MIFACE INVESTIGATION #06MI001

Subject: Female Firefighter Dies When Struck by an Out-of-Control Pickup Truck on an Icy Interstate Highway

Summary

On January 7, 2006, a 34-year-old female firefighter was critically injured after being struck by a pickup truck that had lost control on an icy interstate highway. The fire department responded after being coded as a first call response by 911 dispatch that an accident had taken place on a local highway with occupants trapped. An engine was dispatched with three firefighters, the engine driver, lieutenant and the decedent. The incident occurred near a freeway entrance ramp. The entrance ramp was blocked by a car and pickup truck that had been involved in an accident at the ramp junction with the highway (Figure 1). The lieutenant and the decedent exited the engine and walked on the side of the freeway to the accident site while the engine driver repositioned the engine. As they were walking, a pickup lost control on black ice that had formed on the highway surface. The pickup slid out of control and struck the decedent. She was thrown off the highway shoulder onto the grass bank alongside the highway. Other emergency vehicles responded and she was transported to a local hospital. She died one week later from her injuries. *After the incident, the fire department developed a standard operating procedure (SOP) for emergency response on roadways that incorporated the first four work practice recommendations listed in the RECOMMENDATIONS section of this report. The department's SOP is attached as Appendix A.*

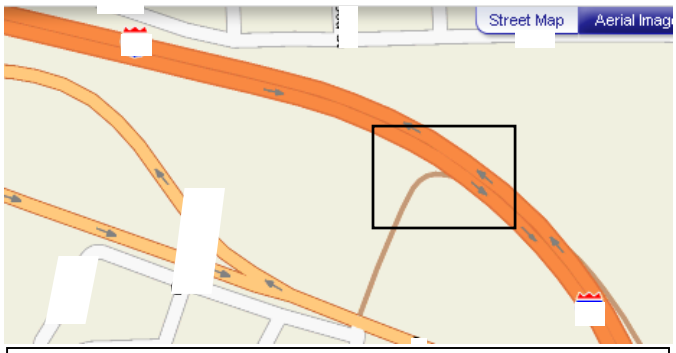

Figure 1. Overview of incident site. Street identifiers removed. Courtesy of Mapquest

RECOMMENDATIONS

- Fire Departments develop, implement, and enforce standard operating procedures/guidelines (SOPs/SOGs) regarding emergency operations for roadway incidents and employees should receive training in the proper procedures and the hazards associated with emergency operations for highway incidents.
- Fire Departments ensure that firefighters establish a protected work area on roadways before safely turning their attention to the emergency.
- Fire Departments establish pre-incident plans regarding traffic control for emergency service incidents and pre-incident agreements with law enforcement and other agencies such as highway departments.

Key Words: Motor Vehicle, Struck By, Firefighter, Public Administration

- Fire Departments ensure firefighters wear suitable high-visibility apparel meeting American National Standards Institute (ANSI) 107-2004 requirements when working as an emergency responder on a roadway.
- The State of Michigan should adopt a training module specific to operational practices in or near moving traffic as part of the Office of Fire Fighter Training firefighter training program.
- Michigan Department of Transportation (MDOT) should continue expanding the use of a "changeable message sign" to inform motorists of hazardous road conditions or vehicular accidents.
- The International Fire Service Training Association (IFSTA) should update the Fire Fighters Training Manual to include a chapter on emergency response vehicle positioning to protect emergency response workers.

INTRODUCTION

On January 7, 2006, a 34-year-old female firefighter was critically injured after being struck by a pickup truck that had lost control on an icy road. MIFACE was notified of the incident by a newspaper clipping. The fire department agreed to participate in May 2006. Since the initial acceptance, MIFACE has had many contacts with the fire department, including three visits to the fire department offices, speaking with one of the developers of the department's Roadway Safety standard operating procedure at the MSU office, and attending a firefighter training program about positioning fire department response vehicles to protect personnel working in the incident scene area.

The decedent's employer was a city fire department employing 90 individuals. The decedent's job classification was firefighter. The department had been established about 100 years ago. The decedent worked full time. The work shift was one 24-hour day with two days off. Her shift began at 7:00 a.m. She had been employed by the fire department for seven years and was a member of the unionized workforce. The department had a written health and safety program, but at the time of the incident, did not have a standard operating procedure for conducting emergency response activities on a roadway.

During the writing of this report, MIFACE reviewed the death certificate, police report and pictures, 911 phone log, and medical examiners report.

INVESTIGATION

The decedent had arrived at work at 6:50 a.m. It had been raining, but not freezing rain. At approximately 7:00 a.m., 911 dispatch personnel notified the fire department to respond to a vehicle crash on the highway with occupants trapped. The engine driver indicated that when the windshield wipers were activated, the rain was freezing on the windshield.

The roadway involved in the incident was an unlighted two-lane highway with a median separating traffic moving in the opposite direction. The speed limit was 70 mph. The area of highway where the incident occurred was a blind curve for traffic moving eastbound.

There was a light drizzle that began to freeze upon contact with the road. The road conditions had turned from being wet to "black ice" in a manner of minutes.

Multiple vehicular accidents had been reported due to the icy conditions. As vehicles traveling eastbound came around the curve, the drivers would see the multiple crashes ahead and would attempt to slow down or turn to avoid the accident vehicles. As the drivers would slow down or turn, they lost control of their vehicles and "spun out" and/or crashed into the median. Although an exact count is unknown, newspaper reports indicated that at least 13 crashes in the area were reported.

All vehicles described below were heading eastbound. Crash #1 (Figure 2, #1) involved a car (Car #1) that had attempted to slow down for another vehicle that was permitting a semi-truck to change lanes. When the driver of Car #1 tapped the vehicle brakes, the driver lost control and struck the rear bumper of a semi-truck. Car #1 came to a stop facing westbound on the right lane shoulder and partially on the entrance ramp used by the fire department to access the highway.

Crash #2 involved a Pickup truck #1 and Car #1 (Figure 2, #2). The driver of Pickup #1 came around the curve and lost control on the curve as he attempted to avoid another vehicle and struck Car #1. Pickup #1 was located to the east of Car #1, also facing westbound on the lane for the entrance ramp just east of the entrance ramp.

Crash #3 occurred when the driver of Car #2, which was traveling in the right lane, came around the curve and noticed the crash of Car #1 and Pickup #1 As the driver of Car #2 began to move from the right lane to the left lane, the driver lost control and spun out. The rear of the Car #2 struck the median wall and stopped. The driver exited the vehicle, walked across the roadway to a wooded area away from the road, and called 911.

Crash #4 involved another car (Car #3) and a pickup truck (Pickup #2). The driver of Pickup #2 struck Car #3. The driver of Pickup #2 was able to pull off to the shoulder and he exited the vehicle. He ran westbound down the eastbound road shoulder waving a flashlight to warn oncoming traffic about the conditions ahead.

The fire engine arrived at the scene. A city police vehicle came very shortly after the fire engine arrival. The fire engine driver parked the engine near the end of the ramp that was partially blocked by Car #1 (Figure 2, Box 1 and Letter X). All of the firefighters were dressed in the traditional turnout gear and duty helmets. The condition of the turnout gear worn at the site was unknown. Turnout gear observed by MIFACE at the time of the site visit to the decedent's fire station was in good condition; the turnout gear was clean and the reflective stripes were visible with little apparent wear. The lieutenant and the decedent exited the fire engine and checked on the status of the driver of Car #1. The engine driver got out of the truck to start the generator for the parapet lights. After ascertaining that the driver of Car #1 did not need medical attention, the lieutenant and the decedent walked down the ramp near the concrete edge of the roadway near the rumble strips and onto the right shoulder of the highway to check on the status of the driver of Pickup #1 (Figure 2, Box 2). The lieutenant was nearest to the shoulder edge.

The lieutenant was in a twelve o'clock position and the decedent was in a ten o'clock position as they approached Pickup #1. As they were walking, the lieutenant instructed the engine operator to move the fire engine to another location to assist in blocking off the scene. The engine's emergency lights were activated.

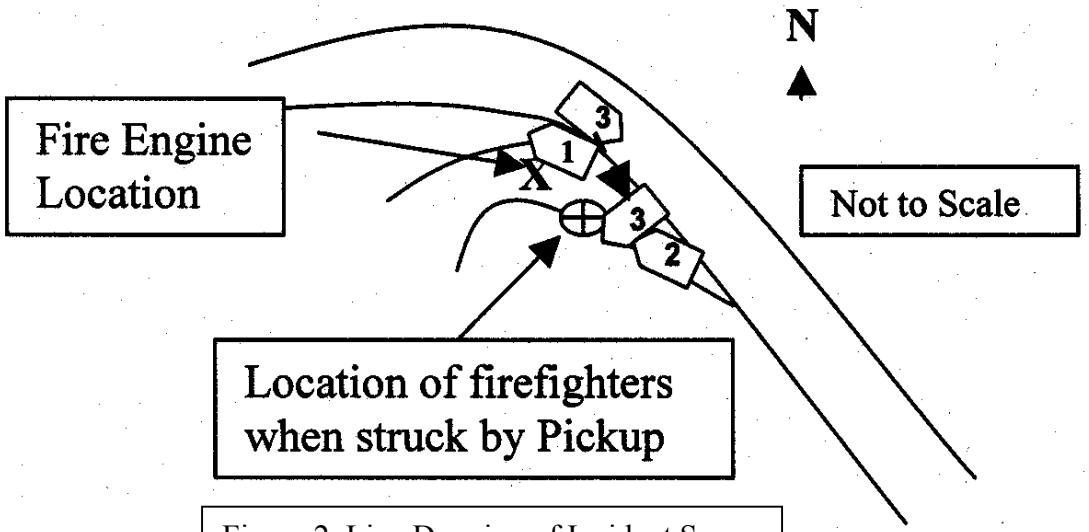

Figure 2. Line Drawing of Incident Scene

Pickup Truck #3 (Figure 2, Box 3) was the vehicle that struck the decedent. As the lieutenant and the decedent walked on the road shoulder toward Pickup #1, the driver of Pickup #3 tapped his brakes in response to a vehicle ahead of him that had tapped its brakes. When driver of Pickup #3 tapped his brakes, the rear driver side of his vehicle began to fishtail and the vehicle began to slide towards the median wall. The vehicle struck the median wall and vehicle began to spin across the lanes of traffic toward the right highway shoulder and Pickup #1. As the decedent and lieutenant were walking toward Pickup #1, the engine driver entered the truck. She had her hand on the gearshift when she saw in her peripheral vision, Pickup #3 sliding toward the shoulder. The lieutenant saw the oncoming out-of-control truck and grabbed the decedent by the arm and told her to run. The lieutenant was able to get clear of Pickup #3 but the decedent was unable to get clear. She was struck by Pickup #3, landing on the hood and then on the ground. The decedent was thrown into the grassy area. Her helmet was found a short distance away. Pickup #3 came to rest on the grassy area of the shoulder facing southbound. The driver of Car #2 reached the decedent first and asked if she was ok. The decedent was unresponsive. The lieutenant arrived and then yelled to the engine operator to call for more help and to bring the oxygen. As the lieutenant and the engine operator were providing CPR, other emergency response vehicles arrived, and the decedent was transported to a local hospital where she died a week later from her injuries.

CAUSE OF DEATH

The cause of death as listed on the death certificate was brain trauma. Toxicology was not performed.

RECOMMENDATIONS/DISCUSSION

- Fire departments develop, implement, and enforce standard operating procedures/guidelines (SOPs/SOGs) regarding emergency operations for roadway incidents and employees should receive training in the proper procedures and the hazards associated with emergency operations for highway incidents.

Emergency responders themselves are at risk of falling victim to "secondary incidents" that occur as they attend to the original incident to which they are dispatched. Firefighters operating at the scene of a motor-vehicle incident on a highway are in danger of being struck by oncoming motor vehicles. Department standard operating procedures/guidelines (SOPs/SOGs) can help establish proper traffic control measures when operating at an incident scene. SOPs/SOGs should include, but not be limited to, the following: parking on the same side of the roadway as the incident, apparatus positioning, lane closures, methods to establish a secure work area, clearing traffic lanes, releasing the incident scene back to normal operation, and wearing appropriate protective clothing at all times including the use of high-visibility reflective apparel when operating in or near moving traffic. As recommended in Protecting Emergency Responders on the Highways, "standard operating procedures (SOPs) should guide vehicle positioning upon arrival as an integral part of traffic control. Procedures should be scalable to incidents of varying size, magnitude, and location so as to be easily adapted to any sort of incident." An example of a SOP for Safe Positioning While Operating In or Near Moving Traffic for fire departments is available at http://www.respondersafety.com.

The US Department of Transportation, Federal Highway Administration, *Manual on Uniform Traffic Control Devices (MUTCD), Chapter 6I, Control of Traffic Through Traffic Incident Management Areas* contains recommended practices for the management of traffic through locations effected by emergency road user occurrences, natural disasters, and other unplanned traffic interruptions. The 2003 revision, dated November 2004, is the most currently available revision of the MUTCD. Michigan adopted the federal 2003 MUTCD with a 2005 Michigan Supplement and Change list (Michigan Manual on Uniform Traffic Control Devices (MMUTCD)). The supplement addresses those items in the Michigan Vehicle Code that conflict with the 2003 Federal MUTCD and Special Items unique to Michigan.

MMUTCD Chapter 6I contains five sections. Section 6I.01 contains general information and guidance about temporary traffic control. Recommendations included within this section include that on-scene responders should be trained in safe practices for accomplishing their tasks in and near traffic. Responders should always be aware of their visibility to oncoming traffic and take measures to move the traffic incident as far off the traveled roadway as possible or to provide for appropriate warning. Responders arriving at a traffic incident should, within 15 minutes of arrival on-scene, estimate the magnitude of the traffic incident, the expected time duration of the traffic incident, and the expected vehicle queue length, and then should set up the appropriate temporary traffic controls for these estimates.

Firefighters who respond to highway incidents have numerous responsibilities, ranging from traffic control to assisting injured or stranded motorists. Responders must be trained to safely conduct multiple tasks near moving traffic. Because of the variability of each incident, all emergency responders should have ongoing, appropriate, task-specific training.

- Fire departments ensure that firefighters establish a protected work area on roadways before safely turning their attention to the emergency.

Some of the most dangerous scenarios faced by firefighters are operations on highways, interstates, turnpikes, and other busy roadways. As stated in NFPA 1451 (8.1.4.1), "fire service vehicles shall be utilized as a shield from oncoming traffic wherever possible." Placement of the first arriving fire apparatus should protect the scene by providing a work area protected from traffic approaching in at least one direction. Fire apparatus should be placed between the flow of traffic and the firefighters working on the incident to act as a shield. The apparatus should be parked on an angle so that the operator is protected by the tailboard. Front wheels should be turned away from the firefighters working highway incidents so that the apparatus will not be driven into them if struck from behind. Also consider parking additional apparatus 150 to 200 feet behind the shielding apparatus to act as an additional barrier between firefighters and the flow of traffic." The positioning of apparatus (as a shield) is referred to as a "block" that creates a protected area known as the "shadow." For limited-access, high-volume highway incidents, the first arriving apparatus (preferably a ladder truck or other large apparatus establishes the "block" by positioning the apparatus) upstream as the traffic approaches the scene from the incident, providing a "shadow" where emergency personnel can safely work. Emergency personnel should never leave the "shadow" for any reason.

Appendix A contains the standard operating procedure developed by the fire department after the incident for responding on a roadway. MIFACE has removed the department identifiers. MIFACE recommends that the fire department change the SOP to the requirement for Class III vests. Vehicular speeds in the area may very well exceed 50 mph. ANSI recommends Class III for areas that meet or exceed 50 mph.

- Fire departments establish pre-incident plans regarding traffic control for emergency service incidents and pre-incident agreements with law enforcement and other agencies such as highway departments.

MMUTCD Chapter 6I, Section 6I.01 also states "In order to reduce response time for traffic incidents, highway agencies, appropriate public safety agencies (law enforcement, fire and rescue, emergency communications, emergency medical, and other emergency management), and private sector responders (towing and recovery and hazardous materials contractors) should mutually plan for occurrences of traffic incidents along the major and heavily traveled highway and street system." Sections 6I02-6I.04 provide these agencies support and guidance for temporary traffic control for major, intermediate and minor traffic incidents. The last section, 6I.05 gives information of the use of emergency vehicle lighting.

According to NFPA 502, fire protection requirements for limited access highways include recommendations that "a designated authority shall carry out a complete and coordinated program of fire protection that shall include written preplanned emergency response procedures and standard operating procedures." NFPA 1620 provides guidance to assist departments in establishing pre-incident plans. Pre-incident planning that includes agreements formed by a coalition of all involved parties such as mutual aid fire departments, EMS companies, police, and highway departments may save valuable time, present a coordinated response, and provide a safer emergency work zone.

The need to identify areas that have higher rates of incidents (e.g., motor vehicle crashes) should be evaluated so that standard operating procedures for emergency personnel can be tailored to the needs of particular sites (e.g., blind curves or corners, hills or sloped areas, and high-traffic areas). Fire departments can work with local highway departments and local law enforcement agencies to identify problem areas and devise solutions to those problem areas in advance. Experience and knowledge of local territory will help in creating pre-incident plans and in the establishment of standard operating procedures to make the response more efficient and safer for emergency responders.

- Fire Departments ensure firefighters wear suitable high-visibility apparel meeting American National Standards Institute (ANSI) 107-2004 requirements when working as an emergency responder on a roadway.

Firefighters are routinely exposed to the hazards of low visibility while on the job. NFPA 1500, Standard for Fire Department Occupational Safety and Health Programs, Chapter 7.1.2 states "Protective clothing and protective equipment shall be used whenever the member is exposed or potentially exposed to the hazards for which it is provided." The need to wear personal protective clothing such as a reflective, brightly colored vest arises from the fact that personnel need to be highly visible while working at the scene of a motor vehicle incident or while directing or blocking traffic near an incident scene.

The American National Standards Institute (ANSI) and the International Safety Equipment Association (ISEA) have published the ANSI/ISEA 107-2004 standard, which specifies different classes of high visibility safety garments based on wearer's activities. This standard was developed in response to workers who are exposed to low visibility conditions in hazardous work zones. ANSI/ISEA have also recently published the ANSI/ISEA 207-2006 Standard for High-Visibility Public Safety Vests which establishes design, performance specifications and use criteria for highly visible vests that are used by law enforcement, emergency responders, fire officials, and DOT personnel. Both standards are voluntary, but they do provide employers consistent, authoritative guidelines for the selection and use of high-visibility apparel in the United States.

ANSI/ISEA 107-2004 is a voluntary standard that offers performance specifications for reflective materials, including minimum amounts, placement, background material, test methods and care labeling. The standard establishes three performance classes for high-

visibility safety apparel based on the wearer's activities, and determined by the total area of background and reflective materials used.

The standard will only affect the Law Enforcement, Emergency Responders, Fire Officials, and DOT Personnel sectors. It will improve the safety in multi-agency incidents by improving visibility and identification. It will reduce confusion and enhance communication between agencies. Basic vest requirements will include:

- Vest Dimensions
- Color: (Red for Fire Officials), (Blue for Law Enforcement), (Green for Emergency Responders), and (Orange for DOT Officials)
- Material Performance
- Special design features for users in fire, emergency medical, and law enforcement
- Higher Visibility (checkered color coded reflective trim)

The primary distinction of ANSI 207 versus ANSI 107 lies in the amount of fluorescent background material. ANSI 207 requires a minimum of 450 in^2. This would fall between ANSI 107 Class 1 (217 in^2) and Class II (775 in^2) garments. The minimum amount of required retroreflective area (207 in^2) did not change from ANSI 107 and 207. The difference in fluorescent material allow for design accommodation of equipment belts and for flexibility to incorporate colored panels to enhance easy, on-scene identification of wearers.

MIFACE recommends that fire departments conduct a survey of worksite low visibility hazards to determine the appropriate class of garments. Factors to consider are worker exposure to speed hazards, weather conditions, worker proximity to traffic, task loads and the traffic control plan. Class III garments provide the highest level of visibility to workers in high-risk environments that involve high task loads, a wide range of weather conditions and traffic exceeding 50 mph. Class III garments can provide coverage to the arms and/or legs as well as the torso, and can include pants, jackets, coveralls or rain wear. The standard recommends these garments for all roadway construction personnel and vehicle operators, utility workers, survey crews, *emergency responders*, railway workers and accident site investigators. These garments will assist approaching motorists to identify workers from a distance of approximately 1,280 feet.

When the safety apparel is issued, employers should ensure that employees receive training that explains the purpose and use of their new high-visibility garments.

- The State of Michigan should adopt a training module specific to operational practices in or near moving traffic as part of the Office of Fire Fighter Training firefighters training program.

According to their website, the Office of Fire Fighter Training (OFFT) serves the training and certification needs of the State's 1,075 fire departments and 30,672 firefighters and officers. The office prepares and publishes training standards, establishes courses of study, certifies instructors, establishes regional training centers, cooperates with State, federal, and local fire agencies to facilitate training of firefighters, and develops and

administers mandatory certification examinations for new firefighters. The OFFT offers a Fire Fighter I and Fire Fighter II certification. Currently, no course is offered on how to position vehicles in an emergency response situation on a roadway to protect the incident scene from motorist or other incursions.

Within the Fire Fighters I and II curriculum are training modules specific to Michigan. These Michigan modules are referenced as M1 through M5, and are specially written modules that the state has adopted. The state could adopt a Michigan Module 6 that could include information on operational practices in or near moving traffic.

Michigan also has a program on apparatus driving. They have adopted the Volunteer Fire Insurance Services' (VFIS) driver training/certification program. This program address inspection, driving and response considerations, but the program does not contain training on parking or operating in the roadway. The VFIS could modify their program, or a Michigan Module could be written and adopted into this program. This course is taken by those firefighters that want to drive apparatus, and would not be delivered to everyone.

Also on the OFFT website is a category of Health and Safety. A program could be written for the state and adopted by them and included in the list of Health and Safety programs that they endorse. The State does have precedent for adopting a program written by a Michigan Fire Department. The State has adopted two programs on Vehicle Extrication that were written by a Fire Chief from a Michigan County.

- Michigan Department of Transportation (MDOT) should continue expanding the use of a "changeable message sign" to inform motorists of hazardous road conditions or vehicular accidents.

The need for this sign arises from the fact that this particular section of the highway is known to be hazardous during and after wet weather conditions. The sign would be permanently installed, spanning over the interstate, and the message would be controlled from the Emergency Operations Center (EOC). Two signs would need to be installed, one for each direction of the interstate. The message would be updated remotely on a real-time basis by the EOC when incidents are reported to them which have occurred on the interstate beyond the signs location. This would inform motorists of hazardous conditions or vehicular incidents ahead. The need to identify areas that have higher rates of automobile incidents should be evaluated so that standard operating procedures for emergency personnel can be tailored to the needs of particular sites (e.g., blind curves or corners, hills or sloped areas, and high traffic areas). Fire departments can work with local highway departments to identify trouble areas and devise solutions to those problem areas.

- International Fire Service Training Association (IFSTA) should update the Fire Fighters Training Manual to include a chapter on emergency response vehicle positioning to protect emergency response workers.

Unfortunately, the IFSTA manual, which is utilized in the Michigan Fire Fighters Training Program, does not contain a chapter on emergency response vehicle positioning to protect the emergency response workers at the scene. Many firefighters and other emergency response personnel have been injured or killed because they were not protected from oncoming traffic. Because the IFSTA manual is extensively used in firefighter training programs across the United States, MIFACE encourages the IFSTA to develop a chapter on this subject matter.

REFERENCES

MIOSHA standards cited in this report may be found at and downloaded from the MIOSHA, Michigan Department of Labor and Economic Growth (DLEG) website at: www.michigan.gov/mioshastandards. MIOSHA standards are available for a fee by writing to: Michigan Department of Labor and Economic Growth, MIOSHA Standards Section, P.O. Box 30643, Lansing, Michigan 48909-8143 or calling (517) 322-1845.

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MIFACE
Investigation Report #06 MI 001
Evaluation

To improve the quality of the MIFACE program and our investigation reports, we would like to ask you a few questions about this report:

Please rate the report using a scale of:

Excellent	Good	Fair	Poor
1	2	3	4

What was your general impression of this MIFACE investigation report?

Excellent	Good	Fair	Poor
1	2	3	4

Was the report…	**Excellent**	**Good**	**Fair**	**Poor**
Objective?	1	2	3	4
Clearly written?	1	2	3	4
Useful?	1	2	3	4

Were the recommendations …	**Excellent**	**Good**	**Fair**	**Poor**
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Useful?	1	2	3	4

How will you use this report? (Check all that apply)

- ❑ Distribute to employees
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Thank You!

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APPENDIX A

ROADWAY SAFETY

PURPOSE:

To establish operational practices for Fire Department vehicles and personnel that will provide maximum protection and safety for personnel operating in or near moving traffic.

POLICY:

It shall be the policy of the Fire Department to operate and position emergency vehicles at any incident on a street, road, highway or expressway in a manner that best protects the personnel and work area. Such operations and positioning shall afford protection to fire department personnel, law enforcement officers, EMS providers, tow service operators and the motoring public from the hazards of working in or near moving traffic.

RESPONSIBILITY:

It is the responsibility of the _____ Fire Department to comply with this procedure. The authority to deviate from this procedure lies with the Incident Commander.

TERMINOLOGY:

The following terms shall be used during incident operations, post-incident analysis, and training activities related to working in or near moving traffic.

a. **Activity Area**: The physical area of the roadway where emergency personnel perform their fire, EMS and rescue tasks at a roadway incident.
b. **Advanced Warning**: Notification procedures that advise approaching motorists to transition from normal driving status to that required by the temporary emergency traffic control measures ahead of them.
c. **Block**: Position a fire department vehicle on an angle to the lanes of traffic, creating a physical barrier between upstream traffic and the work area. Includes 'block to the right' or 'block to the left'
d. **Buffer Zone:** The distance or space between personnel and vehicles in the protected work zone and nearby moving traffic.
e. **Downstream**: The direction the traffic is moving as it travels away from the incident scene.
f. **Inside/Outside**: Terms given to the sides of a highway. Inside is the middle or median.
g. **Lane Number**: Lanes of traffic shall be identified numerically as "Lane 1", "Lane 2", etc beginning right to left when facing in the direction of the normal flow of traffic. Center turn lanes are designated as 'center,' and are not numbered.
h. **Shadow**: The protected work area at a roadway incident that is shielded by the block from apparatus and other emergency vehicles.

i. **Spotter**: A fire department member assigned to monitor approaching traffic and to activate an emergency signal if the actions of the motorist do not conform to establish traffic control measures in place at the highway scene.
j. **Taper:** The action of merging several lanes of moving traffic into fewer moving lanes.
k. **Termination Area:** The area marked to allow traffic to resume normal operation.
l. **Transition Zone:** The lanes of a roadway where approaching motorists change their speed and position to comply with the traffic control measures established at an incident scene.
m. **Upstream**: The direction that traffic is traveling from, as the vehicles approach the incident scene.

PROCEDURE

I. <u>Apparatus and Emergency Vehicle Benchmarks</u>

Listed below are benchmarks for safe parking of emergency vehicles when operating in or near moving traffic.

a. Position first-arriving vehicle to protect the scene, patients, and emergency personnel.
    i. Provide a work area protected from traffic approaching in at least one direction.
    ii. Angle emergency vehicles to create a physical barrier between the scene and approaching traffic.
    iii. Establish an initial block of the lane(s) occupied by the incident plus one additional traffic lane.
    iv. Consider cab access/egress; pump operator/pump panel, specialized equipment access, and roadway configuration when positioning vehicles.
    v. Turn the front wheels of any parked emergency vehicle away from the incident.
b. The ambulance should be positioned within the protected work area, with their rear patient loading door area away from the nearest lanes of moving traffic.
c. At residential medical emergencies, Command should direct the ambulance to park in a driveway or at the nearest curb to the residence for safe patient loading whenever possible.
d. Consider moving the incident as far off the traveled roadway as possible.
e. Stage unneeded emergency vehicles off the roadway and return these units to service as soon as possible.
f. At intersections, or where the incident may be near the middle lane of the roadway, two or more sides of the incident will need to be protected. The blocking of the work-zone must be prioritized, from the most critical or highest traffic volume flow to the least critical traffic direction. Request police

assistance to expand the initial safe work zone for traffic approaching from all directions.

g. During night or inclement weather, turn off white flashing lights, raise floodlights so they shine down; turn on ground lights, and turn on compartment lights.
h. Use " Arrow Stick" type lights to warn or direct traffic.
i. Traffic cones shall be deployed along the activity area. Cones may be spaced up to 25 feet apart on a roadway.
j. Traffic cones should be used to establish a taper when it is safe to do so. The taper should be 50 to 100 feet long. These cones may be placed up to 25 feet apart.
k. Personnel shall place cones and flares and retrieve cones while facing oncoming traffic.
l. Flares should be used in conjunction with cones during nighttime or inclement weather.
m. If the incident is expected to require that a lane be closed for more than 30 minutes, an advanced warning sign should be deployed 350 feet upstream.

II. Incident Command Benchmarks:

Listed below are benchmarks that the Incident Commander must complete to assure that a safe and protected work environment for emergency scene personnel is established and maintained.

a. Establish a unified command system.
b. Advise the law enforcement agency having jurisdiction of any specific Fire Department concerns regarding traffic control, and ensure they will manage the control of traffic through the area.
c. Assign a parking location for all later-arriving vehicles.
d. Consider assigning a Spotter and/or a Scene Safety Officer.
e. If the incident is expected to require that a lane (or more) be closed for more than 1 hour, the Incident Commander should request assistance in establishing a temporary traffic control zone. Assistance can be obtained from City Signs and Signals. On a limited access highway, assistance may also be requested from County Road Commission.

III. Emergency Personnel Benchmarks

Listed below are benchmarks for safe actions of personnel when operating in or near moving vehicle traffic.

a. Personnel shall don a Class II safety vest prior to exiting the emergency vehicle. This requirement is in addition to the personal protective equipment

that may be required in other Department policies. It is not the intent of this policy to require the use of a class II vest during fire suppression activities.

b. Personnel arriving in fire apparatus that allow access/egress from either side of the apparatus should exit and enter the apparatus from the protected downstream side away from moving traffic.
c. Personnel should look before opening doors and stepping out of emergency vehicles into any moving traffic areas. They shall maintain an acute awareness of the high risk of working in or near moving traffic.
d. Personnel, equipment and patients should be moved well away from the roadway or kept within the 'shadow' created by blocking apparatus.

IV. Limited Access Highway Operations - General

Listed below are benchmarks for operating on a limited access highway. These are in addition to the benchmarks outlined in other parts of this, and other SOPs.

a. When the Fire Department Command determines that it is essential for the safety of personnel, any or all lanes, shoulders and entry/exit ramps shall be completely shut down. This, however, should be for as short a period of time as practical.
b. Personnel shall don structural turnout coat, pants, helmet, and Class II safety vest prior to exiting the vehicle. Personnel that respond without structural turnout gear on shall don PPE as soon as practical after arriving.
c. The Battalion Chief, and an additional apparatus over and above the normal assignment for the call, shall be automatically dispatched to all incidents on all limited-access expressways.
d. The first unit to arrive at the location of the incident will establish a block 150 feet upstream of the incident. They will update all other responding units on the nature, location and requirements of the situation. This update must include specific direction to the second arriving unit regarding lane position, need for advance warning and/or additional traffic control.
e. The primary assignment of the second arriving unit shall be to provide an additional block and advanced warning.
    i. The position of this apparatus shall take into consideration all factors that limit sight distance of the approaching traffic including ambient lighting conditions, weather-related conditions, road conditions, design curves, bridges, hills and over- or underpasses.
    ii. Provide advance warning of the emergency scene ¼ to 1/3 mile upstream of the emergency incident, assuring that they are clearly visible to motorists approaching the temporary traffic control zone.
    iii. The apparatus shall position in a blocking position occupying one less lane than the activity area occupies.
    iv. Notify Command of any approaching traffic that is not responding to the speed changes, transition, tapering and merging directions.

v. The Driver/Operator shall sound a series of long blasts (3 seconds each) on the apparatus air horn to warn all personnel if the actions of an approaching motorist pose a life threatening hazard.

f. Traffic cones shall be deployed along the activity area. Cones may be spaced up to 50' apart on a limited access highway.

g. Traffic cones should be used to establish a taper when it is safe to do so. The taper should be 100 to 150' long. These cones may be spaced up to 50' apart.

h. If the incident is expected to require that a lane be closed for more than 30 minutes, an advanced warning sign should be deployed ½ mile upstream.

i. Assign a Spotter in the Activity Area.

j. Police Department vehicles will be used to provide additional blocking of additional traffic lanes as needed.

k. If a responding unit is on the opposite side of a divider from an incident, and the highway is not secured in both directions, the unit shall pass the incident and return on the same side of the divider as the incident. No personnel shall cross or move equipment over a highway divider unless traffic is controlled on both sides of the divider, including securing both inside shoulder lanes, and both inside lanes of the roadway.

l. When an incident is in the median and there is no concrete divider wall, Fire Department vehicles will establish a block on the inside shoulders, protecting the incident from both directions. Additional units will provide advanced warning and lane control from both directions.

V. **Limited Access Highway Operations for Interstate near Avenue A**

Listed below are initial action benchmarks for operating on Interstate at or near Avenue A. These are in addition to the benchmarks outlined in other parts of this, and other SOPs. They shall be utilized any time that an incident is reported to be eastbound or westbound on Interstate between Road A and Road B.

a. The minimum response to an incident in this area shall be Rescue 1, Engine 3, Engine 6 and the Battalion Chief. If any of these units are unavailable to respond, Dispatch will substitute appropriate units, considering that Engine 6 shall enter Interstate westbound at Road C and Engine 3 will enter at Avenue A.

b. Westbound:
   i. Engine 6 will enter westbound at Road C assuming a position on the roadway that slows traffic in both lanes 1 and 2.
   ii. Engine 3 will enter westbound at Avenue A and proceed west.
   iii. The Battalion Chief will block traffic from entering westbound from Avenue A.
   iv. Rescue 1 will stage with the Battalion Chief.

c. Eastbound:
   i. Engine 6 will enter westbound at Road C, assuming a position on the roadway that slows traffic in both lanes 1 and 2.
   ii. Engine 3 will enter westbound at Avenue A and proceed west to the emergency vehicle turn-around near Road B. Engine 3 will enter eastbound, assuming a position on the roadway that slows traffic in both lanes 1 and 2. They will establish a blocking position, stopping both lanes, west of the curve.
   iii. The Battalion Chief will block traffic from entering eastbound from Avenue A.
   iv. Rescue 1 will stage at the entrance to westbound from Avenue A until Engine 3 advises that eastbound traffic has been stopped or provides other direction. When traffic is stopped on the interstate, Rescue 1 will enter I-94 and proceed to the incident.

d. Personnel shall not operate in, or immediately beyond the curve on Interstate without protection from blocking apparatus and advanced warning equipment in position to inform and control traffic.

Safe Parking "Cue Card"

1. **Establish a Unified Command.**
2. **"Block" with first-arriving apparatus to protect the scene, patients, and emergency personnel.**
   - Block for the incident plus one additional lane.
   - Block considering pump panel, equipment access and roadway visibility.
   - Block most critical or highest traffic volume direction first.
   - Consider requesting additional PD assistance.
3. **Crews**
   - Remain vigilant; Wear proper PPE and Class II vests at all times
4. **Establish adequate advance warning.**
   - Deploy traffic cones 50 to 100 upstream, at 25' intervals.
   - Deploy a sign 350 feet upstream if incident will last more than 30 minutes.
   - Consider hills, curves, bridges, obstructed vision areas.
5. **Secure Safe Work Zone**
   - Lane 1 is furthest right lane, next is Lane 2, then Lane 3, etc. from approaching motorist's point of view.
   - Assure that ambulances park in the protected area away from moving traffic.
   - Continue cones or vehicles along activity area, 25' apart.
6. **Command Considerations**
   - Consider assigning a "Spotter."
   - Request City Signs and Signals (County Road Commission also on limited access highway) if incident will last more than 1 hour.
7. **Night or Reduced Light Conditions**
   - Turn OFF unnecessary lights causing glare to oncoming vehicles.
   - Turn on compartment, ground and elevated scene lighting.
   - Use flares in conjunction with cones.
   - Consider additional company for additional upstream "Block".
8. **Limited access, high-volume highway incidents**
   - Establish initial block 150 upstream.
   - Place cones along activity area, up to 50' apart.
   - Initiate taper 100 to 150 feet upstream of apparatus if safe to do so.
   - Additional company establishes Advanced Warning – ¼ to 1/3 mile upstream.
   - Deploy sign ½ mile upstream if incident will last more than 30 minutes.
   - Terminate incident aggressively.