Chapter 2 Work Zone Traffic Control and Safety

General

Safe and effective traffic control is vital for the safety of the traveling public. It is also essential to protect construction, maintenance, and utility workers whose work places them near high speed traffic. The traffic control guidelines in this manual provide the driving public positive and consistent guidance through work zones. These procedures will also reduce the risk to maintenance workers who are exposed to potential traffic hazards.

The Secretary of Transportation has adopted the Manual on Uniform Traffic Control Devices (MUTCD) as the legal standard as required by RCW 47.36.030. It is mandatory that traffic control measures on maintenance projects comply with the MUTCD requirements. The MUTCD outlines basic principles and prescribes standards for the design, application, installation, and maintenance of traffic control devices. The MUTCD details requirements for color, size, shape, location and need for traffic control devices.

In some cases, WSDOT has standards that exceed those in the MUTCD (e.g., see Traffic Manual M 51-02, Chapter 5, and the Work Zone Traffic Control Guidelines M 54-44). In such situations, the most stringent standard is the legal standard you must follow. Learn those standards before you perform traffic control.

Consult the Regional Traffic Engineer when standard layouts are not applicable.

This chapter reflects the work and recommendations provided by the Work Zone Safety Task Force. The Work Zone Traffic Control Guidelines M 54-44 incorporates the recommendations of the Work Zone Safety Task Force and the standards of the MUTCD, and is intended to be used as the companion resource to the guidance in this chapter.

The maintenance employee in charge at a work zone is responsible to see all standards are followed. This includes ensuring temporary signs, warning devices, and flag persons are placed appropriately to protect both motorists and workers. Motorist and worker safety are of primary importance. Safety takes precedence over all efforts to maintain a highway or structure.

Fundamental Principles

Principles to enhance motorist and worker safety in maintenance work areas:

• Develop a comprehensive traffic control strategy that can be implemented at the work site. Evaluation of the work operation, site, and traffic conditions should determine the traffic control measures to be utilized. Refer to the Work Zone Traffic Control Guidelines M 54-44, “checklist for establishing a temporary traffic control zone” and the Traffic Manual M 51-02, “traffic control planning and strategy checklist.”
• Maintain traffic flow as close to normal highway situations as possible.
• Do not surprise the motorist. Locate and place devices to maintain adequate sight distance for driver recognition and reaction on straight highway sections if possible.
• Prepare, understand, and implement a traffic control plan. Do not routinely rely on minimum standards. Evaluation of the work operation, site and traffic conditions should be determined to the appropriate level of traffic control measures.
• Avoid frequent and abrupt changes in alignment.
• Minimize worker exposure time to traffic.
• Provide adequate warning, delineation, and channelization.
• Remove inappropriate pavement markings on long-term projects. (Work occupying a location three days or more)
• Provide flagging only when other methods of traffic control are inadequate.
• Inspect traffic set-up control measures prior to work.
• Monitor traffic control and modify where changing traffic conditions warrant.
• Remove, cover, or turn control devices away from traffic when not needed or in use.
• Channelize traffic with pavement markings, signing, cones, plastic barrels, water filled barriers, or lightweight devices.
• Sand bags may be used for sign ballast. Do not use heavy, solid weights, (e.g., concrete blocks) for stabilizing portable sign supports.
• Traffic control measures must be selected and implemented with the drivers’ perspective in mind. Credible messages must be sent to the driver to provide a reasonable expectation that the driver will comply.
• Plan ahead for work operations and the associated traffic control. Do not rely completely on standard devices and procedures when more effective measures should be considered.
• Use traffic control devices (cones and barrels) to define the closed portion of the roadway that is the work zone. Even short-term operations can realize a safety benefit from placing cones in a manner that sends an obvious message to drivers that a portion of the road is closed and they must divert around the work zone.

Traffic Control Zones

The traffic control zone is the work area between the first advance warning sign and the point beyond where traffic is no longer affected. Traffic control zones are divided into the following areas:
• Advance Warning Area
• Transition Area (for lane or shoulder closures)
• Buffer Space
• Work area
• Termination area
1. **Advance Warning Area** – The advance warning signs are located before the transition area to provide ample opportunity for motorists to accomplish a desired maneuver. Where there is no lane or shoulder closure, as in mowing operations, one sign will suffice. Use signs on both sides of two-way, two-lane highways and multilane roadways.

Message-Information-Action (MIA) signing must relate to all three action words. The first sign to appear in the advance warning area tells motorists they are approaching a work zone (e.g., ROAD WORK AHEAD). The next sign display provides more detailed information about the situation ahead (e.g., ONE LANE ROAD AHEAD), and the third sign states what action to take (e.g., BE PREPARED TO STOP).

2. **Transition Area** – This is the zone where the lane and/or shoulder is closed by channelizing devices. The rate of taper is in accordance with the traffic control plans in the *Work Zone Traffic Control Guidelines* M 54-44. If restricted sight distance is a problem (e.g., sharp vertical or horizontal curve), begin the lane closure well in advance of the view obstruction. Do not hide the beginning of lane closures behind curves.

3. **Buffer Space** – This is the unoccupied space between the transition and work areas. It is there to provide a margin of safety for both traffic and workers. With moving operations, buffer space is the space between the attenuator/buffer truck and the work vehicle.

4. **Work Area** – Where equipment and workers perform maintenance functions.

5. **Termination Area** – Allows traffic to resume normal driving immediately after leaving the work area.

### Traffic Control Devices

Traffic control devices are used to warn, regulate, and guide traffic. They include signs, signals, lighting devices, pavement markings, delineators, channeling devices, hand signaling devices, and temporary barriers. **Traffic control devices must conform to WSDOT and MUTCD standards.** Use traffic control devices where necessary. Remove, cover, or turn them away from traffic when they are not in use or no longer applicable.

1. **Signs and Supports** – Sign supports are either portable or fixed depending on the duration of work. Small sand bags may be used to stabilize portable sign supports. Do not use objects that could become a projectile upon impact (e.g., concrete, chain, etc.). Sign supports should be lightweight, yielding or breakaway in composition.

   Signs on portable supports must be 1 foot minimum above the roadway. Those mounted on fixed posts must be 5 feet above the roadway in rural areas and 7 feet above the roadway in urban areas.

   Sign spacing is set forth in Appendix A. Follow these sign spacing requirements but also consider in-place existing signs when developing and implementing traffic control plans.
Regulatory Signs (e.g., KEEP RIGHT, DO NOT PASS) – These signs impose legal restrictions, and are placed where the regulation applies. Most regulatory signs are black on white. (Use them only as necessary.)

Reduced Legal Speed Limits – Only use reduced legal speed limits when other efforts to control traffic prove to be inadequate. For emergency and other speed reductions, follow speed reduction guidelines outlined in RCW 47.48.020, the WSDOT Construction Manual M 41-01, and WSDOT Directive D 55-20, Reduced Speed in Maintenance and Construction Work Zones.

To change a speed limit, submit a request to do so to the Regional Traffic Engineer. To ensure a work zone is adequately signed, post the speed limit signs in the work zone. Remove all signs when the reduced speed limit is not in effect.

Warning Signs – Their purpose is to give motorists notice of potentially hazardous conditions for traffic. They are erected in advance of the condition. Use warning signs when conditions warrant, particularly if the hazard is not obvious or cannot be seen by approaching motorists. Do not overuse warning signs or they will lose their attention-getting value.

All warning signs shall have black legends on an orange background (except the round railroad advance sign, which is black on yellow). Do not use double faced (back-to-back) signs.

Changeable Message Signs – These signs are recommended for high speed, high volume roadways, or work operations that require a highly visible message. Use them to supplement or enhance work zone safety and not to replace required signs. Two message panels are the maximum allowed. Consider truck mounted Portable Changeable Message Signs (PCMS) for shadow/ buffer vehicles.

Some typical situations include:

• Locations where speed of traffic is expected to drop substantially.
• Locations where significant delays are expected.
• Accident or incident management.

Make messages clear and brief, keeping messages to a maximum of two panels. If special messages are necessary, be consistent with conventional signs and standards normally used. Whenever possible use the pre-programmed stored messages the PCMS is equipped with. Never display a message with an arrow from a PCMS that is located on the same shoulder as the arrow direction (right shoulder/right arrow or left shoulder/left arrow).

2. Channelizing Devices – Channelization devices are used to direct traffic away from or around a work area, or to separate two-way traffic. Channelization devices must be reflective for night use.

Cones – These are the most common device used to separate and guide traffic past a work zone. Cones must be at least 18 inches tall for normal situations. But, they must be 28 inches tall minimum, for high speed, or high volume operations.
Reduced device spacing around work zones is recommended. Make provisions for large work vehicle access as needed (routed off the existing shoulder or through a stagger of channelization devices).

Place barrels or cones diagonally across closed lanes to show motorists which lanes are closed.

Refer to the *Work Zone Traffic Control Guidelines* M 54-44 for more information on channelization devices, application, and placement.

**Cone Placement Procedure**

Prior to establishing traffic control with cones, a meeting is held by the involved parties to discuss the following procedures:

- Technique (e.g., a whistle or voice actuated headset) for signaling between the cone handler and truck operator.
- Will cone tapers across the closed lanes be done by hand?
- Set up and take down a line of cones along lane or center lines:
  - The cone handler should ride in a cone setting cage attached to the front, back or side of the traffic control vehicle, to set and remove cones in the work zone.
  - The driver is responsible for: safe operation of the vehicle, maintaining the vehicle at a safe speed, watching the cone side and the front of the vehicle, and watching the cone handler.
  - The cone handler is responsible for setting and removing cones, and signaling the driver in case of any obstruction or emergency.
  - The driver and cone handler will decide if a shadow vehicle with a truck mounted attenuator is required to protect the cone handler while exposed to traffic.

**Traffic Safety** – Drums are used on freeways due to greater target value and imposing size.

**Barricades** – They protect spot hazards and close roadways and sidewalks with appropriate signing. Barricades can also be used to provide additional protection to work areas. **Lights used to channelize traffic must be steady burning “Type C.”** Do not use flashing “Type A” warning **lights on barricades to channelize traffic.**

**Temporary Pavement Markings** – These markings delineate lanes and tapers on long-term projects. Remove existing markings that may confuse motorists. For short-term maintenance operations, it is not practical to remove and then restore pavement markings. If it is necessary to divert traffic across existing pavement markings, the channelizing device used must be so dominant that a motorist’s attention is drawn completely away from the existing marking. Reduced device spacing is recommended. The use of removable black mask tape (see QPL, *Qualified Products List*) may also be considered to temporarily cover existing markings.

**High Level Warning Devices** – They are tall, portable stands with flags or flashing lights visible above traffic. Used with flags only, they may have a sign or flashing light attached, or be attached to vehicles used in moving or mobile work operations (see MUTCD, Part VI).
3. **Temporary Barrier** – There are several types of barrier protection used in work zones: concrete barrier, movable concrete barrier, steel barrier and water-filled barrier. While barriers are effective and provide positive protection to work operations, they may result in more damage to an impacting vehicle.

**Concrete Barriers** – They are a rigid barrier designed to prevent intrusion of errant vehicles into work areas considered the most substantial type of barrier to enhance worker safety. Contact the Region Traffic Engineer for site specific placement information.

Consider the use of concrete barriers for:

- High speed roadways and areas with a high potential for worker injuries.
- Work zones in “no escape” areas (e.g., tunnels, bridges, and lane expansion work).
- Long term, stationary jobs (work occupying a location for more than three days).
- Worker and traveling public exposure considerations (e.g., high speed and volume of traffic), when workers are not protected by a vehicle, and in proximity to traffic (e.g., concrete slab repair on freeways).

**Movable Barriers** – This specialty barrier requires a Transfer/Transport Vehicle (TVV) to physically move the barrier. NW region owns two TVV’s and barrier.

- High volume traffic conditions with very short-term lane closures.
- Continuous operation over an extended period of time, where there is a need to get the lane back in operation at some point in the day. (Could be used in lieu of reduced lane widths or lane reduction, e.g., lane additions, wall next to roadway).

Protect the ends of concrete barriers with approved crash cushions, unless flared outside the clear Zone. Refer to *Design Manual* M 22-01 Chapter 720 and consult with the Region Traffic Engineer to determine the appropriate end treatment. Do not use concrete barriers as a channelizing taper, but when/if flared or tapered, channelization must be used in advance (e.g., temporary edge line, cones, or plastic barrels) to provide a recovery area for errant vehicles.

**Steel Barrier** – A rigid portable barrier designed to prevent intrusion of errant vehicles into work areas. Recommended for work operations where concrete barrier may also be used. The benefits of using steel barrier include a light weight stackable design that reduces transport costs when compared to traditional barrier. Several hundred feet of the barrier can typically be transported on a single truck with the stacking capability. Optional casters can also be installed to simplify deployment and movement by allowing the barrier to be pushed and pulled into position.

**Water Filled Barriers** – They are a portable traffic barrier designed to prevent intrusion of errant vehicles into work areas. Recommended for stationary work areas with high exposure to high speed traffic where it may not be practical to use concrete barrier, but more protection than channelization devices is desired. Be aware that up to 23 feet of lateral deflection can occur if the barrier is impacted at high speed.
Consider the use of water barriers for:

- Short term projects (zero to three days) of a minimum 100 feet in length.
- **Do not use in lane transitions** until further testing or the situation meets with manufacturer’s specifications.
- Evaluate risk and site conditions. If used, follow manufacturer’s guidelines and specifications. Consult with the Region Traffic Office prior to use.

Additional information on barriers is located in Chapter 710 of the *Design Manual* M 22-01, Chapter 5 of the *Traffic Manual* M 51-02, and the *Work Zone Traffic Control Guidelines* M 54-44.

4. **Hand Signaling Devices** – If other methods of traffic control are inadequate to warn and direct drivers and flagger traffic control is implemented, stop/slow paddles must be at least 18 inches in diameter and reflective for night use. For high speed, high volume traffic or those locations where more advance driver attention is desired, consider the use of 24 inch stop/slow paddles or the Flashing Stop/Slow Paddle (FSSP).

5. **Lighting Devices** – Use to call attention to hazardous situations, especially at night. Includes warning lights, flashing vehicle lights, floodlights, and flashing arrow boards.

**Warning Lights** – These lights are either flashing or steady burn (Types A, B, or C or strobe) mounted on channelizing devices, barriers and signs. Secure warning lights to the channelizing device or sign so they will not come loose and become a dangerous flying object if impacted by a vehicle. See the MUTCD Part VI for additional information.

**Steady Burning Lights (Type C)** – Lights used in a series of channelizing devices or barriers form a taper or separate the work area from traveled lanes. Never use any type of flashing light in sequence for transitions or continuous channelization.

**Flashing Vehicle Lights** – These lights alert motorists to the potential hazards of maintenance vehicles and workers near the traveled lanes. Use flashing lights to warn of isolated hazards or signs. Snow-removal and other highway maintenance equipment use flashing lights for purposes of identification when working. Use flashing lights anytime over width equipment is on the highway per WAC 468-38-390.

**Floodlights** – Use them to illuminate nighttime work. Floodlights permit the crew to see what they are doing and make the crew visible to motorists. Where planned, night operations require flaggers; flood lighting must be provided to illuminate the flagger. Shield the light source to protect motorists from glare.

**Flashing Arrow Boards and Changeable Message Signs** – They are required for day and nighttime tapered lane closures and moving operations. At night, flashing arrow boards are required to use a photocell which automatically dims (minimum 50% dimming) so that motorists will not be temporarily blinded. When used for lane closures tapers, they are located in the lane (or partially on the shoulder) being closed, behind the taper of channelizing devices, usually within the first one third of the taper.
Do not use arrow boards or arrow displays on changeable message signs when:

- Work does not require lane closures, except for moving operations on multilane facilities.
- All work is on or outside the shoulder with no interference requiring closure of the adjacent traveled lane.
- The work is on a two-lane, two-way roadway.
- A shoulder closure only is required.

Do not use more than one arrow display per lane being closed. An arrow display with a shadow vehicle (early warning) is allowed on mobile or moving lane closure operations. The caution mode (flashing four corner lights only) may be used as supplemental warning at work area not requiring a lane closure.

Arrow displays used on PCMSs must meet the same performance standards for flashing arrow boards, see MUTCD Part VI.

**Traffic Control Procedures**

Controlling traffic for maintenance operations is dependent upon the activity being performed, the estimated duration of the activity, type of highway, traffic speeds and traffic volume. Safety clothing will be worn by WSDOT employees while in the highway work zone (for more information, see Chapter 3 of the Safety and Procedures Guidelines Manual M 75-01).

Providing advance warning to drivers approaching road work is required. The specific requirements for advance warning depend on the actual site conditions and could be the flashing beacon on a work vehicle or a series of portable signs and a PCMS. (Refer to the Work Zone Traffic Control Guidelines M 54-44 and MUTCD Part VI for specific advance warning requirements).

Use an advance warning sign when:

- Any work activity that may distract the driver or require the driver to react, beyond the normal driving requirements for that section of road.
- Work is performed on or immediately adjacent to the roadway (within 15 feet of the edge of the roadway).
- Equipment may be moved along or across the highway.
- The shoulder is occupied or closed.
- There is encroachment into traveled lanes.

Typical traffic control plans and additional guidance for maintenance activities are contained in MUTCD Part VI and the Work Zone Traffic Control Guidelines M 54-44. These plans establish typical signing procedures. The maintenance employee in charge must determine the extent of traffic control required to provide motorist and worker safety. Modification to or the development of new traffic control plans may be necessary to accommodate a work operation.

After establishing traffic control, the maintenance employee in charge will drive through the work area at expected motorist speeds to determine the plan’s effectiveness. Periodic monitoring is required to ensure traffic control devices remain in place.
Changing conditions such as traffic, work, or time of day require traffic control adjustment. If an accident or near accident occurs after the control has been set up, make necessary adjustments immediately and monitor for a reasonable period. Remove, cover or turn traffic control devices during non-working hours.

Refer to the *Work Zone Traffic Control Guidelines* M 54-44 and MUTCD Part *Work Zone Traffic Control Guidelines* M 54-44 VI for guidance on specific work operations, duration of work requirements and flagging operations.

**Off-Road Activities**

Where work is being conducted off the roadway and shoulders, but within the right of way, the hazards are usually minimal. However, minimize risks by using an appropriate warning sign (e.g., MOWER). (See above section on advance warning signs).

**Nighttime Activities**

Nighttime maintenance activities are commonly performed because of lower traffic volumes and reduced traffic disruption. Nighttime work is also necessary to respond to emergencies such as fallen trees, mud slides, etc.

Night operations present additional safety concerns. All signs used at night shall be reflective as specified in the MUTCD. Street or highway lighting does not meet the requirements for traffic control device illumination.

Floodlights may be necessary to provide work area illumination and to permit the crew and flaggers to be visible to the motorist. The light source must be shielded to protect drivers from glare. Consult the Safety and Traffic Offices to review WSDOT illumination practices.

The effectiveness of flagging is diminished at night as the flagger may not be visible to the motorist. Make efforts to control traffic by other means when possible. When used, the flagger is located within a coned area (usually the shoulder or other relatively safe location) but not within the taper itself. As with other workers in night work zones, flaggers shall wear traffic vests made of highly visible materials supplemented with reflective material visible on all sides of the wearer and a highly visible hard hat with reflective qualities.

**Automated Flagger Assistance Device (AFAD)**

The AFAD is an automated flagging machine that is operated remotely by a flagger located off the roadway and away from traffic. The device is a safety enhancement for projects that use alternating traffic control by physically placing the human flagger off the roadway while maintaining control of the traffic movements approaching the work zone. Contact the region traffic office for specific guidance and advice on the use of these systems. A traffic control plan is required for use of these systems.
Temporary and Portable Signal Systems

Temporary traffic control signals are typically used in work zones to control traffic such as temporary one-way operations along a one-lane, two-way highway where one lane is closed and alternating traffic movements are necessary. Examples of work operations are temporary one-way operations on bridges and intersections. Contact the region traffic office and signal superintendent for specific guidance and advice on the use of these systems. A traffic control plan is required for use of these systems.

- **Temporary Signal System** – Typically a permanent signal system modified in a temporary configuration such as temporary pole locations during intersection construction, span wire systems, adjustment of signal heads to accommodate a construction stage.

- **Portable Traffic Signal System** – A trailer mounted traffic signal used in work zones to control traffic. These versatile, portable units allow for alternative power sources such as solar power, generator and deep cycle marine batteries in addition to AC power.

Non-Motorized Traffic Control

Give consideration to pedestrian and bicycle traffic where appropriate. Provide alternative routes where designated walkways or bicycle routes are temporarily interrupted due to maintenance operations. Alternative routes need to be free of obstructions and hazards (e.g., holes, debris, mud, construction and stored materials, etc.). Clearly delineate all hazards near or adjacent to the path (e.g., ditches, trenches, excavations, etc.). Bicyclists are subject to the same flagging procedures as vehicles. Do not place signs and other traffic control devices to pose a hazard.

Pedestrian Control

Alternative pedestrian walkways are provided when pedestrian activity is apparent where:

- Walkways traverse the work zone.
- A designated school route traverses the work zone.
- Significant evidence of pedestrian activity exists (e.g., a worn path).
- Existing land use generates pedestrian activity.

Consider the following principles for designing/constructing alternative pedestrian facilities:

- Separate pedestrians and vehicles by barrier or channelizing devices. Use barriers on high speed facilities. Use channelizing devices on low speed (35 mph or less) facilities.
- Walkways used at night, (especially if adjacent walkways are lighted) need temporary lighting.
- Use warning lights to delineate pathways and mark hazards.
- Pedestrians will not go out of their way. Make alternate pathways reasonable.
Bicycle Control

Bicycles have a legal right of access to most highway facilities and provisions for their safe conduct through work zones are necessary.

Provide and sign an appropriate alternate route when maintenance activities close a designated (signed) bicycle path or shoulder bikeway. Where horizontal separation for bicycles and pedestrians existed prior to work, give consideration to separating during work.

When laying out alternative bicycle paths, make sure no overhead obstructions present a direct hazard to normal bicycle operation.

Safety

The safety and welfare of WSDOT employees is paramount. Injuries are costly in terms of both human suffering and economics. For these reasons, WSDOT initiated the employee safety program over 50 years ago.

Guidelines for maintenance employee safety are contained in the Department’s safety manual. Any questions about safety concerns can and should be raised to the employee’s supervisor or the regional safety officer. Accidents involving equipment, falls, and other trauma injuries are a major part of worker safety. As the materials and chemicals used in maintenance become more complex, then the risks to employees also increase. Employees must be trained to know the rules, policies and practices intended to promote a safe work environment.

Safety pays dividends on all jobs. A positive attitude toward safety will not only help to protect the employee from injury, but will also lead to continued job satisfaction. Every employee needs to develop the habit of thinking safety before and during the work to be done.

Work Zone Operations

Maintenance operations require employees to be on the alert to protect themselves, fellow crew members and the traveling public. Performing jobs safely is a priority and an integral part of maintenance operations. The fundamental guide for all staff in the control of maintenance work zones is MUTCD Part VI.

Work zone safety has two aspects that are sometimes not kept in balance. One is when there is too much pressure for production efficiency. The other is when there is too much fear of liability resulting from a traffic accident. Each maintenance employee, as well as each motorist, is entitled to have a work or traffic environment which is reasonably safe. Every effort must be made to ensure that the most effective traffic control strategy is implemented. This strategy must address the needs and requirements of both the workers and drivers. The development and implementation of a comprehensive traffic control strategy will satisfy the concerns of production and potential liability while providing an effective and safe work zone.

Maintenance employees may have innovative ideas that will create improved flow of traffic through a work zone or better protection of the workers. Make sure to get formal approval from the regional traffic engineer to test and evaluate the idea in the field if it is a deviation from this manual or the MUTCD. This will limit WSDOT’s liability if a motor vehicle accident occurs during the testing.
Enforcement

Maintenance supervisors should encourage law enforcement officers to patrol through work zones as frequently as possible. The presence of law enforcement near work zones increases safety and motorist compliance with traffic control regulations.

Contractual use of law enforcement in work zones is based on a combination of local knowledge, sound judgment, and the advice of the regions’ traffic engineering staff. Consider the type of work activity, complexity of the traffic control plan, possible speed reduction needs, traffic volumes, nighttime work activity, geometric conditions, associated cost for use of enforcement (cost benefit analysis), and actual traffic problems observed as the work progresses.

Refer to Instructional Letter IL 4008.00 for specific guidance on the use of WSP traffic control assistance.

An agreement GCA 5080, between WSDOT and WSP exists to keep the payment process consistent statewide. Maintenance offices charge enforcement work to the particular work order number for the control section where the work is done. Contact the region Traffic Office for assistance with WSP traffic control assistance.

Resources for Traffic Control and Work Zone Safety

The following information may provide additional guidance and more specific detail. This list includes manuals, reference documents and staff mentioned throughout this chapter.

- *Work Zone Traffic Control Guidelines* M 54-44 (required for each crew)
- MUTCD Part VI (required for each crew)
- *Traffic Manual* M 51-02, Chapter 5
- Work Zone Safety Task Force Recommendations
- Quality Guidelines for Temporary Work Zone Traffic Control Devices (ATSSA)
- Work Zone Traffic Control Supervisors Notebook
- Planning and Scheduling Work Zone Traffic Control (FHWA IP-81-6)
- IL 4008.00 WSP Traffic Control Assistance
- Directive D 55-20, Reduced Speed in Maintenance and Construction Work Zones
- Region Maintenance or Traffic Office and Public Information Officer (Traffic Engineer or Traffic Control Specialist)
- HQ M&O Traffic Office, State Traffic Control Engineer