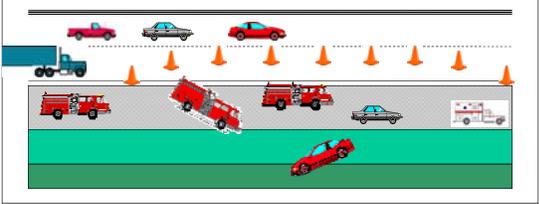


Roadway Incident Safety for Emergency Responders



Roadway Incident Safety for Emergency Responders







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Learning Objectives

- Identify common hazards at roadway incidents and proactive ways to protect emergency responders
- Understand the Manual of Uniform Traffic Control Devices (MUTCD) Chapter 6I – Temporary Traffic Control through Incident Management Areas
- Understand the “NUG” – National Unified Goal for traffic incident management and what it means for emergency services
- Understand the ANSI Standards for “High Visibility” personal protective equipment

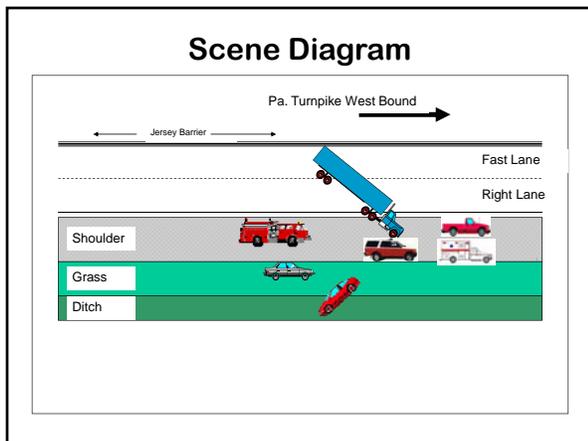
Learning Objectives

- Demonstrate the basics of proper positioning and placement of emergency apparatus & traffic control devices
 - Traffic control equipment (Cones, flares, warning signs etc.)
- Understand the benefits and proper application and use of proactive emergency apparatus safety features for on-scene safety
 - Emergency warning lights
 - High-visibility markings and graphics
- Describe various ways to educate the general public and motorists about “Slow Down & Move Over” for emergency apparatus
- Use tabletop exercises to demonstrate an understanding of scene safety strategies and tactics
 - Training techniques

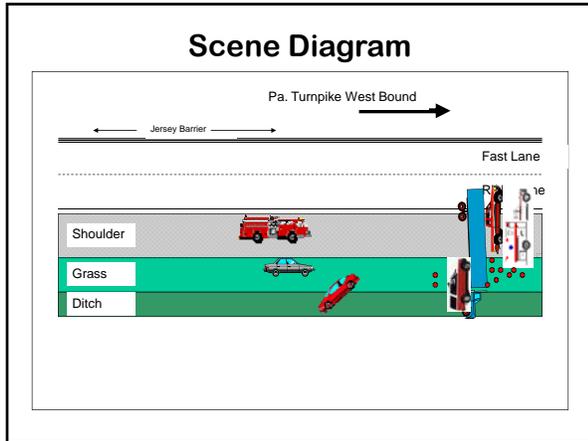
Roadway Incident Safety for Emergency Responders

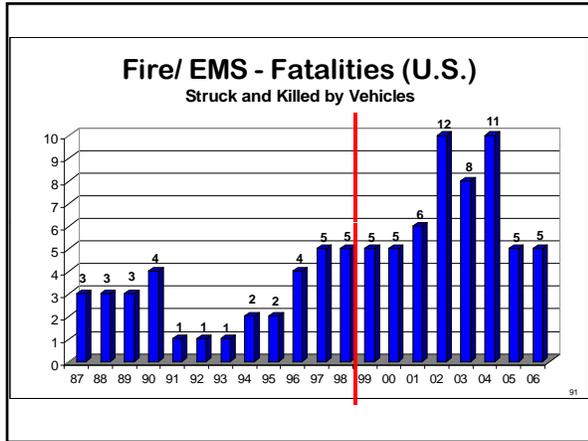






Roadway Incident Safety for Emergency Responders





**Firefighters responding to calls, need to operate
"as if someone is trying to run them over"**

James Joyce, Commissioner
Chicago Fire Dept.

Roadway Incident Safety for Emergency Responders

Fire & EMS “Struck By” Incidents 2000 - 2003

- 121 Incidents Total
- 137 Fire / EMS responders struck
- 33 Fire / EMS Fatalities
- 97 Fire / EMS Injuries
- 34 Apparatus struck

Fire & EMS “Struck By” Incidents 2000 - 2003

- 76 Incidents while at MVA's (63%)
- 27 Incidents while at fire incidents (22%)
- 13 Incidents while at EMS calls (10%)
- 6 Incidents while at training sites (5%)

“Best Practices”

- **Build awareness through more intense training**
 - Job Orientation (Fire, EMS, Police, DOT, Towers)
 - Annual In Service Training
 - Bulletins, SOG's, Lessons from Losses
 - Evaluate equipment placement & safety procedures during all responses and training sessions.

Roadway Incident Safety for Emergency Responders

IAFF Training Resources

Best Practices for Emergency Vehicle and Roadway Operations Safety in the Emergency Services
www.iaff.org/hs/EVSP/guides.html

Emergency Vehicle & Roadway Scene Safety
www.iaff.org/hs/EVSP/power_point.html

“Best Practices”

- **Multi-agency coordination & communication**
 - Fire, EMS mutual aid agencies
 - Law Enforcement agencies
 - DOT, wrecker services, HazMat contractors
 - Preplan traffic control plans for major routes
 - Table top drills with mutual aid agencies
 - The “NUG”!



NTIMC Member Organizations

- Transportation (AASHTO, ATA/ATRI, ATSSA, FHWA, ITE, ITSA, I-95 CC, TRB, AMPO)
- **Fire & Rescue** (Emergency Responder Safety Institute, IAFC, IAFF, IFSTA, NFPA, NVFC, USFA)
- **Emergency Medical Services** (NASEMSO)
- **Public Safety Communications** (APCO, NENA)
- Towing & Recovery (TRAA, AAA)
- **Law Enforcement** (IACP)



Roadway Incident Safety for Emergency Responders

What is the National Unified Goal (NUG)?

The Traffic Incident Management
National Unified Goal is to provide for:

- Responder Safety;
- Safe, Quick Clearance; and
- Prompt, Reliable, Interoperable Communications.



NUG Objective #1 Responder Safety

NUG Strategies for promoting Responder Safety:

- Recommended Practices for Responders;
- Move Over / Slow Down Laws; and
- Motorist Training and Awareness.

National Unified Goal Training

- Establish Policies & Procedures (SOP/SOG)
- Initial Training (Orientation)
 - 10 Cones of Highway Safety
 - “Watch Out Behind You!” Program
 - Managing Highway Incidents (NUG Class)
 - Developing Traffic Control Assistant Program
- Annual Review of Policies/Procedures
- Table-top Exercises or Online Simulations

Roadway Incident Safety for Emergency Responders

National Unified Goal Training

- Proper positioning of apparatus
 - Appropriate units dispatched
 - Units angled at @ 45 degrees in appropriate lanes
 - Wheels turned away from work area
 - Chocks deployed
 - Emergency lighting discipline
 - Traffic control devices (cones, signs, flares etc.)
 - All units on one side of road
 - EMS units with loading area protected
- Exit apparatus on side away from traffic
- Proper PPE

National Unified Goal

- Responder Safety Policies and Legislation
 - Slow Down and Move Over Laws
 - Policies requiring pre-planning for traffic control and traffic diversion
 - Policies supporting multi-agency and multi-jurisdictional training

NUG Objective 2

Safe, Quick Clearance

NUG Strategies for promoting Safe, Quick Clearance are:

- Multidisciplinary TIM Procedures;
- Response and Clearance Time Goals; and
- 24 / 7 Availability !

Roadway Incident Safety for Emergency Responders

Multi-Agency Response (3-C's)

- **C**ommunication
 - Prior to, during, and following the incident
- **C**ooperation
 - Cooperation vs. Competition
- **C**ollaboration/Coordination
 - Before the incident
 - During the incident

Each agency has a role to play in safety and incident stabilization

“Best Practices”

- **Limit the Exposure**
 - Minimum Apparatus & Personnel
 - Limit crews on scene to only those necessary
- **Limit the time on scene**
 - Clear-up crews as soon as possible

“Best Practices”

- **Need for advance warning to slow passing traffic**
 - Arrow Boards, Flares, Cones, Police Cars, DOT signage
 - Variable Message Signs, News Media / Traffic Reports



Roadway Incident Safety for Emergency Responders

MUTCD – Chapter 6I CONTROL OF TRAFFIC THROUGH TRAFFIC INCIDENT MANAGEMENT AREAS

The needs and control of all road users through a **TTC** (temporary traffic control) zone shall be an essential part of highway construction, utility work, maintenance operations, and [the management of traffic incidents](#).

Primary functions of TTC at a traffic incident management area are to [move road users reasonably safely and expeditiously](#) past or around the traffic incident, to [reduce the likelihood of secondary](#) traffic crashes, and to [preclude unnecessary use](#) of the surrounding local road system.

MUTCD – Chapter 6I CONTROL OF TRAFFIC THROUGH TRAFFIC INCIDENT MANAGEMENT AREAS

- **Minor** - expected duration under 30 minutes
- **Intermediate** - 30 minutes to 2 hours
- **Major** - duration of more than 2 hours



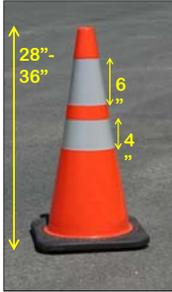
NFPA 1500 – 2007 New Material!

Section 8.7 – Traffic Incidents

- “..all efforts shall be made to protect the members”
- “..establish .. standard operating procedures”
- “Fire apparatus shall be positioned in a blocking position....”
- “....warning devices shall be used to warn oncoming traffic....”
- “First arriving unit shall ensure that traffic is controlled before addressing the emergency”

Roadway Incident Safety for Emergency Responders

NFPA 1901 Revision – Road Cones



- A minimum of five (5) cones will be required for each new motorized fire apparatus
- Recommend that cones meet MUTCD requirements
 - Orange!
 - Minimum 28", suggest 36"
 - Two Reflective bands



Lime-Green Cones

- NOT intended for use on roadways
- Designed for pedestrian traffic on sidewalks
- Guidance is provided by the MUTCD
- Not generally recognized by motorists as a traffic control device

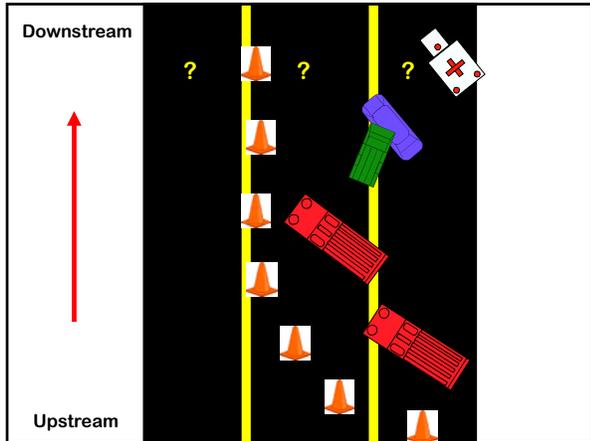
"Best Practices"

• Apparatus Positioning and Arrangement

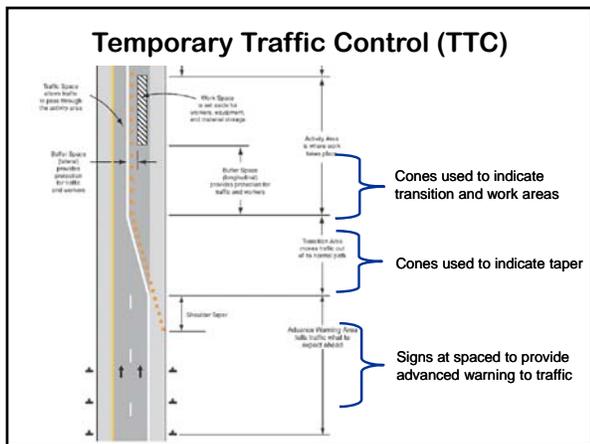
- Guard the scene, guard the crew and the victims
- Park apparatus at an angle & turn the wheels



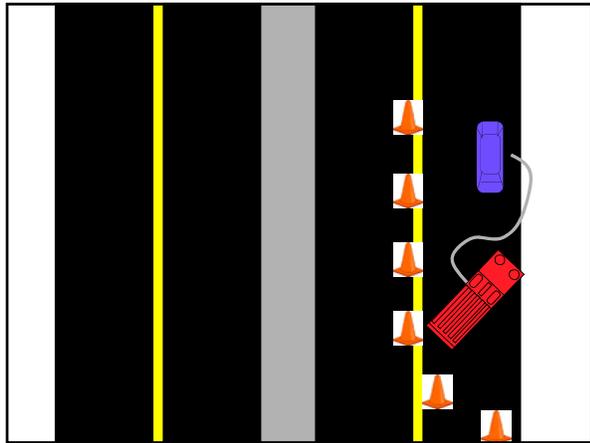
Roadway Incident Safety for Emergency Responders

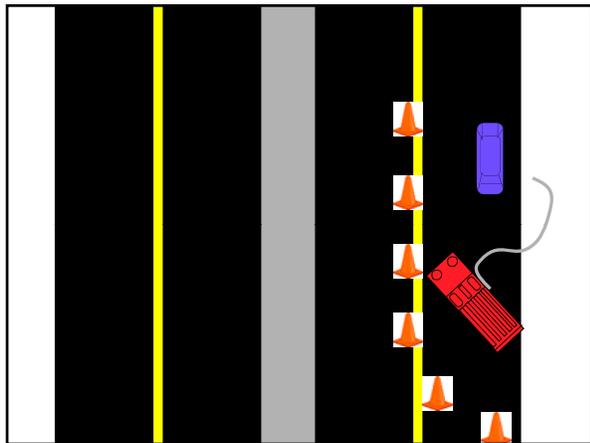


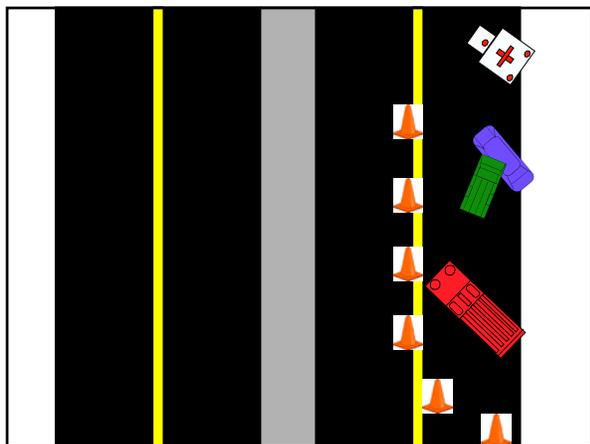




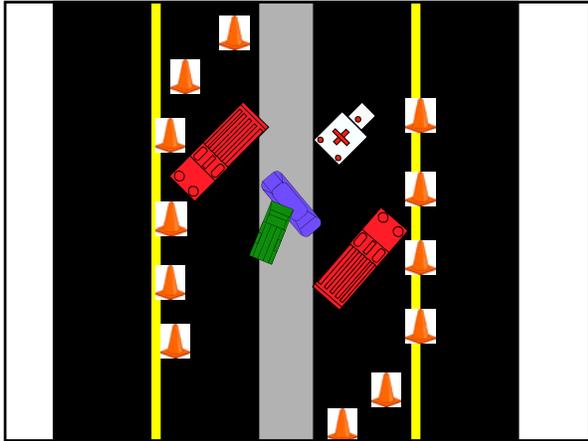
Roadway Incident Safety for Emergency Responders







Roadway Incident Safety for Emergency Responders



“Best Practices”

• Scene Lighting

- Reduce emergency lights, Use “Blocking” mode, Sign Boards, Arrow Boards, Arrow sticks
- Increase use of amber lenses (more apt to slow traffic, draw less rubbernecking)
- Provide scene illumination after dark
- Presence of Police vehicles shown to slow traffic

“Best Practices”

• Work on side away from traffic

- Look !
Before exiting vehicle
- Consider Pump Operators & Location of equipment
- Right-hand traffic stops?



Roadway Incident Safety for Emergency Responders

“Best Practices”

• Personal Protective Equipment

- Use of helmets and full turnouts
- High-visibility PPE
 - Reflective
 - Florescent



“Best Practices”

- Require retro-reflective **AND** florescent PPE
 - Turnout gear may not offer “high visibility”
 - Safety Vests - Get them & Use Them !
 - ANSI 107 - High Visibility Safety Apparel
 - Class 3 garments **MUST** have sleeves
 - ANSI 207 - Public Safety Vest

Public Safety Vests

- Provide access to equipment while worn
- Can be easily worn over firefighting PPE
- Optional breakaway safety feature



Roadway Incident Safety for Emergency Responders

“Best Practices”

- **Design safety features into all new apparatus**
 - Use of better hi-visibility markings on apparatus
 - Space for storage of traffic control equipment
 - Traffic cones
 - Warning signs
 - Traffic control equipment
 - Design warning lights to protect the incident scene
 - Consider location of equipment on truck
 - Rear compartments
 - Pump panel

Apparatus Markings

- NFPA 1901 revisions
 - Requires that 50% of the rear must be marked with high visibility chevrons
 - Red & Lime-green (yellow) combination
- Ambulance markings
 - State and Federal standards

Apparatus Markings

- Vertical Panel
 - MUTCD Section 6F.61 defines chevrons as retro-reflective stripes that slope downward at a 45 degree angle in the direction that traffic is to pass
 - Chevrons cue traffic to go around the vehicle



Roadway Incident Safety for Emergency Responders

Apparatus Markings

Halfway, MD

Amber traffic advisory light

Chevrons on compartment interior

Traffic cones



Apparatus Markings

Montgomery County, MD

Amber traffic advisory lights on each side of apparatus for use during blocking

Chevrons on front and rear of apparatus



“Best Practices”

- **Safety Officer assigned for scene safety**
 - Scene hazards and traffic control
- **Accountability System in Place on ALL Incidents**
 - Ability to account for all personnel on scene
 - Could you identify if any of your crew were under a vehicle that intruded on your scene ?

Roadway Incident Safety for Emergency Responders

NIOSH Firefighter Fatality Investigation Recommendations

- Implement an incident management system to manage all emergency incidents.
- Establish a unified command for incidents that occur where multiple agencies have jurisdiction.
- Ensure that a separate incident safety officer (independent of the incident commander) is appointed.
- Establish pre-incident agreements with law enforcement and other agencies such as the highway department.
- Ensure that fire fighters are trained in safe procedures for operating in or near moving traffic.

NIOSH Firefighter Fatality Investigation Recommendations

- Establish, implement and enforce, standard operating procedures (SOP's) regarding emergency operations for highway incidents.
- Position apparatus to take advantage of topography and weather conditions (uphill / upwind) & protect firefighters from traffic.
- First control oncoming vehicles before addressing the emergency event, in the event the police have not arrived.
- Ensure that personnel position themselves and victims in a secure area, when it's not possible to protect the incident scene.
- (DOT) - Use of "variable message signs" to inform motorists of hazardous conditions or vehicular accidents.

NIOSH Firefighter Fatality Investigation Recommendations

- Ensure that personnel park or stage unneeded vehicles off the street / highway whenever possible.
- Ensure that personnel wear personal protective clothing that is suitable to that incident while operating at an emergency scene such as a highly reflectorized flagger vest (strong yellow green and orange).
- Use a traffic control device that maximizes your visibility to motorists when controlling traffic.
- Establish pre-incident plans for areas that have a higher rate of automobile incidents.

Roadway Incident Safety for Emergency Responders

“Best Practices”

- **Public Education**
 - Community education about highway “manners”
 - Public service announcements on TV and/or radio, newspaper articles, open house displays, fire prevention programs, bumper stickers, brochures etc.
- **Student and Driver Education**
 - High school classroom sessions
 - Drivers education classes
 - Coordinate with school resource police officers
 - Include EMS agencies
 - Use as a recruitment opportunity!

Take Action !

Awareness



Strategy & Tactics

Training



SOP's

Equipment
(New & Existing)

Leadership

Don't be a Target !

The Emergency Responder Safety Institute

www.respondersafety.com

Sponsored by the Cumberland Valley Vol. Firemen's Assoc.



Roadway Incident Safety References and Resources

Compiled by Jack Sullivan CSP, CFPS – ResponderSafety@gmail.com

The **Emergency Responder Safety Institute (ERSI)**

<http://www.respondersafety.com>

ERSI Model Safe Parking SOP - Safe Positioning While Operating in or Near Moving Traffic

Available as a free download from <http://www.respondersafety.com/Training/Downloads.aspx>

ERSI Model SOG Cone & Flare Deployment at Roadway Incidents

<http://www.respondersafety.com/Training/Downloads.aspx>

The **Emergency Responder Safety Institute** - News and Incident Reports

<http://www.respondersafety.com/News.aspx>

NIOSH Safety and Health Topic: Highway Work Zone Safety

<http://www.cdc.gov/niosh/topics/highwayworkzones/>

National Law Enforcement Officers Memorial

Causes of Police Deaths (1995-2004)

<http://www.nleomf.org/facts/officer-fatalities-data/causes.html>

U.S. Department of Labor, Bureau of Labor Statistics, Census of Fatal Occupational Injuries.

www.bls.gov/iif/

United States Fire Administration - Emergency Vehicle Safety

<http://www.usfa.dhs.gov/fireservice/research/safety/vehicle.shtm>

United States Fire Administration - Roadway Operations Safety

<http://www.usfa.dhs.gov/fireservice/research/safety/roadway.shtm>

USFA/FHWA/IFSTA – “Traffic Incident Management” for fire and emergency service providers.

<http://www.usfa.dhs.gov/fireservice/research/safety/roadway.shtm#B>

National Fire Protection Association (NFPA)

Fire Apparatus standards available at – www.nfpa.org

American National Standard for High Visibility Public Safety Vests

(ANSI/ISEA 207-2006): <http://www.safetysafetyequipment.org/c/std207-2006.cfm>

American National Standard for High-Visibility Safety Apparel & Headwear

(ANSI/ISEA 107-2010): <http://www.safetysafetyequipment.org/c/std107-2010.cfm>

The Manual on Uniform Traffic Control Devices (MUTCD) 2009 Edition (12/2009)

http://mutcd.fhwa.dot.gov/kno_2009.htm

The Manual on Uniform Traffic Control Devices (MUTCD) 2009 Edition

Chapter 6-I. - Control of Traffic through Traffic Incident Management Areas

<http://mutcd.fhwa.dot.gov/htm/2009/part6/part6i.htm>

Evaluation of Chemical and Electric Flares (US Dept of Justice)

<http://www.ncjrs.gov/App/Publications/abstract.aspx?ID=246237>

The Manual on Uniform Traffic Control Devices (MUTCD) 2009 Edition
Examples of Traffic Incident Management Area Signs
http://mutcd.fhwa.dot.gov/hdm/2009/part6/fig6i_01_longdesc.htm

NIOSH - Building Safer Highway Work Zones: Measures to Prevent Worker Injuries
From Vehicles and Equipment (DHHS/NIOSH Pub. No. 2001-128):
<http://www.cdc.gov/niosh/docs/2001-128/>

NIOSH - Traffic Hazards to Fire Fighters While Working Along Roadways
<http://www.cdc.gov/niosh/docs/2001-143/>

NIOSH Firefighter Fatality Investigations and Prevention Program
Investigations Involving "Struck-By" Incidents:
<http://www.cdc.gov/niosh/fire/>

NIOSH Report 99F-27 - August 5, 1999 Incident in Oklahoma
2 Career firefighters were struck on an interstate; one was killed.
Available on the internet: <http://www.cdc.gov/niosh/fire/reports/face9927.html>

NIOSH Report 99F-38 - September 27, 1999 Incident in South Carolina
Firefighter dies after being struck by a tractor trailer truck.
Available on the internet: <http://www.cdc.gov/niosh/fire/reports/face9938.html>

NIOSH Report F2003-37 - Oct 27, 2003 Incident in Minnesota
Assistant chief is struck and killed at road construction site
Available on the internet: <http://www.cdc.gov/niosh/fire/reports/face200337.html>

NIOSH Report F2003-16 - Feb 23, 2003 Incident in New Jersey
Fire police captain dies from injury-related complications after being struck by motor vehicle
Available on the internet: <http://www.cdc.gov/niosh/fire/reports/face200316.html>

NIOSH Report F2003-13 - Mar 18, 2003 Incident in Texas
Firefighter killed while walking across an Interstate highway
Available on the internet: <http://www.cdc.gov/niosh/fire/reports/face200313.html>

NIOSH Report F2002-38 - Jul 01, 2002 Incident in Minnesota
Fire captain killed, two fire fighters and police officer injured when struck by a motor vehicle
Available on the internet: <http://www.cdc.gov/niosh/fire/reports/face200238.html>

NIOSH Report F2002-35 - Jun 08, 2002 Incident in Florida
Off-duty career fire fighter dies and another fire fighter is injured after being struck by a truck
Available on the internet: <http://www.cdc.gov/niosh/fire/reports/face200235.html>

NIOSH Report F2002-18 - Apr 11, 2002 Incident in Kansas
Fire chief dies after being struck by a fire truck at a motor-vehicle incident
Available on the internet: <http://www.cdc.gov/niosh/fire/reports/face200218.html>

NIOSH Report F2007-26 – July 27, 2007 Incident in Illinois
Fire Fighter Dies When Struck By a Bus While Working Along an Interstate Highway
Available on the internet: <http://www.cdc.gov/niosh/fire/reports/face200726.html>