



Highway Traffic Incident Management (TIM)

Manejo de Incidentes de Tráfico en Carreteras

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¡Buenos Días!



Good Morning!





Manejo de Incidentes de Tráfico (TIM) en Carreteras

Temas a Cubrirse

1. Introducción
2. Objetivos y Metas
3. Definiciones
 - Traffic Incident Management (TIM)
 - Traffic Management Plan (TMP)
 - Planned Special Events (PSE)
 - Unplanned Events
4. Tipos de incidentes de tráfico en carreteras
5. Rol y propiedades de los aditamentos del control de tráfico
 - Manual de Dispositivos Uniformes de Control de Tráfico (MUTCD)
 - Capítulo 6-I “Traffic Incident Management Area”
6. Preparación de Plan de Control de Tráfico para Manejo de Incidentes
7. Mejores prácticas para el manejo de incidentes
 - Eventos planificados o especiales
 - Choques de tránsito



EL PUENTE

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Educating to Save Lives on the Highways



Putting Puerto Rico on the Map in Traffic Incident Management Training



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Module 1- Introduction





Muere mujer en accidente en el Túnel Minillas

*“Aunque el choque se produjo en dirección hacia Carolina, registran **congestión vehicular** en ambas direcciones...”*



<http://www.elnuevodia.com>

Por Javier Colón Dávila/ Javier.colon@gfrmedia.com

Seguridad: 3 de diciembre de 2014, 10:25 p.m.

Fallece mujer tras chocar contra árbol

Accidente ocurrió en Aguada

- Según datos brindados por la Policía, la tragedia ocurrió a las 5:30 p.m. en la carretera PR-115 cuando la mujer chocó una guagua Jeep Comanche del 2006, **primero contra un poste y luego contra un árbol.**
- Se indicó que el **pavimento estaba mojado** pero no está claro si ese elemento provocó el accidente.



<http://www.elnuevodia.com>

Seguridad: 3 de diciembre de 2014 ,7:41 p.m., modificado: 7:55 p.m.



1. Introduction

- Traffic incidents in the US and Puerto Rico are estimated to cause between 53% and 58% of total delay experienced by motorists in all urban areas.
- Crashes that result from other incidents make up 14%–18% of all crashes. These secondary crashes are estimated to cause 18% of deaths on freeways.
- Approximately 50% of police, EMS, and firefighter fatalities occurred as a result of transportation incidents.
 - Firefighter: 10%
 - Police officer: 8%



1. Introduction (cont.)



- Nearly 10,000 police cars; 2,000 fire trucks; and 3,000 other service vehicles are struck while going to or at traffic incidents.

1. Introduction (cont.)



- Nearly 10,000 police cars; 2,000 fire trucks; and 3,000 other service vehicles are struck while going to or at traffic incidents.

Policía involucrado en accidente de tránsito en la PR-1 en San Juan



- Patrulla quedó con ruedas hacia arriba, así como el vehículo impactado por el policía José Ortiz de la División de Patrullas de San Juan, en un accidente a las 6:53 a.m. en la PR-1 en dirección de Caguas a Río Piedras
<http://www.primerahora.com>, 10/10/2011 |02:19 p.m.

1. Introduction (cont.)



- Traffic Incident Management (TIM) programs, including **surveillance cameras** and service patrols, **reduced congestion** in 56 urban areas by **117 million hours**.



1. Introduction (cont.)

- Traffic Incident Management (TIM) programs, including surveillance cameras and service patrols, reduced congestion in 56 urban areas by 117 million hours.
- Annual cost saving resulting from TIM programs in 75 urban areas was estimated to be \$2.3 billion.



The Crash Pyramid... a public health issue



Three injury
crashes
every minute,
24/7



Source: Traffic Safety Facts 2011 - National Highway Traffic Safety Administration

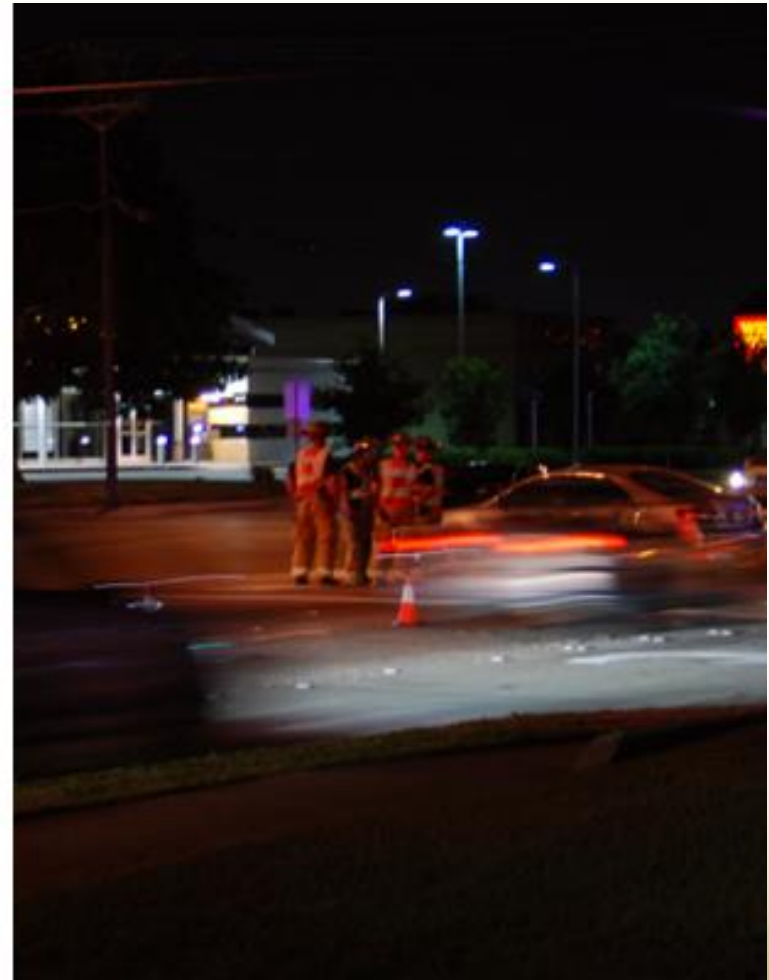


Each injury crash can require...

Each injury crash
can require...

- ✓ 2 Law Enforcement
- ✓ 4 Fire/Rescue
- ✓ 2 EMS
- ✓ 1 Towing & Recovery

= 9 Responders





That's potentially 27 responders rolling out to a new injury crash every minute of every hour, 24/7/365!





Responder Struck-by Fatalities

In a typical year, the following number of responders are struck and killed:

- 12 Law Enforcement Officers
- 5 Fire and Rescue Personnel
- 60 Towing and Recovery Professionals
- Several transportation professionals from DOTs, Public Works, and Safety Service Patrol Programs

Responder Struck-by Crashes





Module 2

Objectives and Scope



2. Objectives and Scope

Objectives

- Provide the participants the ability to identify and discuss the techniques and risks associated with Highway Traffic Incident Management (TIM)

Scope

- **Unplanned events-** those that happened at random or with little advance warning
 - Traffic incidents
 - Emergencies

NOTE: Topics not covered in this seminar: are those associated with planned events such as: Roadway constructions and maintenance



National Traffic Incident Management Coalition





National Traffic Incident Management Coalition (NTIMC)

- A multi-disciplinary partnership forum spanning the public safety and transportation communities to coordinate experiences, knowledge, practices, and ideas.
- Committed to safer and more efficient management of all incidents that occur on, or substantially affect, the nation's roadways in order to:
 - Enhance the safety of on-scene responders and of motorists passing or approaching a roadway incident.
 - Strengthen services to incident victims and to stranded motorists.
 - Reduce incident delay and costs to the traveling public and commercial carriers.



Module 3

Definitions

3. Definition: Traffic Incident

Definition

- An emergency road user occurrence,
- A natural disaster, or
- Other **unplanned event** that affects or impedes the normal flow of traffic.
- The National Incident Management System (NIMS) requires the use of the Incident Command System (ICS) at traffic incident management scenes.

Examples





3. Traffic Incident (cont.)

Classification

1. Major: Expected duration of more than 2 hours
2. Intermediate: Expected duration of 30 minutes to 2 hours.
3. Minor: Expected duration under 30 minutes.

A Natural Disaster





3. Definition: Traffic Incident Management (TIM)

Definition

- Planned and coordinated multi-disciplinary process to detect, respond to, and clear traffic incidents in order that traffic flow may be restored as **safety and quickly as possible**
- Effective TIM reduces the duration and impacts of traffic incidents and improves the safety of motorists, crash victims, and emergency responders.



Ronald Moore, ResQue-1, LLC

Source: National Traffic Incident Management Responder Training

3. Definition: Planned Special Event (PSE)

Definition

- Public activity
- Scheduled *time*, *location* and expected *duration*

PSE Example



3. Definition: Planned Special Event (PSE)

Definition

- Increased *travel demand* and/or *reduced capacity* attributed to event staging
- Impacts the normal operation of the surface transportation system

PSE Example



Other Types of Planned Events

- Roadway construction and maintenance



Unplanned Events

- Traffic incidents and emergencies that happen at random or with little advance warning.





Traffic Management Plan (TMP) vs. Traffic Incident Management (TIM)



1. TMP indicates how traffic, parking and pedestrian operations will be managed on day-of-event
2. TIM is a component of a TMP that specifies crash prevention strategies and traffic incident quick clearance initiatives for day-of-event traffic operations



TMP: Traffic Operations



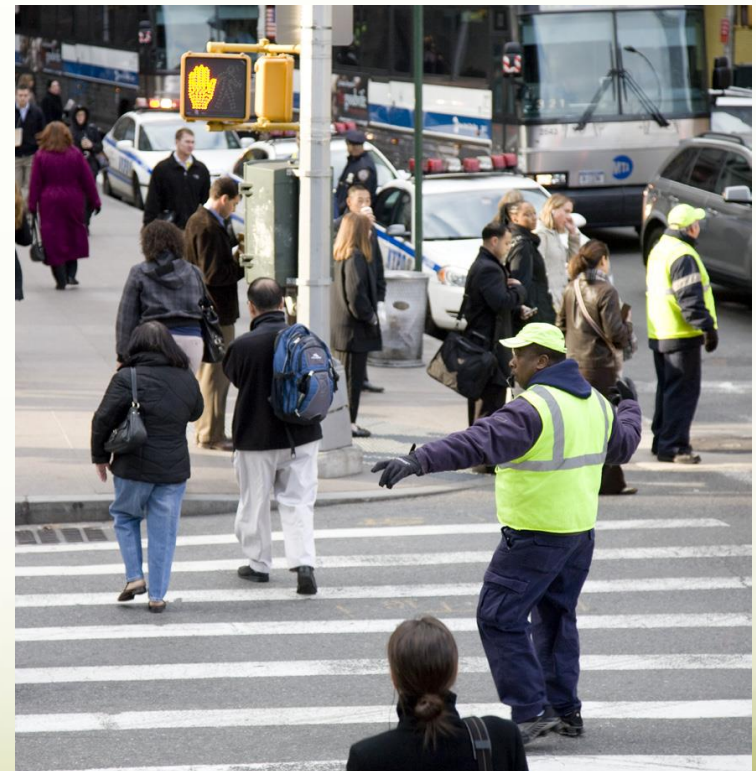


TMP: Parking Operations





TMP: Pedestrian Operations





Safe, Quick Clearance

Safe, Quick Clearance...

Second of the three main NUG objectives, it is the practice of rapidly, safely, and aggressively removing temporary obstructions from the roadway

- Disable Vehicles
- Wrecked Vehicles
- Debris
- Spilled Cargo



Safe, Quick Clearance Goals

- Restore the roadway to its pre-incident capacity as quickly and safely as possible
- Minimize motorist delay through traffic control and opening of lanes
- Make effective use of all clearance resources
- Enhance the safety of responders and motorists
- Protect the roadway system and private property from unnecessary damage during the removal process



What is Safe, Quick Clearance?

- Working with a *sense of urgency*
- Utilizing **Unified Command** and incorporating safe, quick clearance into the incident objectives
- Completing tasks concurrently whenever possible
- Regularly assessing traffic control and on-scene activities to determine if additional lanes can be opened
- Utilizing all available resources for clearance activities
- *Thinking outside of the box and considering how things could be done differently*



Move Over/Change Lane Laws

Move Over Laws require drivers approaching a scene where emergency responders are present to either change lanes when possible and/or reduce vehicle speed

- Washington, D.C. is the only jurisdiction within continental U.S. without a Move Over Law
- Require motorists involved in minor crashes (where there are no serious injuries and the vehicle can be driven) to **move their vehicles out of the travel lanes to the shoulder** or other safe area
- Also referred to as:
 - **Fender Bender**
 - **Move It**
 - **Steer It, Clear It**





Authority Removal Laws

- Provide authority (and immunity from liability in general) for designated public agencies to remove vehicles and/or spilled cargo from the roadway to restore traffic flow
- Serious injury or fatality does not always preclude removal
- Often contain a Hold Harmless clause
- Implemented in a number of states



Communication

Accurate, clear communication among all disciplines involved in TIM means responders arrive at the scene quickly, meet quick clearance goals and clear the scene sooner, and improve safety for themselves and those involved in incidents



Move Over Law in Puerto Rico

- **Ley 22 Artículo 4.01- Regla general**

“El conductor de todo vehículo involucrado en un accidente del que resultaren daños a otro vehículo u otra propiedad, o del que resultare lesionada o muerta una persona, detendrá inmediatamente su vehículo en el lugar del accidente o tan cerca del mismo como fuere posible, de tal forma que no obstruya el tránsito, y dará cumplimiento a todas las obligaciones que bajo esta Ley se disponen. En caso de que un conductor detenga su vehículo cerca del lugar del accidente, pero no exactamente en el mismo, regresará al sitio del accidente y permanecerá en éste hasta tanto cumpla con lo dispuesto en el Artículo 4.03 de esta Ley. Toda parada se hará sin obstruir el tránsito más de lo que fuere necesario.”



Ley de Vehiculos y Transito de Puerto Rico

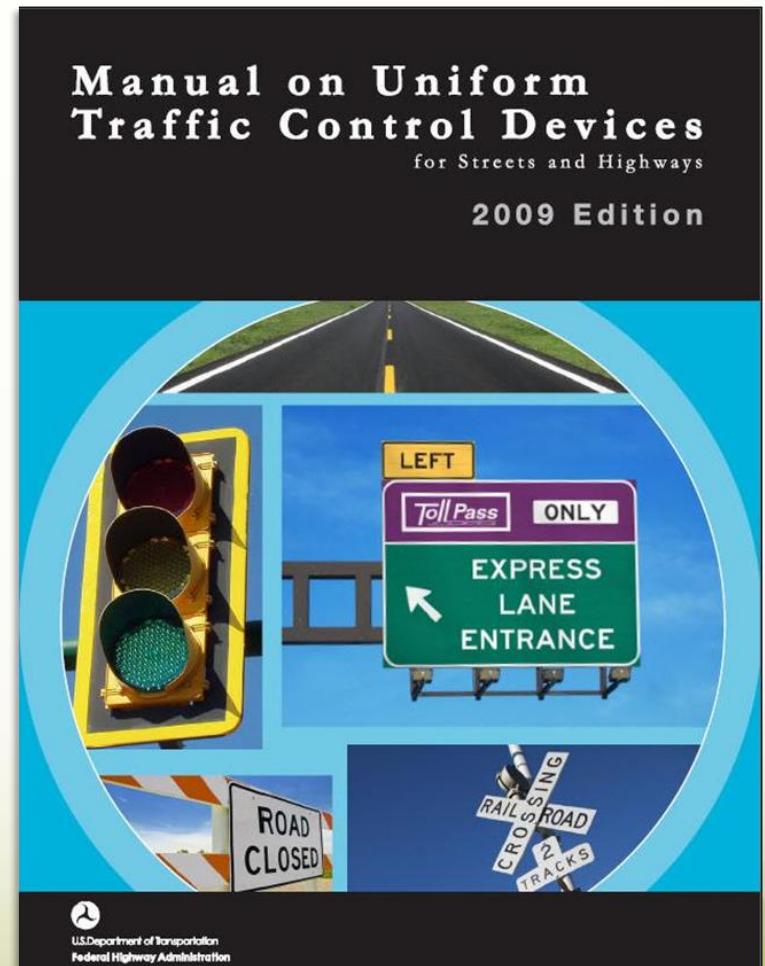
Ley 22 Artículo 4.05- Obstrucción innecesaria del tránsito

“Queda prohibido parar o dejar estacionado un vehículo después de un accidente en forma tal que obstruya el tránsito en la vía pública, excepto en aquellos casos en que las circunstancias, o la situación o condiciones en que los vehículos o sus ocupantes quedaren después del accidente, no lo permitieren.”



Manual on Uniform Traffic Control Devices (MUTCD)

- Federal (FHWA) regulation applicable for all traffic control nationwide
- It also covers all “workers” on all streets, roadways, or highways,
- 2009 Edition, revised May 2012.





Module 4

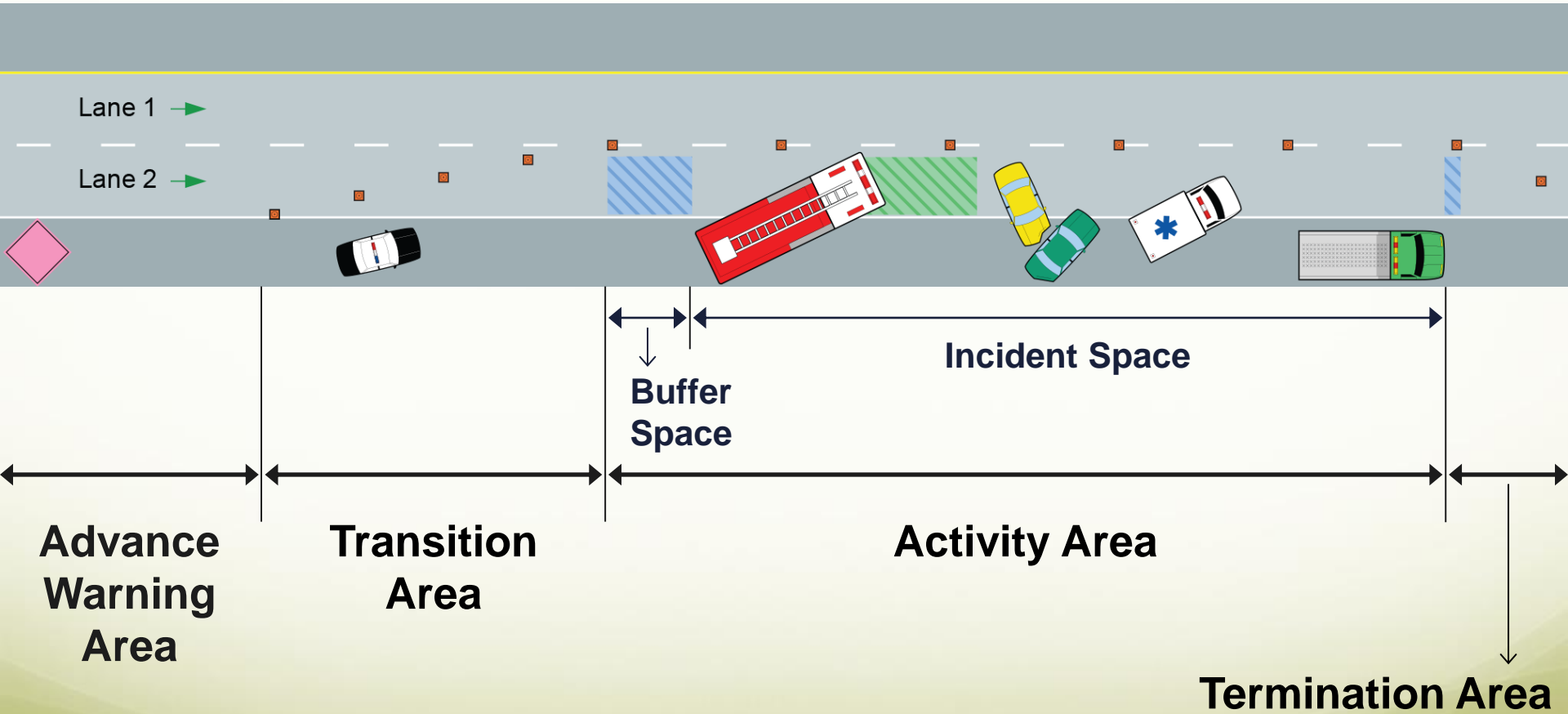
Types of Highway Traffic Incidents

Terminology





Traffic Incident Management Area





Common Response Terminology

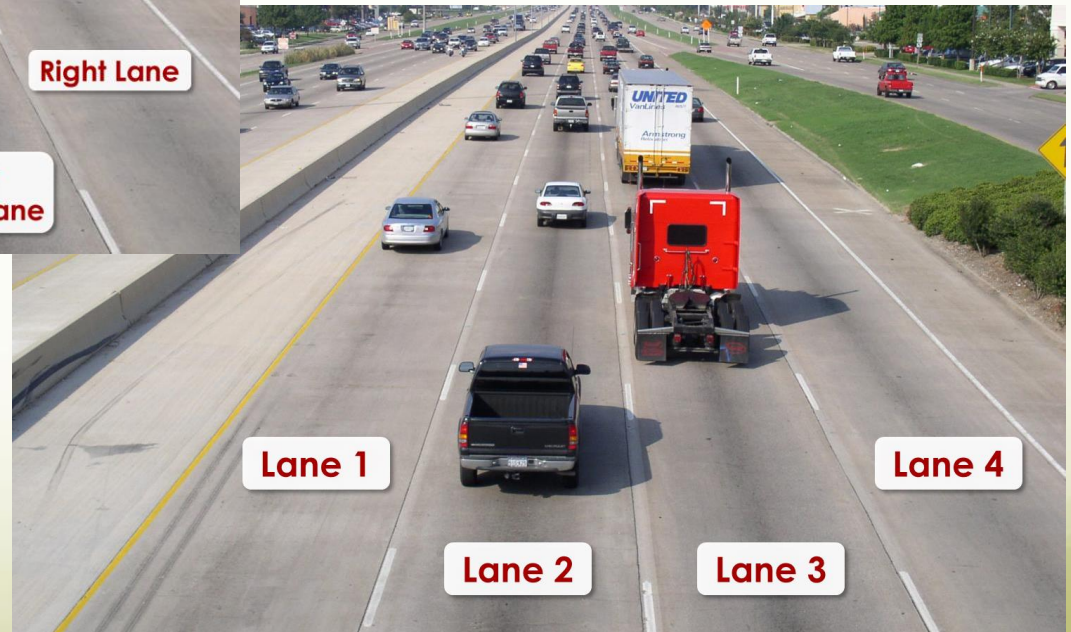


Lane Designation Terminology



Before Recommendation

After Recommendation



If there is an HOV Lane



Tubular Post Separated HOV Lane



Barrier Separated HOV Lane



Upstream and Downstream





Traffic Queues

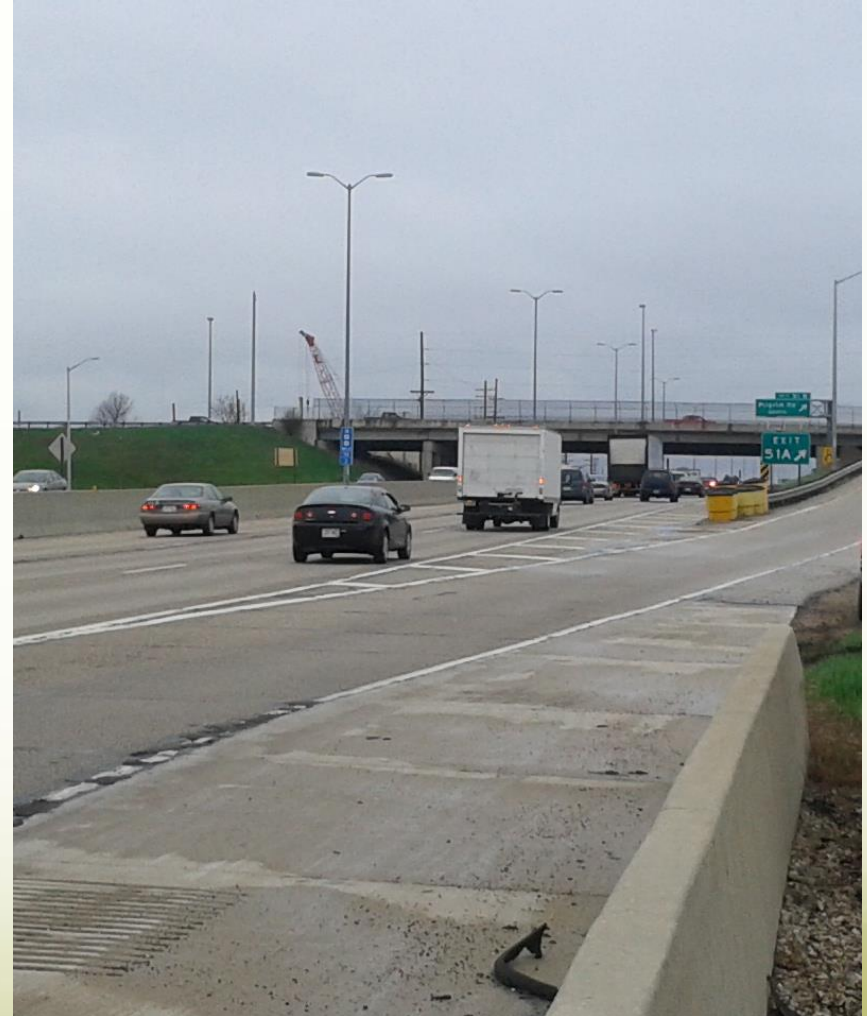
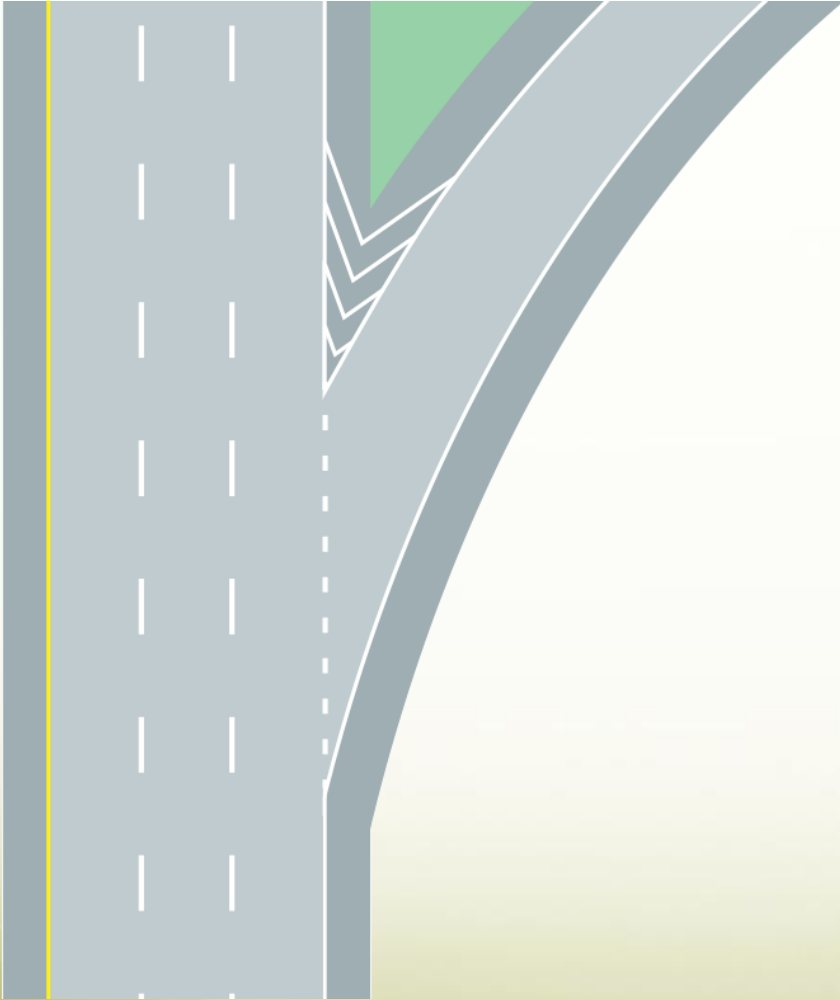
– Backup of Approaching Traffic



Source: National Traffic Incident Management Responder Training



Gore



Source: National Traffic Incident Management Responder Training



Common Response Terminology

- On-ramp/Off-ramp
- Service Road/Access Road
- Distributor/Collector Road
- Overpass/Underpass





Student Activity





Another Incident Location





Describe the Incident Location





Describe the Incident Location





Describe the Incident Location





Rural Road Response Terminology





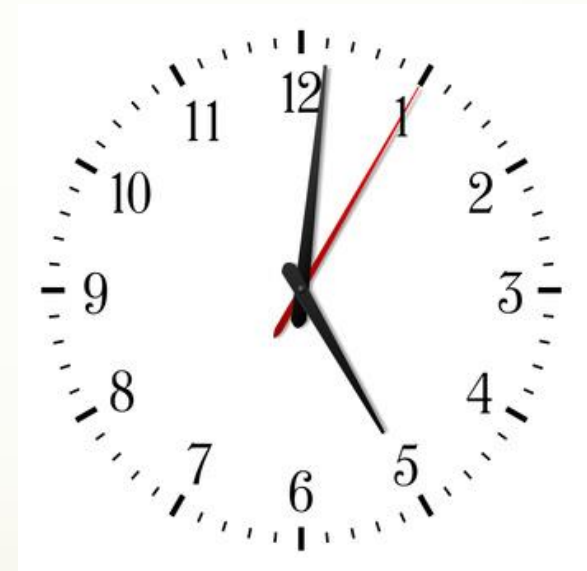
Rural Road Response Terminology





The use of common terminology...

Accurate, clear communication among all disciplines involved in TIM means responders arrive at the scene quickly, clear the scene sooner, and improve safety for themselves and those involved in the incident





Notification and Scene Size-Up





Public Safety Communications Centers

- Telecommunicators are often the first to receive notification of an incident and are responsible for:
 - Providing a basic assessment of the situation
 - Dispatching an appropriate response based on their knowledge of available resources
 - Information received via telephone, mobile data computer, two-way radio, and real-time video observation





Verification

- Verification involves collecting sufficient information on the nature of the incident including identifying:
 - Type and level of incident
 - Exact physical location
 - Number of vehicles involved
 - Color and type if possible
 - Lanes affected
 - Injuries, entrapment



Transportation Management Centers (TMCs)



Source: National Traffic Incident Management Responder Training



Determining the Incident Location

- Passing motorists frequently report a location that is downstream of the actual incident, especially on limited access highways
- When an incident is reported by a citizen caller, knowing the color and type of the vehicles involved is valuable
- Telecommunicators should:
 - Ask the calling party to identify the specific geographic location of the incident, referencing highway mile markers, nearest exit/entrance ramp signs, etc.
 - If applicable, advise motorists of the Driver Removal Law and instruct them to move vehicles off the roadway if there are no injuries
- Once verified, responders are dispatched to respond



Initial/Windshield Size-Up

- Upon first arriving on-scene, an initial or windshield size-up report should be provided
 - Confirmation of geographical location
 - Preliminary analysis of current situation
 - Actions required to mitigate the situation
 - Resources required to support those actions
- Should take into consideration any unique safety situations apparent to responders as they arrive on-scene



Typical Windshield Size-Up Report

- Unit identification
- Exact location of incident
- Number and type of vehicles involved
- Degree of damage
- Number of lanes closed
- Hazards or problems
- Establishment of command



What Is Your Windshield Size-Up Report?



Typical F/R Windshield Size-Up Report:

“Unit one on-scene... Main Street... Minivan fully engulfed in flames in the right lane... The vehicle is leaking fuel... Assuming Main Street command ”



First Responder Arrives On-Scene...

How is the Location Reported?



Source: National Traffic Incident Management Responder Training



What Is Your Windshield Size-Up Report?



Source: National Traffic Incident Management Responder Training



What Is Your Windshield Size-Up Report?



Source: National Traffic Incident Management Responder Training



Progress Reports

- A detailed scene size-up should be provided within 15 minutes
- Additional progress reports should be provided at regular intervals





Incident Duration Classifications

Minor



< 30 minutes

Intermediate



30 min - 2 hrs

Major



> 2 hours





Progress Report

- **Location** – Exact incident location
- **Vehicles** – Number and type of vehicles involved
- **Injured Persons** – Number and extent of injuries, and need for extrication
- **Incident Duration Classification** – Minor, Intermediate, or Major
- **On-Scene Conditions** – Any conditions present that may affect the safety of responders (e.g., limited visibility, downed wires, etc.)
- **Hazardous Materials** – Presence or potential presence at the scene



Progress Report

- **Traffic Conditions**
 - Length of traffic queue
 - Traffic control needs
 - Detour/alternate route needs
- **Towing and Recovery** – Provide accurate, detailed vehicle info
- **Additional Resources**
 - Helicopter EMS services
 - Crash investigation/reconstruction
 - Medical examiner/coroner



Were Their Actions Safe?



Source: National Traffic Incident Management Responder Training



Safe Vehicle Positioning

Move It: This refers to moving vehicles involved in an incident to a secondary location before being worked

Work It: This refers to a situation where the vehicles involved cannot be moved to a secondary location before being worked



Move It or Work It?



Source: National Traffic Incident Management Responder Training



Safe-Positioned – MUTCD Definition

The positioning of emergency vehicles at an incident in a manner that attempts to:

1. Protect the responders performing their duties
2. Protect road users traveling through the incident scene
3. Minimize, to the extent practical, disruption of the adjacent traffic flow



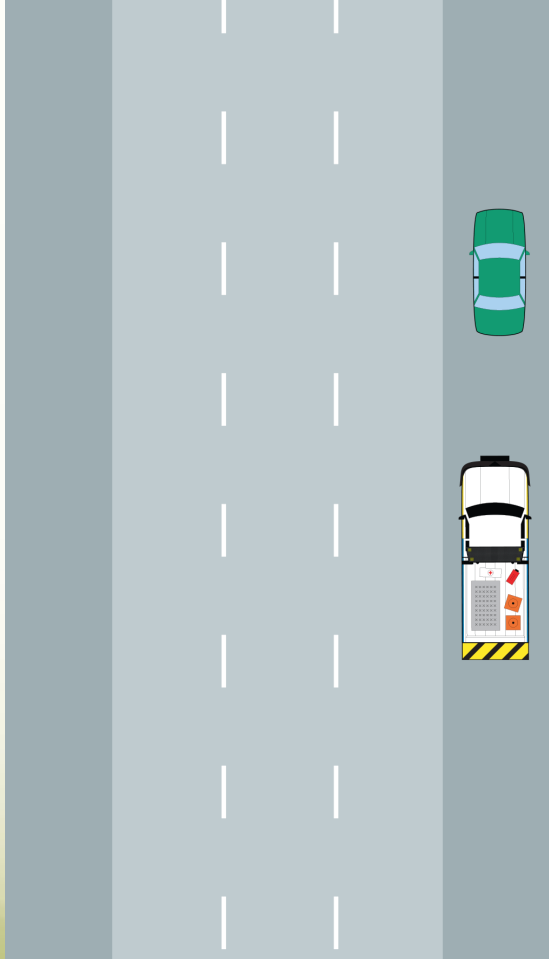
Blocking

- Blocking is the action of positioning a responder vehicle in advance of an incident to obstruct the flow of moving traffic in one or more lanes
 - Linear Block – occurs when a responder positions their vehicle to block a single lane or the shoulder
 - Multi-Lane Block – occurs when the first responder positions their vehicle to block multiple involved lanes

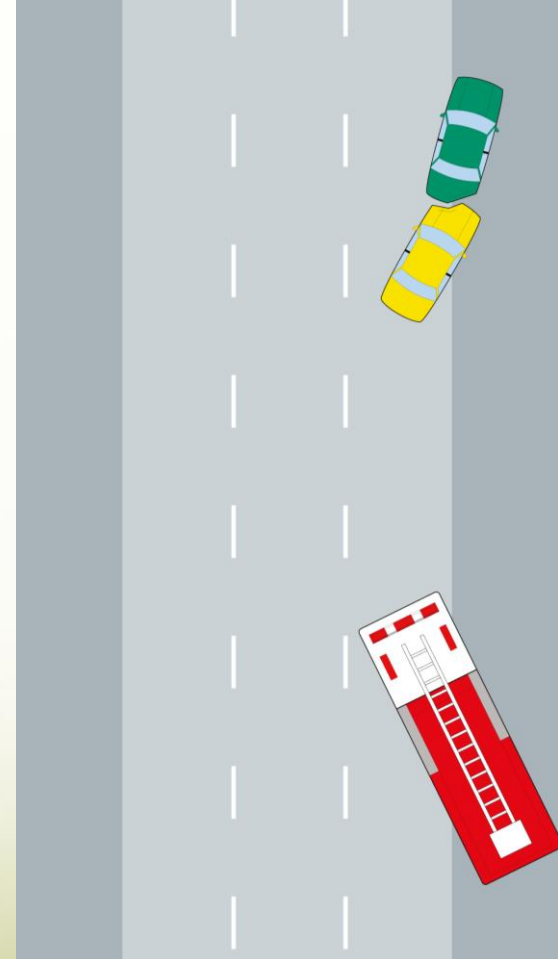


Linear vs. Multi-Lane Blocking

Linear Blocking



Multi-Lane Blocking





Vehicle Positioning

- There are two ways an emergency response vehicle is commonly positioned on the roadway
 - Angled
 - Parallel (straight)
- Considerations for determining how to position a vehicle include:
 - Current conditions, such as roadway geometry, sight distance, weather, etc.
 - Safety of other responders, crash victims, and passing motorists
 - Impact to vehicle visibility, including vehicle markings and emergency vehicle lighting

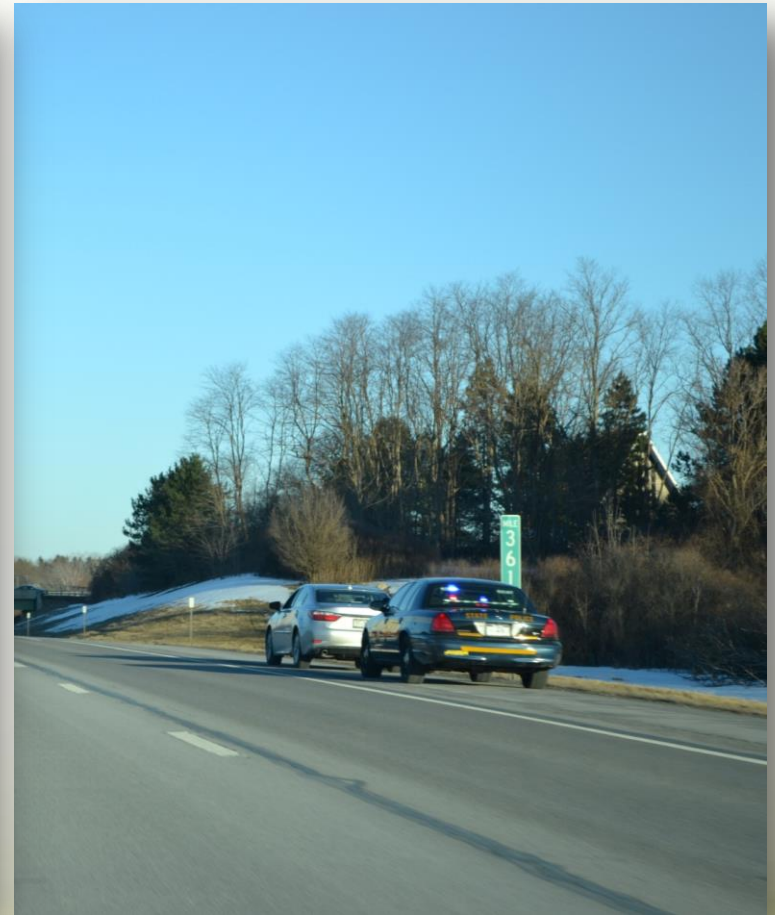


Angled Multi-Lane Blocking





Parallel Linear Blocking





Angled Linear Blocking





Case Study

– A Very Dangerous Linear Block





Case Study

– What are the Safety Concerns





Lane +1 Blocking

- By the very nature of fire/rescue and EMS work, additional space to work is typically required
- Lane +1 blocking occurs when responders block the involved lane(s) plus one additional lane to provide a protected lateral space for safety





Lane +1 Blocking

– Protected Incident Space





Lane +1 Blocking



Patient Loading

Vehicle Fires





Lane +1 Blocking



Source: National Traffic Incident Management Responder Training



Progressively Open Lanes

Take only as many lanes as you need for as long as you need them – as the incident is cleared, lanes can be progressively opened



Critical Wheel Angle

- Turn front wheels of vehicles away from the incident space





Zero Buffer





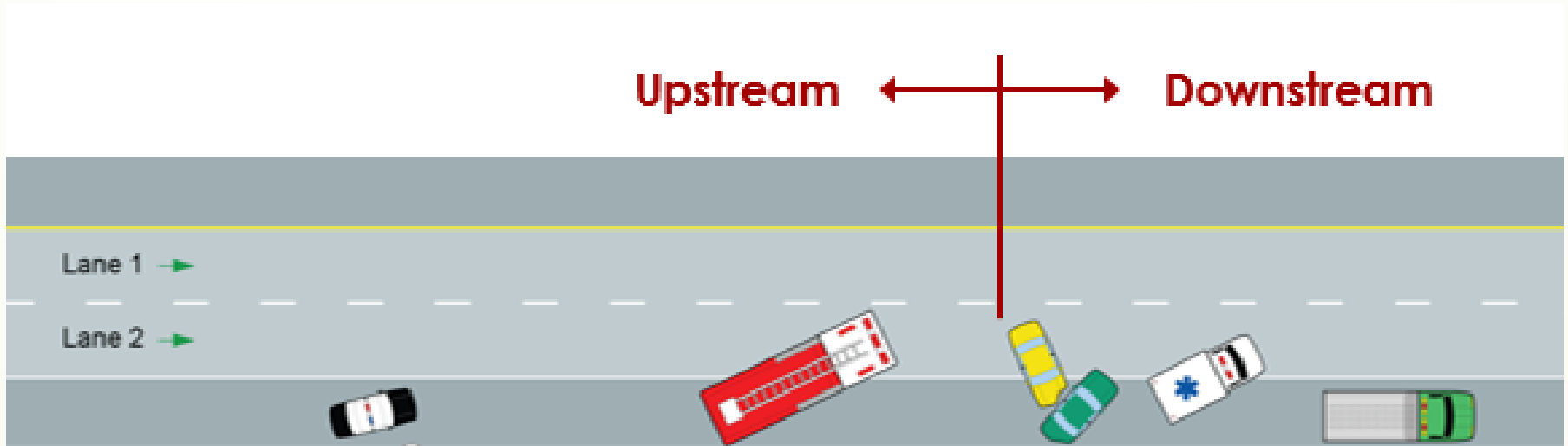
Avoiding the Zero Buffer

- LE traffic stop with non-traffic side occupant contact to avoid the zero buffer hazard





Typical Vehicle Positioning



Upstream

- Law Enforcement
- Fire
- DOT or Safety Service Patrol Vehicle

Downstream

- Ambulance
- Tow Truck
- Other Support Units



Quick Clearance Decisions

- If the vehicle is still functional, have motorist move it out of the roadway onto the shoulder, if possible
- If the vehicle is not functional, an appropriate-sized tow truck must be called
- If the disabled vehicle is commercial and has spilled cargo, it must be determined if the cargo is hazardous before initiating clearance
- If authority removal legislation is in place, determine if vehicle and/or spilled cargo can be moved out of travel lanes



Quick Clearance Equipment – Push Bumpers



Source: National Traffic Incident Management Responder Training



WA Quick Clearance Case Study



Source: National Traffic Incident Management Responder Training



Cargo Removal

- How cargo is handled depends on local or regional procedures
- Typically the trucking company and/or insurance provider must be contacted
 - Usually is it requested that cargo is salvaged, but this means traffic delays
- An aggressive method that allows for responder safety and quick clearance should be used
 - Supported by authority removal and hold harmless legislation in some states



WA Quick Clearance Case Study – Opened Almost 5 Hours Sooner



Source: National Traffic Incident Management Responder Training



Off-site Extrication – Incident Cleared Almost 8 Hours Sooner



Source: National Traffic Incident Management Responder Training



Debris Removal

- Work together to clear the debris – the sooner it's done, the sooner everyone gets to leave
- In many states, towing and recovery service providers are responsible for the removal of debris
- In the interest of safe, quick clearance and responder safety, other responders can assist too



Source: National Traffic Incident Management Responder Training



Towing and Recovery

- Tow operators depend on getting timely, accurate information from those on the scene



Source: National Traffic Incident Management Responder Training



Towing and Recovery Communications

- Called in as a “Hyundai with minor side damage”



Source: National Traffic Incident Management Responder Training



Towing and Recovery Communications

- “Flatbed needed for arrest tow/safe keeping”



Source: National Traffic Incident Management Responder Training



TRAA Vehicle Identification Guide

- Vehicle Class
 - Light-Duty
 - Medium-Duty
 - Heavy-Duty
- Location
- Reason for tow
- Additional vehicle or crash details

LAW ENFORCEMENT VEHICLE IDENTIFICATION GUIDE

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

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

Class 1 through 2 include passenger cars, light trucks and mini vans, full size pickups, sport utility vehicles, full size vans.

CLASS 1 AND 2 - LIGHT-DUTY TOW
Gross Vehicle Weight Rating (6,000 to 10,000 lbs.)
Passenger cars, small SUVs and pickup trucks

☐ Year, make and model? ☐ 4x4 or AWD?
☐ Number of occupants? ☐ Keys?
☐ Full-size pickup or van? ☐ Trailer?
☐ Is it loaded? ☐ What is the load?

VEHICLES IN THESE CLASSES USUALLY HAVE FOUR TIRES.

CLASS 3 - LIGHT- OR MEDIUM-DUTY
(10,001 - 14,000 lbs. GVWR - 6 tires or more)*

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

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

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

Class 3 through 6 include a range of mid-sized to larger vehicles including delivery trucks, utility vehicles, motor homes, package parcel trucks, ambulances, school buses, trucks, landscape vehicles, small flatbed and stake-type trucks, refrigerated and box trucks, small and medium duty buses (school and local transit buses).

CLASS 3, 4, 5 & 6 - LIGHT- OR MEDIUM-DUTY TOW
Gross Vehicle Weight Rating (10,001 up to 26,000 lbs.)

☐ Year, make and model?
☐ Body type - pickup truck, box truck, flatbed, step van
☐ What is the load and is it damaged?
☐ Pickup, van, shuttle bus or motor home?
☐ Number of occupants? ☐ Keys?
☐ Vehicle description is critical to determine the proper tow vehicle

VEHICLES IN THESE CLASSES USUALLY HAVE SIX TIRES.

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

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

Class 7 and 8 include a range of heavier vehicles including large delivery trucks, motor coaches, all tractor-trailer combinations, refuse trucks, construction vehicles, etc.

CLASS 7 AND 8 - HEAVY-DUTY TOW
Gross Vehicle Weight Rating (Class 7 - 26,001 to 33,000 lbs.)
(Class 8 - 33,001 and up to state limit)

☐ Year, make and model? ☐ Two or three axle truck or tractor-trailer?
☐ Bus or motor home? ☐ What is the load and is it damaged?
☐ Number of occupants? ☐ Keys?

STRAIGHT TRUCKS, BUSES OR MOTOR HOMES IN THESE CLASSES WILL USUALLY HAVE SIX TO TEN TIRES. TRACTOR AND TRAILER COMBINATIONS WILL HAVE FOURTEEN OR MORE TIRES.

MOTORCYCLES - LIGHT-DUTY TOW
Sports motorcycle - off road/bic street type
Performance motorcycle - "racing" model type
Touring motorcycle - large, heavy road touring type
Custom or 3-wheel motorcycle

TRAILERS - LIGHT-, MEDIUM- OR HEAVY-DUTY TOW

☐ Is it a truck and trailer to tow or just a trailer to tow?
☐ Number of axles and what is it hauling or is it designed to haul?
☐ Type of load or weight of load?
☐ If a tow, does the trailer have a ball, pintle or a 5th wheel hitch?

MOTOR HOMES - LIGHT-, MEDIUM- OR HEAVY-DUTY TOW

Class C - usually built on a van or pickup type truck chassis
Class A - usually built on a medium to large truck or bus chassis

LOCATION:
All locations are considered to be on the right hand shoulder unless advised the incident is in a lane of travel, in the center divider or off the road.
Locations should always be given so the tow truck can access the scene safely.
Freeway locations should always be given going in one direction, such as southbound south of a specific landmark or intersection.

REASON FOR THE TOW: Service call, storage, wreck or recovery
See below call: Specify the reason, fuel, fire, etc.
Tow: Specify the reason
Storage: Arrest or impound tow
☐ Is the vehicle stripped, burned, flat tires or no wheels?
Wreck: Condition of the vehicle
☐ Is the vehicle/truck overturned?
☐ Are lanes blocked?
☐ Is the vehicle off the road? ☐ How far?
☐ Any special problems at the scene or special equipment needed?

*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 doorjamb. The number of pounds listed on the label can then be compared with the DOT Classification Vehicle Type Chart for the correct DOT class.



Towing and Recovery – Partnerships and Joint Training

- The towing industry is supportive of realistic training standards and supports several training programs nationwide
- Joint training provides an opportunity for other responders to better understand the capabilities of their towing and recovery partners



Source: National Traffic Incident Management Responder Training



Termination

- Final stage of incident response
- Termination includes:
 - Demobilizing and removing equipment, personnel, and response vehicles
 - Restoring traffic flow to normal or close to normal



Emergency Vehicle Markings



Source: National Traffic Incident Management Responder Training



National Fire Protection Association (NFPA) Standards

NFPA1901 – Standard for Automotive Fire Apparatus (2009)

NFPA 1917 – Standard for Automotive Ambulances (2013)

- At least 50% of the rear vertical surfaces of the apparatus shall be equipped with 6 inch (minimum) retroreflective striping, alternating yellow and red, in a chevron pattern sloping downward and away from the centerline of the vehicle at an angle of 45°



Law Enforcement Vehicle Markings



Source: National Traffic Incident Management Responder Training



Law Enforcement Vehicle Markings

– New Vs. Old



Source: National Traffic Incident Management Responder Training



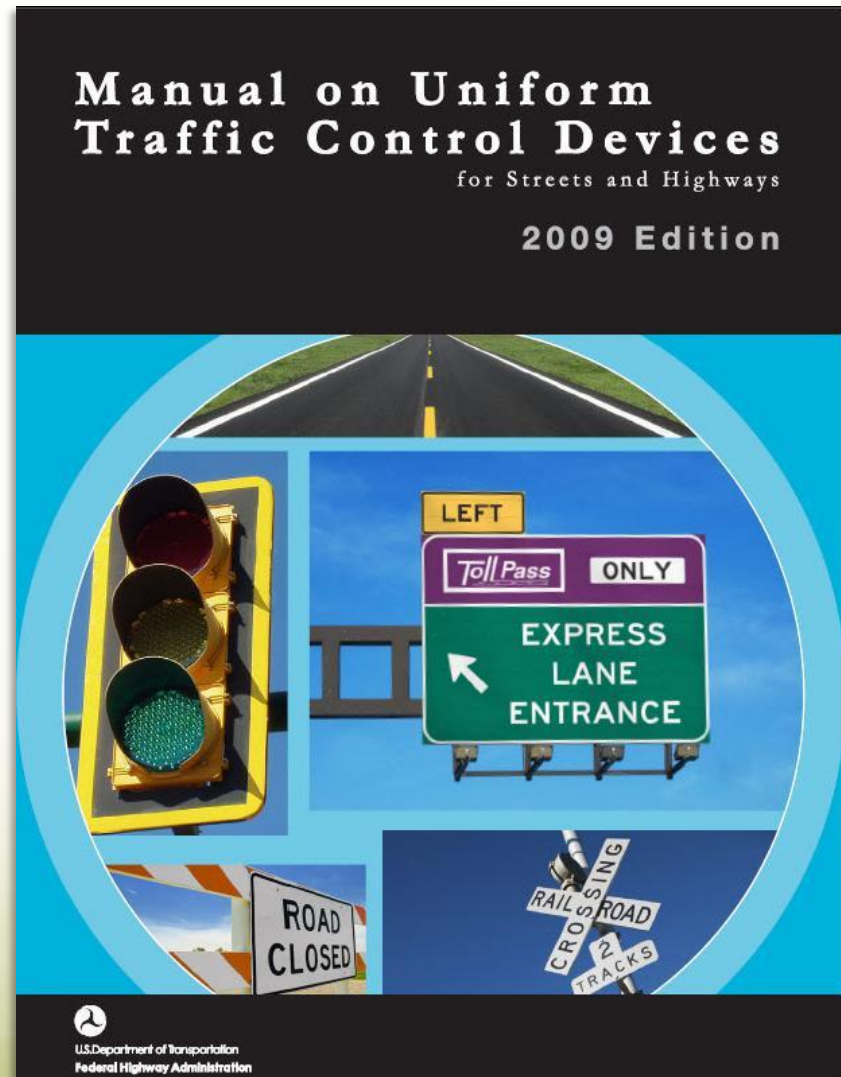
Module 5

An Overview of the Manual On Uniform Traffic Control Devices
(MUTCD)



Manual on Uniform Traffic Control Devices (MUTCD)

- Federal guideline for all traffic control nationwide
- It also covers all “workers” on all streets, roadways, or highways
- This course addresses what is required to adhere to MUTCD standards





MUTCD Chapter 6I

Includes the following 5 Sections:

- 6I.01 – General (Information)
- 6I.02 – Major Traffic Incidents
- 6I.03 – Intermediate Traffic Incidents
- 6I.04 – Minor Traffic Incidents
- 6I.05 – Use of Emergency-Vehicle Lighting



MUTCD Section 6I.05 – Use of Emergency-Vehicle Lighting

- Though essential for safety, use of too many lights at an incident scene can be distracting and can create confusion for approaching road users



Source: National Traffic Incident Management Responder Training



MUTCD Section 6I.05 – Use of Emergency-Vehicle Lighting



Source: National Traffic Incident Management Responder Training



MUTCD Section 6I.05 – Use of Emergency-Vehicle Lighting

- Once good traffic control is established, the MUTCD recommends reducing the amount of emergency-vehicle lighting
- Public safety agencies should examine their policies on the use of emergency-vehicle lighting with the intent of reducing the use of this lighting as much as possible while not endangering those at the scene



Responder Visibility

MUTCD Section 6D.03 states:

All workers, including emergency responders, within the right-of-way of a roadway who are exposed either to traffic (vehicles using the highway for purposes of travel) or to work vehicles and construction equipment **SHALL** wear high-visibility safety apparel...



Emergency Responder High-Visibility Safety Apparel

- Must meet, and be labeled as meeting one of two standards:
 - ANSI/ISEA 107, Standard Performance for:
 - Class II
 - Class III
 - ANSI/ISEA 207, Public Safety Vests



Source: National Traffic Incident Management Responder Training



ANSI 107 vs. ANSI 207

ANSI 107 Class II Vest

ANSI 207 Public Safety Vest



Note shorter length to allow access to items on belt



MUTCD Section 6D.03 Exceptions

- Firefighters or other responders engaged in emergency operations that directly expose them to flame, fire, heat, and/or hazardous materials



Source: National Traffic Incident Management Responder Training



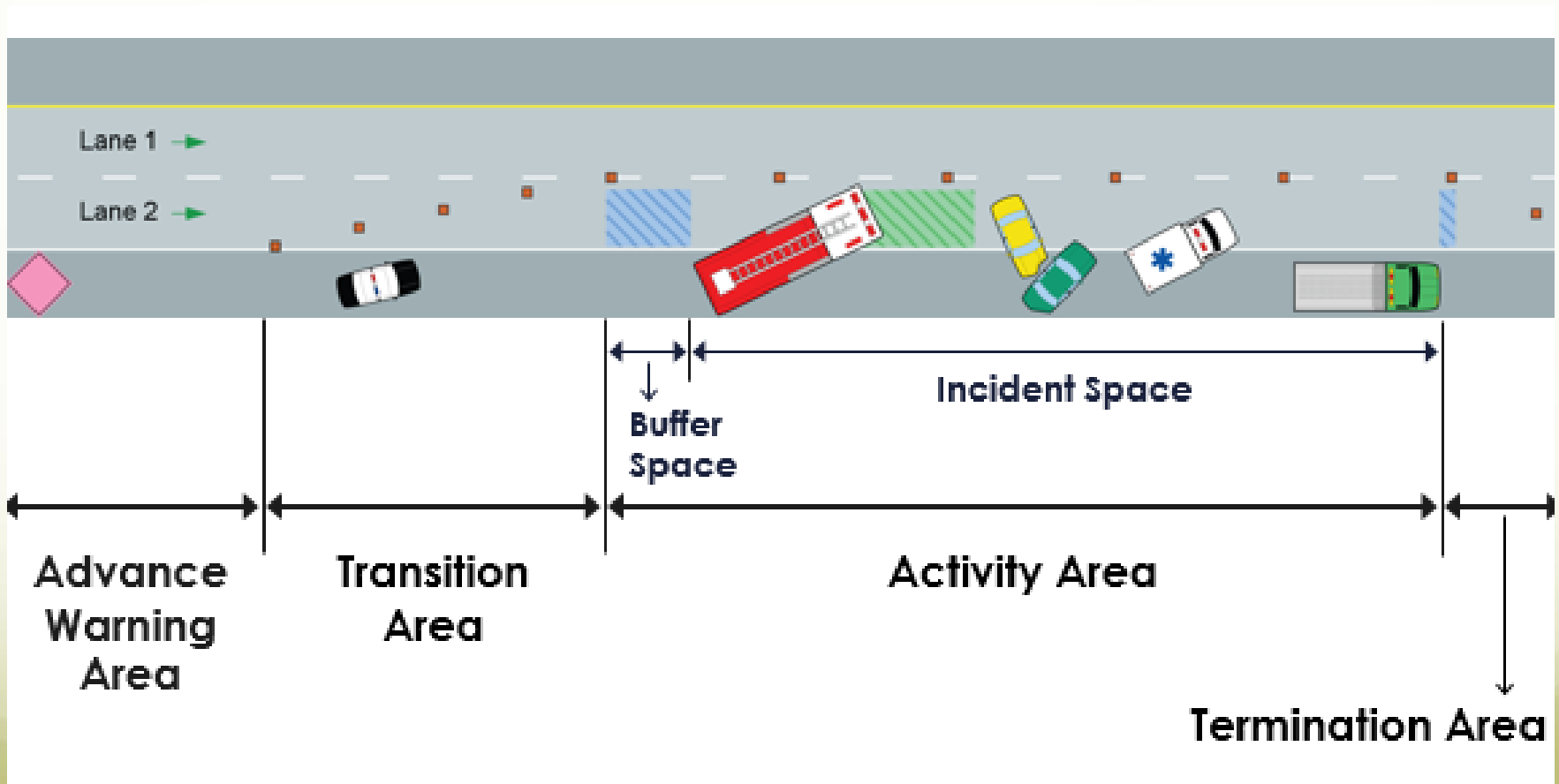
MUTCD Section 6D.03 Exceptions

- Law enforcement when actively engaged in potentially confrontational law enforcement activities (i.e., tactical operations)



Source: National Traffic Incident Management Responder Training

Traffic Incident Management Area





Temporary Traffic Control Distances



- The MUTCD provides recommended lengths and distances for planned work zones
- When establishing a Traffic Incident Management Area responders do not have to meet these distances, but should be working towards achieving the MUTCD recommendations
- If an incident is anticipated to extend past 24 hours, MUTCD requirements for work zones must be met



Temporary Traffic Control Distances

(Required for Incidents Lasting > 24 hours)

	Advance Warning Area				Transition Area			Activity Area	Termination Area	
Speed (mph)	Advance Warning Sign Minimum Distance (ft)				Recommended Lengths (ft)					Cone Spacing (ft)
	A	B	C	Cumulative Total ¹	Shoulder Taper ²	Taper	Distance Between Tapers (longitudinal) ³	Buffer (longitudinal)	Downstream Taper	
25	100	100	100	300	45	125	250	155	50-100	25
35	350	350	350	1,050	85	245	490	250		35
45	500	500	500	1,500	180	540	1,080	360		45
55	1,000	1,500	2,640	5,140	220	660	1,320	495		55
65	1,000	1,500	2,640	5,140	260	780	1,560	645		65



Advance Warning Area

Upstream of the incident to alert drivers of the upcoming incident.

High priority for emergency responders.

Advance warning devices may need to be adjusted near a curve, hill, or other reduced visibility situations.

More advance warning may be necessary during adverse weather conditions.

Monitor traffic backup and make necessary adjustments.



Advance Warning Signs

- Emergency traffic control warning and guide signs should have:
 - Diamond shape
 - Black lettering and a black border
 - Fluorescent pink background
- The signs come in two sizes:
 - 36" x 36" – Low speed, low volume
 - 48" x 48" – High speed, high volume





Advance Warning Signs





Advance Warning Considerations

– Adverse Weather

- Additional advance warning may be necessary during adverse weather situations
 - Wet roads double the average motorist stopping distance over that for dry road conditions
 - Poor visibility can lengthen driver reaction time
 - Increases responder's degree of risk



Source: National Traffic Incident Management Responder Training



Advance Warning Considerations

– Limited Sight Distances

- Additional advance warning may also be necessary due to limited sight distance
 - Hills, curves, bridges, intersections, etc.
 - Smoke, fog, darkness, etc.

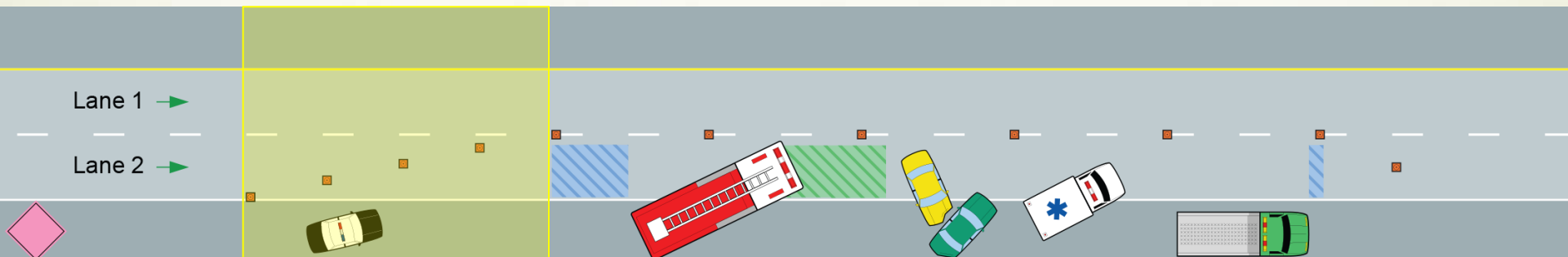


Source: National Traffic Incident Management Responder Training



Transition Area and Tapers

- Section of roadway where drivers are redirected out of their normal path
- Transition Areas usually involve the strategic use of tapers
- Tapers can be set up using cones or flares
 - Skip lines provide a useful guide for measuring distances
- Any taper is better than no taper



Source: National Traffic Incident Management Responder Training



Tapers

- At incident scenes, cones or flares used to establish a taper are typically placed no further apart in feet than the speed limit
 - 35 mph = 35' apart
 - 45 mph = 45' apart
 - 55 mph = 55' apart
 - 65 mph = 65' apart
- An alternative guideline is to place a cone at every skip line





Types of Tapers

Merging

- reduces the number of through lanes in one direction (multi-lane road)

Shifting

- laterally shifts traffic in one direction

Shoulder

- closes a shoulder

One-Lane, Two-Way Traffic

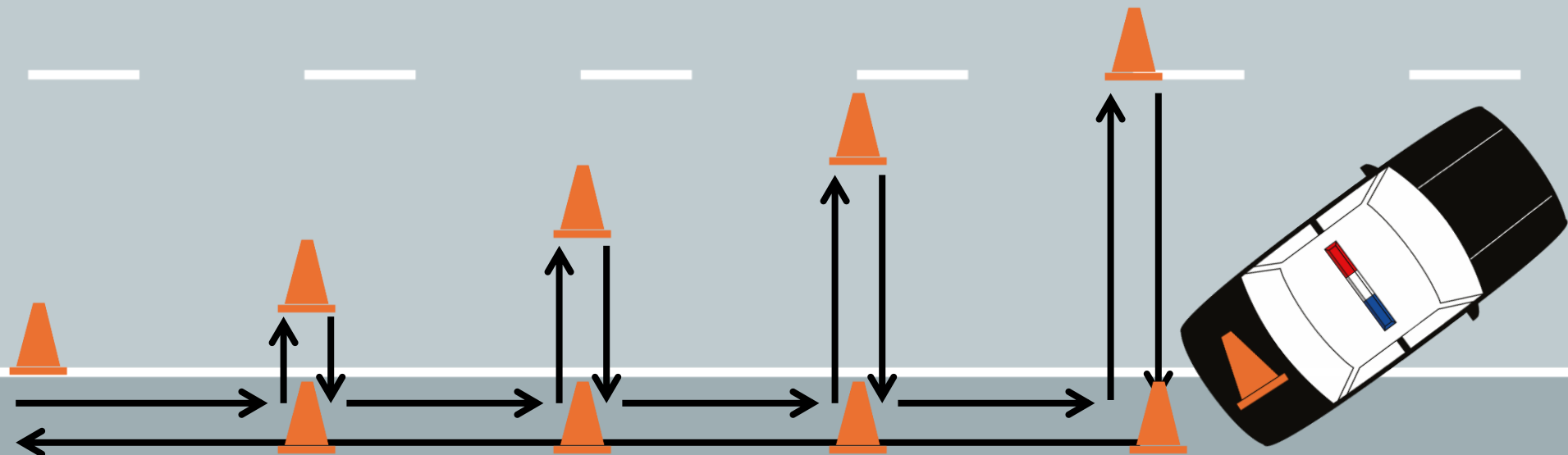
- used with a flagger to close one lane on a two-lane road

Downstream (optional)

- provide visual cue of access available to the original lane



Taper Setup



Source: National Traffic Incident Management Responder Training



Traffic Cones

- As outlined in MUTCD Section 6F.64, cones that are used at night and/or on highways with a posted speed limit \geq 45 mph:
 - Predominantly orange in color
 - 28 inches or greater in height
 - Two retroreflective white bands
- Collapsible cones that are MUTCD compliant are also available





Flares

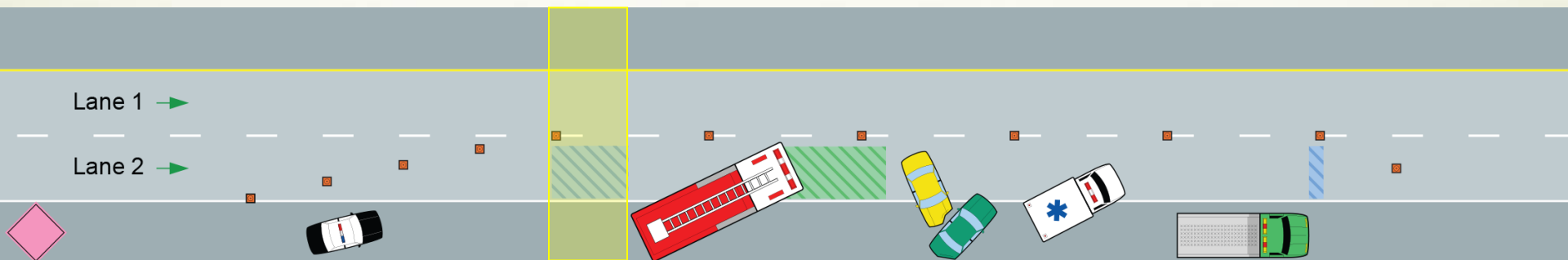


Source: National Traffic Incident Management Responder Training



Upstream (Longitudinal) Buffer Space

- Separates the Transition Area from the Incident Space
- No vehicles should be positioned within the upstream Buffer Space
- Provides recovery area for errant vehicles
- Speed of passing traffic and sight distance should be considered when determining the length of the buffer space



Source: National Traffic Incident Management Responder Training



Lateral Buffer Space

- If lateral buffer space requires part of a lane, close that lane – avoid partial closures

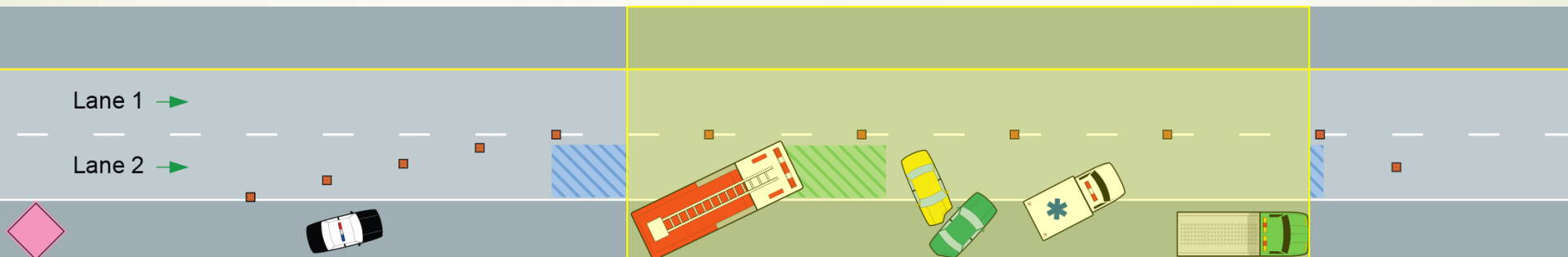


Source: National Traffic Incident Management Responder Training



Incident Space

- Location where the incident has occurred and emergency responders are working
- A blocking vehicle should be positioned at the upstream end of the Incident Space to protect workers from impacts by errant vehicles
- Cones should continue alongside the Incident Space to help define the boundary between responders working and moving traffic

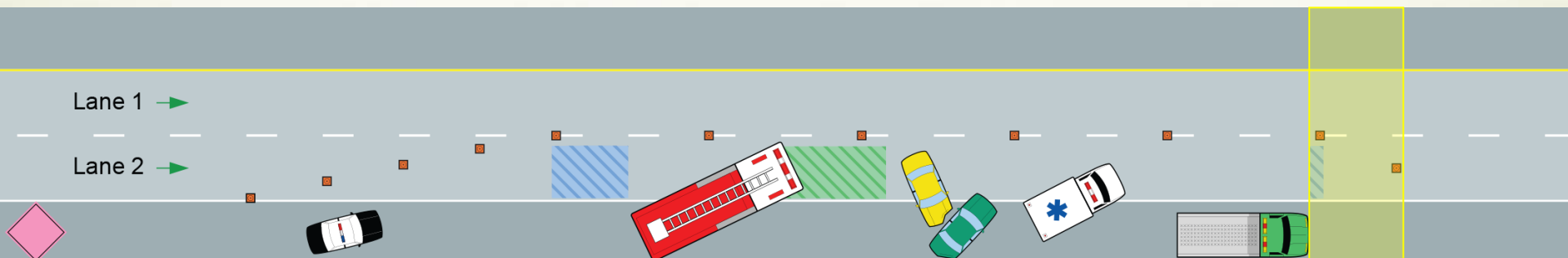


Source: National Traffic Incident Management Responder Training



Termination Area

- Used to notify drivers that the Traffic Incident Management Area is ending and they may resume normal driving
- Includes the downstream buffer space and taper
- Protects emergency responders working at the end of the Incident Space
- Remember drivers will likely be frustrated from being stuck in traffic and may quickly accelerate



Source: National Traffic Incident Management Responder Training



Special Circumstances: Vehicle Fires



Video Courtesy of the Minnesota Department of Transportation



Stay Clear of the Danger Zone



Source: National Traffic Incident Management Responder Training



Vehicle Fire Case Study





Dangers of Smoke When Working Near Moving Traffic



Video Courtesy of the Wisconsin Department of Transportation



Electric and Hybrid-Electric Vehicles (EV and HEV)

National Highway Traffic Safety Administration Guidance



U.S. Department
of Transportation
**National Highway
Traffic Safety
Administration**



DOT HS 811 574

January 2012

Interim Guidance for Electric and Hybrid-Electric Vehicles Equipped With High Voltage Batteries



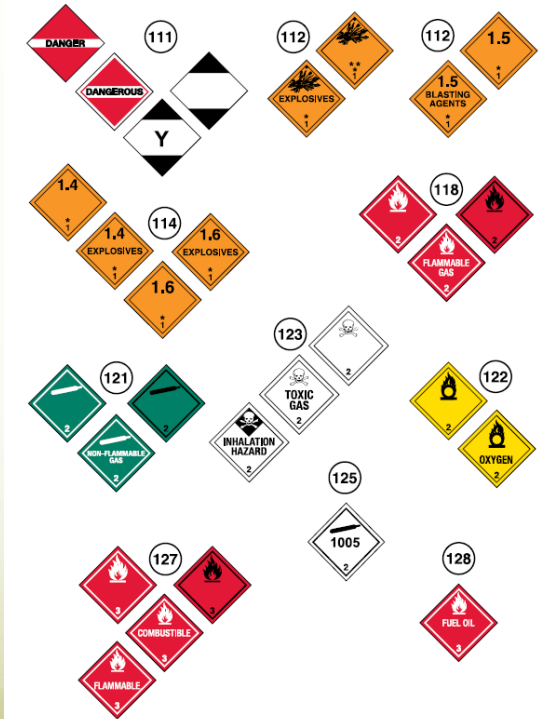
Hazardous Materials (Hazmat) Identification

- Placards
 - Numbered placard
 - Placard with an orange panel
 - Warning or other placard
- Shipping papers or bill of lading
- Commodity names or markings
- Labels



1219

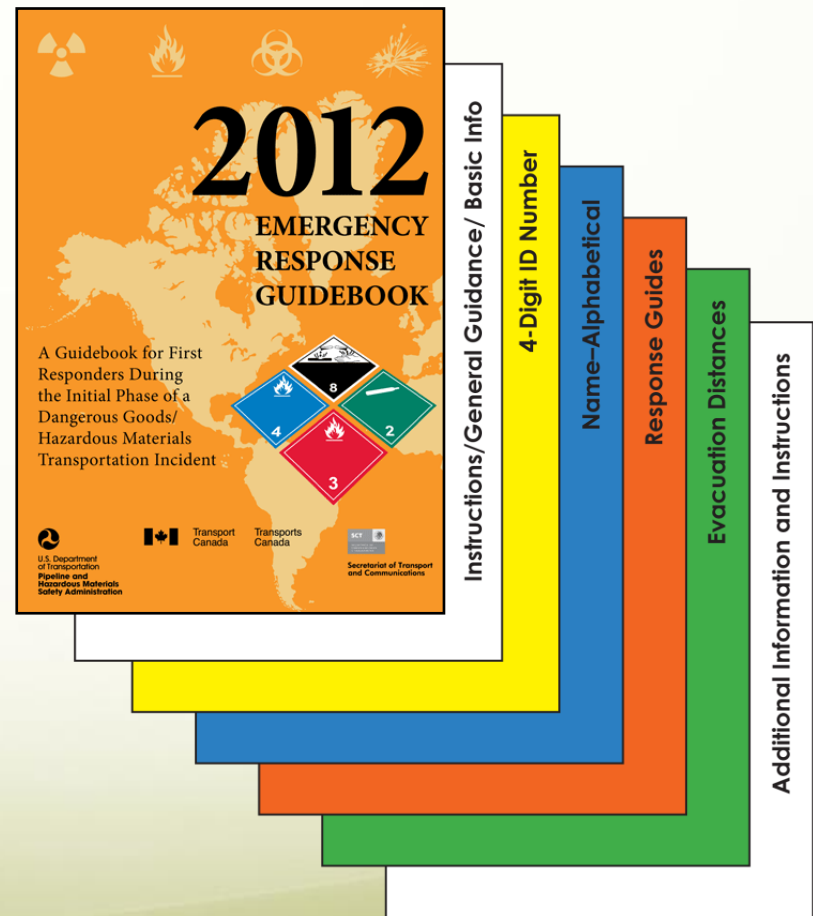
EMERGENCY CONTACT 1-000-000-0000		EXAMPLE OF EMERGENCY CONTACT TELEPHONE NUMBER	
		HAZARD CLASS OR DIVISION NO.	
NO. & TYPE OF PACKAGES		QUANTITY	
1 TANKTRUCK	UN1219	ISOPROPANOL 3	II 12 000 LITERS
ID NUMBER		SHIPPING NAME	PACKING GROUP





Emergency Response Guidebook

- Instructions/General Guidance/Basic Info
- 4-Digit Number
- Name - Alphabetical
- Response Guides
- Evacuation Distances
- Additional Info and Instructions





How to Use the ERG

1. Identify the material
 - ID number from placard, orange panel, shipping document, or package
 - Name of material from shipping document or package
2. Identify 3-digit guide number
 - ID Number Index (yellow)
 - Name of Material Index (blue)
3. Turn to the numbered guide (orange) and read carefully



Placard Number - 1993



Source: National Traffic Incident Management Responder Training



Dangerous Placard



Source: National Traffic Incident Management Responder Training



Hazmat Response

- Not all spills or leaks require a hazmat team response
- Follow your state's protocol for reportable quantities

Accurately identifying that an incident does not require a hazmat team response means quicker clearance of the incident



Spill Response – Vehicle Fluids

Once the spill has been identified as a vehicle fluid that does not meet reportable quantity thresholds:

1. Stop leaking material at the source
2. Contain and limit the spill from spreading
3. Apply available absorbents
4. Remove material from travel lanes
5. Gradually restore traffic flow



Off-Site Landing Zones

- Use of an off-site landing zone is acceptable if there will be no delay to patient care



Source: National Traffic Incident Management Responder Training



Crash Investigation Goals

Primary Goal

- Conduct a thorough crash investigation by collecting the 107 required data elements in a standardized Police Accident Report (PAR), as specified in the Minimum Model Uniform Crash Criteria (MMUCC)

Plays a key role in:

- Properly documenting findings for presentation in a court of law
- Determining crash causation
- Taking appropriate enforcement action as the result of this determination



Point of Impact – Used to Determine Speed of Vehicle



Source: National Traffic Incident Management Responder Training



Short-Lived Evidence

- Short-lived evidence is that which will most likely be lost, destroyed, or compromised once the scene has been cleared
 - Most susceptible to being destroyed at a crash scene
- Critical short-lived evidence include:
 - Tire marks, debris fields
 - Gouges, scrapes, paint transfer
 - Fluid trails
 - Blood, hair, tissue, fibers



Always Ask: Evidence or Debris?

- Evidence Until LE Says Otherwise



Source: National Traffic Incident Management Responder Training



Fatality Investigations



Source: National Traffic Incident Management Responder Training



Module 6

Traffic Control Plan: Special Events



Planned Special Events (PSE) in Principal Cities in the United States

City and PSEs/year

- 508 peak commuter periods per year
- New York City – 5,000+ PSEs/year
- Philadelphia – 4,500+ PSEs/year
- Los Angeles – 2,000+ PSEs/year
- San Diego – 1,000+ PSEs/year
- Dallas – 700+ PSEs/year

Peak commuter periods on a typical year

- 52 weeks/year
- 5 days/week
- 2 peak commuter periods/day
- 12 periods/year (holidays)
- Computation
 $(52 \times 5 \times 2) - 12$
 $520 - 12 = 508$ commuter period per year

Planned Special Event (PSE) Examples

Permanent Venues

- Sporting events
- Concerts
- Festivals
- Conventions



Temporary Venues

- Less frequent public events at temporary venues





Managing Travel for Planned Special Events (PSE) Goals

1. Achieve predictability
2. Ensure safety
3. Maximize efficiency
4. Minimize regional traffic effects from events
5. Meet public and event patron expectations

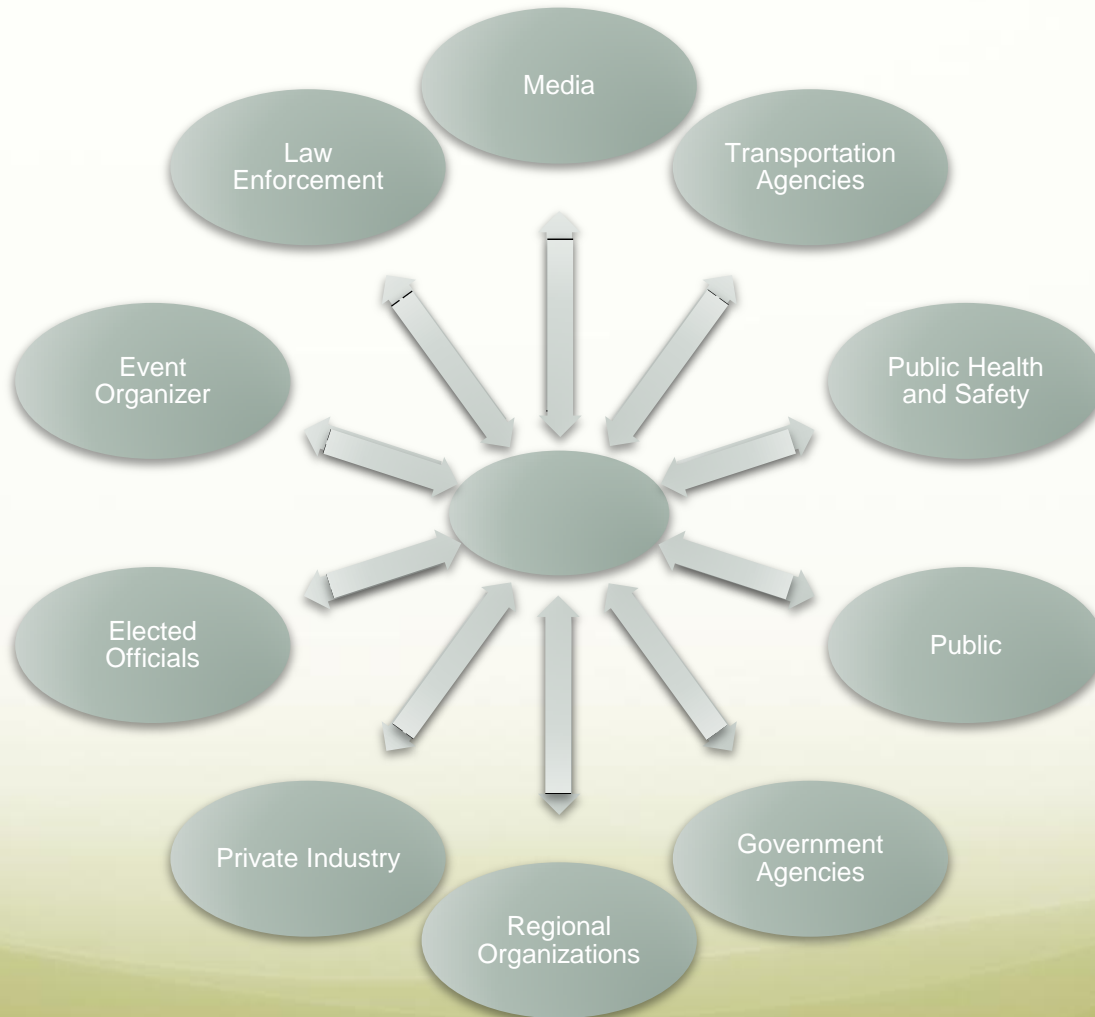


Planned Special Event (PSE) Characteristics





Planned Special Event (PSE) Stakeholders





Planned Special Event (PSE) Categories



1. Discrete/recurring event at a permanent venue
2. Continuous event
3. Street use event
4. Regional/multi-venue event
5. Rural event



1. Discrete/Recurring Event at a Permanent Venue Characteristics

- Predictable starting and ending times
- Known venue capacity
- Anticipated demand typically known
- Advance ticket sales
- Concentrated arrival and departure demands





2. Continuous Event Characteristics

- Occurrence often over multiple days
- Patrons arrive and depart during the event day
- Less reliance on advance ticket sales
- Capacity of venue not always known
- Occurrence sometimes at temporary venues
- Parking availability varies





3. Street Use Event Characteristics

- Occurrence on roadway requiring closure
- Specific starting and predictable ending times
- Capacity of spectator viewing area not known
- Spectators typically not charged or ticketed
- Parking variability
- Impact on emergency access and local services





4. Example Regional/Multi-Venue Event Characteristics

- Occurrence of events at multiple venues at or near same time
- Ingress and egress operations for concurrent events may occur at same time
- Parking areas may service demand from different events over day





5. Rural Event Characteristics

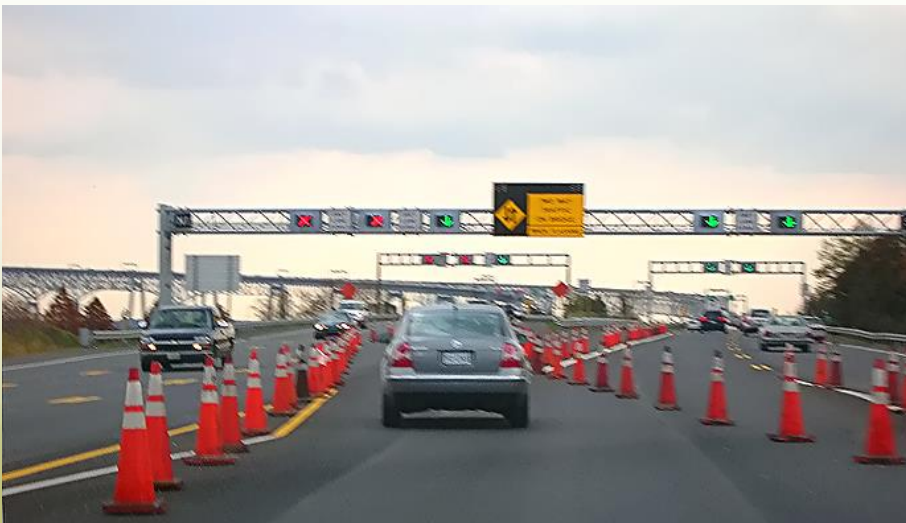
- Rural area and possible tourist destination
- High attendance events attracting event patrons from regional area
- Limited roadway capacity
- Area lacking regular transit service





Planned Special Event (PSE) Travel Choices

- Motor Vehicle:
 - Route selection
 - Parking





Planned Special Event (PSE) Police Blockade





Planned Special Event Travel Choices (cont.)

- Transit:
 - Express bus
 - Charter bus
 - Commuter rail





Planned Special Event Travel Choices (cont.)

- Consideration for pedestrians & other modes





Planned Special Event Impact





Transportation System Users Impacted by Planned Special Events

- Event patron or participant
- Non-attendee road user
- Non-attendee transit user
- Public agency service provider



Managing Travel for Planned Special Events (PSE) - Five (5) Phases

1. Regional planning and coordination
2. Event operations planning
3. Implementation activities
4. Day-of-event activities
5. Post-event activities



Definition: Regional Planning and Coordination

Regional Planning and Coordination

First phase of managing travel for planned special events that encompasses advance planning activities completed months prior to a single, target event or activities related to a series of future planned special events. This level of advance planning involves the participation and coordination of stakeholders serving an oversight role in addition to agencies directly responsible for event planning and day-of-event traffic management.



Definition: Event Operations Planning

Event Operations Planning

Second phase of managing travel for planned special events that involves advance planning and resource coordination activities conducted for a specific planned special event. This phase involves stakeholders organized under the event planning team.



Definition: Implementation Activities

Implementation Activities

Third phase of managing travel for planned special events that represents a transition phase between event operations planning and day-of-event activities. The event planning team and traffic management team work to strategize traffic management plan deployment in addition to conducting necessary equipment testing and personnel training activities.



Definition: Day-of-Event Activities

Day-of-Event Activities

Fourth phase of managing travel for planned special events that refers to the daily implementation of the traffic management plan in addition to traffic monitoring. Rapid deployment of traffic management plan strategies and tactics, including contingency plans, requires a well-organized traffic management team and communications infrastructure.



Definition: Post-Event Activities

Post-Event Activities

Fifth phase of managing travel for planned special events that covers the evaluation of local and regional transportation operations based on stakeholder debriefings and an analysis of traffic data collected during the day-of-event. Evaluation involves both the traffic management team and event planning team working together to identify successes and lessons learned, and the stakeholder groups may transfer their determinations to the oversight team for consideration and action under the program planning phase.



Stakeholder Challenges

- Managing intense travel demand
- Mitigating potential capacity constraints
- Influencing attractiveness of alternative travel choices
- Accommodating potential for heavy pedestrian flow and transit vehicles



Benefits to Stakeholders and System Operations

- Meet other staffing requirements
- Provide expanded and efficient control
- Upgrade transportation system infrastructure
- Improve management of future events
- Transfer strategies to day-to-day operations
- Leverage support for new resources or initiatives



Focus on Operations

- Identify operations planning and program issues
- Examine operational strategies and resource applications
- Profile successful interagency collaboration and communication techniques
- Reduce non-recurring congestion



Exercise

- Purpose: Classify planned special event by identifying characteristics
- Tasks:
 - Identify key operational characteristics of each event that influence the level of impact the event has on transportation operations
 - Classify example planned special events into one of the previously defined categories
- Procedure:
 - Time per event
 - Small groups
 - Share responses after each event



Planned Special Events (PSE): Exercise #1

- QUESTION: Which PSE category is associated with a Baseball Game at Hiram Bithorn Stadium in San Juan, Puerto Rico?





Planned Special Events (PSE): Exercise #1

- ANSWER: Discrete/recurring event at a permanent venue





Planned Special Events (PSE): Exercise #1



Five (5) Characteristics of discrete/recurring event at a permanent venue

1. Predictable starting and ending times
2. Known venue capacity
3. Anticipated demand typically known
4. Advance ticket sales
5. Concentrated arrival and departure demands

Baseball Game at Hiram Bithorn Stadium in San Juan, PR





Planned Special Events (PSE): Exercise #2

QUESTION: Which PSE category is associated with a Bicycle Race in a highway/street in the Municipality of San Juan, PR?





Planned Special Events (PSE): Exercise #2

ANSWER: Street use event.





Planned Special Events (PSE): Exercise #2



Five (5) Characteristics of Street use event

1. Occurrence on roadway requiring closure
2. Capacity of spectator viewing area not known
3. Spectators typically not charged or ticketed
4. Parking availability
5. Impact on emergency access and local services

Bicycle Race in the Municipality of San Juan, PR





Muchas Gracias por su Atención

Educating to Save Lives on the Highways

