pick-up truck on the right-hand shoulder of the southbound lanes (see Diagram).

The sergeant arrived at mile marker 254.5 just before 1000 and parked in the right travel lane, southbound. A motor transit division (MTD) officer arrived at 1005 and parked on the southbound shoulder. After discussing the situation with the sheriff's office personnel, the MTD officer relocated his unit to the northbound lanes. He was followed by the sergeant who parked his unit on the northbound shoulder, with emergency lights on. The MTD officer had parked approximately 100 yards north of the sergeant, on the same shoulder, with emergency lights and dashcam activated.

At 1008, a state police officer arrived on scene in the southbound lanes and parked in the southbound median (see Diagram). The emergency lights and dashcam in his unit were on, and the dashcam captured events to the south of the unit, showing the locations of the sergeant and the striking vehicle between 1008 and 1040.

At the time the sergeant parked on the northbound shoulder, five civilian vehicles were in the immediate vicinity of mile marker 254.5 (see Diagram):

1. Unit 227 was located on the southbound shoulder.
2. South of Unit 227, a disabled pickup truck was situated in the right-hand southbound lane, perpendicular to the direction of traffic, obstructing the lane and shoulder.
3. The animal control officer's unit was in place on the southbound shoulder with emergency lights activated just south of the disabled truck.



**Image 1. Incident site looking south; note gentle down-slope to north end of bridge.
(NIOSH photograph)**

4. The state police officer's unit was located next to the cable barrier on the southbound side.
5. A disabled pickup truck faced north in the northbound median, up against the cable barrier, near the state police unit.
 6. A pickup truck with emergency flashers activated was parked near the disabled pickup truck that was against the cable barrier.
 7. A disabled vehicle faced north in the northbound median a few yards north of the bridge.
 8. A vehicle that had rolled over lay in the rough area off the northbound shoulder, about 200 yards north of the bridge. A roll-back tow-truck was parked abreast of it on the same shoulder. Note, the roll-back truck left the scene at 1020, prior to the incident and is not shown in the diagram.

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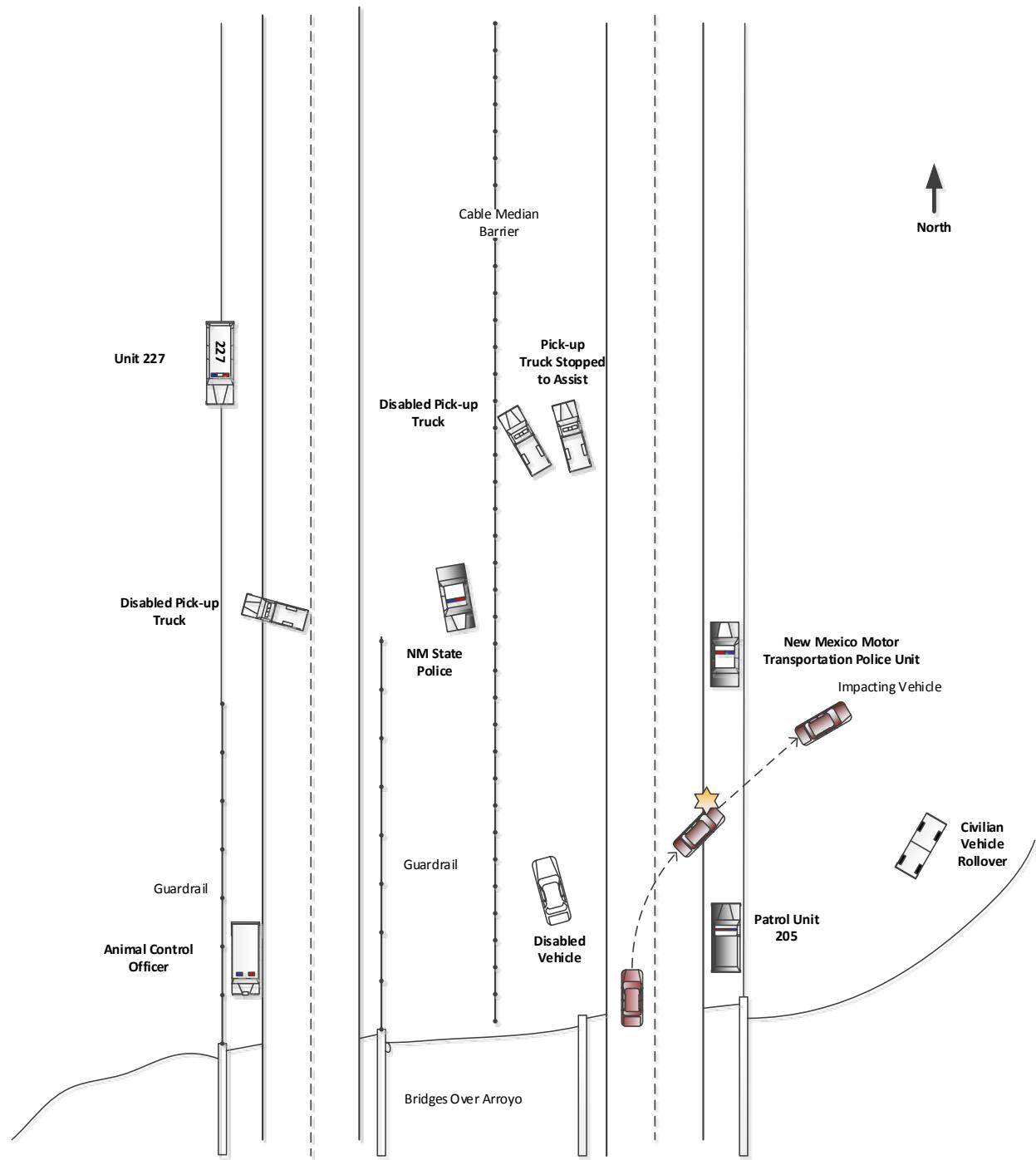


Diagram Locations of vehicles at the time the sergeant was struck

The roads were icy, confirmed by a dashcam video of a momentary slide by the MTD unit on the highway on-ramp at mile marker 252 when he was repositioning his unit from the south to northbound lanes; winds were gusting from the east, and visibility varied from fair to poor, minute by minute, due to blowing snow.

At 1011, the animal control officer and state police officer met and conferred in the median. The sergeant exited his unit and proceeded into the rough to the east of the northbound shoulder, moving toward the rolled-over vehicle and occupants at that location.

At 1012, a sheriffs' deputy who had been attending to a disabled vehicle in the median crossed the northbound lanes, moved between the roll-back tow truck and the MTD unit, and toward the disabled rollover vehicle in the rough area east of the northbound lanes. The animal control officer crossed the southbound lanes and returned to his unit.

At 1013, the sergeant and MTD officer returned to the northbound shoulder. Medic 2242 arrived and pulled onto the shoulder near them; the driver and attendant exited the unit and moved toward the rollover vehicle and occupants.

At 1014, the driver and assistant of the roll-back tow truck moved it further north, crossing from the shoulder to the northbound median near the abandoned truck, and parked in the median.

At 1015, the sergeant crossed the northbound lanes to speak to the driver of the disabled vehicle in the northbound median. The animal control officer crossed the southbound lanes to assist the sergeant with translation.

At 1016, the state police officer crossed the northbound lanes to speak with the sergeant and the animal control officer. The staff of Medic 2242 returned to their unit, having ascertained that no transport was required by occupants of the overturned vehicle.

At 1017, Medic 2242 pulled onto the highway northbound. The sergeant walked north along the median toward the state police unit followed by the state police officer. The animal control officer remained with the disabled vehicle.

At 1020, the rollback truck left the scene and the sergeant moved southward along the median toward his unit. A motorist slowed and stopped, the driver exchanged a few words with the sergeant, and the vehicle then continued northward as directed by the sergeant.

At 1021, the sergeant crossed the northbound lanes to confer with the MTD officer in his unit on the shoulder. He then started southward along the shoulder, facing traffic, toward his own unit (see Image 2).

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At 1022, a car veered from the northbound lanes onto the shoulder, spinning 180 degrees, and striking the sergeant with its left front fender as he walked along the shoulder. The animal control officer witnessed the incident from his unit on the southbound shoulder of the highway; he saw the sergeant struck by the car, tossed several feet in the air, and land on the shoulder. The animal control officer immediately called the county dispatcher and said, "Code 82, officer down." He requested EMS then exited his unit and crossed to the southbound lanes to help the sergeant (see Diagram).



Image 2. The dashcam video of the vehicle approaching the scene prior to striking the sergeant. (dashcam courtesy of sheriff's department)

Upon looking in his rearview mirror and seeing the sergeant struck by the sliding vehicle, the MTD officer moved his unit a few feet forward, parked, called dispatch, and exited his unit. A few seconds later a pickup truck pulled onto the northbound shoulder and parked; the driver and passenger exited and ran south toward the site of the incident. At the same time, the animal control officer crossed the southbound and northbound lanes and moved toward the sergeant. Another unit arrived, parked on the northbound median, and the officer exited his unit and crossed the northbound lanes toward the sergeant.

Unaware of the incident, the state police officer had returned to his unit and was writing his report for one of the vehicles in the median. He attempted to contact dispatch for case information but was interrupted; the dispatcher then called him to advise there was an officer down at his location. He exited his vehicle and went to check on the sergeant. He then took the lead in the investigation of the incident.

At 1023, a car pulled over to the northbound shoulder, reversed toward the parked pickup truck, and the driver exited the car and ran along the shoulder toward the sergeant. Within the next 5 minutes, another car stopped on the northbound shoulder and its driver went to assist at the scene. Another sheriff's office unit arrived in the right-hand northbound lane and parked there, blocking the lane just north of the sergeant's unit, with emergency lights on.

At 1030, Medic 2242 passed the scene southbound, turned around at mile marker 252, and returned in the northbound lanes, arriving at mile marker 254.5 at 1035.

At 1033, a unit established a position just south of the bridge with emergency lights on.

At 1035, the county fire chief arrived on-scene and assumed scene command and maintained scene command for approximately 90 minutes.

At 1036, Engine 43 arrived on-scene and established further traffic and lane control. Traffic at this time moved slowly in the left-hand northbound lane.

At 1037, Medic 43 arrived on-scene with two paramedics who took over patient care in the back of Medic 2242.

At 1039, the county EMS chief arrived on-scene. He checked on patient care and then took charge of getting the Medic 43 unit back to its home station.

At 1044, Medic 2242 left the scene with its staff driving/assisting the patient and the two paramedics from Medic 43 attending the patient, responding Code 3 with emergency lights and siren to the nearest trauma center.

CONTRIBUTING FACTORS

Occupational injuries and fatalities are often the result of one or more contributing factors or events that result in the injury or fatality. NIOSH investigators identified the following contributing factors in this incident:

- **Weather**—*the occurrence of severe weather with little or no warning, causing low visibility and icy road surfaces for motorists*
- **Motorist**—*not moving into the left lane and/or slowing to a speed permitting a complete stop if required*
- **Scene management, traffic control**—*multiple, minor motor vehicle crashes in the same location within a short period of time, limited resources to commit to response*
- **Low-frequency, high-risk event**—*the number and proximity of weather-related crashes in the area was unusual*

CAUSE OF DEATH

The New Mexico Office of Medical Examiner ruled the cause of death as blunt head trauma.

RECOMMENDATIONS/DISCUSSION

The following recommendations focus on methods that could be used to eliminate or mitigate the factors identified as contributing to this incident. They are not aimed at any specific agency, but are intended for consideration by law enforcement agencies, state and local governments and departments of transportation nationwide, as well as safety researchers, and the general public.

Recommendation #1: Law enforcement agencies should consider employing continuous size-ups by an officer in position to monitor the entire response scene and assess and manage the risks of operating at a highway/roadway incident.

Discussion: During this incident, law enforcement officers were responding to multiple single-vehicle crashes. None of these crashes had resulted in significant injury and only one had partially obstructed traffic. As evidenced by the voice recordings from dashcam videos and from witness interviews, the responding officers conferred with each other on an individual basis as they arrived on the scene, with each taking the initiative to work one of the crashes. It appeared that all of the officers on scene were involved with individual tactical level tasks focused on a small part of the overall scene, while attending to disabled vehicles, stranded motorists, and

completing crash reports. While not present upon the initial response, as incident circumstances developed, 5 separate vehicle crashes occurred on both sides of the median. This influenced the placement of the responding public safety and emergency vehicles on both sides and in the median of the interstate highway. A broader assessment by a single responder having sole responsibility for monitoring and evaluating scene conditions at a strategic level may have concluded that additional traffic control measures could be employed to minimize the risks from inattentive motorists traveling through the response scene.

Recommendation #2: Law enforcement agencies consider implementing the Incident Command System when responding to roadside emergencies.

Discussion: One method of providing for strategic level assessments is the Incident Command System (ICS). ICS is a management system designed to integrate resources to effectively attack a common problem. The system is not necessarily exclusive to one set of circumstances. ICS has the flexibility to accommodate varying sets of circumstances. ICS uses a systems approach for command and control of incidents involving response from a single to multiple jurisdictions or agencies. ICS allows agencies to effectively manage emergency incidents and ensure the safety of all responders. ICS designates in advance the specific duties of all participants and determines who will be in charge of the scene with responsibility for monitoring the overall response [USFA 2014].

Prior to entering the State Police Academy, law enforcement officers in New Mexico are required to take ICS 100, Introduction to ICS; ICS 200, Basic ICS; and ICS 700A, Introduction to National Incident Management System. Recruits at the academy practice using ICS in tabletop exercises and scenarios, such as hostage situations and hazardous materials incidents. The 1-week course currently in use focuses mostly on elements of law specific to New Mexico. It should be noted that implementation of an incident command system requires formal commitment from leadership of all agencies likely to be involved in a response prior to the occurrence of emergency incidents.

Recommendation #3: Law enforcement agencies should ensure that officers are provided with temporary traffic control devices and that additional traffic control resources are available to respond to escalating incidents.

Discussion: According to the state police reconstruction report, the motorist in this incident stated that he had attempted to move to the left when he saw the law enforcement vehicles on the right hand shoulder of the south bound lanes. In so doing, he lost control of the vehicle and struck the sergeant.

When reviewing the dashcam videos, NIOSH investigators observed that traffic in the southbound lanes was moving more slowly than the traffic in the northbound lanes. This appeared to be due to the right hand southbound travel lane having been obstructed by a disabled pickup truck, reducing traffic to one lane of travel (see Diagram). In contrast, the northbound lanes were unobstructed and travel was possible in both lanes. Although the NIOSH investigators did not have the capability of direct speed measurement from the video, it was observed that

traffic in the northbound lanes appeared to be moving more quickly than southbound traffic. It was further observed that road surface conditions for north and south bound lanes were similar.

Investigators also noted that just prior to the incident, the striking vehicle had been traveling closely behind two other vehicles which were in the left hand travel lane. The striking vehicle appeared to have been in the right hand travel lane before the motorist lost control. This is corroborated by the motorist's statement to police investigators.

As shown on the diagram, law enforcement vehicles with lights activated were located along the right hand shoulder of the northbound lanes and a disabled vehicle was located off the left hand shoulder. A law enforcement vehicle with lights activated was also located in the east bound side of the median and disabled vehicles were located on the left hand shoulder, northbound. The location of these vehicles, both left and right of the travel lanes may have made it difficult for the motorist to know which lane to use to provide safe clearance for the responders. Additional traffic control devices such as flares, warning lights or cones located along the right hand shoulder further in advance of the law enforcement vehicles may have prompted the motorist to slow down and move left sooner, allowing him to traverse the area without losing control.

Additional emergency vehicles or portable message boards located near the top of the grade may also have served this purpose. Computerized emergency lighting devices are currently available for emergency response and law enforcement vehicles. These lighting devices may be programmed to display lights sequencing left-to-right or right-to-left, warning motorists to move left or right of the emergency vehicles.

Recommendation #4: Law enforcement agencies should ensure that officers wear suitable high-visibility, retro-reflective vests when operating at highway/roadway incidents.

Discussion: During this incident, law enforcement officers responding to the scene were clothed in dark-colored uniforms. Further, as evidenced by the dashcam footage from the MTD unit as it approached the scene northbound, the area near the northbound bridge exit was highly congested (see Image 3). A disabled vehicle was located in the northbound median; a disabled pickup and the pickup of an assisting civilian were also located in the northbound median beyond the first disabled vehicle. To the right was a roll-back tow truck. Note that at the time the striking vehicle was crossing the bridge, the roll-back tow truck had left the scene and the motor transit unit with lights flashing had stopped just short of where the roll-back tow truck had been (see Diagram). Also, as the motorist was crossing the bridge, the sergeant's unit, also with lights flashing, was located on the shoulder near the bridge exit and the sergeant was walking the shoulder toward his vehicle. Finally, the vehicle rollover was located near the edge of the arroyo, off the right shoulder. Three other law enforcement vehicles, all with lights flashing, were located in the southbound median and along the southbound shoulder. The presence of all these vehicles may have distracted the motorist and hampered his ability to see darkly clothed officers on foot in time to safely react to their presence. The use of high-visibility, retro-reflective vests may have permitted the motorist to see the sergeant sooner, allowing more time to react appropriately by

slowing down and safely moving to the left. It should be noted that officers interviewed by NIOSH related that the issued high visibility vests often became tangled while stowed in their units making them unhandy and somewhat difficult to don. They also noted that upon arrival to roadside emergencies they normally assessed the situation at hand and donned the vests if they believed they would be on scene for long periods, but might not use them for short durations. Throughout the length of the 30-plus minutes of video, emergency responders, law enforcement and tow truck personnel were all observed operating in the area on both sides of the road and crossing it to be clothed in dark blue or black garments.

To meet minimum requirements for high-visibility apparel, responders should only use vests that meet a Class II requirement of ANSI/ISEA 107-2010 (or subsequent revisions) or the requirements of ANSI/ISEA 207-2006 for Public Safety Vests. The minimum requirements include:

- fluorescent background material,
- fluorescent material may be yellow-green, orange-red, or red,
- retro-reflective material arranged for 360-degree visibility, and
- the garments should be labeled as compliant with ANSI/ISEA 107-2010 or ANSI/ISEA 207-2006.

Federal Regulation 23 CFR 634 states, “*The purpose of the regulations in this part is to decrease the likelihood of worker fatalities or injuries caused by motor vehicles while working within the right-of-way on Federal-aid highways.*” Law enforcement officers who are operating at a traffic incident and their assignment places them in potential conflict with motor vehicle traffic should wear a garment with fluorescent and retro-reflective material visible from all directions. On November 21, 2008, the FHWA issued an Interim Final Rule modifying the 2006 rule to address concerns of first responders working at incident scenes requiring other special protective equipment. The rulemaking, codified in Title 23 of the Code of Federal Regulations (CFR), Part 634, became effective November 24, 2008, and states:

§ 634.2 Definitions.

"Workers" means people on foot whose duties place them within the right-of-way of a Federal-aid highway, such as highway construction and maintenance forces; survey crews; utility crews; responders to incidents within the highway right-of-way; firefighters and other emergency



Image 3. Dashcam view of scene prior to incident from northbound MTD unit minutes prior to the incident. Note Number of disable and responding vehicles. (dashcam courtesy of sheriff department)

responders when they are not directly exposed to flame, fire, heat, and/or hazardous materials; and law enforcement personnel when directing traffic, investigating crashes, and handling lane closures, obstructed roadways, and disasters within the right-of-way of a Federal-aid highway.

§ 634.3 Rule.

All workers within the right-of-way of a Federal-aid highway who are exposed either to traffic (vehicles using the highway for purposes of travel) or to construction equipment within the work area shall wear high-visibility safety apparel. Fire fighters or other emergency responders working within the right-of-way of a Federal-aid highway and engaged in emergency operations that directly expose them to flame, fire, heat, and/or hazardous materials may wear retro-reflective turn-out gear that is specified and regulated by other organizations, such as the National Fire Protection Association. Fire fighters, law enforcement officers, or other emergency responders working within the right-of-way of a Federal-aid highway and engaged in any other types of operations shall wear high-visibility safety apparel [Worker visibility, 2008].

The International Safety Equipment Association's (ISEA) American National Standard for High-Visibility Apparel and the American National Standards Institute (ANSI) Standard 107-1999 provide guidance standards for the use of high-visibility safety apparel. The *Manual on Uniform Traffic Control Devices (MUTCD)* for high-visibility safety apparel is based on these standards, and much of the equipment in use is designed to the ISEA and ANSI standards. The standard defines high-visibility safety apparel requirements for retro-reflectivity, type of material, colors, and fluorescence. Samples of ANSI/ISEA-compliant Class II (sleeveless vest) and Class III (vest with sleeves) high-visibility apparel in appropriate colors with retro-reflectivity and fluorescence properties are shown in Image 4.

The National Traffic Incident Management Coalition (NTIMC) working with ISEA, the NTIMC sought and successfully obtained a standard for a public safety vest designed to address concerns of public safety responders working at incident scenes. In 2007, ANSI/ISEA released a new standard, ANSI/ISEA 207-2006, American National Standard for High-Visibility Public Safety Vests. ANSI 107-2004 specifically prohibited the classification of sleeveless garments when worn alone. However, this standard did not meet certain special needs of responders, that of apparel that can fit over belt-mounted equipment and apparel that will tear away if caught on a moving vehicle. ANSI/ISEA 207-2006 establishes design, performance specifications, and use criteria for high-visibility vests and meets the special needs not addressed under ANSI 107-2004.

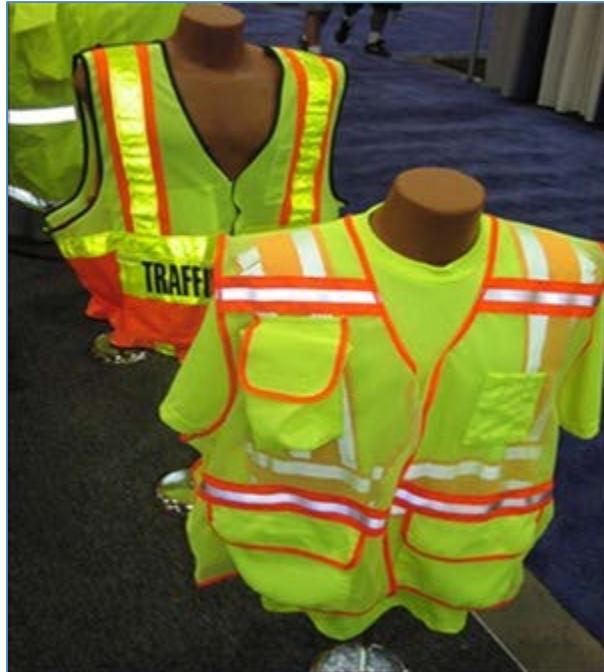


Image 4. ANSI/ISEA Standard 107-Compliant Vests.

It should be noted that ANSI 207-2006 does not replace ANSI 107-2004 and that the new standard is intended to primarily meet the needs of public safety response personnel. Functionally, the public safety vest is a Class II garment [Fire-Police, no date].

Recommendation #5: State, county, and municipal authorities should consider developing pre-incident plans and the use of traffic incident management systems in response to highway/roadway incidents.

Discussion: In this incident, responding law enforcement officers from 3 separate agencies were faced with managing multiple crashes within a short stretch of interstate highway. While none of the crashes resulted in serious injury to motorists, they did result in multiple stranded vehicles and motorists located on and near both north and south travel lanes of the roadway. Each of these crashes demanded attention from responding officers. Law enforcement units were deployed on the right hand shoulders of the south bound lanes, in the north bound median and on the right hand shoulder of the northbound lanes. According to members of the sheriff's office command staff, weather conditions similar to those present at the time of the incident normally occurred about 5 times annually and the sheriff's office usually expected problems throughout the area. However in this incident the number of crashes and their proximity to each other was unusual.

During pre-incident planning, agencies could consider the type of responses that may occur on the types of highways/roadways in their response area and what resources will be needed for safe and efficient response that includes:

- establishing a safe operating area to prevent injuries to emergency workers;
- providing emergency care and transportation of the sick or injured;
- protecting the environment;
- restoring normal traffic flow, as soon as possible;
- keeping as many traffic lanes open as possible;
- preserving evidence for investigators;
- using an Incident Command System to manage the incident.

These objectives also are included in the National Unified Goal for Traffic Incident Management, which was developed by the National Traffic Incident Management Coalition. The primary objective is to protect the first responders in order to allow them to safely operate at the incident scene [NTIMC 2004].

The Traffic Incident Management (TIM) Handbook and 2010 Update contains detailed information to assist in creating SOPs for local law enforcement agencies [FHWA 2010]. For example, with respect to traffic management, the 2010 Handbook Update states: "Current DOT traffic management practices for TIM are based on the **Manual on Uniform Traffic Control Devices (MUTCD)**, chapter 6 (Temporary Traffic Control-TTC). The **MUTCD** defines a traffic incident as "an emergency road user occurrence, a natural disaster, or other unplanned event that affects or impedes the normal flow of traffic" and establishes the structure for managing incident response activities."

MUTCD, chapter 6I (Control of Traffic through Traffic Incident Management Areas) describes three levels of traffic incidents: Major, Intermediate, and Minor. A "Major Traffic Incident" typically requires closing all or part of the roadway for a period exceeding 2 hours.

An "Intermediate Traffic Incident" typically affects travel lanes for a period of 30 minutes to 2 hours. When the use of traffic control is discussed, usually it is focused on these two incident types, which require the close coordination emblematic of mature TIM Programs.

A "Minor Traffic Incident" typically last no more than 30 minutes and does not require lane closures or extensive traffic control. This type of incident is handled by law enforcement, towing and recovery, or a service patrol alone or in combination.

A "Traffic Incident Management Area" (TIMA) is defined as an area of a highway where TTC is imposed by authorized officials responding to a road user incident, natural disaster, hazardous material spill, or other unplanned incident. The TIMA extends from the first warning device (such as a sign, light, or cone) to the last TTC device, or to a point where vehicles return to the original lane alignment and are clear of the incident. **MUTCD**, chapter 6, contains detailed guidance on the recommended size of a TIMA, depending upon road configuration, vehicle speed, and weather conditions [FHWA 2003, section 6E.02].

Recommendation #6: Law enforcement agencies should ensure that all members receive training for conducting emergency operations at highway/roadway incidents.

Discussion: When dealing with highway/roadway operations, the response matrix may include law enforcement, fire, and emergency medical services. This process includes understanding the services, capabilities, resources, and common practices of local agencies that may be ascertained during an incident. Available resources can then be incorporated into a deployment plan that addresses local geography, seasonal weather patterns, staff and equipment resources, and expertise levels. The 'Three C's' of multi-agency response are:

- Communication—prior to, during, and following an incident;
- Cooperation—not competition,
- Collaboration/Coordination—collaboration before an incident; coordination during an incident.

An essential element for successful implementation of any new policy, standard operating procedure, or regulation, is a comprehensive training program for all members. This ensures the members understand the policy, standard operating procedure, or regulation and alleviates misinterpretation or misunderstanding.

The Emergency Responder Safety Institute, Cumberland Valley Volunteer Firemen's Association, offers a curriculum entitled Managing Emergency Incidents on the Roadway [ERSI 2013]. This is an 8-hour course that covers the following topics: first responder fatality and injury statistics related to highway/roadway incidents; case studies dealing with first responder fatalities, injuries, and near misses; types and use of personal protective equipment; federal regulations positioning of apparatus and emergency vehicles; safety procedures for operations on highways/roadways; use of traffic signs and warning devices; use of the Incident Command

System, including Unified Command; and pre-incident planning with law enforcement, state/local Department of Transportation, emergency medical services, tow and recovery operators, and product recovery contractors. This training program is available through <http://www.respondersafety.com> at no cost.

Recommendation #7: State, county and municipal authorities should consider implementing public awareness campaigns to inform motorists of the risks that law enforcement officers face while operating along the roadside and of the need to follow move-over laws.

Dashcam video from a motor transport police unit parked in front of the sergeant's unit showed that, in the 11 minutes prior to the incident, 77 vehicles passed through the site in the northbound lanes. This included 9 semi-truck trailer combinations. Of these vehicles, 22 were traveling in the left hand lane and 55 in the right hand lane. Further, while traffic was moving at slower than normal speeds, it appeared that traffic speed was still such that safe stopping ability would be hampered. Had the motorist involved in this incident moved to the left hand lane further in advance of the parked emergency vehicles, or had he been moving at a speed slow enough to allow stopping or lane changing safely, this incident may not have occurred. Currently, 49 states have laws requiring motorists to move over or slow down when passing through an area where emergency vehicles are present. It is not clear why the majority of vehicles traveling past the emergency vehicles stayed in the right hand lane. There were some instances where both lanes were occupied or where vehicles were traveling closely together that may have prevented moving left. However a recent survey found that 71 percent of Americans had not heard of move-over laws [MoveOverAmerica 2014]. Additionally, law enforcement officers interviewed during the NIOSH investigation noted that move-over laws are difficult to enforce given the resources available to them. For example, a single law enforcement officer conducting a traffic stop does not have the ability to enforce move over laws at the same time. And, for situations as in this incident, resource priority would most likely dictate committing responders to assist injured and stranded motorists and clear the scene of disabled vehicles before making law enforcement units available for traffic enforcement.

REFERENCES

- ERSI [2013]. Traffic incident management. Berkeley Springs, WV: Cumberland Valley Volunteer Firemen's Association, Emergency Responder Safety Institute, http://www.respondersafety.com/Resources/Traffic_Incident_Management.aspx.
- FHWA [2003]. Temporary traffic control, part 6. In: Manual on uniform traffic control devices for streets and highways. Washington, DC: U.S. Department of Transportation, Federal Highway Administration, <http://mutcd.fhwa.dot.gov/pdfs/2003r1/Ch6A-E.pdf>.
- FHWA [2010]. Traffic incident management handbook. Washington, DC: Federal Highway Administration, Office of Transportation Operations, http://www.ops.fhwa.dot.gov/eto_tim_pse/publications/timhandbook/tim_handbook.pdf.
- Fire-Police [no date]. Safety vests. <http://www.fire-police.com/conc/safty-vests/>.
- MoveOverAmerica [2007]. National campaign launches effort educating drivers to “move over” and protect officers on roadways. Jacksonville, FL: MoveOverAmerica, <http://www.moveoveramerica.com/Move-Over-Law-Protect-Officers.html>.
- NTIMC [2004]. National unified goal for traffic incident management. Washington, DC: American Association of State Highway and Transportation Officials, National Traffic Incident Management Coalition, <http://ntimc.transportation.org/Documents/NUGUnifiedGoal-Nov07.pdf>.
- USCB [2015]. 2014 census results. Suitland, MD: U.S. Department of Commerce, U.S. Census Bureau, www.census.gov.
- USFA [2014]. Emergency vehicle safety initiative. Washington, DC: U.S. Department of Homeland Security, Federal Emergency Management Agency, U.S. Fire Administration, FA-336, https://www.usfa.fema.gov/downloads/pdf/publications/fa_336.pdf.
- Weather Underground [2013]. Weather History for KABQ—December 5. Atlanta, GA: The Weather Channel Interactive, Inc., http://www.wunderground.com/history/airport/KABQ/2013/12/5/DailyHistory.html?req_city=NA&req_state=NA&req_statename=NA&MR=1.
- Worker visibility. Rule. 23 CFR 634.4 (2008), <https://www.gpo.gov/fdsys/pkg/CFR-2008-title23-vol1/pdf/CFR-2008-title23-vol1-sec634-1.pdf>.

INVESTIGATOR INFORMATION

This incident was investigated by Paul H. Moore, Chief, and Murrey E. Loflin, Investigator, Fatality Investigations Team, and Jennifer L. Lultschik, MD, Guest Researcher, Special Studies Team, all of the Surveillance and Field Investigations Branch, Division of Safety Research, NIOSH located in Morgantown, WV. This report was coauthored by Jennifer L. Lultschik and Paul H. Moore. An expert subject matter review was conducted by Nicholas Breul, National Law Enforcement Officer Memorial Fund and Wilfred Price, National Traffic Safety Administration, both former law enforcement officers.

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