



Federal Highway
Administration

***Safe and Effective Use of
Law Enforcement Personnel
in Work Zones***

Instructor Guide



Welcome!!

Safe and Effective Use of Law Enforcement Personnel in Work Zones



0-1

Session Title: Module 0. Introduction to course

Performance-Based Learning Outcomes:

Opening module, logistics and other preliminary information.

Instructional Method: Lecture

Session Time: 23 slides. Approximately 20-25 minutes depending on number of students.

Evaluation Plan:

The learning outcomes are evaluated at the end of each module using the questions contained in the last slide of that module and through the exercises.

Two instructor option:

Instructor 1 opens the course, Instructor 2 facilitates student introductions and housekeeping. Instructors may alternate teaching modules as agreed.

Instructor

0-2

Key Message: Instructor's self introduction

Est. Presentation Time: Less than 20 seconds

Explanation of Cues/Builds: None

Suggested Comments: This is not your introduction. This is just to mention your name.

Suggested Questions: None

Additional Information: May ask students to write the name down for the course evaluations.

Possible Problems: You will establish credibility later. Avoid talking about yourself at this point.

Did you know?

*We have more than 42,000 traffic fatalities
every year nationwide*

More than 1,200 of those occur in work zones

*More police officers are killed by traffic
than by bullets*

*4 times more officers were killed when struck by
vehicles than in accidental shootings
over the last 10 years*

Source: www.nhtsa.dot.gov, www.fbi.gov

0-3

Key Message: Describe/quantify the problem of LEO safety when working in highway work zones.

Est. Presentation Time: 1-2 minutes

Explanation of Cues/Builds: 4 boxes that appear one at a time when hitting the space bar or remote advance button.

Suggested Comments: Intended to serve as an eye-opener.

Suggested Questions: You may turn each of these boxes into questions before each box appears.

Additional Information: Refer students to www.nhtsa.dot.gov (National Highway Traffic Safety Administration) and www.fbi.gov (Federal Bureau of Investigations) for additional statistics.

Possible Problems: None

Introductions

- *Name*
- *Agency*
- *City and State*
- *Experiences and anecdotes with work zones*



0-4

Key Message: Students' self-introductions

Est. Presentation Time: 10 minutes more or less, depending on class size

Explanation of Cues/Builds: None

Suggested Comments: Inquire about experiences related to work zones. Identify which agencies are represented and what kind of formal training, if any, they have. Ask them why they are there.

Suggested Questions: Why are you here? {Maybe, Does anyone have previous formal training in work zone safety?}

Additional Information: Interject your own experiences as appropriate.

Possible Problems: Some students may take too long by rambling. Keep moving and, if appropriate, indicate that the material will be covered later. Resist the temptation to discuss items that will be covered later in the class. Keep this moving!

About the Instructor



0-5

Key Message: Instructor's self-introduction

Est. Presentation Time: 1 minute or less

Explanation of Cues/Builds: None

Suggested Comments: Purpose of slide is to establish credibility. Mention your experience with the subject matter and {the length of?} your working experience. Be brief and avoid bragging. Be friendly to develop rapport with students. Keep this brief.

Suggested Questions: None

Additional Information: Try to tie your personal experiences to the experiences expressed by the students.

Possible Problems: None

Logistics

- Ending time
- Restrooms
- Emergency exits
- Breaks
- No smoking
- Cell phones/radios
SILENT



0-6

Key Message: Course logistics and housekeeping

Est. Presentation Time: 1 minute or less

Explanation of Cues/Builds: None

Suggested Comments: Indicate clearly at what time the class will end and when you intend to take breaks. A ten-minute break every hour is recommended. Keep breaks to the specified duration. {Snack machines or cafeteria or served refreshments? Lunch?}

Suggested Questions: None

Additional Information: None

Possible Problems: Police officers may be reluctant to turn radios off. Indicate they can be in the SILENT mode instead. [cell phones on vibrate?]

How Dangerous can WZ be for Law Enforcement Officers?

- Tractor-semi-trailer collided with the **police vehicle**, killing an officer and injuring others



0-7

Key Message: Describe how the lack of training/knowledge can lead to crashes, injuries and/or fatalities.

Est. Presentation Time: 1 minute or less

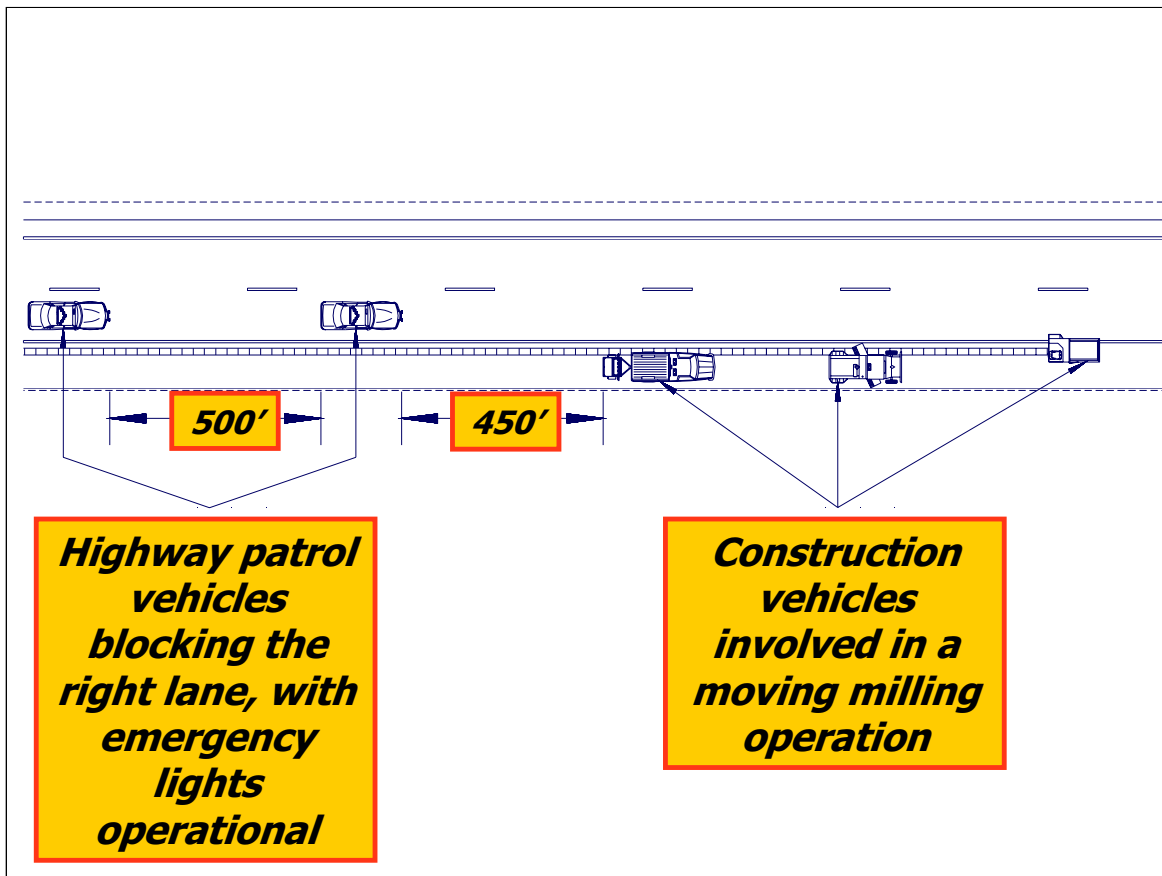
Explanation of Cues/Builds: None

Suggested Comments: This crash occurred in Jackson, TN. Avoid, however, mentioning that fact. The following slides illustrate what happened. A slow-moving highway patrol vehicle was impacted by a tractor-semi-trailer (18-wheeler) resulting in the death of the officer and other injuries.

Suggested Questions: None

Additional Information: None

Possible Problems: Officers in class may be familiar with this crash and may take this personally. Avoid assessing blame. The purpose is to illustrate what can happen, not to assess blame.



Key Message: Illustrate the position of vehicles affected.

Est. Presentation Time: 1 minute or less

Explanation of Cues/Builds: None

Suggested Comments: This was a moving milling operation on a freeway shoulder. All work was on the shoulder. Two highway patrol vehicles were slowly moving on the right lane, basically to serve as a lateral buffer and force freeway traffic to slow down.

Suggested Questions: Do you think this setup is proper? Why? Or why not?

Additional Information: None

Possible Problems: May have to define "milling operation" and "moving operation". At this point, simply indicate that the operation was continuously moving on the shoulder.



Key Message: Arrow shows the location of the impact.

Est. Presentation Time: Less than 1 minute.

Explanation of Cues/Builds: (click) The arrow depicts where the initial impact occurred.

Suggested Comments: At about 8:52 a.m., an eastbound tractor semi-trailer traveling at a driver-estimated speed of 65 mph collided with the trailing Highway Patrol vehicle. [Indicate that this is a high-speed facility.]

Suggested Questions: What was wrong with this setup? What did it assume?

Additional Information: The setup assumed that motorists would see the patrol vehicle, recognize that it was moving slowly, and react by switching lanes, all while moving at high speed.

Possible Problems: None



Key Message: Picture shows the condition of the patrol vehicle after impact.

Est. Presentation Time: Less than 1 minute

Explanation of Cues/Builds: None

Suggested Comments: The patrol car exploded and caught fire upon impact and was pushed approximately 192 feet before it came to rest in the median. The State trooper in the vehicle was killed.

Suggested Questions: None

Additional Information: None

Possible Problems: None



Key Message: Picture shows where tractor trailer ended up, after crossing the median and impacting vehicles in the opposite direction.

Est. Presentation Time: Less than 1 minute

Explanation of Cues/Builds: None

Suggested Comments: The tractor-semi-trailer continued through a 61-foot depressed earthen median and into the westbound lanes, where it collided with a 1997 Chevrolet Blazer. The Chevrolet driver was seriously injured.

Suggested Questions: None

Additional Information: None

Possible Problems:



Key Message: Picture shows location of impact

Est. Presentation Time: Less than 1 minute

Explanation of Cues/Builds: None

Suggested Comments: None

Suggested Questions: None

Additional Information: None

Possible Problems: None

Common Pitfalls When Using Law Enforcement Officers in WZ

- 1. Lack of communication** between work zone (WZ) participants
- 2. Lack of planning and coordination** of traffic control responsibilities
- 3. Inadequate training** of law enforcement personnel (LEO) in traffic control procedures within highway work zones

0-13

Key Message: Describe some pitfalls that led to this crash

Est. Presentation Time: Less than 1 minute

Explanation of Cues/Builds: None

Suggested Comments: During the crash investigation, the following highway and training issues were identified:

- The lack of communication between the state Department of Transportation (DOT), its contractors, and the State Highway Patrol.
- The lack of planning and coordination of traffic control responsibilities between the contractors and the State Highway Patrol before engaging in work zone activities.
- And inadequate training provided to the State Highway Patrol officers on safe traffic control procedures within highway work zones.

Suggested Questions: What do you think led to this crash? Could this crash be avoided? How?

Additional Information: Prior to milling the rumble strips on the day of the accident, the construction foreman advised the LEO that traffic control would be conducted using a "mobile lane closure."

- It was the intent of the foreman to keep all the interstate lanes open, and to have the LEO warn motorists away from the construction vehicles on the shoulder of the roadway.
- The LEO, who again were not trained in work zone traffic control procedures and terminology, did not ask for clarification regarding the traffic control strategy, and proceeded to position their vehicles behind the protection vehicle and in the travel lanes.

Possible Problems: None

Inadequate Training

- May result in officers positioning their **vehicles in unsafe locations**
- May lead to crashes and injuries



0-14

Key Message: Illustrate the importance of training for LEOs working in work zones

Est. Presentation Time: Less than 1 minute

Explanation of Cues/Builds: None

Suggested Comments: Training is important! Proper training of the LEO may have avoided this crash!

Suggested Questions: Do you think that proper training could have avoided this crash? How?

Additional Information: None

Possible Problems: None

US Government Survey of 46 States

66%

Use police
officers for
work zone
projects

20%

Provide only
general
traffic
management
training

0-15

Key Message: Illustrate that even though several states are using LEO in work zones, few are providing training to those officers.

Est. Presentation Time: Less than 1 minute

Explanation of Cues/Builds: (click) 66% side appears, (click) 20% side appears.

Suggested Comments: None

Suggested Questions: None

Additional Information: According to a 2001 FHWA/AASHTO report, of the 46 states surveyed, two-thirds use uniformed police officers for federally funded highway construction projects—but only a quarter had a program in place or under development to train those officers working in construction projects.

AASHTO is the American Association of State Highway and Transportation Officials

FHWA is the Federal Highway Administration

Possible Problems: None

Why Are Work Zones a Concern?

- Speeding
- Hazards present
- Exposed workers
- Situations not familiar to drivers
- Others?



It is dangerous work!

0-16

Key Message: Indicate why work zones are dangerous to all involved

Est. Presentation Time: 1-2 minutes

Explanation of Cues/Builds: Each bullet appears with a click.

Suggested Comments: Indicate that work zones are dangerous to everyone involved, including LEO.

Suggested Questions: Before clicking, you may ask: Why are work zones a concern? Ask if they can think of any other reasons.

Additional Information: None

Possible Problems: None

So, Why Are We Here?

- To provide you with **working knowledge** of traffic control work zones
- To define your **roles and responsibilities** when working in work zone

These are our course objectives

0-17

Key Message: Discuss course objectives.

Est. Presentation Time: 1-2 min.

Explanation of Cues/Builds: None

Suggested Comments: The primary learning objectives for this course are listed on the slide.

Suggested Questions: Why are you here?

Additional Information: Try to generate class participation by asking what the students' expectations are. Generate a list of expectations to be discussed at the end of the course.

Possible Problems: Students may not have any expectations. Be prepared to suggest a couple of expectations, such as "To determine where to position my patrol car?" or "To find out what equipment I should have with me?", etc.

This Training Course

- Provides the basic knowledge that can save lives, **including your own**, when working in a work zone.



This knowledge will help you avoid work zone crashes and improve safety!

0-18

Key Message: Summarize in simple terms the objectives of the course.

Est. Presentation Time: Less than 1 minute.

Explanation of Cues/Builds: (click) Bottom box zooms in.

Suggested Comments: Consider this a summary slide.

Suggested Questions: What would this knowledge help you do?

Additional Information: None

Possible Problems: None

On completion, participants will be able to:

1. Understand standards and guidelines related to temporary traffic control in work zones
2. Understand the role of law enforcement officers in work zones
3. Recognize the component parts of a typical work zone
4. Recognize proper practices and procedures related to the use of law enforcement officers in work zones

0-19

Key Message: List the things that participants will be able to do after completing the course.

Est. Presentation Time: 1-2 minutes

Explanation of Cues/Builds: None

Suggested Comments: Self-explanatory

Suggested Questions: None

Additional Information: None

Possible Problems: None

Course Modules

1. Roles and Responsibilities	30 min.
2. Understanding Work Zones	60 min.
3. Recommended Practices	30 min.
4. Application Workshop	30 min.
5. Closing	10 min.

4 HOURS

0-20

Key Message: Describe the modular approach of this course.

Est. Presentation Time: 1-2 minutes

Explanation of Cues/Builds: (click) "4 HOURS" zooms in.

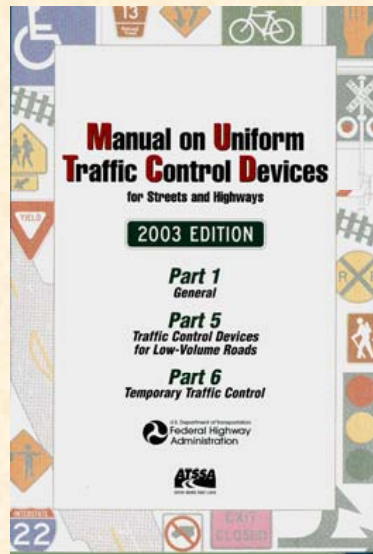
Suggested Comments: Tie the duration to the ending time for the course. Indicate times are approximate and subject to change depending on class composition and interests.

Suggested Questions: None

Additional Information: Encourage class participation.

Possible Problems: Someone may point out that times do not add up to 4 hours. Difference is due to breaks, which are not included.

Course Materials



- Course notebook
- Name tag
- Pencil
- MUTCD can be found on FHWA's website:
<http://mutcd.fhwa.dot.gov>

0-21

Key Message: Introduce the course materials.

Est. Presentation Time: Less than 1 minute.

Explanation of Cues/Builds: None

Suggested Comments: None

Suggested Questions: None

Additional Information: Instructor can secure copies of Part VI of the MUTCD if possible, or direct participants to the MUTCD website listed where the manual can be downloaded. All materials are theirs to keep. Encourage students to wear their name tags, which show first names only and are printed in large type. In addition, FHWA will post the Pocket Guide that accompanies this course on their website mid-2005.

Possible Problems: Avoid discussing what the MUTCD is at this point. This will be discussed later.

Safety is an Integral Part of WZs

The screenshot shows the officer.com website. At the top, there is a banner for '11 ct Sapphire Silver Bracelet'. Below the banner is a navigation menu with 'Home', 'News', 'Interact', 'Resources', 'Shop', 'Magazines', 'Jobs', and 'Search'. The main content area features a news article titled 'Georgia Deputy Struck By Car Is Dead' with a sub-headline 'Dead'. The article is dated 'Updated: January 5th, 2004 02:39:59 PM' and is by 'DENA LEVITZ' from 'The Augusta Chronicle'. The article text mentions 'A Richmond County sheriff's deputy who directing traffic around an accident died' and 'Kenneth Burton, 46, a road patrol deputy pronounced dead at about 12:15 p.m.'. On the left side, there are sidebar links for 'Inside News', 'Today's News', 'Officer Down', 'Homeland Defense', and 'Send News Tip', along with advertisements for 'BOSTON UNIVERSITY Master of Criminal Justice program' and 'ITT Industries Engineered for life'. On the right side, a yellow box contains a list of groups: 'Workers', 'Motorists', 'Pedestrians', 'Bicyclists', and 'LEOs if present'.

Key Message: Module summary slide.

Est. Presentation Time: Less than 1 minute.

Explanation of Cues/Builds: (click) for each bullet in box.

Suggested Comments: Emphasize pedestrians and bicyclists: ALL involved!

Suggested Questions: None

Additional Information: Source: www.officer.com

Possible Problems: Not intended to be read, but to illustrate the importance of work zone safety for everyone involved.

Module Recap

- *Why are we here?*
- *How dangerous are WZs for Law Enforcement Officers?*
- *How big is this problem?*



0-23

Key Message: Recaps Module 1.

Est. Presentation Time: 2-3 minutes

Explanation of Cues/Builds: None

Suggested Comments: None

Suggested Questions: Ask questions to gauge understanding and summarize the concepts learned. The questions listed are samples. Add questions as needed, addressing the material covered. Try to let students answer the questions before giving the answers.

Additional Information: None

Possible Problems: Students may not understand what we are trying to do. Be prepared to answer these questions yourself, at least for this first module. This is repeated for each of the remaining modules.



Session Title: Module 1. Roles and Responsibilities

Performance-Based Learning Outcomes:

Understand the roles and responsibilities of everyone involved with highway work zones.

Instructional Method: Lecture

Session Time: 37 slides. Approximately 30-45 minutes depending on class participation.

Evaluation Plan: Evaluate the learning outcomes at the end of each module by using the questions contained in the last slide of that module and through the exercises.

Module Objectives

- *Recognize the roles of LEOs and others in work zones*
- *List LEO responsibilities and expectations in work zones*
- *Discuss communication channels among all involved and the importance of good communication*

0-25

Key Message: List module objectives

Est. Presentation Time: Less than 1/2 minute

Explanation of Cues/Builds: None

Suggested Comments: Self explanatory.

Suggested Questions: None

Additional Information: None

Possible Problems: None

Decision-Makers

- Set a procedure for how LEOs may be used
- Implement policies
- Be active and engaged – even if contractor is mainly responsible for hiring LEOs
- One state: Regional WZ enforcement coordinators



0-26

Key Message: Decision makers within a highway agency should actively promote sound practices and policies for LEOs in highway work zones.

Est. Presentation Time: 2-3 minutes

Explanation of Cues/Builds: None

Suggested Comments: Example: Oregon

Funding - Originally a result of the OR legislature requiring the DOT to invest \$1 million of FHWA construction money for special work zone patrols by state police. Now elective decision to continue that investment. The program is funded at a statewide level, rather than on an individual project basis.

Program structure - There is a statewide program manager housed in the Governor's Highway Safety Rep office. The program is implemented on a local basis. Oregon is divided into five Regions. Each Region has delegated a person to be responsible for the management of a biennial budget of overtime work zone enforcement hours allocated by the Statewide Program Manager (SPM).

Planning - About six months prior to the beginning of a new biennium, the Region Reps, state and local police, project managers and the SPM meet to plan the upcoming biennium's work zone enforcement program. The SPM has armed the Region Reps with a starting budget of hours. The Reps pair that information with the projects in the STIP [Statewide Transportation Improvement Program]. The agenda consists of discussion of program management issues and refinement of the distribution of hours.

Program management - The DOT is the "owner" of the program. Region Reps and DOT project managers manage the budget of hours. Although the budget for WZ enforcement is not in the individual project, PMs have been given a project budget. They have control over the use of those hours and petition the Region Rep for additional hours if needed. Region Reps can, in turn, petition the SPM for additional hours if needed and the SPM consults with other Region Reps to see if there are hours to spare.

Results - The program was fully implemented in the 1995-97 biennium. 1997 saw a peak in WZ traffic deaths at 21. From that time forward, the deaths declined steadily to a low of two in 2003.

Strong DOT-contractor-enforcement partnerships, fairly substantial investments in public education (Give 'Em A Brake) and a strong "double-fine" law are credited with the dramatic improvement.

Suggested Questions: What about your state?

Additional Information: None

Possible Problems: None

Discussion

- Does your state have a defined process for using officers in work zones?
- How is coordination achieved?
- How would you evaluate your current practice?
- Is the process working as well as it could be?



0-27

Key Message: Discuss state processes for using LEOs in work zones, if any.

Est. Presentation Time: Depends on length of discussion. Limit to 7 minutes.

Explanation of Cues/Builds: The picture originally had a caption on it titled “The winner of the ‘Not My Job’ Award”. The picture is meant to introduce humor and show that coordination and communication is important – even though traffic control setup may not be a primary function of law enforcement, when they see improper practices they should bring it to the attention of the point of contact.

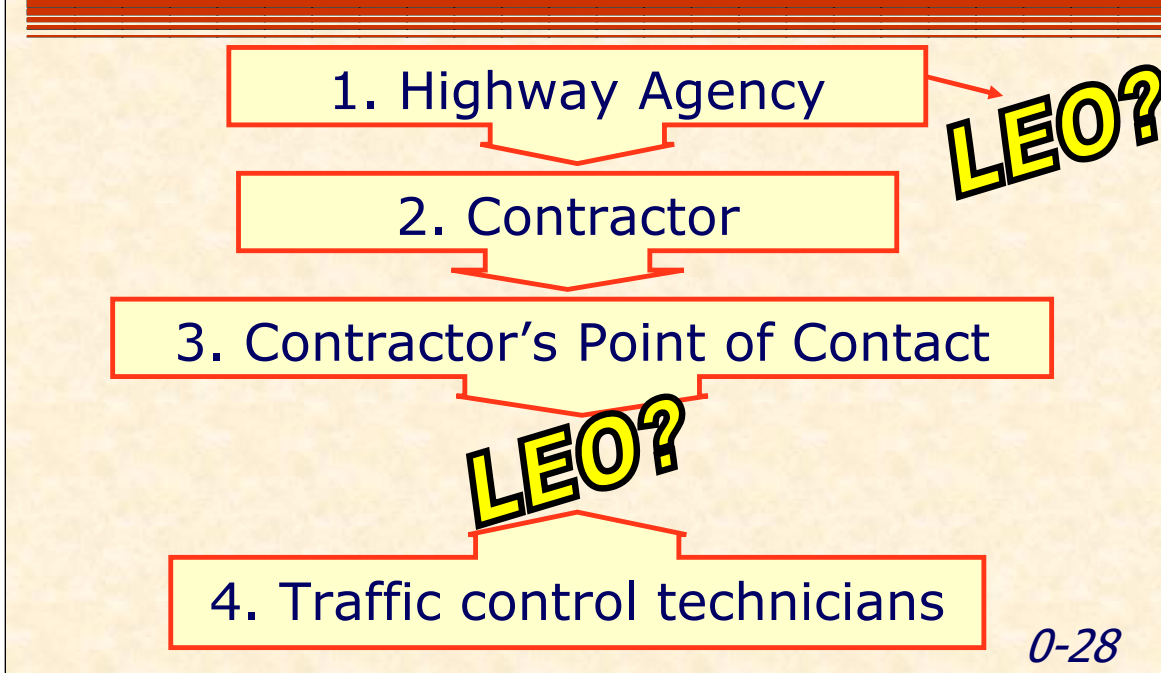
Suggested Comments: Self-explanatory but be prepared to give examples. Refer to Oregon example, if needed.

Suggested Questions: What problems do you see in your state? How can this process be improved?

Additional Information: None

Possible Problems: Lack of participation. Be prepared to lead the discussion.

Typical WZ Stakeholders



Key Message: Lists stakeholders in highway work zone implementation, and shows that the highway agency may coordinate with LEOs, or contractors may hire LEOs directly to perform work. Even though contractor may be responsible, the highway agency has a vested interest in ensuring the safety and efficiency of the operation.

Est. Presentation Time: 2 minutes

Explanation of Cues/Builds: “LEO” zooms in at click, to illustrate where LEOs fit in the “chain”. Second LEO appears on second click.

Suggested Comments: Do not explain each of the stakeholders at this point. The following slides explain each stakeholder in detail. Do not refer to this as a “chain of command”.

Suggested Questions: “Can you think of any other stakeholders?” Someone may say “the traveling public”. Respond by saying that the stakeholders referred to here are “workers”, but that the traveling public is also a stakeholder.

Additional Information: None

Possible Problems: None

1. Highway Agency

- May be:
 - State DOT
 - Other local agency
- Responsible for the **overall project**, including enforcement of the TCP
- The “final authority”
- May contract-out these responsibilities

DOT



*Approves a
Traffic Control
Plan (TCP) for
the project*

0-29

Key Message: Explain the “highway agency” as a stakeholder in highway work zones.

Est. Presentation Time: 1-2 minutes

Explanation of Cues/Builds: Text box appears on click. Define a TCP as a set of drawings that specify how traffic will be controlled during the project. Emphasize that work zones are carefully planned and executed, and that LEOs are a part of this plan.

Suggested Comments: Add that the “agency” may be a county, a state DOT or a city, whoever owns the facility and is responsible for it. Add that the “agency” may not contract with LEOs directly, but through contractors.

Suggested Questions: Who is the highway agency here? It depends on the location and magnitude of the project. Most “major” facilities (interstates, major highways) are owned and maintained by the state.

Additional Information: DOT stands for “Department of Transportation”.

Possible Problems: None

1. Highway Agency (cont.)

- May allocate enforcement resources
- May provide inspection services and liaison with LEOs
- Builds the TCP which includes:
 - Pattern of TCPs
 - Tasks to be performed
 - Project phasing



0-30

Key Message: Continuation of discussion of TCP.

Est. Presentation Time: 1-2 minutes

Explanation of Cues/Builds: None

Suggested Comments: Emphasize that a TCP is very specific, with nothing left to chance. A good TCP would specify the location of a LEO, if used.

Suggested Questions: Have you ever seen a TCP? Were you aware that they exist?

Additional Information: It would be useful to have a copy of a typical TCP to show the class.

Possible Problems: None

1. Highway Agency (cont.)

- May include location/placement of police officers based upon:
 - WZ type
 - Location
 - Duration
 - Time of day



0-31

Key Message: Continuation of discussion of TCP.

Est. Presentation Time: 1-2 minutes

Explanation of Cues/Builds: None

Suggested Comments: Emphasize that a TCP is very specific, with nothing left to chance. A good TCP would specify the location of a police officer, if used.

Suggested Questions: Have you ever seen a TCP? Were you aware that they exist?

Additional Information: It would be useful to have a copy of a typical TCP to show the class.

Possible Problems: None

2. Contractors

- Build and maintain project
- May provide inspection services and liaison to LEO
- **Ensures the traffic control is correct on a daily basis**
- May be responsible for hiring and paying LEOs
- Assumes officers are trained!!

Implements the Traffic Control Plan based on the MUTCD and local standards



0-32

Key Message: Explain the “contractor” as a stakeholder in highway work zones.

Est. Presentation Time: 1-2 minutes

Explanation of Cues/Builds: Text box appears on click. The highway agency develops the plan and they hire a contractor to implement it.

Suggested Comments: Even though contractors are working under contract, and are responsible for ensuring safe conditions, they want to maximize their profits and may be inclined to cut corners.

Suggested Questions: If a LEO sees something done incorrectly, or not according to the TCP, should they approach the contractor with his/her concerns?

Additional Information: The last bullet must be emphasized. Contractor assumes that officers know what they are doing, and perhaps because of intimidation, hesitate to talk to officers, even when they see they are doing something incorrectly. Officers should try to establish a line of communication with the contractor and encourage the exchange of information. In some states, the contractor does not hire for nor manage the work zone enforcement program (the DOT may do it).

Possible Problems: None

Contractors....

- **Do not have the authority to place officers *contrary* to established procedures and/or endanger the police officer**

*Request a briefing
from the contractor or DOT
representative!*



0-33

Key Message: Explain what contractors can ask LEOs to do.

Est. Presentation Time: 1 minute

Explanation of Cues/Builds: Text box appears on click.

Suggested Comments: If officers are asked by contractors to perform an action that the officer feels is not safe, they should refuse. If LEOs feel uneasy about their safety, they should contact the contractor or the highway agency for a briefing. Express your concerns openly.

Suggested Questions: Have you even been in a position where you did not feel safe?

Additional Information: None

Possible Problems: Participants may indicate that this is not practical. Explain that their safety is critical and should not be compromised.

Contractors....

- Should provide a **daily work zone briefing** to police officers prior to the beginning of each shift or special enforcement activity.

The officer you are relieving is another good source of work zone information, but not your only one!



0-34

Key Message: Explain what officers should do when arriving at a work zone
Est. Presentation Time: 1 minute

Explanation of Cues/Builds: Text box appears on click.

Suggested Comments: It is important for the officer to receive information about the work zone. Chances are the officer has not seen the TCP. Where should he/she get the information? The most likely source is the officer they are relieving, if any. This may not be the best source. The best source is the contractor's point of contact. Contractors should brief officers on their tasks, hours of operation, what to do, what not to do, and other aspects related to the work zone. The LEO should ask questions freely.

Suggested Questions: Where should this briefing be conducted? Away from moving traffic and preferably before the project starts.

Additional Information: "... Each shift or activity." The enforcement operation may only be for a Phase change or lane shift.

Possible Problems: None

3. Contractor's Point of Contact (POC)

- Represents the Contractor in the field
- In charge of project
- "Work Zone Supervisor?"
 - Certification?
- DOT Inspector may be your POC – be sure of your communication channels
- **Responsible for inspection and documentation**



*Know your
**primary
contact** in
the field!*

0-35

Key Message: Explain the "POC" as a stakeholder in highway work zones.

Est. Presentation Time: 1-2 minutes

Explanation of Cues/Builds: Text box appears on click.

Suggested Comments: The highway agency develops the plan and they hire a contractor to implement it. The contractor assigns a person to be their representative in the field, the "person in charge". Usually, this person is a "Traffic Control Supervisor", or TCS. The LEO should identify who this POC or TCS is and establish a line of communication with this person.

If there is not a TCS on the project, the LEO should work with the Resident Engineer of the agency or the contractor's foreman, since not all projects will have a TCS. The TCS may be certified to perform this job. Most states require certification, or at least some type of work zone training.

Suggested Questions:

Additional Information: The last bullet must be emphasized. The TCS should document all aspects related to the work zone. He/she is the person responsible for inspecting the work zone during installation, operation and removal.

Possible Problems: None

4. Traffic Control Technicians

- Report to the WZ Supervisor
- Workers
- Are a good technical source on TCP issues
- **Should have some WZ training**
- Understand and support role of law enforcement



0-36

Key Message: Explain the “Technician” as a stakeholder in highway work zones.

Est. Presentation Time: 1-2 minutes

Explanation of Cues/Builds: None

Suggested Comments: Technicians are field people, workers. They report to the TCS. They follow the TCS instructions and help implement the TCP in the field. They should have some type of work zone training. Some states require work zone training and certification for technicians. However, officers should not assume that technicians are trained and know what they are doing. Also, do not assume that technicians will approach officers with their concerns. They may be intimidated by the officer. Because of that, officers should try to be friendly with technicians in the field, to encourage two-way communication.

Suggested Questions: What are your experiences with traffic control technicians?

Additional Information: None

Possible Problems: None

5. Law Enforcement Officers

- Should:
 - **Be trained** in basic work zone operations and safety
 - **Obtain names & numbers** of contractor personnel and POC
 - Attempt to make **daily contact** with Contractor or DOT personnel.
 - Attend the project's **pre-construction conference**



0-37

Key Message: Explain the “LEO” as a stakeholder in highway work zones.

Est. Presentation Time: 2 minutes

Explanation of Cues/Builds: None

Suggested Comments: The slide lists things that the LEO should do. These are not requirements but recommendations. Training is one of those. All LEOs working in highway work zones should be trained, in a course similar to this one. It is also recommended that they attend the pre-construction conference, which is discussed in the next slide.

Suggested Questions: Officers may not be aware of the pre-construction conference and may say that their attendance is not practical. They may not be notified/invited to these meetings. Encourage them to establish communication with the highway agencies to be notified of upcoming projects and meetings. One person may be a central point of contact for all LEO details.

Additional Information: None

Possible Problems: None

The "Pre-construction Conference"

- A meeting where **everyone** involved with the project discusses:
 - Roles and responsibilities
 - Construction details
- Procedures/schedules are discussed
- Decisions are made
- Questions are answered



LEOs should attend and take information back to others!

0-38

Key Message: Explain the pre-construction conference.

Est. Presentation Time: 2 minutes

Explanation of Cues/Builds: Text box appears on click.

Suggested Comments: The pre-construction conference is organized by the highway agency. Its purpose is to inform all stakeholders in the project, to avoid surprises in the future. It results in everyone having the same information. Usually, the TCP is discussed. This is the ideal place for LEOs to ask questions and express concerns. If only one officer attends, this officer should brief other officers that may be working on the project.

Suggested Questions: How do you become aware of these meetings? Do you see a benefit in attending?

Additional Information: None

Possible Problems: Officers may not be aware of the pre-construction conference and may say that this is not practical. They may not be notified/invited to these meetings. Encourage them to establish communication with the highway agencies to be notified of upcoming projects and meetings.

5. Law Enforcement Officers

- **Your activities will affect everyone's safety!**

Your badge does not protect you from traffic impacts!



Anyone working in close proximity to traffic is in **danger!** Watch your back!!

0-39

Key Message: Emphasize the safety of officers.

Est. Presentation Time: 1 minute

Explanation of Cues/Builds: Bottom text box appears on click. Center text box appears on second click.

Suggested Comments: The fact that you are a police officer won't help you if a drunk driver is approaching you at 80 mph. The authority that you represent won't stop that motorist. Always position yourself in the safest possible place and NEVER assume that a motorist will stop just because you are a police officer. The badge you wear won't protect you!

Suggested Questions: Who is in danger in a work zone?

Additional Information: None

Possible Problems: None

Main Types of Police Services in WZ

- a) Presence**
- b) Enforcement**
- c) Traffic Control**
- d) Emergency assistance**



0-40

Key Message: Introduce the four services of LEOs working in highway work zones

Est. Presentation Time: Less than 1 minute

Explanation of Cues/Builds: None

Suggested Comments: List the four types

Suggested Questions: None

Additional Information: Do not elaborate on these types. The following slides expand on each of these services.

Possible Problems: None

Services: a) Presence

- **Deterrent to speeding** and aggressive driving
- Gains the attention of drivers



Most common LEO activity in WZ!

0-41

Key Message: Introduce the first service: Presence

Est. Presentation Time: 1 minute

Explanation of Cues/Builds: Text box appears on click.

Suggested Comments: Presence is the most common use of LEOs in work zones. It involves a positioning an officer within the work zone, to be **VISIBLE** and deter speeding. Officers must be visible for this service to be effective. It is important to note that officers **ARE NOT** enforcing speed limits at this point, just deterring speeding through their **PRESENCE** alone. LEOs may be paid by the contractor when working “off-duty”. The fact that an officer is “off-duty” does not mean he/she is immune from danger. (See **POSSIBLE PROBLEMS** below.) The officer must be alert at all times. Avoid doing paper work and any other activities that may distract you. You are still in danger.

Suggested Questions: What experiences have you had?

Additional Information: None

Possible Problems: Trainees may try to engage in a discussion of the differences between “on-duty” and “off-duty”. Avoid this discussion. Indicate that the definitions vary. What is important is the task that the officer is performing.

Presence Issues

- Jurisdictional boundaries may cause issues
- Work zone impact area may cross boundaries
- Longer queuing and higher traffic impacts
- Multi-agency traffic teams are an option
- Use of State Police is another option for presence officers to reduce jurisdictional issues

Have a process or policy!

0-42

Key Message: Discuss issues related to the presence activity.

Est. Presentation Time: Depends on discussion

Explanation of Cues/Builds: Text box appears on click.

Suggested Comments: Discuss these issues as needed. Give examples as needed. A good example is the Washington DC area where the Washington Beltway crosses Virginia, Maryland, and Washington, DC. Who is in charge? What if a queue formed in one state reaches another one?

Suggested Questions: Why longer queuing? Traffic slows down!

Additional Information: None

Possible Problems: None

Services:

b) Enforcement

- Active enforcement of traffic laws in the WZ
- May not be as common as presence
- Combine with presence



***WZ should be enforced
as strictly as school zones!***

***Presence officers shouldn't do
enforcement! Use local officers.***

0-43

Key Message: Introduce the second service: Enforcement

Est. Presentation Time: 1 minute

Explanation of Cues/Builds: Top text box appears on click. Second box appears on second click.

Suggested Comments: Officers enforce speed limits by writing speeding tickets. This is not the same as presence. Under this service, officers are actively enforcing the speed limit. These officers are “on-duty” and may not be paid by the contractor. (See POSSIBLE PROBLEMS below.) Encourage officers to enforce speed limits in work zones as they do in school areas, to persuade drivers to SLOW DOWN in work zones. State police officers may have a larger range on a large project for presence and may have fewer jurisdictional issues – local officers may be better for spot enforcement.

Suggested Questions: What experiences have you had?

Additional Information: None

Possible Problems: Trainees may try to engage in a discussion of the differences between “on-duty” and “off-duty”. Avoid this discussion. Indicate that the definitions vary. What is important is the task that the officer is performing.

Services:

c) Traffic Control

- **Operations that require traffic control such as intersections**
- May be used in detour/diversion situations
- Or to direct traffic & keep it moving



This may be in line with normal duty for a police officer

0-44

Key Message: Introduce the third service: Traffic control

Est. Presentation Time: 1-2 minutes

Explanation of Cues/Builds: Text box appears on click.

Suggested Comments: Officers control traffic according to the requirements of the work zone. This is an “on duty” task. (See POSSIBLE PROBLEMS below.) A typical application is when traffic must be controlled within an intersection due to the construction (or a crash). In several states, flaggers cannot legally perform this task; only police officers can. The State of Massachusetts does not allow flaggers at all. Police handle all flagging situations.

Suggested Questions: What experiences have you had?

Additional Information: None

Possible Problems: Trainees may try to engage in a discussion of the differences between “on-duty” and “off-duty”. Avoid this discussion. Indicate that the definitions vary. What is important is the task that the officer is performing.

Services:

d) Emergency Assistance

- Not within the scope of this class
- Emergency traffic control is a type of temporary traffic control
- Discussed in section 6i of MUTCD

0-45

Key Message: Introduce the fourth service: Emergency Assistance

Est. Presentation Time: 1 minute

Explanation of Cues/Builds: Text box appears on click.

Suggested Comments: This service is outside of the scope of this class, which is for the use of LEOs in planned work zones. Indicate that emergency traffic control is considered a subset of temporary traffic control and the same procedures apply. The 2003 MUTCD does contain a section (6i) dedicated to incident management practices that can be reviewed.

Suggested Questions: None

Additional Information: Section 6i allows the use of fluorescent pink signs for emergency traffic control.

Possible Problems: Avoid engaging in a discussion on this subject, just indicate that this is another type of service. Not within the scope of this class.

What to do When Working in a Work Zone

1. Stay in communication
2. Be visible
3. Be alert
4. Drive-through
5. Investigate crashes?
6. Arrive early/leave late
7. Monitor TCP compliance?

Let's discuss in more detail!

0-46

Key Message: List some activities LEOs should do when working in a work zone.

Est. Presentation Time: 1 minute

Explanation of Cues/Builds: Text box appears on click.

Suggested Comments: Included in the list are things that officers should do when working in a work zone. Avoid discussing these in detail since the following slides do that. The last bullet does have a question mark since you want to generate discussion on that subject.

Suggested Questions: Others?

Additional Information: These are recommendations, not requirements.

Possible Problems: Do not describe these at this point.

1. Stay in Communication

- **Report** to the POC at beginning of shift
- **Contact Project Engineer** for clarification and directions
- Remain in **radio contact** with the local dispatch



0-47

Key Message: Discuss COMMUNICATION.

Est. Presentation Time: 1-2 minutes

Explanation of Cues/Builds: None

Suggested Comments: Discuss why staying in communication is important. Identify the POC ahead of time and ask questions about the work zone. Make sure you understand the work zone and what your role is. Ask about your position and express concerns about your safety if any. While in your car, stay in communication with the local dispatch. It is also a good idea to be in communication with the POC, in case you have to move, for example.

Suggested Questions: How can you communicate with the POC?

Additional Information: None

Possible Problems: Officers in the class may be new with this idea and may reject it. Emphasize its benefits.

What to discuss with the Point of Contact (POC)

- Project **objective and schedule**
- Your location
- **Contact information**
- Identify enforcement areas?
- Express **concerns** about your safety, if any
- **Be friendly!**



0-48

Key Message: Discuss things you need to communicate (discuss) with the POC.

Est. Presentation Time: 1-2 minutes

Explanation of Cues/Builds: None

Suggested Comments: Self-explanatory. Discuss “what if” scenarios. Friendliness will open communication channels. Technicians are often intimidated by police.

Suggested Questions: Any other?

Additional Information: None

Possible Problems: None

2. Be Visible

- Patrol car emergency lights on
 - No headlights
- If outside the patrol vehicle and within the work zone, **MUST** wear issued **retroreflective safety vest**



Your visibility is critical!

0-49

Key Message: Discuss the importance of visibility, both the patrol vehicle and the officer himself/herself.

Est. Presentation Time: 1-2 minutes

Explanation of Cues/Builds: Text box appears on click.

Suggested Comments: When working in the presence mode, your patrol vehicle has to be visible to be effective. Use your emergency lights, not your headlights, particularly if facing traffic. If you need to be outside your vehicle for any reason, make sure you wear a retroreflective vest, day or night.

Suggested Questions: Why should you wear a vest during the day? What color are most police uniforms?

Additional Information: American National Standards Institute (ANSI) Class 2 or 3 vests are recommended.

Possible Problems: The concept of daytime vests may be controversial since some officers may be reluctant to do this. Reinforce the benefits: enhanced visibility, even during the day.

Where is the safest place to be for PRESENCE?

- Identify the **safest and most efficient location**, that is in compliance with procedures
- Will discuss in next module



0-50

Key Message: Continue discussion of visibility.

Est. Presentation Time: 1 minute

Explanation of Cues/Builds: None

Suggested Comments: When working in the presence mode, your patrol vehicle has to be visible to be effective. Where can you be effective AND safe? This will be discussed in the next module but it is here to generate interest and make them think.

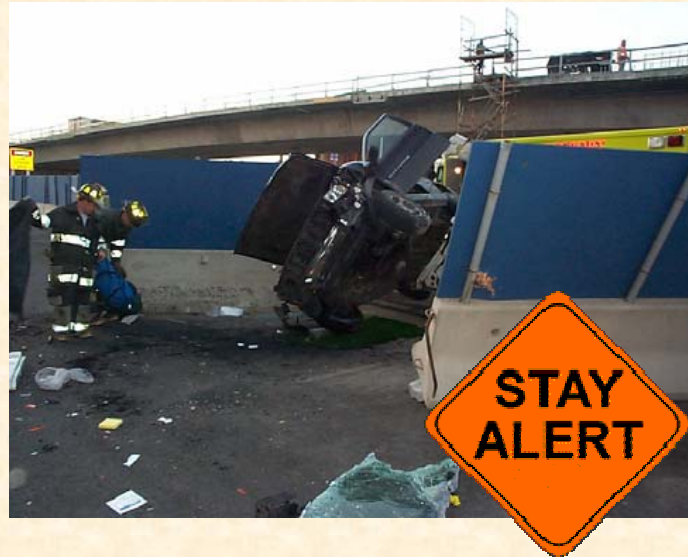
Suggested Questions: On the closed lane? On the shoulder? Where?

Additional Information: None

Possible Problems: Avoid giving the answer at this point. Keep them thinking and guessing.

3. Be alert

- **Stay alert at all times!**



0-51

Key Message: Discuss alertness

Est. Presentation Time: 1 minute

Explanation of Cues/Builds: None

Suggested Comments: Even if you are visible, you must be alert, paying constant attention to traffic. Keep your eyes open. Ask yourself: What would I do if a car is heading my way? Determine an escape route. Avoid getting blocked by guardrails, etc.

Suggested Questions: Why do you need to be alert? What things can distract you? (Falling asleep, doing paper work, watching movies, etc.)

Additional Information: None

Possible Problems: None

4. Drive-Through

- Both directions
- To become familiar with the work zone and its activities
- To determine safe places to investigate crashes and for enforcement
- To identify hazardous conditions

Key Message: Discuss the drive-through

Est. Presentation Time: 1 minute

Explanation of Cues/Builds: None

Suggested Comments: Emphasize why the drive-through is important. Self-explanatory. The more information about the work zone that you have, the better.

Suggested Questions: Why is this important? When should you do this?

Additional Information: None

Possible Problems: None

5. Investigate Crashes?

- Investigate minor property damages crashes that occur within the WZ if the time required to complete the investigation is minimal

*Crashes involving injury shall be investigated by the appropriate personnel, **not the WZ "presence" officer***

Determine local property damage (PDO) policies ahead of time!

Key Message: Discuss the possibility of investigating minor crashes.

Est. Presentation Time: 2 minutes

Explanation of Cues/Builds: Top text box appears on click. Second box appears on second click.

Suggested Comments: Treat this slide as a question to generate discussion. Remember that "presence" officers are typically "off-duty". Because of that, crashes should be investigated by "on-duty" officers. Also, investigating crashes would require "presence" officers to abandon their position, which may result in increased speeds and secondary crashes. When working as "presence", avoid investigating crashes.

Suggested Questions: How do you feel about this? What would you do if there's a crash in the work zone?

Additional Information: None

Possible Problems: None

About Investigating Crashes..

- Limit investigation of minor property-damage crashes to assurance of non-injury.

*Crashes involving injury should be **investigated** by the appropriate personnel, not the WZ "presence" officer. Enforcement agency policy will guide initial involvement.*

Determine local property damage only (PDO) policies ahead of time!

Key Message: Discuss crash investigation.

Est. Presentation Time: 2 minutes

Explanation of Cues/Builds: Top text box appears on click. Second box appears on second click.

Suggested Comments: Expand on the point from previous slide: "Presence" officers are typically "off-duty". Because of that, crashes should be investigated by "on-duty" officers. Also, investigating crashes would require "presence" officers to abandon their position, which may result in increased speeds and secondary crashes. When working as "presence", avoid investigating crashes.

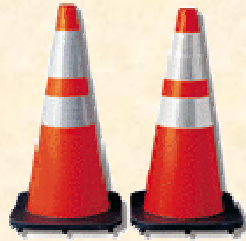
Suggested Questions: What experiences do you have? What benefits do you see to having a pre-established procedure or policy?

Additional Information: None

Possible Problems: Some officers may disagree with this. Be prepared to defend your point.

6. Arrive early/leave late

- **For best worker protection, be present** when the traffic control devices are being installed or removed



**15-Minute
Rule!**

0-55

Key Message: Recommend arriving early and leaving late

Est. Presentation Time: 1-2 minutes

Explanation of Cues/Builds: “15-Minute Rule!” appears on click.

Suggested Comments: Recommend arriving early to gather as much information as possible, driving through, and identifying your POC.

Suggested Questions: How early?

Additional Information: Recommend 15 minutes early, which is called the 15-minute rule. This is a courtesy, a recommendation.

Possible Problems: Attendants may not be aware of this concept and may reject doing this. Again, emphasize the benefits and the fact that this is a recommendation, a courtesy. It also enhances the officer’s safety.

As a courtesy: The 15 Minute Rule

- Arrive **15 minutes before** traffic control devices are being placed, moved or taken down
- Stay **15 minutes after** these changes have taken place, to ensure the new traffic control change is working properly

15-Minute

Rule!

Discuss with POC

0-56

Key Message: Explain the 15-minute rule

Est. Presentation Time: 1-2 minutes

Explanation of Cues/Builds: "15-Minute Rule!" appears on click. Text box appears on second click.

Suggested Comments: Self explanatory. This is a courtesy, not a requirement.

Suggested Questions: Have you ever done this? Why?

Additional Information: None.

Possible Problems: Attendants may not be aware of this concept and may reject doing this. Again, emphasize the benefits and the fact that this is a recommendation, a courtesy. It also enhances the officer's safety.

7. *Inspect TCP Compliance?*

- **Inspect TCP compliance?????????**
 - Check TCP against field inspection
 - Detect safety violations
 - Notify supervisor of problems

Officers are not responsible for TCP inspection, but can be extremely valuable in identifying potential problems.

NJ State Police has a program....

0-57

Key Message: Discuss the possibility of enforcing TCP compliance

Est. Presentation Time: 1-2 minutes depending on discussion

Explanation of Cues/Builds: Top box appears on click. Bottom text box appears on second click.

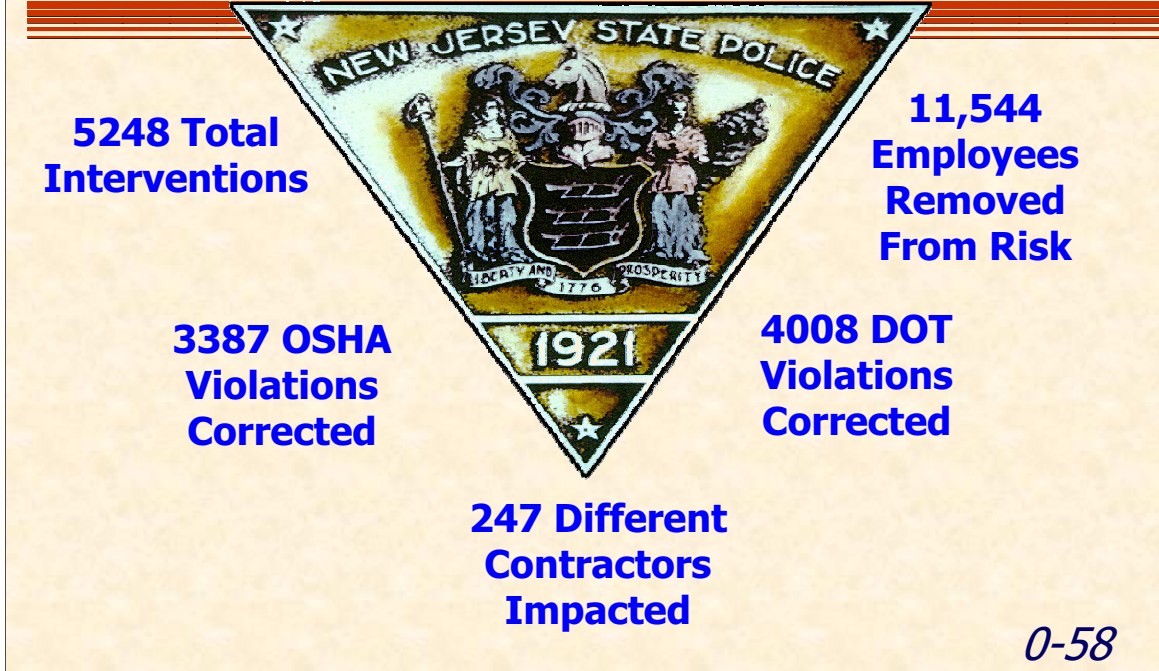
Suggested Comments: This will be controversial and possibly rejected since it is a new concept. Ask, how do you feel about inspecting for compliance with the TCP? Can we enforce TCPs? The State of NJ has a program to do exactly this. This is discussed in the next slide.

Suggested Questions: If you see something that is not right in the work zone, what would you do?

Additional Information: Even if the officer is not authorized to enforce TCPs, as a citizen, if an unsafe condition is detected, isn't our responsibility to notify someone? Play devil's advocate.

Possible Problems: Attendees may not be aware of this concept and may reject doing this.

NJ Safety Intervention Results: July 1, 1995 - November 30, 2000



Key Message: BRIEFLY discuss the NJ Program for work zone interventions by police.

Est. Presentation Time: 1-2 minutes depending on discussion

Explanation of Cues/Builds: None

Suggested Comments: The New Jersey State Police has a program to intervene (enforce) in work zones that are not safe (not according to the standards, safe practices and/or TCP). The slide lists the “intervention” statistics for the period.

Suggested Questions: Do you think a program like this would work in your state? What are the benefits? Pros? Cons?

Additional Information: OSHA = Occupational Safety and Health Administration, DOT = Department of Transportation.

Possible Problems: Attendants may not be aware of this concept and may reject doing this.

DISCUSSION

- *How do you feel about requiring training for officers before they work in or around traffic work zones?*



0-59

Key Message: Discussion slide

Est. Presentation Time: Depends on discussion. Use your judgment.

Explanation of Cues/Builds: None

Suggested Comments: Generate discussion. Emphasize the importance of training.

Suggested Questions: What about certification? Who should provide this training/certification? Discuss.

Additional Information: None

Possible Problems: None

Module Recap

- *What are the traditional roles of LEOs in work zones?*
- *Who else is involved with work zones?*
- *What specific activities are typical of LEOs in work zones?*
- *What is the "15-Minute Rule"?*
- *Do you know your POC?*
- *Do policies related to emergency response exist?*

0-60

Key Message: Recap slide

Est. Presentation Time: 2-3 minutes

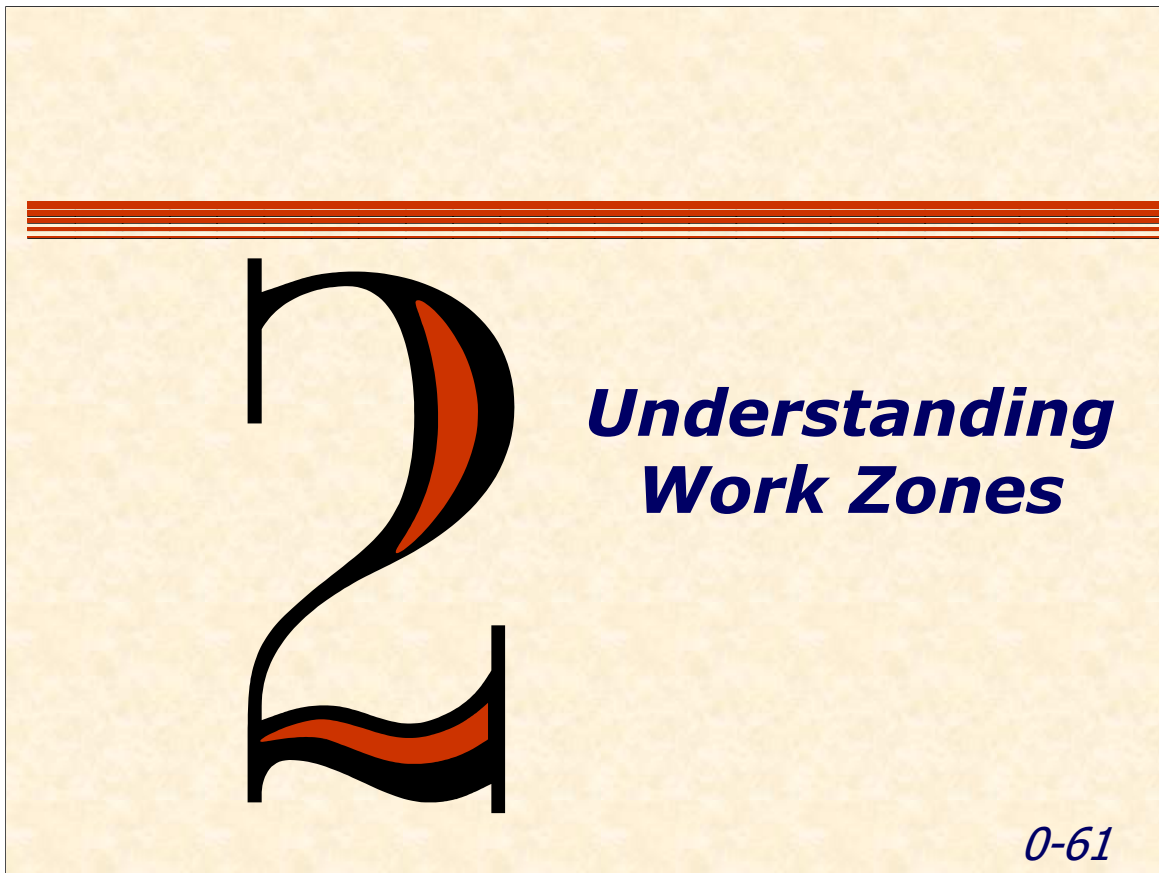
Explanation of Cues/Builds: None

Suggested Comments: Self-explanatory. Try to gauge understanding by asking these questions and others.

Suggested Questions: Shown.

Additional Information: None

Possible Problems: None



Session Title: Module 2. Understanding Work Zones

Performance-Based Learning Outcomes:

Understand the fundamentals (basic concepts) of work zone projects.

Instructional Method: Lecture

Session Time: 46 slides. Approximately 60 minutes depending class participation.

Evaluation Plan: Evaluate learning outcomes at the end of each module using the questions contained in the last slide of that module and through the exercises.

Module Objectives

- *Discuss sources of WZ standards & guidelines*
- *Define the component parts of a TTC zone*
 - *WZ terminology*
- *Discuss patrol vehicle positioning*

0-62

Key Message: List module objectives.

Est. Presentation Time: Less than 1 minute

Explanation of Cues/Builds: None

Suggested Comments: Self-explanatory.

Suggested Questions: None

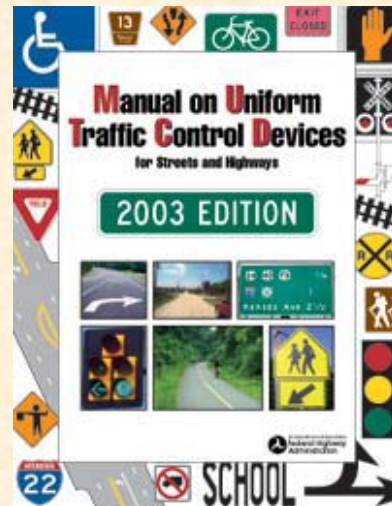
Additional Information: TTC means Temporary Traffic Control – TTC zone is a work zone.

Possible Problems: None

Where Can Federal WZ Standards be Found?

- Manual on Uniform Traffic Control Devices (MUTCD)

Uniformity!



0-63

Key Message: Indicate where Federal standards and guidelines can be found.

Est. Presentation Time: Less than one minute

Explanation of Cues/Builds: “Uniformity” appears on click.

Suggested Comments: Federal standards and guidelines can be found in the MUTCD, published by FHWA (Federal Highway Administration), part of the US Department of Transportation (DOT). The purpose of this document is to provide for the uniformity of traffic control devices nationwide. The current edition is the 2003 edition. This documents applies to all states and territories, according to the Code of Federal Regulations (CFR), Title 23.

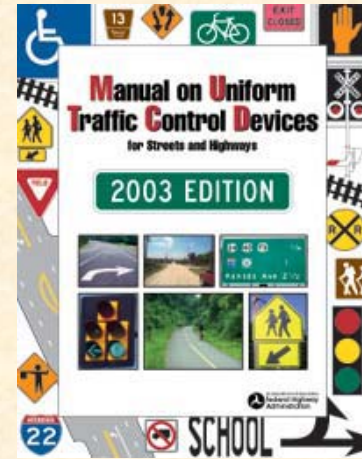
Suggested Questions: Why do we need uniformity?

Additional Information: Standards are different from guidelines. Standards are normally requirements, guidelines are recommendations.

Possible Problems: None

Manual on Uniform Traffic Control Devices

- **MINIMUM** standards
 - States and local agencies can have more restrictive standards
 - Applies to **ALL** streets and highways open to the public travel



0-64

Key Message: Describe the extent/application of MUTCD standards.

Est. Presentation Time: 1 minute

Explanation of Cues/Builds: None

Suggested Comments: The MUTCD establishes “minimum” standards and guidelines, applicable everywhere in the U.S. States and territories may have their own standards as long as they are more strict (restrictive) than the MUTCD.

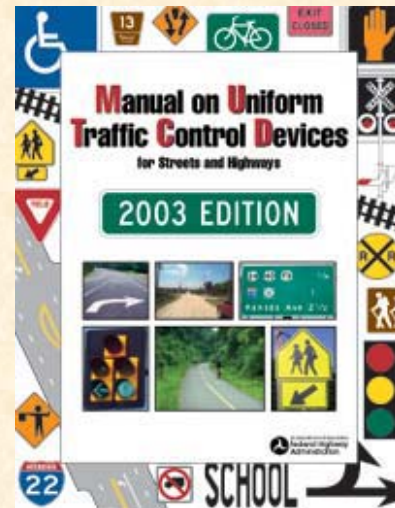
Suggested Questions: What is a “minimum” standard? May give the example of the height of cones. The MUTCD requires cones used on freeways to be 28” high, as a minimum, but several states require 36” cones.

Additional Information: None

Possible Problems: None

The MUTCD

- **Does not** address use of law enforcement officers in WZ
- **Does not** show location of police vehicles



0-65

Key Message: Indicate limitations of MUTCD when it comes to the use of LEOs in work zones.

Est. Presentation Time: 1 minute

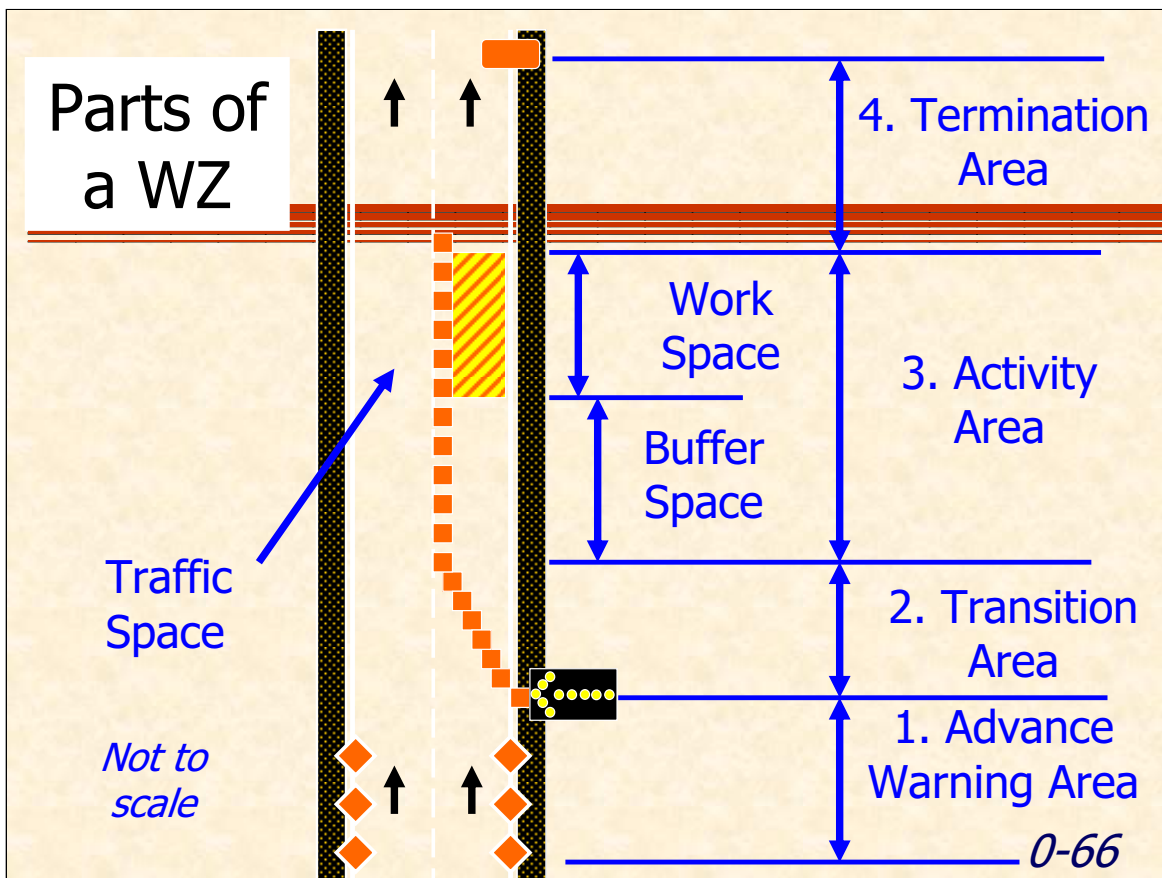
Explanation of Cues/Builds: None

Suggested Comments: These limitations mean that specific information about the use of LEOs is lacking. Their use would be subjective, within the guidelines of the MUTCD. However, the MUTCD does not address LEOs specifically.

Suggested Questions: What do we do if specific standards do not exist? What problems would that create? Answer: Lack or uniformity and improper practices.

Additional Information: States may have their own, more specific, guidelines.

Possible Problems: Attendants may be critical of the MUTCD. Indicate that the MUTCD gives a framework for protecting “workers” (and users). LEOs may be considered workers and the same principles would apply. But in the case of LEOs the information is not specific.



Key Message: Describe the Component Parts of a Typical Work Zone.

Est. Presentation Time: 5 minutes

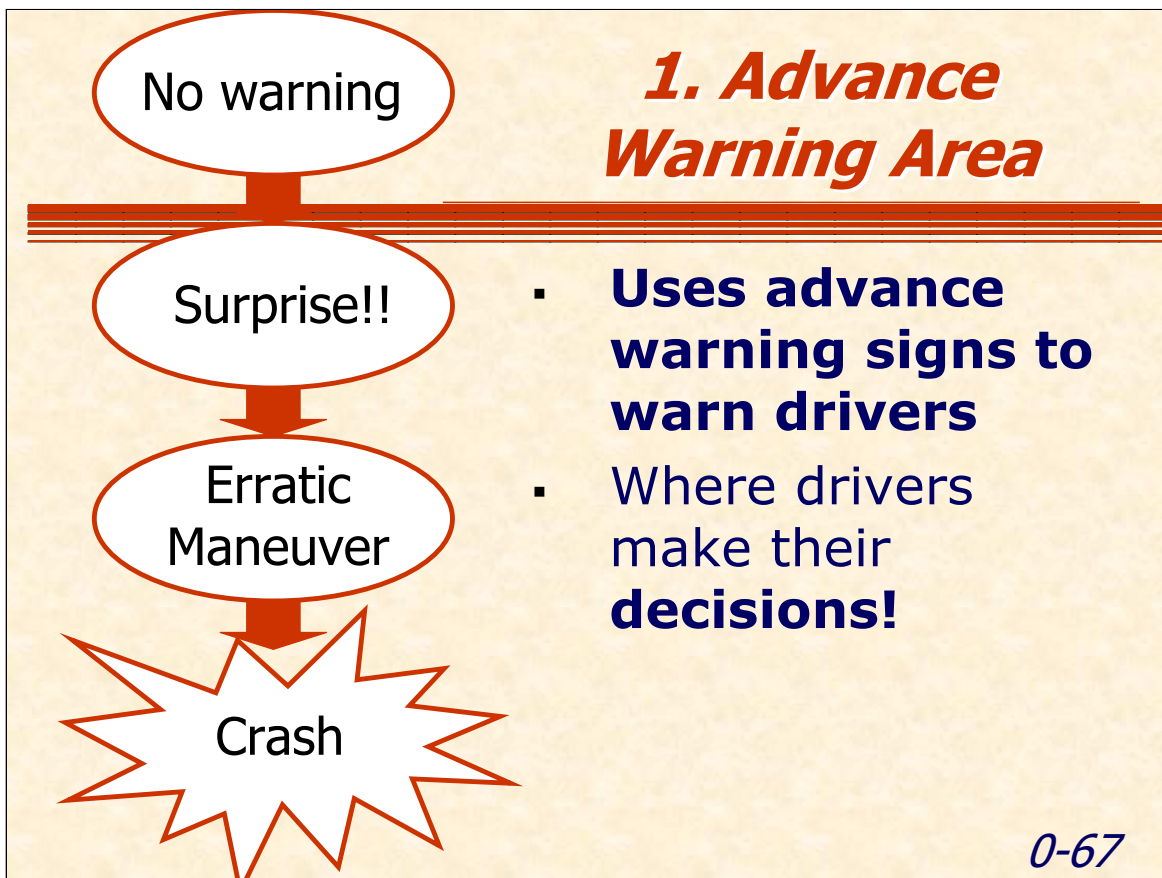
Explanation of Cues/Builds: Each of the component parts appears on click, starting from the bottom.

Suggested Comments: Even though the following slides discuss each part in detail, spend some time on this slide. Indicate this is an example of a right lane closure on a 4-lane divided highway. Go over each of the parts, describing its purpose. For example, the ADVANCE WARNING AREA provides warning to motorists about the situation ahead, and the required action. In this case, it would be: ROAD WORK AHEAD, RIGHT LANE CLOSED, MERGE RIGHT.

Suggested Questions: Is this the way you see work zones in the field? Does this look familiar?

Additional Information: This is a 4-lane divided highway, but only the two northbound lanes are shown. Indicate that this IS NOT a two-lane road. "Divided" refers to presence of a median. "Undivided" highways only have a painted line to separate opposing flows.

Possible Problems: Avoid giving too much detailed information at this point. This is to illustrate terminology only. Specific information is given in the following slides.



Key Message: Describe the Advance Warning Area (AWA).

Est. Presentation Time: 1-2 minutes

Explanation of Cues/Builds: None

Suggested Comments: The AWA is critical to a work zone. Without it, drivers would be surprised, which could lead to erratic maneuvers and crashes. Proper warning allows time for drivers to understand the situation ahead and the required actions. EVERY work zone should have an AWA.

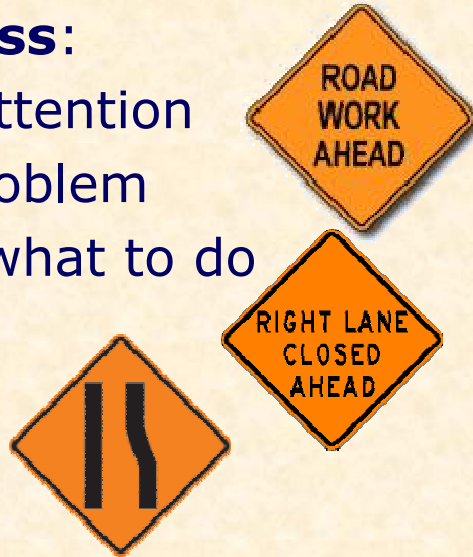
Suggested Questions: What would happen if a lane closure is missing the AWA? How do we warn motorists? Warning signs and supplemental devices such as message boards.

Additional Information: None

Possible Problems: None

Advance Warning Signs

- Usually, **3-step process**:
 - 1st sign: Gets their attention
 - 2nd sign: Tells the problem
 - 3rd sign: Tells them what to do
- **Diamond shape**
- **Orange in WZ**
- **48" x 48"**



0-68

Key Message: Indicate the subcomponents of the AWA.

Est. Presentation Time: 1-2 minutes

Explanation of Cues/Builds: None

Suggested Comments: Usually (not necessarily, particularly in low-speed areas) the 3-step process is used in the AWA. Some states use additional signs. Warning signs are diamond-shape and orange, to indicate a temporary conditions. Signs used in "high-speed areas" shall be at least 48" x 48". Smaller signs may be used in lower speed areas. Indicate that this is a State preference and they should consult their local standards. The instructor may want to become familiar with the local standards.

Suggested Questions: None

Additional Information: None

Possible Problems: Indicate that this is a State preference and they should consult their local standards. The instructor may want to become familiar with the local standards.

MUTCD Suggested Advance Warning Sign Spacing

<u>Road Type</u>	<u>A</u>	<u>B</u>	<u>C</u>
Urban (low speed*)	100'	100'	100'
Urban (high speed*)	350'	350'	350'
Rural	500'	500'	500'
Freeways and Expressways	1,000'	1,500'	2,640'

** Speed determined by local agency 0-69*

Key Message: Discuss Sign Spacing in the AWA.

Est. Presentation Time: 2 minutes

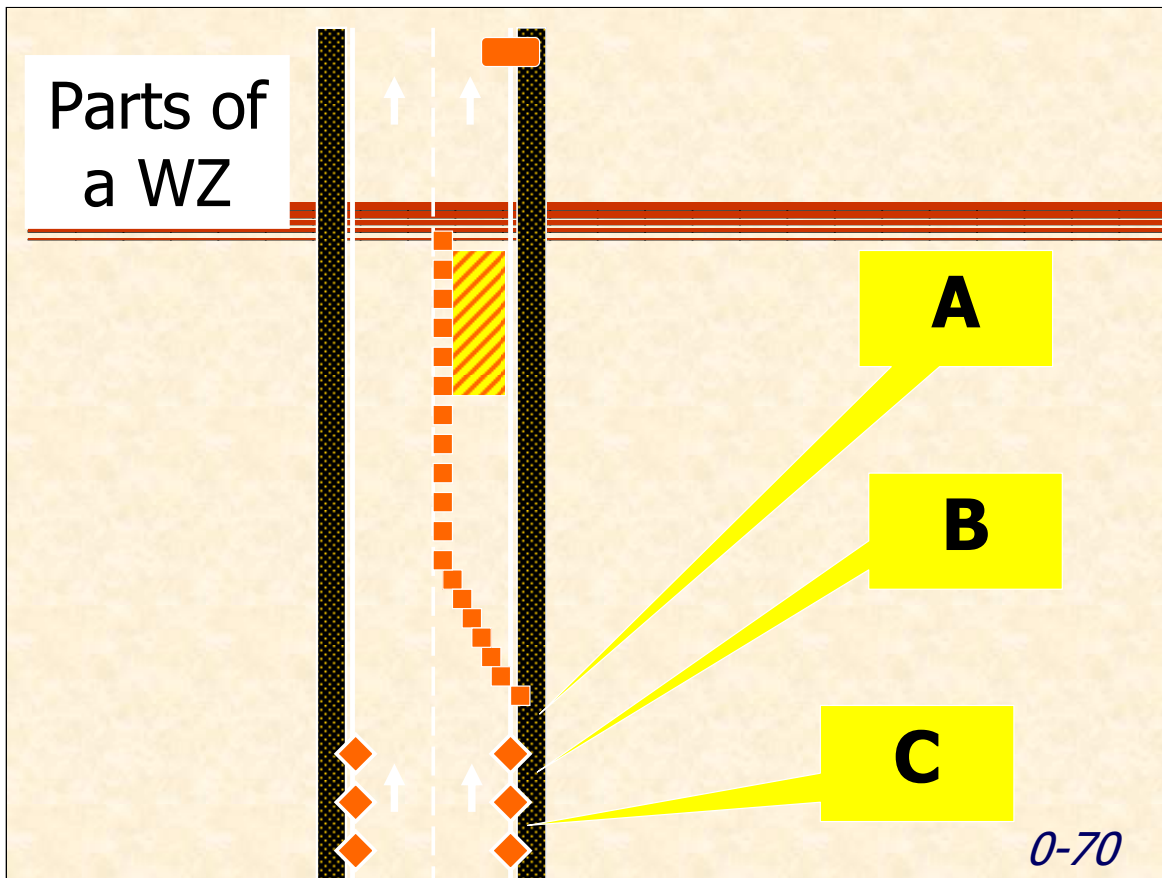
Explanation of Cues/Builds: None

Suggested Comments: This table shows the sign spacing suggested in the MUTCD. The following slide shows what A, B and C are, but they refer to the spacing between signs, when the 3-step process is used. Advance to the next slide to illustrate this point and then return to this one.

Suggested Questions: What would happen if the signs are much closer than this? Motorists would not have the necessary time to make their decisions and take the required action. What is "low speed"?

Additional Information: The breakpoint between low speed and high speed is called the "threshold speed". It varies by jurisdiction but it is typically between 35 and 40 mph.

Possible Problems: Indicate that this is a State preference and they should consult their local standards. The instructor may want to become familiar with the local standards. Also notice this is not a requirement because sometimes it is not possible. If this spacing is not possible, suggest to increase it, not to decrease it. Also, be prepared to define "urban" and "rural". Urban areas are not restricted due to heavier traffic, pedestrians and other obstructions. Define freeways and expressways as the same: Limited access, where access is only through ramps, not intersections.



Key Message: Define A, B and C.

Est. Presentation Time: Less than 1 minute

Explanation of Cues/Builds: None

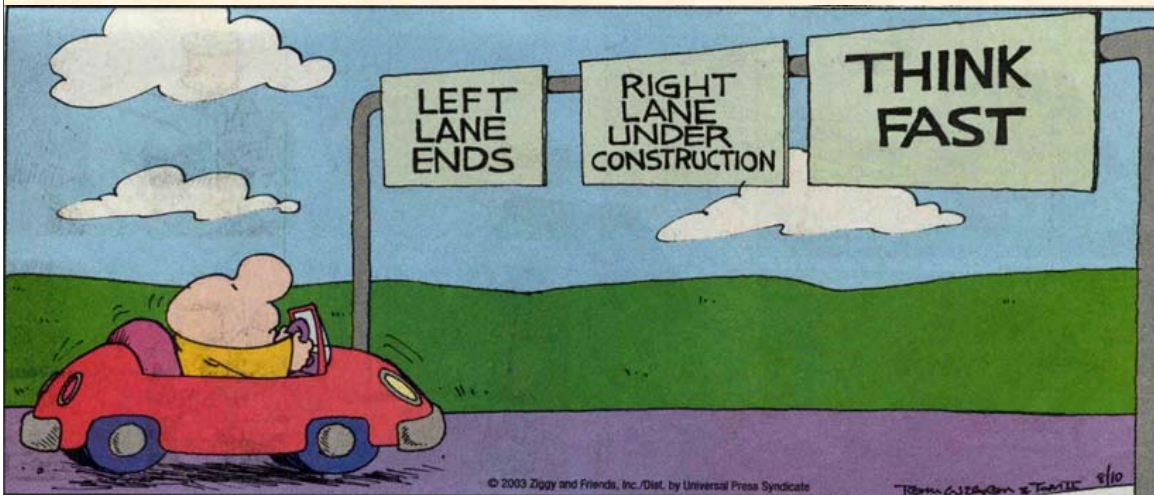
Suggested Comments: See previous slide for guidance on this slide.

Suggested Questions: None

Additional Information: Indicate that A is the distance to the sign closest to the work space.

Possible Problems: None

Sign spacing is critical!



To give TIME to analyze and decide on maneuver

0-71

Key Message: Describe the importance of proper sign spacing.

Est. Presentation Time: Less than 1 minute

Explanation of Cues/Builds: None

Suggested Comments: Meant to be funny. Illustrates how time translates into distance. The closer the signs, the less time motorists will have to make their decisions.

Suggested Questions: How much time is enough time at 65 mph?

Additional Information: None

Possible Problems: Instructor may hide slide if desired.

Portable Changeable Message Signs (PCMS)

- Sometimes used **before the advance warning area**
- **Supplemental** devices
- **Optional** devices



0-72

Key Message: Describe use of PCMS.

Est. Presentation Time: Less than 1 minute.

Explanation of Cues/Builds: None

Suggested Comments: PCMSs are sometimes (optionally) used as supplemental devices prior to the AWA. Supplemental means used “in addition” to static signs, never as a replacement (in lieu of). They may also be used for incident management.

Suggested Questions: Why are PCMS supplemental? Because they may malfunction, cannot be relied upon.

Additional Information: “Message board” is a lay term for a PCMS. PCMSs come in various sizes. Scrolling text is not permitted. Abbreviations and messages must be pre-approved and included in the TCP. They shall be dimmed (50%) for nighttime use.

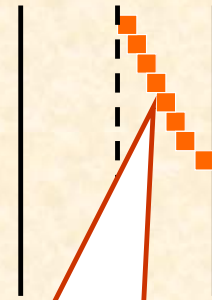
Possible Problems: Avoid an over-technical discussion.

2. Transition

- Typically uses **channelizing devices** to form a **taper**

A taper is a gradual transition

Channelizing devices



0-73

Key Message: Define tapers.

Est. Presentation Time: 1 minute

Explanation of Cues/Builds: Text box appears on click.

Suggested Comments: Define the taper as a gradual transition, from one condition to another. There are various types of tapers. This one illustrates a “merging” taper, which is used on lane closures. These tapers are long so traffic can maintain speed. Short tapers encourage drivers to slow down, leading to congestion. Later in the class we discuss a minimum length for these tapers. Channelizing devices (cones, barricades, drums [next slide]) are used to create tapers.

Suggested Questions: Should these tapers be short or long? Why?

Additional Information: None

Possible Problems: None

Channelizing Devices

- Cones
 - Two white bands for night use!
 - Short duration only
- Drums
- Others



0-74

Key Message: Define channelizing devices

Est. Presentation Time: 1-2 minutes

Explanation of Cues/Builds: None

Suggested Comments: Define channelizing devices as objects used to “channelize” or “delineate” (create lines). The slide illustrates cones and drums only, perhaps the most common. Barricades and tubular markers are also channelizing devices. The use of cones is very limited; usually short duration projects because they need to be maintained. If cones are used at night, they shall have the two retroreflective bands shown. Drums are common in long term projects (unattended).

Suggested Questions: None

Additional Information: The MUTCD requires cones used on freeways to be at least 28” high. Several states require 36” cones. Drums are also 36” high.

Possible Problems: None

Minimum length of **MERGING taper** (L) in feet necessary to close a 12-ft lane

SPEED	L
25	125
30	180
35	245
40	320
45	540
50	600
55	660
60	720
65	780
70	840
75	900

Most lanes are 12'

0-75

Key Message: Define the MINIMUM length of MERGING tapers.

Est. Presentation Time: 2 minutes

Explanation of Cues/Builds: Text box appears on click.

Suggested Comments: Table shows the minimum length of a merging taper, necessary to close a 12-foot lane. Most freeway lanes are 12 feet wide, so this table would apply to most lane closures on freeways. These figures are minimums. The length could be more, but not less. To a certain point, the longer the taper, the smoother traffic will flow.

Suggested Questions: How long is a football field? 300 feet. For a 55 mph zone, a merging taper would be over 2 football fields in length.

Additional Information: These figures are a function of the speed of traffic and the width of the lane. For narrower lanes, shorter tapers may be acceptable according to formulas presented in the MUTCD. The speed used IS NOT the posted speed but the “prevailing” speed in the area.

Possible Problems: Avoid a technical discussion. This table only illustrates that tapers are carefully planned and that there are requirements for their lengths. Avoid discussing formulas.

One-Lane Two-Way Taper

50-100' MAX

- On two-lane roads
- Flaggers required
- **"Flagging taper"**

Special case!!

0-76

Key Message: Illustrate a flagging taper.

Est. Presentation Time: 1 minutes

Explanation of Cues/Builds: None

Suggested Comments: Slide illustrates how "flagging tapers" are an exception to the previous slide. These tapers are used on two-lane roads where one lane is closed. This requires flaggers (or portable signals). Because the flaggers need to slow down and sometimes stop traffic, a short taper is used, as shown.

Suggested Questions: Why do we need a short taper in this situation? What is a "two-lane road"?

Additional Information: Arrow panels (displaying an arrow) are never used in two-lane roads, since they would direct traffic into an oncoming lane.

Possible Problems: Do not elaborate too much. Slide is only here because it is an exception to the explanation from the previous slide (a special case) .

Speeds are Critical in Work Zones!

- The faster the speed:
 - The less **time** motorists will have to make their maneuvers
 - The more severe the crash

**This is called
"Perception-
Reaction
Time"**



0-77

Key Message: Relate time to distance.

Est. Presentation Time: 1 minute

Explanation of Cues/Builds: Text box appears on click.

Suggested Comments: At high speeds, motorists have less time to make their decisions and maneuvers.

Suggested Questions: How much time do we need, as humans, in order to perceive, analyze, and react to a situation? That time is called PRT, or perception-reaction time. The answer is given on the next slide.

Additional Information: None

Possible Problems: None

Perception-Reaction Time (PRT)

- The amount of TIME drivers need to **perceive, analyze, react and complete their maneuvers**

***PRT= 2.5 sec.
under "normal"
conditions***

***PRT= 5+ sec.
for work
zones!!!***

0-78

Key Message: Define PRT.

Est. Presentation Time: 1 minute

Explanation of Cues/Builds: Left text box appears on click. Right text box appears on second click.

Suggested Comments: "Normal" refers to every day, familiar situations. In a work zone, the PRT is typically twice as long, or even longer; 5-7 seconds. This is the time we need as humans. PRT is a "human factor".

Suggested Questions: Why would the PRT be longer in a work zone? Because drivers need more time to analyze a situation that is not familiar to them. [maybe also because there is more visual information to analyze – advance warning signs, cones, maybe a PCMS, maybe a flagger, vehicles entering roadway, etc.]

Additional Information: None

Possible Problems: None

Converting mph to fps

- Multiply the speed in miles per hours by **1.47** to obtain the number of feet a vehicle travels in one second

Example:

$$60 \text{ mph} = (60)(1.47) = 88 \text{ fps}$$

***At 60 mph you travel 88 feet
in ONE second!***

0-79

Key Message: Understand how much distance we cover in one second when traveling at certain speed.

Est. Presentation Time: 1-2 minutes

Explanation of Cues/Builds: Top text box appears on click. Bottom text box appears on second click.

Suggested Comments: Ask participant simply to remember the number 1.47. When you multiply speed in miles per hour by 1.47, you convert speed to feet per second, or the number of feet you would travel at that speed in one second. This is meant to be an eye opener, to help them realize the distance you would cover in one second at a certain speed.

Suggested Questions: If you cover 88 feet in one second, how many feet would you cover during the PRT? [in a work zone, at least 440 feet: 5 seconds x 88]

Additional Information: None

Possible Problems: None

ESTIMATING: Converting mph to fps

- Approximate by using 1.5
 - The number plus its half



Example:

$$60 \text{ mph} = 60 + 30 = 90 \text{ fps}$$

0-80

Key Message: Provide tip to approximate the point made on previous slide.

Est. Presentation Time: Less than 1 minute

Explanation of Cues/Builds: Text box appears on click.

Suggested Comments: If you do not have a calculator or if you are not a math wiz, use this technique to approximate, to get a mental picture of the distances covered in one second at certain speeds.

Suggested Questions: NASCAR fans: How many feet do you cover in one second at 200 mph? Answer: Approximately 300 ft, or 200 + 100.

Additional Information: None

Possible Problems: None

Traveling Speed (mph)	Feet Traveled in One Second
25	37
35	51
45	66
55	81
60	88
65	96
75	110
80	118

Feet Traveled in One Second

0-81

Key Message: Table to illustrate/expand on previous slide.

Est. Presentation Time: Less than 1 minute


Explanation of Cues/Builds: None

Suggested Comments: The example from the previous slide is in this table (60 mph).

Suggested Questions: If you cover this many feet in one second, how many feet would you cover during the PRT? Answer: Multiply these numbers by 2.5 for normal conditions and by 5 for work zones. This is illustrated in two slides.

Additional Information: None

Possible Problems: None



Distance Traveled During the PRT

Speed (mph)	Feet traveled	
	in 2.5 sec.	in 5.0 sec.
25	92	183
35	129	257
45	165	331
55	202	404
60	220	440
65	239	478
75	276	551
80	294	588

Key Message: Relate speed to the number of feet covered during the PRT.

Est. Presentation Time: 2 minutes

Explanation of Cues/Builds: “Football Field” appears on click, to relate the distances on the table to a visual picture.

Suggested Comments: Table illustrates the distances, in feet, covered at certain speed during the PRT. These figures come from multiplying the previous table by 2.5 and 5.0. Emphasize that at 65 mph, you cover 478 feet in 5 seconds, the PRT for a work zone.

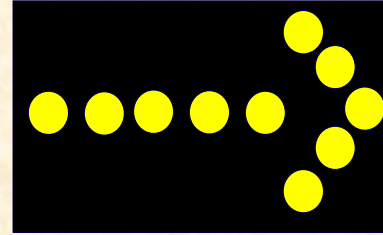
Suggested Questions: None

Additional Information: None

Possible Problems: None

Arrow Panels

- **Supplemental** device
- Used in addition to signs



Arrows are used **ONLY** when a lane is closed and merging is required

0-83

Key Message: Introduce arrow panels.

Est. Presentation Time: 1 minute

Explanation of Cues/Builds: Arrow flashes continuously.

Suggested Comments: Arrow panels are supplemental devices, used IN ADDITION to static signs. Arrows are displayed only when lanes are closed.

Suggested Questions: Why are arrow panels supplemental? Because they may malfunction.

Additional Information: Arrow panels and arrow boards may be used interchangeably.

Possible Problems: None

The "CAUTION" Mode

- Displayed for shoulder operations
- **No arrows if all lanes are open**



0-84

Key Message: Discuss the "CAUTION" mode.

Est. Presentation Time: 1 minute

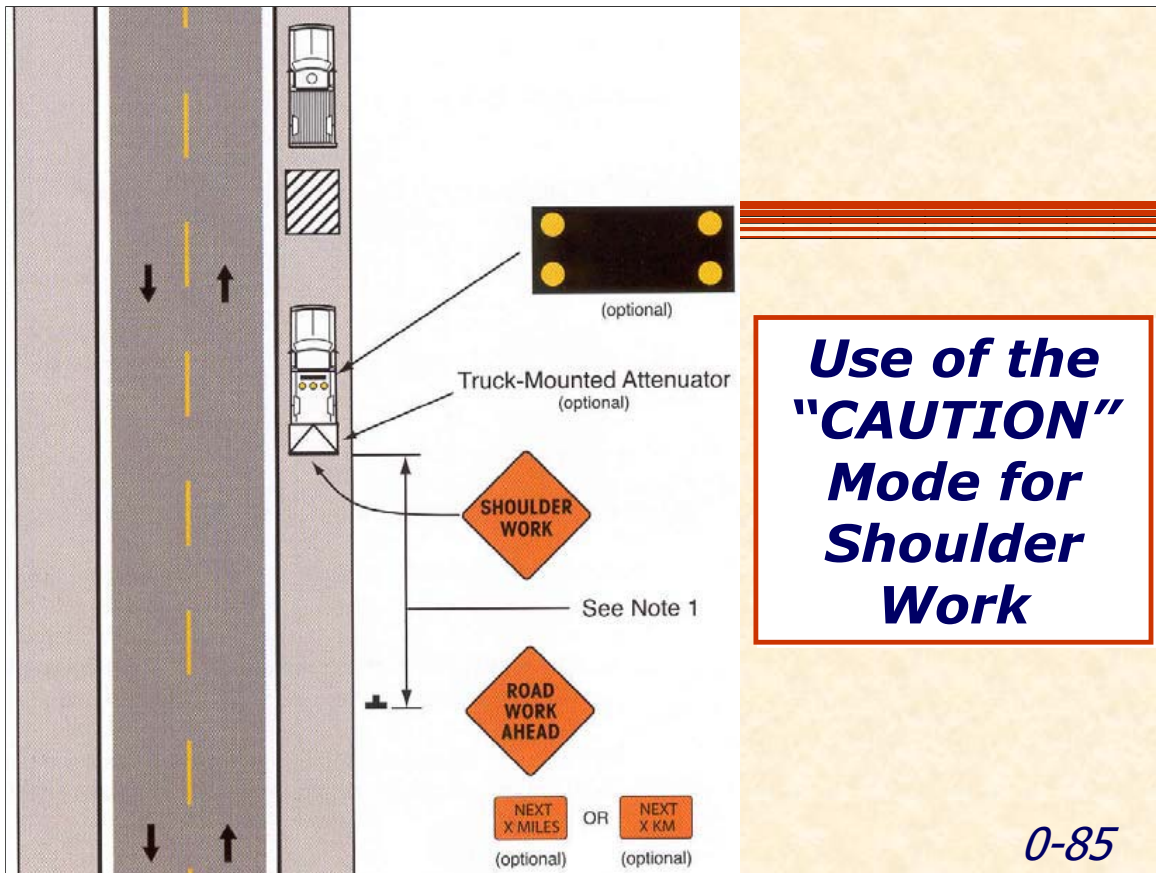
Explanation of Cues/Builds: None

Suggested Comments: The "caution" mode is used for shoulder operations, or when all lanes are open but we wish to "caution" or warn motorists about a condition ahead. Shoulder work is the most common example. The sign displays four corners flashing or a flashing bar (not shown).

Suggested Questions: Have you ever seen this mode?

Additional Information: It is quite common (unfortunately) to see shoulder work with an arrow being displayed. The caution mode should be used instead. Some states prefer the four corners over the flashing bar since the bar may be confused with a malfunctioning arrow.

Possible Problems: None



Key Message: Display example of point made in previous slide.

Est. Presentation Time: Less than 1 minute

Explanation of Cues/Builds: None

Suggested Comments: Notice the use of the CAUTION mode for shoulder operations, in this case on a short-term project on a two-lane road, where the display is mounted on a truck-mounted attenuator.

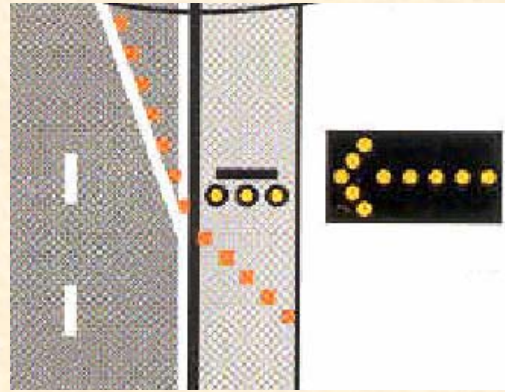
Suggested Questions: None

Additional Information: Fast slide to illustrate the point made in previous slide.

Possible Problems: None

Preferred Arrow Panel Location

- For a stationary lane, panel should be located ***on the shoulder at the beginning of the taper***



0-86

Key Message: Describe the preferred location of the arrow panel for lane closures.

Est. Presentation Time: 1 minute

Explanation of Cues/Builds: None

Suggested Comments: This is the preferred location, on the shoulder at the beginning of the taper. If there is no shoulder, then it should be located inside the taper as close to the merge point as possible.

Suggested Questions: What if there is no shoulder?

Additional Information:

Possible Problems: None

3. Activity Area

- **3 Sub-areas**
 - Buffer space
 - Work space
 - Traffic space

ACTIVITY

0-87

Key Message: List the three sub-areas of the activity area.

Est. Presentation Time: Less than 1 minute

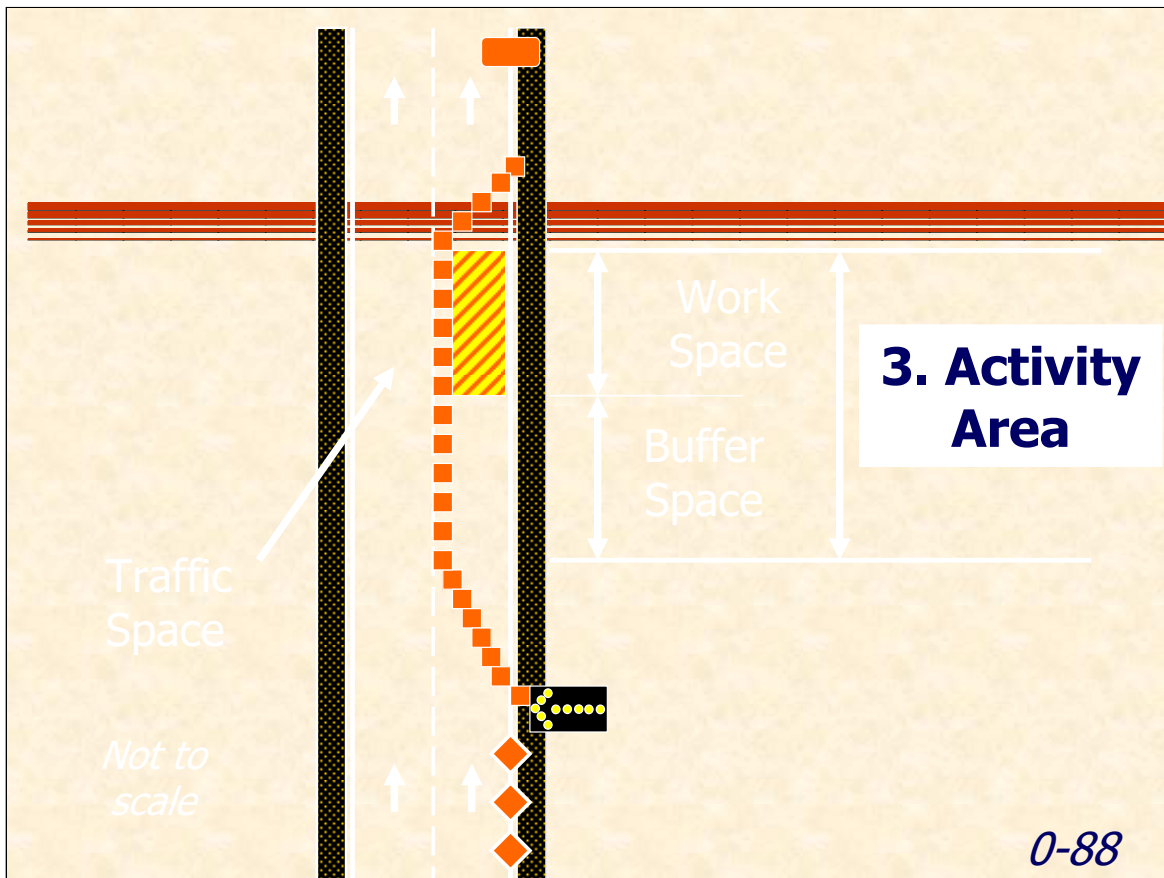
Explanation of Cues/Builds: None

Suggested Comments: Self-explanatory.

Suggested Questions: None

Additional Information: None

Possible Problems: Just list them. The following slides will discuss each of them in detail.



Key Message: Illustrate where the activity area fits within the typical work zone.

Est. Presentation Time: Less than 1 minute

Explanation of Cues/Builds: None

Suggested Comments: Self explanatory.

Suggested Questions: None

Additional Information: None

Possible Problems: None

Buffer Space

- Recovery area for errant vehicles
- Protects workers
- **ALWAYS** empty
 - No vehicles or equipment allowed
- **Highly** recommended



**DO NOT
PARK IN
BUFFER
SPACE!**

A "FORGIVING DESIGN"

0-89

Key Message: Discuss the buffer space.

Est. Presentation Time: 2 minutes

Explanation of Cues/Builds: "A FORGIVING DESIGN" appears on first click. Text box appears on second click.

Suggested Comments: The buffer space is highly recommended. This feature separates the taper from the work area. It allows errant drivers who may drive through the taper [and what do you mean "through the taper" – actually through the cones or barrels? Or just enter the taper and get too far into it without realizing they need to move over?] a distance to recover BEFORE reaching the work zone and injuring workers. Buffer spaces **MUST** be empty or they defeat their purpose. **EMPTY** means clear, nothing there, not a patrol vehicle, nothing.

Suggested Questions: What would happen if there is no buffer and a vehicle runs through the taper? What do you think the length of the taper will depend on? Speed! Not the posted speed, the prevailing speed!

Additional Information: Providing a buffer is considered a "forgiving design" where motorists do not pay with their lives for making a mistake, they are "forgiven". A new concept is a "caring design". If a distracted motorist runs through the taper, he/she has three options: 1) stop, 2) bail into the clear zone, or 3) bail into the traffic space. All three would minimize the severity of the crash, if it does occur at all.

Buffers are not required because sometimes they do not fit (a flexible standard). But if they fit, they should be provided according to the table on slide 31.

Possible Problems: None

Do not park in buffer space!

- Your vehicle is not equipped with an impact attenuator!
- Not a "forgiving design"



0-90

Key Message: Discuss where to position a patrol vehicle on lane closures.

Est. Presentation Time: 2 minutes

Explanation of Cues/Builds: None

Suggested Comments: A buffer space is always empty. A patrol vehicle in the buffer space is not a forgiving design. Motorists who run through the taper will impact the patrol vehicle, injuring themselves and the officer. Unlike a TMA, patrol vehicles are not designed to be impacted.

Suggested Questions: Where should the patrol vehicle be located? Why?

Additional Information: The patrol vehicle should be on the shoulder, within the AWA. This is discussed in detail later in this class. This is a simple concept but affects the LEOs directly. Spend some time discussing it.

Possible Problems: This may be controversial since it may go against current practices. Some students may reject this concept. Be ready to defend it.

Stopping Sight Distance as a Function of Speed

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

(Use for Longitudinal Buffer Spaces) 1

Key Message: Discuss the length of buffer spaces.

Est. Presentation Time: 1-2 minutes

Explanation of Cues/Builds: None

Suggested Comments: This table is from the 2003 MUTCD. The distances are the distances required by a vehicle to stop at certain speed.

Suggested Questions: How long is a football field again? 300 feet. At 65 mph, a buffer space is longer than TWO football fields.

Additional Information: These are minimum distances. If warranted, longer distances may be used. Source: 2003 MUTCD, Table 6C-2. Stopping Sight Distance as a Function of Speed. These distances were increased substantially from previous editions.

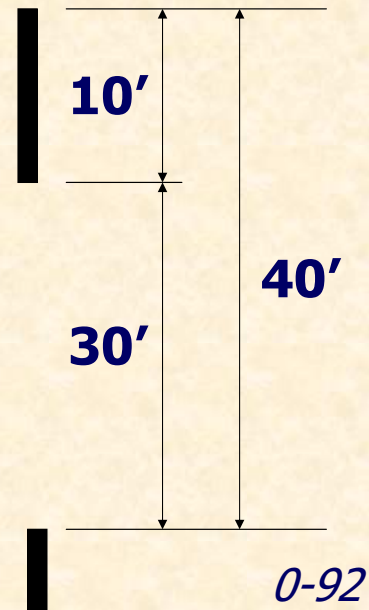
Possible Problems: None

Determining distances in the field

- Use odometer for longer distances
 - 1/10 mile = 525'
- Use skip pattern for short ones

"10-30 SKIPS"

- 10 skips = 400'



Key Message: How to determine distances in the field.

Est. Presentation Time: 1 minute

Explanation of Cues/Builds: Text box appears on first click. Skids appear on second click.

Suggested Comments: When determining distances in the field, you may use your odometer for long distances and/or the "skip pattern" for short ones. A 10-30 skip means that each line is 10 feet long and the gap between the lines is 30 feet. So from one line to the next, there are 40 feet. Not all skips are 10-30, so make sure you know what the pattern is.

Suggested Questions: None

Additional Information: This is a field approximation.

Possible Problems: None

Traffic Space

- The space open for public to pass **safely**



0-93

Key Message: Discuss the traffic space.

Est. Presentation Time: Less than 1 minute

Explanation of Cues/Builds: None

Suggested Comments: Self explanatory. The traffic space is open to the public.

Suggested Questions: What is the minimum width of a traffic lane? It depends on the type of facility and state preferences, but in general terms, the minimum width of a freeway lane is 11 feet.

Additional Information: None

Possible Problems: None

4. Termination Area

- May (optionally) include
 - **Termination taper**
 - **100' min.**
 - **END ROAD WORK** sign



0-94

Key Message: Discuss the termination area.

Est. Presentation Time: Less than 1 minute

Explanation of Cues/Builds: None

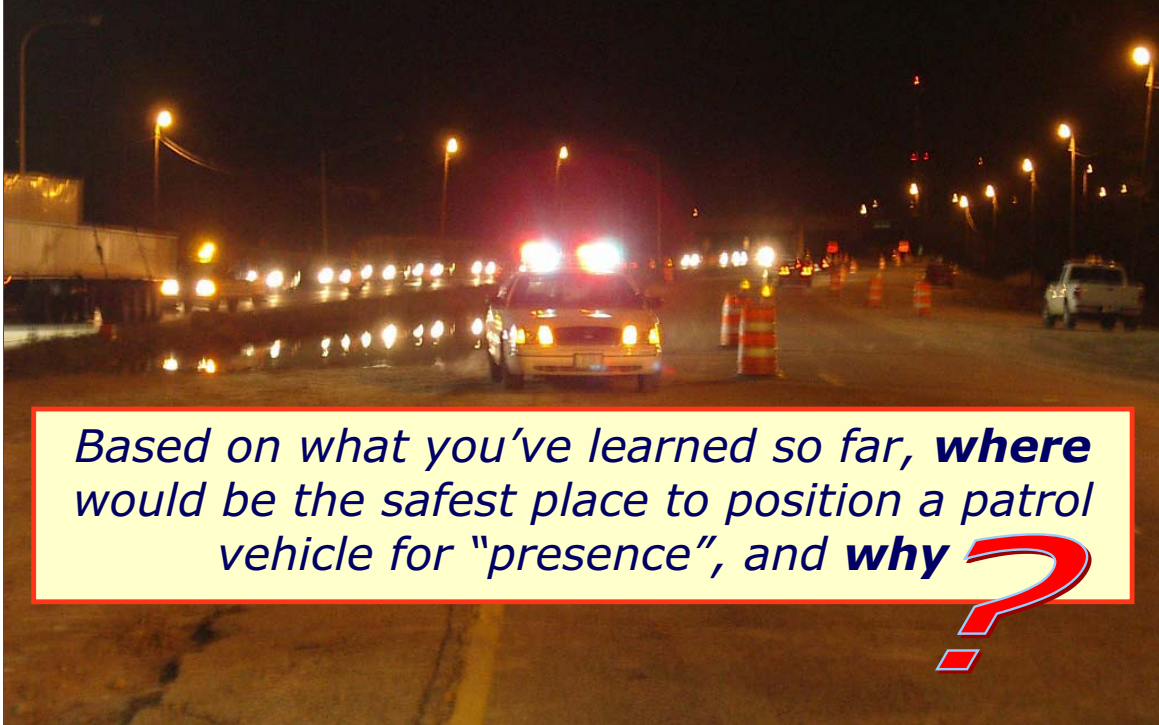
Suggested Comments: The last component part of the termination area, which may optionally include a “termination taper” and an END ROAD WORK sign. The termination taper is a minimum of 100’ long (per lane reopened), and the END ROAD WORK sign is typically 500’ past the last device.

Suggested Questions: None

Additional Information: Termination tapers are usually built with 6 devices at 10’ apart.

Possible Problems: None

Positioning your patrol car



*Based on what you've learned so far, **where** would be the safest place to position a patrol vehicle for "presence", and **why** ?*

Key Message: Discuss patrol vehicle positioning.

Est. Presentation Time: Based on discussion

Explanation of Cues/Builds: Empty text box and question mark appear on first click. Text appears on second click.

Suggested Comments: Let's open the floor for discussion. Based on what you have learned so far, where would you position your patrol vehicle if working on a lane closure?

Suggested Questions: Should it be in the buffer space? In the taper? In the termination area? Where can you be safe and at the same time effective?

Additional Information: None

Possible Problems: Attendees may be reluctant to initiate discussion. Be prepared to ask questions and play devil's advocate.

- *BEFORE* the transition
 - *NOT IN BUFFER*
- *On the SHOULDER or MEDIAN*
- *Between the 2nd and 3rd sign*
 - *Where we need the motorists to pay most attention to what they need to do ahead.*
- *Facing traffic*
- *Headlights OFF*
- *Emergency lights ON*

YOU SHOULD BE HERE!

Key Message: Suggest patrol vehicle positioning.

Est. Presentation Time: 3-4 minutes

Explanation of Cues/Builds: Bullets appear on subsequent clicks.

Suggested Comments: This is what we recommend. Remember each case is different and that judgment is involved. Use common sense! We recommend **FACING TRAFFIC** before the 2nd and 3rd sign. This is when motorists are about to make their maneuvers.

Suggested Questions: Why facing traffic? Advantages? Disadvantage? See following slide.

Additional Information: There is little information on this. This is what one state (Louisiana) is doing. This is not required by the MUTCD or any standard that we are aware of.

Possible Problems: This may be controversial. Be prepared to defend your suggestion (see next slide). Do not argue. This is a suggestion only.

Why Face Traffic??

- Larger field of view
 - More alert!
- Engine protects you
 - Not the gas tank!
- Air bags protect you
- Allows your position to be dynamic



**Case by
case!**

0-97

Key Message: Discuss why we suggest to face traffic.

Est. Presentation Time: 2 minutes

Explanation of Cues/Builds: Text box appears on click.

Suggested Comments: These are the advantages of facing traffic. The disadvantages would be opposite.

Suggested Questions: None

Additional Information: Pay attention to traffic!

Possible Problems: This may be against their practices. Make your point as a recommendation and be prepared to defend it.

Your Position is Dynamic!

- May need to to **move your vehicle** often
- **Minimizes crashes at the end of the queue**



0-98

Key Message: Stress the importance of a dynamic position.

Est. Presentation Time: Less than 1 minute

Explanation of Cues/Builds: None

Suggested Comments: If the queue builds to the point where the signs are no longer effective, move to a location where you can reduce speeds by your presence. This reduced speed would minimize the severity of a vehicle impacting the end of a queue.

Suggested Questions: None

Additional Information: This highlights the importance of facing traffic: You can see what is happening!

Possible Problems: This may be against their practices. Make your point as a recommendation and be prepared to defend it.

Use of Emergency Lights

- Use **emergency lights only**
- **Headlights off** during nighttime WZ
 - May be helpful during the day



0-99

Key Message: Discuss which lights to use.

Est. Presentation Time: 1-2 minutes

Explanation of Cues/Builds: None

Suggested Comments: Do not use your headlights, particularly if facing traffic at night. They blind drivers and can be distracting. Use your emergency lights only.

Suggested Questions: What's wrong with using headlights?

Additional Information: When in the presence mode, you want to be visible and recognized as a LEO. Your emergency lights accomplish that.

Possible Problems: Attendees may have their own policies. Encourage discussion.

If Traffic Backs Up....

- Queuing beyond the advance warning signs may cause **rear end crashes**
- **Move** your vehicle back (toward traffic) to stay ahead of the traffic queue

Stay far enough ahead of stopped traffic to give fast-moving cars plenty of time to stop (approx. ¼ mile.)

0-100

Key Message: Discuss procedures when traffic back up, beyond the advance warning signs.

Est. Presentation Time: 2 minutes

Explanation of Cues/Builds: Text box appears on click.

Suggested Comments: Contractors may be encouraged to move the signs, but it is not likely that they will do this. Your job is to keep an eye on traffic and position yourself where you can effectively help lower speeds of vehicles approaching the end of the queue. Use your judgment and common sense.

Suggested Questions: Why a ¼ mile? Refer to the discussion on PRT. ¼ mile is 1320 feet.

Additional Information: The ¼ mile is what the state of Louisiana recommends.

Possible Problems: This may be against their practices. Make your point as a recommendation and be prepared to defend it.

Moving Operations

- **The work zone moves continuously**
 - Example: Striping
- May use **truck-mounted attenuators (TMA)** to protect workers
 - Unlike patrol vehicles, designed for impacts



0-101

Key Message: Briefly discuss moving operations.

Est. Presentation Time: 2 minutes

Explanation of Cues/Builds: None

Suggested Comments: Define moving operations as those that move continuously. If they move intermittently, they may be referred as “mobile”, but sometimes the two are used interchangeably. The fact that the operation is moving does not mean we do something different. As far as the motorists are concerned, they need the same warning, guidance, control and forgiving design. However, simplified procedures are acceptable, such as using yellow warning lights and/or truck-mounted attenuators.

Suggested Questions: None

Additional Information: None

Possible Problems: None

Installation and Removal of Stationary Lane Closures

- Devices are installed **“with the flow of traffic”**
- Removed **“against the flow of traffic”**
- Except for detours
 - Reverse the above instructions



0-102

Key Message: Briefly discuss installation and removal procedures.

Est. Presentation Time: 2 minutes

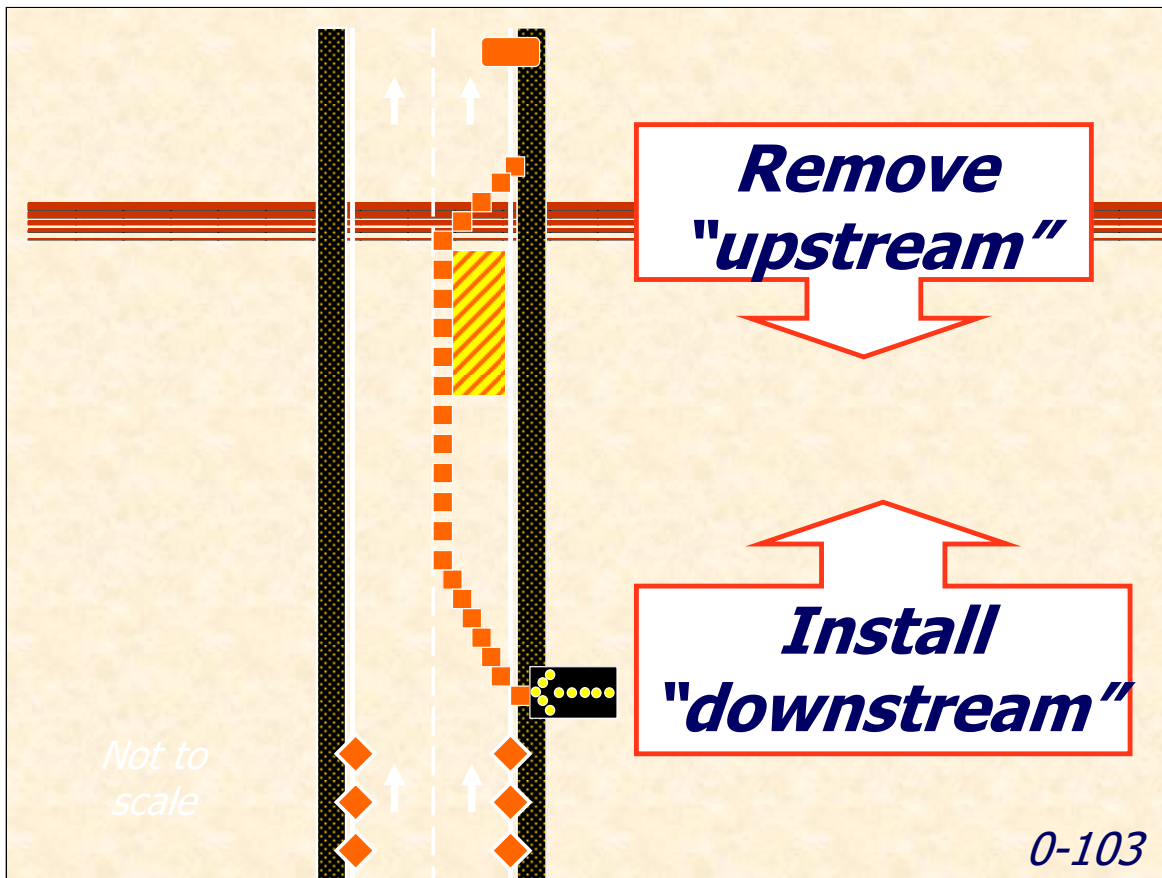
Explanation of Cues/Builds: DETOUR sign appear on click.

Suggested Comments: Generally, devices are installed with the flow of traffic and removed against the flow of traffic. This way, the AWA is activated first and removed last, to give motorists the warning the continuously need. Detours are done backwards and are the only exception to the rule. By installing detours against the flow of traffic we make sure traffic is not detoured until the detour installation is complete.

Suggested Questions: Why are detours done backwards?

Additional Information: None

Possible Problems: None



Key Message: Illustrate point made in previous slide.

Est. Presentation Time: 1-2 minutes

Explanation of Cues/Builds: Bottom box appears on click. Top box appears on second click.

Suggested Comments: Define "downstream" as "with the flow of traffic" and "upstream" as "against the flow of traffic". Repeat briefly the information from the previous slide.

Suggested Questions: Why is it done this way?

Additional Information: When is the arrow board removed?

Possible Problems: LEOs do not do this. So try to be as brief as possible with this slide.

Officer's Visibility

**SAFE?
VISIBLE?**



0-104

Key Message: Briefly discuss the importance of the officer's visibility (when outside the patrol vehicle).

Est. Presentation Time: Less than 1 minute.

Explanation of Cues/Builds: None

Suggested Comments: The officer is visible at a short distance, but at speed, a driver would not have enough time to react (because of PRT). How can we enhance his visibility? Consider a retroreflective vest and apparel.

Suggested Questions: Is this officer visible? What color is the uniform? Is it retroreflective? How visible, in feet, is he? Relate to PRT.

Additional Information: None

Possible Problems: Some may reject the idea of wearing a vest, or may say that a vest keeps them from reaching their holster. Be prepared to defend.

High-Visibility Safety Apparel

- **Wear** if outside the patrol vehicle
- Retroreflective trim provides **human form outline**
 - ANSI Class 2 or 3
- Specially designed to provide **access to holsters**



0-105

Key Message: Discuss high-visibility apparel.

Est. Presentation Time: 2 minutes

Explanation of Cues/Builds: None

Suggested Comments: We recommend as a minimum, ANSI Class 2 apparel. Class 2 apparel have plenty of retroreflective area, needed when working in close proximity to traffic. Class 3 is better but may require retroreflective pants!

Suggested Questions: What is retroreflective? The material returns the light to where it came from: The driver's eyes!

Additional Information: ANSI is the American National Standards Institute. The standard is No. 107-1999 and it is required by the MUTCD (for flagging operations).

Possible Problems: Some may reject the idea of wearing a vest, or may say that a vest keeps them from reaching their holster. Be prepared to defend.

Module Recap

- *Where do we find WZ standards & guidelines?*
- *What are the component parts of a TTC zone?*
- *What is a buffer space?*
- *Where is the patrol vehicle positioned?*
- *How are devices installed and removed?*

0-106

Key Message: Module recap.

Est. Presentation Time: 1-2 minutes

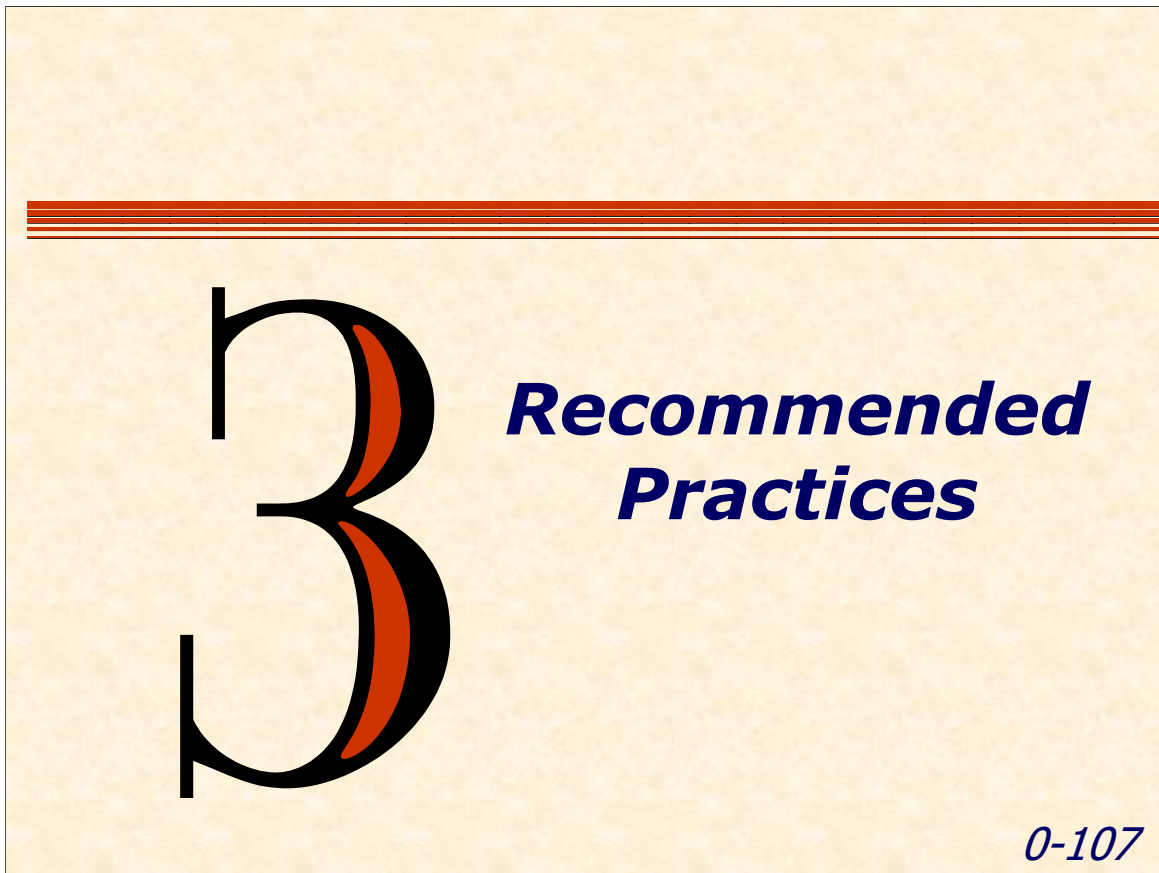
Explanation of Cues/Builds: None

Suggested Comments: Ask questions to gauge understanding. Let students answer. Add other questions as needed.

Suggested Questions: Listed on the slide.

Additional Information: None

Possible Problems: None



Session Title: Module 3. Recommended Practices

Performance-Based Learning Outcomes:

Review and summarize the practices recommended in this course

Instructional Method: Lecture

Session Time: 14 slides. Approximately 30 minutes depending class participation.

Evaluation Plan: The learning outcomes are evaluated at the end of each module using the questions contained in the last slide of that module and through the exercises.

Module Objectives

- *Summarize safe operating practices for LEOs working in WZ*

0-108

Key Message: List module objectives.

Est. Presentation Time: Less than 1 minute

Explanation of Cues/Builds: None

Suggested Comments: Self explanatory.

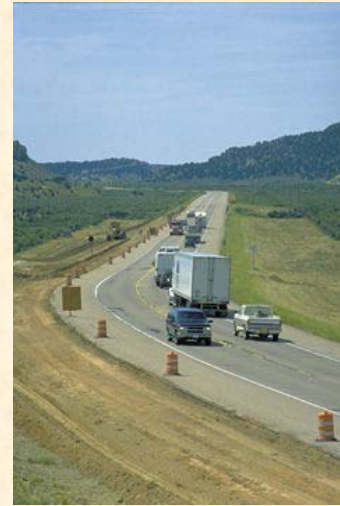
Suggested Questions: None

Additional Information: Consider this a review/summary of what we have learned so far.

Possible Problems: None

About Recommended Practices

- Not requirements, but **recommendations**
- Few specific standards/guidelines exist
 - None in the MUTCD
- **Every case is different!**
- Use your **judgment!**



0-109

Key Message: Frame the recommendations/practices in this course.

Est. Presentation Time: Less than 1 minute

Explanation of Cues/Builds: None

Suggested Comments: Many of the practices discussed in this course are recommendations. Few standards exist and every case is different, so be prepared to use your judgment.

Suggested Questions: None

Additional Information: None

Possible Problems: None

Recommended Practices

- 1. BEFORE** the WZ starts
- 2. On ARRIVAL** at the WZ
- 3. While** at the WZ
 - A. Stationary** operations
 - B. Moving** operations



0-110

Key Message: List the recommended practices by the three categories shown.

Est. Presentation Time: 1 minute

Explanation of Cues/Builds: None

Suggested Comments: Self-explanatory.

Suggested Questions: Who remembers the difference between stationary and moving operations?

Additional Information: None

Possible Problems: Avoid discussing these at this point. This is just a list slide. Each category is discussed in the following slides.

1. BEFORE the WZ Starts

- Attend the **pre-construction conference, if possible**
- **Familiarize** yourself with the project
- Identify your **point of contact**
 - WZ Supervisor
 - Project Engineer
 - Who is responsible for the project?

0-111

Key Message: Summarize practices BEFORE the work starts.

Est. Presentation Time: 1-2 minutes

Explanation of Cues/Builds: None

Suggested Comments: Self-explanatory.

Suggested Questions: What about expressing concerns for your safety?

Additional Information: Stress point made during the class. Treat this as a review.

Possible Problems: It is not likely that LEOs would have access to the Traffic Control Plan, so ask the POC.

2. On **ARRIVAL** at the WZ

- **Be early!**
 - **15-minute rule**
- Contact your **point of contact**
 - Identify your role and safest location
- Gather **information** about the project
 - Drive through the WZ
 - Note signs in the advance warning area
 - Identify possible relocating procedures

0-112

Key Message: Summarize practices on ARRIVAL at the work site.

Est. Presentation Time: 2 minutes

Explanation of Cues/Builds: None

Suggested Comments: Review the 15-minute rule. Stress the drive through, in both directions. Look at signs in the AWA, anticipate congestion, and think ahead!

Suggested Questions: What about identifying an escape route? If you are facing traffic, leaving the vehicle is easier, since you are closer to the edge of the road.

Additional Information: None

Possible Problems: None

3. WHILE in the WZ

- Be **alert!**
- Be **visible!**
- Be **in contact!**
- If applicable, **face traffic!**
- **Pay attention** to queues that may form and **relocate** as necessary
- **Contact your POC** if adjustments are needed

0-113

Key Message: Summarize practices WHILE at the work site.

Est. Presentation Time: 1-2 minutes

Explanation of Cues/Builds: None

Suggested Comments: Self explanatory.

Suggested Questions: What about if you have to leave your vehicle?
Retroreflective apparel!

Additional Information: Treat this as a review.

Possible Problems: None

3A. Stationary Operations

- On the **shoulder**
- **Not in buffer** space
- **Relocate as needed** based on traffic condition
 - **1/4 mile** behind the end of the queue



0-114

Key Message: Discuss potential patrol vehicle position during stationary work zones.

Est. Presentation Time: Less than 1 minute

Explanation of Cues/Builds: None

Suggested Comments: Self explanatory.

Suggested Questions: What does “stationary” mean? The work zone layout does not move, as opposed to a “moving” operation. Why 1/4 mile?

Additional Information: Treat this as a review.

Possible Problems: None

3B. Moving Operations

- The work zone moves continuously!
 - **So should you!**

***EXAMPLES are paving,
striping, rumble strips,
milling operations, etc.***

0-115

Key Message: Discuss potential patrol vehicle position during moving work zones.

Est. Presentation Time: Less than 1 minute

Explanation of Cues/Builds: Text box appears on click.

Suggested Comments: Self-explanatory. Define “moving” as “the activity area moves”, either intermittently or continuously. Even if it is moving, WZ principles are the same!

Suggested Questions: None

Additional Information: None

Possible Problems: None

3B. Moving Operations

- Your position will change
- May have to move in reverse on the shoulder
 - This may not be feasible if moving “fast”
- REMEMBER:
 - Your role is **PRESENCE**
 - **You are not a crash attenuator!**

0-116

Key Message: Discuss potential patrol vehicle position during moving work zones.

Est. Presentation Time: 1-2 minutes

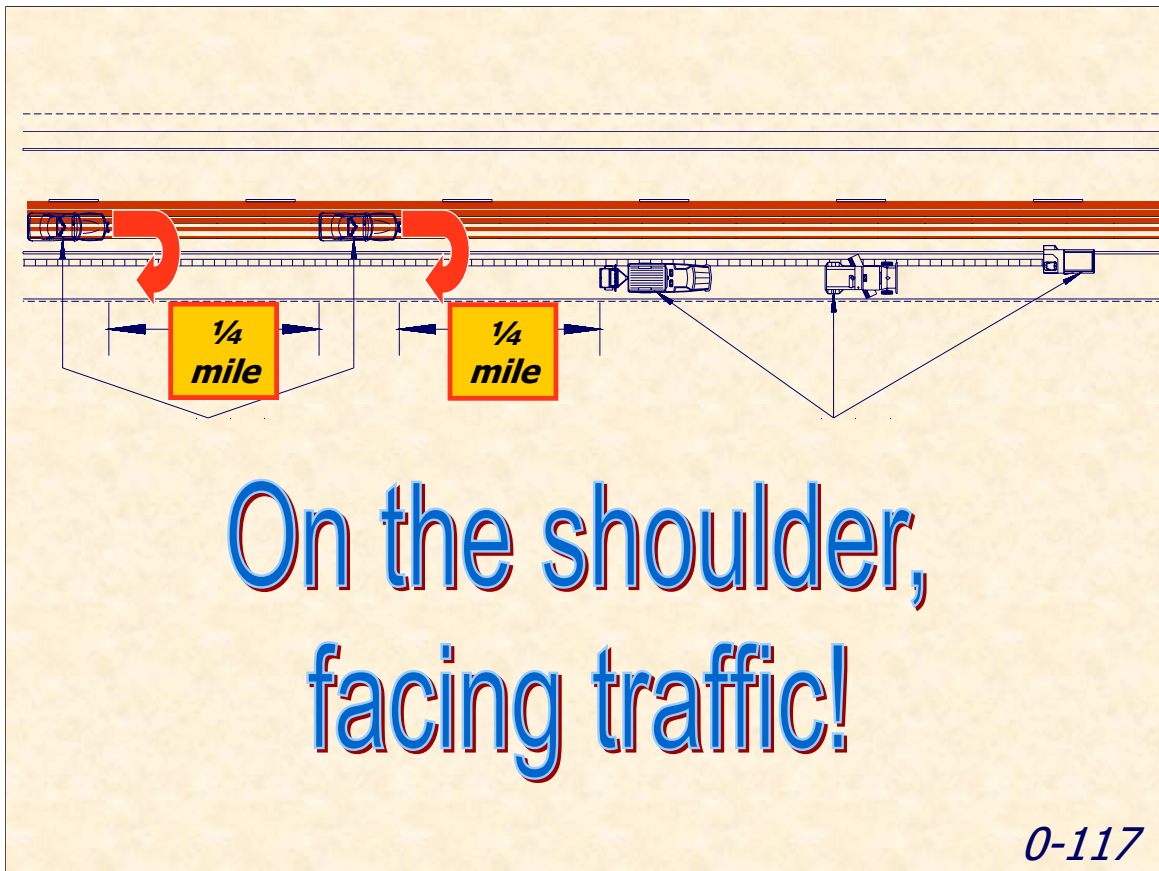
Explanation of Cues/Builds: None

Suggested Comments: Self explanatory. “Moving fast” refers to the relative speed between the work vehicles and traffic. Most moving operations are moving slowly, so the speed difference is high, increasing the severity of crashes. If moving slowly, then moving in reverse becomes feasible and recommended. This way you will face traffic!

Suggested Questions: None

Additional Information: Treat as a review.

Possible Problems: None



Key Message: Reinforce the ON THE SHOULDER, FACING TRAFFIC recommendation.

Est. Presentation Time: 1-2 minutes

Explanation of Cues/Builds: None

Suggested Comments: Graphic shows the position of the vehicles during the crash discussed during the course introduction. This was a moving operation. The patrol vehicles did not have to be in the moving (open) lanes. Stress the 2 things to do: 1) Be on the shoulder, not in the buffer space, and 2) Face traffic to protect yourself, move if necessary and have a larger field of view.

Suggested Questions: None

Additional Information: None

Possible Problems: None

DO	WHY?
Attend the pre-construction conference and ask questions	To familiarize yourself with the project
Discuss the TCP	To understand the project
Communicate with the WZ supervisor	To express concerns; to establish a point of contact
15-minute rule	Common courtesy
Position your vehicle in the safest, most efficient location	To avoid parking in the taper or buffer areas
Face forward	To have a larger field of view; better protection; dynamic

Key Message: Summarize the recommended practices discussed in this class.

Est. Presentation Time: 1-2 minutes

Explanation of Cues/Builds: Table appears on click.

Suggested Comments: Self-explanatory.

Suggested Questions: None

Additional Information: Treat as a review.

Possible Problems: None

DO	WHY?
Be alert at all times	To see what's coming; to move as needed
Move vehicle position as traffic conditions change	To be at the most effective location
Wear retroreflective apparel if outside the vehicle	To be visible!
Protect yourself!	To protect your life!

0-119

Key Message: Summarize the recommended practices discussed in this class.

Est. Presentation Time: 1 minute

Explanation of Cues/Builds: Table appears on click.

Suggested Comments: Self-explanatory.

Suggested Questions: None

Additional Information: Treat as a review.

Possible Problems: None

Module Recap

- What are some of the recommended practices when working in a work zone?
 - Before?
 - During?

0-120

Key Message: Module recap.

Est. Presentation Time: 1-2 minutes

Explanation of Cues/Builds: None

Suggested Comments: Self-explanatory.

Suggested Questions: None

Additional Information: None

Possible Problems: None



Session Title: Module 4. Application Workshop

Performance-Based Learning Outcomes:

Apply the concepts learned in this course through hands-on exercises.

Instructional Method: Workshop

Session Time: Approximately 30 minutes depending class participation.

Evaluation Plan: The learning outcomes are evaluated at the end of each module using the questions contained in the last slide of that module and through the exercises.

Module Objectives

- Apply the concepts learned to a **freeway lane closure**
 - Case 1. Without a back up
 - Case 2. With a back up
- Discuss possible solutions, variations and adjustments

0-122

Key Message: List module objectives.

Est. Presentation Time: Less than 1 minute

Explanation of Cues/Builds: None

Suggested Comments: Self explanatory.

Suggested Questions: None

Additional Information: Divide the class into groups of 6 maximum, 4 preferred. Hand out the exercise materials. If not available, students may use a sheet of paper and draw as needed. There are a total of four exercises that can be used. Introduce both of the first two cases at once and give them time to complete. Walk around the groups and gauge their understanding and participation. Assist as needed. Introduce the second two for discussion purposes. All four cases can be used if needed – the instructor should tailor this module to provide maximum effectiveness for the situation and determine what approach would be most effective based on the make up of the class (LEOs, DOT rep's, split, etc.)

Possible Problems: None

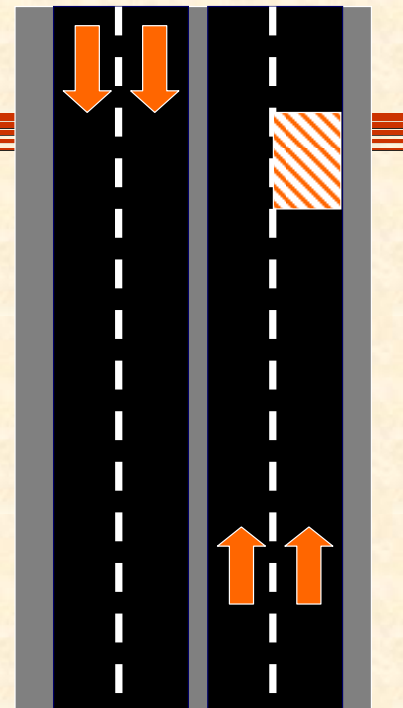
Case 1: Light Traffic

Given:

- *Four-lane freeway in a rural area, light traffic*
- *Speed = 55 mph*
- *Lane width = 12 ft.*
- *Duration: 6 daylight hours*

Indicate:

- *Signs (& spacing) needed*
- *Length of taper & buffer necessary to close the area shown*
- *Position of patrol vehicle for presence and enforcement*



0-123

Key Message: Introduce Case 1.

Est. Presentation Time: Less than 1 minute

Explanation of Cues/Builds: None

Suggested Comments: It is a 4-lane freeway. We will be addressing the Northbound direction only. Notice the location of the work space. Place signs, arrow panels, tapers, buffer space, etc. Be specific, noting distances between signs, taper and buffer lengths, etc.

Additional Information: Divide the class into groups of 6 maximum, 4 preferred. Hand out the exercise materials. If not available, students may use a sheet of paper and draw as needed. Introduce both cases at once and give them time to complete. Walk around the groups and gauge their understanding and participation. Assist as needed.

Solution:

L= 660'

Buffer = 495''

Signs:

A = MERGE RIGHT (1,000)

B = RIGHT LANE CLOSED (1,500')

C = ROAD WORK AHEAD (2,640')

Cones @ 55' on taper and 110' on tangent

Patrol vehicle located between the A and B signs!

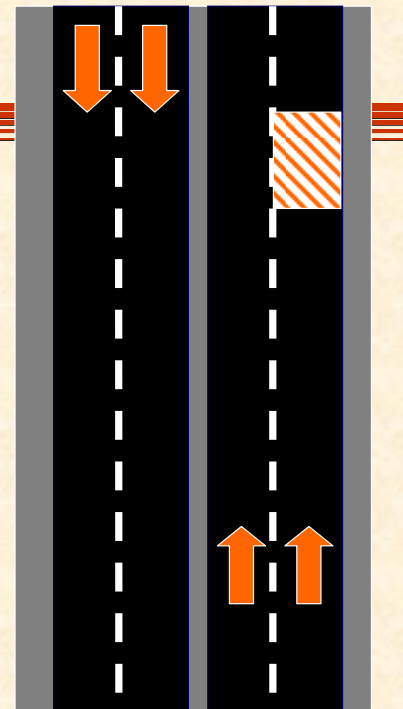
Case 2: Heavy Traffic

Given:

- Same conditions as in Case 1, except....
- Heavy traffic slowly creates a 2-mile backup from the beginning of taper

Discuss:

- Possible adjustments
- Position of patrol vehicle
- Safest place to pull-over violators



0-124

Key Message: Introduce Case 2.

Est. Presentation Time: Less than 1 minute

Explanation of Cues/Builds: None

Suggested Comments: Same as previous: It is a 4-lane freeway. We will be addressing the Northbound direction only. Notice the location of the work space. Place signs, arrow panels, tapers, buffer space, etc. Be specific, noting distances between signs, taper and buffer lengths, etc.

Suggested Questions: None

Additional Information: Solution will be the same. Adjustments may include moving the patrol vehicle. Where? Let them discuss advantages and disadvantages and play devil's advocate.

Possible Problems: None

Solution: Same solution but patrol vehicle should be relocated to: 2 ¼ mile from beginning of taper.

Case 3

- Single LEO on scene. Work zone is 10 miles long on a north-south rural, multi-lane freeway – 3 lanes each direction with 10-foot shoulders.
- A serious injury crash occurs 500 yards from an off-ramp in the NB lanes in the middle of the project, blocking all three lanes in that direction.
- There is a concrete median barrier. The next nearest interchange is 5 miles on either side of this one.
- The LEO is patrolling three miles up stream from the crash.
- Contractor personnel are present in the vicinity of the crash. The nearest town is seven miles south of the project.

0-125

Key Message: Introduce Case 3.

Est. Presentation Time: 2-3 minutes

Explanation of Cues/Builds: None

Suggested Comments: Set up #1 – Single LEO is on scene. Work zone is 10 miles long on a north-south rural, multi-lane freeway – 3 lanes each direction with 10-foot shoulders. A serious injury crash occurs 500 yards from an off-ramp in the NB lanes in the middle of the project, blocking all three lanes in that direction. There is a concrete median barrier. The next nearest interchange is 5 miles on either side of this one. The LEO is patrolling three miles up stream from the crash. Contractor personnel are present in the vicinity of the crash. The nearest town is seven miles south of the project.

Suggested Questions:

What is the communication sequence of events?

What part does the LEO play?

Where will the emergency vehicles be directed to go?

What information will be given to the media and by whom?

Additional Information: This case was designed to generate discussion and may depend on other factors in the situation.

Possible Problems: None

Solution: Contractor should alert LEO of the crash – LEO would then report crash and appropriate emergency services personnel. LEO can move downstream to locate the back of the queue and pull over on the shoulder (possibly facing traffic to be able to move as the queue builds). LEO should request assistance in responding to the crash so that he/she is able to continue with work zone presence and patrol duties.

Case 4

- A temporary work zone, 45 MPH, four-lane city arterial.
- The work area is in the eastbound outside lane (closed).
- The taper is comprised of 12 cones spaced 10 feet apart, and a flagger has been positioned at the beginning of the lane taper to direct eastbound traffic
- Fifty feet ahead of the flagger is a sign reading "Be Prepared to Stop". One-hundred-fifty feet in front of the BPTS sign is a sign reading "Road Work Ahead".
- The LEO has just driven through the work area in advance of positioning himself/herself for patrol.

0-126

Key Message: Introduce Case 4.

Est. Presentation Time: 2-3 minutes

Explanation of Cues/Builds: None

Suggested Comments: Set up #2 - A temporary work zone has been set up on a 45 MPH, four-lane city arterial, two 12-foot lanes in each direction. The work area is in the lane next to the curb of the eastbound lanes and both lanes of eastbound traffic are being reduced to one. Westbound traffic is unaffected. The taper closing the curb lane is comprised of 12 cones spaced 10 feet apart. A flagger has been positioned at the beginning of the lane taper to direct eastbound traffic to slow and to merge and is standing in the middle of the lane being closed, just inside the cone taper. Fifty feet ahead of the flagger is a sign reading "Be Prepared to Stop". One-hundred-fifty feet in front of the BPTS sign is a sign reading "Road Work Ahead". The LEO has just driven through the work area in advance of positioning himself/herself for patrol.

Suggested Questions:

What things would the LEO be likely to report to the work area foreman for correction?

Having reported into the foreman, the LEO patrol vehicle takes up a position to slow traffic in advance of the work area. Where should the vehicle best be positioned?

Additional Information: This case was designed to generate discussion and may depend on other factors in the situation.

Possible Problems: None

Solution: Minimum merging taper length should be 540 feet (currently only 110 feet given 12 cones spaced 10 feet apart); there may not be any buffer space in the setup (should have 360 feet); signs should be spaced 350 feet apart - on approach, begin with "Road Work Ahead" followed by sign that shows right lane merging into left lane; a flagger is not necessary in this situation.

Don't park vehicle in buffer space or in any lanes in this situation - best position is within the signing but it's situation specific; have to see what is available access-wise around the area (parking lots, etc.), how close the nearest intersection is, what the street looks like upstream, etc.

Module Recap

- Patrol vehicle position is
 - **Important**
 - **Critical**
 - **Dynamic**
 - May vary depending on traffic conditions and other factors

0-127

Key Message: Module recap.

Est. Presentation Time: 1-2 minutes

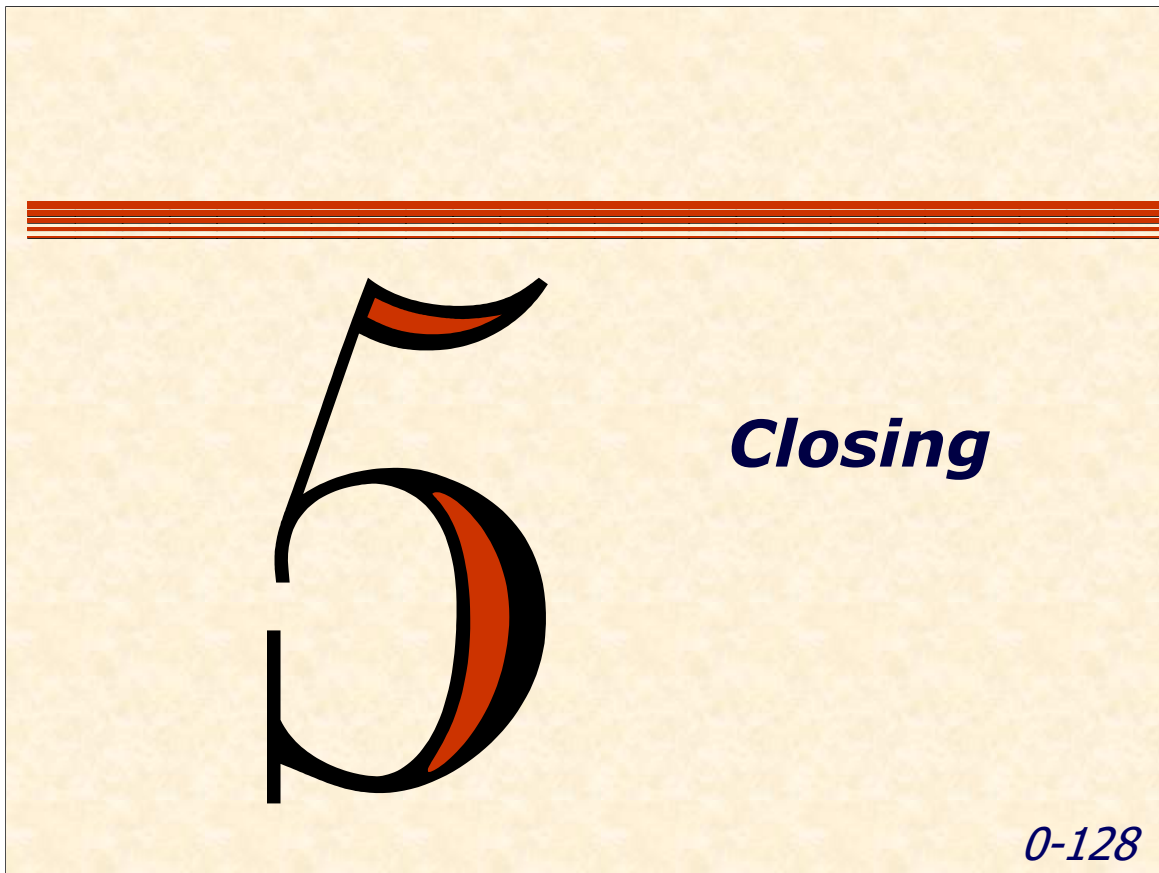
Explanation of Cues/Builds: None

Suggested Comments: Self explanatory.

Suggested Questions: None

Additional Information: None

Possible Problems: None



Session Title: Module 5. Closing

Performance-Based Learning Outcomes:

Close the course

Instructional Method: Lecture

Session Time: Approximately 10 minutes depending class participation.

Evaluation Plan: Course evaluation

Module Objectives

- Review course objectives
- Discuss your expectations
- Complete course evaluations
- Adjourn



0-129

Key Message: List module objectives.

Est. Presentation Time: Less than 1 minute

Explanation of Cues/Builds: None

Suggested Comments: Self explanatory.

Suggested Questions: None

Additional Information: None

Possible Problems: None

Course Objectives

- To provide you with **working knowledge** of traffic control work zones
- To define your **roles and responsibilities** when working in work zones

0-130

Key Message: Review course objectives.

Est. Presentation Time: Less than 1 minute

Explanation of Cues/Builds: None

Suggested Comments: These are the objectives we gave ourselves at the beginning of the course. Read them. Have we met the objectives? Anyone who feels we did not meet these objectives?

Suggested Questions: Do you have a better understanding of work zones now? More so than 4 hours ago?

Additional Information: None

Possible Problems: None

You should be able to:

1. Understand standards and guidelines related to temporary traffic control in work zones
2. Understand the role of law enforcement officers in work zones

0-131

Key Message: Review things participants should be able to do AFTER taking this course.

Est. Presentation Time: 1 minute

Explanation of Cues/Builds: None

Suggested Comments: Self explanatory

Suggested Questions: None

Additional Information: None

Possible Problems: None

You should be able to:

3. Recognize the component parts of a typical work zone
4. Recognize proper practices and procedures related to work zones and the role of law enforcement officers

0-132

Key Message: Review things participants should be able to do AFTER taking this course.

Est. Presentation Time: 1 minute

Explanation of Cues/Builds: None

Suggested Comments: Self explanatory

Suggested Questions: None

Additional Information: None

Possible Problems: None

Your Expectations

- Did we meet your **expectations**?
- Did you get information you can use?
- How do you feel about work zones and workers now?



0-133

Key Message: Discuss participants expectations?

Est. Presentation Time: 1 minute

Explanation of Cues/Builds: None

Suggested Comments: Self explanatory.

Suggested Questions: Did we meet your expectations for this class?

Additional Information: Seek class participation.

Possible Problems: If none, ask questions to gauge understanding.

Course Evaluations

- How can we improve the course?
- Your honest input will help us!
- **Negative and/or positive**



0-134

Key Message: Complete course evaluations.

Est. Presentation Time: 5 minutes

Explanation of Cues/Builds: None

Suggested Comments: Please complete the course evaluations. Be honest. We appreciate negative and/or positive input. Your name is optional.

Suggested Questions: None

Additional Information: If multiple instructors, indicate which one is A and which one is B.

Possible Problems: Give them sufficient time to complete.

THANK YOU!!

Safe and Effective Use of Law Enforcement Personnel in Work Zones



0-135

Key Message: END of course.

Est. Presentation Time: Less than 1 minute

Explanation of Cues/Builds: None

Suggested Comments: Thank you for your attendance. I enjoyed having you here. I hope you found it beneficial. Be safe!

Suggested Questions: None

Additional Information:

Possible Problems: Don't forget your laptop's power cord!