

February 2008

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TRANSPORTATION MANAGEMENT PROGRAM



ON SCENE TRANSPORTATION MANAGEMENT
TRAINING

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DelTrac
DelDOT



Agenda

- **Part 1: Introduction / Overview**
- **Part 2: Incident Command Structure (ICS) & Agency Roles**
- **Part 3: Guidelines**
- **Part 4: Traffic Control Devices**
- **Part 5: Setting-Up Incident Scenes**
- **Part 6: Training Resources**
- **Scenario Exercises**
 - ❖ All items in this document are recommended practices but should not be considered legally binding





Acronyms

- ANSI American National Standards Institute
- DeIDOT Delaware Department of Transportation
- DNREC Department of Natural Resources and Environmental Control
- DRBA Delaware River & Bay Authority
- DSP Delaware State Police
- EMS Emergency Medical Services
- EOC Emergency Operations Center
- FD Fire Department
- FEMA Federal Emergency Management Agency
- FHWA Federal Highway Administration
- HAZMAT Hazardous Materials
- IAP Incident Action Plan
- ICS Incident Command System





Acronyms

- MSHA Maryland State Highway Administration
- MTA Maryland Transportation Authority
- MUTCD Manual on Uniform Traffic Control Devices
- NFSIMC National Fire Service Incident Management Consortium
- NIMS National Incident Management System
- NTIMC National Traffic Incident Management Coalition
- PennDOT Pennsylvania Department of Transportation
- TIEMP Transportation Incident & Event Management Plan
- TMC Transportation Management Center
- TMT Transportation Management Team
- TTC Temporary Traffic Control
- VMS Variable Message Sign





Part 1 – Introduction & Overview





Overview

What is On-Scene Transportation Management?

- On-scene transportation management is the application of control measures and traffic monitoring in the field.
- There are three basic types of on-scene transportation management:
 - Transportation Incident Management
 - Work Zone Transportation Management
 - Special Event Transportation Management





Overview

Why are we here?

- To better understand the three types of on-scene transportation management (transportation incident management, work zone transportation management, and special event transportation management) and how to conduct safe field operations.
- Effective on-scene transportation management improves both emergency responder and motorist safety, and reduces traffic delays.





Overview

What will we accomplish?

- We will examine briefly all three types of on-scene transportation management:
 - Transportation Incident Management
 - Work Zone Transportation Management
 - Special Event Transportation Management
- The proper layout and installation / removal of temporary traffic control (TTC) devices.
- Recommended safe practices for on-scene personnel.





Transportation Incident Management





Overview

- **Transportation Incident**
 - A non-recurring event that causes reductions in roadway capacity or abnormal increases in demand.

 - Examples include:
 - vehicle accident
 - terrorist incident
 - chemical spill
 - nuclear incident
 - natural disaster, etc.





Overview

- Congestion Examples
 - Non-recurring congestion: unpredictable
 - Incident
 - Accident
 - Weather
 - Construction
 - Recurring congestion: predictable
 - Daily rush hour
 - Summer beach traffic





Overview

- Incident management consists of using people and resources to detect incidents, assess incident size, identify necessary actions, and effectively coordinate resource usage.
- When done properly the following results should occur:
 - A safe environment will be provided for emergency responders, motorists and pedestrians.
 - Traffic delays are minimized.
 - The risk of secondary incidents away from the primary incident site are minimized.



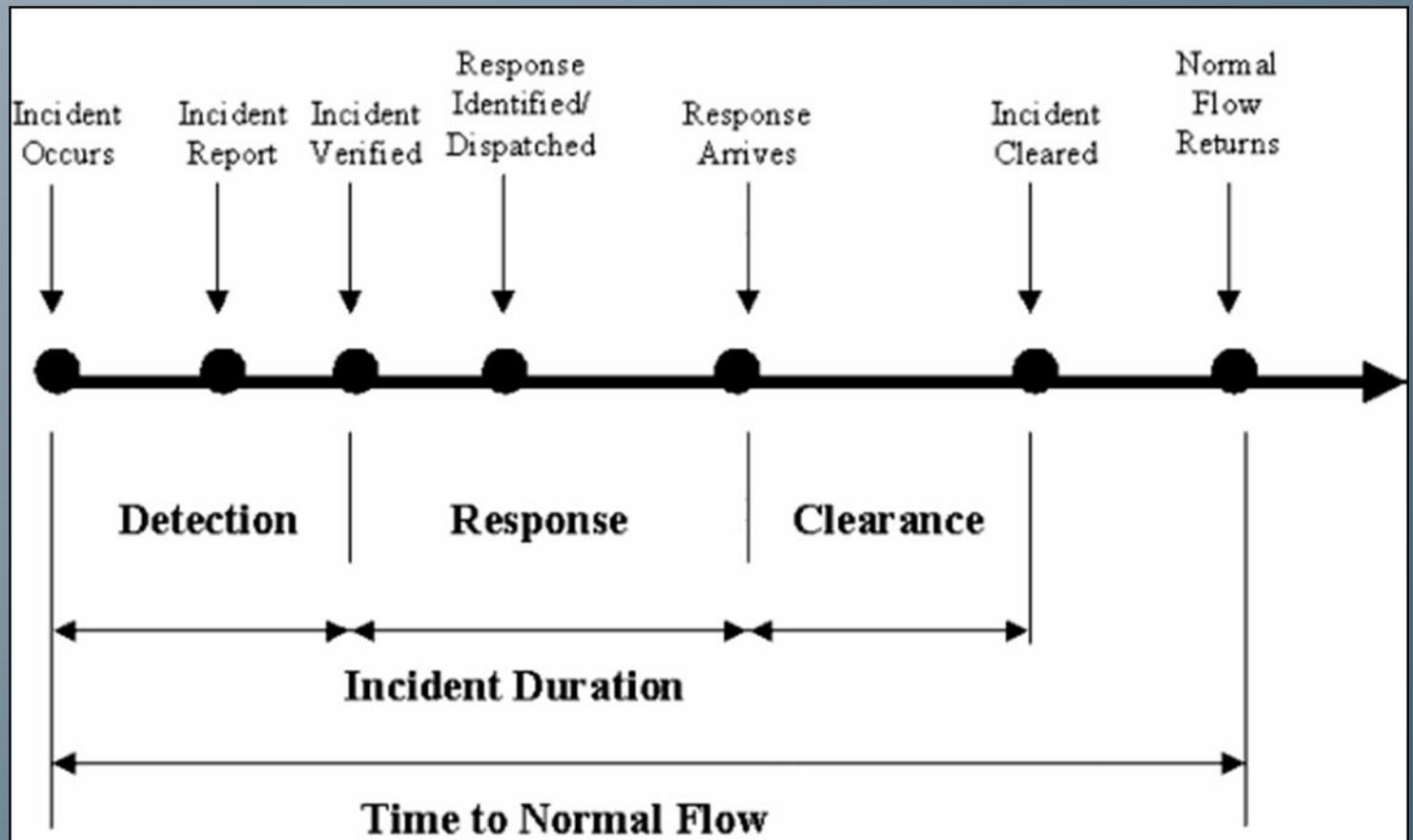


Overview

It takes quite a while to return to normal conditions.

20% of all incidents are secondary incidents (FHWA)

Every minute an interstate lane is blocked causes 4 minutes of travel delay (NTIMC)





Overview

See 'Appendix; Part 1' for estimated capacity reduction for Delaware roads

Roadway Capacity Reduction

NUMBER OF LANES BLOCKED	CAPACITY REDUCTION
Normal Flow (3 lanes)	N/A
Shoulder Blocked	26%
One Lane Blocked	48%
Two Lanes Blocked	79%

See Training CD for a video presentation (Seattle Wave) illustrating the effects of lane closures on road way capacity.

Source: Freeway Incident Handbook, 1991





Overview

- Effective transportation incident management can help save lives.
- Parties at risk:
 - Incident Responders
 - Placed in harm's way when performing responsibilities
 - Motorist
 - Potential for secondary accidents
 - Individuals whose vehicles were directly involved in the initial incident.
 - Pedestrians

“Incident scenes are the leading cause of death to police officers who die in the line of duty and the second highest cause of death to fire personnel.”¹

¹Earl Sweeney, Asst. Commissioner New Hampshire Dept. Of Safety;
Chair of IACP Highway Safety Committee





Overview

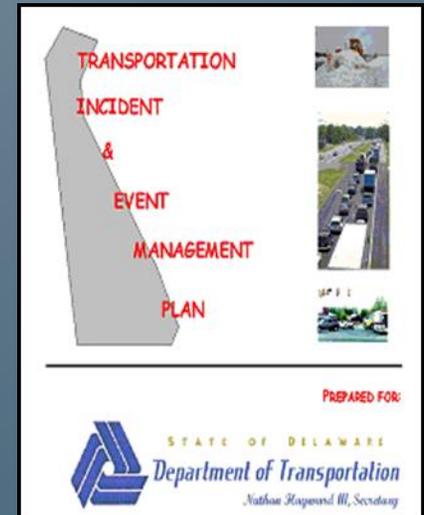
- **Transportation Incident & Event Management Plan (TIEMP)**

- Established the Transportation Management Team (TMT) concept, which:
 - Aids interagency communication through monthly gatherings of incident responders.
 - Encourages planning and discussion before and after incidents.



- Defined the responsibilities and guidelines for TMTs:

- Communication
- Response
- Resources



- The website is located at:

- <http://www.deldot.net/static/projects/tmt/index.shtml>
- The site is regularly updated with new information





Overview

- The TMT concept uses levels of response for the “level” of impact an incident or event has on the transportation system.
 - Allows the amount and assignment of resources to be more readily defined.
 - Can reduce the time associated with incident identification, response, and clearance.
 - Anticipated strategies or action items to be taken by each TMT agency have been identified for each level of response.

For more information on this topic and a detailed chart outlining the levels of response see ‘Appendix; Part 1’





Work Zone Transportation Management





Long-Term vs. Short-Term Operations

Manual on Uniform Traffic Control Devices (MUTCD) / DeIDOT Section 6G.02 - Work Duration

- **Five Categories of Work Duration**
 - Long-Term Stationary - occupies a location more than three days
 - Intermediate-Term Stationary - occupies a location for more than one daylight period to three days or nighttime work lasting longer than one hour
 - Short-Term Stationary - occupies a location more than one hour, daylight period, but not more than one day
 - Short Duration - occupies a location up to one hour
 - Mobile - moves intermittently or continuously





Long-Term vs. Short-Term Operations

- **Long-Term Stationary & Intermediate-Term Stationary**
 - Ample time to install fixed / semi-permanent temporary traffic control (TTC) devices like concrete barriers, pavement markings or temporary roadways.
 - TTC will be in place at night so retroreflective / illuminated devices shall be used.
 - For intermediate-term stationary set-ups, it may not be practical to use the more substantial devices used in a long-term stationary set-up. (Ex. Instead of using concrete barriers to channelize traffic, drums would be used.)





Long-Term vs. Short-Term Operations

- **Short-Term Stationary, Short Duration, & Mobile**
 - Majority of maintenance and utility operations fall under these categories.
 - Even if the work zone moves frequently, worker safety should not be jeopardized by using fewer than necessary TTC devices.
 - TTC vehicles with high intensity flashing lights may be used for short duration or mobile work in lieu of fixed signs and channelizing devices.
 - Signs and/or vehicles used to warn of mobile operations should be moved occasionally to keep them near the work area.





Special Event Transportation Management





Special Event Transportation Management

- What is special event transportation management?
 - A special event is, generally, a planned event that leads to higher than normal demands on the transportation infrastructure.
 - The basic skills for incident and work zone management work for special event management, but special event management generally deals with an increase in volume with no decrease in available transportation resources where incident and work zone management deal with a decrease in available transportation resources with no decrease in traffic volume.

For more
information
on this topic
see
'Appendix;
Part 1'





Part 2 – Incident Command Structure (ICS) & Agency Roles





Coordination and Communication

- **The transportation management center (TMC) operates 24 hours/day, 7 days/week**
 - Telephone 659-4600
 - Fax 659-6128
 - 800 MHz – Use N SW TMC, K SW TMC, S SW TMC
 - TMC1@mail.dot.state.de.us
- **Report any event or activity that impacts the transportation system**
 - Construction
 - Maintenance
 - Accidents
 - Disabled vehicles
 - Debris in roadway
 - Blockage
 - Malfunctioning traffic signal
 - Damaged / missing traffic control device
 - Flooding, ice, snow, high winds





Coordination and Communication

- Report the following Information:
 - Date
 - Time
 - Report by
 - Location
 - Direction
 - Problem / activity
 - Property damage or personal injury
 - Hazmat
 - Lanes blocked
 - Estimated / planned duration
 - Detour route
 - Scene contact





Incident Command Structure (ICS)

- Federally adopted system to manage all types of incidents, which details procedures for command and control at an incident scene.
- Foremost, protect the life and health of victims and first responders
- First Responder on Scene
 - Verify location
 - Assess site stability
 - Determine severity of incident
 - Contact TMC or Communication Center
 - Stabilize scene until support arrives
 - Assume incident command until relieved





ICS - Incident Commander

See
'Appendix;
Part 2' for
more
information
about the
incident
commander

- Establish incident commander.
- Establish incident command post.
- Ensure agency supervisors relay information to the incident commander.
- Ensure smooth transition between incident command and unified command structure.
- Ensure smooth transition between incident commanders including a briefing.





ICS - Field Communications

- Agency supervisors are liaisons between incident commander and their resources.
- Coordinate a single system for ordering resources.
- Establish procedures for joint decision-making.
- Develop an Incident Action Plan (IAP).
- Incident is not over until the last person has safely left the scene.





ICS – Interagency Communication

- **Communication should be open between:**
 - Individual agencies
 - Field personnel and communications or operations centers
 - Public service agencies and the motoring public

- **When the lead agency changes, resource and incident status should be communicated to the new incident commander.**





Benefits of ICS

- A single set of objectives is developed for the entire incident.
- A collective approach is used to achieve these objectives.
- Information flow and coordination is improved between all agencies involved.
- No agency's legal authority is compromised or neglected.





Agency Roles & Responsibilities

See 'Appendix;
Part 2' for a
detailed list of
agency roles
and
responsibilities

- The key to successful incident and event management is established communication procedures and defined roles and responsibilities.
- Each agency has specific roles that they are best suited to handle.
- By identifying roles and responsibilities before an incident occurs, the institution of the ICS, interagency communication, and incident response will be more efficient.



* Source Delaware TIEMP





Part 3 – Guidelines





Guidelines

- Guidelines for protecting the safety of emergency responders and the general public are provided in statewide standards and several National Standards / Publications:
 - DeIDOT MUTCD
 - Manual on Uniform Traffic Control Devices (MUTCD)
 - Federal Emergency Management Agency (FEMA)
 - Federal Highway Administration (FHWA)
 - I-95 Corridor Coalition
 - National Fire Service Incident Management Consortium (NFSIMC)
 - Applicable National Fire Protection Association Standards





Guidelines

- **High Visibility Safety Apparel**
 - Section 1402 of SAFETEA-LU, Title 23 Code of Federal Regulations
 - Delaware adopted statewide January 1, 2008
 - Decrease worker fatalities/injuries while working within the right of way (ROW) of federal-aid highways
 - High-visibility safety apparel is personal protective safety clothing that is intended to provide conspicuity during both daytime and nighttime usage, and that meets Performance Class 3 requirements of the ANSI/ISEA 107-2004 Publication entitled “American National Standard for High-Visibility Safety Apparel and Headwear” or the Public Safety Vest (ANSI/ISEA 207-2006)
 - Required for anyone working in the ROW, including volunteer groups





Guidelines

- MUTCD / DeIDOT MUTCD
 - The MUTCD & DeIDOT Traffic Manual divide transportation incidents into three classes:
 - Major - duration of more than two hours
 - Intermediate - duration of thirty minutes to two hours
 - Minor - duration of less than thirty minutes

Level of Response	MUTCD Class
1	Intermediate, Minor
2	Major, Intermediate
3	Major
4	Major





Guidelines

- MUTCD / DeIDOT MUTCD (con't)
 - Major and Intermediate Incidents
 - Proper traffic diversion, tapered lane closures, and upstream warning devices should be setup as soon as possible.
 - Manual traffic control should be provided by qualified flaggers, fire police or uniformed law enforcement officers .
 - If flares are used to delineate the initial traffic control, they should be removed and replaced with the appropriate temporary traffic control (TTC) devices, such as cones and barrels.
 - Minor Incidents
 - Generally do not involve lane closures.





Transportation Control Design Guidelines

- **MUTCD / DeIDOT Section 6B (Fundamental Principles) provides the following guidance for designing TTC plans.**
 - TTC plans should provide for the safety of all individuals who will pass through the TTC area.
 - Vehicles should be routed through the work zone in a way that as closely as possible represents normal travel operations.
 - A TTC plan that reflects the complexity of the work zone should be designed and understood by all parties prior to the implementation of the plan.





Transportation Control Design Guidelines

- MUTCD / DeIDOT Section 6B (con't)
 - Traffic flow should be disrupted as little as possible.
 - Provide motorists with clear guidance as they enter, travel through, and leave the TTC area - eliminate or cover any conflicting signage.
 - Routine inspections of the TTC devices should be conducted to ensure the safety of motorists and workers.
 - For long TTC zones provide areas for emergency pull-off.





Transportation Control Design Guidelines

- MUTCD / DeIDOT Section 6B (con't)
 - Everyone who is responsible for designing, setting-up, maintaining, and/or working in the TTC zone should be properly trained, based on their responsibilities.
 - Before any new detour or temporary route is opened to traffic, all necessary signs shall be in place.
 - DeIDOT Traffic Manual and MUTCD Section 6H (Typical Applications) contains 46 diagrams of TTC for different situations. See also Appendix; Part 5.





Traffic Control Set-Up Guidelines

- FHWA - Design and Operation of Work Zone Traffic Control
 - Installation / removal of TTC devices is often more dangerous than working in a completed TTC zone.
 - Efficient installation / removal of TTC devices as the result of good planning / training reduces the risk to which a worker is exposed.
 - Before beginning the installation or removal of the TTC devices, the procedures appropriate for the site should be explained to and understood by all crew members.





Traffic Control Set-Up Guidelines

- FHWA (con't)
 - If TTC devices will be removed and installed multiple times, small dots can be painted on the road surface to indicate the location of the TTC device - making for a more efficient and safer installation.
 - Police cars with flashing lights are helpful for enforcement / protection and causing motorists to slow down in the work area.
 - Trucks with attenuators are good protection / blocker vehicles for workers in the road and on truck mounted platforms.





Traffic Control Set-Up Guidelines

- FHWA (con't)
 - Worker Training
 - Workers should be trained in the proper / safe use and installation of any TTC device that they will be using
 - Before beginning the installation or removal of the TTC devices, the procedures appropriate for the site should be explained to and understood by all crew members.
 - Workers should always face oncoming traffic when installing / modifying / removing TTC devices.
 - Always know what and where your escape routes are in case of an emergency





Traffic Control Set-Up Guidelines

- FHWA (con't)
 - Sequence of Installation
 - Installation for detour routes should begin with the sign at the end of the detour and work back towards the beginning of the detour route.
 - Warning devices, flashing lights, and flaggers - if necessary - should be used to warn motorists that workers are in the road during the installation / removal of TTC devices
 - Police cars with flashing lights are helpful for enforcement and causing motorists to slow down in the work area. Trucks with attenuators are good protection / blocker vehicles for workers in the road and on truck mounted platforms
 - TTC devices should be removed in the opposite order they were installed





Traffic Control Set-Up Guidelines

- FHWA (con't)
 - Placement of Channelizing Devices
 - See 'Part 5 – Setting Up an Incident Scene / Work Zone' for the cone spacing chart.
 - The first device should be placed at the shoulder line or road edge
 - When a worker is placing devices by hand, the device should be carried from the shoulder with the worker watching traffic as they move into the lane.
 - Generally for tapers each device is placed one foot further away from the shoulder as the lane is closed
 - If trucks are used to place TTC devices, it needs to have a suitable work platform with protective railings installed.





Traffic Control Set-Up Guidelines

- FHWA (con't)
 - Placement of Channelizing Devices (con't)
 - To aid in the efficiency of sign placement consider loading the signs on the truck so that the last sign loaded will be the first sign you need
 - When installing barricades or barrels, it may be safer to install cones first to create a safer work area, since a worker needs to spend more time in the roadway when installing barricades or barrels





Traffic Control Set-Up Guidelines

- FHWA (con't)
 - An initial inspection of the TTC zone should be conducted after it has been set-up to confirm:
 - that traffic is flowing properly through the area,
 - that all TTC devices have been installed in their proper places, and
 - all TTC devices are functioning properly.
 - Daily inspections of the TTC zone and devices should be conducted, looking for damaged or defective TTC devices that need repaired or replaced.





Guidelines

Safe Quick Clearance Program (I-95 Corridor Coalition)

- **Basic Components of Safe Quick Clearance**

- Driver Stop - Drivers involved in a crash must stop their vehicles without obstructing traffic more than is necessary.
- Driver Removal - Places direct responsibility on drivers involved in a crash, whose vehicles block all or portion of a travel lane, to move their vehicles off the traveled way when practical.
- Authority Removal - Provides authorization to a pre-designated set of public agencies to remove: driver-attended disabled or wrecked vehicles and spilled cargo or other personal property blocking a travel lane(s) or otherwise creating a hazard to the flow of adjacent traffic.

See 'Appendix;
Part 3' for
more
information
about the I-95
Corridor
Coalition





Guidelines

Safe Quick Clearance Program (I-95 Corridor Coalition)

- **Basic Components of Safe Quick Clearance (con't)**
 - Authority Tow - Similar to 'Authority Removal'. Emphasizes the removal of driver-attended disabled or wrecked vehicles from the highway right-of-way to a legal parking area or storage yard.
 - Hold Harmless Clause - Shields the 'authority' from personal liability claims for any damage incurred while acting in good faith in clearing vehicles or personal property from the incident scene.
- **Currently Delaware only has laws allowing police officers - only - to order the removal of vehicles or debris.**
- **For more information on Safe Quick Clearance see:**
<http://144.202.240.28/pman/ViewProject.asp?pid=128>





Guidelines

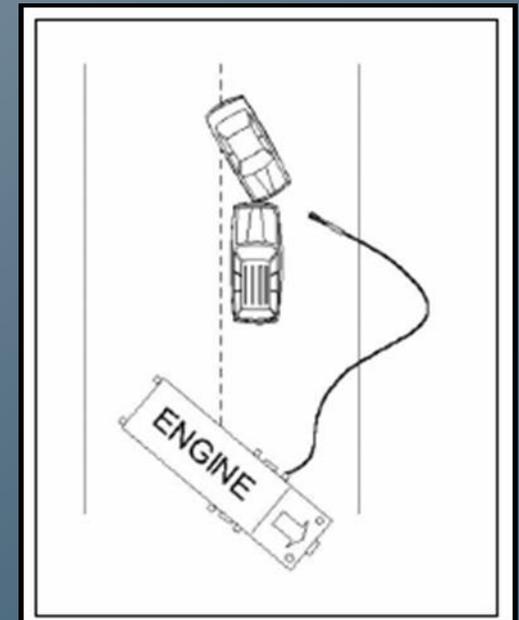
- **Site Safety**
 - At night scenes, unnecessary vehicle headlights, spotlights, strobes, etc. (white lights) should be turned off to avoid blinding motorists as they approach and travel past the incident. Care should also be taken when placing light plants that oncoming traffic is not blinded.
 - Limit on-scene vehicles to only those necessary to control the incident, all unnecessary or standby vehicles should be held at a designated staging area (temporary location near the incident scene: fire station / police barracks, etc.).
 - Where possible place a fire engine prior to the scene at an angle with the pump panel facing the incident and the wheels turned away from the incident to protect the responders at the incident scene.





Guidelines

- Site Safety (con't)
 - All vehicles should be parked in a manner that protects the incident scene. Fire units should be parked so that the pump operator is protected from oncoming traffic.
 - Vehicles should not block any more space than necessary.
 - Emergency response vehicles – primarily fire units - can be used as a traffic control device and/or safety barrier.
 - Vehicles with a truck mounted arrow board should be parked to protect the scene and maximize the visibility of the arrow board.





Guidelines

- **Site Safety (con't)**
 - ALL responders should have proper ANSI 107-2004, Class III high visibility reflective clothing or ANSI 207-2006 public safety vest on when working on or near a roadway.
 - Caution should be taken exiting vehicles on the traffic flow side of the vehicle, whenever practical responders should exit the vehicle on the side opposite traffic flow.
 - Whenever possible a response vehicle should be between the responder and the traffic flow.
 - Responders should avoid standing between response vehicles as they could be crushed if one of the vehicles is struck.
 - When working on or near a roadway **ALWAYS** keep an eye on oncoming traffic and know what your escape routes are. Never turn your back to oncoming traffic.





Guidelines

- **Site Safety (con't)**
 - Cones / flares should be placed beginning prior to the incident area and then proceeding past the incident area. They should be picked up in the opposite order they were placed. For both placement and removal, a shadow vehicle with flashing lights should be present to protect the workers.
 - For extended scenes, advanced warning signs should be placed as soon as possible, and a traffic control safety person should be designated who is tasked with verifying the safe placement of equipment and individuals.





Guidelines

- **Safe Positioning of Motorists During an Incident**
 - Uninjured motorists should be moved as soon as possible to a safe area - the shoulder, median, etc. - away from the flow of traffic.
 - Motorists should not be allowed to stand between vehicles involved in the incident or response vehicles.
 - In inclement weather, an appropriate response vehicle may be used to shelter motorists.





Guidelines

- **Incidents at an Intersection**
 - Cones (or flares in an emergency) should be used, when necessary, to funnel traffic into a lane that bypasses the incident. See Scenarios section for diagrams of set-ups for intersections. (MUTCD)
 - Flaggers should be placed at all approaches to the intersection to control all inbound traffic.
 - When flagging at a intersection with a traffic light, directions given by the flagger should not contradict the directions given by the traffic light. (Ex. Flagger should not signal 'Slow' during a red light.) Ideally the traffic light should be turned off or switched to flashing yellow as soon as possible to reduce confusion for motorists.
 - At 'Stop' sign controlled intersections, the 'Stop' signs should be covered while flaggers are controlling the intersection to prevent confusion.





Guidelines for Flaggers

- **Responsible for safety of motorists and incident responders by safely directing traffic**
 - Most contact of all responders with the traveling public
 - Flagger must be clearly visible to oncoming motorists
 - STOP / SLOW paddles preferred to red flags, red flags should be used in emergency situations only
 - A flagger shall be a person who provides TTC. All flaggers, except for emergency personnel and law enforcement officers, shall be certified by a DeIDOT-recognized flagger certification program. All flaggers, except for emergency personnel and law enforcement officers, shall be required to carry a flagger certification card and photo identification on their person at all times. (DeIDOT MUTCD)



DeIDOT flaggers should be trained by the American Traffic Safety Services Association





Guidelines for Flaggers

- Flagger station shall be located so that approaching traffic has sufficient time to respond and stop if necessary
- Except for emergency situations, flaggers shall be preceded by advanced warning signs
- Flagger shall stand either on shoulder adjacent to the road being controlled or in the closed portion of the roadway
- Flagger shall not stand in the portion of the roadway used by motorists until the vehicles have come to a complete stop





Part 4 – Traffic Control Devices





Traffic Control Devices

- Portable Variable Message Signs (VMS)
- Traffic Cones
- Tubular Markers
- Plastic Drums (sand filled or other)
- Portable Barrier
- Arrow Boards
- Flags, Flag Personnel (Police can assist)
- Various Lighting (for nighttime operations)
- Vehicles
- Signals





Traffic Control Devices

- Primarily used to alert motorists of unexpected situations

- MUTCD Examples:

- Speed of traffic is expected to drop significantly
- Queuing and delays are expected
- Changes in alignment
- Changes in road user pattern occur
- Changes in surface conditions
- Adverse environmental conditions present
- Advance notice of ramp, lane or roadway closures needed
- Crash or incident management is needed



Large VMS signs such as this should be visible at 0.5 miles in both day and night conditions. Smaller VMS signs should be visible from at least 330 ft.



VMS

- Sign should have adjustable display rates and each phase should contain only one thought
- No more than two phases should be put on a single VMS
- Message should be brief and concise
- Abbreviations should be easily understood
- Text shall not scroll or travel horizontally or vertically
- Portable VMS signs should be placed in the shoulder or even further from the roadway
- Should be delineated with reflective traffic control devices





Traffic Cones

- Traffic cones are used to channelize traffic and act as a guide to roadway users for smooth gradual vehicular flow from one lane to another
- Traffic cones should be made of material that will not damage vehicles when struck
- Cones should be “crashworthy”.
- Cones should be 28 to 36 inches tall with two white retroreflective stripes





Traffic Cones

- When channelizing traffic for lane closures using traffic cones, proper taper length is critical

Taper Length = (posted speed limit) x (lane width)

Example: Speed limit = 45 mph

Lane width = 12 ft

Taper Length = 45 x 12 = 540 ft

- There should be 540 feet in between the first cone and the last cone
- * For limited access roadways, taper length should not be less than 1000 ft.



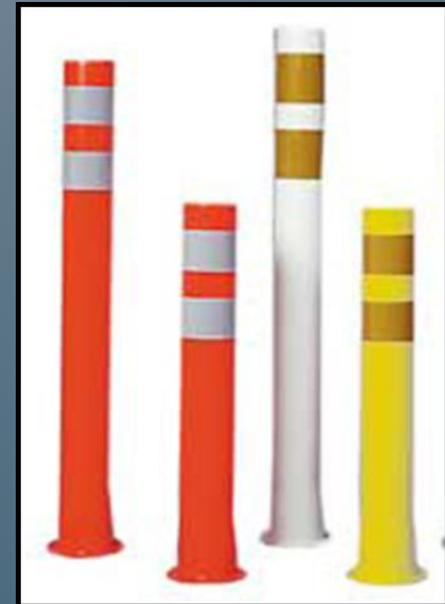
Traffic cone with proper reflective markings for nighttime operations should have two reflective stripes as shown above





Tubular Markers

- Tubular markers are used similarly as traffic cones and traffic barrels
- Cones are preferred provided there is ample space however tubular markers are useful where space is limited





Plastic Drums

- Delineate unusual traffic patterns
- Mark hazard areas on roadway
- Create safe area to provide working room for incident responders
- Used in the same fashion as traffic cones to channelize traffic



Markings on drums should always be horizontal and contain alternating stripes of orange and white retroreflective stripes, each 4 to 6 inches wide



Plastic Drums

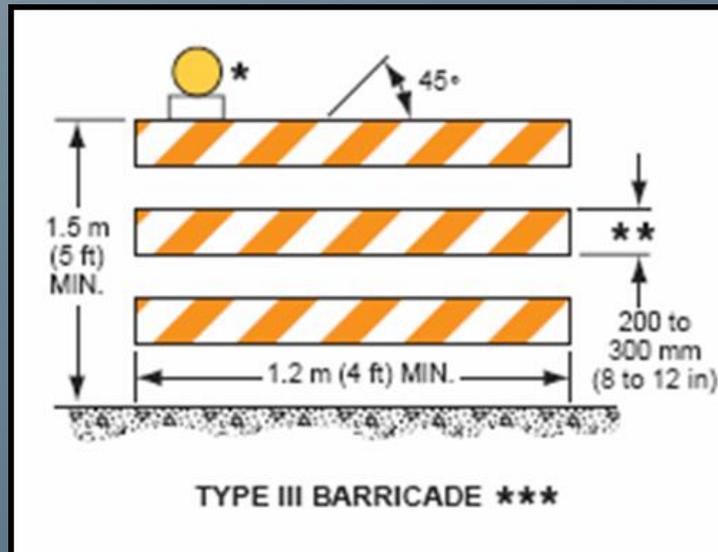
- Drums must be constructed of lightweight deformable materials
- Drums shall have closed tops so debris cannot collect within
- Advantages of Using Drums:
 - Highly visible
 - Give a formidable appearance commanding respect of drivers
 - Have good target value
 - Can remain in a place for long periods of time yet are still relatively lightweight and easily portable





Type III Barricade

- Should be used to close or partially close a road
- May be placed across a roadway or from curb to curb
- Signs may be installed on barricades
- The diagonal stripes should angle downward in the direction you want traffic to go. The example below is directing traffic to the left.





Arrow Boards

- Arrow Boards are used to alert motorists of potential lane closures or places where lane changes are needed
- Arrow Boards are four standard sizes:
 - Type A - Low-speed (min 48" x 24")
 - Type B - Intermediate-speed (min 60" x 30")
 - Type C - High-speed (min 98" x 48")
 - Type D - Mounted on authorized vehicles (48" x 24")



Arrow Boards should ideally be placed on the shoulder of the roadway if not further from the travel lanes and be delineated with reflective cones or barrels





Arrow Boards

- Trucks carrying Arrow Boards must be equipped with high intensity rotating, flashing, oscillating and / or strobe lights
- Arrow Boards shall have adjustable intensities
- Multiple lane closures require separate arrow boards
- Flashing rate should be no less than 25 and no more than 40 flashes per minute
- Minimum element “on-time” should be no less than 50 percent with equal intervals of 25 percent for each sequential phase





Lighting / Nighttime Operations

- Incident scenes are **EXTREMELY** dangerous at nighttime, proper lighting is essential
- There are four standard lighting devices
 - Floodlights
 - Flashing warning beacons
 - Warning lights
 - Steady burn electric lamps
- Care should also be taken when placing light plants that oncoming traffic is not blinded.





Part 5 – Setting Up an Incident Scene / Work Zone





Setting-Up an Incident Scene / Work Zone

- Proper placement of TTC devices and emergency vehicles is critical to providing a safe environment for both responders and motorists.
 - Always install TTC devices in the direction traffic flows through the TTC Zone.
 - Order of Set-up:
 - Advanced warning area
 - Transition area
 - Activity area
 - Termination area

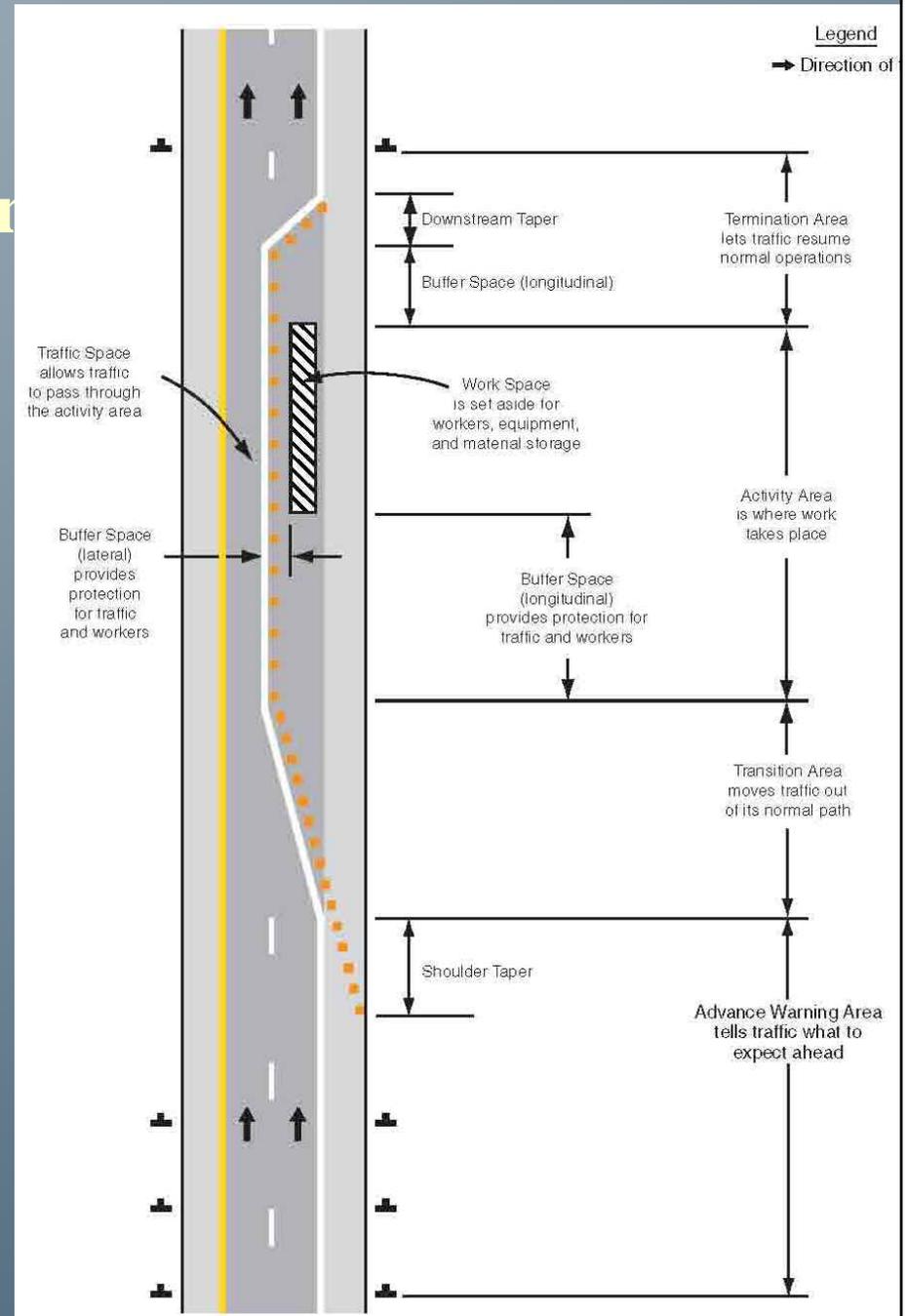


* ResponderSafety.com



Setting-Up an Incident

- The MUTCD separates incident scenes into four distinct areas
 - Advanced warning area
 - Transition area
 - Activity area
 - Termination area





Setting-Up an Incident Scene / Work Zone

- Proper TTC device placement (con't)
 - The first device should be placed at the shoulder line or road edge.
 - You should always face oncoming traffic when installing / modifying / removing TTC devices.
 - When placing devices by hand, the device should be carried from the shoulder while watching traffic as you move into the lane.
 - If trucks are used to place TTC devices, they need to have a suitable work platform with protective railings installed.
 - Generally for tapers each device is placed one foot further away from the shoulder as the lane is closed.



* ResponderSafety.com



Setting-Up an Incident Scene / Work Zone

- TTC Device Placement

Cone, Barrel, & Flare Placement

See 'Appendix; Part 5' for equations for calculating device placement

Posted Speed Limit (mph)	30	35	40	45	50	55*	65*
	Lane Width 14 ft.						
Length of Taper (ft.)	210	286	373	630	700	770	1000
Min. Number of Cones	9	11	12	17	17	18	23
Max. Distance bet. Cones (ft.)	30 [†]	35 [†]	40 [†]	45 [†]	50 [†]	50 [†]	50 [†]
	Lane Width 12 ft.						
Length of Taper (ft.)	180	245	320	540	600	660	1000
Min. Number of Cones	8	9	11	15	15	16	23
Max. Distance bet. Cones (ft.)	30 [†]	35 [†]	40 [†]	45 [†]	50 [†]	50 [†]	50 [†]
	Lane Width 11 ft.						
Length of Taper (ft.)	165	225	293	495	550	605	1000
Min. Number of Cones	7	9	10	14	14	15	23
Max. Distance bet. Cones (ft.)	30 [†]	35 [†]	40 [†]	45 [†]	50 [†]	50 [†]	50 [†]

* For limited access roadways, the minimum taper shall be 1,000 ft.

[†] Spacing between first four cones should not exceed 25 ft.





Setting-Up an Incident Scene / Work Zone

- Proper TTC device placement (DeIDOT Traffic Control Manual)
 - Tangent TTC device placement is the placement of the devices that run parallel to traffic through the work zone.
 - The tangent should extend from the end of the taper to the end of the incident area, and should not be shorter than twice the taper length.

Advanced Warning Sign Placement

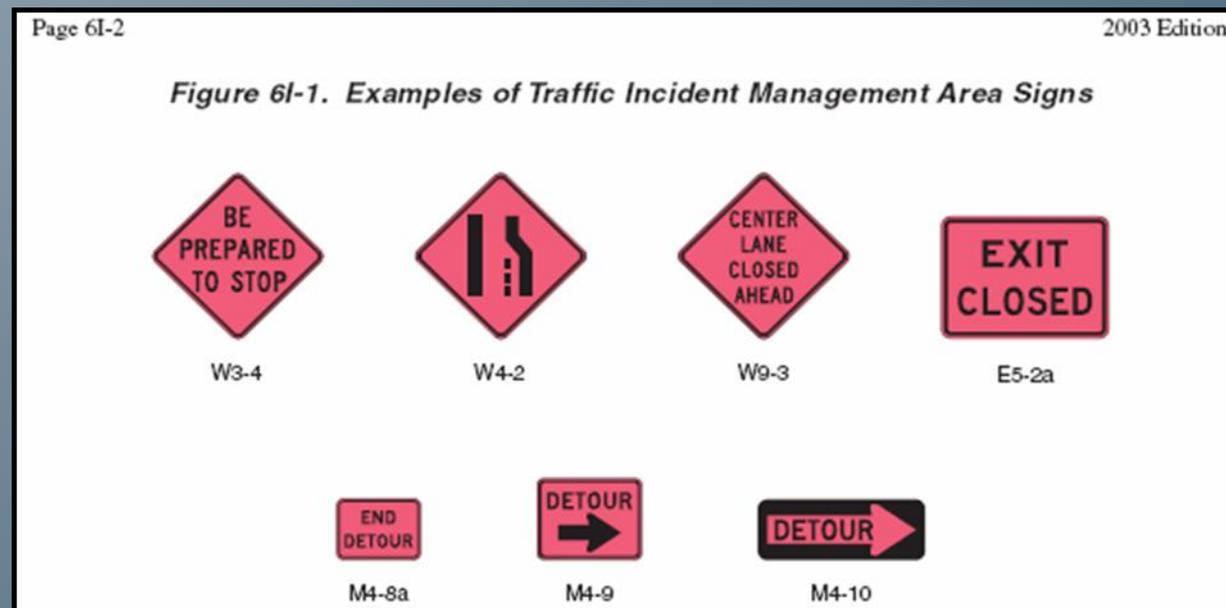
Road Type	Distance between Signs (ft)		
	Sign Closest to Incident	Middle Sign	Sign Furthest from Incident
Expressway / Freeway	1000	1640 (0.3 mi)	2640 (0.5 mi)
All other Roadways	500	500	500





Setting-Up an Incident Scene / Work Zone

- MUTCD / DeIDOT MUTCD
 - 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).
 - Whenever possible avoid mixing standard orange/black warning signs with traffic incident pink/black signs.





Traffic Control Set-Up Guidelines

- Proper TTC device placement
 - To aid in the efficiency of sign placement consider loading the signs on the truck so that the last sign loaded will be the first sign you need.
 - When installing barricades or barrels, it may be safer to install cones first to create a safer work area, since a worker needs to spend more time in the roadway when installing barricades or barrels.





Evacuation & Detour Plans

- Through the TMT program evacuation and detour plans have been developed for the state of Delaware.
 - Evacuation Plans have been developed for all three counties. Maps outlining the evacuation routes for each county can be found at the following website:
http://deldot.gov/information/projects/tmt/proj_docs.shtml
 - Detour Plans have been developed for many of the major roads in all three counties. The detour plans can be found at the following website: <http://deldot.gov/information/projects/tmt/detour.shtml>





Evacuation Plans

- Evacuation Plans Website

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Transportation Management Team

Project Documents

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- Communications Working Group Tabletop Exercise After Actions Report [PDF](#)
- I-95 Corridor Coalition Quick Clearance and 'Move It' Best Practices Executive Summary [PDF](#)
- DE Transportation Incident and Event Management Plan [PDF](#)
- TMT Presentation at the ITE (Institute of Transportation Engineers) Annual Meeting - May 2005 [PDF](#)
- Reference Location Signs Report [PDF](#)
- Salem and Hope Creek Emergency Evacuation Traffic Operations Manual (36.5 MB) [PDF](#)

Annexes:

- New Castle County All Hazards Evacuation Annex - 2007
 - o New Castle County All Hazards Evacuation Annex - 2007 (13.7 MB) [PDF](#)
 - o Appendix A (13.7 MB) [PDF](#)
 - o Delmarva Peninsula Evacuation Map (1.2 MB) [PDF](#)
 - o Evacuation Routes for a Hurricane affecting New Castle County (1.6 MB) [PDF](#)
 - o Evacuation Routes for a Hurricane affecting the Southern Peninsula (1.6 MB) [PDF](#)
 - o Wilmington Evacuation Route Map (1.6 MB) [PDF](#)
 - o Newark Evacuation Route Map (1.5 MB) [PDF](#)
 - o Middletown Evacuation Route Map (1.6 MB) [PDF](#)
- Kent County All Hazards Evacuation Annex - 2007
 - o Kent County All Hazards Evacuation Annex - 2007 (3.0 MB) [PDF](#)
 - o Appendix A (3.0 MB) [PDF](#)
 - o Delmarva Peninsula Evacuation Map (1.2 MB) [PDF](#)
 - o Kent County Regional Evacuation Map (25 MB) [PDF](#)
- Sussex County All Hazards Evacuation Annex - 2006
 - o Sussex County All Hazards Evacuation Annex - 2006 (2.4 MB) [PDF](#)
 - o Appendix A (6.2 MB) [PDF](#)
 - o Delmarva Peninsula Evacuation Map (1.2 MB) [PDF](#)
 - o Sussex County Regional Evacuation Map (1 MB) [PDF](#)

Internet Resources:

- Delmarva Hurricane Evacuation Study - Army Corps of Engineers



Project Information

- Project Home Page
- Project Overview
- Project Documents
- Evacuation Plans
- Meetings and Public Workshops
- Detour Routes for Incident Management

Public Feedback

Contact: Public Relations
 Phone: 302-760-2080
 1-800-652-5600 (in-state
 only)
 email: dot-public-relations
 @state.de.us

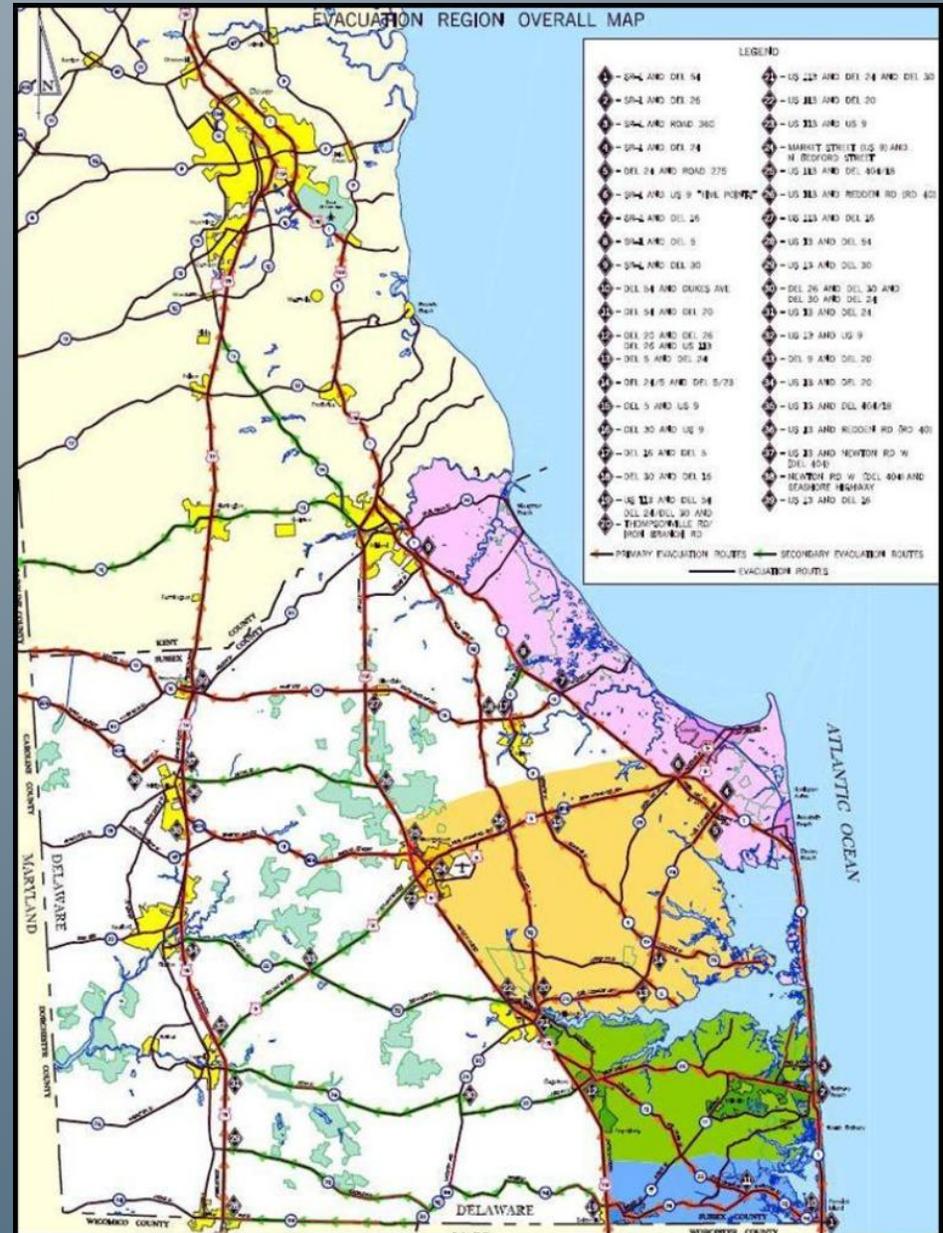
Project Information:
 Contact: Mr. Gene S.
 Donaldson
 Title: Project Manager/TMC
 Operations Manager
 Phone: 659-2404
 email:
 gene.donaldson@state.de.us





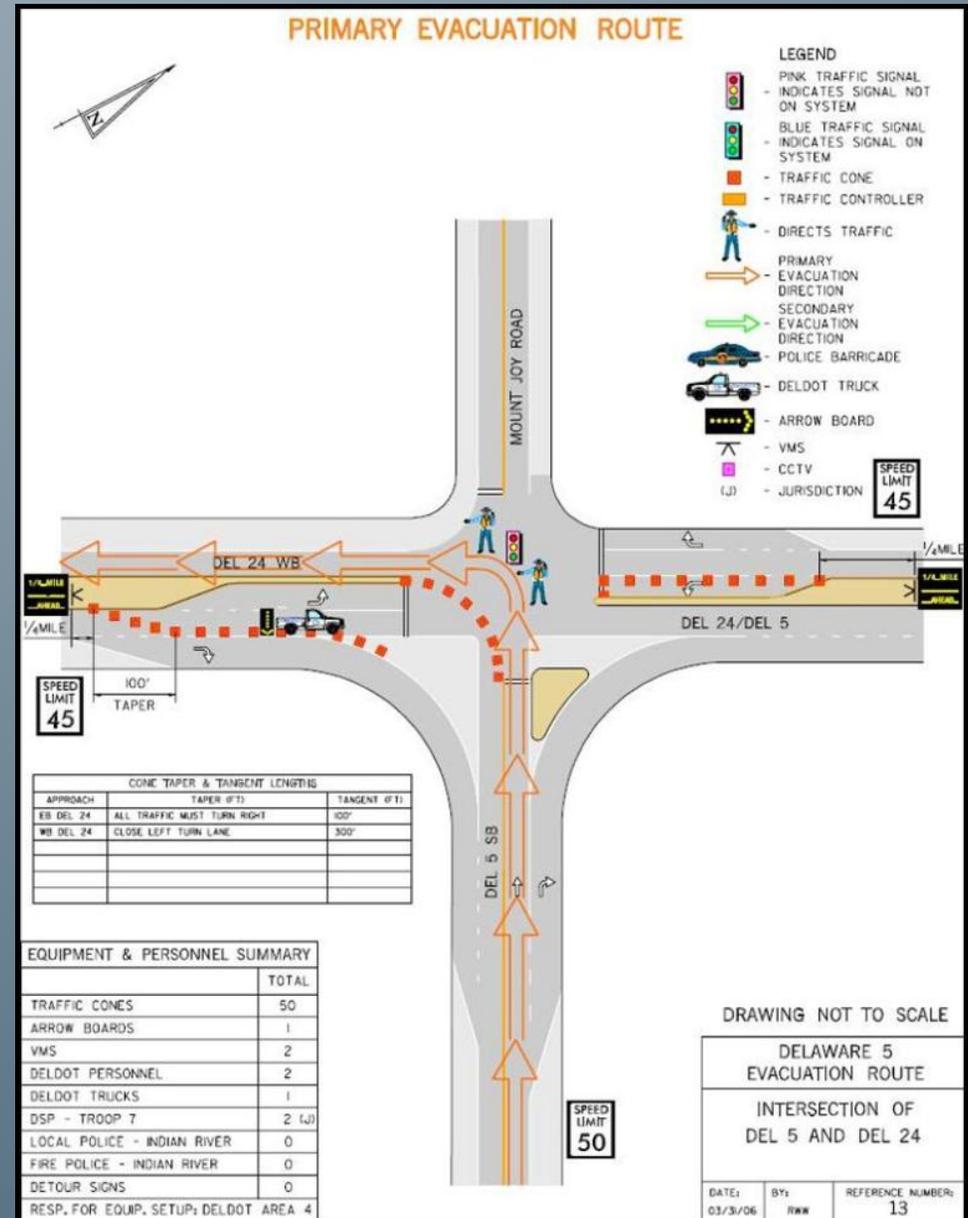
Evacuation Plans

- Consists of written policies, maps, and intersection diagrams.



Evacuation Plans

- Intersection diagrams provide detailed descriptions of the required traffic control at a specific location.





Detour Plans

- The plans establish detour routes for an incident that requires the closure of the road.
- Having standard detour routes prepared ahead of time eliminates the need to develop routes on the spot during an incident.





Detour Plans

- Detour Plans Website

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PROJECTS - Transportation Management Team

Detour Routes for Incident Management

In order to view the file(s) on this site that are saved in Portable Document Format, you will need to download the free Adobe Acrobat Reader from Adobe Systems.

[Detour Routes](#)
 - I-95
 New Castle County
 - SR 1
 Kent County
 New Castle County
 - US 113
 Kent County
 - US 13
 Kent County
 New Castle County
 Sussex County
 - US 301
 New Castle County

Project Information

- Project Home Page
- Project Overview
- Project Documents
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- Detour Routes for Incident Management

Public Feedback

Contact: Public Relations
 Phone: 302-760-2080
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Project Information:
 Contact: Mr. Gene S. Donaldson
 Title: Project Manager/TMC Operations Manager
 Phone: 659-2404
 email: gene.donaldson@state.de.us

Last Updated: Friday, 15-Jun-2007 09:14:17 Eastern Daylight Time





Detour Plans

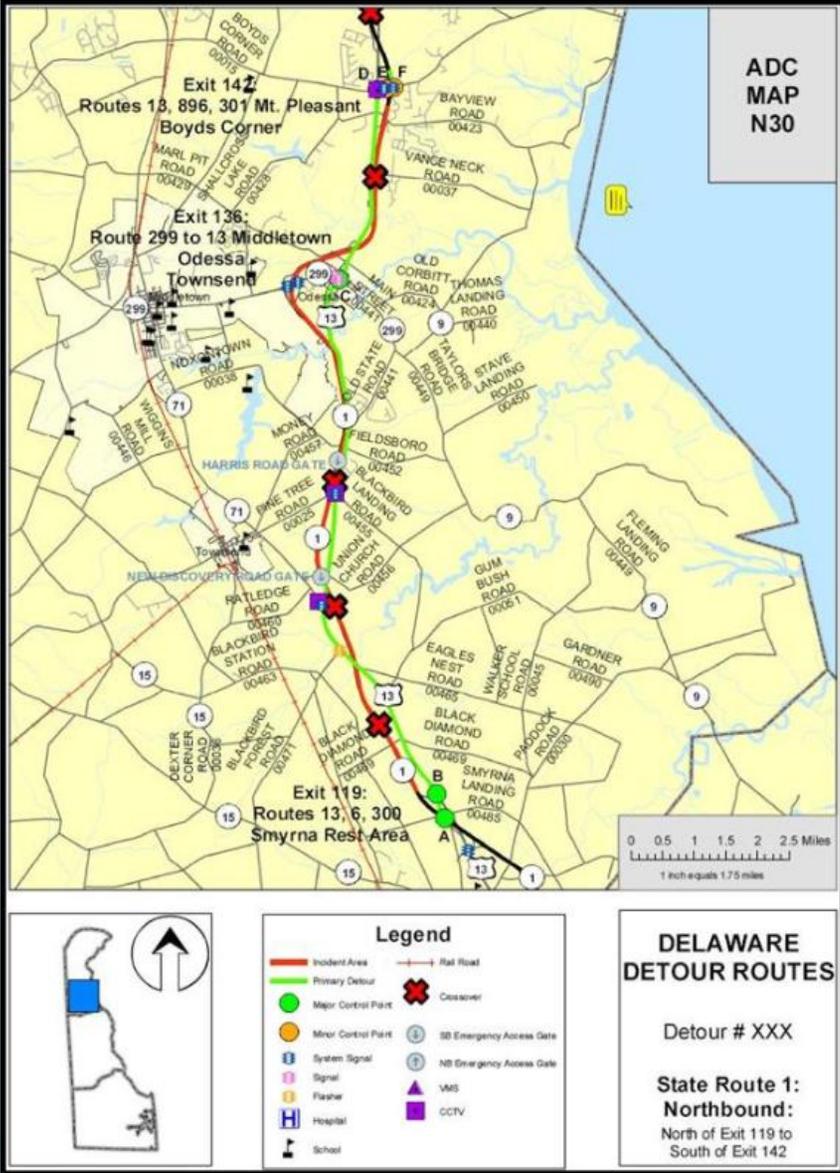
- From the first screen: select the road, the county, the direction, and finally the road segment file.
- From the road screen (similar to one displayed here), zoom into the location of the incident and then click on the location of the incident. This will open the detour plan for that location.





Detour Plans

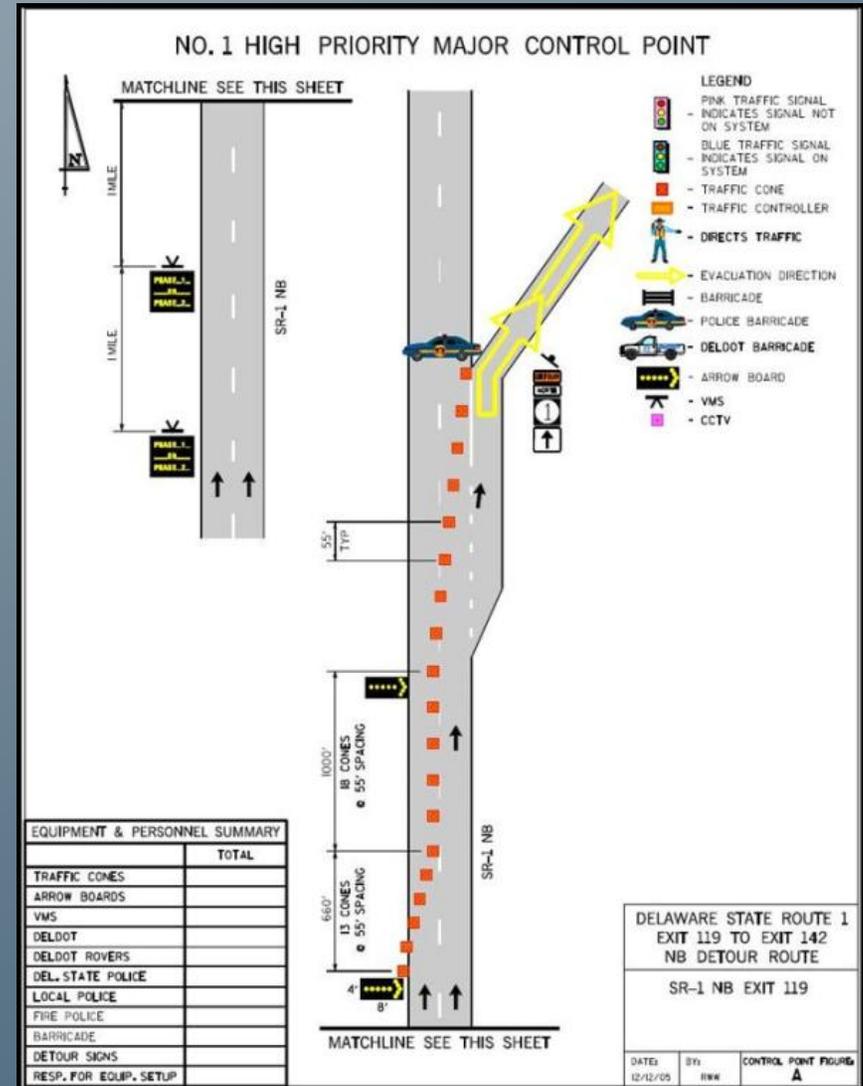
- In most locations at this time only the detour routes have been developed. (June 2007)
- In some locations, by clicking on the control point letter you can access detailed intersection diagrams that show the required traffic controls necessary to implement the detour route.





Detour Plans

- Example of a control point diagram.





Setting-Up an Incident Scene

- **Scene Management**
 - Initial Responder
 - Parking
 - ≈ If driving a response vehicle with emergency flashing lights, the vehicle should be placed in such a position to protect the incident scene, to warn oncoming motorists and protect initial responders.
 - ≈ They should make sure the next responding vehicle parks in such a way as to provide further blocking and protection of the scene.
 - Responsibilities
 - ≈ Roles are basically the same whether the initial responder is DeIDOT, fire, or police.





Setting-Up an Incident Scene

- **Scene Management**
 - Initial Responder (con't)
 - Incident Command
 - ≈ Immediately assumes incident command until relieved and communicates scene information to appropriate agencies. (See the ICS section for specific details.)
 - ≈ Formulates and implements an initial plan for the placement of arriving response vehicles and identifies a staging area for support units.
 - ≈ Turns over incident command, when appropriate. (See the ICS section for specific details.)
 - Equipment
 - ≈ If equipment is available, sets out flares, cones, and/or advanced signing to further delineate and protect the incident scene.





Setting-Up an Incident Scene

- **Scene Management**

- Second Unit Arrives

- Parking

- ≈ Either parks the vehicle to further extend the protected work zone or parks in a position to begin addressing the incident.

- Responsibilities

- ≈ Fire

- » Part of the crew begins addressing the incident

- » At least one is tasked with extending the traffic control, if possible, and directing the arriving response vehicles into their appropriate positions including standby position at the staging area.

- ≈ Police / Fire Police

- » Focus on traffic control

- » Directing the arriving response vehicles into their appropriate positions including standby position at the staging area.





Setting-Up an Incident Scene

- **Scene Management**
 - Second Unit Arrives
 - Responsibilities (con't)
 - ≈ DeIDOT
 - » Focus on expanding the traffic control zone
 - » Placement of further traffic control devices
 - » Directing the arriving response vehicles into their appropriate positions including standby position at the staging area
 - Incident Command
 - ≈ Based on the type of incident, the first responder may need to turn over incident command to the ranking crew member of the second unit. (See the ICS section for specific details.)





Setting-Up an Incident Scene

- **Scene Management**
 - Remaining Initial Response Vehicles Arrive
 - Parking
 - ≈ All vehicles should be positioned to provide a protective shadow for the incident.
 - ≈ It should be confirmed that a staging area for additional units and personal vehicles was set-up near the scene but in an area that will not further contribute to traffic disruption.
 - Incident Command
 - ≈ Based on the type of incident, the incident command may be turned over to the ranking crew member of the appropriate agency. (See the ICS section for specific details.)





Setting-Up an Incident Scene

- Scene Management
 - Remaining Initial Response Vehicles Arrive (con't)
 - Equipment
 - ≈ Traffic controls should be in place as completely as possible with the equipment on hand.
 - ≈ Based on anticipated incident duration, proper traffic controls (cones, arrow boards, advanced warning signs, etc.) should be on route and then installed.





Setting-Up an Incident Scene

- **Scene Management**

- EMS Units / Helicopter Arrives

- For an ambulance:

- ≈ Should park in the “shadow” of other response vehicles to protect the EMS crew and victims as they are being treated and/or loaded into the EMS unit.

- ≈ Should not leave the scene until a uniformed “flagger” stops traffic and directs the ambulance to proceed.

- For a helicopter:

- ≈ Traffic in both directions should be stopped

- ≈ A level area clear of overhead obstructions should be delineated.

- ≈ Only authorized individuals should enter this area from the time the helicopter begins its approach until it clears the incident area.





Setting-Up an Incident Scene

- **Scene Management**
 - EMS Units / Helicopter Arrives (con't)
 - Equipment
 - ≈ EMS crew should be outfitted with proper ANSI 107-2004, Class II or III high visibility reflective clothing or ANSI 207-2006 public safety vest.





Setting-Up an Incident Scene

- **Scene Management**

- Tow Agency / Specialty Removal Service Arrives

- Parking

- ≈ Should park at scene where directed by the incident commander, but may be initially based out of the staging area until needed.

- **Responsibilities**

- ≈ If it is necessary to pull the vehicle into the traffic flow, a flagger(s) should be positioned to stop traffic before the vehicle enters the traffic flow.

- ≈ No individual should enter the traffic flow to clean up debris / spill unless a flagger(s) is present to control traffic and protect the individual.

- ≈ Should not leave the scene until a uniformed “flagger” stops traffic and directs the vehicle to proceed.





Setting-Up an Incident Scene

- **Scene Management**
 - Tow Agency / Specialty Removal Service Arrives (con't)
 - Incident Command
 - ≈ Near this stage, the incident command will be turned over the ranking police officer. (See the ICS section for specific details.)
 - Equipment
 - ≈ Tow operators should be outfitted with proper ANSI 107-2004, Class II or III high visibility reflective clothing.





Setting-Up an Incident Scene

- **Scene Management**
 - Responders Leave Scene & Normal Traffic Flow is Restored
 - Responsibilities
 - ≈ Ideally, response vehicles should leave beginning with the vehicles parked after the incident first and ending with the last vehicle prior to the incident.
 - Incident Command
 - ≈ Based on the type and size of the incident, the incident commander will be either DeIDOT or a police officer at this stage. (See the ICS section for specific details.)





Setting-Up an Incident Scene

- **Scene Management**
 - Responders Leave Scene & Normal Traffic Flow is Restored (con't)
 - Equipment
 - ≈ If cones and flares have been placed then they should be removed beginning with the last cone after the incident to the first cone before the incident.
 - ≈ It is important that there is always a shadow vehicle with flashing lights be present during the removal of all traffic control devices.
 - Normal flow is restored.

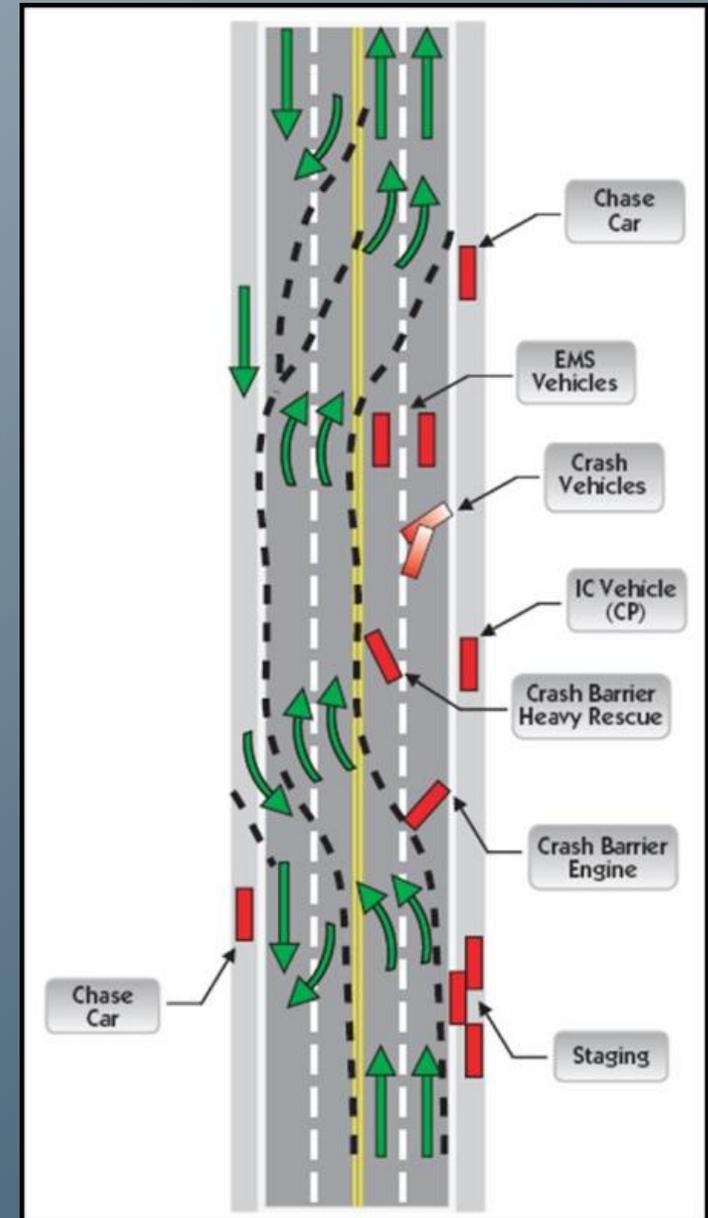




Scenarios

- The proper placement of the response vehicles is critical to the safety of the responders, accident victims, motorists, pedestrians, etc.
- The 'Appendix; Part 5' contains several scenarios that show the correct placement of vehicles and TTC devices.

* Map from the MUTCD





Part 6: Training Resources





Training Resources

- **Federal Highway Administration (FHWA)**
 - Provides direct training or links to FHWA approved agencies for incident command system, incident management, work zone management, special event management, and many other topics
 - <http://ops.fhwa.dot.gov/incidentmgmt>
- **American Traffic Safety Services Association (ATSSA)**
 - Provides training and certification for both work zone and emergency traffic control.
 - www.atssa.com
- **Federal Emergency Management Agency (FEMA)**
 - Training primarily for emergency responders
 - <http://www.fema.gov/about/training/emergency.shtm> or <http://training.fema.gov/IS/crslist.asp>





Training Resources

- **National Fire Service Incident Management System Consortium (NFSIMSC)**
 - FHWA recommend source for ICS information and training
 - <http://www.ims-consortium.org>
- **I-95 Corridor Coalition**
 - Information on Quick Clearance policies and other traffic related standards, studies, and seminars
 - <http://144.202.240.28/pman/ViewProject.asp?pid=128> for Quick Clearance or www.i95coalition.org for the main website
- **Responder Safety**
 - Best practices for highway safety operations
 - <http://www.respondersafety.com>
- **Delaware Emergency Management Agency (DEMA)**
 - <http://dema.delaware.gov/services.shtml>





Appendix; Part 1 – Introduction / Overview





Overview

Examples of Roadway Capacity Reduction

NUMBER OF LANES BLOCKED	I-95 during Rush Hour	US 40 during Rush Hour	SR-1 during Rush Hour
Normal Flow	6765 vph	1647 vph	2365 vph
Shoulder Blocked	5000 vph	1220 vph	1750 vph
One Lane Blocked	3520 vph	860 vph	1230 vph
Two Lanes Blocked	1420 vph	350 vph	497 vph





Overview

- Agencies involved in the TMT program
 - Delaware Department of Transportation
 - DRBA, MSHA, MTA, PennDOT
 - Fire / Rescue / EMS / Fire Police
 - State EOCs
 - Police / 911 Dispatch
 - DNREC
 - Towing Agencies





Overview

- **Transportation Management Team (TMT)**
 - Has established a website that details:
 - Monthly TMT meeting minutes;
 - Documents and publications created through the TMT program;
 - Evacuation routes for Sussex, Kent, and New Castle counties; and
 - Detour routes for incidents on I-95, SR-1, US 13, US 113, and US 301





Overview

Levels of Response

Level	Area of Impact	Resources	Emergency Operation Centers (EOC) Activation for unplanned events	Highest Level of Decision Making	Examples
1	Site/Area specific	Normal staffing.	Normal interagency communication – No EOC activation.	Normal operations.	Day-to-day operations.
2	District wide or Multi-district	Limited re-assignment of personnel and equipment – greater expertise may be needed. Primary agencies notified or activated.	Elevated communications, local/county EOCs may be partially or fully activated. State EOC on notice.	District Managers/ Chief Traffic Engineer/ Operations Managers.	Traffic may need to be diverted to other roads (i.e. blockage on main road); major accident; closing of a road; injuries; isolated road flooding; HAZMAT incident; power outage; bridge structural damage; large planned events (i.e., Dover Downs Races).
3	Multi-Districts	Reassignment of personnel and equipment – greater expertise needed. Primary agencies activated. Support agencies notified. Federal agencies notified (FHWA, USACE). Contractors may be activated.	Higher elevated communications, impacted local /county EOCs may be activated if human needs are required (i.e. shelter, mass care). State EOC may be partially or fully activated – DeIDOT liaison to county EOC and may be to state EOC, if activated.	Division Director or Department Secretary.	Coastal storm; high volumes of rain or snow; major HAZMAT incident; limited evacuation.
4	Statewide/ Multi-State	Total activation of personnel and equipment. Primary, contract, and support agencies activated. Ongoing federal coordination.	Impacted local/county & state EOCs activated – DeIDOT liaison to county EOC and state EOC if state EOC activated.	Governor or DEMA or Cabinet Members.	Hurricanes; floods; blizzards; catastrophic HAZMAT incident; biological incident; weapons of mass destruction; acts of terrorism.





Characteristics & Categories of Planned Special Events

- **Event Operation Characteristics**
 - **Event Time of Occurrence**
Time of day event occurs
 - **Event Time & Duration**
Definite start time or continuous operation
 - **Event Location**
Special travel considerations as a result of the venues location
 - **Area Type**
What other travel options are available near the venue - buses, subways, sidewalks, etc.





Characteristics & Categories of Planned Special Events

- Event Operation Characteristics (con't)
 - Event Market Area
 - How large an area, commercially, does the event affect
 - Expected Attendance
 - Maximum number of expected patrons
 - Audience Accommodation
 - Will attendance fluctuate due to outside factors or is it predictable
 - Event Type
 - Does the type of event require any special consideration



Characteristics & Categories of Planned Special Events

- Categories of Planned Special Events

- Discrete / recurring event at a permanent venue

- Occurs regularly, begins at a specific time, and the end time is predictable
- Has predictable high peak travel demands
- Examples: sporting events or concerts at stadiums



- Continuous event

- Occurs over an entire day or multiple days
- Does not generally have as high peak travel demands
- Examples: conventions or county fairs

Characteristics & Categories of Planned Special Events

- Categories of Planned Special Events (con't)

- Street use event

- Requires temporary street(s) closures
- Affects businesses and neighborhoods in the area
- Examples: Street bike race, marathon, or parade



- Regional / multi-venue event

- Multiple events at different venues in a region all scheduled to start at approximately the same time
- Events do not have to be related just occur at the same time and affect the same areas
- Example: sporting events occurring at adjacent venues



Characteristics & Categories of Planned Special Events

- **Categories of Planned Special Events (con't)**
 - Rural event
 - Any special event that occurs in a rural area
 - It is a special case due to limited road capacity, limited route alternatives, and lack of local transit and lodging
 - Example: rural music festivals
- **Many of the guidelines that apply to Transportation Incident and Work Zone Management apply to Special Event Management.**
- **The incident severity classifications found in the MUTCD / DelDOT - major, intermediate, and minor - can also be used to classify special events.**





Implementation Activities

- **Event Personnel**
 - To maintain normal daily activities and provide personnel for event coverage, agencies will often need to bring in temporary employees and volunteers.
 - Volunteers can release experienced personnel from nonessential tasks such as event patron assistance or passive traffic control.
 - Temporary staff and volunteers should be overseen by experienced staff.
 - Volunteers need to be trained so they fully understand their role in the transportation management plan and how it should be executed.





Day-of-Event Activities

- The command structure and management process should be instituted.
- A multi-agency command post should be set-up.
- All TTC should be installed.
- The transportation management plan should be evaluated during the event.





Day-of-Event Activities

- Implement systems to allow managers to make changes to the transportation management plan in response to actual traffic conditions.
- Establish and maintain interagency communication systems.
- Use the media to communicate with the public.
- Monitor traffic continuously on the day of the event.



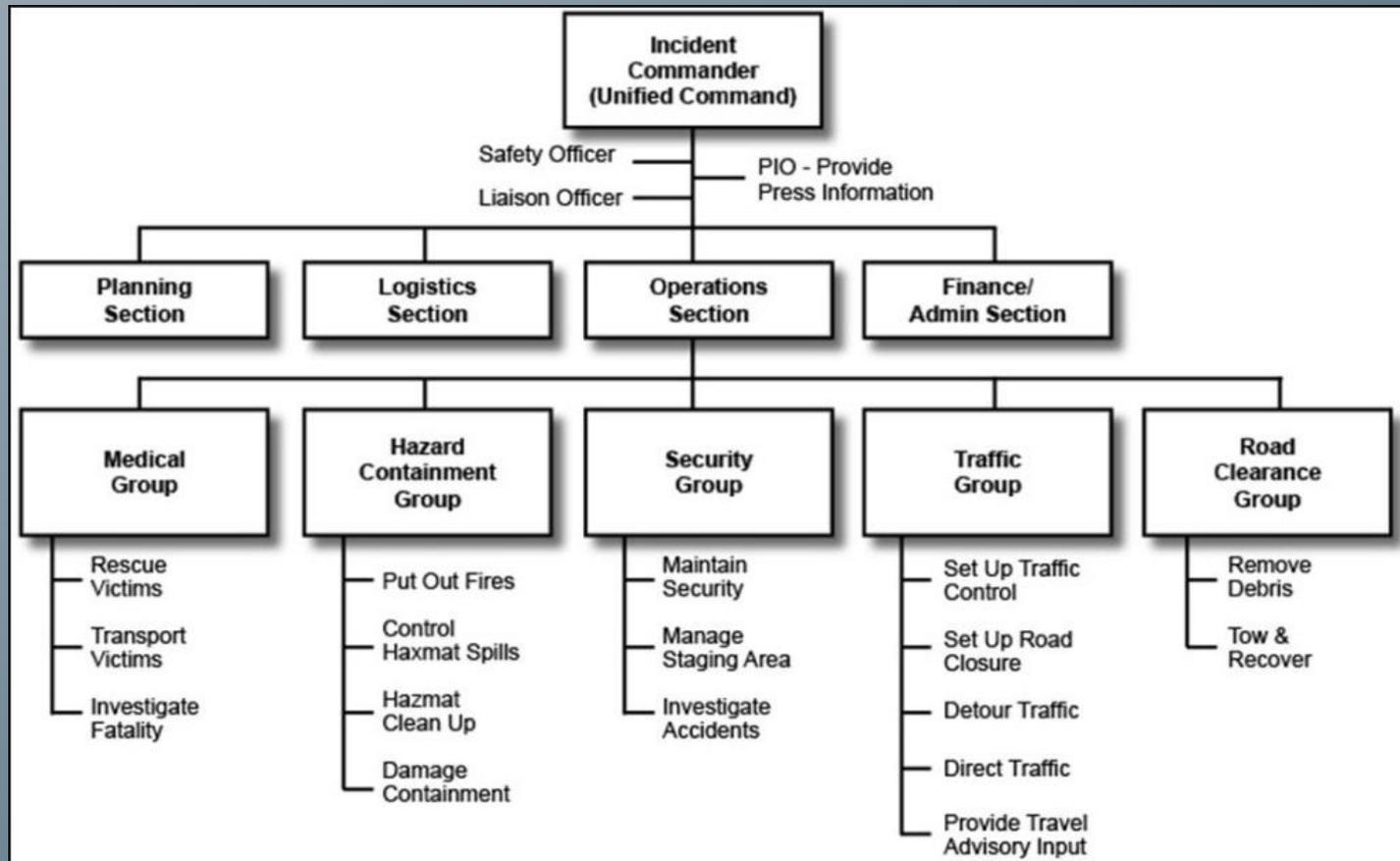


Appendix; Part 2 – Incident Command Structure (ICS) & Agency Roles





Incident Command Structure (ICS)





Incident Command Structure (ICS)

Who May Serve As Incident Commander?

- First on the scene until specialized agency arrives
- Fire and Rescue (Rescue Operations Phase)
- Law Enforcement (Investigation Operations Phase)
- Environmental Protection Agencies (Hazmat Containment, Clean Up Phase)
- Transportation and DPW (Road Clearance Operations Phase)
- Transportation and DPW (Infrastructure Damage Containment Phase)
- Utilities (System Damage Containment Phase)
- Military (Weapon-Load Spills Removal Phase)

Medical	Hazard Containment	Security	Traffic	Road Clearance
<ul style="list-style-type: none"> • EMS • Fire & Rescue • OCME 	<ul style="list-style-type: none"> • Fire/Hazmat • Environmental Protection • Utilities • DPW • Transportation • Military 	<ul style="list-style-type: none"> • Police/Sheriff • Fire 	<ul style="list-style-type: none"> • Police/Sheriff • Transportation • DPW • Fire/Fire Police 	<ul style="list-style-type: none"> • Transportation • DPW • Towing & Recovery • Fire





Agency Roles & Responsibilities

- **DeIDOT**
 - During an incident or event, transportation facilities will continue to be managed and directed by DeIDOT.

 - DeIDOT will control, direct, and coordinate all transportation management systems and will be responsible for:
 - Transportation management
 - Event route planning
 - Secondary incident management
 - Providing real-time information
 - Deploying assets



* Source Delaware TIEMP



Agency Roles & Responsibilities

- **DeIDOT**
 - Provide traffic control / alternate routing
 - Monitor transportation operations
 - Disseminate transportation information
 - Provide special equipment (VMS signs, arrowboards, cones, etc.)
 - Provide transportation support as requested through fire or police communication centers
 - Provide transportation support as requested through State or local EOC
 - Repair and restore roadway



* Source Delaware TIEMP



Agency Roles & Responsibilities

- **Fire / Rescue / Fire Police**
 - Protect incident scene
 - Rescue / extrication and treatment of victims
 - Extinguish fires
 - Assess incidents involving HAZMAT - assist in containment and mitigation
 - Transportation control
- **Police / Law Enforcement**
 - Protect and secure the incident scene
 - Conduct investigation of incident / crash investigation
 - Assist with traffic control / detour routing
 - Have authority to order tow trucks





Agency Roles & Responsibilities

- **911 Dispatch Centers**
 - Maintain direct verbal link between incident witnesses and incident responders
 - Initial evaluation and dispatch of appropriate resources (fire, police, medical, etc.)
 - On-going communication and coordination
- **DNREC**
 - Mitigate environmental hazards
 - Remediate HAZMAT situations
 - Enforcement





Agency Roles & Responsibilities

- **Emergency Medical Services (EMS)**
 - Provide medical treatment to the injured
 - Determine destination and transportation requirements for the injured
 - Transport victims for additional medical treatment
- **Tow Agencies**
 - Prompt incident response
 - Mitigate non-hazardous material cargo) spills
 - Safely clearing and removing damaged vehicles / cargoes

* Source Delaware TIEMP





Appendix; Part 3 – Guidelines





Guidelines

I-95 Corridor Coalition

- Partnership of state DOT, regional and local transportation agencies, law enforcement, transit, port and rail organizations.
- Members are working to reduce congestion and increase safety / security. The Coalition pursues a wide range of projects and activities related to providing reliable and timely travel information, coordination of incident response and management, energy savings through improved mobility, the effective movement of people and freight within the corridor and across different modes of travel, and electronic systems to make payment of tolls and transit fares easier





Guidelines

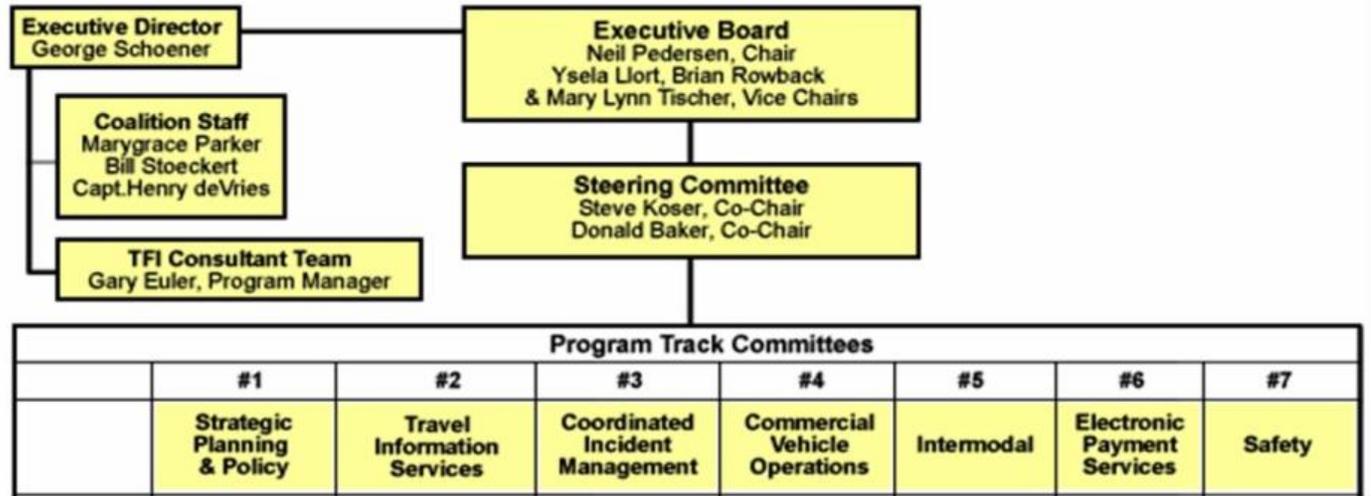
I-95 Corridor Coalition

Organization Chart

Member agencies, Coalition staff and private partners carry out the Coalition's Business Plan within an organizational framework that defines specific responsibilities and roles. The Organizational Chart below depicts the Coalition's operating structure.

INTERACTIVE CHART

Obtain more information on each group simply by clicking on it.





- **Points of Interest from I-95 CC**

- European emergency responder vehicles are painted so that when parked in a specific way the paint scheme on the vehicle acts as an arrow directing traffic.



- The Swiss have developed incident management simulation software that the I-95 CC is currently modifying for use in the United States.



Appendix; Part 5 – Setting Up an Incident Scene / Work Zone (Scenarios)





Setting-Up an Incident Scene

- TTC Device Placement (DelDOT Traffic Control Manual)

Table 6C-3. Taper Length Criteria for Temporary Traffic Control Zones

Type of Taper	Taper Length (L)*
Merging Taper	at least L
Shifting Taper	at least 0.5*L
Shoulder Taper	at least 0.33*L
One-Lane, Two-Way Traffic Taper	100 ft maximum
Downstream Taper	100 ft per lane

Table 6C-4. Formulas for Determining Taper Lengths

Speed Limit (S)	Taper Length (L) Feet
40 mph or less	$L = \frac{WS^2}{60}$
45 mph or more	$L = WS$

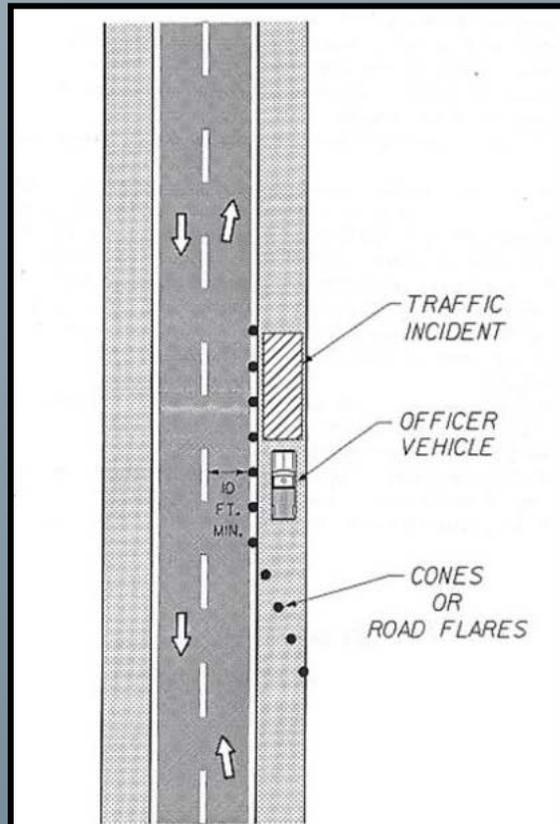
Where: L = taper length in feet
 W = width of offset in feet
 S = posted speed limit, or off-peak 85th-percentile speed prior to work starting or the anticipated operating speed in mph



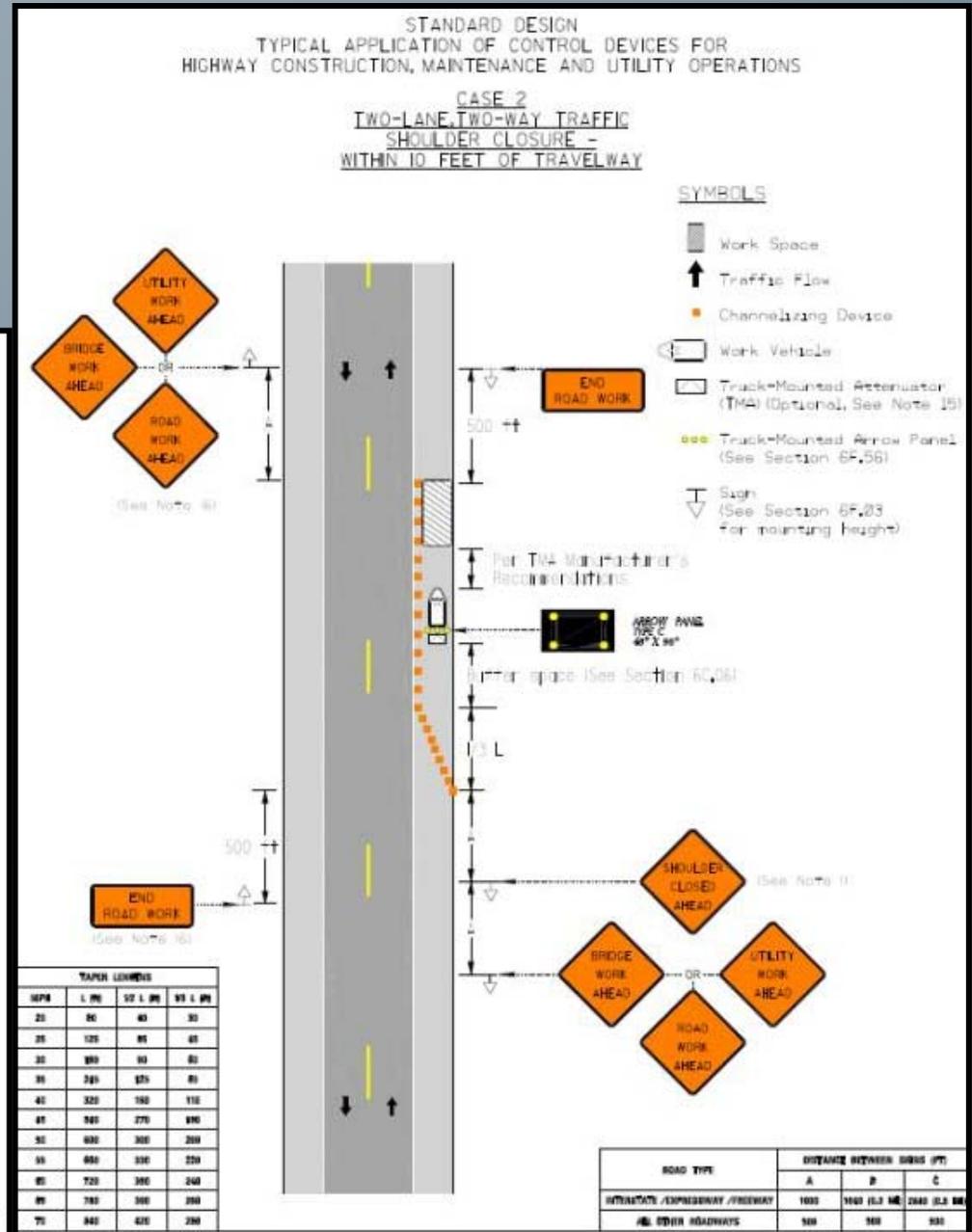
Scenario #1



* DE State Fire School

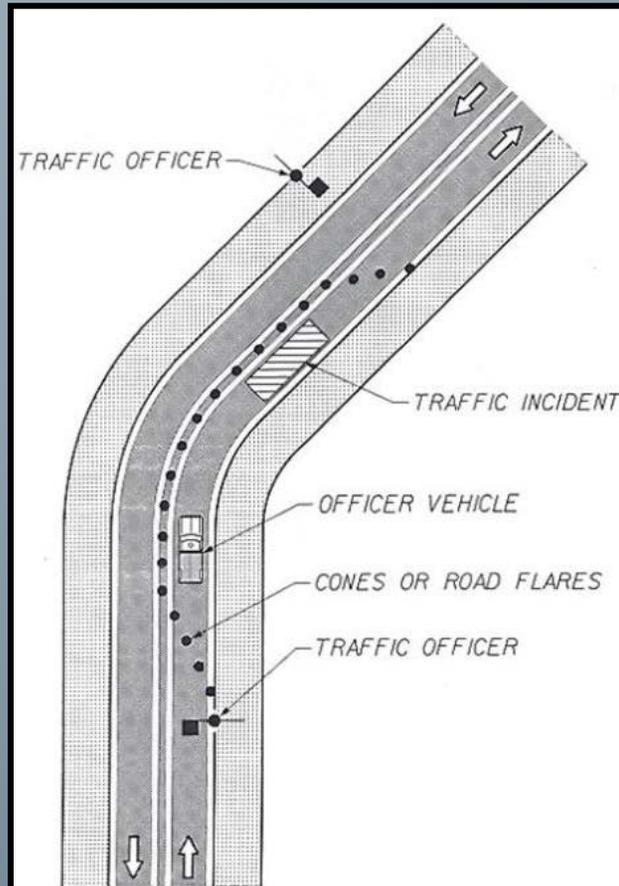


TRAFFIC INCIDENT:
On shoulder with minor encroachment

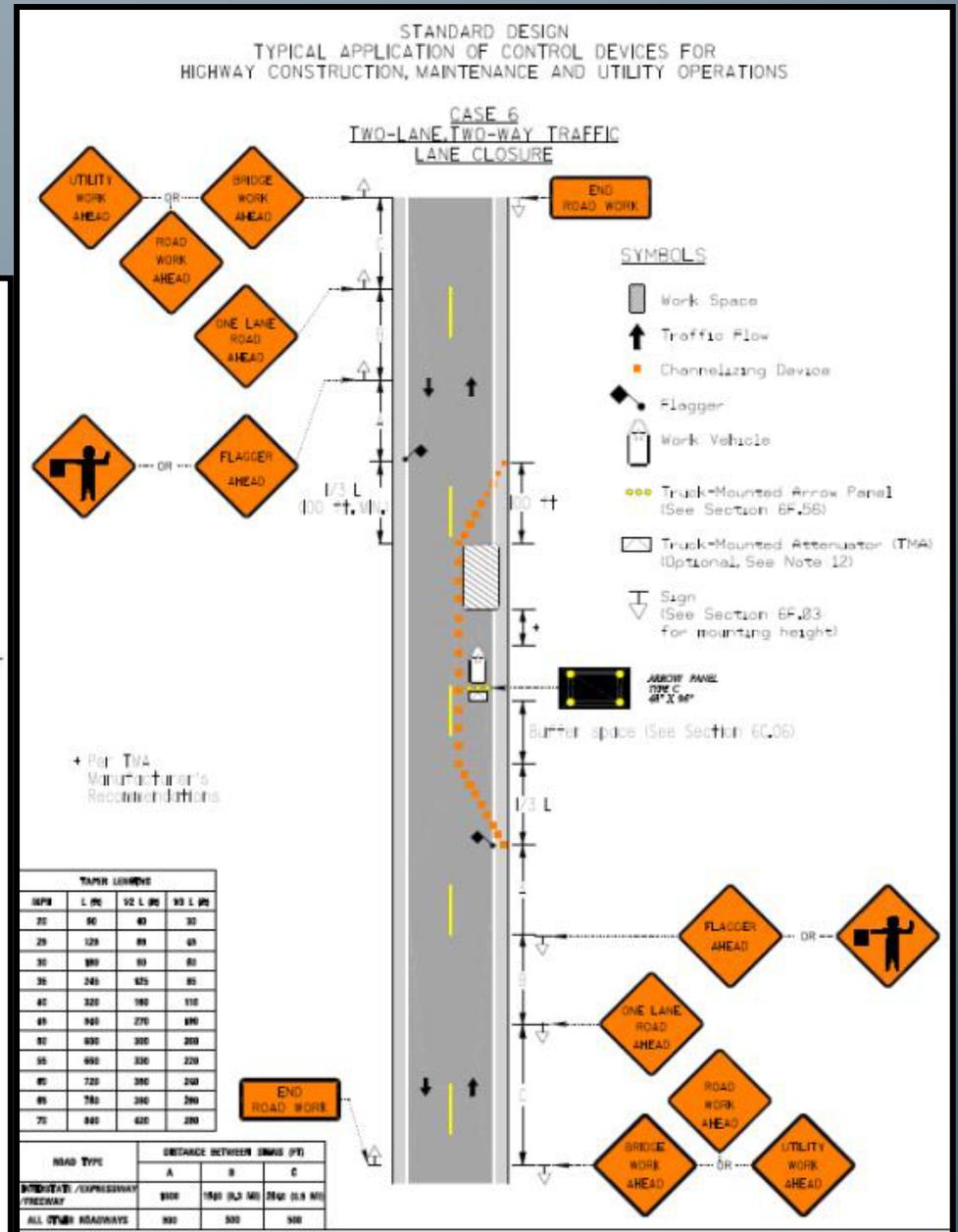


Scenario #2

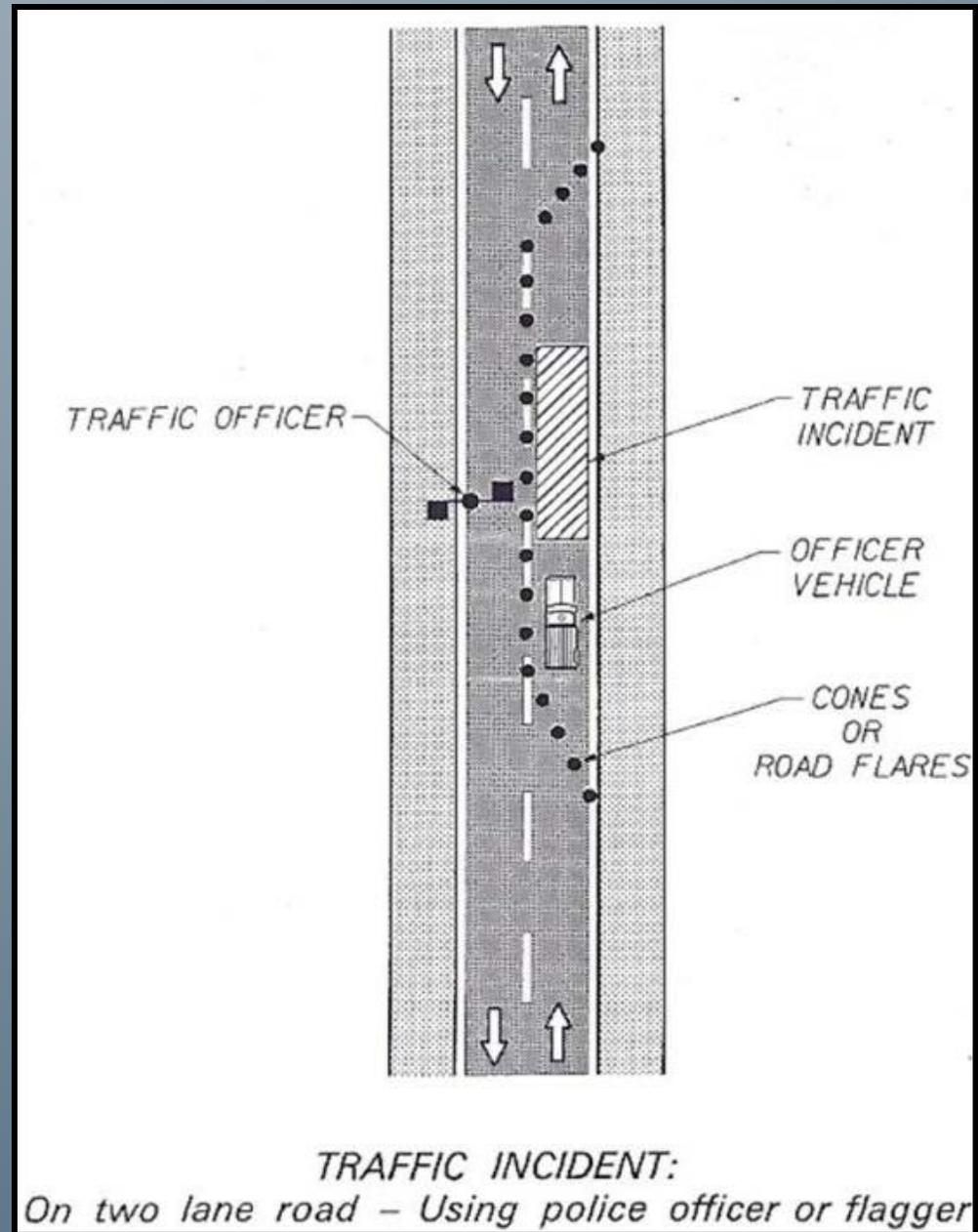
* DE State Fire School



TRAFFIC INCIDENT:
Closure for one-lane two way traffic

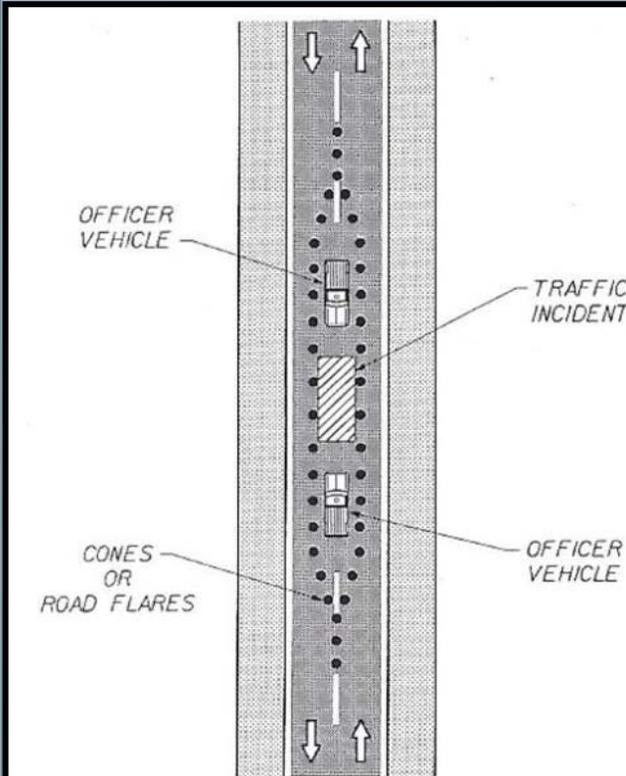


Scenario #3

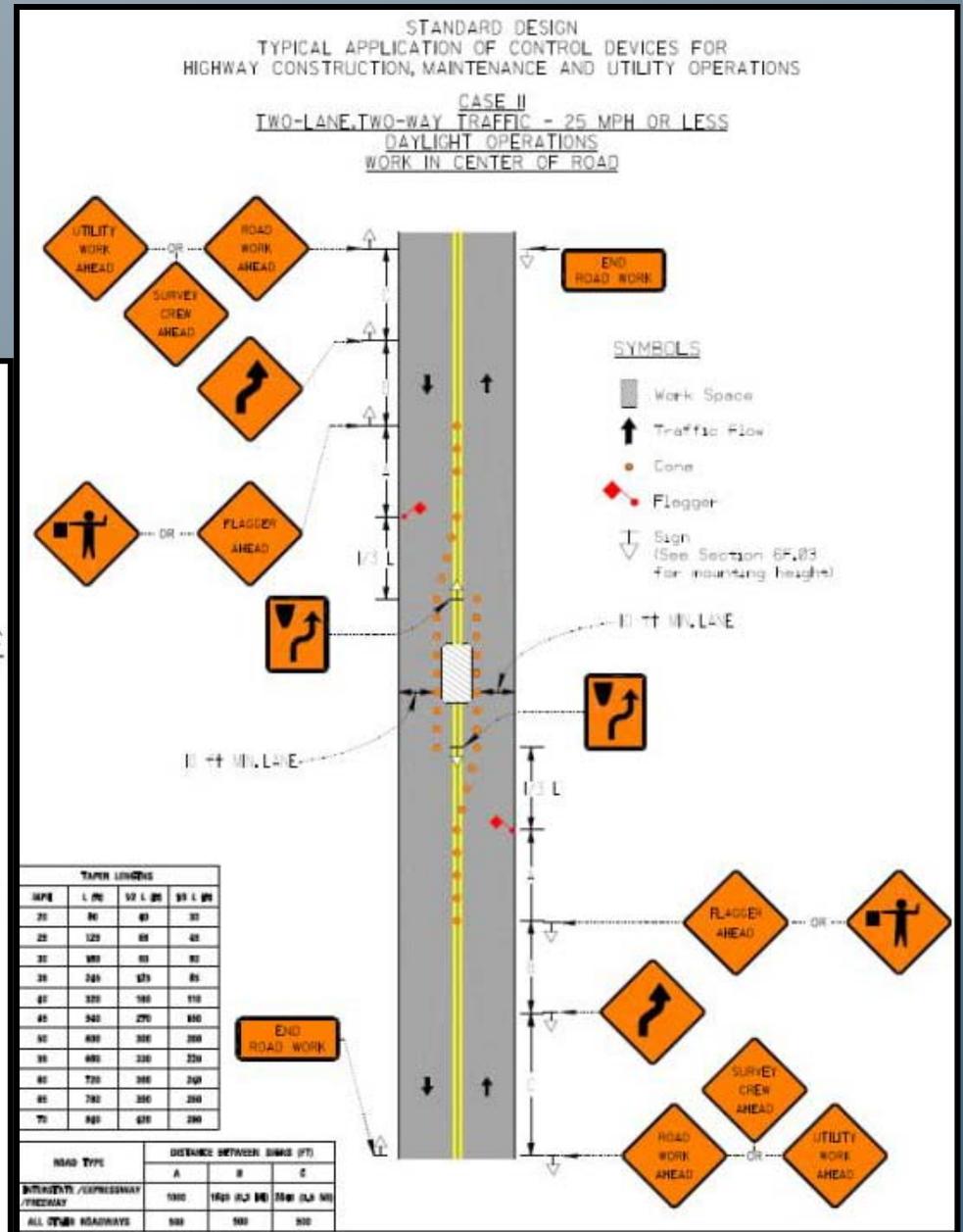


Scenario #4

* DE State Fire School

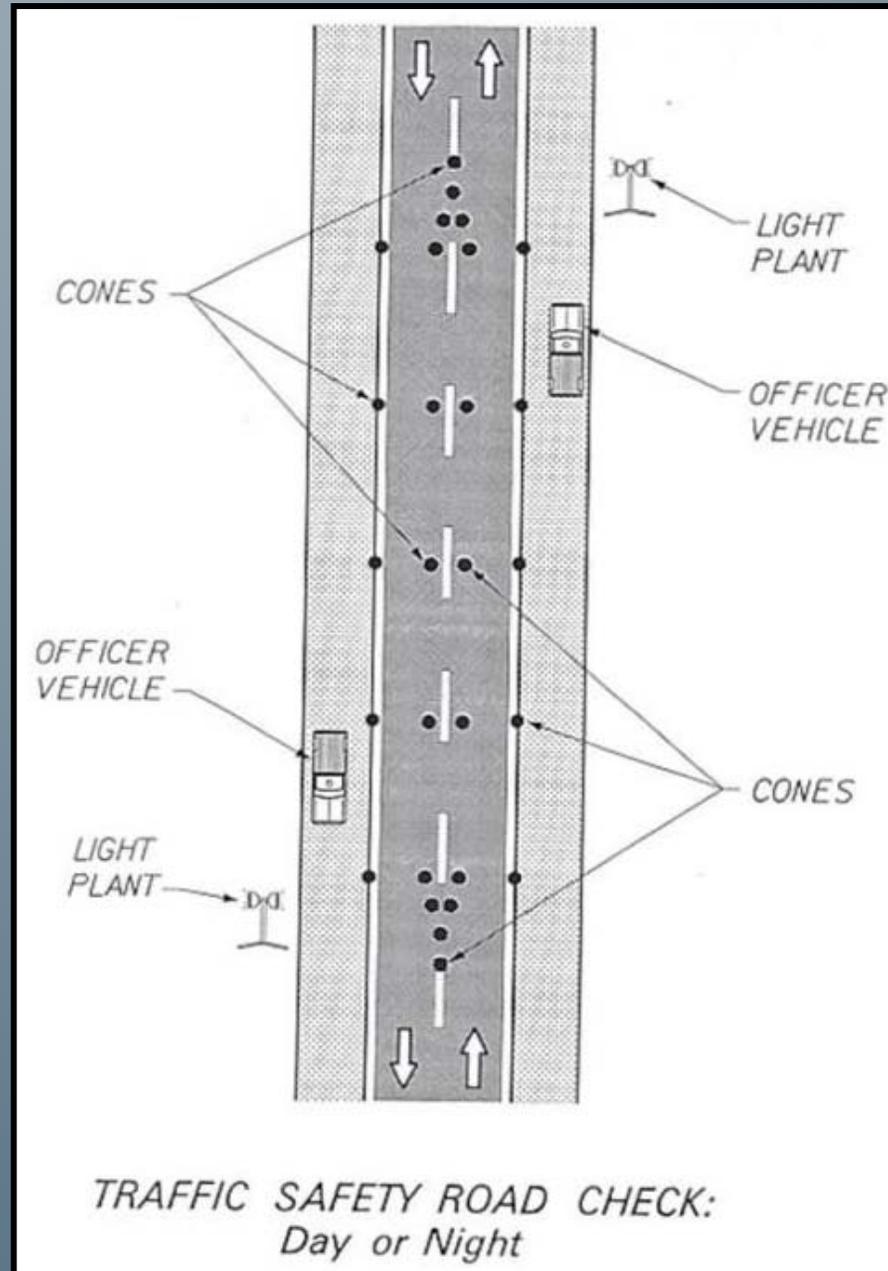


TRAFFIC INCIDENT:
On two lane road – Keeping traffic moving



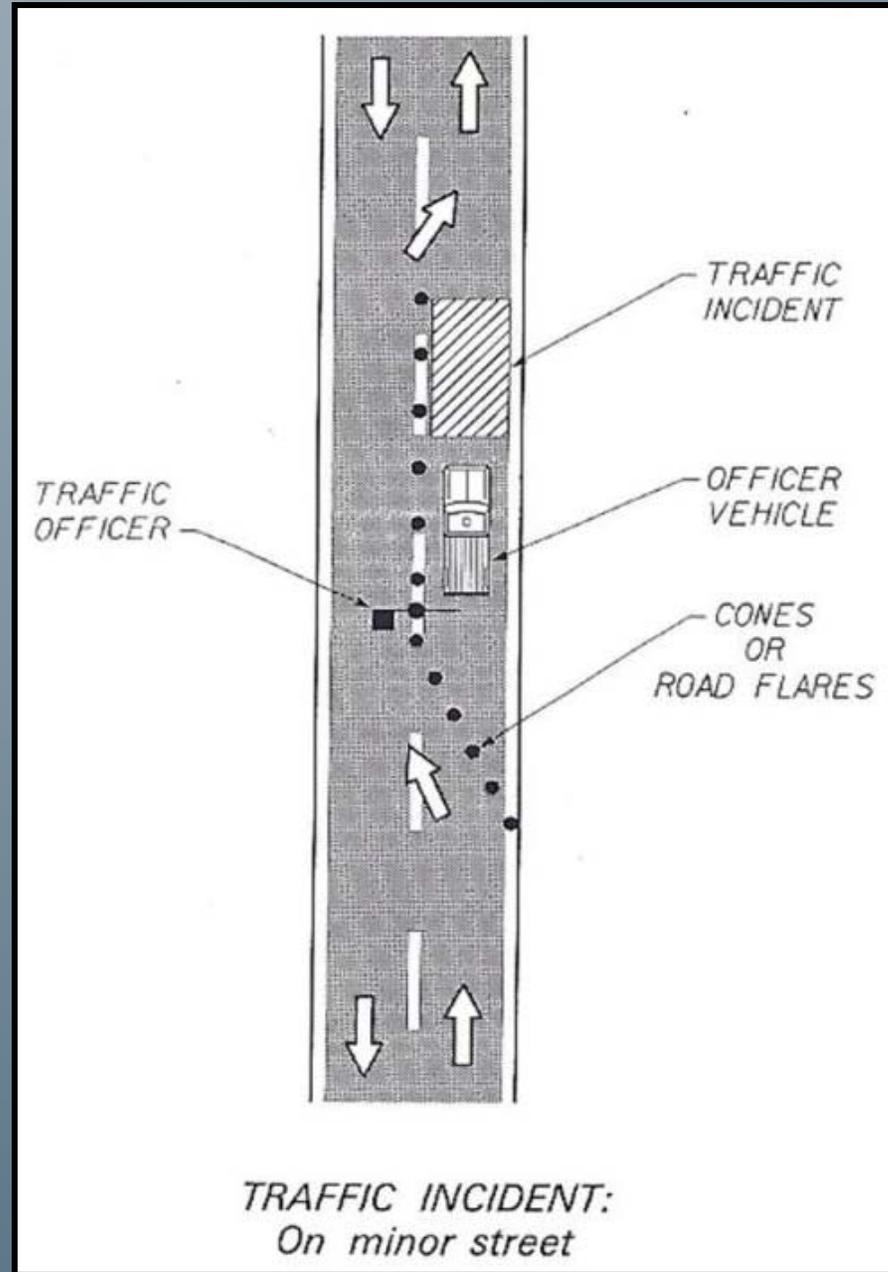


Scenario #5





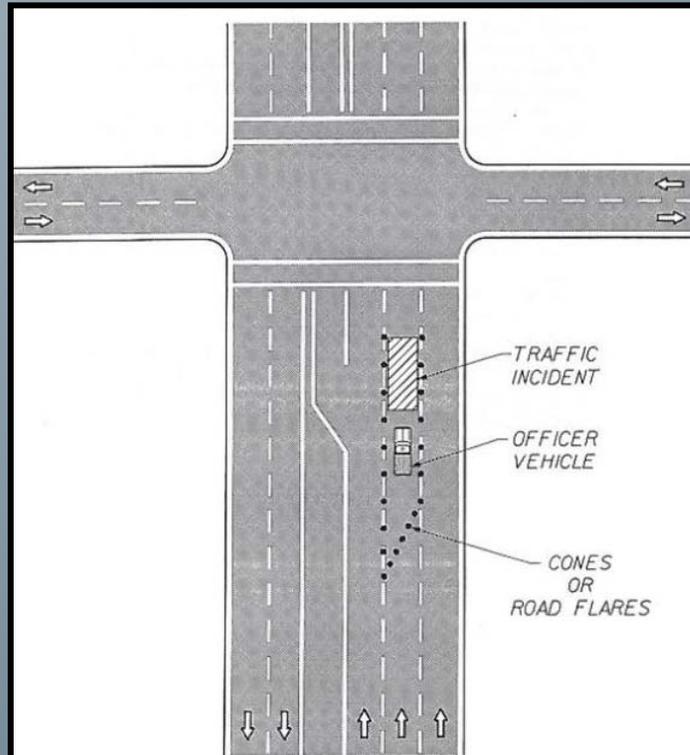
Scenario #6



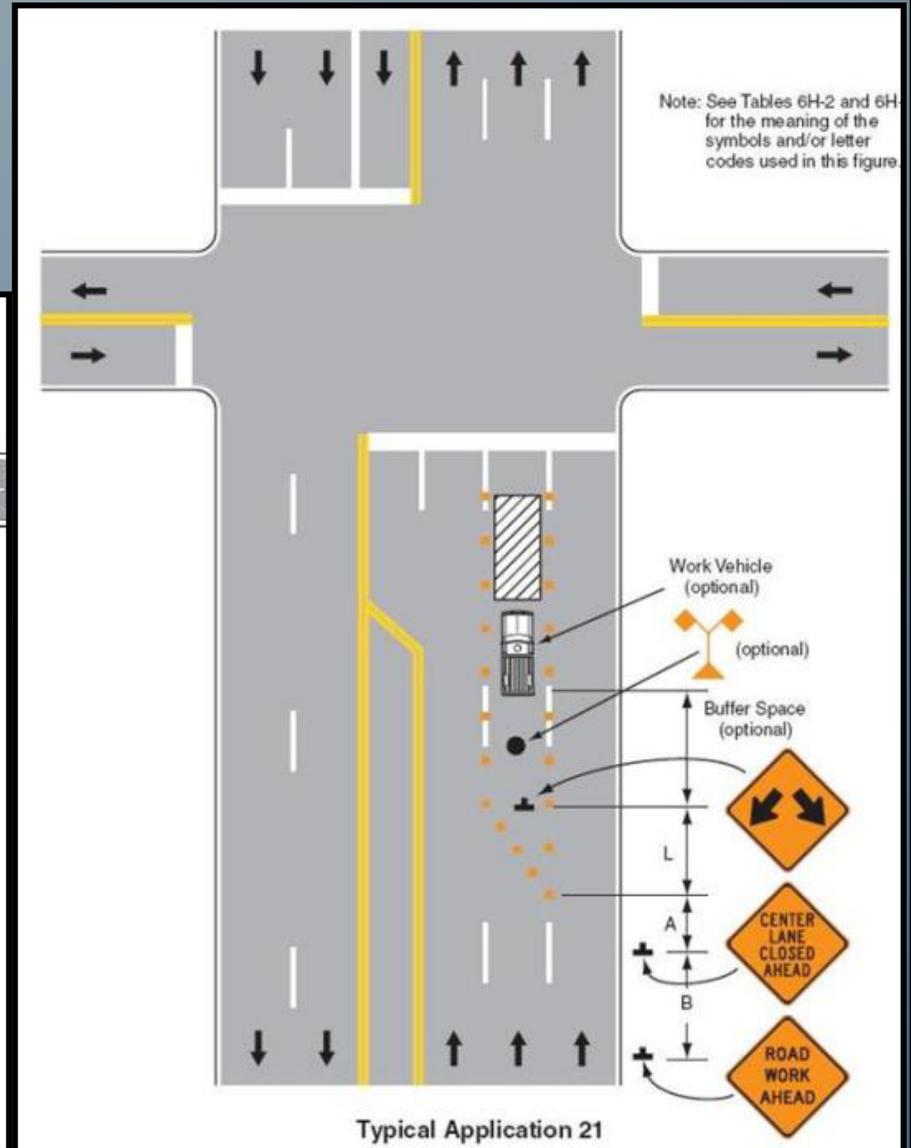
Scenario #7



* DE State Fire School

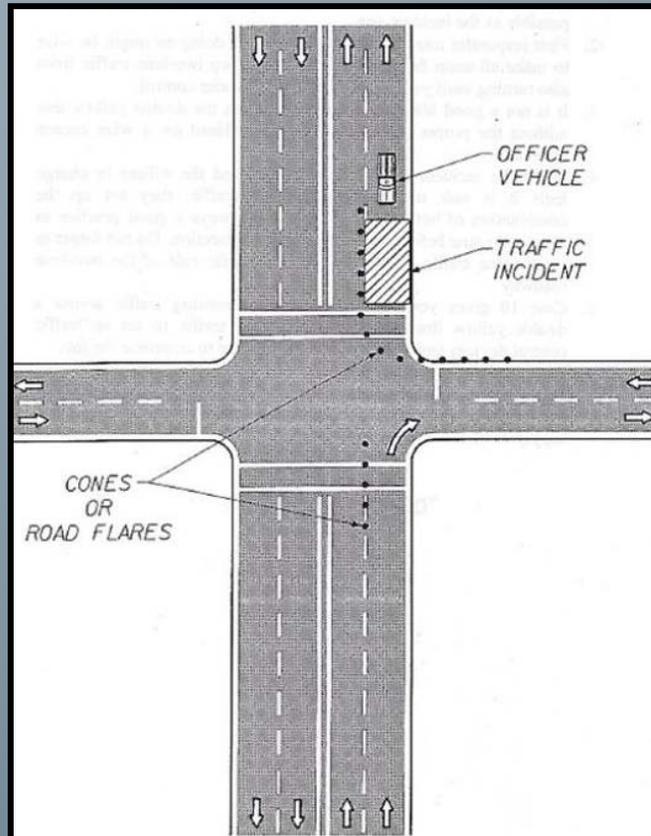


TRAFFIC INCIDENT:
With lane closure (Near side of intersection)

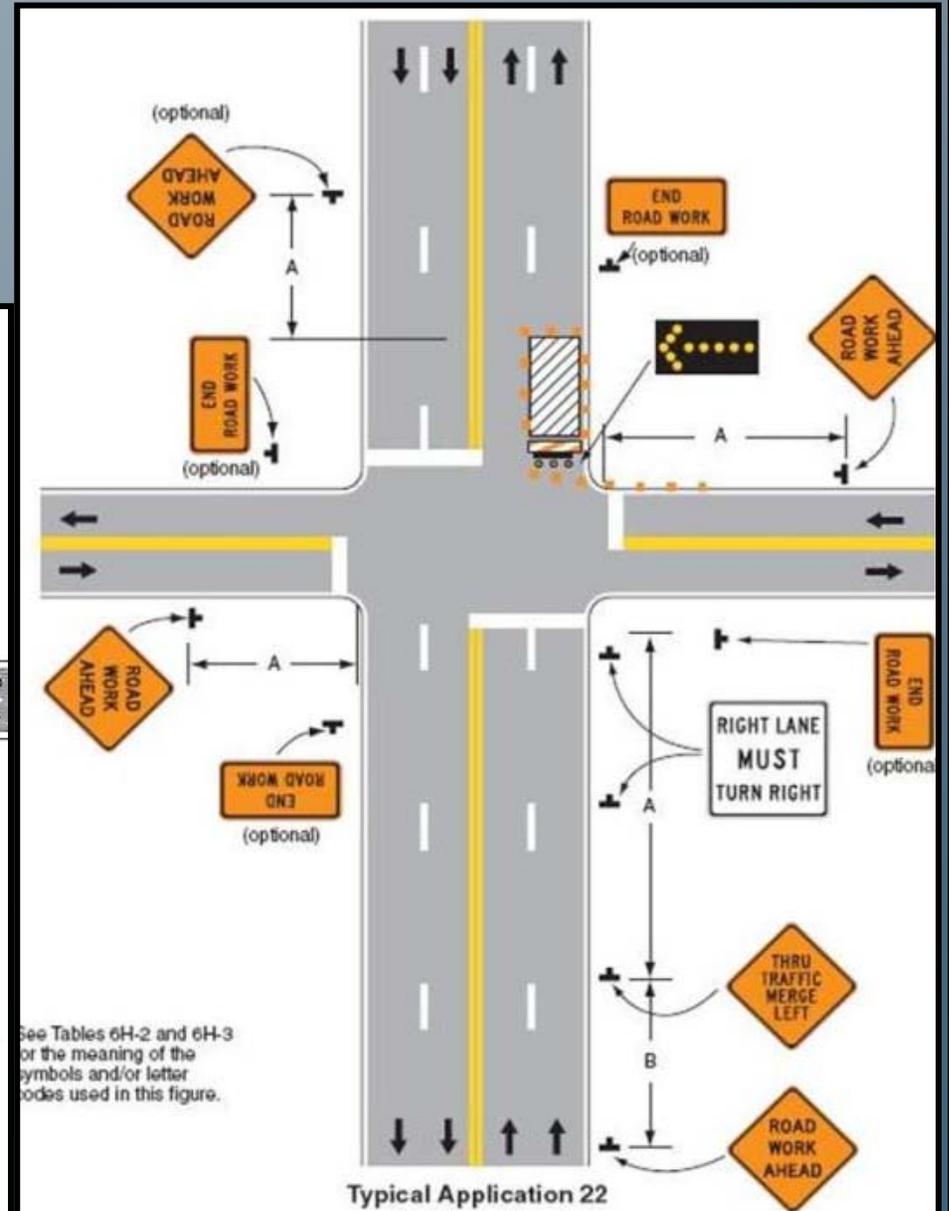


Scenario #8

* DE State Fire School



TRAFFIC INCIDENT:
With right lane closed on far side of intersection

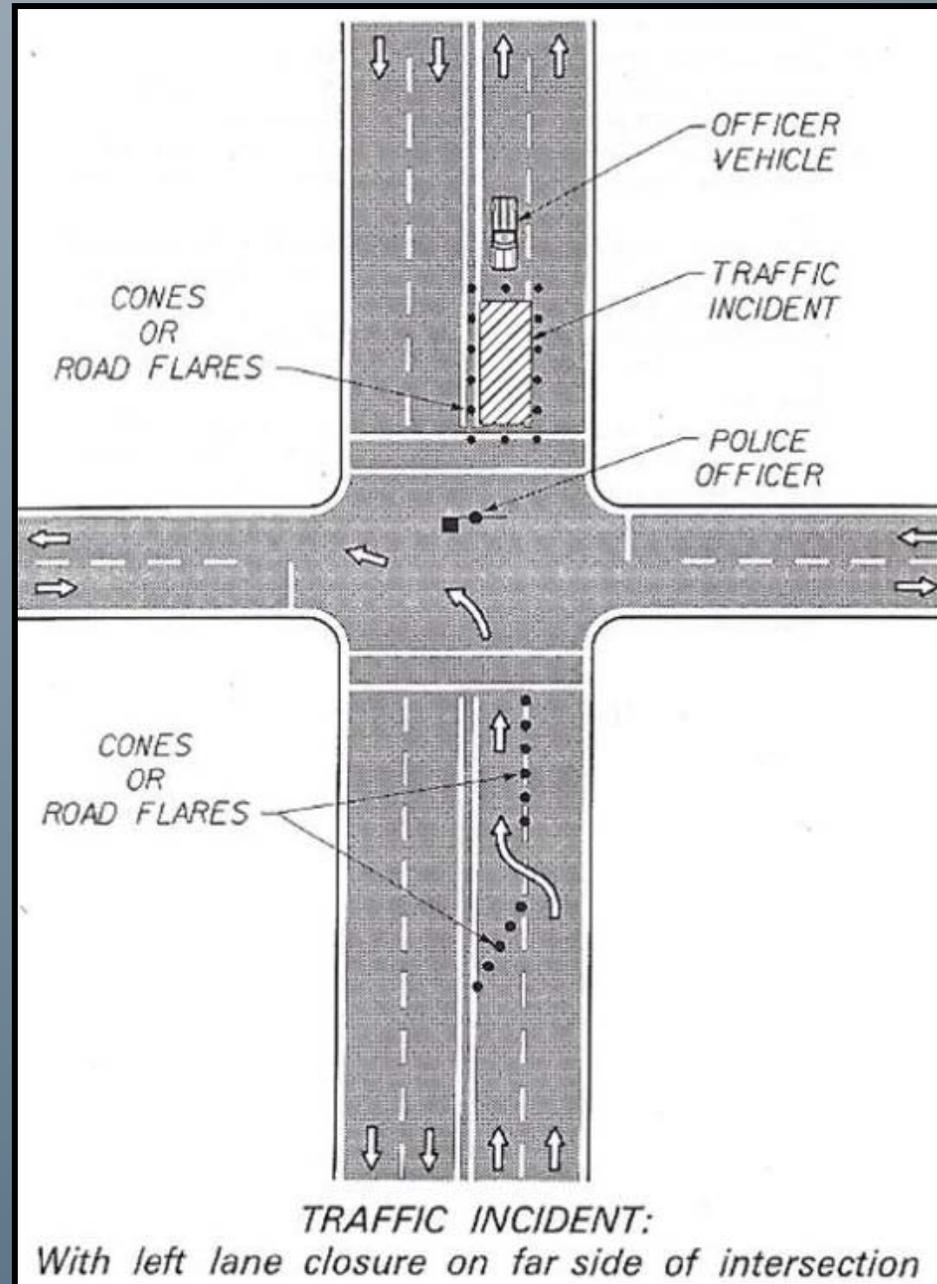


Typical Application 22



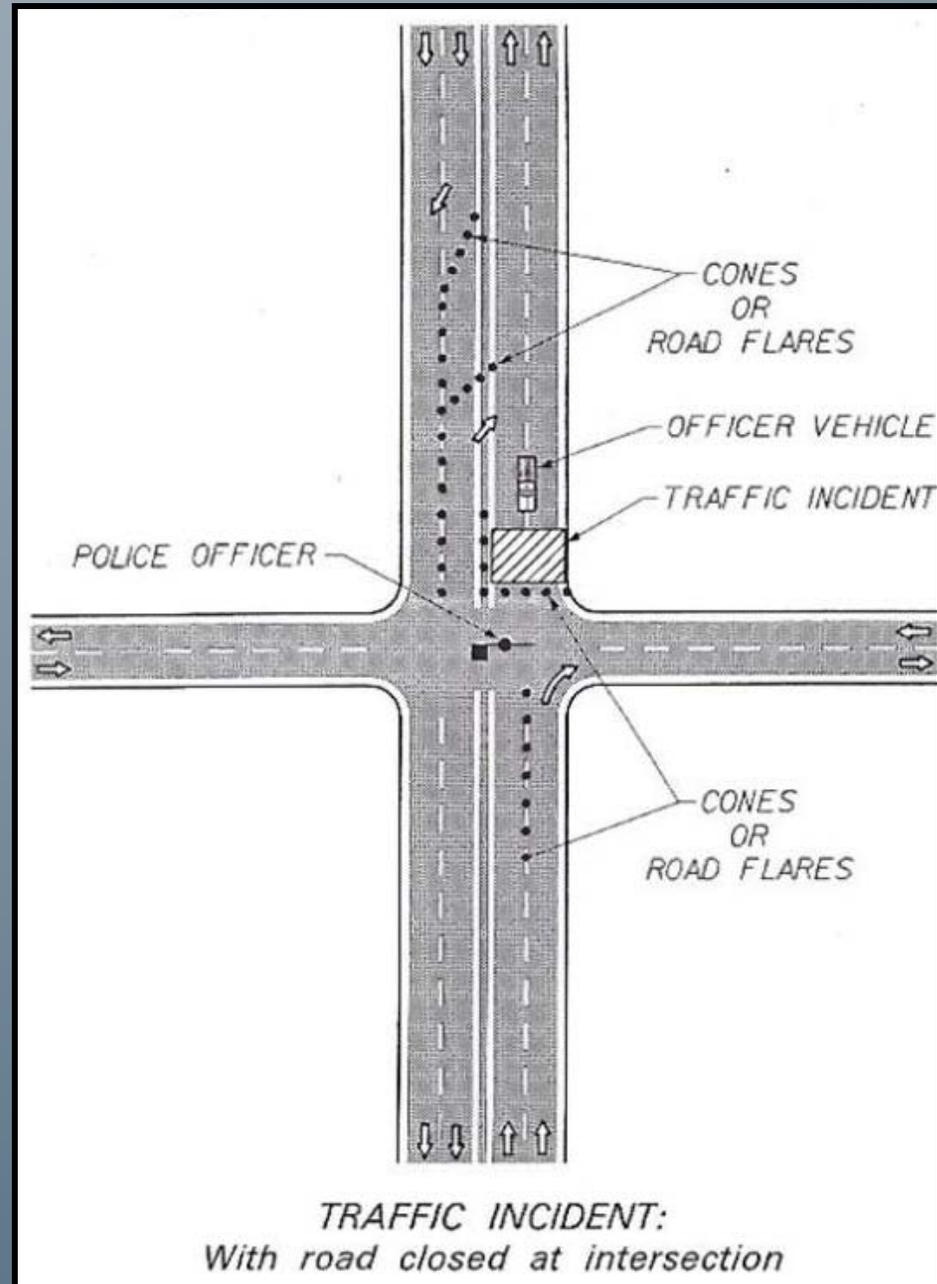
Scenario #9

* DE State
Fire School

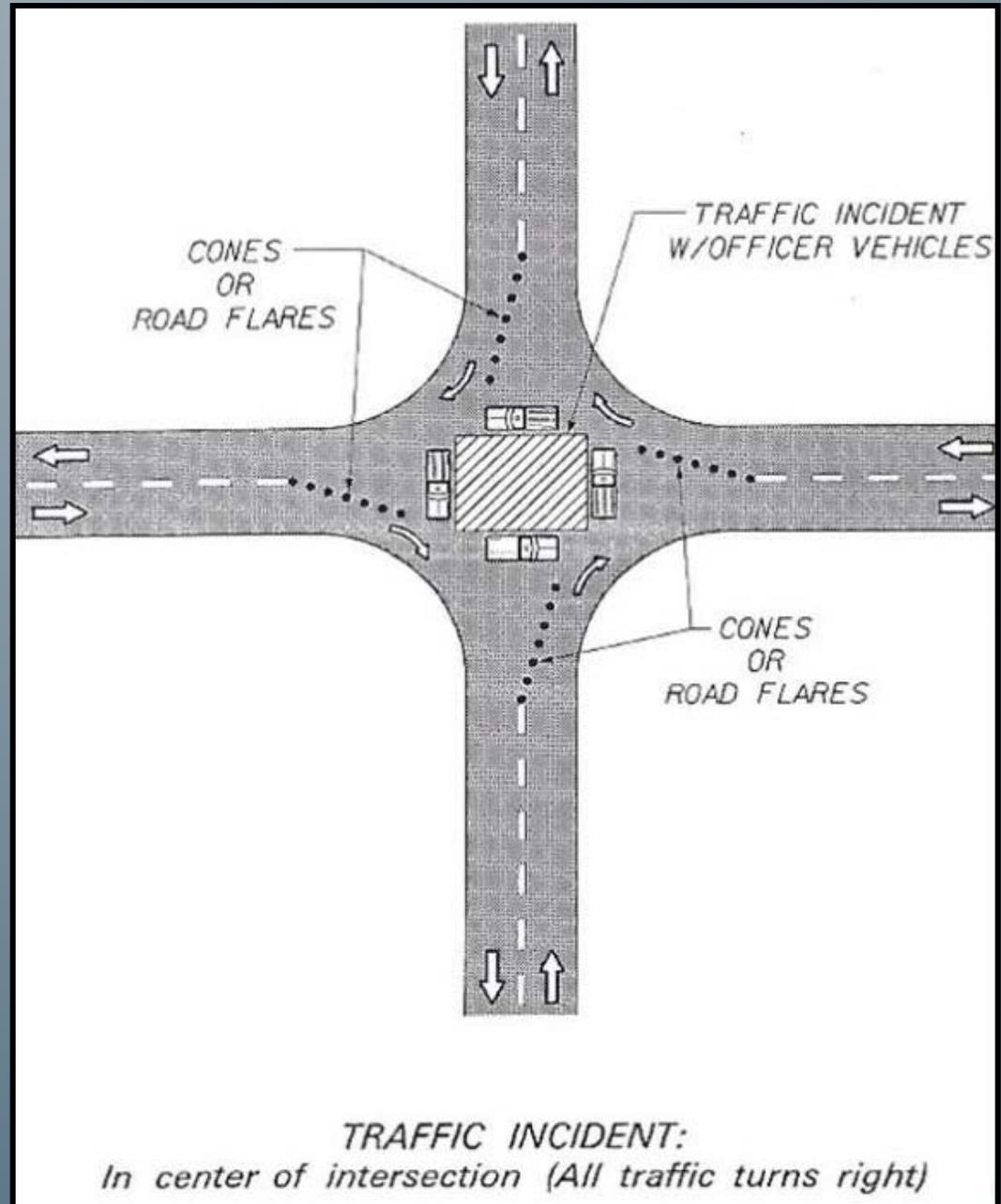


Scenario #10

* DE State
Fire School



Scenario #12

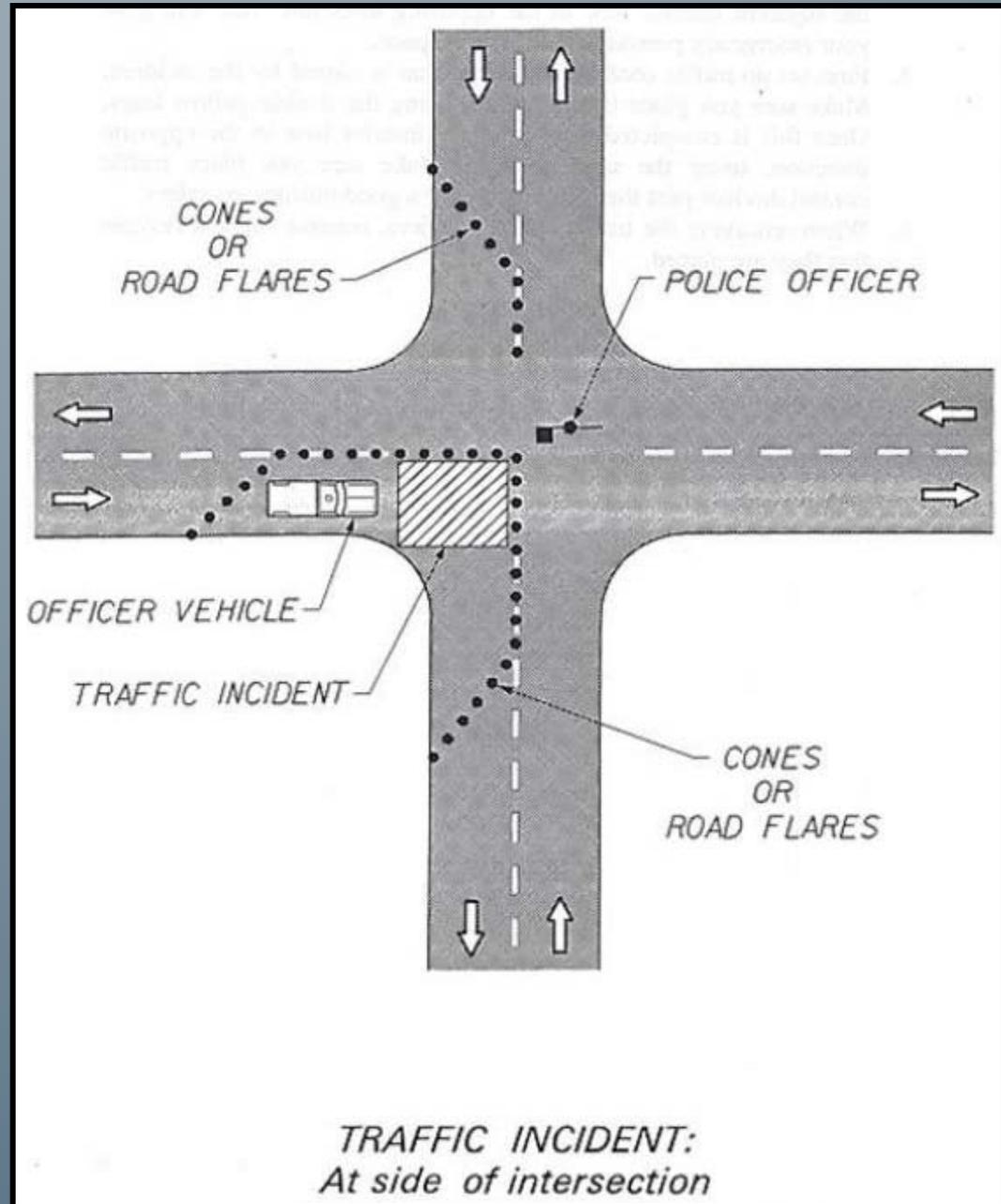


* DE State Fire School



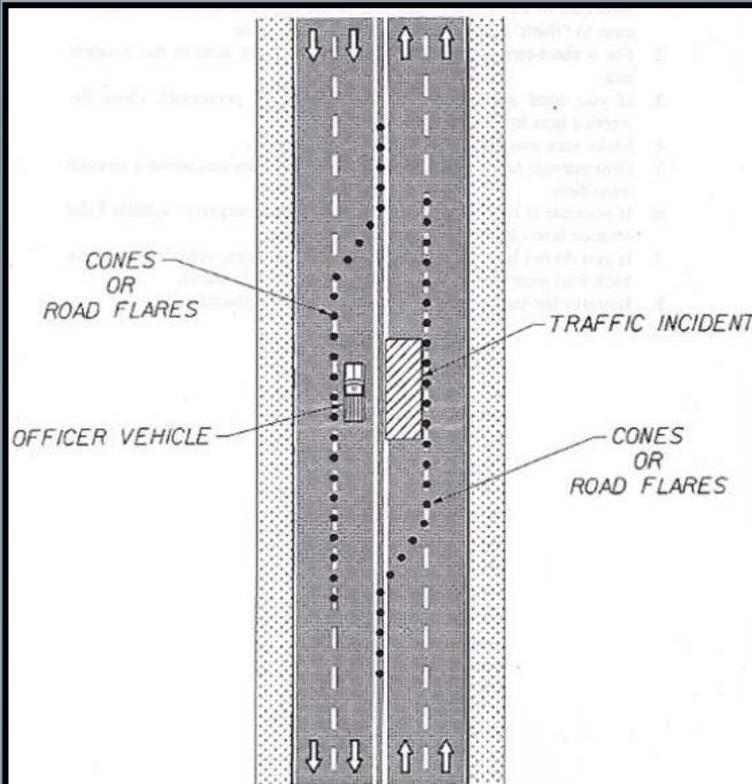
Scenario #13

* DE State
Fire School

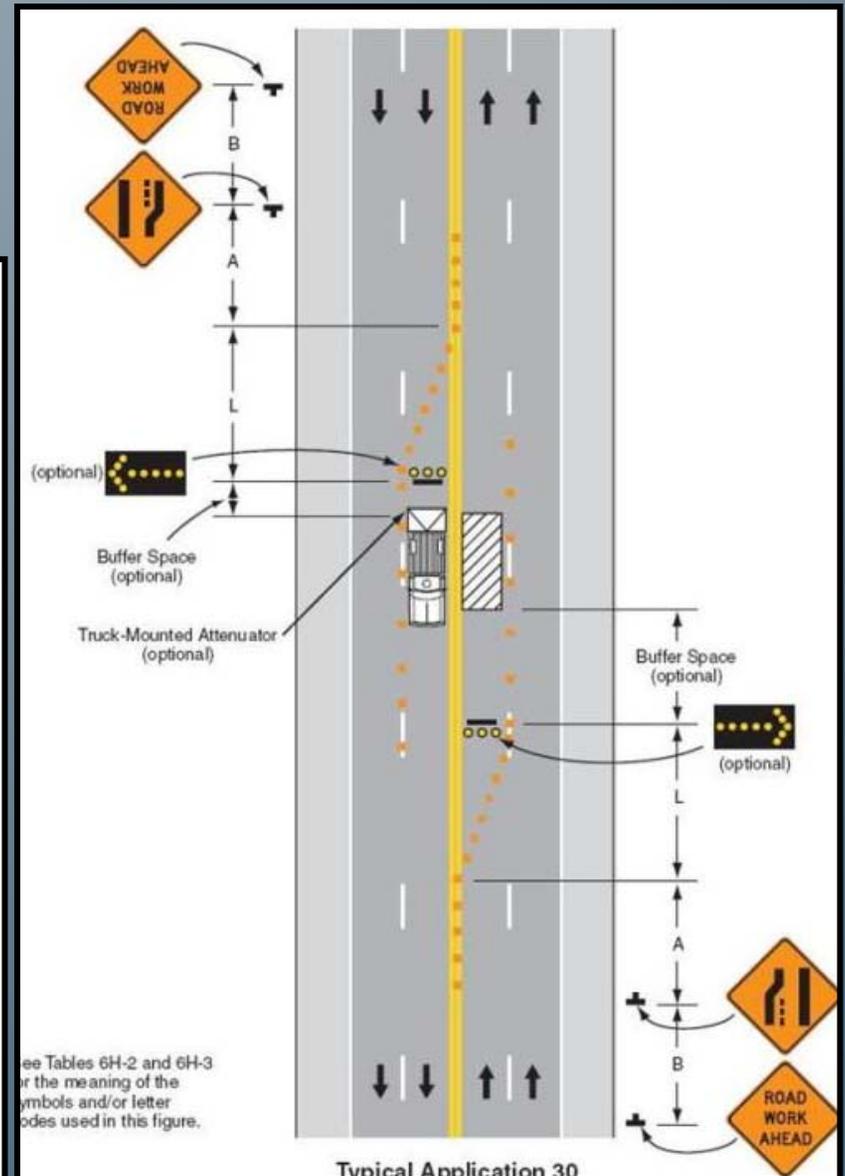


Scenario #14

* DE State Fire School



TRAFFIC INCIDENT:
Closing both lanes on multilane street



Typical Application 30



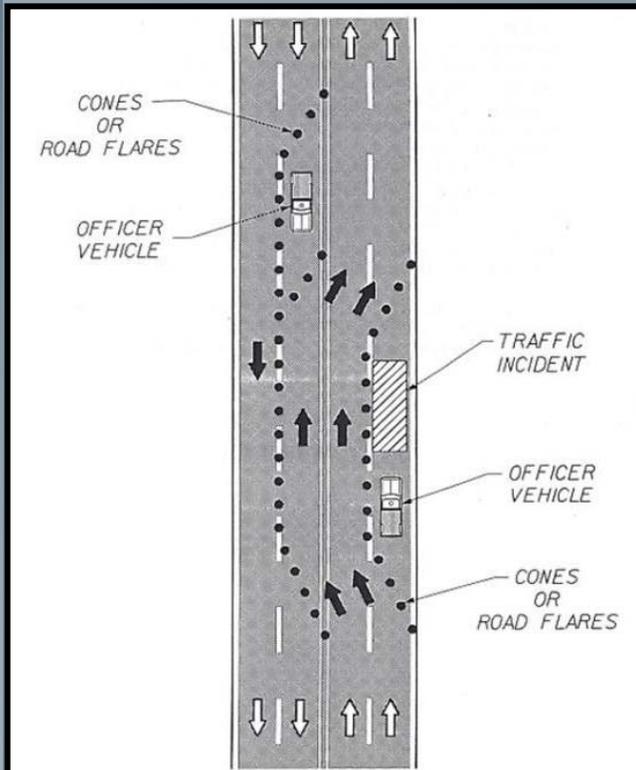
Scenario #15



* DE State Fire School



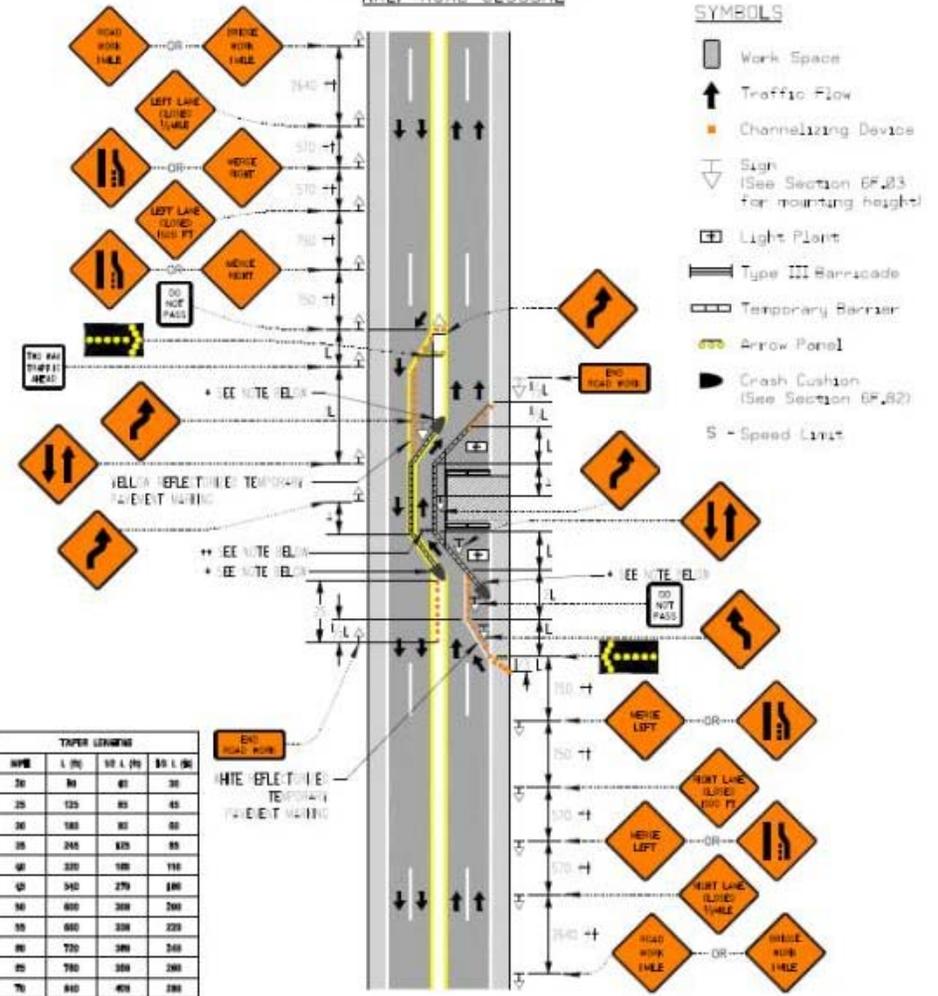
JE JACOBS



TRAFFIC INCIDENT:
On street with uneven directional volumes of traffic

STANDARD DESIGN
TYPICAL APPLICATION OF CONTROL DEVICES FOR
HIGHWAY CONSTRUCTION, MAINTENANCE AND UTILITY OPERATIONS

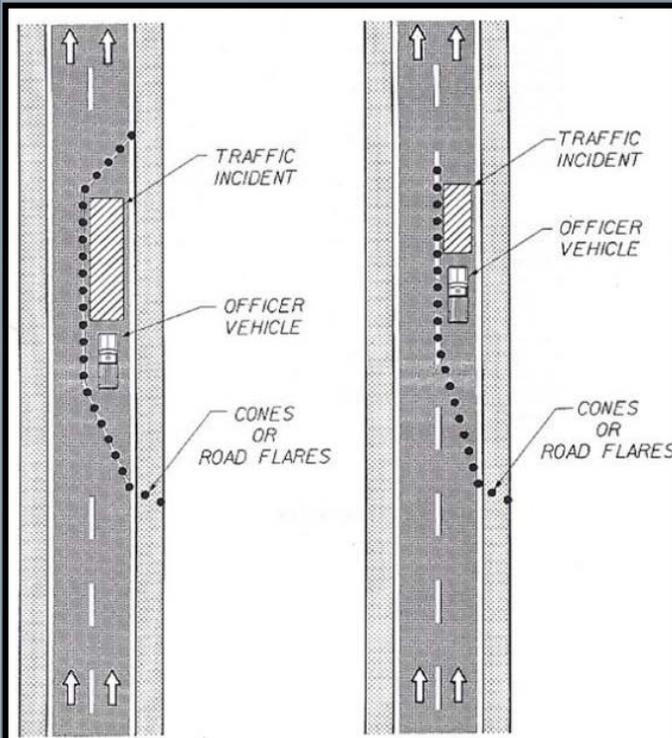
CASE 12
MULTILANE, DIVIDED HIGHWAYS -
HALF ROAD CLOSURE



- * TIE TEMPORARY BARRIER INTO EXISTING MEDIAN BARRIER WHERE POSSIBLE. END PROTECTION WITHIN CLEAR ZONE FOR OPPOSING TRAFFIC MUST BE COMPLIANT WITH NCHRP-350.
- ** MINIMUM LANE WIDTH SHALL BE 12 FT, AND MINIMUM DISTANCE BETWEEN TEMPORARY TRAFFIC BARRIER SHALL BE 14 FT, UNLESS DIRECTED OTHERWISE BY TRAFFIC ENGINEER.

Scenario #16

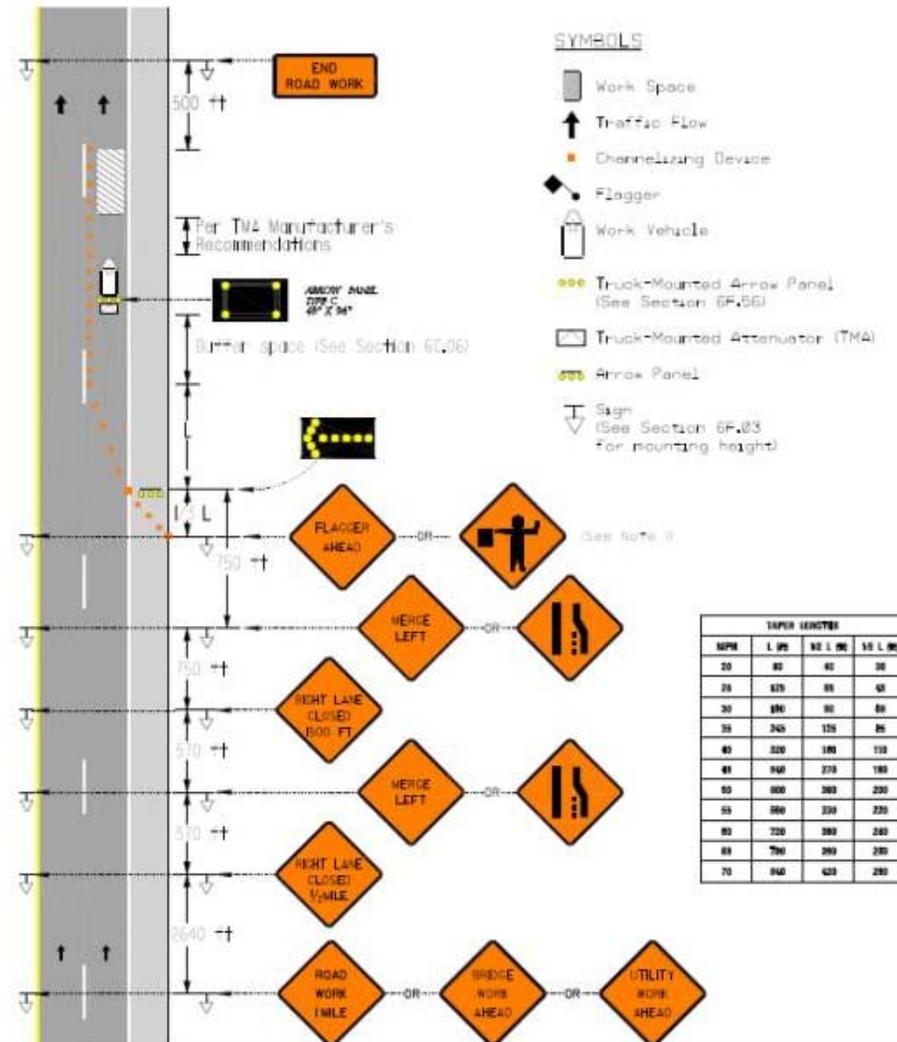
* DE State Fire School



TRAFFIC INCIDENT:
Right lane closure on divided highway

STANDARD DESIGN
TYPICAL APPLICATION OF CONTROL DEVICES FOR
HIGHWAY CONSTRUCTION, MAINTENANCE AND UTILITY OPERATIONS

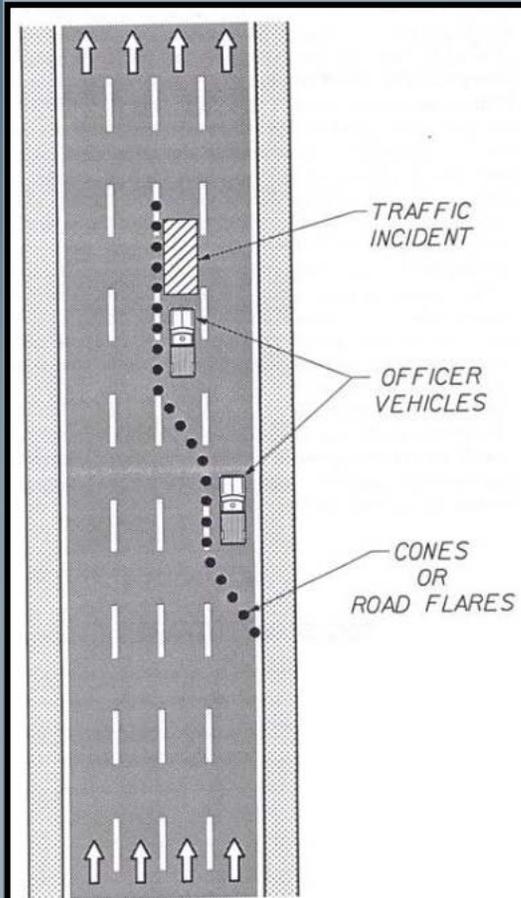
CASE 7
MULTILANE, DIVIDED HIGHWAYS AND INTERSTATES - LANE CLOSURE



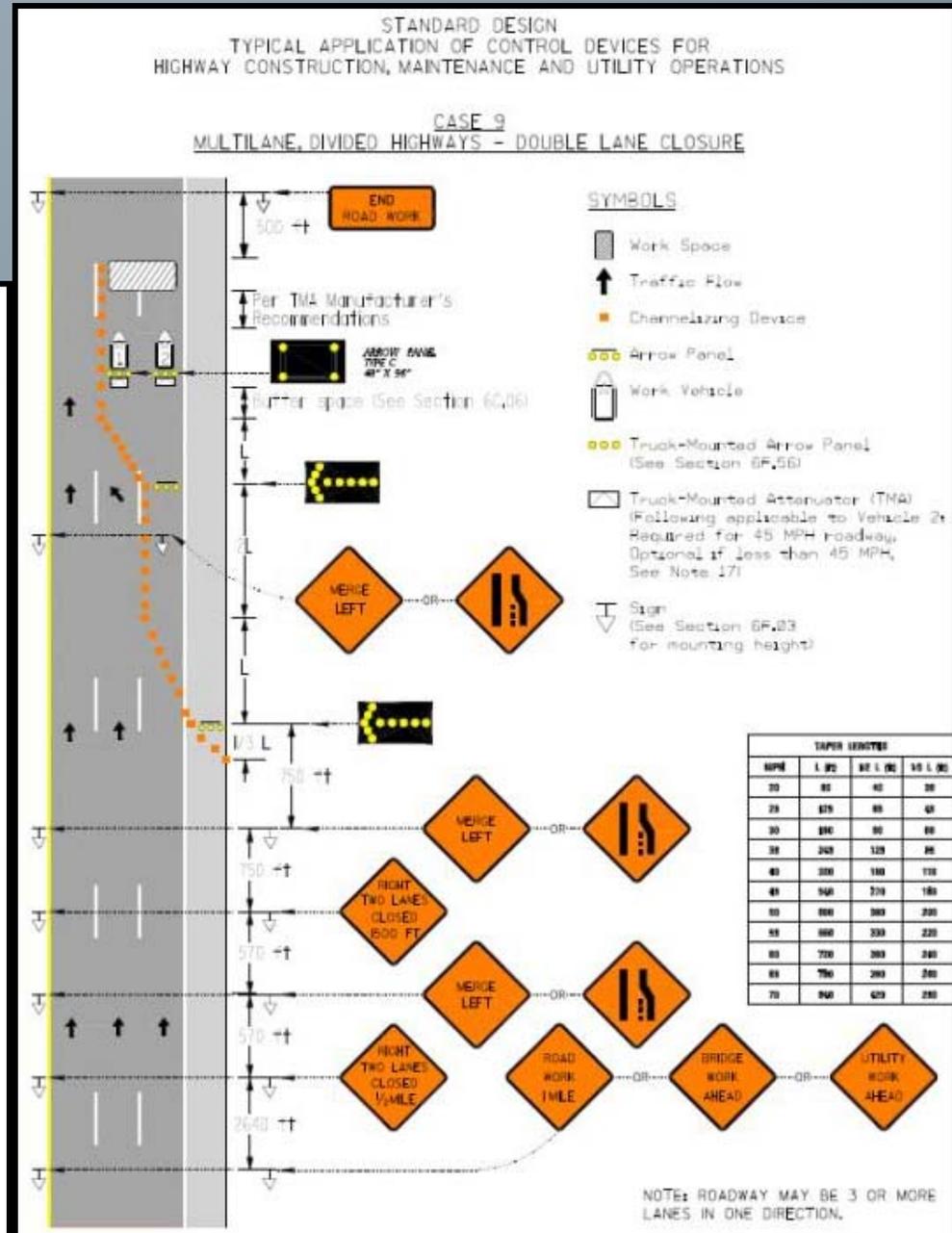
Scenario #17



* DE State Fire School

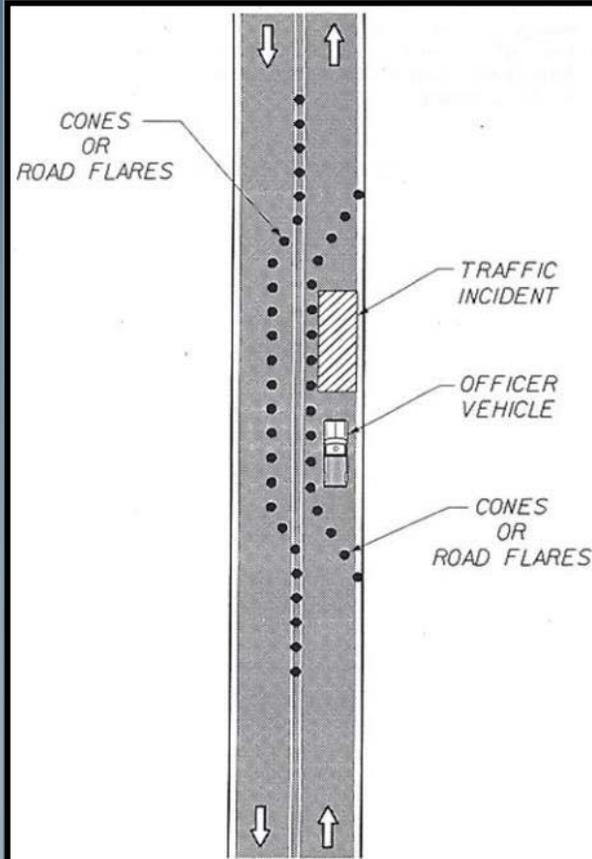


TRAFFIC INCIDENT:
With double lane closure

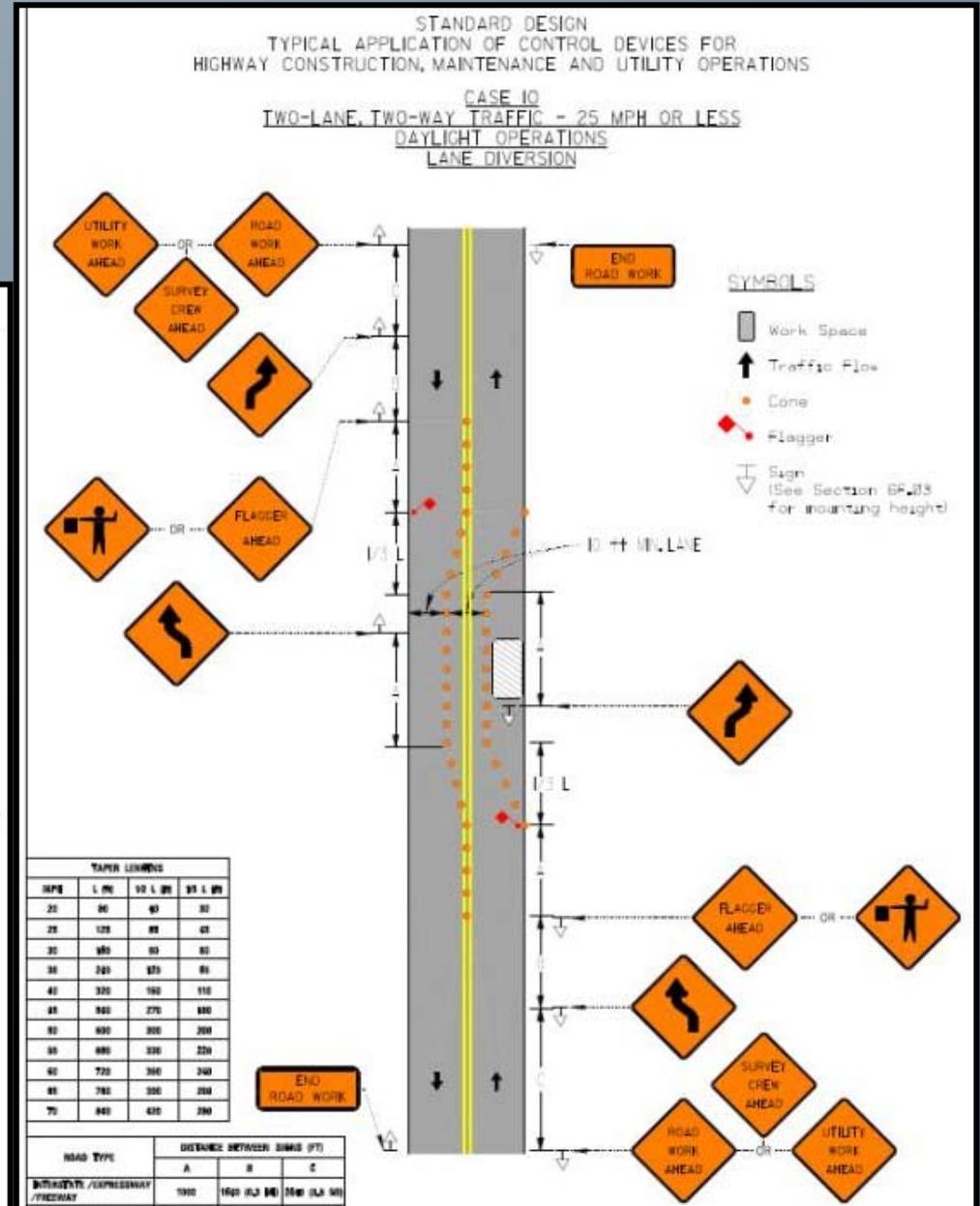


Scenario #19

* DE State Fire School

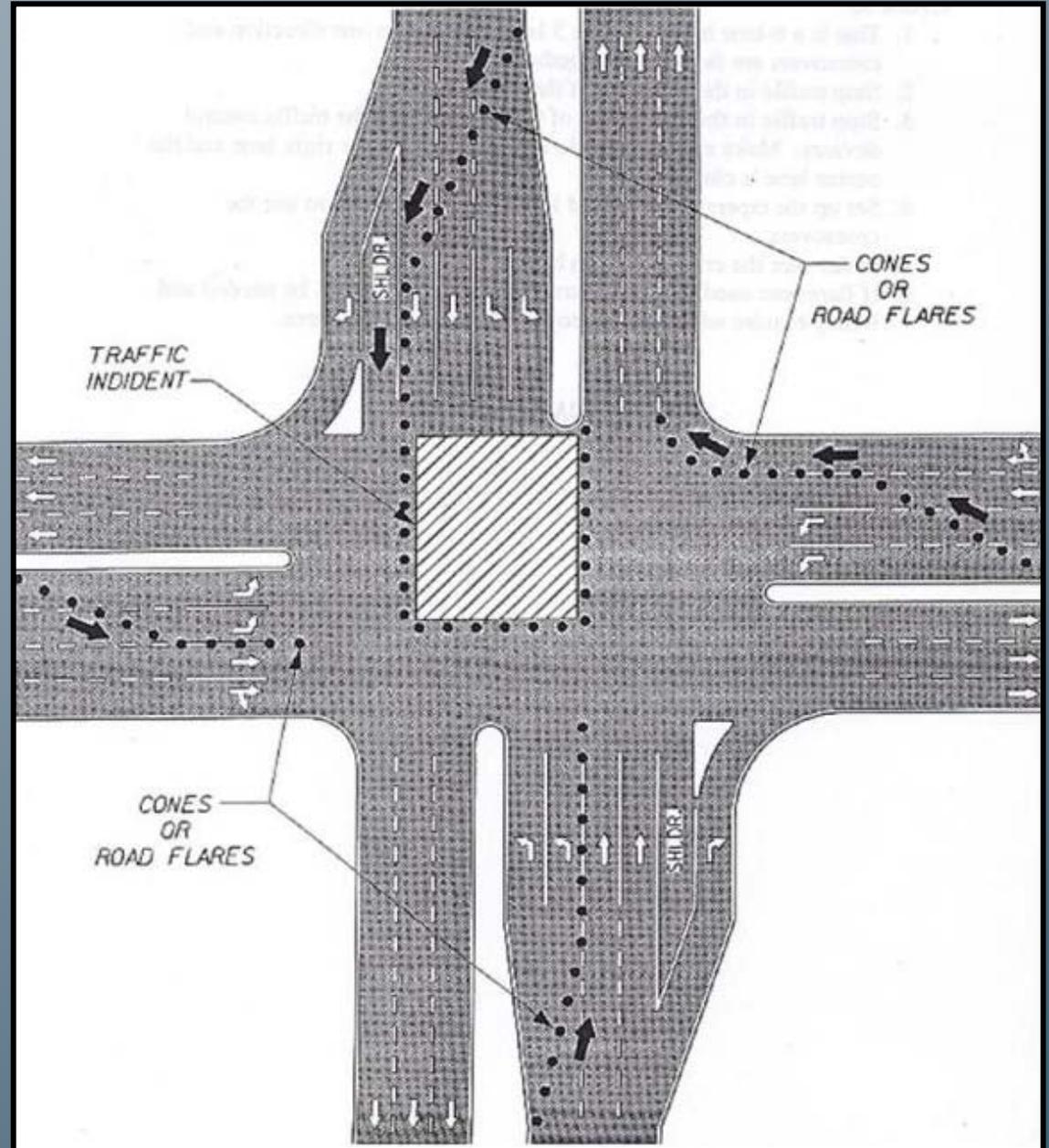


TRAFFIC INCIDENT:
Two-way traffic using lane shift



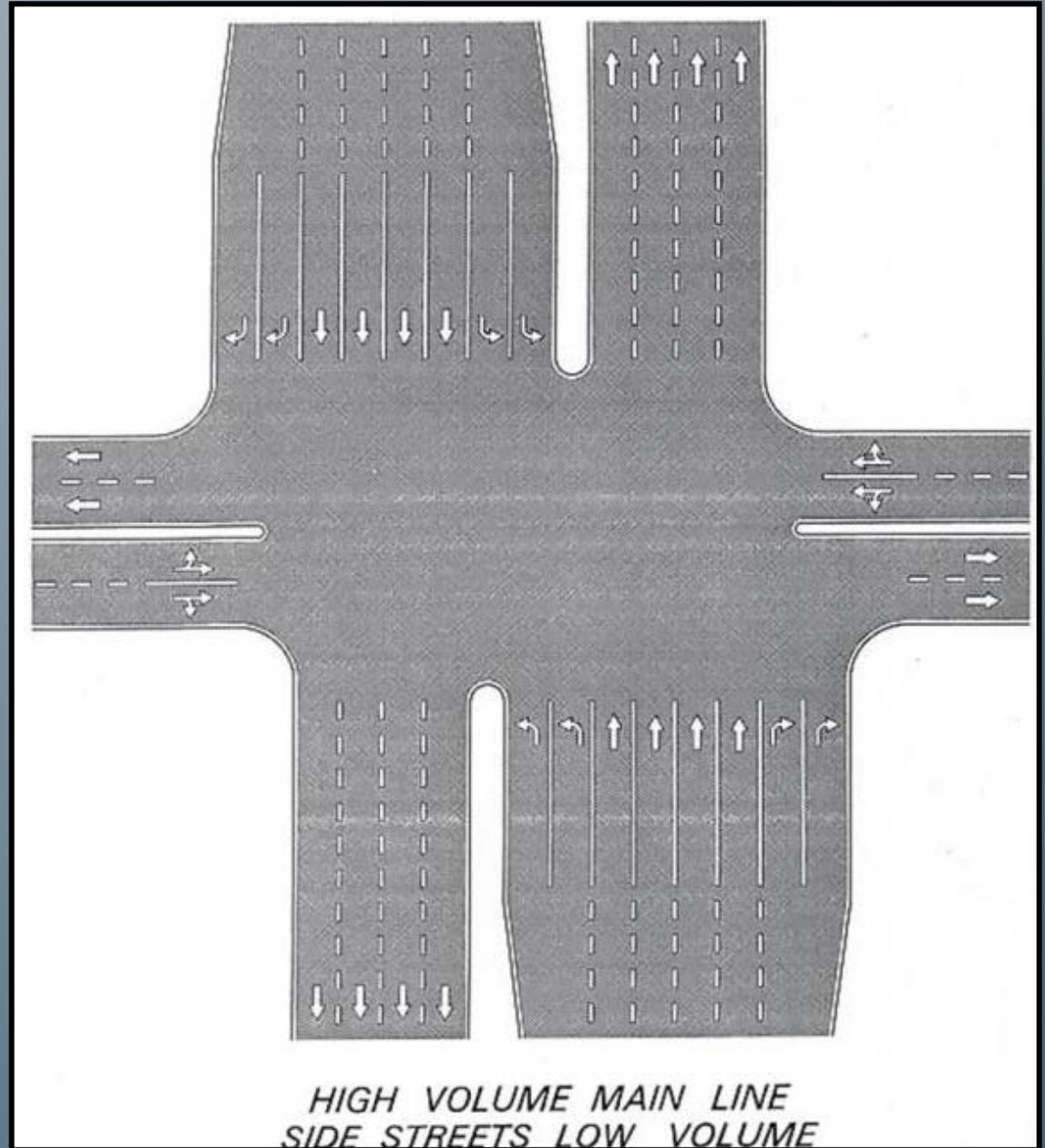
Scenario #20

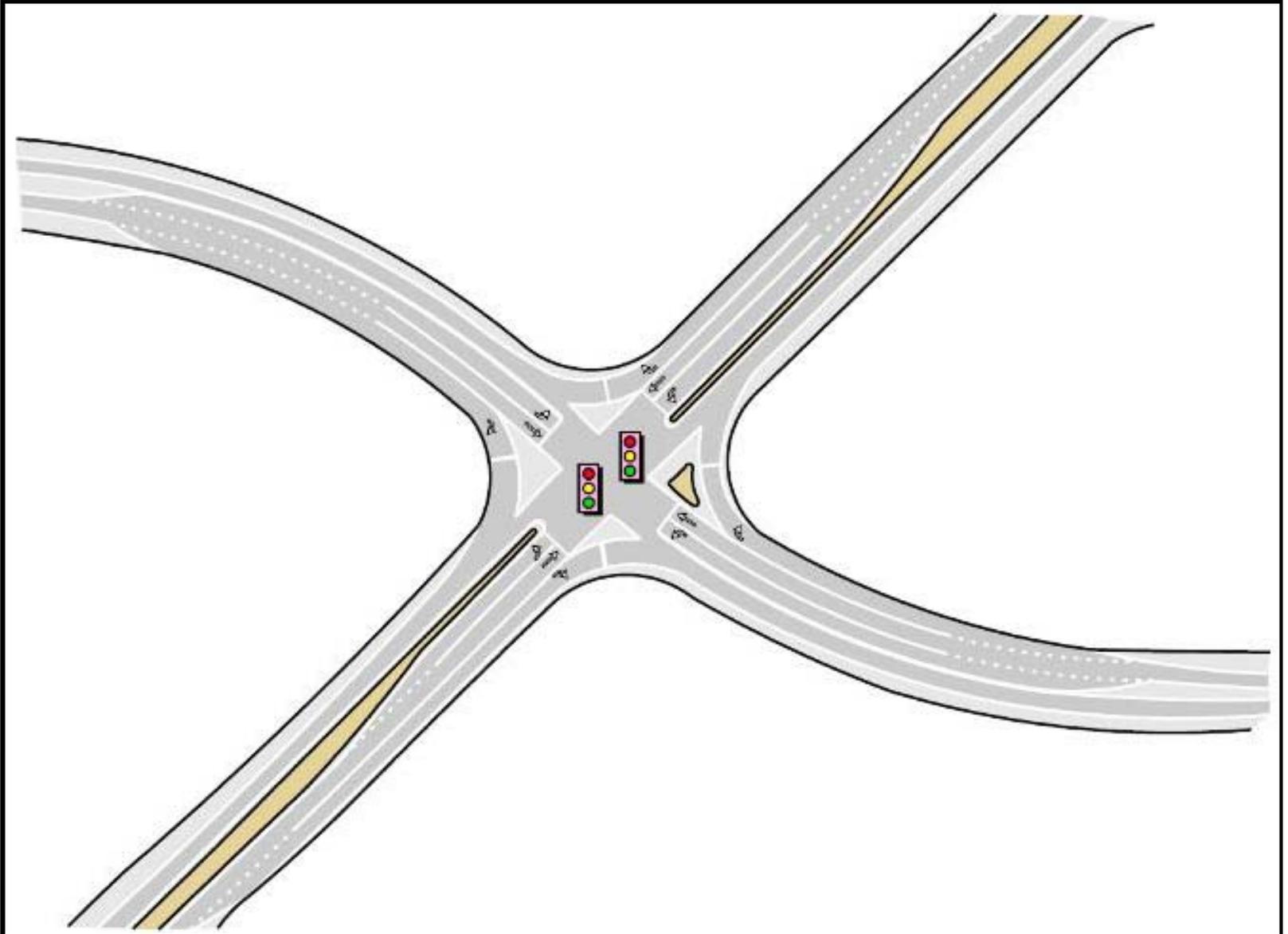
* DE State Fire School



Scenario #21

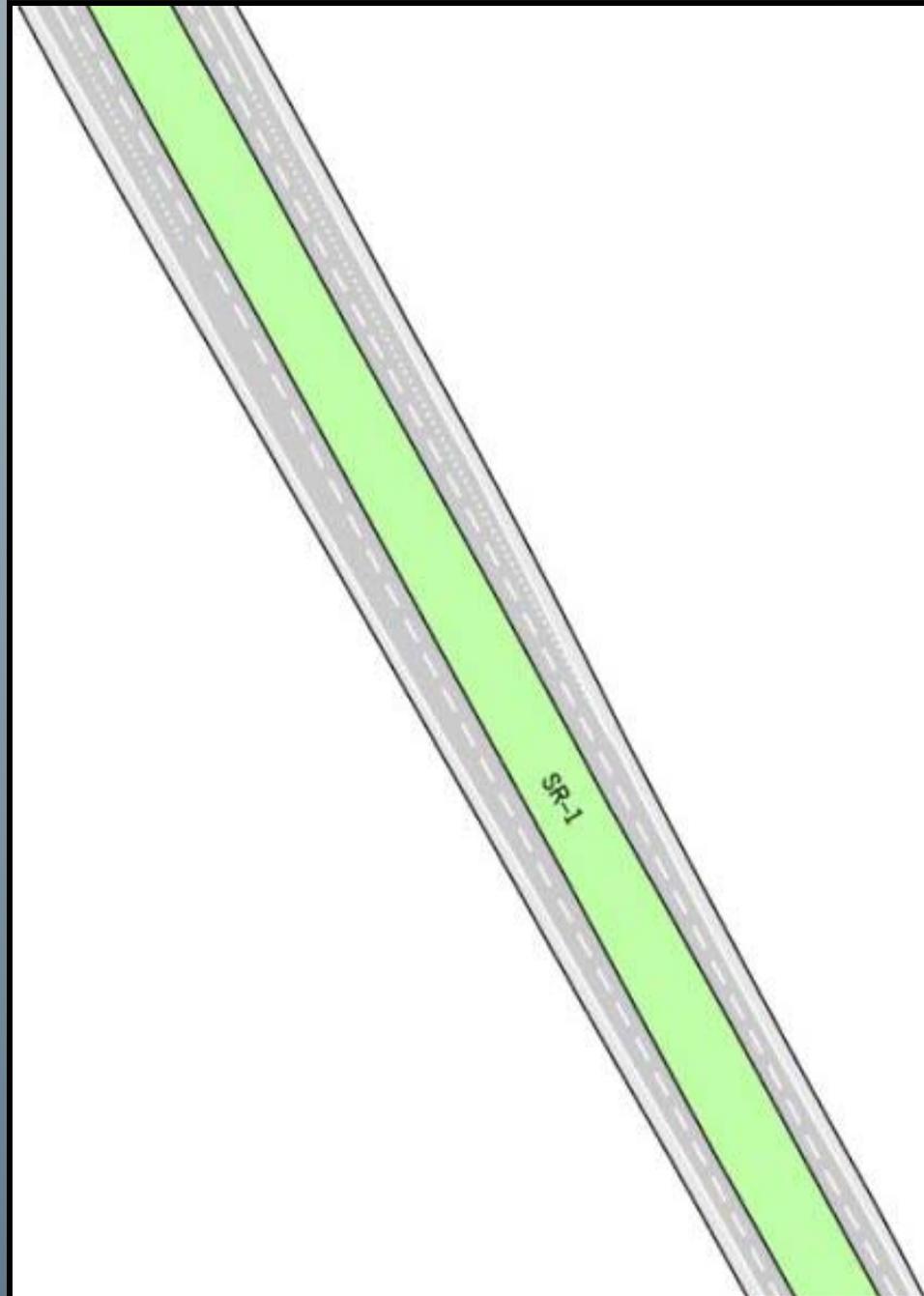
* DE State
Fire School







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