North Florida TPO
Transportation Planning Organization
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TIME 4 SAFETY

Traffic Incident Management Handbook

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Background

The Traffic Incident Management Handbook was funded by North Florida Transportation Planning Organization (North Florida TPO) and developed by HNTB Corporation in Jacksonville, Florida. Time for Safety (TIM4Safety) is a comprehensive multi-agency, multi-discipline program, dedicated to improving responders' safety, coordination, and enhancement of the Traffic Incident Management within the northeast Florida region. This effort is in support of the ITS coalition whose membership includes North Florida TPO, Jacksonville Transportation Authority, Florida Department of Transportation, City of Jacksonville, and other members of the northeast Florida Intelligent Transportation Systems Coalition. The study area encompassed four counties within the North Florida TPO boundary - Clay, Duval, Nassau, and St. Johns, as well as, neighboring counties - Alachua, Baker, Bradford, Flagler, Putnam and Union.

On October 14, 2008, North Florida TPO in association with Florida Highway Patrol hosted a northeast Florida Traffic Incident Management stakeholders' workshop in Jacksonville, Florida. This workshop attracted multi-disciplinary representatives from law enforcement, fire and rescue, road ranger, towing and recovery, and transportation agencies within northeast Florida. Through discussions and hands on activities during this four hour workshop, all attendees were encouraged to comment on previously submitted standard operating guidelines, which were also briefly presented during the session. Based on comments received during and after the workshop, as well as after reviewing other nationwide initiatives, this Traffic Incident Management (TIM) Handbook was created. The handbook can be downloaded from the North Florida TPO website at www.northfloridatpo.com.

In addition to the handbook, five training modules were produced in the form of eight to ten minute videos. These are also available through the North Florida TPO.

Acknowledgements

The following agencies provided their relentless support and encouragement in developing the TIM Handbook and training modules:

- Florida Highway Patrol
- Florida Department of Transportation
- Clay County Sheriff's Office
- Clay County Fire and Rescue Department
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- Jacksonville Sheriff's Office
- Jacksonville Road Ranger Service
- Jacksonville Towing and Recovery Agencies
- Nassau County Fire and Rescue Department
- Nassau County Sheriff's Office
- St. John's County Fire and Rescue Department
- St. John's County Sheriff's Office

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1. INTRODUCTION

1.1. Need for this Project

Between 1997 and 2006, 153 law enforcement officers[1] and 49 firefighters[2] lives were lost in the US because of traffic crashes that occurred during incident management conditions.

In addition to the loss of human life, there are major economic impacts associated with the traffic incidents. According to a report released by the Maryland Department of Transportation, the cost of congestion resulting from traffic incidents is $14 per person per hour for passenger movements and $71 per hour for commercial vehicles. According to another report released by American Automobile Association (AAA), the average annual cost to Americans because of the congestion delay is $12 billion, and 40 percent ($4.8 billion dollars) of that is attributable to the congestion delay resulting from traffic incidents. The report also states that the average per-minute cost to Americans because of the traffic incident congestion is $7,000.

The US Fire Administration (USFA), National Traffic Incident Management Coalition (NTIMC), and National Incident Management System (NIMS) have identified the following factors as contributors to safety risks and increased congestion during traffic incidents:

- Careless, inattentive, and impaired drivers
- Failure to establish proper temporary traffic control devices around the incident scene
- Improper positioning of response vehicle within the traffic incident management area
- Inappropriate response vehicle lighting
- Low visibility condition
- Altered traffic pattern as a result of the travel lanes affected by the incident

While responders are often acutely aware of the predominant dangers that they face everyday, the risk of working in or near the live traffic is often overlooked. **To ensure their safety while at the traffic incident scene, responders must take some proactive approach to the traffic incident management.** Therefore, to improve safety and reduce the risk of being injured, the following strategies are necessary:

- Enhance the traffic incident management and operations training to include the basics of response vehicle positioning and parking. Use temporary traffic control devices to increase the effectiveness of incident scene clearance and reduce congestion by lowering the safety risk to responders, motorists, and victims.
- Enhance situational awareness learned through training and exercises. Effectively manage operations during the incident to reduce the risk of secondary collisions involving incident management responses.
- Enhance visibility of incident management personnel using retroreflective apparel such as high-visibility vests, and visibility of response vehicles with vehicle lighting and taping.

1.2. Purpose

The purpose of this handbook is to establish standard guidelines and recommendations for traffic incident management and operations. The objectives of these guidelines are to improve safety of the responders, motorists, and victims and to enhance the efficiency of the incident scene clearance, thereby reducing congestion and secondary incidents.

This handbook provides standard guidelines to the incident responders for incident management processes. Incident management is a dynamic and responsive activity. The availability of equipment and personnel and situational awareness should guide the appropriate response during any incident.

[1] National Law Enforcement Officers Memorial Funds, website: www.nleomf.com/TheMemorial/Facts/causes.htm
[2] US Fire Administration Traffic Incident Management Systems report, April 2008, website: www.usfa.dhs.gov/downloads/pdf/publications/tims_0408.pdf

1.3. Traffic Incident Management Definition

Traffic incident management is a planned, systematic, and coordinated effort between different agencies to respond to an incident by optimizing the use of technical, material, and human resources to achieve safe and efficient incident clearance.

1.4. Benefits of Traffic Incident Management

At a national level, the benefits attributed to formal traffic incident management programs include enhanced safety of responders, motorists, and victims and reduced congestion duration and probability of secondary collisions. The National Traffic Incident Management Coalition conducted extensive research nationally and internationally on various traffic incident management programs and identified the following benefits:

- Reduced incident duration by 65 percent
- Reduced secondary collision between 30 and 50 percent
- Improved responders' safety by reducing the number of responders who were struck by vehicles

Traffic incident management programs in states such as Michigan, California, Washington, and Wisconsin have also identified the following benefits:

- Enhanced interagency communication
- Enhanced efficiency of first responders through coordinated responses to an incident
- Enhanced awareness of interagency operating procedures
- Promotion of common terminology between responding agencies
- Improved dissemination of incident information

1.5. Study Area

The North Florida Transportation Planning Organization initiated this project to establish a set of regional traffic incident management operating guidelines for all the agencies that respond to traffic incidents. The North Florida TPO service area includes the entire Duval County and parts of Clay, Nassau, and St. Johns Counties as shown in Figure 1.

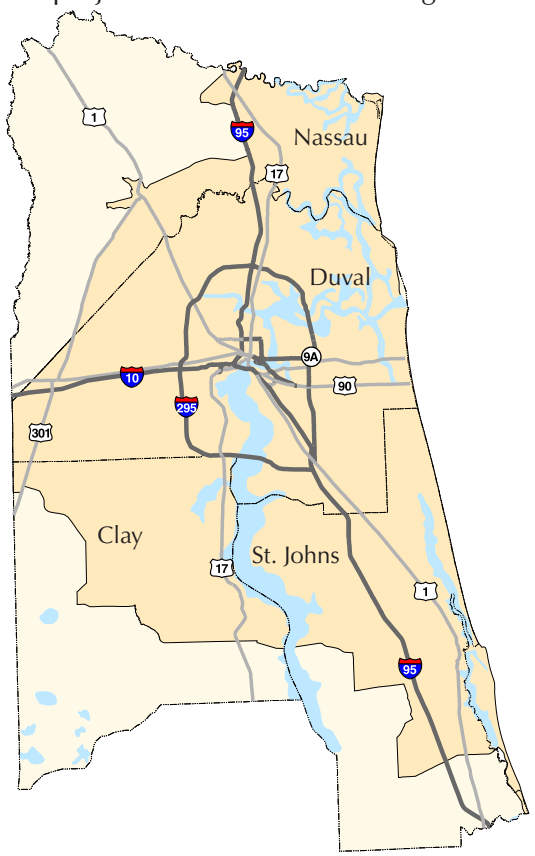


FIGURE 1. NORTH FLORIDA TPO SERVICE AREA MAP

Source: Modified from North Florida TPO

2. REGIONAL TRAFFIC INCIDENT MANAGEMENT PLAN FOUNDATIONAL INFORMATION

The handbook provides recommendations and guidelines to improve responders' safety during incident response develop measures of effectiveness for successful implementation and ongoing execution of traffic incident management. Various nationwide initiatives, as mentioned below, were used as a foundational source of information to support the guidelines, policies, and technical materials developed for this handbook. This foundational information is in the form of directives, concepts, training, or formal documents that incident responders refer to periodically to carry out various traffic incident management activities. To be consistent with the policies and procedures existing nationwide, this handbook synthesizes the concepts illustrated in the following nationwide and State of Florida statutes and initiatives.

2.1. 2003 Homeland Security Presidential Directive (HSPD-5)

To receive federal funding, the 2003 Homeland Security Presidential Directive on Management of Domestic Incidents mandates all federal departments and states, territories, tribes, and local governments to adopt National Incident Management Systems in their standard operating procedures. Along with this directive, the Federal Highway Administration (FHWA) also supports the Incident Command System concept and promotes it among all transportation professionals by sponsoring the 2003 Model Procedures Guide for Highway Incidents and 2008 Simplified Guide to the Incident Command System for Transportation Professional.

2.2. National Incident Management System (NIMS)

The Department of Homeland Security developed the National Incident Management System[3] concept in 2004 following the Homeland Security President Directive. The National Incident Management System training provides uniform sets of processes and procedures for the incident management nationwide, which enables responders to work together, manage all levels of domestic incidents, and support the Incident Command System at the incident scene. More information on Incident Command is provided in a later section.

2.3. Incident Command System (ICS)

In 1980, a program called National Interagency Incident Management System (NIIMS) integrated the Incident Command System[4] in its policy, which was later endorsed by various federal agencies to integrate this program in their standard operating procedures. However, this initiative was mandated fully only after the HSPD-5 directive released in 2003. A successful implementation of the Incident Command System enables integrated communication and planning by establishing manageable span of control on different organizations with various jurisdictional boundaries. Incident Command System includes five manageable functions for emergency response operation (1) command, (2) operation, (3) planning, (4) logistics, and (5) finance and administration.

2.4. Unified Command (UC)

Unified Command supports the role of Incident Commanders from multiple disciplines to work on a common goal of safe, efficient, and quick incident scene clearance while they are carrying out their own jurisdictional responsibilities. Although a single Incident Commander handles the command function, an Incident Command System organization should be expanded into Unified Command System to carry out a multi-disciplinary coordinated effort.

[3] National Incident Management System website: www.nimsonline.com
[4] US Department of Labor Occupational Safety and Health Administration website: www.osh.gov/SLTC

2.5. Emergency Responder Safety Institute (ERSI)

The Emergency Responder Safety Institute serves as an informal advisory panel of public safety leaders committed to reduce fatalities and injuries of the emergency responders on the nation's streets, roads, and highways. The members of this institute include trainers, writers, managers, government officials, technical experts, and leaders who bring together their institutional and technical expertise. The website[5] provides detailed information on various responder safety tips and trainings.

2.6. National Traffic Incident Management Coalition (NTIMC)

The National Traffic incident Management Coalition,[6] launched in 2004, is a coalition of various incident responder organizations such as American Automobile Association, American Association of State Highway and Transportation Officials (AASHTO), International Association of Fire Fighters (IAFF), International Association of Fire Chiefs (IAFC), and others to promote the safe and efficient management of traffic incidents. This coalition established the National Unified Goal (NUG) in association with the national and international traffic incident responder's organizations. The National Unified Goal is organized into three main objectives:

- Responders' safety
- Safe and quick clearance
- Prompt and reliable incident communications

The National Unified Goal promotes these objectives though 18 strategies that include development of multi-jurisdictional and multi-disciplinary traffic incident management policies, procedures, and training.

2.7. US Department of Transportation (USDOT) Traffic Incident Management Program

The US Department of Transportation Traffic Incident Management Program[7] was initiated almost a decade ago as a part of a larger all-hazard program called Emergency Transportation Operations (ETO). This program is established to address six different areas of traffic incident management:

1. Traffic incident management self-assessment
2. Traffic incident management performance measures
3. Quick clearance
4. Incident command system
5. Integrated communication
6. Planned special event traffic management

It is important for the traffic incident management stakeholders within North Florida TPO service area to familiarize themselves with these federal guidelines.

2.8. North Florida Intelligent Transportation Systems Master Plan

Intelligent Transportation System (ITS) includes the dynamic message signs (DMS), highway advisory radio (HAR), closed circuit television (CCTV) camera, and others for the management and operation of the roadway facilities. These systems help perform various functions in traffic incident management including incident detection, verification, and information dissemination to travelers and incident responders.

[5] Emergency Responder Safety Institute website: www.respondersafety.com
[6] National Traffic Incident Management Coalition website: www.timcoalition.org
[7] US Department Of Transportation Traffic Incident Management Program website: www.ops.fhwa.dot.gov/incidentmgmt/index.htm

In April 2006, the North Florida TPO, then called the First Coast Metropolitan Planning Organization, in partnership with the Jacksonville Transportation Authority, Florida Department of Transportation District 2, City of Jacksonville, and other members of the First Coast Intelligent Transportation Systems Coalition developed a Regional Intelligent Transportation Systems Master Plan to:

- Establish the region's vision and goals for intelligent transportation systems
- Determine the steps needed to achieve those goals
- Guide the Coalition in coordinating, integrating, and prioritizing projects

The study area encompassed four counties within the North Florida TPO boundary - Clay, Duval, Nassau, and St. Johns, as well as neighboring counties - Alachua, Baker, Bradford, Flagler, Putnam and Union. The project was completed in the fall of 2007. The Regional Intelligent Transportation Systems Master Plan was divided into the following four parts:

- *First Coast Regional Intelligent Transportation Systems Operational Concept*, which presents the regional mission, vision, goals and objectives, identifies the stakeholders that play a part in regional intelligent transportation system activities, and defines their roles and responsibilities for providing key transportation services within the region.
- *First Coast Regional Intelligent Transportation Systems Architecture*, which is a roadmap for transportation systems integration in the First Coast region over the next 10 years.
- *Approach to Intelligent Transportation Systems Project Planning and Implementation*, which defines a process that will bring the proposed projects into the funding mainstream of either the North Florida TPO or other mechanism for areas outside the North Florida TPO.
- *Five- and Ten-year Implementation Plan*, which establishes the planned deployments for the members of the Coalition in the near- and mid-term periods.

This project builds on the work completed as a part of the Regional Intelligent Transportation Systems Master Plan to define in detail the regional traffic incident management for responders' safety.

2.9. Existing State of Florida Policies, Procedures, and Statues

The State of Florida has various policies and procedures that are intended to ensure quick clearance of the scene and the safety of responders. They are listed below:

2.9.1. Open Road Policy – Quick Clearance for Safety and Mobility

In 2002, the open road policy[8] was established statewide between Florida Highway Patrol and Florida Department of Transportation to expedite the removal of vehicles, cargo, and debris from roadways of the State Highway System to restore, in an urgent manner, the safe and orderly flow of traffic following a motor vehicle crash or incident on Florida's roadways. This policy encourages all incident responders to work together to quickly restore the normal traffic flow condition. The policy states that incidents should be cleared from the roadway within 90 minutes of arrival of the first responder at the incident scene.

2.9.2. Rapid Incident Scene Clearance (RISC)

The Florida Department of Transportation District 7, or Florida's Turnpike Enterprise, started the Rapid Incident Scene Clearance program[9] in 2004. This program helps meet the Open Road Policy's goal of clearing major incidents and truck crashes within 90 minutes of arrival of the first responder at the incident scene. It ensures that only the highly trained certified wrecker and heavy recovery equipment operator responds to the incident scene with proper equipment to clear the incident scene quickly and efficiently. In July 2007, the FDOT executive board voted to expand the Rapid Incident Scene Clearance program as a statewide effort.

[8] Visit FDOT website: www.dot.state.fl.us/trafficoperations/Traf_Incident/pdf/Open_Roads_Policy_FDOT_FHP.pdf
[9] Visit the statewide Traffic Incident Management Program website: www.dot.state.fl.us/trafficoperations/Traf_Incident/pdf/TIM%20Strategic%20Plan%20Final.pdf

2.9.3. Mitigation of Accidental Discharges of Motor Vehicle Fluids (Non-cargo)

In 2004, the State of Florida released the Mitigation of Accidental Discharges of Motor Vehicle Fluids (Non-cargo) guidelines to provide direction to responders of crashes involving spilled vehicle fluids to reduce the confusion and subsequent delays in reopening roadways when spilled vehicle fluids are involved. The goal is to provide guidance to the first responders and assist them in meeting the Open Road Policy goal to clear the incident within 90 minutes of arrival of the first responder at the incident scene. These guidelines were prepared and endorsed in coordination with Florida Department of Transportation, Florida Department of Environmental Protection, and Florida Highway Patrol.

2.9.4. Florida Sate Statute 316.061: Crashes Involving Damage to Vehicle or Property

Statute 316.061 was established to prevent the unnecessary delay to the traveling public when a vehicle is involved in a crash or disabled on the road. As stated in the statute, "if a damaged vehicle is obstructing traffic, the driver of such vehicle must make every reasonable effort to move the vehicle or have it moved so as not to block the regular flow of traffic." A recent statewide campaign by Florida Highway Patrol called "Move It. Yes You Can!" was also developed to raise motorists' awareness to this law.

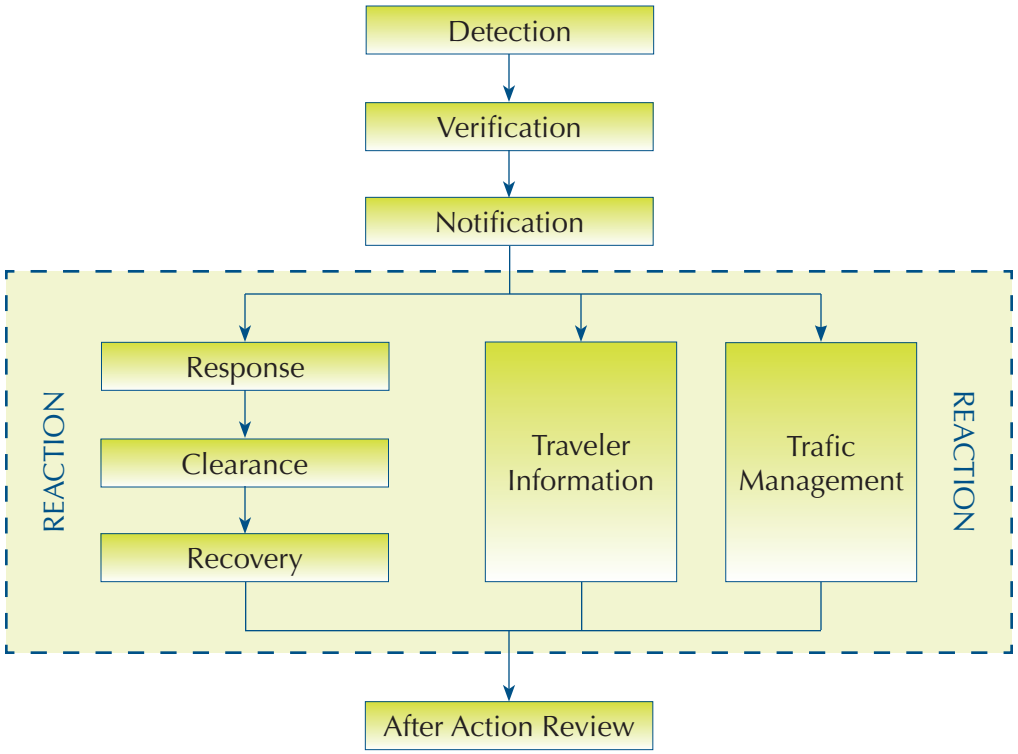
2.9.5. Florida State Statute 316.126 (1) (b): Operation of Vehicles and Actions of Pedestrians on Approach of Authorized Emergency Vehicle

Statute 316.126(1) (b) outlines the recent statewide initiative called "Move Over or Slow Down" when approaching an emergency vehicle attending the incident scene or investigation. An excerpt from this statute is, "when an authorized emergency vehicle making use of any visual signals is parked or wrecker displaying amber rotating or flashing lights then the driver of every approaching vehicle shall (1) vacate the lane closest to the emergency vehicle or wrecker, or (2) slow to a speed that is 20 miles per hour less than the posted speed limit when posted speed limit is 25 miles per hour or greater."

3. TRAFFIC INCIDENT MANAGEMENT PROCESSES

Traffic Incident Management is a systematic, planned, and coordinated use of human, institutional, mechanical, and technical resources to improve safety of responders, motorists, and victims to reduce incident duration. Figure 2 below provides an overview of the standard processes involved in traffic incident management.

FIGURE 2. TRAFFIC INCIDENT MANAGEMENT STANDARD PROCESSES



3.1. Detection

Incident detection is the process of discovering and identifying the incident on the roadway system. Motorists are most vulnerable from the time an incident occurred until the additional help arrives; therefore, early incident detection is of primary importance. Typically, motorists driving by an incident scene are the first ones to detect the incident and notify law enforcement through 911. The responders that are involved in the detection process are:

- Law enforcement officers on patrol
- Traffic Management Center (TMC) operators
- Public works department personnel such as Road Rangers

3.2. Verification

The incident verification process immediately follows the incident detection. It is the process of confirming the incident time, location, and detail. Accurate incident verification is vital for an appropriate response. There are two types of incident verifications:

1. Location verification – involves identifying the physical location of the incident (mainline, ramp, intersection), direction of travel, nearest mile markers, etc.
2. Incident detail verification – involves identifying the number of vehicles involved, extent of damage, number of lanes affected, types of injuries, etc.

If the traffic management center camera coverage is available at the incident scene, the camera operators should assist with the verification process. If there is no camera coverage, the verification is attained through the road users or responding agency personnel who detect the incident and contact the dispatch center.

3.3. Notification

Incident notification is the process of informing the proper response agencies about the incident with the details collected in the detection and verification processes. The need to notify an agency typically depends on the incident and the responding agency's jurisdictional boundary. If the notified agency does not have the required amount of response personnel or resources, they may contact the non-jurisdictional counterpart for a response. An early and proactive notification to all the responding agencies is the key for a quick incident response.

3.4. Response

Incident response is the start of the process of reacting to an incident with appropriate technical, material, and human resources needed for deployment at the incident scene. Once the responding agency is notified, it is their personnel's responsibility to assess and solicit required resources for the incident and determine the fastest and/or shortest route possible to arrive at the incident scene. The first responder at the incident scene is responsible for the following:

- Securing the incident scene by deploying temporary traffic control (TTC) devices
- Parking the response vehicle upstream of the incident to protect the incident scene
- Assuming the role of Incident Commander
- Attending the victim and providing first aid until additional help arrives
- Assessing the need for additional responder or resource for a safe and quick clearance

Incident scene management is an important aspect of the response process, which involves proper assessment of the incident, establishing priorities at the scene, maintaining clear communication between the responding agencies, and establishing an on-scene point of contact or Incident Commander for incident management. The response duration occupies a major portion of the incident duration and includes responders' arrival time, temporary traffic control device deployment time, and time required to solicit additional resources to the incident scene. Additional information on first responder is provided in Section 4.0.

3.5. Clearance

Incident clearance is the process of removing incident debris and fuel spill contents that may hinder the normal traffic flow. There are two different types of clearance processes as identified below:

1. Roadway clearance – includes removal of vehicle wreckage, debris, spilled fuel, and other material from the travel lane to restore the normal traffic flow.
2. Incident scene clearance – follows the roadway clearance, which includes damage repair, responder's departure from the incident scene, and clearance of any remnants of the incident from the incident scene.

The typical order of responder departure from the incident scene is:

1. Emergency medical services

2. Fire and rescue
3. Towing and recovery
4. Law enforcement
5. Road Rangers

Typically, the law enforcement officer and/or Road Ranger are the last ones to depart from the incident scene, after ensuring that the incident scene is cleared of any debris or blockage. Depending on the incident severity and the number of response agencies involved at the incident scene, the clearance duration may vary.

3.6. Recovery

Incident scene recovery is the last process of the incident reaction chain. It is the process of restoring the normal or close-to-normal (in case of a major highway damage or fuel spills) traffic flow condition on the roadway system. The following are the main activities involved in the recovery process:

- Recovering the roadway from any damage caused by the incident
- Removing temporary traffic control devices from the incident scene
- Lifting the alternate route or detour restrictions
- Informing drivers of the return to normal traffic flow condition
- Departure of the responders from the incident scene

The agencies involved in the recovery process are roadway maintenance, law enforcement, and public works.

3.7. Traveler Information

Traveler information involves disseminating the accurate and timely information to the public using various resources such as internet, radio stations, dynamic message signs, highway advisory radios, and others. Providing accurate and timely information helps motorists in making an informed en-route decision, such as whether to continue on the same route or detour. The effective and continuous use of this process reduces congestion through the incident scene. It is important to disseminate the incident information until the traffic condition returns to normal; sometimes, major incidents require continuous information dissemination for several hours. Information Service Providers (ISPs), local media, and radio announcements are the traditional sources of information dissemination. The regional traffic management center, 511 call-in system, and internet are playing an increasing role in traveler information dissemination.

3.8. Traffic Management

Traffic management is the process of managing traffic around the incident scene to improve incident scene safety. Traffic management around the incident scene is classified into the following three categories:

1. Approach
2. Access or exit
3. Detour or alternate route

3.8.1. Approach Traffic Management

Traffic approaching an incident scene is most vulnerable to the roadway obstructions, which may potentially trigger a secondary incident. The objective of approach traffic management is to make the incident area as prominent as practical to warn motorists using temporary traffic warning signs and traffic control devices.

3.8.2. Access or Exit Traffic Management

Access or exit traffic management is a safety precaution adopted by incident responders while entering and exiting the incident area. These movements should be limited, controlled, and monitored by response personnel to ensure a high level of safety for responders and passing motorists. In addition, proper use of turn signals, strobe lights, flashers, etc., increases the visibility of responders and warns traffic of their intention.

3.8.3. Detour or Alternate Route Traffic Management

Detour or alternate route traffic management is a process of managing traffic passing through the incident scene using standard equipment such as detour signs and portable changeable message signs (PCMS) to reduce congestion around the incident scene and thereby reduce the chances of secondary collisions. Incident commanders should prepare and implement the detour or alternate routes with the help of the local public works department, usually directed from the traffic management center.

Once detoured, it is very important for motorists to have continuing directional signs to route them back to their original path. The local public works department may provide additional personnel when requested. The signs typically involved are temporary traffic control signs, trailblazer signs or portable changeable message signs along the alternate route.

3.9. After Action Review

Emergency responders within the North Florida TPO service area meet periodically at regional traffic incident management team meetings led by FDOT District 2. These meetings provide stakeholders a platform for open communication, which strengthens their working relationship and enhances the state of the practice for incident management within the region.

Responders at the incident scene should fill out an after action review form with their comments and suggestions as requested in the evaluation form provided in Appendix A. Each responder should fill out this evaluation form, preferably away from the roadway facility or in their office, to submit to their agency supervisor. The supervisors should bring these forms to the periodic traffic incident management team meetings for discussion and submittal to the team leader.

4. TRAFFIC INCIDENT MANAGEMENT FIRST RESPONDER

The first responder to the incident scene is the first person who detects the incident and notifies the dispatch center and/or secondary responders. The typical first responders to the incident scene are:

- Law enforcement officer
- Fire and rescue personnel
- Public works department personnel or Road Ranger
- Towing and recovery agency personnel
- Florida Department of Transportation personnel
- HAZMAT agency personnel
- Local media or public information office personnel

The most frequent type of first responder to the incident scene is the law enforcement officer. Local media or public information office personnel are included in the first responder category because of the the nature of their profession. They are frequently out on the road and may encounter the incident first hand. Unlike other responders, they only participate in the initial process of detecting, verifying, and notifying the incident to 911 dispatch center.

4.1. Guidelines and Responsibilities of the First Responders

The following statements highlight the important guidelines and responsibilities of the first responders at the traffic incident scene:

- Put on the safety apparel before exiting the response vehicle
- Park response vehicle upstream of the incident scene with warning lights activated
- Approach the incident scene with caution and while keeping an eye on traffic
- Assume the role of Incident Commander
- Provide first aid to the victim as appropriate
- Set up the initial taper using the traffic cones available
- Assist removing or moving disabled vehicle away from the travel lane to open the travel lane to the traffic
- Assess the incident scene by estimating the
    - Incident severity
    - Traffic delay and back-up
    - Incident duration
    - Required resources
- Notify other responders to solicit additional resources
- Assist other responders to access the incident scene safely
- Transfer the role of Incident Commander, as appropriate

5. INCIDENT TYPES

For the purpose of traffic incident management, four incident types have been identified, in conformance with the State of Florida's Open Road Policy.

5.1. Catastrophic Incident

Catastrophic incidents are natural or man-made disasters that include lane closures with an extended duration typically ranging from **12 hours to several days**. Catastrophic incidents may require attention from agencies such as the State Warning Point, Florida Department of Environmental Protection, Homeland Security, HAZMAT contractors, and others. Catastrophic incidents may be caused by, but are not limited to:

- Major bridge damage
- Wild fire related closures
- Weather related closures such as major storm or hurricane
- Crashes that have a significant environmental impact, suc as a significant HAZMATspill
- Acts of terrorism or vandalism

5.2. Major Incident

Major incidents have an expected duration ranging from **90 minutes to 12 hours** and require coordination between different agencies including federal agencies. Major incidents are long-duration incidents and typically require setting up a complete traffic incident management area. Major incidents may be caused by, but are not limited to:

- Chain-reaction crashes
- Severe injury and/or fatal crashes
- Environment-related crashes such as a fuel spill
- Weather-related closures such as fog or major storm

5.3. Intermediate Incident

Intermediate incidents have an expected duration **between 30 and 90 minutes**. The upper time limit conforms to the State of Florida's open road policy, which sets a goal of clearing all incidents within 90 minutes. Intermediate incidents usually require setting up a proper traffic incident management area. Intermediate incidents may be caused by, but are not limited to:

- Major roadway debris
- Overturned vehicles
- Non rollover multiple vehicle crashes
- Rollover and/or multi-vehicle crashes
- Commercial carrier crashes

5.4. Minor Incident

Minor incidents involve events with a duration **less than 30 minutes**. They are the most commonly occurring incident type. Typically, only Road Rangers or the law enforcement officer on patrol respond to the incident scene and assist victims in clearing the incident scene. These incidents require minimum coordination between responding agencies. Minor incidents may be caused by, but are not limited to:

- Minor property damage
- Disabled vehicle
- Roadway debris

6. STAKEHOLDERS' ROLES AND RESPONSIBILITIES

This section provides the description of each stakeholders roles and responsibilities during each traffic incident management process as shown in Table 1.

TABLE 1. STAKEHOLDERS' PARTICIPATION IN TRAFFIC INCIDENT MANAGEMENT PROCESS

Stakeholders	Detection	Verification	Notification	Response	Clearance	Recovery	After Action Review	Traveler Information	Traffic Management
Law Enforcement	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes
Medical Examiner				Possible	Possible		Possible		
Crash and Homicide Investigator				Possible	Possible		Possible		
Fire and Rescue				Yes	Yes	Yes	Yes		Yes
Emergency Medical Service				Yes	Yes	Yes	Yes		Yes
Transportation Agencies									
Traffic Management Center	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Service Patrol	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes
Roadway Maintenance				Possible	Possible	Possible	Yes		Yes
Public Works/Traffic Operations				Possible	Possible	Possible	Yes		Possible
Public Information Office/Media							Yes	Yes	
Private Agencies									
Towing/Recovery	Possible	Possible	Possible	Yes	Yes	Yes	Yes		Yes
HAZMAT				Possible	Possible	Possible	Possible		Possible

6.1. Law Enforcement

The law enforcement officer plays a major role in almost all of the traffic incident management processes. A law enforcement officer often plays the role of Incident Commander or implements Unified Command at the incident scene.

- Detection – the law enforcement officer on patrol may detect the incident first. Alternatively, the law enforcement 911 dispatch center operators may detect the incident with the help of traffic cameras, road user calls, or traffic management center notification.
- Verification and notification – if the law enforcement officer on patrol detects the incident, then they should verify the incident location and details and notify the secondary responders to solicit additional help at the incident scene. If the law enforcement 911 dispatch center operator detects an incident first, then they should detect and verify the incident followed by a notification to the law enforcement officer or other responders.
- Response – the law enforcement officer should perform the following roles:
  - Assume the role of Incident Commander or establish Unified Command in multi-agency responses
  - Secure the incident scene
  - Assist disabled vehicles
  - Provide emergency medical aid until additional help arrives
  - Provide emergency traffic management around the incident scene
  - Safeguard personal property of the victim
  - Solicit additional help at the incident scene as appropriate

  - Communicate and cooperate with various agencies present at the incident scene
  - Assess the incident scene continuously and call for additional help as required
  - Promote temporary channelization of traffic versus complete shutdown of the lanes
- Clearance – the law enforcement officer should perform the following roles:
  - Encourage and assist drivers to remove crash/disabled vehicles from travel lanes
  - Assist fire and rescue personnel to provide aid to the victim
  - Assist in towing and recovery activity
  - Help remove debris from the incident scene
  - Manage and control traffic through the incident area
  - Detour traffic or plan an alternate route with the help of the local transportation agency
  - Conduct police investigation with minimum lane blockage
  - Practice proper emergency light discipline especially during night and bad weather conditions
  - Communicate with media, the public information office, and traffic management center for updates on incident
  - Help other responders in evolving the incident scene
- Recovery – the law enforcement officer should assist other responders in returning the roadway to the normal traffic flow condition. The officer should stay at the incident scene until the recovery process is complete, unless there is HAZMAT or major fuel spill involved at the incident scene and/or he or she is not needed for evidence collection or traffic control purpose.
- Traveler information – law enforcement officers typically do not participate in the traveler information process. However, they may be contacted by the local media, the public information office, and traffic management center as and when appropriate.
- Traffic management – the law enforcement officer at the incident scene should participate in the traffic management process by setting up the lane closures, planning a detour, or preparing an alternate route with the help of the public works department.
- After action review – the law enforcement officers should participate in the after action review meetings.

6.2. Medical Examiners

Medical examiners should report to the incident scene only when there is fatality involved or when called upon by the on-scene law enforcement officer. Medical examiners may participate in the response, clearance, and after action review processes and may share the investigation responsibilities with other agencies to expedite the crash investigation. During the clearance process, the medical examiner may authorize other responding agencies' personnel to move or remove victims from the incident scene. Currently, this responsibility is shared without a formal memorandum of understanding, and it is recommended that such memorandum be established to avoid any liability issues.

6.3. Crash and Homicide Investigators

The on-scene law enforcement officer summons the crash and homicide investigators at the incident scene during severe injury or fatal crashes to participate in the response, clearance, and after action review processes. The homicide investigators should bring sufficient personnel to conduct the investigation quickly or may seek assistance from the on-scene law enforcement officer. Currently, this responsibility is shared without a formal memorandum of understanding and it is recommended that such memorandum be established to avoid any liability issues.

6.4. Fire and Rescue

Fire and rescue personnel should respond to the major incidents involving fire, injury, fatalities, major spills, or presence of HAZMAT. The fire and rescue personnel should be prepared to act as an Incident Commander and establish Unified Command structure at the incident scene as appropriate.

- Detection, verification, and notification – the fire and rescue department typically do not participate in these processes.
- Response – the fire and rescue department should respond promptly to the incident scene and perform the following roles:
  - Secure incident scene by parking upstream of the incident scene
  - Extricate victims
  - Assume the role of Incident Commander and/or participate in Unified Command as appropriate
  - Transfer Incident Command when appropriate
  - Assist establishing the traffic incident management area
  - Park vehicle in a fend-off or angled position
- Clearance – the fire and rescue personnel should coordinate with the Unified Command and perform the following roles:
  - Clean HAZMAT spills
  - Clean cargo, saddle-tank, and major fuel spills and stop further leak
  - Movie or remove crash vehicles
  - Reposition fire and rescue vehicles to minimize lane blockage
- Recovery – the fire and rescue department typically does not participate in the recovery process unless they are responding to an incident involving fire, major spills, or HAZMAT.
- Traveler information – the fire and rescue department typically does not participate in this process unless they are responding to an incident involving fire, major spills, or HAZMAT. In those cases, they should provide a continuous update on incident development to the local media, public information office, and traffic management center as and when appropriate.
- Traffic management – the fire and rescue department plays an important role in traffic management by assessing the partial or complete lane closure for the rescue effort. The fire and rescue personnel should coordinate with the on-scene Unified Command in determining proper vehicle positioning to act as a barrier for the approaching traffic and minimize the lane blockage.
- After action review – the fire and rescue personnel should participate in the after action review meetings.

6.5. Emergency Medical Service

The emergency medical service and fire and rescue departments are one unit within the North Florida TPO service area. Periodically, the private ambulance services are also used as a separate responding unit to the incident scene.

- Detection, Verification, and Notification – the emergency medical service department typically does not participate in these processes.
- Response – the emergency medical service department should respond to the incident scene only when called by the Unified Command or Incident Commander. They may assume the role of Incident Commander and/or participate in Unified Command as appropriate.

- Clearance – emergency medical service personnel should expedite the medical treatment by assessing the possibility of providing only the necessary treatment at the incident scene and continuing the rest of the treatment in the ambulance and/or off the roadway system.
- Recovery – the emergency medical service department typically does not participate in the recovery process.
- Traveler information – the f emergency medical service department typically does not participate in this process.
- Traffic management – the emergency medical service department typically does not participate in this process.
- After action review – the emergency medical service personnel should participate in the after action review meetings when they played a major role.

6.6. Local Transportation Agency or Public Works Department

The local transportation agency or public works department includes traffic engineering, roadway maintenance, Road Ranger, and traffic management center. Their roles within the traffic incident management processes are:

6.6.1. Traffic Engineering

Traffic engineering department personnel involved with incident management may include traffic engineers, transportation planners, and managers. They play an important role in establishing the traffic incident management policies and procedures and may get involved in the following scenarios:

- Soliciting heavy-duty equipment at the incident scene
- Coordinating with agencies that are not typically involved in traffic incident management
- Coordinating response with the roadway maintenance resource office
- Arranging emergency procurement of the additional resources
- Assist in emergency planning such as evacuation, detour, alternate route planning, etc.

Traffic engineering department personnel should participate in the after action review meeting when they play a major role in traffic incident management.

6.6.2. Roadway Maintenance

Roadway maintenance personnel are often on the road and may encounter an incident and participate in the incident detection, verification, and notification processes. The roadway maintenance personnel get involved in traffic incident management processes in the following situations:

- When there is any type of highway damage, the roadway maintenance personnel are responsible to perform or solicit another agency for the repair work. While at the incident scene, the roadway maintenance personnel should assess the extent of highway damage and may perform the repair work at the same time or postpone it to a later date, depending on the extent of damage repair. In situations when the repair work is postponed, they should mark the damaged area properly to warn motorists of the hazard. During repair work, the roadway maintenance personnel may seek help from other agencies, such as law enforcement officers, to close travel lanes for incident scene safety.
- When there is a major incident and it requires procurement of additional resources, the roadway maintenance department may provide material and personnel help. The roadway maintenance or public works department in general provides the arrow boards, portable changeable message signs, additional traffic control devices, and others.

- When there is minor vehicle spill on the roadway, the roadway maintenance personnel may perform the clean-up process, conforming to the State of Florida non-cargo vehicle spill guidelines provided in Appendix E.

The roadway maintenance personnel should participate in the after action review meeting when they play a major role in traffic incident management.

6.6.3 Service Patrol or Road Rangers

The typical services provided by Road Rangers may include changing tires, assisting in moving vehicles, providing jump-starts, providing gasoline, providing first aid or cardio-pulmonary resuscitation (CPR), containing minor spills, and setting up the temporary traffic control devices. The Road Ranger program does not service the entire North Florida TPO service area. However, where this program is available, Road Rangers participate in the following traffic incident management processes:

- Detection, verification, and notification – Road Rangers are often on the road patrolling; therefore, they might encounter the incident first. When the Road Rangers are the first responders, they should notify the traffic management center and request additional help through them. In the case of a minor incident, Road Rangers provide assistance to the disabled vehicle and clean up any debris on the road.
- Response – Road Rangers may also play the role of first responder when they detect the incident first. The role of first responder is provided in Section 4.0. Road Rangers should summon additional help through the traffic management center or may contact the 911 dispatch center.
- Clearance – Road Rangers participate in the clearance process and perform the following roles:
  - Help move the incident vehicles from the travel lanes and provide additional help such as, tire change, jump-start, and provision of gasoline
  - Assist other responders with the temporary traffic control device relocation or removal
  - Clean and remove debris from the roadway
  - Direct traffic around the incident scene using flags and/or arrow boards
  - Mitigate minor spills or leaks and clean up debris
- Recovery – Road Rangers should clean up the incident scene and help recover the normal traffic flow condition.
- Traffic Management – Road Rangers may participate in traffic management and aid other responders with additional resources as requested. Road Rangers should also provide help in setting up the temporary traffic control devices along alternate routes or detours.
- Traveler Information – Road Rangers do not participate in this process; however, they should update the traffic management center periodically on incident scene development.
- After action review – The Road Ranger supervisor should participate in the after action review meetings.

6.6.4. Traffic Management Center

The traffic management center personnel include operators, dispatchers, customer service representatives, and non-engineer managers dedicated to incident management. The operator's primary role is to monitor and help coordinate the incident activities using traffic cameras, dynamic message signs, highway advisory radios, and other means as shown below:

- Detection – the operators continuously monitor the roadway system using traffic cameras and may be involved actively in the incident detection process. The operators may also detect incidents by answering the phone calls directly from the road users.
- Verification – the operators use traffic cameras to verify the incident detail and location. In case of a

road-user phone call, they should ask a series of questions to the callers to complete the verification process.

- Notification – after verifying the incident, the operators should notify the dispatch center and Road Rangers about an appropriate response.
- Response – the traffic management center personnel may help in the response process by performing the following functions:
  - Implement the pre-prepared standard response plan
  - Activate the dynamic message signs
  - Activate the highway advisory radios
  - Notify local media and the public information office
  - Notify management of any severe incident
  - Coordinate with the on-scene responders to summon any additional help
- Clearance – the traffic management center personnel may help in the clearance process by performing the following functions:
  - Continue with the response plan
  - Update the public information office and local media about the incident scene development
  - Coordinate with the on-scene responders
  - Help activate the special response team during major and catastrophic incidents
  - Coordinate with the other regional traffic management centers, if the incident affects their system
- Recovery – the traffic management center personnel should discontinue the response plan once the incident scene is cleared.
- Traffic management – the traffic management center operators typically do not participate in the traffic management process. They may update the Unified Command on the traffic situation around the incident scene when requested.
- Traveler information – the traffic management center department plays a major role in disseminating the traveler information by:
  - Activating traveler information system such as dynamic message signs and highway advisory radios
  - Continuously updating the traveler information as incident evolves
  - Help planning detour or alternate routes and disseminate information to motorists
- After action review – the traffic management center manager or team leader should participate in the after action review meetings.

6.7. Public Information Office

The public information office communicates with the public, information service providers (ISPs), or local media to disseminate traffic and traveler information via radio, television, internet, and mobile phone services. They play a major role in traveler information dissemination and continuously updates.

When the public information office and local media personnel have access to traffic cameras, they may participate in the incident detection, verification, and notification processes. Alternatively, the public information office or local media personnel are often on the road where they may encounter an incident. In

either situation, they should notify the 911 dispatch center.

The public information office and local media personnel do not participate in the response, clearance, and recovery processes. However, they should participate in the after action review meeting when they play a major role in the traffic incident management.

6.8. Towing and Recovery

Towing and recovery agencies may get involved in the following traffic incident management processes:

- Detection, verification, and notification- the towing and recovery truck operators are often on the road and may detect the incident first. In that situation, they should notify the 911 dispatch center. They may play the role of first responders until additional help arrives. Additional information on first responder is provided in Section 4.0.
- Response – the towing and recovery truck operators should respond to the incident scene promptly and come prepared with the equipment and towing vehicles matching the incident need. The operators should verify the incident details with the solicitor to come prepared.
- Clearance – the towing and recovery truck operators play a major role in the clearance process in the following ways:
  - Help remove debris and crash vehicles from the roadway
  - Assist in spill and leak mitigation
  - Transport the crash victim to a safer location
  - Handle financial negotiations outside the incident scene
- Recovery – the towing and recovery personnel should help clean debris and remove temporary traffic control devices.
- Traveler information – the towing and recovery department does not participate in this process.
- Traffic management – the towing and recovery department may help set up the temporary traffic control devices along the traffic incident management area.
- After action review – the towing and recovery personnel should participate in the after action review meetings.

6.9. HAZMAT Mitigation Agencies

The on-scene fire and rescue or law enforcement officer solicits the HAZMAT mitigation agencies[10] at the incident scene. They may assume the role of Incident Commander and/or participate in Unified Command when playing an active role. These agencies should minimize the clean-up time to reduce the amount of HAZMAT exposure and the chances of lingering effects. The HAZMAT agency participates in the after action review process when they play a major role in traffic incident management.

[10] Florida Department of Environmental Protection website: http://www.dep.state.fl.us/
US Coast Guard Environmental Response website: http://www.uscg.mil/D1/response/ENVIRON.htm
More information on the local and federal HAZMAT mitigation agencies can be found at: http://hazmat.dot.gov/hazhome.htm

7. TRAFFIC INCIDENT MANAGEMENT AREA ESTABLISHMENT

A traffic incident management area is the area of a roadway where temporary traffic controls are imposed by the traffic incident responders in reaction to an incident. A traffic incident management area extends from the first warning device (such as a sign or traffic cone) to the last warning device or to a point where vehicles return to the normal or unrestricted traffic flow conditions and are clear of the incident. The traffic incident management area provides a safe working area for responders at an incident scene. Incident responders should establish a traffic incident management area as soon as practical, using all temporary traffic control devices available to them while at the scene.

According to the 2003 Manual of Uniform Traffic Control Devices[11] (MUTCD), the purpose of establishing a traffic incident management area is 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. Responders shall deploy additional temporary traffic control devices when they become available to expand and enhance the traffic incident management area. The traffic incident management area shall evolve as the incident progresses and the number of lanes closed changes.

Manual on Uniform Traffic Control Devices (MUTCD) Chapter 6I provides standards for establishing a traffic incident management area. It states that, "while some traffic incidents might be anticipated and planned for, emergencies and disasters might pose more severe and unpredictable problems. The ability to quickly install proper temporary traffic controls might greatly reduce the effects of an incident, such as secondary crashes or excessive traffic delays. **An essential part of fire, rescue, spill clean-up, highway agency, and enforcement activities is the proper control of road users through the traffic incident management area in order to protect responders, victims, and other personnel at the site while providing reasonably safe traffic flow.** These operations might need corroborating legislative authority for the implementation and enforcement of appropriate road user regulations, parking controls, and speed zoning. It is desirable for these statutes to provide sufficient flexibility in the authority for, and implementation of, temporary traffic control to respond to the needs of changing conditions found in traffic incident management areas." It may not be possible to install temporary traffic control devices for all incident types; however, it is suggested to establish the traffic incident management area whenever possible, especially when it affects the travel lanes. A copy of MUTCD Chapter 6I can be found in Appendix B.

Traffic incident management area consists of four components:

1. Advance warning area
2. Transition area
3. Activity area
4. Termination area

These components are illustrated in Figure 3 and described in the following sections:

7.1. Advance Warning Area

The advance warning area is established upstream of the incident area for alerting oncoming traffic of the incident ahead and to promote a reduction in travel speeds. The advance warning area should include placement of warning signs such as portable changeable message signs, fluorescent pink signs, cones, flares, and other means. The length of advance warning area depends on the road characteristics (rural or urban), geometry (straight or curved section), and speed (low or high). Tables 2a and 2b below show the advanced warning area sign details and spacing:

[11] MUTCD website: http://mutcd.fhwa.dot.gov/pdfs/2003r1r2/pdf_index.htm

TABLE 2A. ADVANCE WARNING AREA SIGN DETAILS

Sign Size	48 in. x 48 in. for high speed road (> 65 MPH) 36 in. x 36 in. for moderate to low speed road
Sign Color	Fluorescent pink with black texts and border
Sign Material	Vinyl rollups
Sign Height[12]	1 ft. for signs mounted on temporary supports
Sign Lateral Clearance[13]	2 ft. - 4 ft. in urban areas 6 ft. – 12 ft. in rural areas

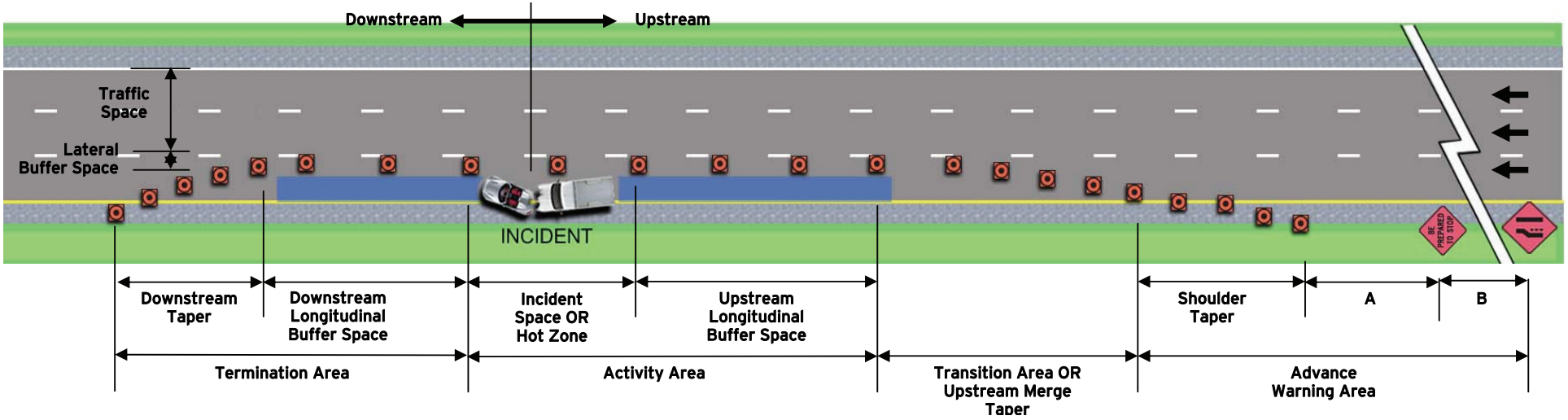
Source for Table 2a and 2b: Modified MUTCD Chapter 6C

[12] Sign height is the distance between the roadway elevation and the bottom of the sign
[13] Sign lateral clearance is the distance between the edge of travel lane and the corner of the sign

TABLE 2B. ADVANCE WARNING AREA SIGN SPACING

Roadway Type	Distance Between Signs (ft.) A	B
Low Speed Urban (less than or equal to 40 MPH)	100	100
High Speed Urban (greater than or equal to 45 MPH)	350	350
Rural	500	500
Expressway/Freeway	1000	1500

FIGURE 3. TRAFFIC INCIDENT MANAGEMENT AREA



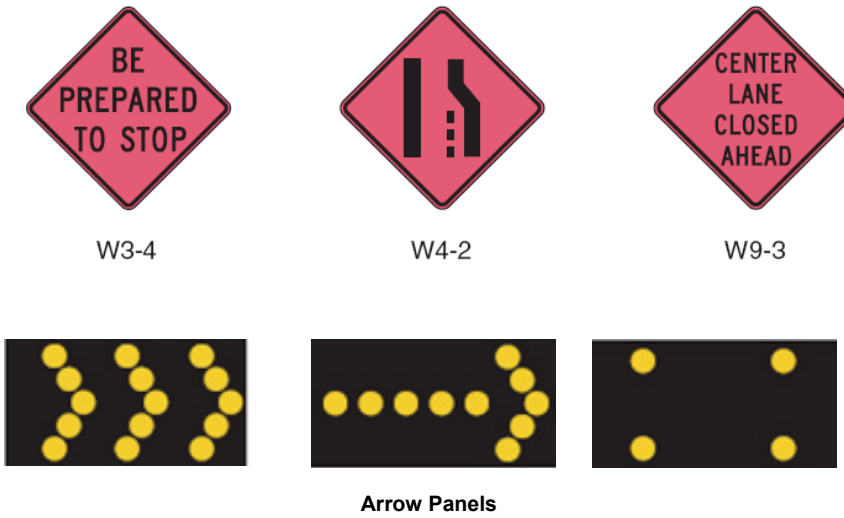
Schematic not to scale
Source: Modified 2003 MUTCD

Use the following checklist while setting up the advance warning signs at the incident scene:

- Set up signs to the left, right, or on both sides of the roadway
- Set up signs perpendicular to the roadway and facing the traffic
- Set up signs well in advance for the roadway with vertical and horizontal curves
- Set up signs at least two feet away from the travel lane
- Set up signs in advance of any visual obstruction such as trees or road curvature

Examples of typical advance warning area signs are shown in Figure 4 below.

FIGURE 4. ADVANCE WARNING AREA SIGNS

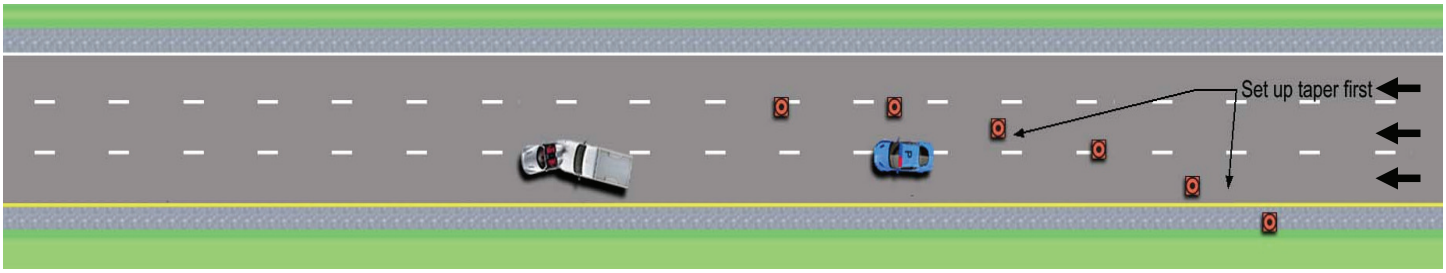


Source: 2003 MUTCD Chapter-6F and 6I

7.2. Transition Area

The transition area is used to redirect approaching traffic out of its normal travel path by setting up a merge taper, as shown in Figure 3. The first responders at the incident scene should use the amount of cones available with them to set up an initial taper, as shown in Figure 5. Because of the limitation of the amount of cones available with each responder, it may not be possible to set up a long taper meeting the MUTCD criteria. However, a short quick, taper should be set up for the closed travel lane as soon as practical because **any taper is better than no taper**.

FIGURE 5. INITIAL TAPER SETUP SCHEMATIC



* Schematic not to scale

Use the following checklist while setting up the taper at an incident scene:

- Taper length should be sufficient to allow space for parking responders' vehicles
- Taper should allow sufficient buffer length for the incident scene
- Taper should include any line of sight obstruction such as road curvature or trees
- Traffic cone spacing should be maximized until additional cones become available
- Taper length should be extended as additional cones become available to allow sufficient stopping distance for safe merge and lane change

The following section summarizes the methodology to calculate various taper lengths. It is suggested to use the following dimension measurements as guidelines and not standards.

7.2.1. Taper Lengths

The MUTCD Chapter 6C identifies three types of taper lengths establishment around the work zone that also applies to the incident Hot Zone:

1. Merge taper – provides a safe merge space for approaching traffic during lane closures. The length of the merge taper varies with the roadway speed, and the same taper length should be used for multiple lane closures.

2. Shoulder taper – provides a safe shoulder activity space for the responders and acts as a traffic warning. It is important to set up a shoulder taper when an incident requires an extended duration of shoulder occupancy.

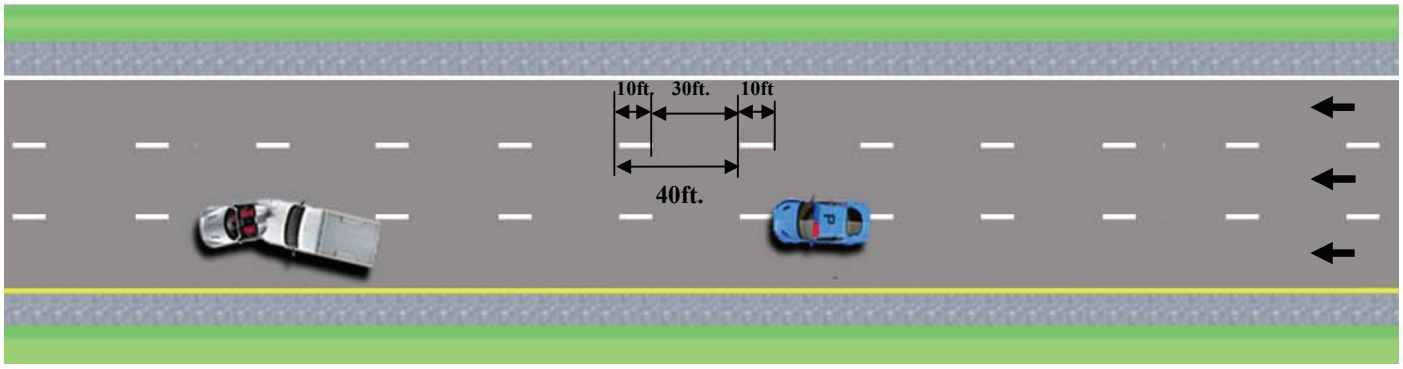
3. Downstream taper – prevents traffic from abruptly cutting in front of the responders while they are still working on the incident. The length of the downstream taper is standard and should be established the same for all the lanes, which is 100 feet per lane.

The minimum taper length dimensions are provided in Table 3 as a guideline.

7.2.2. Field Placement of Traffic Control Devices

Length measurement could be a difficult task in the field. It may not be practical during incident management conditions to measure the distance between traffic control devices or traffic incident management area component lengths by accurately using the measurement tools. Therefore, one useful reference in the field can be the pavement markings. The standard white skip markings are 10 feet long spaced at 30-fot intervals, as illustrated in Figure 6.

FIGURE 6. FIELD DISTANCE MEASUREMENT SCHEMATIC



*Schematic not to scale

Use this technique to establish the approximate traffic incident management area component lengths, starting at the approximate start of the incident scene and moving upstream to measure the upstream buffer space and transition taper lengths, and downstream to measure the downstream buffer space and termination taper lengths.

7.2.3. Quick Reference Table

The quick reference table shown below contains taper lengths, buffer space lengths, and traffic cone spacing corresponding to the road speed limit. Higher speed limit requires longer lengths or spacing.

TABLE 3. QUICK REFERENCE TABLE FOR SPACING AND NUMBER OF TRAFFIC CONTROL DEVICES

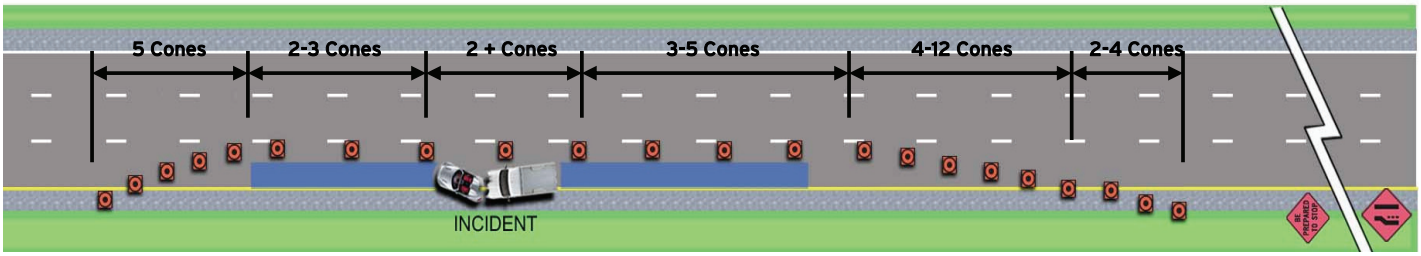
Road Speed Limit (MPH)	Traffic Cone Spacing[14] (ft.)		Upstream Shoulder Taper	Upstream Transition Tape	Upstream Buffer Space	Downstream Buffer Space	Downstream Termination Tape
	Taper	Non-Taper	Length (ft.)	Length (ft.)	Length (ft.)	Length (ft.)	Length (ft.)
20	20	40	25	80	115	40	100 per lane
25	25	50	40	125	155	63	100 per lane
30	30	60	60	180	200	90	100 per lane
35	35	70	80	245	250	123	100 per lane
40	40	80	110	320	305	160	100 per lane
45	45	90	180	540	360	270	100 per lane
50	50	100	200	600	425	300	100 per lane
55	55	110	220	660	495	330	100 per lane
60	60	120	240	720	570	360	100 per lane
65	65	130	260	780	645	390	100 per lane
70	70	140	280	840	730	420	100 per lane

Source: Modified 2003 MUTCD

Note: The dimensions shown in Table 3 are for guidance purpose only. Incident responders are not obliged to comply with these dimensions, as they may vary depending on the incident type and situation. Any taper is better than no taper, and using any traffic control devices are better than no devices.

Figure 7 below shows the approximate number of traffic cones that could be used to set up along the different traffic incident management area components.

FIGURE 7. APPROXIMATE NUMBER OF CONES



*Schematic not to scale

[14] According to MUTCD Section 6F.58, the channeling device spacing (traffic cone in this case) should not exceed a distance of 1.0 times the speed limit when used for taper channelization and 2.0 times the speed limit when used for the tangent (non-taper) channelization

7.2.4. Sample Calculation to Determine the Minimum Number of Cones Required

Consider a scenario with two-lane closure on a three-lane highway with the posted speed limit of 65 MPH.

Step 1. Determine the shoulder taper length.
Using Table 3, the shoulder taper length, corresponding to the 65 MPH speed, is 260 ft. Use the 65-ft. taper device spacing to arrange traffic cones along the shoulder taper. The approximate number of cones in this case would be 260/65 = **4** cones.

Step 2. Determine the upstream transition or merge taper length.
Using Table 3, the transition taper length, corresponding to the 65 MPH speed, is 780 ft. Use the 65-ft. taper device spacing to arrange traffic cones along the transition taper. The approximate number of cones in this case would be 780/65 = 12 cones per lane or **24** cones for two lanes.

Step 3. Determine the upstream buffer space length.
Using Table 3, the upstream buffer space length, corresponding to the 65 MPH speed, is 645 ft. Use the 130-ft. non-taper device spacing to arrange traffic cones along the upstream buffer space. The approximate number of cones in this case would be 645/130 = **5** cones.

Step 4. Cones along incident space.
The incident space length changes with the incident type. However, as a rule of thumb, carry at least **3** additional cones to set up along the incident space. Use 130-ft. non-taper cone spacing in this case.

Step 5. Determine the downstream buffer space length.
Using Table 3, the downstream buffer space length, corresponding to the 65 MPH speed, is 390 ft. Use the 130-ft. non-taper device spacing to arrange traffic cones along the downstream buffer space. The approximate number of cones in this case would be 390/130 = **3** cones.

Step 6. Determine the downstream termination taper length.
Using Table 3, the termination taper length, corresponding to the 65 MPH speed, is 100-ft. per closed lane. In this scenario, the total number of lanes blocked is two. Therefore, provide 200-ft. long downstream taper to close both the lanes. Use the 20-ft. device spacing to arrange traffic cones along the termination taper. The approximate number of cones in this case would be 100/20 = 5 cones per lane or **10** cones for two lanes.

Step 7. Calculate the total number of cones.
The total number of cones required is equal to the number of cones obtained from steps 1 through 6. Therefore, the total number of cones required is 4 + 24 + 5 + 3 + 3 + 10 = **49**.

7.3 Activity Area

The activity area is where response activities take place. It is comprised of two parts (1) the buffer space and (2) the incident space or Hot Zone. The buffer space includes an upstream longitudinal buffer space and a lateral buffer space adjacent to the incident space, as shown in Figure 8 on the next page. The following sections describe them in detail.

7.3.1. Buffer Space

The buffer space is an additional work area around the incident scene to provide a safe working space for the responders. The buffer space also provides a recovery area for errant vehicles that may enter the traffic incident management area. There are two types of buffer space in the activity area:

1. Upstream Longitudinal Buffer Space – this buffer space covers the distance between the incident space and transition area. The length of the upstream longitudinal buffer space is determined based on the stopping sight distance[15] of a vehicle traveling at posted speed limit. Table 3 provides the longitudinal downstream buffer space lengths based on roadway speed limits.

[15] Stopping sight distance is defined as the distance needed for drivers to see an object on the roadway ahead and bring their vehicles to safe stop before colliding with the object – FHWA Definition.

2. Lateral Buffer Space – This is the space between the adjacent travel lane and incident space. The lateral buffer space provides an additional safe operating area adjacent to the incident scene to protect responders from passing traffic. The amount of lateral buffer space needed depends on various conditions, such as time of day, weather, and roadway condition. As a rule of thumb, if the lane adjacent to the incident cannot maintain a minimum travel lane width of 10 feet, the entire lane could be closed.

Table 3 provides the recommended cone spacing for the upstream buffer space, incident space or Hot Zone.

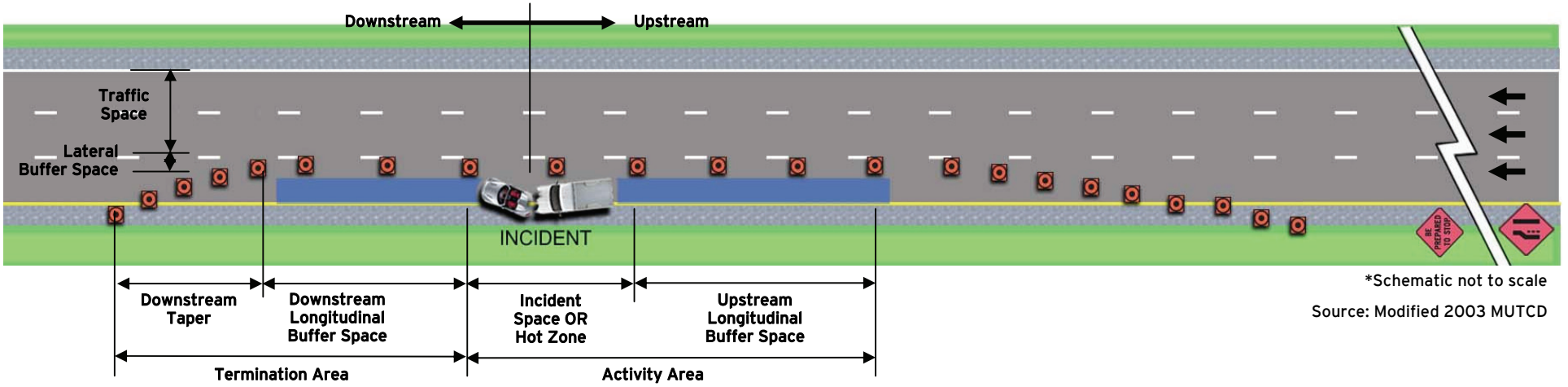
The incident space, sometimes referred to as the Hot Zone, is the portion of activity area where the incident occurred. Incident space varies with each incident, and it provides a reference to establish the buffer space around the incident scene. The traffic cone spacing should be twice the speed limit of the roadway; and as a rule of thumb, the responders should account for three additional traffic cones to accommodate the incident space.

7.4. Termination Area

The termination area is used to notify motorists that the traffic incident management area is ending and returns them to their normal driving path. The termination area is comprised of two components, as shown in Figure 3 and discussed below:

1. Downstream buffer space – is the space between the incident scene and the start of the termination taper, as shown in Figure 3. The length of upstream buffer space should be at least half of the downstream buffer space length, as shown in Table 3.
2. Downstream taper – is provided to prevent sudden traffic cutting in front of the incident responders. The length of the downstream taper should be 100 feet long for each lane closed. Therefore, the termination area length varies with the number of lanes closed.

FIGURE 8. TRAFFIC INCIDENT MANAGEMENT ACTIVITY AND TERMINATION AREA



8. RESPONDERS' SAFETY PRECAUTIONS AND EQUIPMENTS

Traffic incident responders are exposed to the hazardous conditions that result from working in or around traffic. The following sections provide safety precautions established for responder safety.

8.1. High-visibility Safety Apparel

The use of high-visibility safety apparel increases responders' visibility, especially at nighttime and low visibility conditions. Responders shall conform to the 2008 Code of Federal Regulations (CFR) 634 Section-23,[16] which requires anyone working within the right-of-way of a federally funded highway to wear high-visibility clothing that meets the Performance Class II or III requirements of American National Standard Institute (ANSI)/International Safety Equipment Association (ISEA) requirements 107-2004. This rule applies to all the responders. In addition, the law enforcement officers, firefighters, emergency medical services, and other public safety personnel could also use the safety apparel conforming to ANSI/ISEA[17] code 207-2006.

According to these standards, the color of the high-visibility safety apparel shall be either fluorescent orange-red or fluorescent yellow-green in color. The reflective material shall be orange, white, yellow, silver, yellow-green, or a fluorescent version of these colors, and shall be visible at a minimum distance of 1000 feet. The retroreflective safety is apparel designed to identify the wearer as a person during low visibility conditions.

Response agencies should periodically check vests to ensure they conform to the new standards. Figure 9 below shows examples of American National Standard Institute/International Safety Equipment Association-approved safety vests used across the US.

FIGURE 9. APPROVED SAFETY APPAREL

Source: International Safety Equipment Association

[16] More information on 23 CFR 634 can be found at website: www.gpoaccess.gov/cfr
[17] Visit ANSI website for more details: www.ansi.org
Visit ISEA website for more details: www.safetyequipment.org

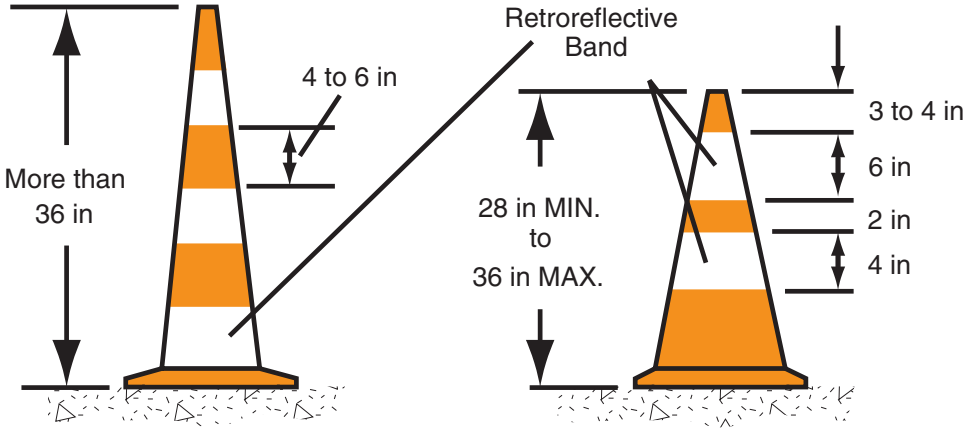
8.2. Traffic Cones

Traffic cones are the most common temporary traffic control device used to delineate traffic and establish the safe traffic incident management area for the incident responders. Because of space limitation in the response vehicle, the first responders can only carry a limited number of traffic cones with them. Keeping that into consideration, a minimum recommended number of traffic cones is established as listed below for each response agency:

- Law enforcement - 6 cones
- Fire and rescue - 10-15 cones
- Road Ranger - 20 cones
- Roadway Maintenance - 20 cones
- Towing and recovery - 15 cones

According to the MUTCD Section 6F.59, these traffic cones shall be fluorescent orange in color with white retroreflective bands for maximum retroreflectivity. The minimum height of the traffic cone should be 28 in. to a maximum of 36 in. Figure 10 below shows the traffic cones' specifications.

FIGURE 10. TRAFFIC CONES



Source: Modified from 2003 MUTCD Chaper 6F

8.3. Vehicle Markings/Retroreflective Taping

The use of retroreflective tape on response vehicle increases its visibility at nighttime and low visibility conditions. The amount of retroreflective markings on a vehicle may vary depending on the responding agency's guidelines. Some response vehicles may not have the sophisticated lighting apparatus necessary to be conspicuous to passing traffic during low visibility conditions. Therefore, having a good amount of retroreflective taping on these vehicles may substitute for such a deficiency. Figure 11 provides examples of vehicles with retroreflective taping during day and night hours.

FIGURE 11. VEHICLE MARKINGS

The National Fire Protection Association (NFPA) Section 1901 provides the fire and rescue department vehicles retroreflective taping guidelines.

The choice of color for the retroreflective tape varies depending on the responding agency's color of preference. Typically, alternating bands of red and white or red and yellow are the colors of choice. In some cases, the responding agency's standard logo may substitute some amount of taping. Use the following checklist as a quick guideline to retroreflective taping:

- Apply tapes on the front, back, and sides of the vehicle
- Test the retroreflectivity life of the tape periodically
- Clean and replace tape periodically
- Optimize the amount of vehicle taping
- Avoid excessive taping to prevent a blinding effect

[18] More information on the NFPA standards can be found at: www.nfpa.org/aboutthecodes/AboutTheCodes.asp?DocNum=1901

8.4. Vehicle Lighting

Emergency vehicle lighting enhances the safety of the incident scene by increasing the visibility of the response vehicles and by warning the approaching traffic. However, excessive lighting may distract oncoming motorists, especially during nighttime and low visibility conditions. Emergency vehicle lights are for warning purpose only, and optimal use of such lights ensures safety of responders at the incident scene.

MUTCD Chapter 6I recommends that public safety agencies examine their emergency vehicle lighting policies, especially those that relate to lighting after a traffic incident scene is secure. The objective should be to reduce the amount of lighting at the incident scene, while maintaining the safety of those at the scene. The following are the basic guidelines developed for the use of emergency vehicle lights at a traffic incident:

Emergency flashing lights should be turned off:

- When the emergency vehicle is outside and farther away from the travel lanes.
- When multiple response vehicles are parked at the incident scene, turn off the overhead flashers on all the vehicles except for the rear and front vehicles.

After securing the incident scene, use the following light-shedding procedures to best utilize the various emergency lights at the incident scene:

- Turn off the opti-com lights
- Turn off the headlights, unless required to illuminate the incident area
- Turnoff the white strobes
- Turn on the ground lights when present
- Turn on the amber arrow board/directional lights
- Turn on the compartment lights

Note: Do not use the high-intensity flashing lights. The high-intensity flashing lights may instigate certain medical conditions in drivers susceptible to such frequencies and may greatly distract the approaching traffic.

8.5. Emergency Scene Access

The Incident Commander or first responder should determine the shortest and/or fastest route available to arrive at the incident scene; and notify other agencies responding to the incident scene. While responding to an incident, responders should practice the following precautions:

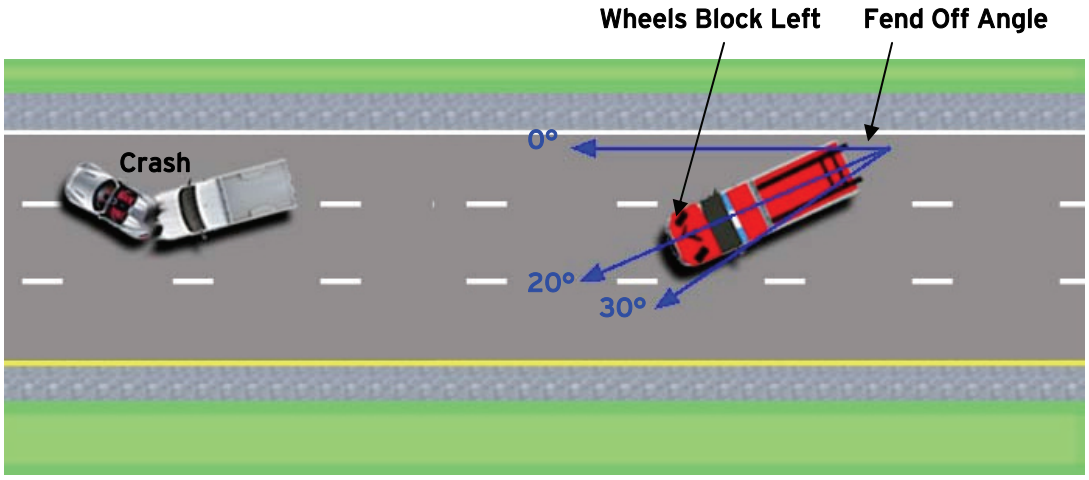
- Establish contact with the Unified Command or on-scene responder
- Use the highway shoulder whenever possible to access the incident scene
- Use sirens and flashlights while working through the traffic
- Slow down the vehicle gradually and do not use sudden braking
- Travel against the traffic flow only with extreme caution
- Exit from the protected side
- Look around before moving or exiting from the incident scene
- Work within the established traffic incident management area
- Coordinate with the Incident Commander if any additional space is needed

8.6. Vehicle Parking

Proper vehicle parking within the traffic incident management area can add protection to the incident scene by creating a physical barrier between upstream traffic and the incident space. The following checklist provides guidelines for proper vehicle parking at an incident scene:

- Allow sufficient buffer space between the incident and the response vehicle.
- All responding agencies should park their vehicles on same side of the roadway as the incident. This reduces the need for responders to cross traffic lanes and reduces responders' exposure to the live traffic.
- Fire and rescue personnel should position their vehicle at an angle or fend off position, as shown in Figure 12, to shield the activity area and protect responders and victims at the incident scene. Parking angle to the right or to the left of the incident scene depends on the location of the incident on the road and the equipment access needs of fire/rescue personnel. It may also vary depending on the use of apparatus equipped with the side-mounted pumps; in that scenario, park the fire and rescue apparatus downstream of the incident with the pump side angled toward the incident. To minimize lane blockage, use the following precautions:
  - Close only the lane(s) blocked or impacted by the incident
  - Occupy additional lane(s) only when absolutely required for victim and/or responder safety
  - Open the blocked lane(s) when no longer required
- Responders should turn the wheels of a parked vehicle away from the incident scene. If the vehicle is struck by an errant motorist, this may reduce the probability of the vehicle dragging straight into the incident scene.

FIGURE 12. EMERGENCY VEHICLE PARKING



*Schematic not to scale

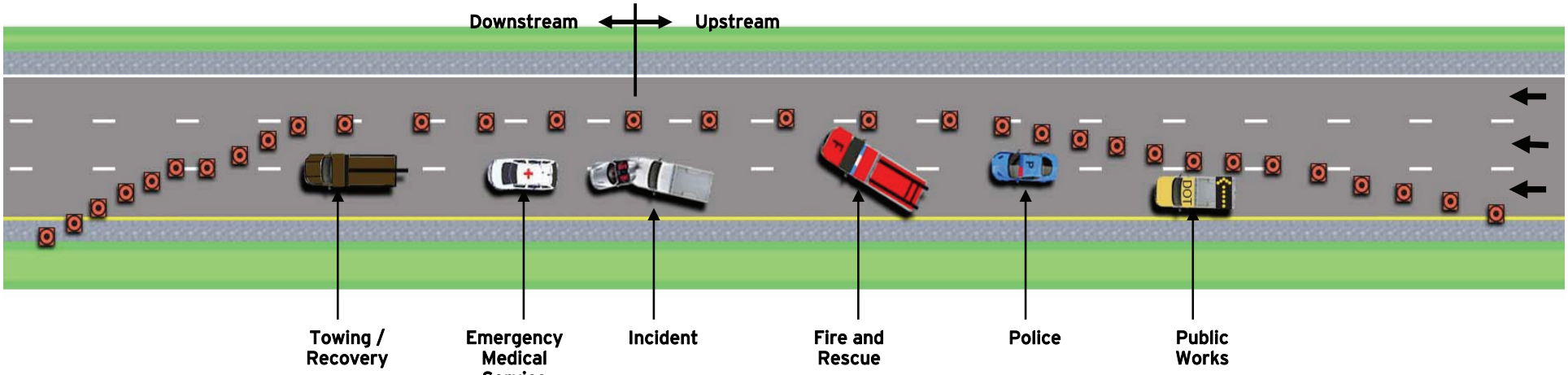
8.7. Vehicle Positioning

Strategic vehicle positioning can facilitate an efficient response and support clearance activities. Use the following order of vehicle positioning according to motorists' perspective:

- Upstream vehicle positioning
  1. Transportation agency
  2. Law enforcement
  3. Fire and rescue
- Downstream vehicle positioning
  1. Emergency medical services
  2. Towing and recovery
  3. Other investigators (homicide or medical examiner)

Transportation personnel should position their vehicles at the extreme upstream location of the traffic incident management area, with or without arrow panel, to provide advance warning and direct traffic away from the closed travel lane(s). Fire and rescue personnel should position their vehicle closest to the incident scene at an angle or fend-off position. Emergency medical services and towing and recovery personnel should position their vehicles downstream of the incident. Emergency medical services personnel are often the first to depart from the incident scene, and upstream positioning provides them the safest conditions while they render aid to the injured victims. In situations when emergency medical services and the fire and rescue department are a single unit, the vehicle position shall be **downstream** of the incident and angled in such a way that it provides safe and easy access to rescue equipment. Figure 13 below shows typical vehicle positioning.

FIGURE 13. TYPICAL VEHICLE POSITIONING



*Schematic not to scale

8.8. Arrow Panels

Responders may use arrow panels to notify approaching traffic about the lane closure or for caution when closing a shoulder. Typically, the public works or roadway maintenance personnel carry the arrow board in their vehicles. In some cases, law enforcement vehicles may also be equipped with an amber arrow strip in the back of their vehicle.

According to the MUTCD Chapter 6F, the arrow board panel should be a sign with matrix of elements capable of either flashing or sequential displays. This sign shall provide additional warning and directional information to assist in merging and controlling road users through or around a temporary traffic control zone. Figure 14 shows the standard displays of the arrow panels.

FIGURE 14. ADVANCE WARNING ARROW DISPLAY SPECIFICATIONS

Operating Mode	Panel Display (Type C panel illustrated)
I. At least one of the three following modes shall be provided:	(Right arrow shown; left is similar)
Flashing Arrow	Merge Right
Sequential Arrow	Merge Right
Sequential Chevron	Merge Right
II. The following mode shall be provided: Flashing Double Arrow	Merge Right or Left
III. At least one of the following modes shall be provided: Flashing Caution or Alternating Diamond Caution	Flashing Caution or Flashing Caution or Alternating Diamond Caution

Panel Type	Minimum Size	Minimum Legibility Distance	Minimum Number of Elements
A	48 x 24 in	1/2 mi	12
B	60 x 30 in	3/4 mi	13
C	96 x 48 in	1 mi	15
D	None*	1/2 mi	12

*Length of arrow equals 48 in, width of arrowhead equals 24 in

Source: Modified from 2003 MUTCD Chaper 6F

8.9. Incident Scene Illumination

The headlights of the response vehicle should be turned off while parked at the incident scene. However, additional incident scene illumination may be required during nighttime or low visibility conditions. In such situations the headlights could be used with extreme caution so that the headlight's focus is diverted away from the approaching traffic and toward the incident scene.

8.10. Cancel En-route Responders

The Incident Commander may cancel en-route secondary responders depending on the need of the incident. Before issuing a cancellation, the Incident Commander should thoroughly assess the entire incident scene. En-route responder cancellation policies should be discussed with all stakeholders in advance to avoid interfering with an agency's standard operating procedures. Canceling en-route responders not only reduces their exposure to hazardous condition but also creates an additional space for the activity area.

8.11. Personal Vehicle Use

Responders should limit the use of personal vehicles at an incident scene because they lack safety features such as vehicle marking, strobe lighting, and other safety apparatus that are present in the response vehicles. If personal vehicles must be used, responders should park the vehicle as far away from the travel lanes as possible. When possible, park the vehicle entirely off the roadway system such as at a parking lot or rest area.

8.12. Helicopter Landing and Staging

Incident responders should solicit an air ambulance or a helicopter service at the incident scene when an incident requires an urgent and time-sensitive medical attention for an injured victim. When an air ambulance or a helicopter arrives at the incident scene, the following precautions are advised:

- Close both directions of traffic flow and summon additional resources as needed
- Land the helicopter at an off-incident scene location where the victim can be transported easily if possible
- Land the helicopter downstream of the incident and on the same side of the incident with its front facing the incident
- Land the helicopter on a paved surface if possible
- Land the helicopter on a flat area if possible
- Approach the helicopter from its front end so that the pilot can see the responders approaching
- Ensure that there is no loose debris or temporary traffic control device within the 50-ft. proximity of the helicopter landing radius
- Mark the landing zone with tape, lime, or a heavy stack of traffic cones
- Secure the landing area of any wires or fences around the landing zone to avoid any entanglement of such materials to the helicopter rotors
- Do not overload the helicopter to minimize gliding effect during landing and take-off

8.13. Spotter

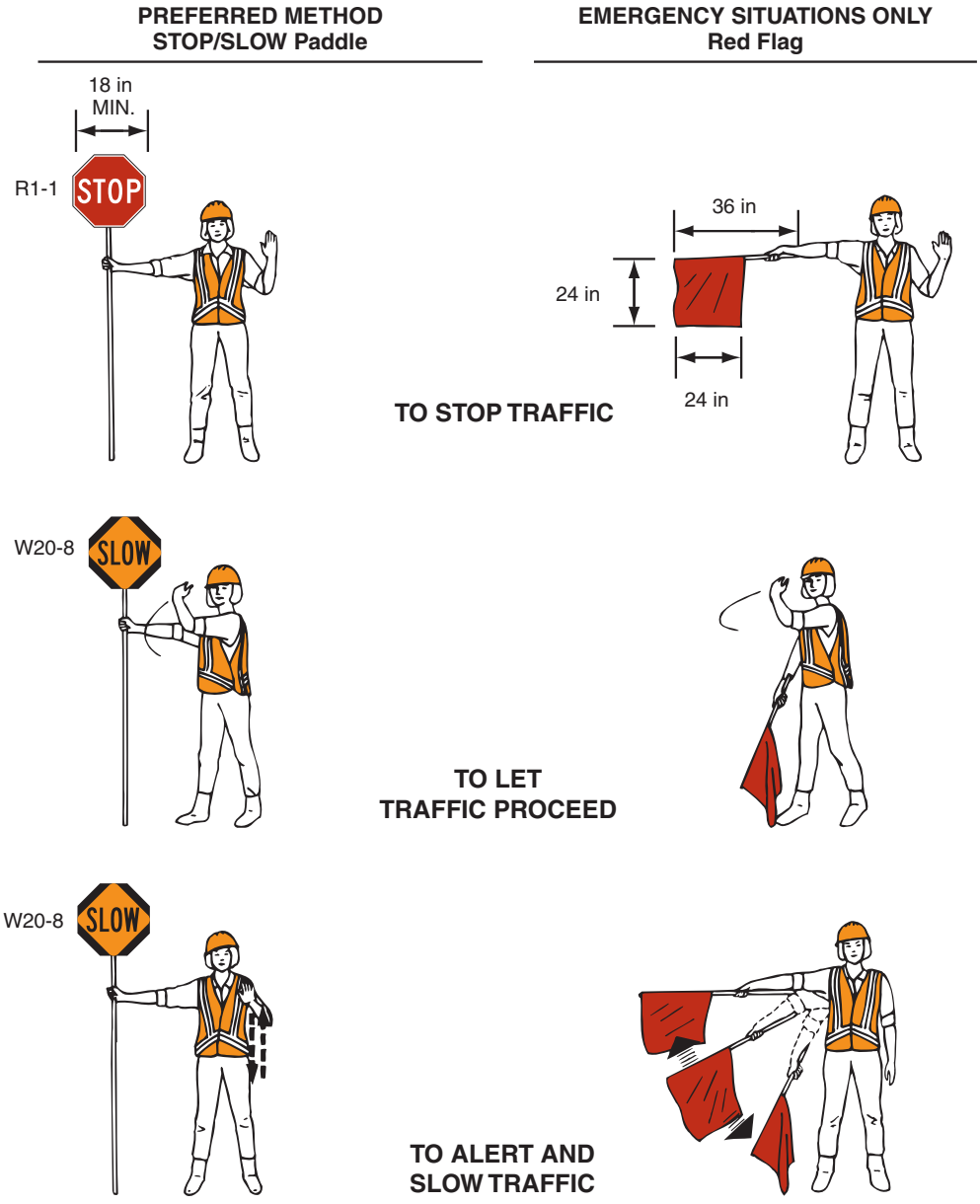
The role of a spotter is to monitor traffic around the incident scene and warn responders using a radio device or blow whistle when an unexpected emergency arises at the incident scene, such as an errant vehicle entering. The spotter's role should be assigned when an additional responder is available at the incident scene. The role of flagger and spotter may be combined when an incident occurs at a minor low speed artery.

8.14. Flagger

The role of flagger is to help control the traffic movement around the incident scene using a red flag or stop-slow paddle. The flagger's role is especially important when an incident occurred at a low speed minor artery. Flaggers should be trained and should be assigned when an additional responder is available at the incident scene. If needed, the same person can perform both roles of flagger and spotter. The device that the responders should carry with them is MUTCD standard red roll-up flag or stop-slow paddle.

Figure 15 below shows the use of flag and stop-slow paddles. Note that the flagger should always wear the American National Standard Institute/International Safety Equipment Association-approved high-visibility safety apparel while performing this role. MUTCD Chapter 6E elaborates on the flagger control procedures, attached in Appendix D.

FIGURE 15. DETAILS AND USE OF HAND SIGNALING DEVICES



Source: Modified from 2003 MUTCD Chaper 6E

8.15. Towing and Recovery Association of America Guide

The responding agencies within the North Florida TPO service area have an existing method of classifying crash vehicles based on vehicle weight as:

1. Class A with gross vehicle weight less than 10,000 lb.
2. Class B with vehicle gross weight ranging between 10,000 lb. and 20,000 lb.
3. Class C with vehicle gross weight greater than 20,000 lb.

This classification system relies on the incident responders' experience in classifying the crash vehicle into one of these categories.

The towing and recovery agencies carry tools and equipment that can be used to classify the crash vehicles into further detail, as identified in the Towing and Recovery Association of America (TRAA) guide. This guide could help towing agencies to come prepared at the incident scene. It is recommended to use this guide as an extension to the existing classification system to identify the crash vehicles in further detail, in an event when the existing classification system fails to do so. This guide classifies the crash vehicles into three different categories, which are further sub-categorized as shown below:

1. Light Duty (<10,000 lb.):
   - Class 1: gross vehicle weight 6,000 lbs or less with four tires
   - Class 2: gross vehicle weight between 6,001 lb. and 10,000 lb. with four tires
2. Medium Duty (10,000 lb. - 26,000 lb.):
   - Class 3: gross vehicle weight between 10,001 lb. and 14,000 lb. with six tires or more
   - Class 4: gross vehicle weight between 14,001 lb. and 16,000 lb. with six tires or more
   - Class 5: gross vehicle weight between 16,001 lb. and 19,500 lb. with six tires or more
   - Class 6: gross vehicle weight between 19,501 lb. and 26,000 lb. with six tires or more
3. Heavy Duty (> 26,000 lb.):
   - Class 7: gross vehicle weight between 26,001 lb. and 33,000 lb. with six tires or more
   - Class 8: gross vehicle weight between 33,001 lb. and over with 10 tires or more

Appendix C contains a copy of TRAA guide.

8.16. Other Situational Awareness

Every incident is different and it is critical that first responders maintain situational awareness at all times. The following is the list of situations that responders should keep in mind:

- Taper length adjustments may be required when incidents are in close proximity to an interchange ramp, cross roads, curves, or other influencing factors; a long taper may not always be better than a short taper, particularly in urban areas with characteristics such as short block lengths or driveways.
- Respect Incident Command structure and follow coordination instructions as advised.
- Understand and value the other agency's standard operating procedures.
- Don a safety vest before coming out of the vehicle.
- Park the response vehicle as far away from the travel lane as practically possible and apply emergency brakes while parked at the incident scene.
- Avoid blind siding or turning the back to the approaching traffic.
- Plan an escape route and be prepared for any unexpected situation.
- Be aware of the surrounding traffic while accessing or exiting the incident scene.
- Be aware of the local weather at the incident scene and come prepared.
- Communicate with other responders for any additional help they may need.
- Depart from the incident scene when no longer taking an active role.

9. RESPONDER'S TRAINING

Every agency playing an active role in traffic incident management should establish a periodic responders' training program to acquire the skills involved in traffic incident management processes. Ideally, training should be interagency and multi-disciplinary to improve communication and coordination between different agencies. It should also address the efficient use of technical, material, and human resources between different agencies at the incident scene. The purpose of traffic incident management training should be focused on improving responders' awareness, to enhance performance at the incident scene, and improve incident scene safety.

These training sessions can be conducted in the form of field drills, table-top exercises, or classroom lectures and discussion. The participants of the training could be incident responders, managers, and/or policy makers depending on the purpose of the training. All or a group of stakeholders may be included in a single or separate training session. The training material should achieve the following objectives:

- Familiarize responders with the traffic incident management processes, activities, tools, and techniques, and identify opportunities to improve them periodically
- Promote understanding of roles and responsibilities of various responding agencies
- Foster interagency communication and coordination
- Emphasize the maintenance of a safe environment for responders, collision victims, and other motorists
- Identify and discuss traffic incident management policies and regulations
- Ensure proper understanding of the relevant command system (e.g., NIMS, ICS, etc.)
- Review procedural information and equipment use
- Emphasize best practices derived from after action reviews

Agencies should coordinate with their management teams to schedule such training sessions periodically at a convenient setting conducive to all agencies. All training sessions should be based upon these standard procedures and be consistent in content and delivery.

10. INCIDENT SCENE EVOLUTION

An incident scene evolves as responders arrive and additional resources become available, and again as responders leave and the scene is cleared. The following section provides an example of the evolution of an incident, starting with initial detection and ending with the travel lanes being cleared.

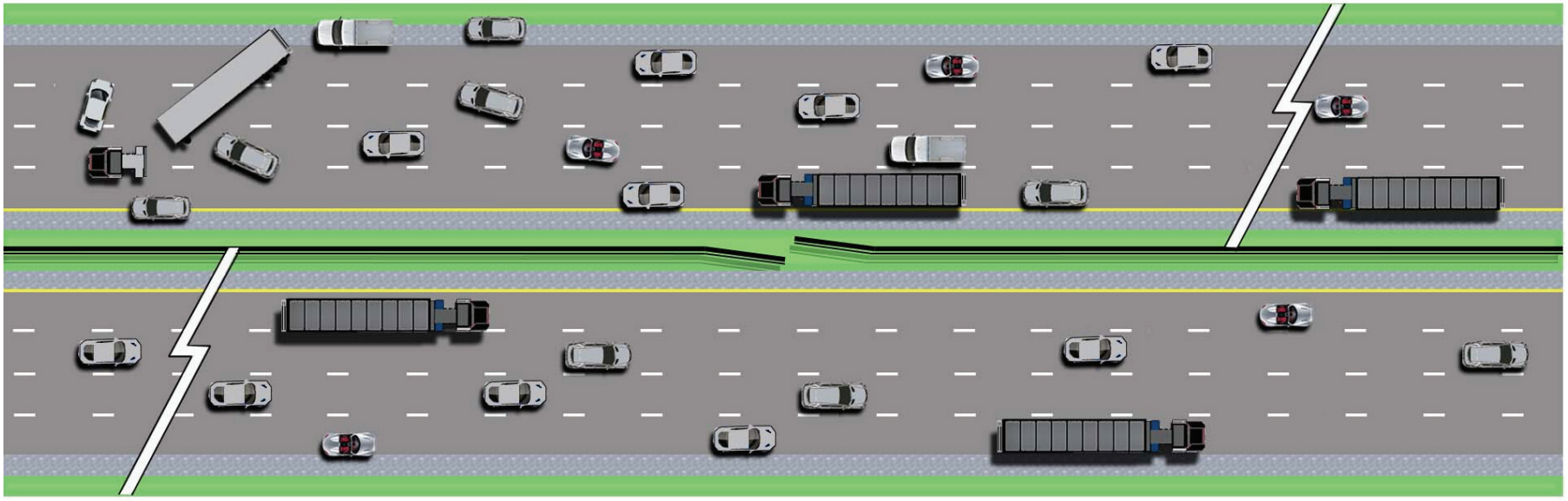
Note: The schematics shown in Scene 1 through 8 are not to scale.

10.1. Secure the Incident Scene First (Scene 1 and 2)

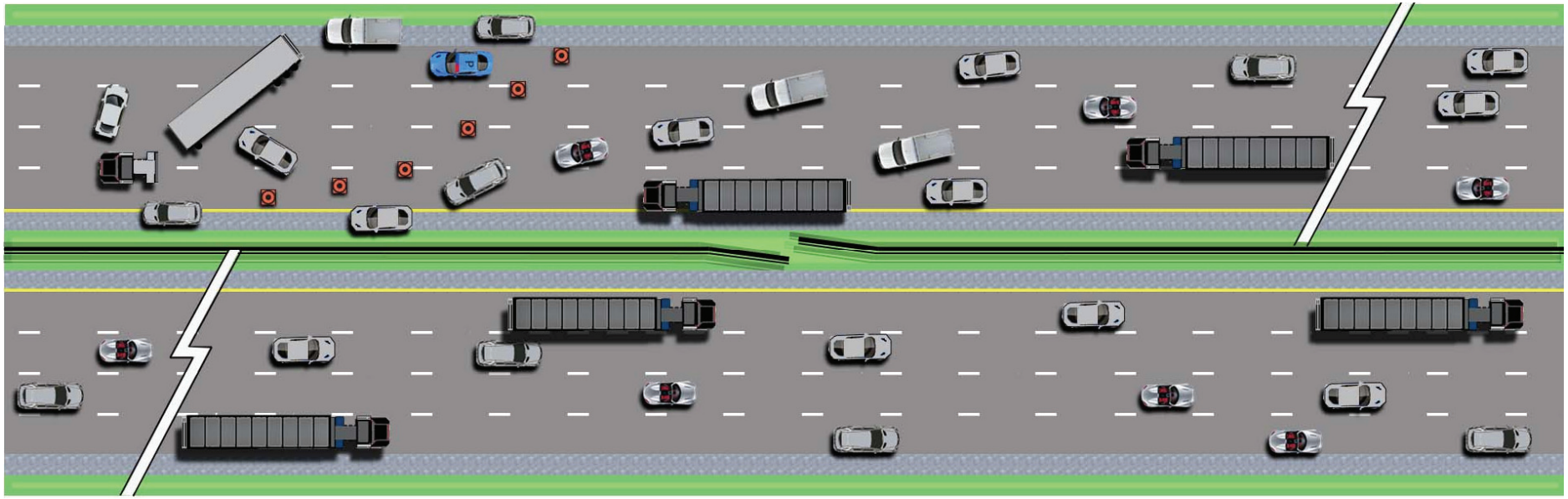
As soon as the first responder arrives at the incident scene:

- Position the vehicle upstream to protect the incident scene with warning lights and flashers turned on
- Put on high-visibility safety apparel prior to exiting vehicle
- Approach the incident scene with caution, keeping an eye on traffic

Scene 1: Incident occurred



Scene 2: Law enforcement officer arrives and secures the incident scene using six cones

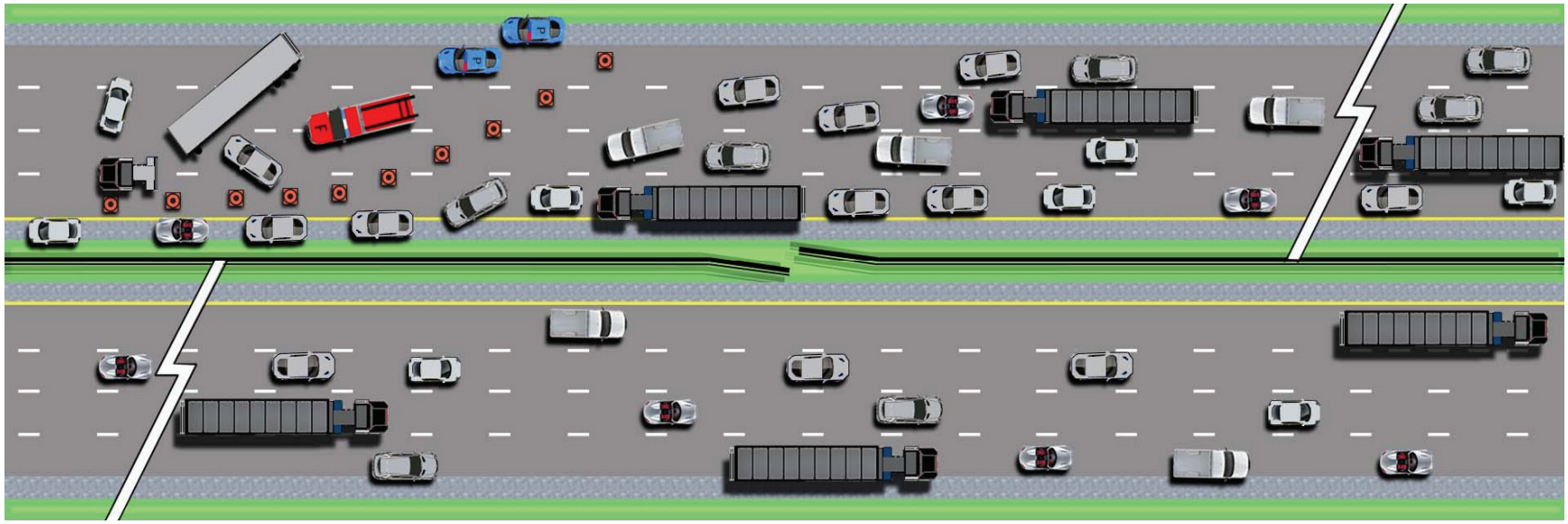


10.2. Set Up Temporary Traffic Control Devices (Scene 3 to 5)

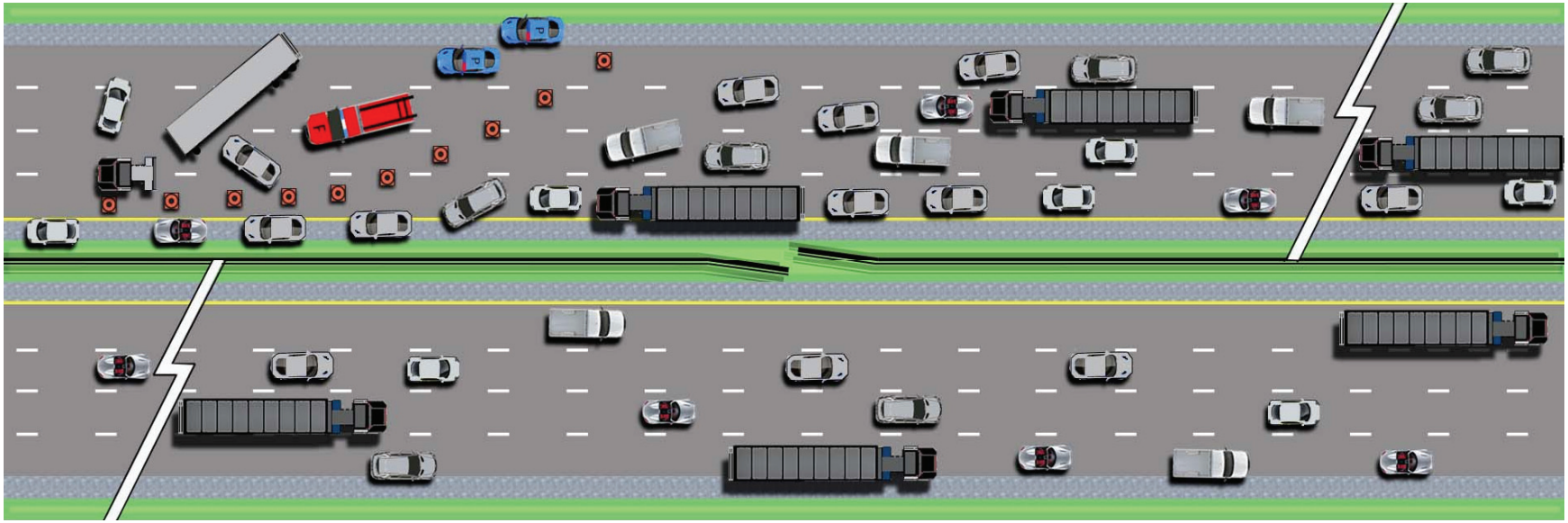
Use the amount of cones available, depending on the responding agency at the incident scene, to set up the lane closure using a taper arrangement. For an ideal situation, the number of cones and other traffic control devices are identified in Table 3. If available, set up the arrow board to direct traffic out of their normal path. After assessing the incident scene, notify the appropriate responding agencies. The first responder should now help crash victims move their crash vehicle to the shoulder, if possible. As additional help arrives, use more cones to set up the traffic incident management area. The fire and rescue vehicle should be parked at an angle or fend-off position at upstream and closer to the incident scene.

The number of lanes closed may increase to accommodate the activities of additional responders. However, every effort should be made to minimize the number of lanes closed, and work with the available space and shoulder to ensure safe condition for responders, motorists, and victims.

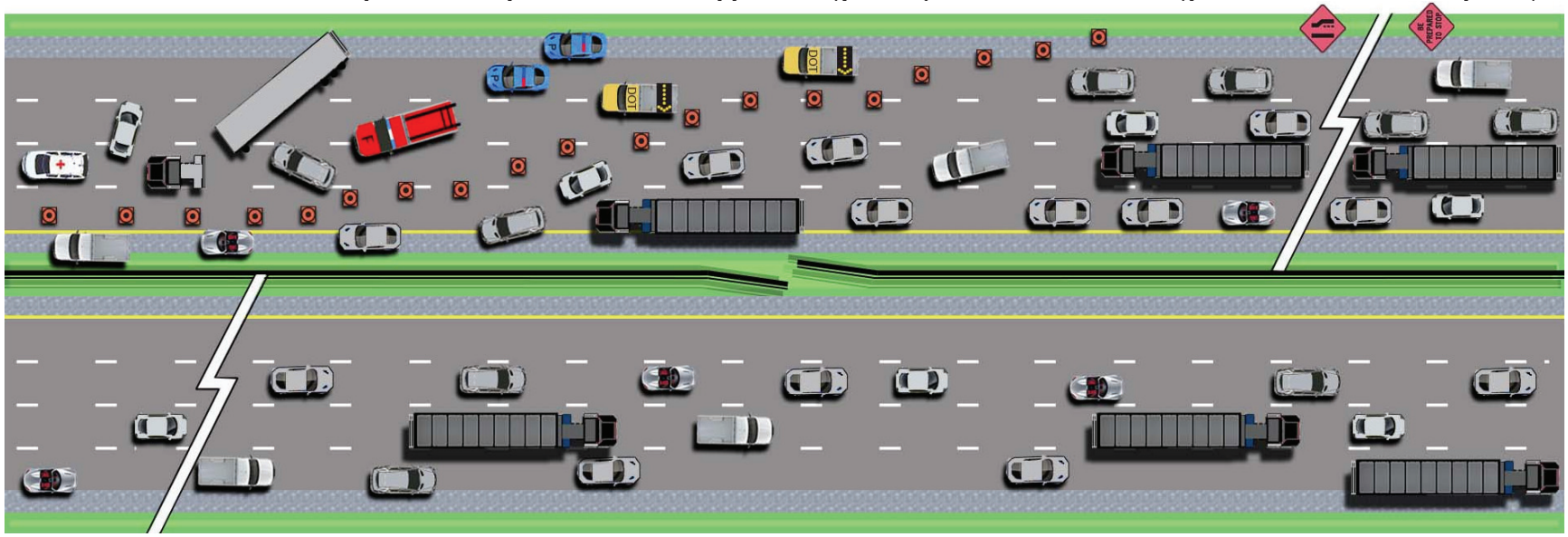
Scene 3: Fire and rescue truck arrives at the incident scene and provides additional cones to extend the merge taper



Scene 4: EMS vehicle arrives at the incident scene and other responders set up the advance warning signs



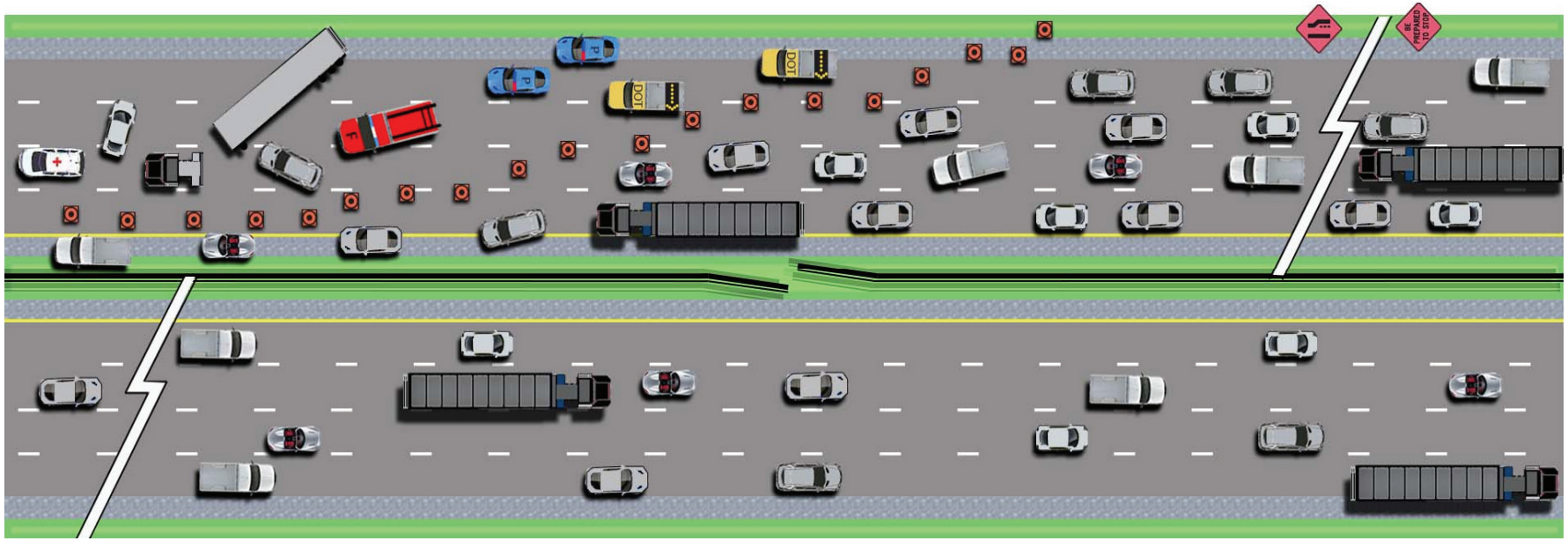
Scene 5: Public works vehicles positioned upstream to warn approaching traffic; traffic incident management area is now completely established



10.3. Departure from the Incident Scene (Scene 6)

Incident responders who are no longer required at the incident scene should depart from the scene as soon as practical to avoid any unnecessary exposure to the hazardous conditions around live traffic. As agencies depart, it may be necessary to reposition the response vehicles still at the scene to maintain a safe traffic incident management area and minimize the lane closure.

Scene 6: EMS vehicles depart from the incident scene and towing and recovery personnel perform the removing operation

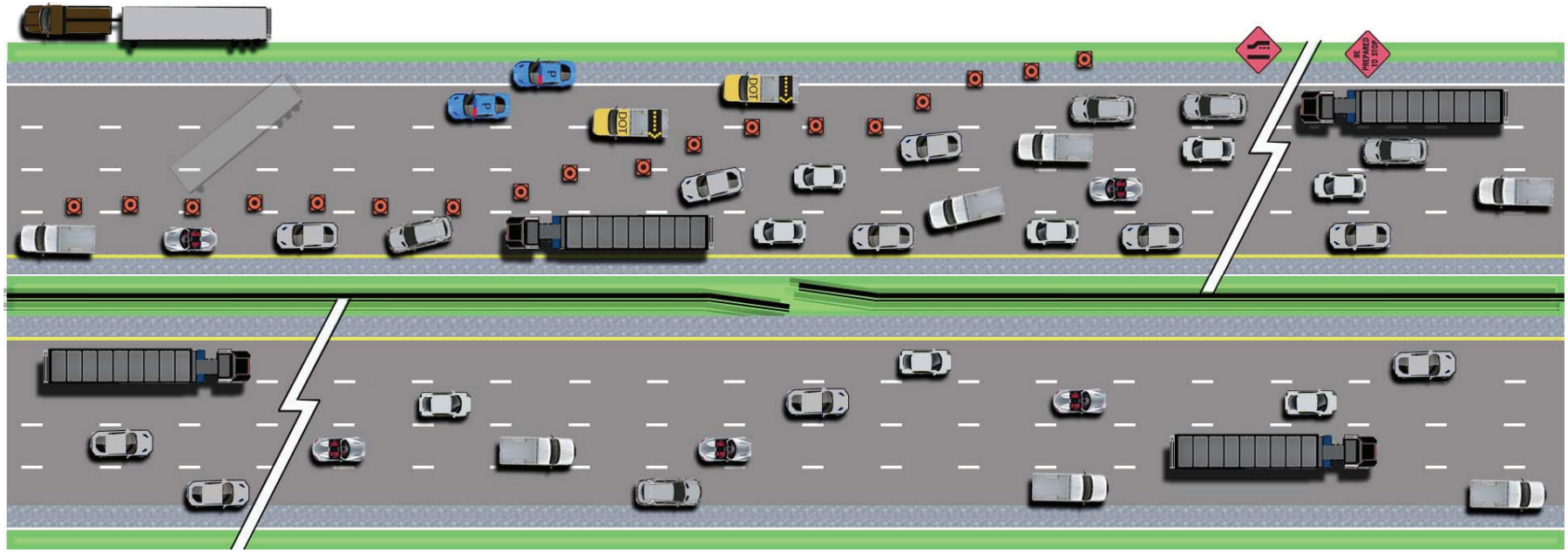


10.4. Reposition Response Vehicles and Step Down the Incident Scene (Scene 7 and 8)

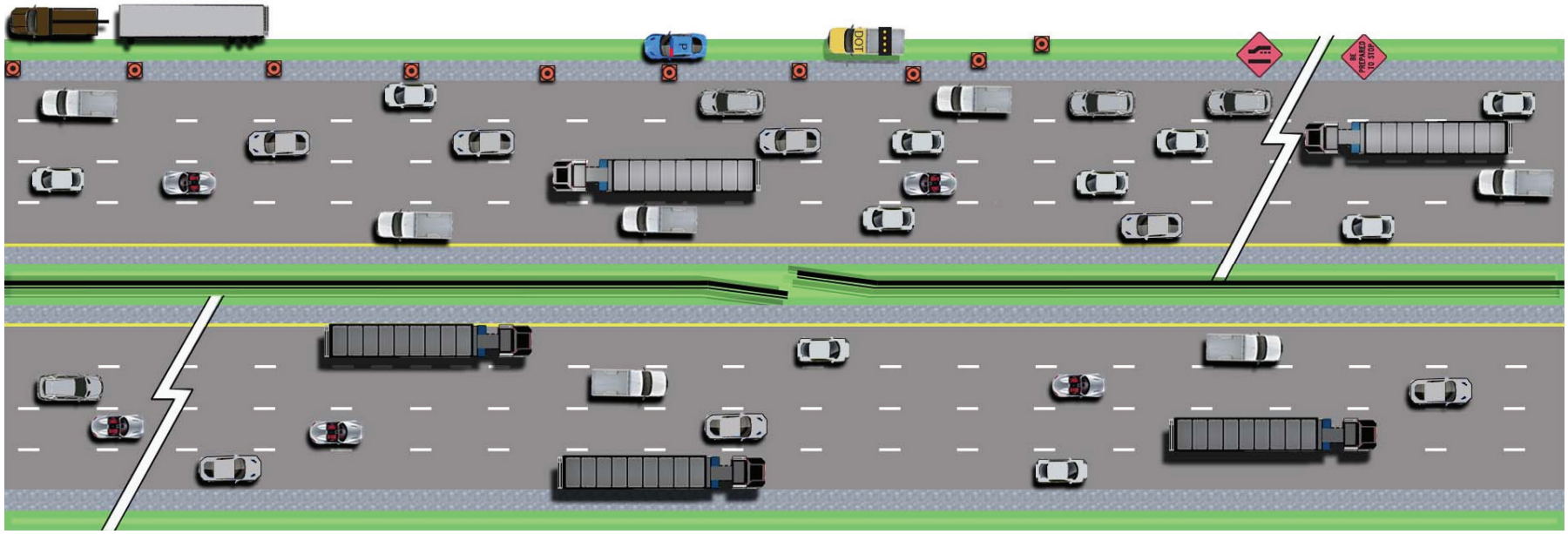
At this stage, the responders should consider repositioning their vehicles to open closed lanes whenever it is practical and safe to do so. In addition, the fire and rescue personnel should reposition their vehicles (possibly in a fend-off position) to minimize the lane blockage.

As the incident duration progresses, and depending on the incident scene demand, reposition the temporary traffic control devices to open travel lane(s) to traffic. Follow this process until all travel lanes are open as the crash vehicle is being shifted to the shoulder. At that stage, relocate all the traffic cones to the shoulder, or remove them entirely.

Scene 7: Towing and recovery vehicle operator removes crash vehicle from travel lane, fire and rescue vehicles depart from the incident scene



Scene 8: Remaining responders relocate to the shoulder and clear the roadway to open travel lanes to traffic



10.5. Roadway Clearance followed by Incident Clearance

Responders should make every effort to clear the roadway first,followed by the incident scene clearance. Responders should start by clearing the travel lanes of any debris or spills caused by the incident to open affected lanes to traffic as soon as practical. Whenever possible, responders should move the crash vehicle to the shoulder first or remove it completely from the incident scene. After clearing the road and moving the crash vehicle to shoulder, clear the entire remaining incident scene of any debris, spills, or damage. At this time, the incident scene should not have any response vehicles and traffic control devices remaining, and the normal traffic flow condition should be restored.

Note: Incident scene clearance may not be possible at the same time of roadway clearance; therefore, response agencies should make every effort to expedite opening the travel lanes first.

11. TYPICAL INCIDENT SCENARIOS

This section presents seven typical incident scenarios with action items for the responders to use as guidelines to manage the incident scene efficiently. The action items associated with each typical incident scenario shown in this section do not highlight the standard activities performed by all responders at the incident scene on a regular basis, such as:

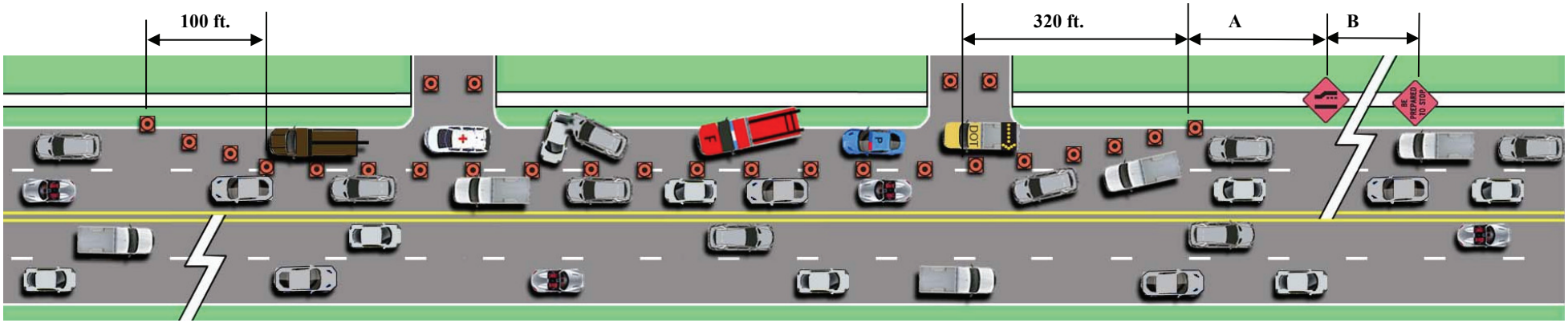
- The first responder carries out his or her regular duties, as mentioned in Section 4.0.
- As appropriate, one of the on-scene responders should assume the role of Incident Commander and solicit additional resources at the incident scene.
- Only trained law enforcement, fire and rescue, Road Rangers, or roadway maintenance personnel should engage in the role of Incident Commander, and the role should be transferred as appropriate.
- The Incident Commander oversees, facilitates, and helps decide major action items at the incident scene for a quick and safe clearance. The Incident Commander should be able to:
  - Assess and understand the incident needs
  - Outline the response plan
  - Coordinate with different agencies including the public information office and local media
  - Solicit additional resources as needed
  - Make an informed decision in coordination with other agencies
- The Incident Commander or law enforcement officer should coordinate with the public information office and local media, if awaiting a follow-up report.
- Responders should understand and value the Unified Command.
- The Incident Commander should assign a flagger and/or spotter for the incident scene, if additional trained responders are available on-scene.
- The Road Ranger, roadway maintenance, and/or towing and recovery personnel should clean up the incident scene of any debris, spills or damage
- Responders should coordinate with the Florida Department of Environmental Protection (FDEP) during vehicle spills of more than 25 gallons.
- Responders trained in the motor vehicle spill clean up should conform to the State of Florida fuel spill mitigation guidelines provided in Appendix E.
- All catastrophic incidents as well as some major incidents should be coordinated with the State Warning Point and other federal agencies with a stake.

The following typical scenario diagrams illustrate the use of traffic cones and describe the action items for responders corresponding to those scenarios. The guidelines listed along with the incident scenarios assume that the above standard activities are also taking place simultaneously.

Note:

- The dimensions and number of cones shown in typical scenarios are for guidance purpose only. Incident responders are not obliged to comply with these dimensions and the number of traffic cones, becuase the numbers and dimensions may vary depending on the incident situation. However, any taper is better than no taper, and using any traffic control devices is better than none.
- The seven typical scenarios shown below are not to scale.

11.1. Scenario 1: Crash on Arterial Road with Driveways



This crash resulted in closure of one lane on an arterial roadway with driveways. Use the following steps as guidelines in such similar situations:

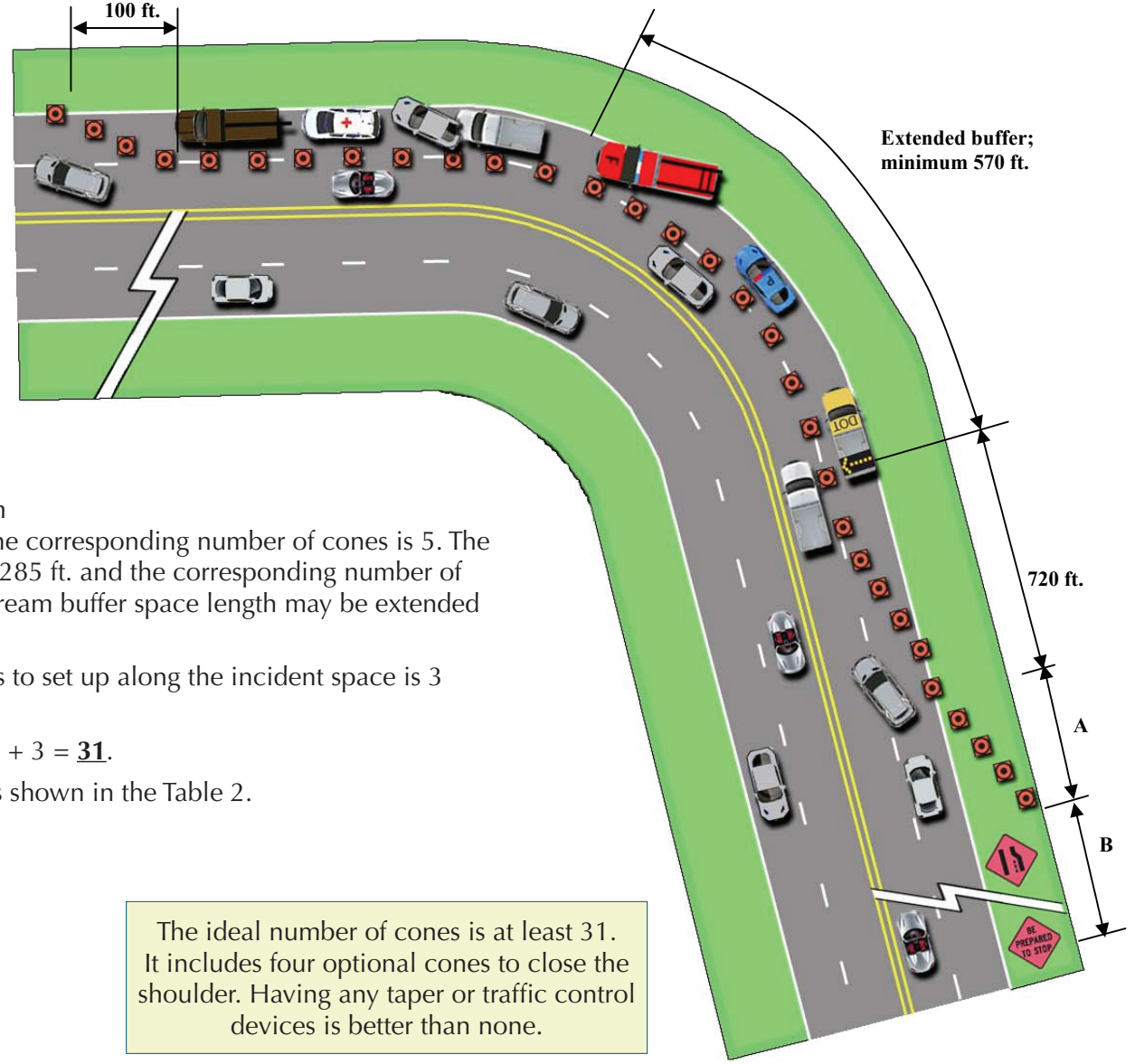
- Close all driveways as soon as possible to prevent traffic entering the incident scene
- Provide an alternate driveway exit, if available
- Calculate the number of cones using Table 3 as shown, assuming the speed limit of 40 MPH:
  - For merge and termination taper: Use 40-ft. cone spacing for both tapers. The merge taper length is 320 ft. and the corresponding number of cones is 8. The termination taper length is 100 ft. and the corresponding number of cones is **5**.
  - For upstream and downstream buffer space: Use 80-ft. cone spacing for both. The upstream longitudinal buffer space length is 305 ft. and the corresponding number of cones is 4. The downstream longitudinal buffer space length is 155 ft. and the corresponding number of cones is **2**.
  - For incident space and driveways: The default number of cones to set up along the incident space is 3 with 80-ft. cone spacing. Use 2 cones to close each driveway. Therefore, the total number of cones required to close both driveways is **4**.
  - The total numbers of cones is 8 + 5 + 4 + 2 + 3 + 4 = **26**.
- Avoid shoulder taper if curb and gutter is present along the roadway.
- Set up warning signs with necessary sign spacing as shown in Table 2.
- Coordinate with businesses affected when contacted.
- Allow driveway traffic to come out, controlled by the response personnel, if the incident duration extends longer.

The ideal number of cones is at least 26. It includes four optional cones to close the driveways. Having any taper or traffic control devices is better than none

11.2. Scenario 2: Crash on Curved Roadway Section

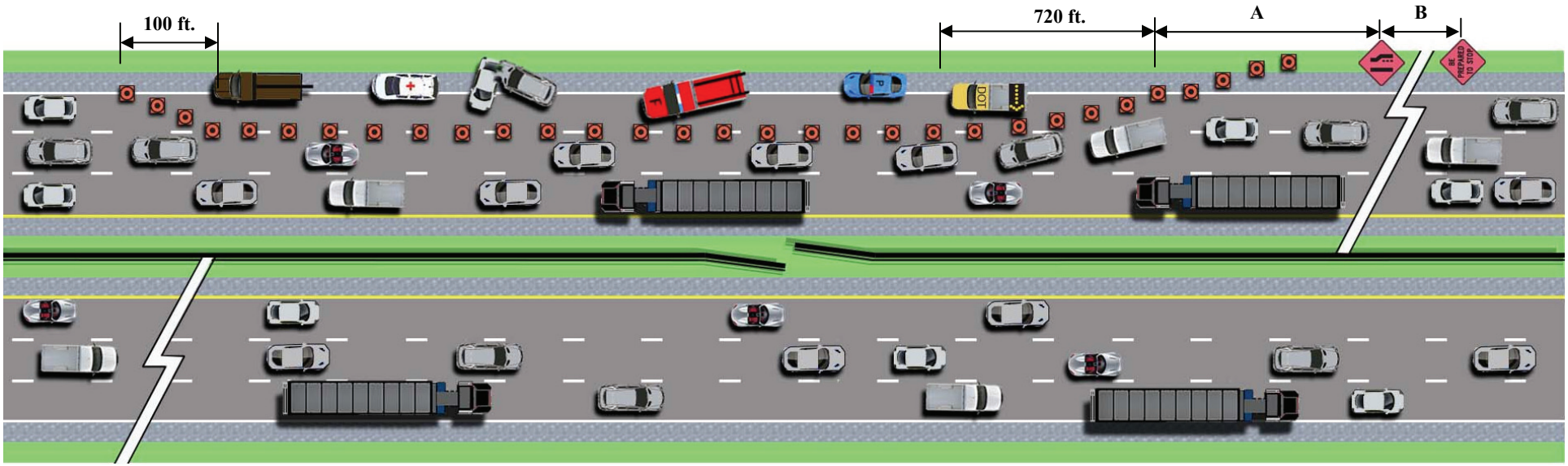
This crash resulted in closure of one lane on a curved roadway section. Use the following steps as guidelines in similar situations:

- Calculate the number of cones using Table 3 as shown, assuming the speed limit of 60 MPH:
  - For merge and termination taper: Use 60-ft. cone spacing for both tapers. The merge taper length is 720 ft. and the corresponding number of cones is 12. The termination taper length is 100 ft. and the corresponding number of cones is 5.
  - For shoulder taper (optional): Use 60-ft. cone spacing. The shoulder taper length is 240 ft. and the corresponding number of cones is 4.
  - For upstream and downstream buffer space: Use 120-ft. cone spacing for both. The upstream longitudinal buffer space length is 570 ft. and the corresponding number of cones is 5. The downstream longitudinal buffer space length is 285 ft. and the corresponding number of cones is 2. Becuase of road curvature, the upstream buffer space length may be extended using 120-ft. cone spacing.
  - For incident space: The default number of cones to set up along the incident space is 3 with 120-ft. cone spacing.
  - The total number of cones is 12 + 5 + 4 + 5 + 2 + 3 = **31**.
- Set up warning signs with necessary sign spacing as shown in the Table 2.



The ideal number of cones is at least 31. It includes four optional cones to close the shoulder. Having any taper or traffic control devices is better than none.

11.3. Scenario 3: Crash with Single-lane Closure

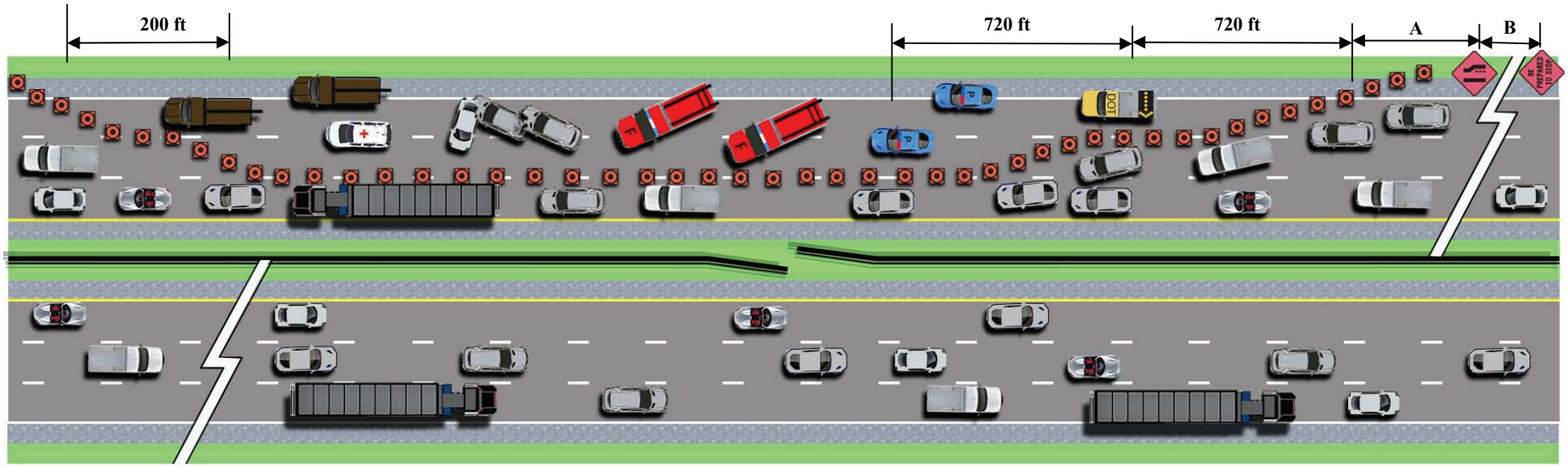


This crash resulted in closure of one lane on a highway segment. Use the following steps as guidelines in such similar situations:

- Calculate the number of cones using Table 3 as shown, assuming the speed limit of 60 MPH:
  - For merge and termination taper: Use 60-ft. cone spacing for both tapers. The merge taper length is 720 ft. and the corresponding number of cones is **12**. The termination taper length is 100 ft. and the corresponding number of cones is **5**.
  - For shoulder taper (optional): The shoulder taper length is 240 ft. and the corresponding number of cones is **4**. Use 60-ft. cone spacing.
  - For upstream and downstream buffer space: Use 120-ft. cone spacing for both. The upstream longitudinal buffer space length is 570 ft. and the corresponding number of cones is 5. The downstream longitudinal buffer space length is 285 ft. and the corresponding number of cones is **2**.
  - For incident space: The default number of cones to set up along the incident space is 3 with 120-ft. cone spacing.
  - The total number of cones is 12 + 5 + 4 + 5 + 2 + 3 = **31**.
- Set up warning signs with necessary sign spacing as shown in Table 2.

The ideal number of cones is at least 31. It includes four optional cones to close the shoulder. Having any taper or traffic control devices is better than none.

11.4. Scenario 4: Crash with Two-lane Closure



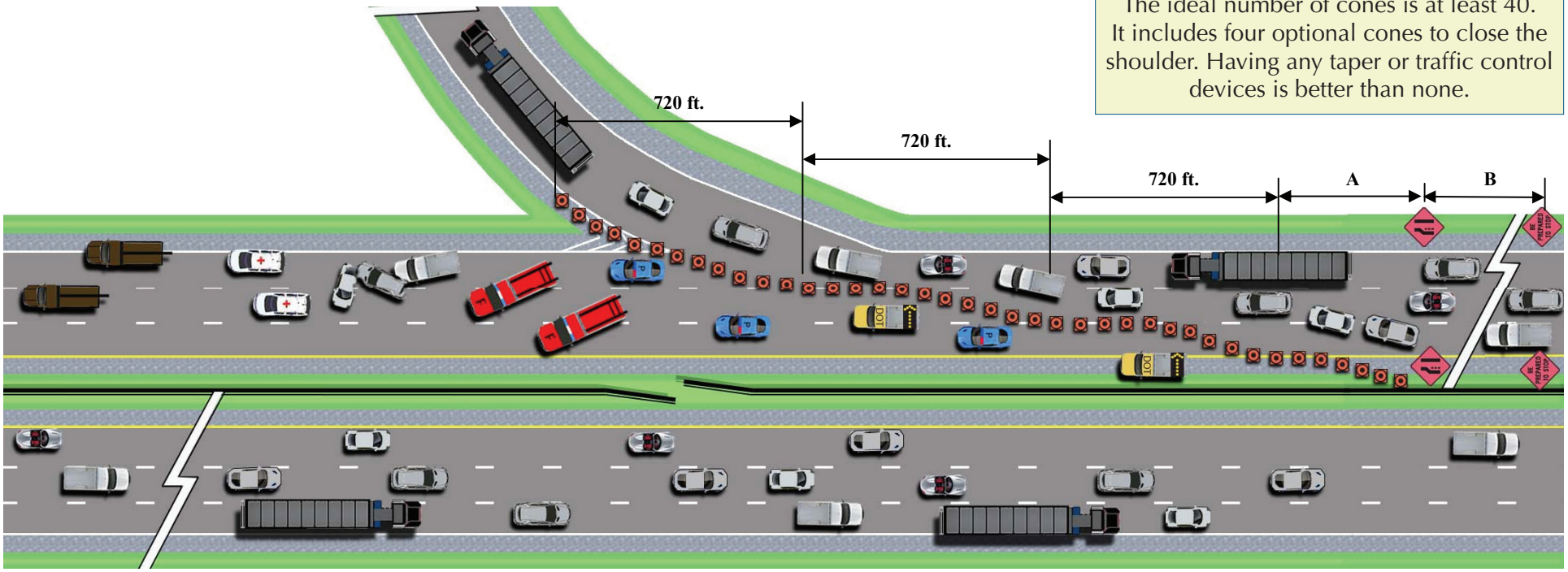
This crash resulted in closure of two lanes on a highway segment. Use the following steps as guidelines in such similar situations:

- Calculate the number of cones using Table 3 as shown, assuming the speed limit of 60 MPH:
  - For merge and termination taper: Use 60-ft. cone spacing for both tapers. The merge taper length is 720 ft. and the corresponding number of cones is 12. The termination taper length is 100 ft. and the corresponding number of cones is 5. Double this number as it is a two-lane closure scenario; therefore, the total number of cones for both the tapers is (2 x 12) + (2 x 5) = **34**.
  - For shoulder taper (optional): Use 60-ft. cone spacing. The shoulder taper length is 240 ft. and the corresponding number of cones is **4**.
  - For upstream and downstream buffer space: Use 120-ft. cone spacing for both. The upstream longitudinal buffer space length is 570 ft. and the corresponding number of cones is **5**. The downstream longitudinal buffer space length is 285 ft. and the corresponding number of cones is **2**.
  - For incident space: The default number of cones to set up along the incident space is **3** with 120-ft. cone spacing.
  - The total number of cones is 34 + 4 + 7 + 3 = **48**.
- Set up warning signs with necessary sign spacing as shown in Table 2.

The ideal number of cones is at least 48. It includes four optional cones to close the shoulder. Having any taper or traffic control devices is better than none.

11.5. Scenario 5: Crash with One-direction Lanes Closure

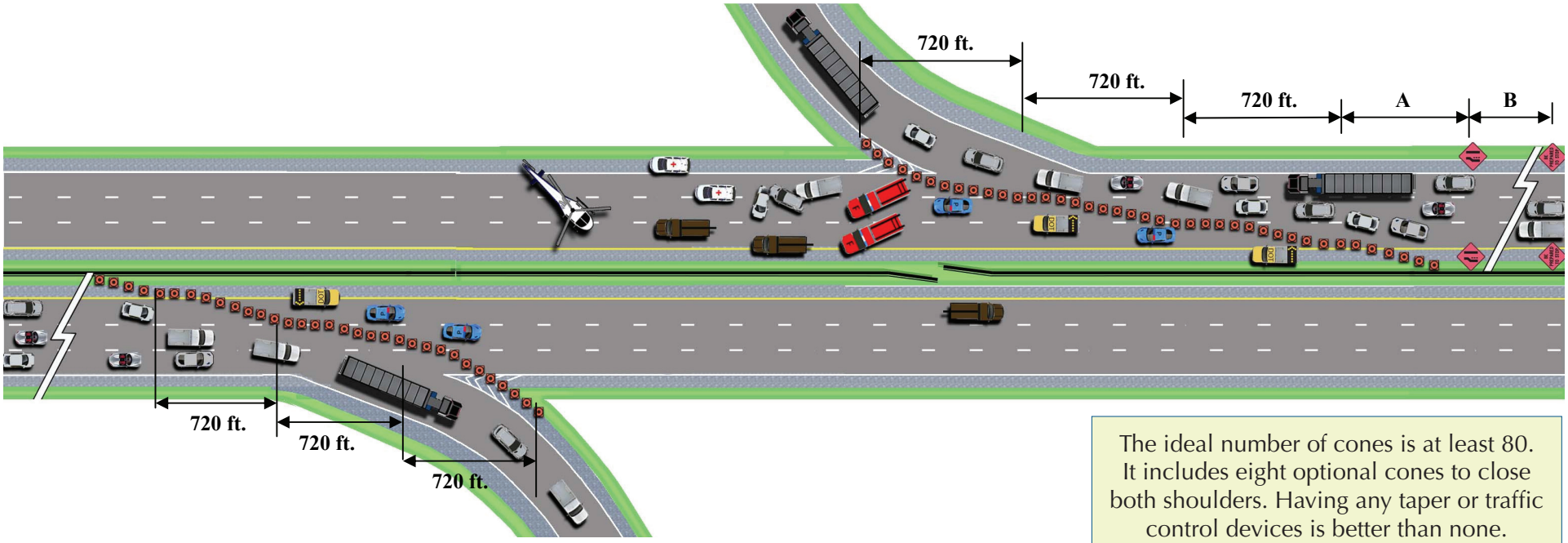
The ideal number of cones is at least 40. It includes four optional cones to close the shoulder. Having any taper or traffic control devices is better than none.



This crash resulted in closure of the entire one-direction lanes on a highway segment. Use the following steps as guidelines in such similar situations:

- Calculate the number of cones using Table 3 as shown, assuming the speed limit of 60 MPH:
  - For merge taper: Use 60-ft. cone spacing. The merge taper length is 720 ft. and the corresponding number of cones is 12. As this is a three-lane closure scenario, multiply the number of cones by three. Therefore, the total number of cones is 3 x 12 = **36** cones.
  - For shoulder taper (optional): Use 60-ft. cone spacing. The shoulder taper length is 240 ft. and the corresponding number of cones is **4**.
  - The total number of cones is 36 + 4 = **40**.
- Set up warning signs with necessary sign spacing as shown in Table 2 .
- Divert traffic at an upstream exit ramp, if required.

11.6. Scenario 6: Crash with Both Direction Lanes Closure



The ideal number of cones is at least 80. It includes eight optional cones to close both shoulders. Having any taper or traffic control devices is better than none.

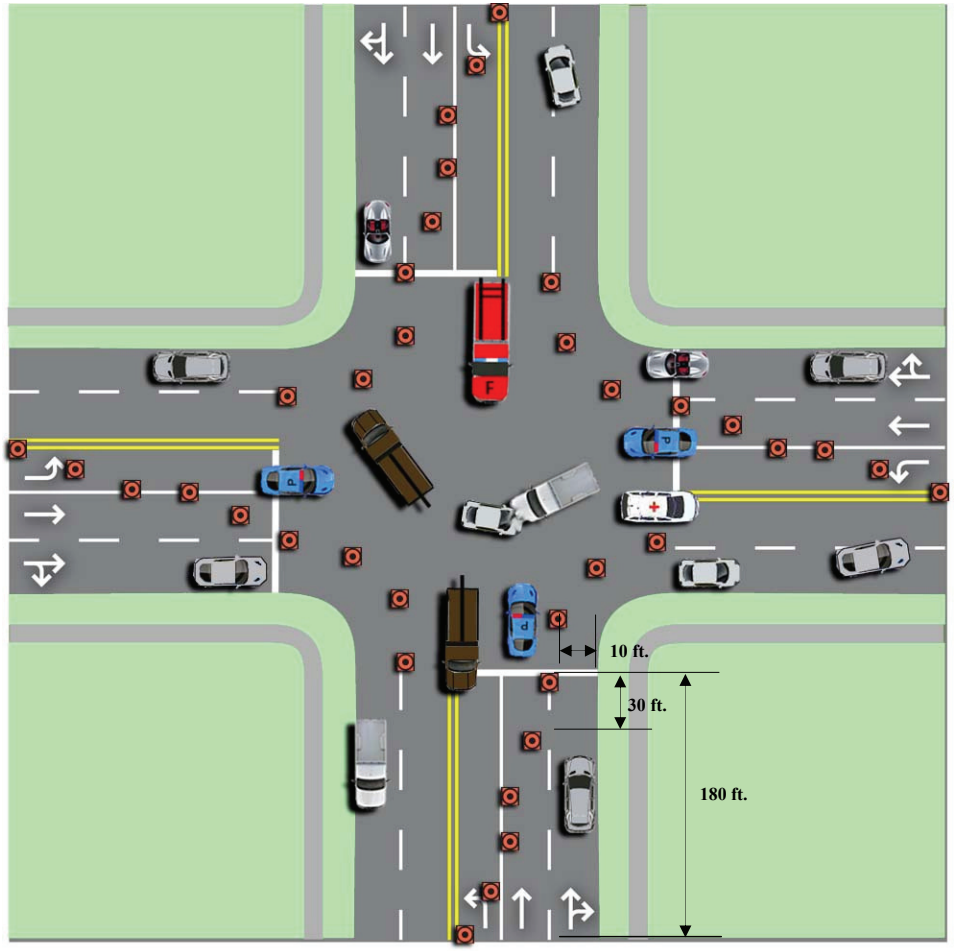
This crash resulted in closure of the entire one-direction lanes on a highway segment. Use the following steps as guidelines in such similar situations:

- Calculate the number of cones using Table 3 as shown, assuming the speed limit of 60 MPH:
  - For merge taper: Use 60-ft. cone spacing. The merge taper length is 720 ft. and the corresponding number of cones is 12. As this is a three-lane closure scenario, multiply the number of cones by three. Therefore, the total number of cones is 3 x 12 = 36. Double this number to allow both direction closures; therefore, the total number of cones is 2 x 36 = **72** cones.
  - For shoulder taper (optional): Use 60-ft. cone spacing. The shoulder taper length is 240 ft. and the corresponding number of cones is 4. Double this number to allow both direction shoulder closures, therefore, the total number of cones is 2 x 4 = **8**.
  - The total number of cones is 72 + 8 = **80**.
- Set up warning signs with necessary sign spacing as shown in Table 2.
- Follow the helicopter landing safety precautions when solicited at the incident scene.
- Divert traffic at an upstream exit ramps, if required.

11.7. Scenario 7: Crash at a Signalized Intersection

This is a partial intersection closure scenario (with right turn movements allowed) because of a crash in the middle of the intersection. Use the following steps as a guideline in such similar situations:

- Restrict traffic flow through the intersection and close to the incident scene. Setup traffic cones with the help from other responders, as shown in the rendering
- Allow right turn movements from all approaches with at least a 10-ft. travel lane whenever possible
- Calculate the number of cones using Table 3 as shown, assuming the speed limit of 30 MPH.
  - For merge taper: Use 30-ft. cone spacing. This is a one through lane closure scenario, therefore, use the 180-ft. taper. The corresponding number of cones is 6. Multiply this number by 4 as there are four approaches. Therefore, the total number of cones is 4 x 6 = **24**.
  - For right turn channelization: Use 60-ft. cone spacing. Right turn is allowed, therefore, use 3 additional cones. Multiply this number by 4 as there are four approaches. Therefore, the total number of cones is 3 x 4 = **12**.
  - The total number of cones is 24 + 12 = **36**.
- Change traffic signal phasing in coordination with the public works department
- Close the respective approaches when single or multiple approach(s) are blocked becuase of the incident. In that scenario, divert traffic at the nearest upstream intersection.
- Install the warning signs upstream of the closed approach lanes, preferably before the upstream intersection. Similarly, if the entire intersection is blocked, divert traffic at the nearest upstream intersection for all of the approaches.
- Position arrow boards appropriately at each approach to warn drivers of the lane closures.



The ideal number of cones is at least 36. Having any taper or traffic control devices is better than none.

12. REFERENCES

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APPENDIX A

AFTER ACTION REVIEW ASSESSMENT FORM

TIM Assessment Form

Every incident is unique, and the rescue effort involved with the incident varies with each incident type. Fill out this incident assessment form to provide feedback on actions taken and decisions made at the incident scene. This form includes a section to discuss best practices and opportunities for improvements in TIM. The feedback gathered from this form, and in TIM meetings, will help in modifying or updating TIM standard operating guidelines.

Responder's Contact Information:

Name:	Agency/Section:
Phone:	Fax:
E-mail:	Date:

Incident Location:

Road Name:	Mile Marker (if any):
Cross Street Name:	County:
City:	

Incident Details:

CAD/Crash Report #:	AM/PM:
Weather:	Total Duration:

Incident Description *(brief description of the incident; also include the information about incident type, injury level, number of vehicles involved, etc.):*

Traffic Management *(include the information about ITS activities, number of lanes closed, alternate route or detour):*

Responding Agencies *(provide names and brief description of the responding agencies):*

Time Line *(identify the key events and the timeline as they occurred during TIM):*

Best Practices *(discuss best practices during TIM, which helped in quick incident clearance safely):*

Suggested Improvements

- *Include any pictures available of the incident.*
- *Submit completed assessment form to the respective agency supervisor for TIM meeting.*

TIME 4 SAFETY

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APPENDIX B

MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES CHAPTER 6I

CHAPTER 6I. CONTROL OF TRAFFIC THROUGH TRAFFIC INCIDENT MANAGEMENT AREAS

Section 6I.01 General

Support:

Whenever the acronym "TTC" is used in this Chapter, it refers to "temporary traffic control".

Standard:

The needs and control of all road users (motorists, bicyclists, and pedestrians within the highway, including persons with disabilities in accordance with the Americans with Disabilities Act of 1990 (ADA), Title II, Paragraph 35.130) through a TTC zone shall be an essential part of highway construction, utility work, maintenance operations, and the management of traffic incidents.

Support:

A traffic incident is an emergency road user occurrence, a natural disaster, or other unplanned event that affects or impedes the normal flow of traffic.

A traffic incident management area is an area of a highway where temporary traffic controls are imposed by authorized officials in response to a road user incident, natural disaster, hazardous material spill, or other unplanned incident. It is a type of TTC zone and 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.

Traffic incidents can be divided into three general classes of duration, each of which has unique traffic control characteristics and needs. These classes are:

A. Major—expected duration of more than 2 hours;
B. Intermediate—expected duration of 30 minutes to 2 hours; and
C. Minor—expected duration under 30 minutes.

The 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. Examples include a stalled vehicle blocking a lane, a traffic crash blocking the traveled way, a hazardous material spill along a highway, and natural disasters such as floods and severe storm damage.

Guidance:

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.

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.

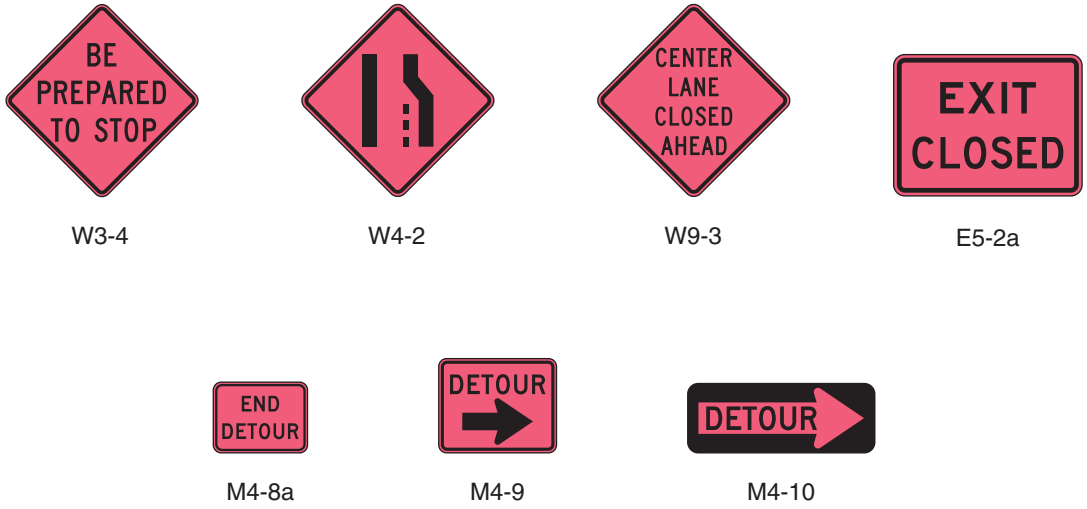
Option:

Warning and guide signs used for TTC traffic incident management situations may have a black legend and border on a fluorescent pink background (see Figure 6I-1).

Support:

While some traffic incidents might be anticipated and planned for, emergencies and disasters might pose more severe and unpredictable problems. The ability to quickly install proper temporary traffic controls might greatly reduce the effects of an incident, such as secondary crashes or excessive traffic delays. An essential part of fire, rescue, spill clean-up, highway agency, and enforcement activities is the proper control of road users through the traffic incident management area in order to protect responders, victims, and other personnel at the site while providing reasonably safe traffic flow. These operations might need corroborating legislative authority for the implementation and enforcement of appropriate road user regulations, parking controls, and speed zoning. It is desirable for these statutes to provide sufficient flexibility in the authority for, and implementation of, TTC to respond to the needs of changing conditions found in traffic incident management areas.

Figure 6I-1. Examples of Traffic Incident Management Area Signs



Option:

For traffic incidents, particularly those of an emergency nature, TTC devices on hand may be used for the initial response as long as they do not themselves create unnecessary additional hazards.

Section 6I.02 Major Traffic Incidents

Support:

Major traffic incidents are typically traffic incidents involving hazardous materials, fatal traffic crashes involving numerous vehicles, and other natural or man-made disasters. These traffic incidents typically involve closing all or part of a roadway facility for a period exceeding 2 hours.

Guidance:

If the traffic incident is anticipated to last more than 24 hours, applicable procedures and devices set forth in other Chapters of Part 6 should be used.

Support:

A road closure can be caused by a traffic incident such as a road user crash that blocks the traveled way. Road users are usually diverted through lane shifts or detoured around the traffic incident and back to the original roadway. A combination of traffic engineering and enforcement preparations is needed to determine the detour route, and to install, maintain or operate, and then to remove the necessary traffic control devices when the detour is terminated. Large trucks are a significant concern in such a detour, especially when detouring them from a controlled-access roadway onto local or arterial streets.

During traffic incidents, large trucks might need to follow a route separate from that of automobiles because of bridge, weight, clearance, or geometric restrictions. Also, vehicles carrying hazardous material might need to follow a different route from other vehicles.

Some traffic incidents such as hazardous material spills might require closure of an entire highway. Through road users must have adequate guidance around the traffic incident. Maintaining good public relations is desirable. The cooperation of the news media in publicizing the existence of, and reasons for, traffic incident management areas and their TTC can be of great assistance in keeping road users and the general public well informed.

The establishment, maintenance, and prompt removal of lane diversions can be effectively managed by inter-agency planning that includes representatives of highway and public safety agencies.

Guidance:

All traffic control devices needed to set up the TTC at a traffic incident should be available so that they can be readily deployed for all major traffic incidents. The TTC should include the proper traffic diversions, tapered lane closures, and upstream warning devices to alert approaching traffic of the end of a queue.

Attention should be paid to the end of the traffic queue such that warning is given to road users approaching the end of the queue.

If manual traffic control is needed, it should be provided by qualified flaggers or uniformed law enforcement officers.

Option:

If flaggers are used to provide traffic control for an incident management situation, the flaggers may use appropriate traffic control devices that are readily available or that can be brought to the traffic incident scene on short notice.

Guidance:

When flares are used to initiate TTC at traffic incidents, more permanent traffic control devices should replace them as soon as practical. Both the flare and its supporting device should then be removed from the roadway.

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.

Section 6I.03 Intermediate Traffic Incidents

Support:

Intermediate traffic incidents typically affect travel lanes for a time period of 30 minutes to 2 hours, and usually require traffic control on the scene to divert road users past the blockage. Full roadway closures might be needed for short periods during traffic incident clearance to allow traffic incident responders to accomplish their tasks.

The establishment, maintenance, and prompt removal of lane diversions can be effectively managed by inter-agency planning that includes representatives of highway and public safety agencies.

Guidance:

All traffic control devices needed to set up the TTC at a traffic incident should be available so that they can be readily deployed for intermediate traffic incidents. The TTC should include the proper traffic diversions, tapered lane closures, and upstream warning devices to alert approaching traffic of the end of a queue.

Attention should be paid to the end of the traffic queue such that warning is given to road users approaching the end of the queue.

If manual traffic control is needed, it should be provided by qualified flaggers or uniformed law enforcement officers.

Option:

If flaggers are used to provide traffic control for an incident management situation, the flaggers may use appropriate traffic control devices that are readily available or that can be brought to the traffic incident scene on short notice.

Guidance:

When flares are used to initiate TTC at traffic incidents, more permanent traffic devices should replace them as soon as practical. Both the flare and its supporting device should then be removed from the roadway.

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.

Section 6I.04 Minor Traffic Incidents

Support:

Minor traffic incidents are typically disabled vehicles and minor crashes that result in lane closures of less than 30 minutes. On-scene responders are typically law enforcement and towing companies, and occasionally highway agency service patrol vehicles.

Diversion of traffic into other lanes is often not needed or is needed only briefly. It is not generally possible or practical to set up a lane closure with traffic control devices for a minor traffic incident. Traffic control is the responsibility of on-scene responders.

Guidance:

When a minor traffic incident blocks a travel lane, it should be removed from that lane to the shoulder as quickly as possible.

Section 6I.05 Use of Emergency-Vehicle Lighting

Support:

The use of emergency-vehicle lighting (such as high-intensity rotating, flashing, oscillating, or strobe lights) is essential, especially in the initial stages of a traffic incident, for the safety of emergency responders and persons involved in the traffic incident, as well as road users approaching the traffic incident. Emergency-vehicle lighting, however, provides warning only and provides no effective traffic control. It is often confusing to road users, especially at night. Road users approaching the traffic incident from the opposite direction on a divided facility are often distracted by emergency-vehicle lighting and slow their vehicles to look at the traffic incident posing a hazard to themselves and others traveling in their direction.

The use of emergency-vehicle lighting can be reduced if good traffic control has been established at a traffic incident scene. This is especially true for major traffic incidents that might involve a number of emergency vehicles. If good traffic control is established through placement of advanced warning signs and traffic control devices to divert or detour traffic, then public safety agencies can perform their tasks on scene with minimal emergency-vehicle lighting.

Guidance:

Public safety agencies should examine their policies on the use of emergency-vehicle lighting, especially after a traffic incident scene is secured, with the intent of reducing the use of this lighting as much as possible while not endangering those at the scene. Special consideration should be given to reducing or extinguishing forward facing emergency-vehicle lighting, especially on divided roadways, to reduce distractions to on-coming road users.

Vehicle headlights not needed for illumination, or to provide notice to other road users of the incident response vehicle being in an unexpected location, should be turned off at night.

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APPENDIX C

TOWING AND RECOVERY ASSOCIATION OF AMERICA GUIDE

TRAA VEHICLE IDENTIFICATION GUIDE©

CLASS 1 • LIGHT-DUTY • (6,000 lbs. or less GVW - 4 tires)*

CLASS 2 • LIGHT-DUTY • (6,001 - 10,000 lbs. GVW - 4 tires)*

Classes 1 and 2 include passenger vehicles, light trucks, minivans, full size pickups, sport utility vehicles and full size vans.

CLASS 3 • MEDIUM-DUTY • (10,001 - 14,000 lbs. GVW - 6 tires or more)*

CLASS 4 • MEDIUM-DUTY • (14,001 - 16,000 lbs. GVW - 6 tires or more)*

CLASS 5 • MEDIUM-DUTY • (16,001 - 19,500 lbs. GVW - 6 tires or more)*

CLASS 6 • MEDIUM-DUTY • (19,501 - 26,000 lbs. GVW - 6 tires or more)*

Classes 3 through 6 include a wide range of mid-size vehicles, delivery trucks, utility vehicles, motorhomes, parcel trucks, ambulances, small dump trucks, landscape trucks, flatbed and stake trucks, refrigerated and box trucks, small and medium school and transit busses.

Information Needed To Correctly Dispatch Towing and Recovery Units:

- Year, Make and Model of Vehicle to be Towed or Recovered
- DOT Classification (Class 1 – 8 based on GVW)
- Location of Vehicle
- Type of Tow (impound, accident, recovery motorist assist, etc.)
- Additional Vehicle Information
  - 2 wheel drive, 4 wheel drive, all wheel drive
  - damage to vehicle, tire condition
  - vehicle loaded or empty
  - cargo contents
  - does the vehicle have a trailer
  - are the keys with the vehicle

Note: Any vehicle may carry hazardous materials. Advise if placarded.

*** Note:*** The Gross Vehicle Weight Rating (GVWR) of the vehicle to be towed or recovered can be found on the identification label on the vehicle's driver's side doorframe. The number of pounds listed on the label can then be compared with the DOT Classification Vehicle Type Chart for the correct DOT class.

CLASS 7 • HEAVY-DUTY • (26,001 - 33,000 lbs. GVW - 6 tires or more)*

CLASS 8 • HEAVY-DUTY • (33,001 lbs. and over GVW - 10 tires or more)*

Classes 7 and 8 include a wide range of heavy vehicles, large delivery trucks, motor coaches, refuse trucks, cement mixers, all tractor trailer combinations including double trailers.

Illustrations: © T.T. Publications/Vehicle Identification Guide: ©TRAA

Law enforcement communications with towing and recovery operators describing an incident and the vehicles involved can insure quick and efficient clearing of these scenes and less disruption to traffic flow. In an effort to standardize communications, the towing industry is adopting the federal vehicle class standards as outlined herein.

VIN CODES

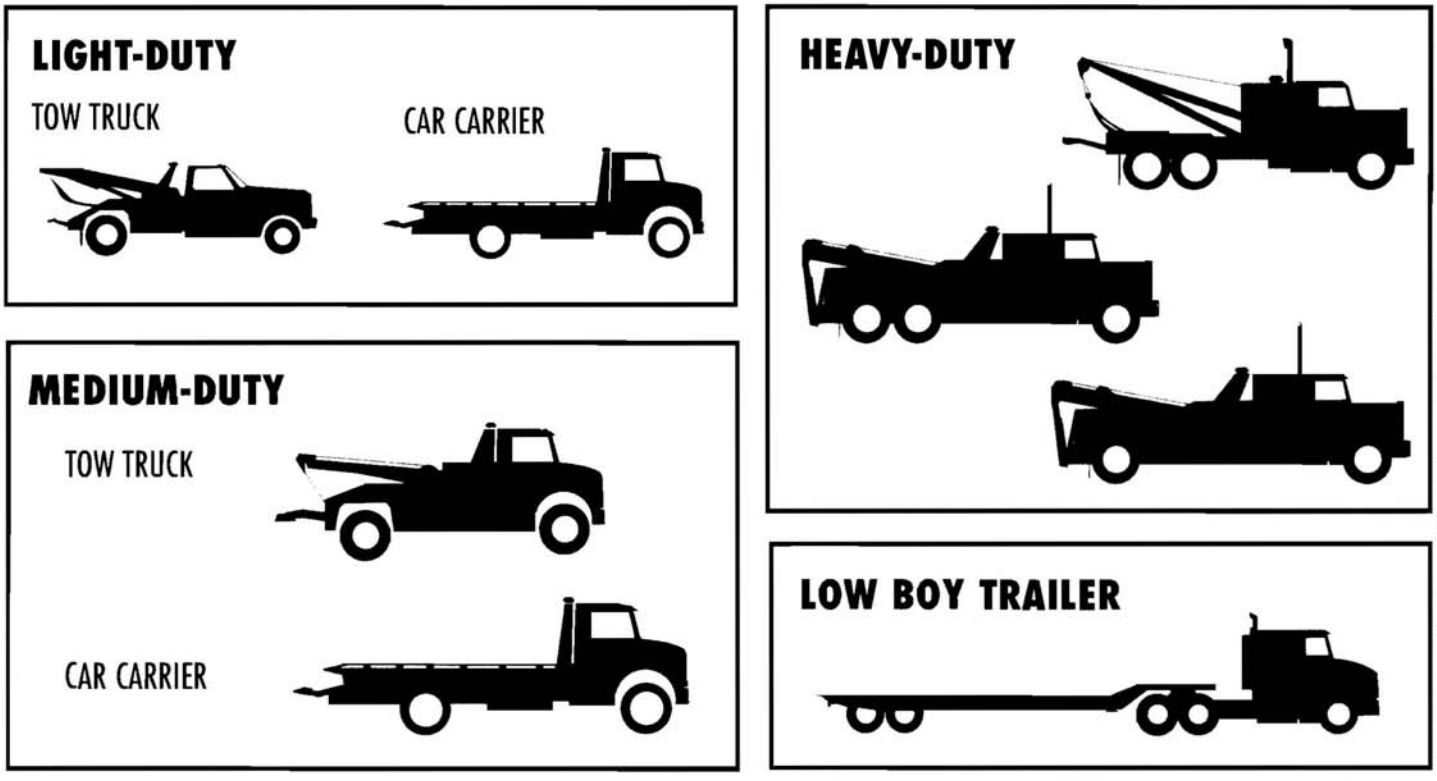
The year of the vehicle is critical information for towing operators in order for them to reference correct towing procedures. The diagrams on the front are examples of classifications. The following information about vehicle identification numbers affixed to the chassis will help determine the vehicle's year. As noted, the vehicle's year, identified by a letter or number in the VIN sequence, is the eighth character from the right.

1P8ZA1279SZ215470

EXAMPLE 1995 VIN NUMBER:

1980.....A	1987.....H	1994.....R	2001.....1	2008.....8
1981.....B	1988.....J	1995.....S	2002.....2	2009.....9
1982.....C	1989.....K	1996.....T	2003.....3	2010.....A
1983.....D	1990.....L	1997.....V	2004.....4	2011.....B
1984.....E	1991.....M	1998.....W	2005.....5	2012.....C
1985.....F	1992.....N	1999.....X	2006.....6	
1986.....G	1993.....P	2000.....Y	2007.....7	

TOW TRUCK/CAR CARRIER CLASSIFICATION



Illustrations: © T.T. Publications and Vehicle Identification Guide: ©TRAA

Compliments of Delaware Valley Regional Planning Commission.

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APPENDIX D

MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES CHAPTER 6E

CHAPTER 6E. FLAGGER CONTROL

Section 6E.01 Qualifications for Flaggers

Support:

Whenever the acronym "TTC" is used in this Chapter, it refers to "temporary traffic control".

Standard:

A flagger shall be a person who provides TTC.

Guidance:

Because flaggers are responsible for public safety and make the greatest number of contacts with the public of all highway workers, they should be trained in safe traffic control practices and public contact techniques. Flaggers should be able to satisfactorily demonstrate the following abilities:

A. Ability to receive and communicate specific instructions clearly, firmly, and courteously;
B. Ability to move and maneuver quickly in order to avoid danger from errant vehicles;
C. Ability to control signaling devices (such as paddles and flags) in order to provide clear and positive guidance to drivers approaching a TTC zone in frequently changing situations;
D. Ability to understand and apply safe traffic control practices, sometimes in stressful or emergency situations; and
E. Ability to recognize dangerous traffic situations and warn workers in sufficient time to avoid injury.

Section 6E.02 High-Visibility Safety Apparel

Standard:

For daytime and nighttime activity, flaggers shall wear safety apparel meeting the requirements of ISEA "American National Standard for High-Visibility Apparel" (see Section 1A.11) and labeled as meeting the ANSI 107-1999 standard performance for Class 2 risk exposure. The apparel background (outer) material color shall be either fluorescent orange-red or fluorescent yellow-green as defined in the standard. The retroreflective material shall be either orange, yellow, white, silver, yellow-green, or a fluorescent version of these colors, and shall be visible at a minimum distance of 300 m (1,000 ft). The retroreflective safety apparel shall be designed to clearly identify the wearer as a person.

Guidance:

For nighttime activity, safety apparel meeting the requirements of ISEA "American National Standard for High-Visibility Apparel" (see Section 1A.11) and labeled as meeting the ANSI 107-1999 standard performance for Class 3 risk exposure should be considered for flagger wear (instead of the Class 2 safety apparel in the Standard above).

When uniformed law enforcement officers are used, high-visibility safety apparel as described in this Section should be worn by the law enforcement officer.

Section 6E.03 Hand-Signaling Devices

Support:

Hand-signaling devices, such as STOP/SLOW paddles, lights, and red flags, are used to control road users through TTC zones.

Guidance:

The STOP/SLOW paddle should be the primary and preferred hand-signaling device because the STOP/SLOW paddle gives road users more positive guidance than red flags. Use of flags should be limited to emergency situations.

Standard:

The STOP/SLOW paddle shall have an octagonal shape on a rigid handle. STOP/SLOW paddles shall be at least 450 mm (18 in) wide with letters at least 150 mm (6 in) high and should be fabricated from light semirigid material. The background of the STOP face shall be red with white letters and border. The background of the SLOW face shall be orange with black letters and border. When used at night, the STOP/SLOW paddle shall be retroreflectorized.

Option:

The STOP/SLOW paddle may be modified to improve conspicuity by incorporating either white or red flashing lights on the STOP face, and either white or yellow flashing lights on the SLOW face. The flashing lights may be arranged in any of the following patterns:

A. Two white or red lights, one centered vertically above and one centered vertically below the STOP legend; and/or two white or yellow lights, one centered vertically above and one centered vertically below the SLOW legend; or
B. Two white or red lights, one centered horizontally on each side of the STOP legend; and/or two white or yellow lights, one centered horizontally on each side of the SLOW legend; or
C. One white or red light centered below the STOP legend; and/or one white or yellow light centered below the SLOW legend; or
D. A series of eight or more small white or red lights no larger than 6 mm (0.25 in) in diameter along the outer edge of the paddle, arranged in an octagonal pattern at the eight corners of the border of the STOP face; and/or a series of eight or more small white or yellow lights no larger than 6 mm (0.25 in) in diameter along the outer edge of the paddle, arranged in a diamond pattern along the border of the SLOW face.
E. A series of white lights forming the shapes of the letters in the legend.

Standard:

If flashing lights are used on the STOP face of the paddle, their colors shall be all white or all red. If flashing lights are used on the SLOW face of the paddle, their colors shall be all white or all yellow.

If more than eight flashing lights are used, the lights shall be arranged such that they clearly convey the octagonal shape of the STOP face of the paddle and/or the diamond shape of the SLOW face of the paddle.

If flashing lights are used on the STOP/SLOW paddle, the flash rate shall be at least 50, but not more than 60, flashes per minute.

Flags, when used, shall be a minimum of 600 mm (24 in) square, made of a good grade of red material, and securely fastened to a staff that is approximately 900 mm (36 in) in length.

Guidance:

The free edge of a flag should be weighted so the flag will hang vertically, even in heavy winds.

Standard:

When used at nighttime, flags shall be retroreflectorized red.

Section 6E.04 Flagger Procedures

Support:

The use of paddles and flags by flaggers is illustrated in Figure 6E-1.

Standard:

The following methods of signaling with paddles shall be used:

A. To stop road users, the flagger shall face road users and aim the STOP paddle face toward road users in a stationary position with the arm extended horizontally away from the body. The free arm shall be held with the palm of the hand above shoulder level toward approaching traffic.
B. To direct stopped road users to proceed, the flagger shall face road users with the SLOW paddle face aimed toward road users in a stationary position with the arm extended horizontally away from the body. The flagger shall motion with the free hand for road users to proceed.
C. To alert or slow traffic, the flagger shall face road users with the SLOW paddle face aimed toward road users in a stationary position with the arm extended horizontally away from the body.

Option:

To further alert or slow traffic, the flagger holding the SLOW paddle face toward road users may motion up and down with the free hand, palm down.

Standard:

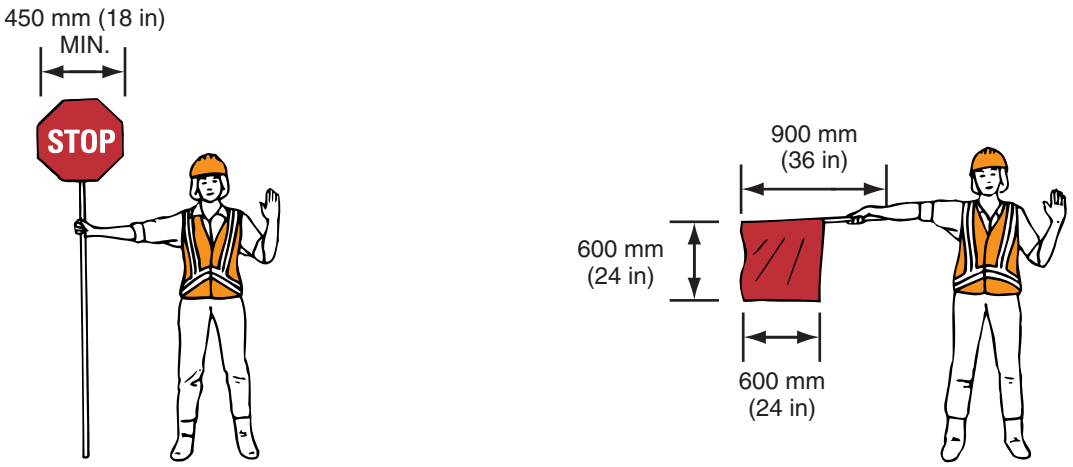
The following methods of signaling with a flag shall be used:

A. To stop road users, the flagger shall face road users and extend the flag staff horizontally across the road users' lane in a stationary position so that the full area of the flag is visibly hanging below the staff. The free arm shall be held with the palm of the hand above the shoulder level toward approaching traffic.
B. To direct stopped road users to proceed, the flagger shall stand parallel to the road user movement and with flag and arm lowered from the view of the road users, and shall motion with the free hand for road users to proceed. Flags shall not be used to signal road users to proceed.
C. To alert or slow traffic, the flagger shall face road users and slowly wave the flag in a sweeping motion of the extended arm from shoulder level to straight down without raising the arm above a horizontal position. The flagger shall keep the free hand down.

Figure 6E-1. Use of Hand-Signaling Devices by Flaggers

PREFERRED METHOD
STOP/SLOW Paddle

EMERGENCY SITUATIONS ONLY
Red Flag



TO STOP TRAFFIC

TO LET
TRAFFIC PROCEED

TO ALERT AND
SLOW TRAFFIC

Section 6E.05 Flagger Stations

Standard:

Flagger stations shall be located such that approaching road users will have sufficient distance to stop at an intended stopping point.

Option:

The distances shown in Table 6E-1, which provides information regarding the stopping sight distance as a function of speed, may be used for the location of a flagger station. These distances may be increased for downgrades and other conditions that affect stopping distance.

Guidance:

Flagger stations should be located such that an errant vehicle has additional space to stop without entering the work space.

Standard:

Except in emergency situations, flagger stations shall be preceded by an advance warning sign or signs. Except in emergency situations, flagger stations shall be illuminated at night.

Guidance:

The flagger should stand either on the shoulder adjacent to the road user being controlled or in the closed lane prior to stopping road users. A flagger should only stand in the lane being used by moving road users after road users have stopped. The flagger should be clearly visible to the first approaching road user at all times. The flagger also should be visible to other road users. The flagger should be stationed sufficiently in advance of the workers to warn them (for example, with audible warning devices such as horns or whistles) of approaching danger by out-of-control vehicles. The flagger should stand alone, never permitting a group of workers to congregate around the flagger station.

Option:

At a spot constriction, the flagger may have to take a position on the shoulder opposite the closed section in order to operate effectively.

At spot lane closures where adequate sight distance is available for the reasonably safe handling of traffic, the use of one flagger may be sufficient.

Table 6E-1. Stopping Sight Distance as a Function of Speed

Speed* (km/h)	Distance (m)
30	35
40	50
50	65
60	85
70	105
80	130
90	160
100	185
110	220
120	250

Speed* (mph)	Distance (ft)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730
75	820

* Posted speed, off-peak 85th-percentile speed prior to work starting, or the anticipated operating speed

APPENDIX E

STATE OF FLORIDA GUIDELINES FOR MITIGATION OF THE ACCIDENTAL DISCHARGES OF MOTOR VEHICLE FLUIDS

Guidelines
For the
MITIGATION OF ACCIDENTAL DISCHARGES OF MOTOR VEHICLE FLUIDS (NON-CARGO)
6/25/04

Purpose, Goal and Objectives

The following guidelines were prepared to outline steps that can be taken by early responders to motor vehicle crashes to reduce the confusion and subsequent delays in re-opening roadways when spilled vehicle fluids are involved. Refer to the existing policies in place for dealing with Hazardous Material releases.

These guidelines were developed by the multi agency, Florida Statewide Traffic Incident Management Program (TIMP) to clarify the goals, objectives and processes for clearing the highway of spilled motor vehicle fluids resulting from crashes and other vehicle incidents. The guidelines were reviewed and indorsed by the Florida Department of Transportation (DOT), Florida Department of Environmental Protection (DEP), and Florida Highway Patrol. The content of these guidelines is based on and consistent with the open letter to Fire-Rescue Departments and other response agencies from the Department of Environmental Protection dated June 14, 2002.

Spilled vehicle fluids are generally petroleum products, and most commonly are crankcase engine oil or diesel fuel, but they may also include transmission, hydraulic, or other fluids. Typically, absorbed vehicle fluids rarely fail the Toxicity Characteristic Leaching Procedure (TCLP) and thus are **usually not hazardous wastes.**

The goal is to provide guidance to responders and assist them in meeting the primary Incident Management goal of the Open Road Policy (ORP), namely to clear the incident scene within 90-minutes of the arrival of the first responder. In many incidents involving this level of spill, this goal can be far exceeded if these guidelines are followed.

The objectives of these guidelines are to:

- Provide specific procedural guidance for spilled vehicle fluid cleanup, and;
- Provide a reference for the disposal of spill materials.

Definitions

For the purposes of these guidelines, the following definitions apply:

- Absorbent materials are any materials, manufactured or natural that may be used to absorb spilled fluid, and may include commercial absorbents, saw dust, floor sweep, peat moss, absorbent pads, sand, clay or even topsoil.

- Cargo means the commercial (or other) materials being transported by the motor vehicle. Materials that are an intrinsic part of the vehicle itself are "non-cargo", even if the vehicle is a commercial vehicle.
- Commercial vehicle is one that carries cargo of commercial materials for pay, and may include, but not limited to, small, medium and heavy trucks; panel trucks and vans; tractor-trailers; commercial busses.
- **Defensive Actions For the purpose of these Guidelines Defensive Actions are those actions taken to contain the vehicle fluids.**
- Hazardous materials (HAZMAT) are materials posing immediate life-threatening danger to people and property, as defined in the US DOT "North America Hazardous Materials Guidebook"
- **Offensive Actions For the purpose of these Guidelines Offensive Actions are those actions taken by trained responders to plug or otherwise stop vehicle fluid leaks.**
- Private vehicle is any vehicle that is used for the personal transportation of its occupants on a not-for-hire basis, and may include, but not be limited to, passenger cars and cycles, vans and SUVs, motor homes and recreational vehicles, and busses used for private purposes.
- Responders may include fire rescue, wrecker operators, Road Rangers, contractors, and DOT or local highway agencies.
- Responsible party is the entity having dominion over the product prior to the spill, not necessarily the party responsible for the accident.
- Spill means the expulsion of any vehicle fluids upon the roadway itself or the abutting areas that cause an immediate threat to traffic by hindering its normal operation in any way (covering surfaces causing slicks, dripping onto traffic below, etc.).
- Vehicle fluid, or simply fluid(s), are non-cargo liquid materials that are spilled from the vehicle, such as gasoline, diesel fuel; motor oil; coolants; transmission, brake and hydraulic fluids. These may originate from the engine, drive train, fuel tanks, wheel assemblies, compressors, air handlers or any component of the vehicle, including tractor and trailer, as applicable.

Scope

These guidelines only apply to spilled motor vehicle fluids from private and commercial vehicles used for the operation of the vehicle. They do not apply to any hazardous material cargo spill.

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The full extent of these guidelines cover crashes involving commercial vehicles. Spilled fluids from **passenger vehicle** crashes are exempt from regulation with respect to removal and reimbursement, but should be routinely cleaned up by responders and/or vehicle owners in accordance with this guideline for clearance.

Clearance Procedure

In situations involving the spillage of vehicle fluids on a roadway from both **commercial vehicles** and **private vehicles**, the preferred clean-up method is to soak up as much material as possible using absorbent materials. Also, move the absorbent materials out of the travel lanes and store at the roadside, preferably well off the shoulder**.** In some cases the material may be containerized and placed in the damaged vehicle(s) for removal by the towing company. **Note DOT and other crash-scene responders may apply absorbents and sweep off travel lanes regardless of the quantity** It is **not** necessary to await a licensed clean-up contractor.

Clean up normally involves the use of granular absorbents or vermiculite, floor sweep, peat moss, pads and booms, clay or topsoil. In limited situations, sand can also be used but it is better suited for increasing friction than to be used as an absorbent. If immediately available, an alternative method for dealing with the thin film that may remain after absorbents are used is to apply a light dusting with Portland cement.

Defensive actions can include containment, diking or soil berming. Offensive actions can include stopping the leak at the source. These efforts not only limit the size of the release, but also can help prevent the spilled material from entering storm drains. Pails, buckets, kiddy pools, as well as hand transfer pumps are typical items used to contain and limit diesel fuel spills on roadways.

The Responsible Party [RP] is accountable for vehicle fluid spillage, including the final removal and proper disposal of absorbents and if needed the subsequent site remediation. If the RP does not or cannot handle this responsibility in a timely manner, the governing authority [State of Florida, County, City, etc.] will initiate disposal and the responsible party will be billed. **Clean-up actions taken by early responders do not affect or limit this responsibility.**

Responders should be aware that it often takes several hours for a clean-up contractor to arrive on-scene. Therefore, priority should be given to re-opening the travel lanes. In many cases lanes can be re-opened with a minimal effort using available absorbents applied by on-scene personnel.

Additional or incidental material spilled during the relocation of the vehicle out of the travel lanes of the roadway can be cleaned up and moved to the roadside with the other absorbents used at the scene. *The responsible party remains accountable!*

Absorbent material moved out of travel lanes may be bagged in heavy-duty trash bags, wrapped or 'diapered' in plastic sheeting, or containerized in pails or barrels. The material should be well off the travel portion of the roadway and can remain there a reasonable time to allow for disposal by the responsible party or a contractor, [paid by the responsible party]. The material may be placed in a container and placed in the damaged vehicles and removed by the towing company.

The containers used to hold the material should be tagged and clearly marked to indicate the type of absorbent used and the material that was spilled. It is also desirable to indicate the responsible party. Care should be taken not to overload the containers used to store the absorbents. If trash bags are used, double bag and limit each bag to about 15 pounds.

The reportable quantity of 25 gallons does not automatically prevent or limit on scene actions to mitigate the spill. In fact **prompt intervention is encouraged** to limit the congestion impact and prevent the high probability of secondary incidents as a result of extended traffic blockage**. It is very important that every effort be made to limit the amount of time the spilled fluids are in contact with asphalt pavement.**

Traffic cones or other readily identifiable methods should be used at the site to mark the location of the material for later retrieval.

Spill clean up by a fire department; highway agency, wrecker operator, roadway contractor or the responsible party should be limited to spills of a magnitude within their capabilities. However, *no **qualified** responder is restricted from taking prompt action to stop the spill at its source or to contain and limit the size of the spill, to limit the damage to the pavement surface, and to prevent any flammable material from catching fire*.

Vehicle fluid spills, which have soaked into soil, will require cleanup but may be completed at a later date by the responsible party. Care must be taken to locate any underground utilities prior to the excavation of contaminated soil.

Disposal options for non-hazardous fuels, oils, and other vehicle fluids include, but not limited to:

- Thermal treatment at a permitted soil burner
- The use of an approved oil hauler for liquids
- Incineration at a local landfill incinerator
- And delivery to a local Household Hazardous Waste Facility. (Some limitations may apply)

Responders should have 'Right to know' instruction for handling these vehicle fluids and have completed the "Awareness" level of Hazardous Material Training.

Summary

A quick-reference of these guidelines is included on the next page.

NOTIFICATION and REPORTABLE QUANTITIES

Florida DEP has adopted the US Environmental Protection Agency's **Reportable quantities** for hazardous substances, and an **RQ** of 25 gallons for spilled petroleum products spilled on land, or any amount which causes a sheen on navigable waters shall be called in. If in doubt about the amount, it is recommended the incident be reported by calling the State Warning Point, who will contact DEP's Bureau of Emergency Response (BER).
STATE WARNING POINT [800] 320-0519, 24 hours, 7 days
When calling be prepared to give the location, type of fluid spilled, RP name, address and phone number

- **VEHICLE FLUID SPILL CLEAN-UP GUIDELINES**

Quick Action Guide

- Identify spill as a vehicle fluid
- Stop leaking material at the source
- Contain and limit spill from spreading
- Apply available absorbents
- Sweep material off travel lanes
- Second application if necessary
- Gradually restore traffic flow
- ID RP and mark location of material
- Assure proper notification made, State Warning Point 800/320-0519

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