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1.1 Introduction

The primary function of work zone traffic control is to allow vehicles, cyclists, and pedestrians to move safely and easily through or around work areas while still allowing for safe and efficient work operations to be conducted. Effective temporary traffic control enhances traffic safety and efficiency. Drivers and pedestrians need to be guided in a clear and positive manner while approaching and navigating temporary traffic control zones.

The Traffic Control Plans (TCPs) contained in these guidelines are furnished in an effort to address common road maintenance work operations and are to be used along with good judgment. Minor modifications may be made, as necessary, to accommodate site conditions and specific work operations; however, a plan's original intent must be maintained. An alternate or more project specific plan should be considered if substantial revisions are necessary. Consult the Region Traffic Office staff for additional guidance and assistance in modifying a plan.

Traffic control plans and procedures consistent with these guidelines should be developed to address the specific needs of work operations that are not included in these guidelines.

The traffic control plans included in these guidelines are not drawn to scale, are typical in nature, and are not intended to satisfy all conditions for all work zones and can generally be adapted to a broad range of conditions. In many instances, an appropriate TCP is achieved by combining features from various typical applications to fit the operation and specific roadway features such as intersecting roads or driveways. The *Manual on Uniform Traffic Control Devices* (MUTCD) is adopted by the Washington State Department of Transportation (WSDOT) as the legal standard. Principles set forth in Part 6 of the [MUTCD](#) titled "Temporary Traffic Control" are represented in these guidelines to provide traffic control guidance for common work operations.

These guidelines do not specifically address individual types of work operations. Standards do not allow exceptions based on work type. Many types of work operations such as surveying, maintenance, utility, developer, etc., can be applied to the guidance and plans contained within.

The typical applications (TAs) shown in MUTCD Part 6 may be used as needed to address work operations not shown in this manual. If any of the plans shown in the MUTCD are used keep in mind they meet the minimum national standards and may not meet the minimum WSDOT requirements. Any use of the TAs or revisions to the TAs are subject to following the intent and guidance as shown in this manual and must be approved by the region Traffic Engineer prior to implementation.

The plans and text included in these guidelines have been developed to provide WSDOT personnel consistent statewide basic traffic control methods for common work operations. **This manual is not for use in WSDOT contracts and the plans are not formatted for such use and may not meet requirements for the project.** Typical traffic control plans have been developed and formatted for contract use and can be found at www.wsdot.wa.gov/design/standards/plansheet/tc_1_18.htm.

Work zone design information can be found in *Design Manual* M 22-01, Chapter 1010, and at the WSDOT [Work Zone Safety](#) web page.

1.2 Considerations

1. Provide substantial protection and minimize worker exposure to traffic by applying positive protection devices in practical ways. Long-term projects (three days or longer) may warrant the use of positive protection devices such as concrete temporary barrier, while short-term operations may be better served by a truck-mounted attenuator (TMA). Always consider the use of positive protection whenever practical.
2. Prior to the beginning of work operations, evaluate all aspects of the work area, including sight distance, traffic speed, volume, road approaches, work duration, and the type of work activity, before deciding on a traffic control plan.
3. After the traffic control plan is implemented, the supervisor (i.e., the person(s) supervising the actual work task(s) for which the TCP was implemented) must drive through the work area, at the anticipated speed of the motorists, to determine the effectiveness of the plan and make adjustments as appropriate. Additional reviews throughout the work shift are recommended to ensure that traffic control devices remain in place. It is important for work occurring during nighttime hours that the devices are reviewed to ensure proper visibility.
4. Whenever the temporary traffic control zone extends more than **2 miles** from the first advance warning sign, the devices need to be moved forward in order to maintain appropriate advance warning to drivers, especially in urban areas with multiple interchange ramps.
5. Contact the region traffic management center (TMC) prior to starting work and after completion when appropriate, based on region policies to notify them of your work operation status. Also coordinate with the region communications manager for public notification and to be included in the weekly region construction activity report.

6. Plan ahead for manpower, equipment, and materials (such as signs, channelizing devices, pavement marking materials, etc.) needed for traffic control to address your planned work operation and whenever possible look for opportunities to combine multiple work operations within a temporary traffic control zone with the aide of the region work zone database to minimize impact to drivers and for maximum efficiency. This may include region wide and statewide crews that may have a need to work within your maintenance area.
7. The distances shown on the traffic control plans are desirable minimum requirements. Device spacing, buffer space, and sign spacing might require adjustments to provide for site conditions such as driveways.
8. The Washington State Patrol (WSP) is generally available to assist WSDOT by enforcing excessive speed and impaired driver laws in critical work zone traffic control situations if they have manpower available. These may include nighttime lane closures on high volume/high speed freeways or road closures. Coordinate with local detachment for availability. Contact the Region Traffic Office staff for specific information regarding procedures to utilize the WSP under the reimbursement program. Refer to *Traffic Manual* M 51-02, Appendix 5.A, for guidance.
9. Traffic control devices are used to visually guide drivers through work zones. Signing, channelizing devices, arrow boards, and warning beacons all provide a message to the driver. Work zone credibility is established through the proper and consistent use of these devices to send correct messages to drivers. Poor work zone credibility has a direct, negative impact on work zone safety by causing driver confusion, frustration, and disrespect.
10. During paving or chip seal operations, temporary pavement markings must be maintained throughout the project. Temporary pavement markings shall be installed on the roadway that was paved that day. Temporary pavement markings shall, as a minimum, be in accordance with [TCD 9](#) (Temporary Pavement Marking Details) in these guidelines.
11. Traffic delays due to work zone operations must be anticipated and addressed appropriately. Excessive delays contribute to work zone incidents of road rage or crashes. Traffic capacity issues must be addressed with the Region Traffic Office prior to starting work. Many regions have developed lane closure work hour charts for specific routes with heavy traffic volumes and must be considered prior to beginning work operations. **Traffic should not be allowed to back up past the advance warning signs.** Sign locations may need to be adjusted to fit actual site conditions or additional signs added to the sequence. Use of advance warning signs such as portable changeable message signs (PCMS) and highway advisory radio (HAR) are recommended.

1.3 Work Duration

The categories of work duration and their time at a location shall be:

1. Long-term stationary is work that occupies a location more than three days.
2. Intermediate-term stationary is work that occupies a location more than one daylight period up to three days, or nighttime work lasting more than one hour.
3. Short-term stationary is daytime work that occupies a location for more than one hour within a single daylight period.
4. Short duration is work that occupies a location up to 1 hour.
5. Very Short Duration is work that may only take a few seconds or minutes to perform.
6. Mobile is work that moves intermittently or continuously.

1.4 Personal Attributes

Awareness – Routinely working near traffic for extended periods of time can lead to workers becoming complacent to the danger around them. Therefore, it is necessary to continually remind ourselves and those around us of the dangers to which everyone is exposed. *Pre-activity Safety Plans and daily “tail-gate” meetings are required prior to beginning any work operation to ensure everyone is aware of the task to be performed and their respective duties.*

Alertness – There is no place on a “*traffic exposed*” work crew for a daydreamer or distracter. Each individual, for their own protection and that of the crew, must stay constantly alert and attentive.

Attitude – A positive, safety-conscious attitude on the part of each crewmember will contribute greatly to the overall safety of crew operations.

Responsibility – Each person is responsible for ensuring their own safety and to see all standards are followed. This includes ensuring temporary signs, warning devices, and flag persons are placed appropriately to protect both the motorists and workers. *Motorist and worker safety are of primary importance.*

1.4.1 Worker Protection

“All WSDOT employees are directed to make the safety of workers and the traveling public our highest priority during roadway design, construction, maintenance, and related activities” (excerpt from [Executive Order E 1001.01](#)).

Working on or along the highway can present a potentially hazardous work environment. Consider the risk to workers when determining the traffic control plans to be used for the work operations that shift. An assessment of worker safety should be made prior to beginning work operations.

1.5 Personal Protective Wear

Refer to the *Safety Procedures and Guidelines Manual* M 75-01 for guidance and requirement on personal protective equipment and a preactivity safety plan (PSP).

For specific questions regarding personal protective equipment, contact the Region Safety Office.

1.6 Equipment

1.6.1 Traffic Control Device Crashworthy Requirements

All Category 2 traffic control devices (portable sign stands with signs, type 1, 2, and 3 traffic barricades, and other work zone devices less than 100 lbs.) **must be compliant with the federal NCHRP 350 and MASH crash test requirements.** Sign stands must have an identifying label on the stand indicating it meets crashworthy requirements.

1.6.2 Condition and Care of Equipment

All personal equipment and traffic control devices must be kept clean to provide protection for the crew through better visibility to the motorist. The condition of signs and traffic control devices shall be “acceptable or marginal” as defined in the book *Quality Guidelines for Temporary Traffic Control Devices*. A sign or traffic control device determined to be “not acceptable” shall be replaced as soon as possible. Limited copies of the Quality Guidelines book may be obtained from the HQ Traffic Office or ordered through the American Traffic Safety Services Association (www.atssa.com).

1.6.3 Signs

Signs that are no longer retroreflective (visible and legible at night) or are in poor condition are to be replaced. All standard temporary warning signs are required to be 48 inches × 48 inches diamond shape with black letters or symbols on an orange background consisting of Type X reflective sheeting. Refer to the *Sign Fabrication Manual* M 55-05 for standard sign legends. WSDOT maintenance crews are allowed to use roll-up sign material along with any short duration utility or developer operations working under permit. All WSDOT contract work requires aluminum or aluminum composite substrate.

Some work operations might require the use of special, modified, or regulatory signs. Contact Regional Traffic Office for assistance with special signs. **Use of double-faced (back-to-back) signs or signs made of plywood substrate are not allowed.** Sign supports must be maintained in good condition, be capable of withstanding normal wind stresses along the highway and must be crashworthy.

Not all warning signs may have been shown on the traffic control plans but are still required to address specific work zone hazards when conditions warrant, particularly if the hazard is not obvious or cannot be seen by approaching motorists. When the work space is within the traveled way, except for short-duration and mobile operations, advance warning shall provide a general message that work is taking place and shall supply information about highway conditions. Devices shall indicate how vehicular traffic can move through the work area.

Examples:

- Abrupt Lane Edge*
- Motorcycles Use Extreme Caution*
- Bump
- Traffic Revision Ahead
- Road Narrows
- Grooved Pavement*
- Rough Road
- Loose Gravel*
- No Shoulder
- Water Over Roadway
- Steel Plate*

*Refer to [Section 1.8.3](#) for additional information of motorcycle warning sign.

Signs that will be in place at one location continuously for longer than three days must be post mounted.

Minimum sign mounting height for temporary warning signs is 1 foot above the ground. In some locations where the sign is located behind a traffic control device such as a traffic safety drum or temporary barrier, raise the minimum height to 5 feet in order to provide additional visibility. Neither portable nor permanent sign supports should be located on sidewalks, bicycle facilities or areas designated for pedestrian or bicycle traffic.

For the purpose of temporary sign installation, the median barrier is considered to be part of the shoulder and its measurement shall be used to determine the total width of the shoulder. Smaller sign sizes may be used in the median when the median width is between 6.5 feet and 8 feet to provide left sign assemblies on multilane roadways. Where it is necessary to add weight to signs for stability, sand bags or other ballast may be used, but the height to the top of the ballast must not be more than 4 inches above the roadway surface and must not interfere with the breakaway features of the device. Follow manufacturer recommendation for sign ballasting.

1.6.4 Vehicles

- **Work Zone Vehicle** – All construction vehicles used within the work zone must be equipped with an approved flashing warning beacon. When a beacon is used in conjunction with a truck mounted arrow board, the flashing beacon should be turned off for a stationary operation once the arrow is setup to reduce any confusion with the lights. Consideration must be given to the location of workers in relation to the work vehicles. Worker safety can be jeopardized if the motorists' attention is focused on the work vehicle and beacon when the workers are at an unexpected location. Additional information on vehicle lighting can be found in the [TEF Operating Rules Manual M 3015, Chapter 5 Vehicle and Equipment Warning Light Systems](#).
- **Protective Vehicle** – Usually a stationary vehicle (in stationary work zones) is strategically placed in advance of the work area, between the buffer space and the roll-ahead space, to protect workers from oncoming traffic. The use of a Truck Mounted Attenuator (TMA) on this vehicle is **required on high-speed (45 mph or higher) multi-lane roadways**. Allow for roll-ahead distance resulting from an impact. Refer to the data block shown on the TCPs for specific information on roll ahead distances. The protective vehicle can be a work vehicle if no other vehicles are available.

- **Shadow Vehicle** – Very similar to the protective vehicle but usually a moving vehicle (mobile work zones). All of the above guidelines for the protective vehicle apply to the shadow vehicle **except for the roll-ahead distances shown on the buffer data charts only apply to a stationary operation**. For moving operations, the roll-ahead distances vary and shall be determined in the field based on the work operation and site specific conditions. An arrow board or truck mounted Portable Changeable Message Sign (PCMS) may also be used on the shadow vehicle.

1.6.5 Portable Changeable Message Signs (PCMS)

- Shall **not** be used to replace required signs.
- Shall meet the minimum visibility and legibility standards established in the [MUTCD 6F.60](#).
- Should be able to read the message twice at the posted speed. **Typically use 2.0 seconds per message panel.**
- A complete message cycle should consist of **no more than two** displays in sequence in order for drivers to fully read the intended message. Refer to [MUTCD Table 1A-2](#) for a list of acceptable message abbreviations.
- **Bottom of sign panel shall be a minimum of 7 feet above roadway.**
- Consider use of a truck mounted PCMS for protective and shadow vehicles to allow for maximum flexibility.
- Consider use of permanently located changeable message signs when applicable to supplement work operations.
- **When PCMS are not being used, they are to be removed.**
- Except when the PCMS trailer is actually being moved, it shall be detached from the towing vehicle. **Towing trailer devices with the display active as a mobile operation is not allowed.**

When locating a PCMS in the field:

- Avoid placing in locations that compete with drivers decision points (like exit and on ramps).
- Don't park within gore areas.
- Avoid locations that compete for the drivers attention.
- Consider the other signing in the area and try to space at least 500 feet from other signs (800 feet is preferred).
- Try to place 1,000 feet or more beyond the diverge point.
- Try to place behind guardrail or barrier if plausible.
- Select widened shoulder areas to maintain a minimum 4-foot clearance to the edge of the travelled lane.
- Place a taper of at least three channelizing devices in advance of the PCMS (drums or cones as appropriate).
- Avoid placing in areas where it is in the natural path of a driver (such as the outside of a curve).

If the PCMS cannot be placed with the guidelines above, then evaluate the added value versus the risk. Look at alternatives, such as static signs. Remember that a PCMS is not a substitute for the static sign, it is a supplement.

1.6.6 Arrow Boards

- **Required on multi-lane roads for all lane closure tapers, except during an emergency. A separate arrow board is required for each lane being closed.**
- Arrow boards shall meet the minimum size, visibility, legibility distance, number of elements, and other specifications as shown in the [MUTCD Section 6F.61](#).
- Arrow boards shall not be used to laterally shift traffic.
- Arrow boards shall not be used on a two-lane, two-way roadway.
- Arrow boards shall only be used in the caution mode when used for shoulder closures.
- **Only the four-corner flash mode shall be used to indicate caution. The Double Diamond or flat bar caution modes are not allowed.**
- The arrow board shall be located behind channelizing devices (unless used in mobile operations where it is truck mounted).
- An arrow display mounted on a shadow (early warning) vehicle is allowed on mobile lane closure operations.
- Type “C” arrow boards are required for high-speed, stationary lane closures. Type “B” arrow boards are allowed for maintenance and mobile lane closure operations. (See [MUTCD Section 6F.61](#) for additional information on arrow boards.)
- Except when the arrow trailer is actually being moved, it shall be detached from the towing vehicle. **Towing trailer devices with the display active as a mobile operation is not allowed.**

1.6.7 Channelizing Devices

Traffic safety cones are the most common devices used to separate and guide traffic past a work area. Cones must be a minimum of 18 inches tall. **For high speed (45 mph or higher), high volume, or nighttime operations, devices must be a minimum of 28 inches tall, and retro-reflectorized.** Traffic safety drums must be 36 inches tall and are required for use in lane closure tapers on multi-lane high-speed roadways due to their greater visibility and imposing size. Tall Channelizing devices are a minimum of 42 inches tall, using a tapered cone type shape and are recommended for use on high speed roadways in lieu of 28 inch cones due to their greater visibility. If a supervisor does not use the traffic safety drum for the lane closure taper as stated, approval from the region Traffic Engineer is required.

Minimum device spacing requirements are shown on the TCPs. Tubular markers should only be used where space restrictions do not allow for other more dominate devices. Tubular markers may be used to divide opposing traffic lanes, divide open lanes in the same direction of low speed roads in the same direction and to delineate the edge of a pavement drop off.

Vertical flat panel devices and devices with directional stripe patterns are not allowed due to frequency of placement errors.

1.6.8 Barricades

Generally used to protect spot hazards but can also be used to close roadways and sidewalks with appropriate signing. Barricades can also be used to provide additional protection to work areas. Barricades must be crashworthy and [NCHRP 350](#) or [MASH](#) approved. The barricades used in work zone applications are portable devices. They are used to control traffic by closing, restricting, or delineating all or a portion of the roadway. There are three primary barricade types:

1. **Type 1 Barricade** – Used on lower speed roads and streets to mark a specific hazard, or can be used for sidewalk closures as appropriate.
2. **Type 2 Barricade** – Used on higher speed roadways and has more reflective area for nighttime use to mark a specific hazard.
3. **Type 3 Barricade** – Used for road closures.

Signs mounted on Type 3 Barricades are allowed provided they are located behind other traffic control devices such as a shoulder or lane closure.

Refer to [Standard Plan K-80.20](#) for additional details for the approved WSDOT Type 3 barricade design.

1.6.9 Positive Protection Devices

Positive protection devices provide a physical separation between traffic and the work operation. The devices are not considered channelizing devices because their primary function is to provide a method to keep errant vehicles out of the work space and protect workers.

1.6.10 Temporary Concrete Barrier

Temporary concrete barrier is designed to prevent intrusion of errant vehicles into work areas and to provide positive protection to work areas. Barrier is recommended for long-term stationary work areas with high exposure to traffic.

Consider the following for use of concrete barriers:

- Areas where there is a high potential for injury to workers or “no escape” areas such as internal lane work, work zones in tunnels, bridges, lane expansion work, etc.
- Long-term, stationary jobs (work occupying a location for more than three days).
- Areas of high exposure to workers and motorists such as high speed and high volume of traffic.
- The approach ends of temporary concrete barriers must be adequately protected. If the barrier cannot be mitigated by either tapering outside clearzone, behind guardrail, or buried in the back slope then the end must be fitted with a temporary impact attenuator.

Other barrier products available on the market such as steel barriers and water barriers have limitations and restrictions that need to be considered before being purchased or included as part of the work operations. Contact the Region Traffic Office for assistance on additional product information.

1.6.11 Truck Mounted Attenuators

A truck mounted attenuator (TMA) is a portable impact attenuator attached to the rear of a 15,000 lb truck. Ballast is added to the truck to minimize the roll-ahead distance when impacted by a vehicle. The TMA is used as a shield to prevent errant vehicles from entering the work zone. If a TMA is not available, the use of a shadow vehicle is still highly recommended. The WSDOT approved TMAs are listed on the QPL.

Considerations for the use of TMAs:

- **Speed of Traffic** – Higher operating speeds on multilane roadways leave less reaction time and impacts generally result in more severe injuries and damage. Therefore, the higher the operating speed the more probability that a TMA is necessary.
- **Type of Activity** – In lane work, Mobile, short duration, very short duration, or stationary.
- **Duration of Project** – Typically daily maintenance operations are suitable for TMAs, but for longer term operations positive protection from devices such as temporary concrete barrier should be considered.
- **Roadway Environment** – Access controlled vs. non-access controlled, urban vs. rural, and roadway geometrics. Access controlled facilities frequently give drivers a false sense of security since interruptions are not expected. Therefore, activities on freeways may be more susceptible to incidents than are activities on non-access controlled facilities, where drivers are generally more alert.
- **Traffic Volumes** – More traffic means more worker exposure.
- **Exposure to Special Hazards** – Operations involving personnel on foot or located in exposed positions (for example, on the approved platform of a pickup truck placing cones or in a lift-bucket performing overhead operations) is particularly susceptible to severe injuries or death. TMAs should be strongly considered for use in these operations.
- **Location of Work Area** – Locations of primary concern are those within the traveled lanes or within frequently used all-weather shoulders. Activities taking place within the traveled lanes are more likely to become involved in an incident than are shoulder activities.
- **Roll Ahead Distance** – This distance applies only to stationary operations. The minimum 30-foot roll-ahead distance shown in the Buffer Data block on the TCPs is based upon a minimum 15,000 lb. host vehicle weight and a maximum weight in accordance with the manufacturer's recommendations. The distance shown is the recommended minimum distance to be used as per the manufacturer's recommendations for roll-ahead distances for roads 45 mph or less. For speeds higher than 45 mph, a longer roll-ahead may be considered. Keep in mind as the more space is allowed between the TMA and the work area the more opportunity for a vehicle to re-enter the closed work space. A maximum space of 100 feet is recommended. A protective vehicle is recommended regardless if a TMA is available. If no TMA is used, the protective vehicle shall be strategically located in the field to shield workers and no specific roll-ahead distance has been provided. The TMA shall be

positioned to separate and protect work zone activities from normal traffic flow. During use, the attenuator shall be in the full down and locked position. For stationary operation, the parking brake shall be set and the tires aligned straight as per manufacturers direction.

1.6.12 Warning Lights

These lights are either flashing or steady burn (Types A, B, C, or D) 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](#) Section 6F.83 for additional information.

1.6.13 Flares

All work vehicles should carry a supply of flares. Use flares only to alert drivers to emergencies and not as routine traffic control device. Emergencies are defined as unforeseen occurrence endangering life, limb, or property. Use caution at incident sites where flammable materials, such as fuel spills, are suspected.

Consider the following for use of flares:

- Primarily used in high hazard conditions only (i.e., incidents, spills, equipment breakdowns, dangerous snow and ice conditions).
- Use electronic flares or orange/red-glow sticks instead of incendiary flares where flammable materials are suspected. Electronic flares or light sticks should be removed when the incident has terminated.

1.6.14 Portable Signal Systems

Portable traffic control signals are trailer mounted traffic signals used in work zones to control traffic instead of using a flagger. The maximum distance between signal heads is 1,500 feet to minimize wait time and clearance interval. These versatile, portable units allow for alternative power sources such as solar power, generator, and deep cycle marine batteries in addition to AC power. Several regions own portable signal systems, check with your region traffic office and signal superintendent if you have a work operation that would benefit from using a portable signal. Portable signals are typically used in work zones to control traffic such as temporary one-way operations along a two-lane, two-way highway where one lane is closed and alternating traffic movements are necessary. An example work operation is temporary one-way operations on a bridge or around a slide or rockfall. 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, [TCD 11](#) is provided as an example for creating a site specific plan. Refer to [MUTCD](#) Section 6H-12 for additional information.

1.6.15 Automated Flagger Assistance Device (AFAD)

The AFAD is an automated flagging machine. The device is operated remotely by a flagger located off the roadway and away from traffic. The device is essentially an extension of the flaggers arm and they use a remote control instead of a paddle to control the movements of traffic. The device is considered to be 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. A maximum distance of 800 feet between stop locations is recommended unless there is a pilot car used along with the device. 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 and a typical version is provided by referring to [TCD 12](#) of this manual. Additional information is available in MUTCD Section 6E.04.

1.6.16 Portable Highway Advisory Radio (HAR)

A portable trailer mounted roadside radio system that provides traffic and traveler related information (typically affecting roadway being traveled) via AM radio. Many regions own at least one system and can be moved from location to location as necessary. Contact the Region Traffic Office or Region Signal Superintendent for specific guidance, availability, and advice on the use of these systems.

1.7 Flagging

Refer to [WAC 296-155-305](#) for specific flagging requirements.

- Flagging should be employed only when all other methods of traffic control are inadequate to direct, or control, traffic.
- **A TCP showing flagger locations is required for any flagging operation.**
- **Minimum standard flagging paddle size allowed is 18 inches. It is recommended that a 24-inch paddle be used to improve visibility and for all high speed operations.**
- The use of a flashing stop/slow paddle is allowed instead of a standard paddle. Follow the guidance shown in the [MUTCD](#) Section 6E.03 for additional information.
- In a mobile operation when the flagger is moving with the operation, all signs associated with the flagger shall be moved ahead whenever work advances to more than **2 miles** from the first advance warning signs. Also ***the flagger ahead sign must be within 1,500 feet of the flagger*** and the flagger station must be able to be seen from the sign. If terrain does not allow a motorist to see the flagger from the “flagger ahead sign”, the distance between the sign and the flagger must be shortened to allow visual contact but at no time shall it be closer than as described in the sign spacing chart shown in this manual.
- During hours of darkness, flagger stations **shall** be illuminated without causing glare to the traveling public by using a portable light plant or approved alternative such as balloon type lights. Lighting of flagger stations shall be done so by aiming the light either parallel or perpendicular to the roadway to minimize glare. Mounting height of 10 to 25 ft above the ground. The flagger should be visible and discernable as a flagger from a distance of 1,000 ft.

- Pilot car operations as part of a flagging operation are appropriate for long distance alternating traffic needs to maintain driver speeds and to help guide through the work site. Pilot car operators shall be certified flaggers and are able to trade off duties with other flaggers. Refer to TCP 2 for traffic control for a pilot car operation. Determine who the pilot driver will be during pre-activity meeting and discuss any special instructions at that time to ensure everyone understands expectations.
- When flagging in the vicinity of signalized intersections, special consideration must be made to address the specific needs to traffic movements. The signal must be either turned off or set to all red “flash” mode. **At no time shall traffic be flagged with an active signal in full operation.** Contact region signal superintendent for assistance with signal operation.
- ***The placement of a flagger at the center of an intersection to control traffic is not allowed as per WAC468-95-302.*** The only person allowed to legally control traffic from the center of an intersection is a uniformed police officer.
- No matter who is performing the intersection flagging, the appropriate advance warning signing is required to be in place. Additionally, a recommended best practice is when multiple lanes approach the intersection, close at least one lane in an effort to minimize confusion and allows the flagger better opportunity to control movements. It is recommended to reduce traffic to one lane of traffic per direction whenever possible.
- **A four-sign sequence is required for flagging on roadways with posted speeds of 45 mph or higher.** WSDOT’s standard four-sign sequence for “one lane road” situations is in compliance. However, there are flagging situations other than “one lane road” where the four-sign sequence is still required. These situations could be truck crossings, bridge work, surveying, etc., where flaggers are required to stop traffic for a short period of time. In these cases, the most appropriate standard warning sign that reflects the roadway condition or work operation should be used in place of the “one lane road ahead” sign to comply with the four-sign sequence requirement. These signs might be:
 - Truck crossing
 - Road machinery
 - Utility work
 - Survey crew
 - Blasting
 - Worker symbol sign or simply a sign saying Workers (this sign could be a very generic yet appropriate solution in many cases)

If the above signs are not available or appropriate for the operation, an acceptable alternative would be to repeat the “Flagger Ahead” symbol sign or the “Be Prepared to Stop” sign. Again, the preferred method is to use the sign that most appropriately describes the roadway condition or work operation.

1.8 Pedestrians, Bicycles, and Other Roadway Users

Give consideration to pedestrian and bicycle traffic where appropriate. Provide alternative routes where designated walkways or bicycle routes are temporarily interrupted due to work operations. Alternative routes need to be free of obstructions and hazards (e.g., holes, debris, mud, construction, and stored equipment). Clearly delineate all hazards near or adjacent to the path (e.g., ditches, trenches, excavations). Refer to [MUTCD Chapter 6D](#) for additional requirements and [TCD 10](#) of this manual for a typical plan for pedestrian traffic control.

1.8.1 Pedestrians

Most public highways and streets cannot deny access to pedestrians if no other route is available to them. **All pre-existing ADA compliant pedestrian facilities within the work zone must continue to comply with ADA requirements for access during work operations.** Consider the following when addressing pedestrian issues within and around work zones:

- Accessibility through the work area for pedestrians must be accounted for prior to starting work operation. If temporary pedestrian ramps are necessary at the work location, refer to Standard Plans for [temporary ramp](#) detail.
- Pedestrians should not be led into conflicts with work site vehicles, equipment, and operations.
- Pedestrians should not be led into conflicts with vehicles moving through or around the work site.
- Pedestrians should be provided with a safe, convenient path that replicates as nearly as practical the most desirable characteristics of the existing sidewalks or a footpath.
- Pedestrians generally will not go out of their way. Make alternate pathways reasonable.
- Do not place signs and other traffic control devices within the pathway that may pose a hazard.
- **Placements of sidewalk closure signs are required in advance of the closure point for pedestrians to make adjustments to their route. It must be recognized that pedestrians are reluctant to retrace their steps to a prior intersection for a crossing.**

1.8.2 Bicycles

- Bicycles have a legal right of access to most highway facilities and provisions for their safe conduct through work zones are necessary.
- Provide for and sign an appropriate alternate route when 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.
- Riding surfaces are important for safe bicycle operation. Loose gravel, uneven surfaces, milled pavement, and various asphaltic tack coats endanger the bicyclist. Consider the condition of the surface the bicyclist will be required to use.

1.8.3 Motorcycles

The driving or roadway surface is also important for motorcycle rider safety. The same surfaces that are a problem for bicyclist are also difficult for motorcyclists. Stability at high speed is a far greater concern for motorcycles than cars on grooved pavement, loose gravel, milled asphalt, and abrupt edge tapers from existing pavement down to milled surfaces. Adequate signing to warn for these conditions in work zone operations to alert the motorcycle rider are required by [RCW 47.36.200](#) and [WAC 468-95-305](#). See [TCD 2](#) for a typical signing layout example.

1.8.4 Schools

Work zone operations in the vicinity of schools require consideration to ensure that conflicts are kept to a minimum. Issues that should be considered are:

- Student path to and from the school.
- Bus movements for loading and unloading students.
- Coordination with crossing guards.
- School hours to minimize impacts.

1.9 Additional Work Zone Considerations

1.9.1 Work Zone Speed Limits

The speed limits on state highways are set by the State Traffic Engineer and cannot be changed without approval. Only use reduced legal speed limits when the safe operating speed of the roadway determines the need to do so. Safety issues such as loose gravel from chip seal operations, access points, sight distance, poor roadway condition, and reduced geometric features are some examples of issues that may apply. Speed reduction guidelines are outlined in [RCW 47.48.020](#), [Executive Order E 1060.00](#), and [Traffic Manual M 51-02](#), Appendix 5.B.

Do not reduce speed limits based on the hope that traffic will slow down when there is no driver perceived need to do so. Proposals to reduce the speed limit for work zones must be submitted to the Region Traffic Office for consideration and Regional Administrator or State Traffic Engineer for approval.

1.9.2 Buffer Space and Shy Distance

Buffer space is a lateral and/or longitudinal area that separates road user flow from the work space or an unsafe area, and might provide some recovery space for an errant vehicle.

- Lateral buffer space provides space between the driver and the active work space, traffic control device, or to a potential hazard such as an abrupt lane edge or drop-off. A minimum of 2-foot lateral buffer space is recommended.
- Shy distance is the distance from the edge of the traveled way beyond which a roadside object will not be perceived as an immediate hazard by the typical driver to the extent that the driver will change the vehicle's placement or speed.
- Longitudinal buffer is the space between the end of the taper and the buffer vehicle. Refer to [Appendix 3](#) for additional information.

Devices used to separate the driver from the work space should not encroach into adjacent lanes. If encroachment is necessary, it is recommended to close the adjacent lane to maintain the lateral buffer space.

In the case of short-term lane closure operations, the adjacent lane may need to be closed or traffic may need to be temporarily shifted onto a shoulder to maintain a lateral buffer space.

1.9.3 Lane Closure Setup/Takedown

Operations to set up and take down traffic control often are the times when crews are at their greatest exposure. Due to the multiple variations of crew size, available equipment and location no one procedure can fit all situations. In an effort to provide consistency and guidance on how to best perform the operation the following steps have been provided.

1. **Prior to any operation beginning and before any crew member is exposed to live traffic the crew will discuss the daily pre-activity safety plan involving the activity.**
2. Within the pre-activity safety plan, discussion regarding the procedure for the setup and take down operation for the traffic control is to be decided and all crew members will be fully aware of their duties and what is expected of them.
3. The traffic control plan being implemented for the work operation will be discussed and any modifications to the plan will be noted by the supervisor and the plan will be onsite during work operation.

1.9.4 Survey Work Zones

For surveying operations along the centerline of a two-lane two-way road, one lane shall be closed following the guidance shown on [TCP 1](#).

The guidance and TCPs contained in these guidelines do not reflect a specific type of work operation, which is consistent with the principles of Part 6 of the [MUTCD](#). **It is intended that survey crews will follow the guidance shown in these guidelines to accommodate their work needs.** Moving centerline work operations are not allowed. Survey crews are not allowed any additional flexibility than other work crews to conduct work operations in a safe manner as intended within the established rules and guidance. However, TCPs more specific to survey operations may be considered. If specific plans are necessary or additional guidance is needed, contact the Region Traffic Office for assistance.

1.9.5 Public Information

Accurate and timely reporting of work zone information to the public is a valuable element in the overall traffic control strategy. The use of public information resources, such as web pages, newspapers, radio, and television can greatly improve the public's perception and acceptance of the necessary delays and other inconveniences caused by the work operation. Contact the Region Public Information Office for assistance.

Issues to consider are:

- Emergency services coordination so they are aware of the operation and can make adjustments to routes if necessary when responding to emergencies.
- Transit organizations, they may require adjustments to bus stop locations within project limits.
- Schools and local business, special considerations may be necessary for them to maintain access to their sites.

1.9.6 Roundabout Traffic Control

For work within the roundabout, initial advance warning signs are required for each approach leg. If the work operation and all work vehicles are out of the travel lanes and central island apron, a single Road Work Ahead sign per approach is all that is required. If any of the road approaches to the roundabout cannot access the intersection due to work operations, then either flagging or possibly a detour is required. If the central island apron will be impacted by the work or equipment, treat it as a shoulder closure for the length of work and consider diverting truck traffic due to large vehicle wheel tracking. For multi-lane roundabouts, if work can be done without closing both travel lanes, flaggers may not be needed. Appropriate signs for lane closure at each entry are required.

A traffic control plan must be developed for each individual roundabout specific to the location since all roundabouts are unique. A generic typical detail has been provided as a guide in developing a plan (see [TCD 13](#)).

1.9.7 Road Closures

This work type requires the complete closure of the roadway in order to pursue the work operation. **Advance notification of the closure is required** and a signed detour route is required when appropriate. Closing a highway, street, or ramp, while not always practical, is a desirable option from a safety viewpoint. For the traveling public, closing the road for a short time might be less of an inconvenience than driving through a work zone for an extended period of time.

Workers should not assume that because a road closure is in place that danger from vehicles does not exist. Even with a posted road closure, the potential may exist for a vehicle to get past a closure point. It is important for workers to remain vigilant and aware of their surroundings at all times.

When it is necessary to close a road, street, or ramp, submit a request to the Region Traffic Office in advance of the need. Per [RCW 47.48.010](#), the Regional Administrator has the authority to close a road, street, or ramp.

Short-term closures are allowed without advance public notification for emergencies but planned off-peak closure (night closure) must follow the guidance above. Check with the region traffic office prior to implementing a closure.

1.9.8 Detour

This work zone type involves total closure of the roadway. Traffic is rerouted to an adjacent street or roadway to avoid a traffic control work zone operation. Detours should be clearly signed over their entire length so that drivers can easily use existing roadways to return to the original highway. Follow the steps outlined earlier for road closures. If closing the state route and detouring traffic onto another state route is possible then local agency approval is not required.

1.9.9 Special Events

Be aware that special events may conflict with the planned work operation and make adjustments to work hours if necessary. Coordinate with event to minimize impacts.

Each region has a person that coordinates approval of special events in the region so this person should be the lead in the event planning. Contact this person along with the region's public information officer to provide assistance in the coordination effort.

For any special event (parade, bike event, movie, or television commercials, etc.) on a state route where there is a roadway closure, detour, flagging operation or other traffic control, a traffic control plan is required. Event organizers must coordinate with WSDOT to obtain permits and submit a traffic control plan for approval prior to any event taking place on the state route. Refer to [Traffic Manual M 51-02](#), Chapter 7, for additional information.

1.9.10 Work Over Traffic

Work above an open lane of traffic is allowed provided that the work can be done by utilizing industry standard safe work practices. Safe work practices must consider the potential risk of falling debris, tools, or equipment onto traffic. Also, the vertical clearance above live traffic must be carefully considered as to not create a hazard for workers, or to vehicles passing under the work platform or equipment. Examples of this type of work allowance would be maintenance or repair work to signal heads, luminaires, sign illumination and signs. A lane closure should be considered for work operations that are not a standard or routine practice or may have a higher risk of significant damage or injury due to the location and nature of the work such as, setting falsework and girders or sign bridges as examples. (Caution: Maximum legal load height is 14 feet, but there is potential to encounter occasional overheight loads.)

Checklist for Establishing a Temporary Traffic Control Zone*

<i>Completed</i>	<i>Item</i>
<input type="checkbox"/>	Determine the duration of work (Stationary, Short-Duration, Mobile).*
<input type="checkbox"/>	Determine hours of work to avoid peak periods (refer to region work hour chart when applicable or contact the Region Traffic Office for assistance).*
<input type="checkbox"/>	Select the appropriate TCP for operation using duration, type of roadway, volume, and speed, from guidelines. See volume considerations in Section 3.5.2 .
<input type="checkbox"/>	Document any modifications to typical TCPs.
<input type="checkbox"/>	Verify decision sight distance.
<input type="checkbox"/>	Include intersections and driveways in TCP modifications.
<input type="checkbox"/>	Make accommodations for pedestrians and ADA needs as appropriate.
<input type="checkbox"/>	Allow for buffer space free of obstructions.
<input type="checkbox"/>	Check the condition of devices (refer to Quality Guidelines Booklet) and replace devices as appropriate.
<input type="checkbox"/>	Install devices beginning with the first device or sign the driver will see. Device spacing and layout as per TCPs or modified TCPs.
<input type="checkbox"/>	Conduct a drive through to check for problems. Make adjustments as appropriate.
<input type="checkbox"/>	Document temporary traffic control zone, problems and major modifications to the layouts.
<input type="checkbox"/>	Continuously maintain devices while in place.
<input type="checkbox"/>	Remove devices as soon as the work is completed, beginning with the last device placed.

*Utilize the Region Traffic Office staff for assistance to address specific concerns and questions.

