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LESSON PLAN

Roadway Incident Safety Teaching Topic Package 3: ADVANCE WARNING & TRANSITION AREAS

Overview & Purpose:

Explain the concepts of the advance warning & transition areas and review procedures to set up these areas

Topics:

- Advance Warning Area features
- Transition Area features
- Department SOP
- Set up of advance warning devices
- Set up of transition area
- Adapting to hazards

Pre-Class Assignment:

Complete the Advance Warning module on learning.respondersafety.com. Bring certificate to class.

Read our department's Advance Warning & Transition Areas SOP (see Appendix C for model SOP)

Materials:

- Department SOP handouts
- TIMA diagram handouts (See Appendix D)
- Copy of NFPA 1091
- Advance warning device(s), such pink drop sign or portable variable message sign
- At least 5 MUTCD-compliant traffic cones with flares
- High visibility apparel for all personnel
- Sufficient space to practice device placement

Learning Objectives:

- Understand department SOP on advance warning and transition areas
- Identify advance warning and transition areas within a TIMA
- Explain purpose and advantages of advance warning and transition areas
- Properly deploy available advance warning devices
- Set up a proper transition area, including a 5-8 cone transition area
- Adapt advance warning and transition area to hazards



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NFPA 1091 JPRs:

- 4.2.3 Establish a TIMA at a traffic incident
- 4.2.4 Establish advance warning for the traffic incident
- 4.2.7 Monitor and adjust the TTC measures
- 4.2.8 Adapt the TIMA in response to a hazard

Correlations to Dept Training Rotations:

To be filled in by Instructor

Related SOPs/SOGs:

Titles to be filled in by Instructor

Introduction (10 min):

Introduce the topic of the Advance Warning Area and the Transition Area:

- Show the TIM in a Minute video
- Relate to 1091 JPRs and departmental training requirements and explain how this training will help fulfill those
- Discuss a struck by or near miss case related to the advance warning or transition area, local if possible.

See Appendix A for suggested cases.

SOP Review (10 min):

- Distribute TIMA diagram and refresh students on the IMA areas and orient them to discussing Advance Warning and Transition Areas.
- Distribute a copy of the department's Advance Warning & Transition Areas SOP. Review the SOP with the group. Discuss and answer questions about the expectations set by the SOP.

Discussion (10 min):

Discuss with the group:

- How advance warning and transition area setup are currently executed at roadway incident scenes.
- Identify gaps between current practice and the SOP.
- Discuss how to eliminate those gaps.



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Exercise 1 (15 min):

Wearing high visibility apparel, demonstrate then practice deployment of advance warning devices available to the department. This may include:

- Emergency lighting, retroreflective markings, and traffic control devices (such as directional arrows) on response vehicles (capabilities of the department's vehicles, refer to safe parking SOP for positioning, how to deploy lighting and integrated traffic control devices)
- Portable variable message sign (how to requisition, where to place, how to program)
- Fixed variable message signs and other DOT resources (when to call for, how to contact the Traffic Management Center to change message)
- Pink emergency scene ahead drop signs (where stored on apparatus, how to deploy, how to remove)

Exercise 2 (10 min):

Wearing high visibility apparel, demonstrate then practice setting and removing a cone taper using a recommended method such as shown in Appendix B. Use a minimum of 5 cones, making sure it's a realistic number for what is available on responding vehicles.

Wrap Up:

Discuss situations where advance warning and transition practices may need to be adjusted, such as limited sight distance, roadway curves, poor visibility in bad weather, or multiple approaches and how to adjust accordingly.

Resources:

Additional resources available at:

https://learning.respondersafety.com/Training_Programs/Advance_Warning.aspx

http://www.respondersafety.com/Resources/Advance_Warning.aspx



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Appendix A: Suggested Case Studies

Career fire captain killed, fire fighter and police officer injured at the scene of a motor vehicle crash - Arkansas <https://www.cdc.gov/niosh/fire/reports/face201209.html>

Volunteer Fire Fighter Struck and Killed While Directing Traffic at an Interstate Highway Incident - Iowa <https://www.cdc.gov/niosh/fire/reports/face201123.html>

Volunteer Fire Chief Struck and Killed on Interstate Highway While Directing Traffic - Pennsylvania <https://www.cdc.gov/niosh/fire/pdfs/face201312.pdf>

Forest Fire Service Fire Fighter Monitoring Prescribed Burn from Roadway is Struck and Killed When Smoke Obscures Visibility Following a Wind Shift - New Jersey <https://www.cdc.gov/niosh/fire/pdfs/face201306.pdf>

Career Fire Captain Dies When Struck by a Pickup Truck While Working at the Scene of Two Traffic Incidents - California <https://www.cdc.gov/niosh/fire/reports/face201207.html>

One Career Fire Fighter Killed, Another Seriously Injured When Struck By a Vehicle While Working at a Grass Fire Along an Interstate Highway - South Carolina <https://www.cdc.gov/niosh/fire/reports/face201036.html>

Volunteer Fire Fighter Dies When Struck By a Bus While Working Along an Interstate Highway - Illinois <https://www.cdc.gov/niosh/fire/reports/face200726.html>



Appendix B: Recommended Cone Taper Procedure

There are many different ways to set a cone taper based on the available equipment and the situation. The following is a general, recommended procedure when 5 or more cones are present on an emergency response vehicle. In this procedure, you first space out the cones upstream of the incident in a straight line along the side of the lane you will close, closest to the shoulder or fog line. Then, you will move each cone into its proper position in the lane being closed. A two-lane roadway in each direction with no shoulder is used as the example.

While wearing a high-visibility garment and always keeping an eye on oncoming traffic, remove cones from the emergency vehicle. Stand on the shoulder side edge of the lane you intend to close.

Pick up the first cone, walk about 20 paces, which is approximately 30', upstream of the first blocking vehicle. This will place you behind the blocking vehicle along the fog line.

Place a cone.

Watching traffic, return to your stack of cones and pick up another cone. Walk 20 paces past the first cone and place another cone in a straight line with the first cone, along the side of the lane to be closed.

Repeat for the remaining cones. This places 5 cones, each about 20 paces apart, laid out in a line along the side of the lane to be closed.

Now, starting where you are (at the most upstream start of the taper), pick up that cone, which is the fifth one you placed, and place it on the lane fog line. While watching traffic, go to the next cone in the line, and walk it 1/4 of the way into the lane being closed. Place the cone. Continuing to watch traffic, return to the line of cones again and move the third cone to about halfway across the lane. Return to the line of cones and move the fourth cone 3/4 of the distance into the lane being closed. Finally, place the last cone all the way across the lane being closed, along the line at the opposite side of the lane from where you placed the first cone. The cone taper is complete.

Flares can then be placed at each cone to increase the cone's visibility.

Remember to execute the same procedure in the termination area using five additional cones.

Use any remaining available cones to mark the edge of the closed lane line across the Activity Area. Remember to keep an eye on traffic at all times.

If the incident is on a freeway, the skip lines may be used as visual markers for spacing the cones downstream.



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Appendix C: Model Advance Warning & Transition Areas SOP

- MODEL -

Standard Operating Guideline (SOG)

Cone, Flare, or Sign Deployment at Traffic-Related Incidents

OFFICE of the CHIEF

Date:

Attention: Fire Officers, Fire Rescue Specialists, EMS Crewmembers, Technical Rescue Squad members

Subject

Guidelines for Establishing Advance Warning and Transition Areas at Highway-Related Incidents where Members are Working In or Near Moving Traffic

Effectively immediately, utilize the following Standard Operating Guideline (SOG) when establishing Advance Warning and Transition Areas at highway-related incidents.

Per orders of: Chief XXXXXXXXXX

Effective Date: _____

PURPOSE:

It shall be the intent of this Standard Operating Guideline (SOG) that the safety of operating personnel working in or near moving traffic shall be assured. Balanced with concerns for member safety and the safety of those persons exposed to moving traffic, department personnel are encouraged to comply with applicable local, state, and MUTCD Temporary Traffic Control Zone criteria when operating in or near moving traffic at street, roadway, or highway- related incidents.

It is understood that a compliant MUTCD Temporary Traffic Control Zone includes an incident scene with clearly identifiable areas such as the Advance Warning, Transition, Buffer, Work, and Termination Areas.

When the determination has been made that fire department personnel are to use available portable traffic control equipment, such as 28-inch or taller traffic cones, highway flares, retro-reflective pink deployable signs, or other signaling devices to establish the Advance Warning and/or Transition Area, it is understood by all that for the personnel involved, this is a high risk and potentially life-threatening activity. The member(s) performing this work is typically outside of the protected work area and may be working in close proximity to moving traffic.

APPENDIX C

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RESPONSIBILITY

The following conditions are assumed to be in place prior to the person or persons assigned to establish the Advance Warning or Transition Area beginning their assignment;

- A suitable responder vehicle is on location within the Temporary Traffic Control Zone and the vehicle is positioned in a blocking position so as to create a protected Work Area and Buffer Space
- Portable traffic control equipment (cones, flares, deployable sign, etc) are available and readied for use
- Fire Department member performing task has been assigned to specifically deploy portable devices to create an Advance Warning and/or Transition Area, not a freelance effort, and
- Fire Department member is wearing proper PPE including high-visibility garment and helmet. During periods of low light level or reduced visibility weather conditions, member has operating hand light with them and it is turned ON during this activity

OPERATIONAL STEPS

The following operational steps can serve as a recommended guideline for performing this assigned function;

- Gather portable equipment while member is inside protected Work Area.
- Coordinate activity with an assigned "Watch Out" or safety partner, if staffing permits.
- The member gathers equipment, faces on-coming traffic, and moves along a linear, safe pathway on the shoulder or median area of street, road, or highway to furthest upstream location where first device is to be deployed.
- The member shall deploy the first device along shoulder/edge of lane of street, road, or highway while standing in the Safe Area.
 - This initial deployment point should be approximately 100 to 120 feet for deployment of five (5) devices
 - Deployment point should be up to 200 to 240 feet upstream for deployment of eight (8) devices
 - The initial deployment point should take into considerations environmental weather or poor lighting conditions and any visual obstructions for approaching motorists including hills, curves, or other visual obstructions. Furthest traffic control device can be extended further upstream according to these sight-limiting conditions.



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OPERATIONAL STEPS (continued)

- The member shall move a distance of ten (10) paces back toward the incident scene along this safe pathway area. When determined safe to do so, the member may enter into the nearest travel lane a distance of one (1) pace or approximately three (3) feet and deploy the second traffic control device.

NOTE: When deploying highway flares, ignition of the flare should take place while member is standing in the safe pathway area. Once lit, the member can move the appropriate distance into the nearest travel lane and deploy the flare.

- The member shall immediately return to the shoulder or median Safe Area and move an additional ten (10) paces along the safe area back towards the incident scene.
- When determined safe to do so, the member may enter into the travel lane being closed a distance of two (2) paces or approximately six (6) feet and deploy the third traffic control device.
- This pattern of 10 paces back towards the incident scene and a distance of three (3) additional feet into the travel lane each time a cone or flare is deployed creates an effective diagonal line of cones or flares across a travel lane of the street, road, or highway. Ideally, the final device shall be near the rear of the responder vehicle that is in a blocking position at the incident scene.
- If using a retroreflective, pink deployable sign to comply with NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, carry the sign in the folded condition upstream along the safe area (shoulder or median). Deploy the sign along the shoulder or median at a location ten (10) additional paces further upstream of the initial cone or flare.

APPENDIX D

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Appendix D: TIMA Diagram

Traffic Incident Management Area (TIMA)

also known as a Temporary Traffic Control Zone (TTC)

