Chapter 5  Work Zone Traffic Control

5.1 General

Work zone traffic control is a major aspect of any roadway project. It must be designed from the motorists point of view to provide the motorists with the necessary information to proceed in a safe and orderly manner through a construction or maintenance work zone which may have unexpected roadway conditions, changes in alignment, and temporary roadside obstacles relating to the work activity. The sudden transition to tighter geometrics and the closer proximity of traffic control must be incorporated into the work area in a manner that will minimize driver uncertainty. Effective work zone traffic control is the result of strategy planning, plan development and preparation, and field applications. The goal of any work zone traffic control plan is to allow no reduction in the level of service for traffic.

TCP (Traffic Control Plans) must be included in the PS&E to provide for the orderly movement of vehicular and pedestrian traffic through construction and maintenance areas.

No single standard sequence of signs or other traffic control devices can be used as an inflexible arrangement for all situations due to the variety of roadway and traffic conditions that may be present in a roadway project. A TCP that adequately address the variables motorists will encounter on each specific project are generally preferred.

5.2 Principles

Guidelines for TCPs are found in Section VI of the Manual on Uniform Traffic Control Devices (MUTCD). Section VI details the fundamental principles of temporary traffic control, including the design and erection of signing, traffic control layout, pavement markings, delineation, lighting, and flagging standards. This chapter sets forth specific principles for designing traffic control.

A. Traffic Control Features

1. **Lane Geometry.** The approach lane width should be equaled or exceeded throughout the connection. The minimum allowable lane width is 10 feet. Design the lane and the lane width reductions prior to any lane shifts within the transition area.

   Every effort should be made to maintain an approach speed that matches the design speed of the facility. Where this is not possible, a 10 mph reduced speed advisory, posted with a warning sign which tells the driver of the hazard, is considered maximum per speed.
change. Design for the highest design speed allowed with respect to curve radii. Curve radii and lane width should not be reduced simultaneously.

The objective is to use lane geometrics that will be clear to the driver and keep the vehicle in the intended lane. Lane lines and construction joints must be treated to provide a smooth flow through the transition area. It may also be necessary to modify or remove other existing traffic control devices.

2. **Physical Barriers.** There are three types of barrier protection used in construction workzones: water-filled barriers, moveable barrier, and concrete barriers. Several items as summarized below must be considered when determining their use.

**Water-filled Barriers**

- Short-term projects (zero to three days) for a minimum 100-foot length.
- Do not use in lane transitions until further testing has been done or unless the situation meets with manufacturer’s specifications. In the case of an open construction work area, use in conjunction with TMAs.
- Evaluate risk and site conditions and if used, follow manufacturer’s guidelines and specifications. Provide chart for Washington State Department of Transportation (WSDOT) designers to use which shows deflection based on speed of vehicle.

**Moveable Barriers**

- High volume traffic conditions with very short-term lane closures.
- Continuous operation over 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, i.e., HOV lane additions; wall next to roadway.)

**Temporary Concrete Barriers**

- High speed roadways and areas where there is a high potential for injury to workers (i.e., internal lane work).
- Work zones in “no escape” areas such as tunnels, bridges, lane expansion work, etc.
- Long-term, stationary jobs (work that occupies a location more than three days).
• Worker and traveling public exposure considerations such as high speed and volume of traffic, when workers are not protected by vehicle, and in proximity to traffic (concrete slab repair in freeways).

Temporary concrete barriers are normally installed for:

a. The operation of opposing traffic where two-way traffic must be maintained on one roadway of a normally divided highway for an extended period of time.

b. The separation of opposing traffic where a four-lane divided highway transitions to a two-lane, two-way roadway that is being upgraded to become a divided four-lane roadway.

c. Projects where existing safety features such as bridge rail or guardrail are removed.

A 2-foot minimum shy distance is normally provided between the lane edge and the near edge of the separation barrier.

It may be necessary to utilize a portion of the roadway shoulder to provide the roadway width needed for the barrier use.

In areas where temporary concrete barriers cannot be installed, drums, cones, barricades, or vertical panels can be used as an acceptable alternate. However, temporary concrete barriers must be used in the transition areas between multilane and two-lane, two-way roadways, and as described in (c) above.

Exposed ends of concrete barriers must be located outside the clear zone and adequately flared, or have a crashworthy end treatment.

Where drums, cones, etc., are used, consistent patterns of the devices are important to help alleviate driver confusion. Random mixing of these devices at any given location is undesirable.

Where positive barriers are not used throughout a two-way connection, warning lights may be used to mark opposing traffic separation devices.

3. Illumination. Full lighting is normally provided through traffic control areas where power is available. Illumination will be placed in accordance with Chapter 840 of the Design Manual M 22-01.

4. Delineation. Removable temporary or painted lane lines and edge lines are normally used to delineate the roadway. These pavement markings are preferred for shifts in travelway alignment. Type 2 raised pavement markers and guideposts may be used to accentuate the lane and edge lines in illuminated areas.
In areas where power for illumination is not available, reflective devices must be used to delineate the traveled way for nighttime driving. Guideposts provide eye-level delineation, while Type 2 raised pavement markers provide lane line delineation. Reflective devices are also installed on temporary concrete barriers used in transition areas and/or to separate opposing traffic.

When concrete barrier is used, lateral clearance markers may be installed at the barrier’s angle points and at other locations along the barrier where additional delineation may be needed.

Pavement marking arrows are placed in lanes to indicate direction of travel.

Delineation guidelines are shown in Chapter 830 of the Design Manual.

5. **Speed Limit or Speed Advisory Signing.** As part of the design process for construction and projects for maintenance, speed reductions are an option requiring a thorough traffic analysis conducted prior to making a change. For emergency and other necessary speed reductions, guidelines are outlined in RCW 47.38.020, WSDOT Construction Manual M 41-01, and Directive D 55-20 “Reduced Speed in Maintenance and Construction Zones.”

When a change of speed is necessary, a request for change of speed limit must be submitted to the regional Traffic Control Engineer. When regulatory speed limit reduction or advisory speed signing is necessary, use the letters “XX” to represent the speed limit on the TCP. The actual posted speed indicated on the signs is determined prior to opening the temporary connection.

Some items to consider when reducing speeds in work zones because of worker safety include:

- Post speed limit signs in the work zone. When speed limit is lowered and enforced (monitored by WSP/local law enforcement), ensure work zone is adequately signed.
- Post regulatory speed limit signs for work hours only (identify hours when the limit is in effect if condition for speed limit reduction is not present when work is not being conducted). Remove signs when reduced speed limit is not in affect.
- Use variable message signs more frequently (as a supplement to standard signs) to display either advisory speeds or regulatory speed limits and explain the activity requiring the reduction.
6. **Variable Message Signs.** Per the MUTCD, the primary purpose of VMS in temporary traffic control zones is to advise the driver of unexpected traffic and routing situations. Some typical situations can include the following:

- Where speed of traffic is expected to drop substantially.
- Where significant queuing and delays are expected.
- Where adverse environmental conditions are present.
- Where there are changes in alignment or surface conditions.
- To provide advance notice of ramp, lane, or roadway closures.
- For accident or incident management.

Operators must always be aware of what the arrow board is displaying. Keep displays appropriate and when not needed, turn them off. For instance, when the vehicle or arrow board is placed on the right shoulder, never display the “right arrow” because it would move people off the shoulder/road and be potentially hazardous to drivers/workers. This also applies to “left arrow” usage in the left lane/shoulder placement.

Make messages clear and brief. Keep 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 “canned” messages that the VMS is equipped with.

7. **Truck Mounted Attenuators (TMAs).** Items to consider for determining TMA use:

- Speed of Traffic: Higher operating speeds leave less time for response, and impacts at higher speeds generally result in more severe injuries and damage. Therefore, activities on facilities with high speed limits are likely to entail more frequent and more severe incidents than are activities on facilities with low speed limits.
- Type of activity: moving, intermittent, or stationary.
- Duration of project.
- Roadway environment: access controlled vs. non-access controlled, urban vs. rural; and geometrics of roadway. Access controlled facilities frequently give drivers a false sense of security resulting in a lower expectation of interruptions to free traffic flow. Therefore, activities on freeways may be more likely to become involved in incidents than are activities on non-access controlled facilities where most drivers are operating at a higher state of alertness.
• Traffic volumes which relate directly to worker exposure.

• Exposure to special hazards: Operations involving personnel on foot or located in exposed positions on or within work vehicles (for example, on the platform of a cone pickup truck or in a lift-bucket performing overhead operations) are particularly susceptible to high severity incidents.

• Location of work area: Locations of primary concern are those within the traveled lanes and those within all-weather frequently used shoulders. Activities taking place within the traveled lanes are more likely to become involved in an incident than are shoulder activities.

Some suggested priorities for the application of truck-mounted attenuators are contained in Figure 5-2.

8. **Use of Flaggers.** Flaggers should be employed only when all other methods of traffic control are inadequate to warn and direct traffic. They should be used prudently when signing and other methods cannot work. The use of more innovative, restrictive, traffic control methods such as signs, signals, channelization, etc., should be considered.

Flaggers must be part of an approved Traffic Control Plan and included in the initial design.

On high speed locations, post speed advisory plaques with appropriate warning signs and other innovative traffic control methods, preceding flaggers, to slow the traffic down and to let drivers know there are people ahead.

Flaggers should not be used when there is no intention to control traffic.

Use of flaggers should be consistent between regions/offices/locations for like jobs. For instance, use flaggers for the following conditions:

• **Slow Traffic.** Do not rely solely on flaggers to slow the traffic; supplement with traffic control set up (i.e., simplify traffic flow, restrict traffic flow).

• **Direct Traffic.** The flagger is sometimes necessary to keep traffic from following work vehicles into the work zone. They are responsible for redirecting vehicles back into the flow of traffic safely.

• **Stop Traffic.**

9. **Use of Enhanced Enforcement.** For use of enforcement, the initial determination should be based on engineering judgment (between maintenance/construction office and district traffic office) considering the type of construction 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.

Enhanced enforcement in the work zone is recommended to:

- Provide single stationary patrol car for work zones where the work area is less than 1,000 feet in length. (This is the length of the actual work area and excludes the advance warning, taper, and buffer spaces before and after the actual work zone.)

- Provide two or more stationary patrol vehicles for work zones with a work area greater than 1,000 feet in length. (This is the length of the actual work area excluding the advance warning, taper, and buffer spaces before and after the actual work zone). The WSP stated that use of two troopers (one set up at the start of the project who would radio to the trooper at the end of the project) works best for enforcement. One trooper would be available to transport individuals as needed and one trooper would remain to cover the work zone.

B. **Pedestrian and Bicycle Safety.** Special consideration must be given to the safe accommodation of pedestrians when the work zone encroaches upon a sidewalk, crosswalk, or other areas used by the pedestrian.

Where walkways are closed by construction or maintenance, provide an alternate walkway when feasible. Where it is necessary to divert pedestrians into the parking lane of a street, provide barricades and delineation to separate the pedestrian walkway from the adjacent traffic lane. Pedestrians should not be diverted into a portion of the street used for vehicular traffic. At locations where adjacent alternate walkways cannot be provided, post appropriate signs at the limits of construction and in advance of the closure at the nearest crosswalk or intersection to divert pedestrians across the street.

When overhead work could endanger pedestrians, it may be necessary to install a fixed pedestrian walkway of the fence or canopy type to protect and control pedestrians. In such cases, wood and chain link fencing can be used with warning lights and illumination to warn and guide both pedestrians and motorists.

Fences around a construction area are often necessary. They are constructed in conjunction with a special pedestrian walkway around deep excavations, or when pedestrian access to the job site is not desirable. Installation of such fencing must consider relocation of existing control devices and facilities such as traffic signals, pedestrian signals, traffic signs, and parking meters. Open mesh or other suitable fencing may be needed at intersections to ensure adequate sight distance.
When the work zone encroaches upon a bicycle path, an alternate route should be considered and provided for cyclists where feasible. Bicycles should not normally be directed into the same path used by pedestrians. See Part IX of the MUTCD for details on bicycle traffic control.

Appropriate considerations should be made for traffic control operations that are conducted during the hours of darkness.

C. Types of Work Zones. Anticipated work zones are categorized as: (1) Short-Term Stationary, (2) Continuous Moving, and (3) Long-Term Stationary. Different criteria will apply to the design and planning of the necessary traffic control measures for each of these categories. The following is a generalized description of the characteristics for these three types of work zones.

1. Short-Term Stationary. In this type of work zone, situations exist where the work activity is of a very short time, such as, picking up obstacles or inspecting a culvert for debris. For these very short-time work periods, a flashing/rotating beacon in addition to the vehicle’s four-way flashers may give drivers, approaching on sections of highway that have no restrictions to sight distance, adequate warning. When the driver’s sight distance is obscured by roadside obstacles or the roadway geometry, appropriate advance warning signs, and/or other traffic control devices, are required.

Advance warning signs should be used if the short-term activity is repetitive after moving only a short distance. The signs selected should be appropriate for the operation and the signs should be moved ahead as required in order to maintain an appropriate spacing between the warning signs and the activity. The maximum advisable distance between the advance warning signs and the work activity is one mile.

2. Continuous Moving. Continuous moving work areas are activities where work is being done while the equipment is moving either beside or on the traveled lanes of the highway. Included in this category would be striping, roadside spraying, sweeping, and other similar tasks.

The advance warning signs used for moving operations can be mounted on the shoulder or on a shadow vehicle, or both. Shadow vehicles should carry a sign which describes the work ahead and warning lights. If the shadow vehicle must encroach on the traveled lane, a flashing arrow board should be used. Whether the advance warning signs are ground mounted on the roadside shoulder or mounted on shadow vehicles, the signs should be moved ahead as required in order to maintain an appropriate distance between the signs and the work activity. The maximum advisable distance between the advance warning signs and the continually moving work activity is 1 mile.
**On Multi-Lane Highways.** The requirements for traffic control during moving operations on multi-lane highways are similar to those for stationary operations. If work vehicles must encroach on the traveled way, a flashing arrow board should be used while working on multi-lane highways.

An advance warning sign which describes the operation should be mounted on a separate or shadow vehicle. The distance between the shadow vehicle and the work vehicle can vary but it should not be so great that traffic has the tendency to pull back into the lane behind the work vehicle where the work is being done.

**On Two-Lane Highways.** Moving operations on two-lane highways can basically be handled in the same manner as on multi-lane highways with the exception that a flashing arrow board should never be used in the arrow or directional mode. Advance warning signs should be placed on the roadway shoulder or on a shadow vehicle.

3. **Long-Term Stationary.** Traffic control plans developed for long-term stationary operations address each anticipated work situation that encroaches into the traveled lanes or shoulders. The considerations for those traffic control plans should include all traffic entering the work zone from driveways, intersections, ramps, and the main roadway. The plans should also consider how traffic will leave the work area and re-enter the main traffic stream or leave by the way of an intersection or off-ramp.

Detour routes should be given special consideration when directing traffic through urban areas. Local jurisdictions are to be consulted when detoured traffic must use local streets and roads. Also, advise local emergency services, transit and major traffic generators, such as airports and port facilities, about any detour routes.

If ramps, structures or intersections are to be temporarily closed, signs giving advance notice of the closure dates and times are necessary so commuting motorists have the option of selecting alternate routes. The advance notice should be placed a minimum of seven days in advance of the closure.

**5.3 Strategy Planning**

On construction projects, the design report establishes the parameters for the project’s specific needs. At that time such items as lane restrictions and closures, working hours, ramp closures, detour options, and other possibilities should be considered. On low volume rural highways, traffic control procedures may be simple to develop; whereas, traffic control procedures on limited access, multi-lane, high volume routes can be complex and require extensive planning.
From this strategy the Work Zone Traffic Control Plan is developed to identify the type and location of devices (signs, pavement markings, delineation, and flaggers) required to adequately inform the motorists of the situation.

The keys to strategy planning for traffic control on any public roadway, whether rural roads, urban streets, or freeways are the traffic, with considerations for both volume and types of vehicles, and the roadway characteristics. Careful consideration should be given to the effect the traffic control will have on the traffic flow in the work area and on the adjacent roadways. Traffic volumes, along with the speed and classification of vehicles, express the character of the traffic to be encountered. Hourly volumes show the periods of heavy traffic which should be avoided or that will require special treatment. Any restrictions, such as lane closures, and the hours for those restrictions can then be established by the District Traffic Engineer. Special attention should be directed to bicycles and over-sized vehicles and the detouring of those vehicles which may be necessary. Figure 5-1 is a generalized checklist intended to assist in strategic planning and does not necessarily contain all the elements for consideration.

5.4 Plan Preparation

To aid in the preparation of traffic control plans, the Traffic Control Zone is divided into traffic control areas or elements. These individual traffic control areas or elements are used to develop the complete traffic control plan.

A. The Traffic Control Zone. The traffic control zone is the section of street or highway having traffic control devices warning motorists of upcoming conditions or to guide motorists through a construction or maintenance operation. Complex projects may have more than one traffic control zone, one for each operation which may be going on at any one time. The traffic control zone extends from the first advance warning sign to the last sign which indicates the end of the traffic control zone.

The traffic control zone typically consists of five areas (illustrated in Figure 5-2):

1. Advance Warning Area. The area of initial warning and communication with the driver.
2. Transition Area. The area where lane closure tapers and detours transition traffic to the paths required for travel through or around the work area.
3. Buffer Area. The area in advance of the work area which provides a margin of safety for both traffic and the workers.
4. Work Area. The area where the operation or activity is taking place.
5. Termination Area. The area which provides a short distance for traffic to clear the work area and to return to normal traffic lanes.
B. **Plan Development.** The work zone traffic control strategies are to be identified early in the design of a project in accordance with Section 8.10 of the *Design Manual*. Plan development begins with a review of the strategy contained in the design report. The supporting data should be checked and any changes in roadway or traffic characteristics should be taken into consideration while preparing the traffic control plan. Site specific traffic control is to be prepared for each work operation on the project unless the roadway and the work operation is repetitive and each location is similar in character.

There are a number of typical traffic control situations stored in a CADD file. These figures are not intended to be standard control plans for any given operation. They are shown only as examples for the situations depicted and are to be used as aids in the development of traffic control plans.

The traffic control devices shown in each area or element of the traffic control zone are available in a “CEL” library for CADD or PC Microstation and can be placed directly on the plan sheets drawn in either one of these systems.

Roadway plan sheets for the project should be used in preparing the traffic control plan. This provides the scale drawing of the roadway section needed to establish proper placement for the signs and devices. Signs and devices can then be placed on the plan sheet in their proper locations by using the CADD. An on-site review of the area is recommended, since many characteristics cannot be determined from a drawing. Give special attention to existing signs which are to be maintained during the work activity that could conflict with or obstruct the view of the traffic control signs. All features and characteristics which will have an effect on the movement of traffic within and adjacent to the traffic control zone should be included in the plan.

The drawings of sample situations included in the CADD file can be used as guidelines for the selection and placement of traffic control devices. The unique characteristics of the specific work area should be individually addressed. Those features may include side roads, driveways, ramps, commercial approaches, bus stops, bridges or areas which have no shoulders (which make temporary sign placement difficult), substandard roadway width, vertical or horizontal alignment which will affect the sight distance of approaching traffic, add-lanes, drop-lanes, railroad crossings, regulatory traffic controls, or any other characteristics which differ from the examples shown in the sample drawings or the standard plans.

The traffic control devices shown on traffic control plans should clearly and concisely give the motorists information needed to adjust their speed and travel direction through the work area. The prepared plans should
include any special signs for situations in which standard signs do not give accurate information and should be supplied as an item in the contract. The use of special signs should be kept to a minimum and used only where necessary. The Headquarters Traffic Office should be consulted regarding the use of special signs. Signing should be as specific as possible and always relate to the immediate situation to be encountered.

1. **Work Area.** Although the work area is not the first area of a traffic control zone encountered by a motorist, it is the area that must be considered first when developing traffic control plans. Traffic control requirements for all the other traffic control zone areas are determined by the location of the work area and type of activity taking place within that area. The other areas of traffic control will then be designed to complement the activities and channelization requirements within the work area.

   Identifying the work requirements in the work area, such as which lanes need to be closed, exposure to drop-offs, obstacles created, and equipment considerations will indicate what kind of traffic control or warning devices will be required in advance. With an understanding of the kind of work to be done, the designer then works back to the next element of traffic control which is the buffer area.

2. **Buffer Area.** The buffer area is a safety area but it can have other uses. Vehicles hauling material can be parked in the buffer area for short periods of time during the work day. This area should never be used as a material or equipment storage area unless the traffic is protected by a temporary barrier. The buffer area allows the driver to become accustomed to the channelization and to recognize the path of channelization they will follow through the work area.

   After the desirable length of the buffer area is determined, by considering the number of vehicles which might be parked there and the channelization which the driver must follow, the next upstream element to be designed is the Transition Area.

3. **Transition Area.** This is the area where normal traffic flow is transitioned or shifted to the path it must follow around or through the work area. No parking of vehicles or storage should be permitted in the transition area. Lane closure and traffic shift taper lengths are established to recommended minimums depending on the speed limit of the highway and width of the traveled lane. Formulas for determining a taper length are found in Part VI of the MUTCD and a chart for determining taper lengths is available in the CADD file.
4. **Advance Warning Area.** Upstream from the transition area is the advance warning area that gives the oncoming driver information about the situation ahead. Messages used on the advance warning signs will depend on the type of transition ahead. Sign messages which give the driver clear and concise information are the most effective.

5. **Termination Area.** The final area of traffic control to be designed is the termination area. This is the area which gives the driver notification that the temporary traffic control situation is ended. Terminal notification is generally accomplished with a sign such as “END CONSTRUCTION” or may be indicated with channelizing devices which indicate the conclusion of the road work situation and a transition back to normal alignment.

6. **Other Considerations.** Planning temporary traffic control area by area has distinct advantages, especially for complex situations. For instance, if a flagger is needed in advance of the work area, the buffer space should be lengthened to provide space for a secondary warning area where warning signs for the flagging situation would be placed. Roadway features can affect the traffic control in many ways. For example, an on-ramp or side road which enters the highway within the proposed transition area will require special treatment. In such situations advance warning signs should be installed on the ramp or side road and the transition area might have to be relocated to provide a well channelized path for all vehicles.

After locations for the work site traffic control have been established, project signing such as “Road Construction Ahead,” “Road Construction Next XX Miles” (if required by the length of the project), and “End Construction” may be added to the plan.

The time of day when most drivers will encounter the traffic control should be considered while preparing the plans. If traffic control will be in effect during nighttime hours, the signs and devices might need to be supplemented with lights to increase perception and credibility. During a nighttime field review, give consideration to the area’s background lighting from adjacent facilities and advertising signs which are competing for the driver’s recognition.

Warning signs and channelization devices should be positioned in a sequence which can be recognized and respected by the driver. In order to assure proper application, conduct a visualization review of the signs and devices on the plans from a reasonable driver’s point of view. Make sure that the messages and devices are appropriate for each situation the reasonable driver will face.

Temporary concrete barriers and barrier end protection are to be shown on the traffic control plans.
5.5 Work Zone Operations

After traffic control plans based on strategy from the design report are reviewed by the District Traffic Engineer, traffic control can be put into operation on the project.

A drive through inspection of the project to compare actual field conditions, prior to installing the traffic control, can identify characteristics which might require adjustments on the traffic control plan. Aspects of the plan that are not appropriate for the field conditions should be revised. Any modifications to the traffic control plan should be documented. Section 1 of the Construction Manual gives additional guidelines for effective traffic control.

Immediately after the traffic control is laid out on the roadway, a drive-through inspection should be conducted by the individual designated as the “responsible person” for the project’s traffic control to check the installation and position of the signs and other devices; and, to determine if the overall configuration of the traffic control relays clear, concise information to the reasonable motorist. Special attention should be given to the traffic control for overlapping and potentially conflicting traffic control zones. If the traffic control plan is going to remain in effect during the hours of darkness, a drive-through inspection is to be made after sunset to ensure that all devices meet the requirements for reflectorization, proper position, and that the messages are clearly legible. The night review should also ensure work area flood lights and flashing arrow boards do not blind approaching motorists.

Periodic reviews (twice daily is recommended for long-term traffic control) of the traffic control devices should be made to verify the adequacy of the traffic control and to identify any needed revisions. Additional night reviews may be necessary to confirm that the devices are clean and that the reflectorized qualities of the signs and devices are being maintained. These reviews should be documented. Particular attention should be given to motorist’s reaction through or around the work area and if there appears to be confusion, additional reviews should be initiated.

The documentation refers to both the location, appropriateness and condition of the signs or devices. Devices are to be replaced as necessary when their appearance and condition dictate. A form to document the traffic control reviews is useful and most districts or project offices have developed their own forms for this purpose. A photo or video inventory of the work zone traffic control may be used to supplement documentation. If photos or video are used, supplemental inventory information should be referenced in the project documentation.

Should an accident occur on the project or within the work area, a review of the traffic control plan and the devices should be made and documented as soon as possible. This review should be done not only to see if the devices
are in place as shown on the plan, but also to determine if the devices are adequate or if the plan should be revised in light of experience. Each field office should have a procedure for analyzing accidents which take place with the limits of the project. Formal communications with the Washington State Patrol must be established at the pre-construction stage and arrangements made to receive copies of accident reports in a timely manner. Occasional contact with WSP for their perception of the traffic flow through the construction area can be beneficial.

If any assistance is desired at any stage of traffic control plan development, consult the District Traffic Engineer’s office. Each district traffic engineer’s office should have a traffic control specialist to review and provide guidance in the preparation of the traffic control plans for the PS&E, to review traffic control in the field, and to have the authority to approve revisions to the traffic control plans.

The following is a list of things to consider when designing construction traffic control and writing traffic control specifications.

Effective traffic control is integrated into the project early in the design and planning process. Traffic control will often determine the staging of a project and will always effect the project cost.

**Step 1 — To Close Or Not To Close**

Closing the roadway or ramp is the most desirable option. This usually lowers construction costs, decreases contract time and increases worker safety.

Roadway closure can be considered if an alternate route is available. The alternate route must carry the additional traffic volumes and any weight or height restrictions must be considered.

For the traveling public, closing the road for a short time may be less inconvenient than having the road under construction for a long time.

Consider the following while determining if a road should be closed.

1. Is there an available detour route?
2. Can the proposed detour carry the additional traffic?
3. Will businesses or residences be isolated if the road is closed? If so, is there an alternate access point.

If a complete closure is possible, do the following:

- Get the approval of the governing agency to use the proposed detour route.
- Meet with the community and businesses to discuss the roadway closure. Find resolutions to the community’s concerns. This may mean leaving the roadway open during construction.
• Determine the maximum number of allowable days of closure and incorporate this into the special provisions.

• Determine if liquidated damages or incentives for early completion should be included in the special provisions.

**Step 2 — Strategy Or “How Can This Thing Be Built?”**

If the roadway must remain open during construction, determine how to build the project with the least possible impact on traffic.

1. Read any District policy about lane closures or restrictions.

2. Determine the volumes of traffic on the facility and the hours of high volume.

3. Determine if long duration lane closures are needed. Some construction activities that require long closures are:

   Concrete panel replacement
   Bridge overlays
   Major excavations in the roadway
   Large continuous concrete pours

4. Determine the hours of restriction — the hours that lanes and shoulders must be open and clear for traffic.

   For a quick analysis, assume the following volumes of vehicles per hour in urban construction areas:

   - 1400 Veh/hr/lane on controlled access highways
   - 600 Veh/hr/lane on undivided rural and suburban highways
   (any signals will lower the capacity)

   When determining the hours of restriction, check the local noise ordinances and determine what construction work can be done at night. Loud construction work, such as pile driving, is prohibited at night in many areas. For work that is prohibited from being done at night, provisions must be made for daytime work. Avoid engine powered generators for VMS or arrow panels in residential areas during night-work, if possible.

   Be sure to consider holiday weekends, special events, and regular weekend traffic when determining the hours of restriction.

   Also, consider the impact on private or commercial driveways or road access.

5. Determine if there should be liquidated damages in excess of the standard specification amount. Determine if there should be contract incentives for early completion of the project. Determine the amounts of each of these.
6. Study the project and determine how it could be built. Is it possible to build the project within the restrictions stated? Is staging necessary?

Staging a project can be as simple as deciding one lane must be paved at a time. Staging is a suggested way of building the project, not the only way to build a project. By staging the project we determine:

- If our traffic control special provisions are realistic.
- The approximate duration of lane closures.
- If temporary structures and detours are needed.
- If existing utility systems can remain operational during construction, or will they have to be relocated/replaced. (Examples: signals, electrical, drainage)
- If the work areas are adequate. (Examples: storage space for equipment and materials, space to load/unload trucks.)

7. Incorporate into the project design ways of lessening the traffic impact. Some examples are:

a. Use precast concrete or steel girders instead of cast-in-place concrete for structures over main traffic lanes.

b. Specify materials that have faster cure times than conventional materials.

c. Building detours and improving alternate routes in order to carry the increased traffic volumes.

8. Study the project and determine if traffic control or lane closures are needed on adjoining roads. Adjoining roads include frontage roads, intersections, overcrossings, and undercrossings. Some examples are:

- Low clearance because of bridge falsework.
- Long-term lane closures for bridge falsework and substructure excavation.
- Short- and long-term lane closures on frontage roads because of retaining wall construction.
- Placement of “Road Construction Ahead” signs and other warning signs.
- Short-term access closures for paving intersections.

If traffic control is needed on facilities that are not state highways, get permission to use the facility from the governing agency.

9. Determine if there are any areas that construction vehicles cannot safely leave or enter the highway because of limited sight distance. Label these areas on the traffic control plans.
10. Work zone sites exhibiting one or more of the following characteristics should be reviewed for possible enhanced enforcement needs:

- **Sites where “excessive speeding” is observed or could be anticipated within the construction zone.** Based on a study conducted by the California Department of Transportation (Caltrans), “speeding” and speed-related measures were identified as the primary factor affecting work zone safety. While sufficient warning of desirable travel speeds through the work zone may be placed in compliance with the MUTCD, driver acceptance and compliance with the advisory speeds is, in many cases, poor. The use of increased enforcement to “command” adherence to the speed limit has been shown to be effective in maintaining these speeds, as evidenced by the findings in the literature review and interviews with the Caltrans and California Highway Patrol (CHP) personnel.

- **Sites where a reduced speed limit is recommended.** The purpose of a reduced regulatory speed limit within a construction zone is based on a perceived need, such as reducing travel speeds prior to diverting or detouring traffic, reducing speeds adjacent to unprotected construction workers. For a complete discussion, refer to D 55-20. Based on the findings from the study sources, adherence to reduced speed limits is, in many cases, poor. To ensure adherence to the speed limit, enhanced enforcement may be necessary.

- **Sites having a complex traffic plan or multiple phases to the plan.** Sites with traffic control plans having a number of traffic diversions, lane closures, or traffic restrictions requiring a number of decisions by motorists, particularly in a short distance, are highly susceptible to increased accident activity. Much of this activity may be attributed to motorist’s indecision through the area, to differentials in travel speeds through the site, and to the lack of adherence to speed controls in the area. Past efforts have shown that enhanced enforcement, through manual control/flagging or a visible presence, have resulted in smoother, more efficient traffic flow through the work zone. Typically, a lower level of accident activity has resulted.

In addition, construction projects requiring multiple traffic control phases are shown to exhibit greater accident activity than those containing a single phase. Much of this may be attributed to the driver indecision associated with “learning” a new traffic pattern each time a new traffic control phase occurs. As the requirements for the motorists’ decision-making increases between subsequent phases, accident activity is also likely to increase. The use of enhanced enforcement to supplement the existing traffic controls has an “alerting” effect, helping motorists recognize field changes and the need for increased safety through the area. Use of enhanced enforcement for a specific time period following traffic control phase changes has been found to be effective.
• **Sites currently exhibiting a “high” accident rate.** Based on research, accident rates during the construction activity typically increase over the pre-construction accident rate. As such, sites exhibiting a “high” accident rate prior to construction (under normal field conditions) may require supplemental traffic control in the form of enhanced enforcement in order to minimize accidents during construction. Oftentimes, site characteristics (horizontal and vertical curvature, geometrics, access) prior to construction are a major factor in the level of pre-construction accident activity. The presence of construction activity may worsen the impact of these characteristics.

• **Sites having high volume conditions and/or limited roadway capacity.** Construction activity resulting in significant reductions in the available roadway capacity can have a dramatic impact on travel speeds and congestion in an area. To aid in maintaining an acceptable level of traffic operations, selective enforcement through the work zone may be desirable. The enforcement may take the form of traffic control/flagging or the visible presence of police officers and vehicles.

• **Sites planned for nighttime construction.** Research has identified safety problems associated with nighttime work in construction areas. Increased distraction to motorists, unique construction lighting needs, reduced perception levels by motorists, sub-optimal traffic controls, as well as excessive travel speeds for the conditions through the work zone contribute to the increased accident activity. The use of enhanced enforcement to “alert” motorists to the need for increased caution and to enforce excessive speeding in the area can be extremely valuable in maintaining safety during nighttime construction activities.

The safety impact associated with nighttime travel through work zones with no construction activity presents a similar problem. Faced with similar field situations as identified above (e.g., reduced perception levels by motorist, sub-optimal traffic controls, excessive speeding), accident activity through the work zone during nighttime conditions has exhibited major increases over nighttime conditions prior to construction, particularly where traffic movement through the area drastically differs from the “normal” condition. Enhanced enforcement measures have been shown to aid safety in these situations.

• **Sites involving short-term activities.** Past studies have shown that the most critical safety period for work zones is the initial implementation period. Motorists accustomed to driving through an area with no restrictions are forced to adhere to restrictions and “unfamiliar” situations that did not exist previously. Driver indecision is at its peak and driver compliance to regulations varies sharply. As a result, increased accident activity typically results. As drivers become more familiar with the field conditions, the level of accident activity typically is reduced. For short-term project activities (less than one
day), little or no adjustment period exists. The accident activity can be quite high, particularly for field situations requiring traffic diversions, detours or lane reductions. Enhanced enforcement for these conditions may be warranted.

- **Sites with restricted geometrics.** Where steep grades, sharp curves, narrow lanes, or other abnormal field conditions exist, enhanced enforcement to supplement the traffic controls per the MUTCD may be necessary. Sites with restricted geometrics can exhibit accident rates higher than normal. The use of enhanced enforcement can reduce the anticipated accident levels.

- **Sites in areas during periods of poor weather conditions.** In areas where weather conditions such as snow, fog, ice, and heavy rain are anticipated to occur during periods of construction activity, enhanced enforcement services during these conditions would be beneficial. The visible presence of enforcement personnel would serve to “alert” motorists to the potential hazards and need for driver caution through the area. Most construction projects shut down during adverse weather conditions.

- **Sites extending for long distances (>½ mile).** Past studies show that in long construction zones, a location within the zone exists where motorists become “comfortable” with field conditions and are likely to become lax in maintaining safe driving practices. Examples of such practices can include speeding or unsafe lane changes. At this location, there is a need to reinforce safe driving techniques and motorists’ caution within the work zone. Proper placement of enhanced enforcement personnel are included in a later portion of this section.

- **Sites requiring incident management.** Where immediate response to freeway incidents (accidents, breakdowns) is desirable in order to reduce traffic delays and additional traffic accidents, the use of enhanced enforcement techniques is beneficial. Numerous studies have documented the benefits associated with improved response times to freeway incidents. These benefits have often led to the implementation of freeway surveillance techniques. On-site availability of enhanced enforcement personnel at areas where quick response is critical (high volume corridors, peak period conditions, limited off-road space) is desirable.

- **Sites where workers are not protected by barrier.** Situations falling under this heading generally include only those work areas where personnel must work within 10 feet of the traveled way. Having an officer on the site can, as stated before, keep the drivers more “alert” and attentive, increasing the safety margin for both the workers and the drivers.
11. Determine traffic control concerns that should be addressed in the special provisions. Examples are:

- Abrupt lane edges
- Installation of sign bridges
- Rolling slow-down operations for short time complete closures of a highway.
**WSP Field Check List**

**To be Completed by WSDOT Inspector**

<table>
<thead>
<tr>
<th>Contract No.</th>
<th>SR</th>
<th>Milepost From</th>
<th>To</th>
<th>Begin WSP Shift</th>
<th>End WSP Shift</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Date</td>
<td>Time</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>AM</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>PM</td>
</tr>
</tbody>
</table>

**Title**

- Project Engineer
- WSP Task Order No.
- WSDOT Onsite Contact
- Field Phone (include area code)
- Traffic Control Strategy Meeting Location
- Attended By
- Traffic Control Strategy (review with WSP officer)

**To be Completed by WSP Officer - Return Completed Form to WSDOT Inspector**

<table>
<thead>
<tr>
<th>Percent of Time</th>
<th>Duties</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Assistance in traffic control setup and takedown (blue lights)</td>
</tr>
<tr>
<td></td>
<td>Passive presence (yellow lights)</td>
</tr>
<tr>
<td></td>
<td>Proactive patrol in work zone (blue lights)</td>
</tr>
<tr>
<td></td>
<td>Ramp closures (yellow lights)</td>
</tr>
<tr>
<td></td>
<td>Lane closure (yellow lights)</td>
</tr>
<tr>
<td></td>
<td>Road closure (yellow lights)</td>
</tr>
<tr>
<td></td>
<td>Detours (yellow lights)</td>
</tr>
<tr>
<td></td>
<td>Other duties as outlined in Strategy Session (above)</td>
</tr>
</tbody>
</table>

Is a second officer needed for similar work in the future?  ☐ Yes  ☐ No

Suggestions For Traffic Control Improvements (mandatory):

- 
- 
- 
- 
- 
- 
- 

Total Violators Contacted

No. of Accidents Within Work Zone

WSP Officer Name

WSP Badge No.

**Traffic Control Planning and Strategy Check List**

*Figure 5-1*
<table>
<thead>
<tr>
<th>Closure/Exposure Condition</th>
<th>Priority*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Freeway</td>
</tr>
<tr>
<td><strong>No Formal Lane Closure</strong></td>
<td></td>
</tr>
<tr>
<td>Shadow Vehicle for Operation Involving Exposed Personnel</td>
<td>1</td>
</tr>
<tr>
<td>Shadow Vehicle for Operation Not Involving Exposed Personnel</td>
<td>1</td>
</tr>
<tr>
<td><strong>No Formal Shoulder Closure</strong></td>
<td></td>
</tr>
<tr>
<td>Shadow Vehicle for Operations Involving Exposed Personnel</td>
<td>2</td>
</tr>
<tr>
<td>Shadow Vehicle for Operations Not Involving Exposed Personnel</td>
<td>2</td>
</tr>
<tr>
<td><strong>Formal Lane Closure</strong></td>
<td></td>
</tr>
<tr>
<td>Barrier Vehicle for Operation Involving Exposed Personnel</td>
<td>1</td>
</tr>
<tr>
<td>Barrier Vehicle for Condition Involving Significant Hazard</td>
<td>1</td>
</tr>
<tr>
<td><strong>Formal Shoulder Closure</strong></td>
<td></td>
</tr>
<tr>
<td>Barrier Vehicle for Operation Involving Exposed Personnel</td>
<td>3</td>
</tr>
<tr>
<td>Barrier Vehicle for Condition Involving Significant Hazard</td>
<td>3</td>
</tr>
</tbody>
</table>

The numerical rank indicates the level of priority assigned to the use of a TMA on an assigned shadow/barrier vehicle. The use of a TMA under the defined conditions is:

1. Very highly recommended.
2. Highly recommended.
3. Recommended
4. Desirable.
5. May be justified on the basis or special conditions encountered on an individual project.

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**Suggested Priorities for the Application of Truck-Mounted Attenuators**

*Figure 5-2*
Appendix 5.A  Work Zone Traffic Control

Washington State Patrol Work Zone Enforcement and Assistance

Introduction

The use of Washington State Patrol (WSP) enforcement and assistance in work zones can increase driver compliance and improve worker safety and traffic movement. The need for WSP assistance in a work zone is considered and determined during project development or when planning a maintenance operation. Region Designers, with input from the Region Work Zone Safety Specialist, assess all work zone impacts and develop a work zone strategy in accordance with Design Manual Chapter 1010. If used, the appropriate level of WSP enforcement and assistance is spelled out in the Transportation Management Plan (TMP). In addition, local law enforcement agencies may be considered for work zone enforcement or assistance; their use is also managed following the procedures provided in this appendix.

This appendix:

• Discusses factors to consider when determining appropriate use of WSP for work zone enforcement and assistance.
• Provides guidance on work zone strategies, equipment, and procedures related to WSP assistance and enforcement.
• Establishes the procedures to make specific work zone assignments.

Policy

WSP assistance is considered as part of an overall work zone strategy:

• In areas of high worker exposure.
• Where a high level of traffic violations are expected.
• Where there are other unique safety concerns.

WSP assistance is not a replacement for effective work zone strategies and traffic control devices. However it can be a cost effective enhancement that provides enforcement emphasis or other specific assistance duties when other measures are not practical or effective. Active enforcement of traffic laws in operating work zones is the most effective strategy for achieving driver attention and compliance. Routine enforcement by WSP in our work zones is always welcome.
Determining the Need for WSP Enforcement or Assistance

The need for WSP assistance or enforcement is determined during the Project Development phase and is based on specific project conditions. Consider the following factors:

**Work Zone Location.** Consider WSP use if the work zone includes any of the following:

- High Accident Location (HAL) or corridor.
- High traffic volume or high speed roadway segment.
- Unprotected work zone areas.
- Speed enforcement emphasis area.
- DUI enforcement area.

**Type of Work.** Consider the use of WSP assistance in work zones which include:

- **Mobile Work Operations.** Both construction and maintenance use mobile operations for the installation and removal of traffic control and other operations. WSP may be used as a “shadow vehicle” on the shoulder in advance of the first traffic control device, to alert motorists to the operation.

- **Short-Term Work Operations.** Because these operations are of short duration, it is not practical to install positive protection devices such as barriers; thus, workers can be subjected to greater levels of traffic hazards. WSP presence can alert drivers to the work zone and the workers. Short term closures or rolling slowdowns may also require WSP assistance.

- **Night Work.** Because of reduced visibility and potentially higher numbers of impaired drivers, consider WSP assistance for night work.

Enforcement Strategies and Techniques

Enforcement is used to enhance the work zone traffic control measures. It is not a “stand alone” substitute for appropriate traffic control design, signs and devices. Any decision to use WSP assistance or enforcement must focus on the worker safety benefits and the possible reduction of work zone crashes. The local WSP detachments are familiar with operational and enforcement issues along state highways; it is important to request their early input during work zone strategy development.
Random/Roving Enforcement. High profile enforcement in work zones results in increased levels of driver compliance and leads to a “residual compliance effect” even when WSP is not present. The appropriate number of troopers and the frequency of use are determined with input from WSP. A minimum enforcement effort would employ one or two troopers for a shift.

Typically, enforcement can be implemented once or twice a week, depending on the location, to provide adequate compliance and may be used Region-wide in multiple work zones. Implement enforcement during active work operations, stage change-overs, major traffic control shifts, etc. Troopers should be located prior to or just beyond the work area since it can be difficult and potentially hazardous to pull over vehicles within the work area limits. Coordinate with the Region Public Information Office (PIO) as part of this strategy. A Task Assignment form is needed for specific enforcement requests.

Speed Limit Reductions in Work Zones. The rules and guidance for setting regulatory work zone speed limits are covered in Executive Order E 1060.00 and Traffic Manual, Chapter 5, Appendix 5.B.

Public Information Campaign. A Public Information Campaign to increase driver awareness of work zone safety issues increases the effectiveness of using WSP enforcement or assistance. A campaign should include notice of the “double fines” law for a work zone citation. The Region PIO can help develop information strategies to fit the situation.

Routine Patrols. The occasional presence of WSP in work zones will maintain driver awareness and compliance with traffic laws. Local detachments will often increase their presence when notified by WSDOT of the work zone. There is no cost to WSDOT and no Task Assignment form is needed.

Short Term Road or Ramp Closures. Use of a traffic barrier for short term roadway or ramp closures may not be practical. WSP can provide effective enforcement of the closure where violations are likely to occur, such as on a high volume roadway or where there is no convenient detour route. A Task Assignment form is needed to implement this strategy.

WSP Vehicles. The WSP uses patrol cars or motorcycles in their enforcement or assistance efforts. A WSP vehicle shall not be used as a buffer vehicle. In some cases, motorcycles may be more effective due to their ability to navigate narrow work zones, but they are generally used only during daytime operations. Contact WSP to determine which vehicle type is most appropriate for a specific work zone condition.

Passive vs. Active. Active enforcement of traffic laws is a more effective use of the WSP, rather than the passive use of a WSP vehicle stationed in the vicinity of a work zone.
Flagging at Intersections. WSP flagging at either signalized or unsignalized intersections provides a cost effective operation with high driver compliance. A complex intersection may require more than one trooper. When flagging at a signalized intersection, the signal shall be turned off or set to all-red flash mode. Coordinate with WSP to determine who accesses the signal controller. Use of WSP for a flagging operation requires a Traffic Control Plan (TCP) and Task Assignment form.

Rolling Slowdowns. WSP typically conducts any rolling slowdown, particularly on freeways. The WSP troopers are skilled in the techniques used to implement the operation and their presence adds a high level of compliance. Use of WSP for rolling slowdowns requires an approved TCP and Task Assignment form. The WSP should be notified of any rolling slowdown or stop operation, even if they are not conducting it.

Short term Traffic Stops. This operation is a variation of the rolling slowdown and the use of WSP is advised. An approved TCP and Task Assignment form is needed.

Toolbox (Exhibit 1). This list provides guidance on the appropriate use of WSP or other law enforcement in work zones.

Sign and Radio Equipment

Specialized signing and radio equipment is often used in a work zone to provide current and pertinent information to drivers. Driver compliance to these messages is increased by the use of WSP enforcement. Consider use of special signs when WSP speed enforcement is part of the work zone strategy. The Region Traffic office or work zone specialist can assist with use of special equipment and appropriate messages.

Portable Changeable Message Sign (PCMS). PCMSs display work zone information to drivers and send safety, enforcement and compliance messages. PCMSs are available with optional radar speed detection and display equipment.

Following are example PCMS messages to display when using WSP assistance or enforcement. A minimal level of enforcement will be needed to validate the message.

“WORK ZONE AHEAD – SPEED LIMIT ENFORCED”
“WORKERS ON ROAD – SPEED LIMIT ENFORCED”
“WORK ZONE AHEAD – WSP PATROLED”
“WORK ZONE AHEAD – ACTIVE WSP PATROL”
***“YOUR SPEED IS XX – SPEED LIMIT ENFORCED”
***“YOUR SPEED IS XX – SLOW DOWN”
** These messages are for use with a PCMS sign with incorporated radar.
**Speed Display Signs.** The units are available separately or as an option for a PCMS. Radar speed detection equipment measures an approaching vehicle’s speed and displays it on the sign’s message panel. The speed can be accompanied by a message of “YOUR SPEED IS XX.” Studies show that most drivers will check and adjust their speed when provided this clear message.

Use these devices when active enforcement is in place; effectiveness is reduced when drivers see no consequence associated with their speed.

**Portable Highway Advisory Radio (PHAR).** These portable radio stations are used to broadcast messages to drivers regarding roadway restrictions, detours, or other work zone impacts. Enforcement and safety messages strengthen WSP efforts to enforce traffic laws in the work zone.

**“Double Fines in Work Zones” Signs.** The WSP encourages the use of these signs in our work zones. Although the signs are not required to enforce the “double fines” law, they can be an effective reminder to drivers and provide the WSP with a “no excuse” back-up when issuing a work zone citation. Install “double fines” signs at strategic locations, usually in advance of the work zone, or where side traffic enters the work zone.

**Procedures for Incorporating Use of WSP Assistance or Enforcement**

**Project Scoping.** Use of WSP enforcement and assistance must be determined and coordinated at the Project Development phase as part of the TMP. Early planning secures adequate funding and ensures WSP resource availability. A preliminary cost estimate is developed using $75/hour (which includes the trooper and vehicle).

**Project Design.** The work zone design strategy identifies specific uses of WSP assistance or enforcement. A more complete cost estimate is prepared to identify the dollar amount attached to the project. Average cost rates are shown in Agreement GC 5080 (Exhibit 2) and are applied to the number of estimated hours. A Task Assignment (Exhibit 3, WSDOT Form 130-020EF) showing costs and assigned WSP activities must be completed and processed prior to advertisement of the project, to establish the reimbursement work order.

Local WSP representatives should always be invited to the work zone design strategy meeting even if specific WSP assistance is not anticipated.

Enforcement activities are managed by WSDOT, but are not part of the contract work items.

**Project PS&E.** Traffic control plans are required for specific WSP traffic control assistance. Typical operations requiring TCP’s are rolling slowdowns, traffic stops, intersection flagging or similar assignments. The *Work Zone*
Traffic Control Guidelines M 54-44 are used as a reference during plan development. Do not develop TCP’s for routine enforcement operations.

**Project Construction.** The local WSP representative is included in the preconstruction meeting. Their input is valuable and it is important that they are aware of the project and how it might impact traffic operations, safety and mobility. Projects with WSP assistance or enforcement need to have a TMP strategy meeting to discuss specific project assignments, schedules, report forms, communication contacts and expectations.

**Maintenance.** Regional maintenance divisions may establish a standing Task Assignment agreement (considered a “best practice”). This allows for a quick response by the WSP if needed, with the paperwork already in place.

**Emergency Response and Incidents Within a Work Zone.** WSP responds to emergencies and incidents in work zones, just as in regular roadway sections. If incidents or emergencies occur in the work zone contact WSP if they are present; otherwise call 911. Do not resume the same work zone activity until it is determined if the traffic control needs to be revised or protective measures added. If WSP activities are not directly related to work zone features or project traffic control, costs incurred will be covered by the WSP.

Ensure that flaggers and others working at isolated areas in the work zone have a means of communication with the WSP.

**Agreement GC 5080 (Exhibit 2)**

This agreement between WSDOT and WSP is the legal document that allows WSDOT to reimburse WSP for costs associated with assigned work zone enforcement or assistance.

**Task Assignment Form 130-020EF (Exhibit 3)**

The Task Assignment form is completed to assign specific work zone activities to the WSP. It also connects WSDOT reimbursement to a specific work order. The Task Assignment form must be approved and signed by the Agreement manager, Region approving authority, and WSP prior to requesting WSP presence on the roadway.

The following steps provide a “walk through” on completing the Task Assignment:

Each Region assigns a person the duties of Task Agreement Manager; typically this is the Work Zone Specialist in the Traffic office. The Task Agreement Manager requests the agreement number for the Task Assignment from the Headquarters Traffic Office fiscal manager. Do this via email to provide a written record of the request. Include the project name and route number, Contract or Work Order number, if known, and estimated dollar amount.
Once the task number is assigned, the Task Assignment form can be filled out by the Region Task Agreement Manager and signed by both WSP and WSDOT. The WSDOT signature is typically a Region Construction Engineer and the WSP signature is from their Budget and Fiscal manager (Mailstop 42602). Two originals are required, one for WSP and one for WSDOT.

A signed original Task Assignment must be submitted to WSDOT Headquarters Budget Office. Copies are to be sent to Region Program Management, the Project Engineer’s Office administering the project, the Region Accounting Office, and the Region Traffic Office.

The Region accounting office reimburses WSP per the Task Assignment Agreement.

For use of local agency law enforcement personnel, the Region Local Programs office develops a project specific agreement between WSDOT and the agency to establish procedures for use and reimbursement.

**WSP Field Checklist Form 421-045 EF (Exhibit 4)**

The WSP field checklist is filled out by the project inspector. Use of the form establishes the “on the job” expectations for the work to be performed by the WSP trooper. To ensure effective enforcement or assistance work, discuss the specific details with the trooper, including any suggestions the trooper may offer.

**Schedule.** On each project, identify the person who will coordinate with the WSP to schedule troopers. In some Regions scheduling is done by the individual project office administering the contract. In other Regions the traffic office is the primary scheduling contact. This communication should be established prior to the project to avoid confusion and overlapping of duties. The WSP contacts can be identified at the preconstruction meeting or from the WSP Contact List in this document (Exhibit 5).

To ensure troopers will be available, secure scheduling as soon as possible. Cancel only when necessary; this may include incidents of inclement weather, work stoppage, etc. A 2-hour minimum call out is required when assigning troopers for a project.

**Field Monitor and Adjust the Work Zone.** The field engineer or project inspector should meet with the assigned WSP trooper(s) at the beginning of each shift to determine communication methods and to discuss WSP tasks for the work operation. The goal is to have steady, balanced traffic flow through the work area.
The project inspector monitors the traffic control operation and WSP enforcement or assistance activities. If there is excessive braking, queuing of traffic, etc., due to WSP presence, then adjustments may be necessary.

**Additional Resources**

Secretary’s Executive Order E 1060.00


Standard Specifications, Section 1-10

General Special Provisions, Division 1-10

WSDOT/WSP Joint Operating Procedures (JOPs)
The Work Zone Safety Task Force has developed this toolbox to provide guidance on the appropriate use of WSP troopers in work zones. The toolbox is intended to be used as a quick reference to common procedures and the appropriate category for use. Use of the WSP checklist (Form 421-045 EF) is required on individual contracts, but is not needed when WSP use is part of a region-wide enforcement emphasis. The Task Assignment (Form 130-020 EF) must be approved and funded prior to WSP use.

The following specific assignments for WSP are allowed as listed below.

**Recommended**

- **Enforcement Emphasis** – The most effective overall strategy is active enforcement in the work zone.
- Signalized intersection control in lieu of flaggers, signal off or on all-red flash.
- Rolling slowdowns or temporary stopping of traffic.
- Full closures of roadways that are high-volume or at high risk for motorist intrusion.
- During installation and removal of traffic control devices. (WSP trooper on the shoulder in advance of the first traffic control device, not as a buffer vehicle).
- To control access points where motorists could follow construction vehicles into the work zone.

**Not Recommended**

The following tasks are not recommended as efficient use of WSP assistance and are generally not allowed. Short term use may be considered, but not an ongoing strategy.

- General or routine use, especially with no significant traffic impacts expected.
- Passive use (vehicle parked near or inside work zones with blue or yellow lights flashing). WSP presence is not a substitute for proper traffic control.
- Shoulder or HOV closures.
- Single-lane closure on a multi-lane highway unless significant traffic impacts are likely.
- Single-lane closure on a two-lane highway.
- A ramp closure without other traffic control devices.
- WSP vehicles are not buffer vehicles and shall not be the first vehicle in the lane when setting up or removing traffic control.
AGREEMENT 5080
STATEWIDE WORK ZONE ENFORCEMENT and TRAFFIC CONTROL ASSISTANCE
AGREEMENT BETWEEN WSDOT and WSP

THIS AGREEMENT is made and entered into this 22 day of February, 2000, by and
between the State of Washington, Department of Transportation, hereinafter called the
"WSDOT," and the Washington State Patrol, hereinafter called the "WSP," referred to
collectively as the "PARTIES" and individually as the "PARTY."

WHEREAS, WSDOT and the WSP first entered into Agreement GC 9131 on July 1,
1991 for the purpose of having WSP provide traffic control in WSDOT work zones, and

WHEREAS, GC 9131 needs to be superseded to reflect the PARTIES current agreement, and

WHEREAS, WSDOT, as it deems necessary, desires WSP to provide traffic control in
work zones where project work may disrupt the smooth flow of traffic, increase the risk
of crashes to the traveling public, and/or increase hazards to roadway workers, and

WHEREAS, WSDOT may not at times have sufficient trained personnel in traffic control
available to provide the needed traffic control for safe highway project operations for the
benefit of the traveling public and roadway workers, and

WHEREAS, WSDOT does not have the authority to enforce traffic laws, and

WHEREAS, WSP is also concerned with the safety of the traveling public and roadway
workers and agrees to provide the additional traffic control as needed by the WSDOT and
as provided under this AGREEMENT, and

WHEREAS, the PARTIES deem it to be in the public's best interest for WSP to be
present in the work zones to enforce traffic laws and to assist WSDOT with traffic
control when requested by the WSDOT,

NOW, THEREFORE, by virtue of chapter 39.34 RCW, and in consideration of the terms,
conditions, covenants and performance contained herein,

IT IS MUTUALLY AGREED AS FOLLOWS:

1. WSP RESPONSIBILITIES

1.1 WSP agrees to furnish uniformed officers, vehicles and associated equipment to
assist the WSDOT in traffic control operations, hereinafter the "WORK," when requested
by WSDOT. The WORK to be assigned to WSP under this AGREEMENT may include,
but is not limited to, the following: work zone traffic enforcement; rolling slowdowns;
flagging; controlling pedestrians, spectators and participants; controlling signalized
intersections; and controlling traffic in restricted lane situations and/or providing support
during ramp, lane or road closures.
1.2 The officers provided by WSP, under the terms of this AGREEMENT, shall be under the sole direction, management and control of the Chief of the WSP or his/her designee and shall perform the WORK required by this AGREEMENT in a manner consistent with WSP policy and regulations, applicable state and local laws, and the Constitutions of the State of Washington and the United States.

1.3 The assignment of uniformed officers to accomplish the WORK under this AGREEMENT shall be at the discretion of the Chief of the WSP or his/her designee.

2. **SCOPE OF WORK**

2.1 The PARTIES agree to enter into separate Task Assignments for the WORK performed under the terms of this AGREEMENT. WSDOT may assign WORK to the WSP only as authorized by an agreed upon and executed Task Assignment. Task assignments shall be made in writing and shall at a minimum include: date, time, and location of WORK; number of personnel and type of equipment needed; estimated hours per day required; estimated number of days required; and name, location and phone number of WSDOT contact in charge of the WORK. WSDOT Traffic Manual (M51-02) outlines the process for developing the Task Assignment.

2.2 If time or circumstances do not permit preparation of a written Task Assignment prior to the start of WORK, WSDOT may verbally authorize WSP to proceed with WORK and document this authorization in a written Task Assignment within 72 hours after the verbal authorization is given. The PARTIES agree that the terms and conditions of this AGREEMENT shall be in full force and effect with any verbal authorization to start WORK prior to entering into a written Task Assignment.

3. **PAYMENT AND RECORDS**

3.1 WSDOT, in consideration of faithful performance of the WORK to be performed by WSP, agrees to reimburse WSP for the actual direct and related indirect costs in accordance with a work order accounting procedure as prescribed and approved by the Office of Financial Management for all reimbursable work requested by WSDOT.

3.2 Costs for WORK under this AGREEMENT are likely to be included in requests to the Federal Highway Administration for reimbursement of project costs; therefore, WSP agrees to follow the rules of the Office of Management and Budget (OMB) Circular A-87. In particular, WSP shall follow A-87, regarding equitable distribution of indirect costs and the provisions for costs of Interagency Services (sections F and G of A-87). All labor costs billed to WSDOT by WSP shall comply with WSP regulations and policies relating to employee compensation.
3.3 WSP may make requests for payment at any time, but such requests shall not be more frequent than once per month. Payment shall be made by WSDOT to WSP within (30) days following the date the invoice is received.

3.4 WSP agrees to submit a final invoice to WSDOT within sixty (60) days after notification by WSDOT that WSP’s services for the WORK under a Task Assignment are no longer required.

3.5 WSDOT will reimburse WSP for actual hours worked by WSP officers or a minimum of 2 overtime hours for each WSP officer called out from an off-duty status to provide WORK under this AGREEMENT. WSDOT will reimburse WSP for overtime salaries and benefits; indirect costs at WSP’s federally approved current indirect rate; and mileage at WSP’s current rate. Two examples of the overtime cost rates for staff typically assigned to this type of WORK are as follows:

WSP Trooper (w/ 10 years service):
O.T. rate w/ 35% Indirect Costs (i.e. overhead) $60.31

WSP Sergeant (w/ 15 years service):
O.T. rate w/ 35% Indirect Costs (i.e. overhead) $70.74

3.6 WSP will be paid mileage for its vehicles at WSP’s approved rate which is currently $0.48/mile. WSDOT acknowledges that the WSP approved rate is higher than the Office of Financial Management approved mileage rate for privately owned vehicles.

3.7 For the purposes of estimating costs of providing the requested WORK, the all inclusive (labor, vehicle, mileage) amount of $75.00 per hour shall be used when preparing WORK estimates.

3.8 During the progress of the WORK and for a period of not less than three (3) years from the date of the final Task Assignment payment to the WSP, the records and accounts pertaining to the WORK under this AGREEMENT and accounting therefore are to be kept available for inspection and audit by WSDOT and/or the Federal Government and copies of all records, accounts, documents, or other data pertaining to this AGREEMENT WORK shall be furnished upon request. If any litigation, claim, or audit is commenced, the records and accounts along with supporting documentation shall be retained until all litigation, claim, or audit finding has been resolved even though such litigation, claim, or audit continues past the 3-year retention period.

4. EXTRA WORK AND AMENDMENTS

4.1 In the event unforeseen conditions require an increase in the costs of a specific Task Assignment by twenty-five percent (25%) or more, or a change in scope of the WORK to be accomplished in connection with a specific Task Assignment is required, the PARTIES agree to amend the Task Assignment in writing to cover the increase or change.
5. AGENCY REPRESENTATIVES

5.1 WSDOT’s representative under this AGREEMENT shall be the Region Administrator of the WSDOT Region for which the WORK is being performed or an appointed representative; except in the case of oversize loads, WSDOT’s representative shall be located at WSDOT Headquarters Maintenance and Operations Division in Olympia. These representatives shall be responsible for requesting the WSP provide WORK and shall be responsible for verifying and processing billings for payment. WSP’s representative shall be the Headquarters Duty Officer or his/her designee.

6. ADMINISTRATION OF WORK

6.1 WSDOT shall follow the requirements of WSDOT’s policy and procedures contained in the WSDOT Traffic Manual Chapter 5 throughout the process of assigning, implementing and compensating for WSP traffic control. Task Assignments must be authorized by the designated WSDOT manager prior to beginning work or within 72 hours for unforeseen or emergency conditions.

7. TERMINATION

7.1 Either PARTY to this AGREEMENT may terminate this AGREEMENT by giving thirty (30) days written notice to the other PARTY. In the event that this AGREEMENT is terminated, such termination shall also terminate all outstanding Task Assignments. The WSP shall be entitled to recover its costs as provided under this AGREEMENT for WORK provided up until the termination date of this AGREEMENT and any Task Assignment.

7.2 WSDOT will initiate a biennial review of this AGREEMENT to ensure that it is kept current.

8. GENERAL PROVISIONS

8.1 Independent Contractor: WSP shall be deemed an independent contractor for all purposes under the terms of this AGREEMENT or any Task Assignment. WSP officers and employees shall not be deemed employees, agents or representatives of WSDOT.

8.2 Amendment: This AGREEMENT may be amended by the mutual agreement of the PARTIES. Such amendment or modifications shall not be binding unless they are in writing and signed by persons authorized to bind each of the PARTIES.

8.3 Disputes Resolution: In the event that a dispute arises under this AGREEMENT which cannot be resolved between the PARTIES, the dispute shall be settled in the following manner: Each PARTY to this AGREEMENT shall appoint a member to a dispute board. The members so appointed shall jointly appoint a third member to the
dispute board who is not employed by or affiliated in any with the two PARTIES to this AGREEMENT. The dispute board shall evaluate the facts, contract terms, and applicable statutes and rules and make a determination of the dispute. The determination of the dispute board shall be final and binding on the PARTIES hereto. All costs associated with the appointment of the third party to the disputes board shall be split evenly between the two PARTIES. As an alternative to this process, either of the PARTIES may request intervention by the Governor, as provided by RCW 43.17.330, in which event the Governor's process will control.

8.4 Venue: In the event that a PARTY deems it necessary to institute legal action or proceedings to enforce any right or obligation under this AGREEMENT, the PARTIES hereto agree that any such action or proceedings shall be brought in Thurston County Superior Court.

IN WITNESS WHEREOF, the PARTIES hereto have executed this AGREEMENT as of the day and year first above written.

WASHINGTON STATE PATROL                WASHINGTON STATE DEPARTMENT

Paul S. Beckley                                      Signature

Name  Date

1-27-07

Approved as to form

1/17  2007

BY:  Assistant Attorney General

Ted Tremain                                      Signature

Name  Date

1/27/07

Approved as to form

12-22-07

BY:  Assistant Attorney General

GC – 9131
Page 5 of 5
### Task Assignment Form

**Washington State Department of Transportation**

**Task Assignment**

*NOTE: This form cannot be used for "Y" Agreements*

All terms and conditions of this agreement are in full force and effect for this Task Assignment document.

<table>
<thead>
<tr>
<th>Agreement Manager Information</th>
<th>Task No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agreement Manager</td>
<td>Phone</td>
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<tr>
<td>Mailing Address</td>
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<td>Mailstop</td>
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<table>
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<th>Project Manager Information</th>
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<td>Mailing Address</td>
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<tr>
<td>Project Title</td>
<td></td>
</tr>
<tr>
<td>State Route No(s).</td>
<td>County(s)</td>
</tr>
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**Task Schedule**

Task Start Date | Task End Date

No payment will be made for work done PRIOR to Task Start Date or for work done AFTER Task End Date.

**Task Cost**

<table>
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Total Task Amount

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<tr>
<th>Prime Consultant</th>
<th>Contact</th>
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<tbody>
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<tbody>
<tr>
<td>Phone</td>
<td>Fax</td>
</tr>
<tr>
<td>E-Mail</td>
<td>Federal I.D. No.</td>
</tr>
</tbody>
</table>

Are there any Subconsultants working on this project?  
☐ Yes  ☐ No

If Yes, complete the Subconsultant Worksheet and return with signed Task Assignment.

**Approval Signatures**  

*Note: Two original signed Documents are required.*

<table>
<thead>
<tr>
<th>Consultant</th>
<th>Washington State Department of Transportation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agreement Manager</td>
<td>DOT Form 130-020 EF 7/08</td>
</tr>
</tbody>
</table>

Exhibit 3
## Scope of Task Assignment

Provide description of work and reference attachments for prime consultant and all subconsultants (to include detailed description of work schedule and estimate).

<table>
<thead>
<tr>
<th>Agreement No.</th>
<th>Task No.</th>
<th>Report Due Date</th>
</tr>
</thead>
</table>

**Distribution:**
- [ ] Consultant
- [ ] Accountant
- [ ] File
- [ ] Task Manager
- [ ] Consultant Services
- [ ] Other

DOT Form 130-020 EF 7/08
## WSP Field Check List Form

**Exhibit 4**

### WSP Field Check List Form

**To be Completed by WSDOT Inspector**

<table>
<thead>
<tr>
<th>Contract No.</th>
<th>SR</th>
<th>Begin WSP Shift</th>
<th>End WSP Shift</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Date</td>
<td></td>
</tr>
<tr>
<td>Milepost</td>
<td></td>
<td>Time AM</td>
<td>PM</td>
</tr>
<tr>
<td>From To</td>
<td></td>
<td>AM AM</td>
<td></td>
</tr>
<tr>
<td>Title</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Project Engineer</td>
<td>WSP Task Order No.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WSDOT Onsite Contact</td>
<td>Field Phone (include area code)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Traffic Control Strategy Meeting Location</td>
<td>Attended By</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Traffic Control Strategy (review with WSP officer)</td>
<td></td>
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</tr>
</tbody>
</table>

**To be Completed by WSP Officer** - *Return Completed Form to WSDOT Inspector*

<table>
<thead>
<tr>
<th>Percent of Time</th>
<th>Duties</th>
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<tbody>
<tr>
<td></td>
<td>Assistance in traffic control setup and takedown (blue lights)</td>
</tr>
<tr>
<td></td>
<td>Passive presence (yellow lights)</td>
</tr>
<tr>
<td></td>
<td>Proactive patrol in work zone (blue lights)</td>
</tr>
<tr>
<td></td>
<td>Ramp closures (yellow lights)</td>
</tr>
<tr>
<td></td>
<td>Lane closure (yellow lights)</td>
</tr>
<tr>
<td></td>
<td>Road closure (yellow lights)</td>
</tr>
<tr>
<td></td>
<td>Detours (yellow lights)</td>
</tr>
<tr>
<td></td>
<td>Other duties as outlined in Strategy Session (above)</td>
</tr>
</tbody>
</table>

Is a second officer needed for similar work in the future?  Yes  No

Suggestions For Traffic Control Improvements (mandatory):

Total Violators Contacted  No. of Accidents Within Work Zone

WSP Officer Name  WSP Badge No.

DOT Form 421-045 EF Revised 2/97

Distribution: White - Project Engineer; Canary - Regional Traffic; Pink - WSP
Exhibit 5  WSP Task Assignment Contact List (7/08)

WSP Statewide and District Contacts

The website for the WSP is www.wsp.wa.gov
Overtime Coordinator – Each district has an overtime coordinator to establish the call out list for troopers available for projects.

WSP Administrative Headquarters
General Administration Building
PO Box 42600
Olympia, WA 98504-2600
(360) 753-6540 (Budget & Fiscal Manager, signs Task Assignment)
(360) 753-0692 (WSP Contracts Coordinator, administers Task Assignments)

District 1 Headquarters and Communications – Tacoma
State of Washington Combined Transportation Center
2502 112th Street East
Tacoma, WA 98445-5104
(253) 536-6210

Detachments:
Olympia/Thurston County
222 Tumwater Blvd., Building 16
PO Box 42640
Tumwater, WA 98504-2640
(360) 586-4443

District 2 Headquarters and Communications – Bellevue
2803 156th Avenue SE
Bellevue, WA 98007-6523
(425) 649-4370

Detachments:
Enumclaw  Seattle North
333 Griffin Avenue  811 E Roanoke
Enumclaw, WA 98022  Seattle, WA 98102
(360) 825-6154  (206) 720-3040

North Bend  Seattle South
134 Sydney Avenue  15666 International Blvd.
PO Box 1127  Seattle, WA 98188-6523
North Bend, WA 98045  (206) 439-3830
(425) 888-1116
District 3 Headquarters – Union Gap
2715 Rudkin Road
Union Gap, WA 98903
(509) 575-2320

Detachments:
Kennewick Walla Walla
143302 East Law Lane 406 Wellington
Kennewick, WA 99337-2011 Walla Walla, WA 99362
(509) 734-7029 (509) 527-4413

Sunnyside
173905 West Interstate 82
Grandview, WA 98930
(509) 882-9945

District 4 Headquarters and Communications – Spokane
6403 West Rowand Road
Spokane, WA 99224-5300
(509) 227-6566

Detachments:
Colfax Ritzville
840 West Fairview Street 1563 East Gun Club Road
Colfax, WA 99111-9515 Ritzville, WA 99169-9713
(509) 397-3600 (509) 659-1210

Colville Spokane Port of Entry
751 South Main RR1 Westbound I-90, Milepost 299
Colville, WA 99114-2704 Liberty Lake, WA 99019-9801
(509) 684-7431 (509) 226-3366

District 5 Headquarters and Communications – Vancouver
11018 NE 51st Circle
Vancouver, WA 98682-6686
(360) 260-6333

Detachments:
Chehalis Kelso
850 NW Louisiana Avenue 1823 Baker Way
Chehalis, WA 98532 Kelso, WA 98626
(360) 748-2194 (360) 578-4147

Goldendale Morton
PO Box 105 342 Morton Road
Goldendale, WA 98620 Morton, WA 98356
(509) 773-3775 (360) 496-3323

District 6 Headquarters and Communications – Wenatchee
2822 Euclid Avenue
Wenatchee, WA 98801-5916
(509) 663-9721
Detachments:
Cle Elum Scale (CVD)  Moses Lake
PO Box 550  101 Laguna
Cle Elum, WA 98922  Moses Lake, WA 98837-0151
(509) 674-9704  (509) 765-6175
Ellensburg  Okanogan
291 Thorp Highway S  PO Box 486
Ellensburg, WA 98926  Okanogan, WA 98840-0486
(509) 925-2698  (509) 826-7400

District 7 Headquarters and Communications – Marysville
2700 116th Street NE
Marysville, WA 98271-9425
(360) 658-2588

Detachments:
Bellingham  Oak Harbor
3860 Airport Way  840 SE 8th Avenue #101
Bellingham, WA 98226-8040  Oak Harbor, WA 98227-2996
(360) 676-2007  (360) 675-0710
Burlington  Silverlake
10945 Chuckanut Drive  Interstate 5
Burlington, WA 98233  Silverlake, WA 98204
(360) 757-7553  (425) 514-5444
Monroe
909 West Main Street, Suite 1A
Monroe, WA 98272-2031
(360) 805-1153

District 8 Headquarters and Communications – Bremerton
4811 Werner Road
Bremerton, WA 98312-3333
(360) 478-4646

Detachments:
Hoquiam  Port Angeles
3111 Pacific Avenue  62 Old Olympic Highway
Hoquiam, WA 98550-4222  Port Angeles, WA 98362-9121
(360) 533-9332  (360) 417-1738
Naselle  Poulsbo
797 State Route 4  22065 Viking Way NW
Naselle, WA 98638  Poulsbo, WA 98370-9451
(360) 484-3130  (360) 478-4646
Shelton
629 West Dayton Airport Road
Shelton, WA 98584-8945
(360) 427-2180
Appendix 5.B  Speed Limit Reductions in Work Zones

I. Introduction

It is the department’s policy to design and operate work zones which minimize the need for and the use of regulatory speed limit reductions (Executive Order E 1060.00).

A Traffic Management Plan (TMP) is developed for each work zone during the design process. This plan considers strategies and techniques to address specific work zone conditions and traffic control requirements. Design applications that reduce work duration, decrease the number of work stages, and that maintain traffic in long-term work zone configurations can eliminate the need for a regulatory speed limit reduction. Where work zone design applications cannot mitigate the condition, a speed advisory or a variable or continuous speed limit reduction may be considered.

It is important to be consistent in implementing speed limit reductions to maintain credibility with roadway users throughout the state. This appendix includes the work zone speed limit policy and provides guidance to determine the need for a work zone speed limit reduction. Sample speed reduction worksheet, request, and approval documents are included.

A. Work Zone Speed Limit Reductions. Following are the speed reduction types and examples of appropriate use:

- **Advisory Speed Reduction** – Where drivers encounter work zone conditions (such as rough road, bump, temporary alignment) that require a specific safe speed message, a sign warning of the actual condition with an appropriate advisory speed is installed.

- **Variable Regulatory Speed Limit Reduction** – Effective where a temporary work zone condition (such as workers on foot close to live traffic or a short-term lane shift) requires a lower operational speed and in place only for the duration of the warranting condition—often a single work shift.

- **Continuous Regulatory Speed Limit Reduction** – A speed reduction effective 24 hours a day for the number of days that work zone conditions warrant, used only where construction elements cannot be mitigated by design elements.
B. WSDOT Policy Statement on Reduced Speed Limits in Work Zones.
   Excerpted from Secretary’s Executive Order E 1060.00, September 2009:

   WSDOT employees are directed to design and operate work zones so that the existing posted speed limit is not reduced. Work zones that have unique design and safety issues that can only be addressed through a speed limit reduction, will be considered for approval and implementation in accordance with this Secretary’s Executive Order.

C. Rules. Secretary’s Executive Order E 1060.00 (September 2009)
   Section III, notes the following regarding work zone speed limit reductions:

   1. The Regional Administrator approves or denies all variable speed limit reductions and any continuous regulatory speed limit reduction of 10 mph or less on any route. This authority may be delegated to the Region Traffic Engineer.

   2. The State Traffic Engineer approves continuous regulatory speed limit reductions as follows:
      • Greater than 10 mph on any route.
      • Any reduction to less than 60 mph on freeways.
      • Any reduction in a work zone that is unique or not covered by the Secretary’s Executive Order.

   3. The Region Traffic Engineer approves advisory speed reductions.

   4. A Traffic Control Plan (TCP) approved by the Region Traffic Engineer, is required for a regulatory speed reduction, and must show locations of existing and proposed speed limit signs, advance warning and speed resumption signs, and any covering or removal of existing speed limit signs.

   5. A Speed Limit Reduction Worksheet (Figure 5.B-1) approved by the Region Traffic Engineer, is required for any continuous regulatory speed limit reduction.

   6. Notification of all Reduced Regulatory Speed Limits shall be published as required by RCW 47.48.020 (Figure 5.B-2).

   7. All project specific regulatory and advisory reduced speed limit signing shall be displayed only during the work zone operation that warrants the reduction. All such signs shall be removed or covered when the need for the reduction has ended.
8. When a Region approves a **continuous regulatory speed limit reduction of 10 mph or less**, the Headquarters Traffic Office must be notified. A copy of the approval memo is sufficient. Include copies of the Speed Limit Reduction Worksheet and the TCP. Notification to HQ is not required for **variable regulatory speed limit reductions**, **advisory speed reductions**, or **speed limit reductions allowed by the operational exceptions** described below.

9. Notify the applicable District Office of the Washington State Patrol (WSP) by memorandum of any speed limit reduction. The memo should explain the intended type of reduction with approximate dates, and any plans to coordinate speed enforcement activities. Follow up with specific dates when established.

10. Operational Exceptions are noted in Section III D, which designate speed limit requirements for several unique work zone situations.

   • **Bituminous Surface Treatment (BST/Chip Seal)** work zone speed limits are 35 mph until the roadway is in suitable condition to return to the original speed limit.

   • Speed limits for **temporary roadway alignments** must be consistent with the geometrics of the alignment, as determined by the Regional Traffic Engineer.

   • The design of work zones where **temporary traffic signals** are combined with minimum roadway geometrics and temporary intersections and road approaches, may require a speed limit reduction, which is to be shown on the Traffic Control Plan.

   • **Emergencies** such as natural disasters and long-term incidents within the work zone may require an emergency continuous regulatory speed limit reduction.

   • When work zone conditions leave **workers unprotected** by temporary barrier or truck mounted attenuators, a variable regulatory speed limit may be used as part of a worker safety strategy.

### II. Guidance

#### A. Work Zone Assessment

A **Transportation Management Plan (TMP)** is developed for each project. It integrates all work zone factors, including traffic speed and volumes, project design, worker exposure, constructability, and traffic operations. Before considering a work zone speed reduction, a work zone impact assessment is conducted which considers, and implements where possible, design strategies that address the specific work zone conditions. **Any decision to implement a reduced speed limit must be assessed and justified as part of the TMP.**
Reduced speed limit boundaries should be set to match the limits of the work zone to which they apply, or for that portion of the work zone where conditions warrant the speed reduction. In general, do not extend the reduced regulatory speed limit beyond the actual work zone limits. However, to avoid abrupt short or inconsistent speed zones, consider extending an adjacent existing lower speed limit boundary to encompass a work zone where the speed limit will be reduced. This can reduce driver confusion about short and different speed zones and improves credibility and compliance with the lowered speed limit.

Worker exposure and driver confusion are common work zone conditions that may be mitigated through effective safety solutions that do not include a speed limit reduction. As part of work zone assessment, consider these and other strategies:

1. **Worker Exposure to Traffic Hazards.** When workers are exposed to live traffic, do not assume that a lower speed limit will improve worker safety. Reduce worker exposure and traffic speeds using these effective safety strategies:
   - Use a pilot car for two lane paving operations to effectively control traffic speed past workers.
   - Provide positive protection such as barriers and Truck Mounted Attenuators.
   - Provide a lateral buffer space between workers and live traffic, defined by channelization devices, to allow space for minor traffic intrusions or occasional encroachment by workers. A half to full lane width is an acceptable lateral buffer for high speed conditions.
   - Use closely spaced drums or tall channelizing devices to improve work area separation and motorist guidance.
   - Additional warning devices such as temporary rumble strips, portable changeable message signs, or an automated flagger assistance device may improve flagger protection.

2. **Enhanced Traffic Control.** Driver confusion can be avoided or reduced through the use of enhanced guidance and information. Driver performance is improved by providing concise and accurate messages and visual cues that show the work zone conditions and travel path. Electronic driver feedback signs and occasional enforcement may be used to reinforce the existing speed limit and minimize any traffic speed differential. Before proposing a reduced speed limit, consider the following measures:
   - Remove existing pavement markings that conflict with temporary alignment.
   - Add enhanced pavement markings and traffic control devices.
Appendix 5.B Speed Limit Reductions in Work Zones

- Minimize decision point conflicts or confusion.
- Add overhead or other enhanced signing.
- Design effective merge areas.
- Add temporary illumination.

B. Work Zone Speed Reduction Assessment Factors. Consider these factors together to determine if a work zone speed limit reduction is needed. If a speed reduction is proposed, note the justifying factors on the Work Zone Speed Reduction Worksheet.

1. Roadway Factors
   - Roadway surface is rough, uneven, gravel, has abrupt edges, etc.
   - Temporary Concrete Barrier (TCB) is 2 feet or closer to high speed traffic (45 mph or more).
   - Traffic lanes are less than 11 feet wide.
   - Shoulders are less than 4 feet wide.
   - Work zone is in a roadway section with more than two (2) lanes in each direction.
   - Work zone elements such as temporary road approaches, intersections, or intersection control (such as a temporary signal) have changed the roadway or roadside environment.
   - Work zone has unusual or reduced roadway geometrics such as lane shifts, ramps, and acceleration/deceleration tapers.

2. Operational Factors
   - Work zone is on a high speed roadway (existing speed limit above 60 mph).
   - Work zone has active operations during hours of darkness.
   - Sight distance is restricted due to traffic barriers, temporary alignment, or intersection locations.
   - Unprotected work activities or workers are closer than 10 feet to high speed traffic.
   - Work zone has detours or alignment changes designed for speeds below the existing limit.

3. Human Factors

   When considering a speed limit reduction be aware that drivers generally do not slow down until there is a perceived reason to do so. If motorists do not see the reason for a reduced speed limit, it is often ignored. In addition, note these factors when assessing the need for a speed limit reduction:
• A “Reduced Speed Limit” sign is not automatically noticed or effective in slowing traffic. Most drivers determine their speed by observing visual cues from their surroundings, including the visible work activity, specific warning signs, pavement markings, and other traffic control devices.

• Studies show that drivers slow down more in work zones with PCMS’s, electronic driver feedback signs (“Your Speed Is XX”) and flashing warning lights.

• Most drivers do not voluntarily reduce their speed more than 10 mph unless law enforcement is active.

• Work zone speed limit reductions of more than 10 mph show an increase in crashes due to a wider speed differential between vehicles.

C. Speed Limit Reduction Assessment Examples. The following are examples of common work zone situations where a speed limit reduction may be appropriate:

• Situation: 70 mph Freeway – Long-Term Construction Project
  During work zone operations these projects often have:
  – Narrowed or restricted lanes or there are no shoulders.
  – Lane shifts and closures.
  – Temporary Concrete Barrier 2 feet or less from the lane edge.
  – Work operations which create driver distractions.

  Consider a Continuous Regulatory Speed Limit Reduction of 10 mph for the above conditions.

• Situation: 60 mph Two Lane Highway – Paving Project
  During work zone operations these projects often have:
  – High worker exposure.
  – Limited opportunities to use positive protection such as Temporary Concrete Barrier to protect workers and separate the work operation from traffic.
  – Flaggers exposed to high speed traffic.

  Consider a variable regulatory speed limit reduction to 40 mph (below the “high speed” 45 mph threshold) for the duration of the work zone operation—often a single shift. Note that use of a pilot car operation will effectively control traffic speeds through the work zone so a variable speed limit reduction may be unnecessary.
III. Speed Limit Reduction Approval Process

A. Decision Making – Identifying Benefits. A Continuous or Variable Regulatory Speed Limit Reduction may be justified when the project presents specific safety issues that cannot be addressed through other work zone design or operational options. When safety benefits can be achieved by applying work zone design standards or other safety enhancements, they are not justification for approval of a speed limit reduction.

Consider the roadway and operational factors for each project, and understand the human factor that a speed limit reduction may not automatically reduce actual traffic speeds. If factors cannot be mitigated through application of work zone standards, design strategies and features, or other enhancements such as Temporary Concrete Barrier, identify how a speed reduction will provide safety benefits in the following areas and identify the expected safety benefits on the Work Zone Speed Reduction Worksheet.

- **Traffic Safety** – What safety benefit would be provided beyond that realized through standard or enhanced work zone safety and traffic control methods?
- **Worker Safety** – What safety benefit would be provided beyond worker protective equipment or other designed features?
- **ADA, Pedestrian, and Bike Safety** – What safety benefits would be provided for these roadway user groups that cannot be provided in the work zone design and operation?

B. Request for Approval Process. The following are the steps to request a speed limit reduction.

1. The project manager submits a “Speed Reduction Request” to the Regional Administrator, through the Region Traffic Engineer (Figure 5.B-3). The request includes:
   - A completed Work Zone Speed Reduction Worksheet. Specific safety benefits must be identified to warrant approval.
   - The Traffic Control Plan(s) showing all speed limit reduction related details. Example TCPs are shown in Figures 5.B-4a, 5.B-4b, and 5.B-4c.
   - Other supporting documents including the TMP and law enforcement assistance agreements.

2. The Region Traffic Engineer (RTE) reviews the speed limit reduction request to determine if it is warranted.
   - The RTE has the authority to approve advisory speed reductions without further approval by the Regional Administrator.
• For a Variable or Continuous Speed Limit Reduction, the RTE makes a recommendation for approval or denial to the Region Administrator.

3. The Regional Administrator approves or denies the Speed Limit Reduction. Notification of a continuous regulatory speed reduction is sent to the State Traffic Engineer and WSP. Notification to the public is also required per RCW 47.48.020, which states speed reductions must be published in a local newspaper at least three days in advance of the regulation change. The regulation does not take effect without this public notice.

4. The following speed limit reduction requests are sent to the State Traffic Engineer for approval:
   • Speed Limit reductions of over 10 mph.
   • Speed Limit reductions to less than 60 mph on freeways.
   • Unique requests that are not consistent with WSDOT policy, rules, and guidance.

IV. Summary

WSDOT policy, set by Executive Order 1060.00, is to design work zones that can safely maintain the existing speed limit wherever possible. Work zone conditions that can be mitigated through design or other work zone strategies do not warrant a speed limit reduction.

The need for a speed limit reduction is determined through a work zone assessment, which considers the project roadway and operational factors together with motorist behavior (human factors). Specific safety benefits must be identified to warrant approval of a speed reduction. A work zone assessment may determine that no speed limit reduction is needed, and that implementing design and operational strategies that address the actual work zone conditions is the most effective safety plan.

Speed limit reductions are approved and implemented through a defined process after a work zone assessment determines that a reduction is warranted. Approval authority is based on the type of speed reduction, as noted in the Secretary’s Executive Order 1060.00.
Resources

- WSDOT Traffic Manual M 51-02
- Revised Code of Washington RCW 47.48
- WSDOT Work Zone Traffic Control Guidelines M 54-44.01
- WSDOT Design Manual M 22-01
- WSDOT Maintenance Manual M 51-01
- WSDOT Construction Manual M 41-01
- Federal Regulations 23 CFR Part 630 Subpart J
- Part VI of the Manual on Uniform Traffic Control Devices (MUTCD) FHWA

Contacts

- Region Traffic Office
- Region Work Zone Specialist
- HQ Traffic Office, Work Zone Team
WORK ZONE SPEED REDUCTION WORKSHEET
(Refer to Traffic Manual Chapter 5, Appendix 5B for guidance)

Date:_________ SR:____ Work Order/Contract Number:______________

Project Name:________________________

Existing Conditions
Posted Speed Limit:________ ADT: __________
Number of lanes:________ Lane Width: _______ Shoulder Width: _______

Type of Speed Limit Reduction Proposed:
☐ Continuous ☐ Variable ☐ Advisory
Proposed Speed Limit:________ Duration for Speed Reduction:_________

Work Operation for proposed reduction:_______________________________
Mile Post Limits for reduction:_____________________________________

Work Zone Conditions Specific to Speed Reduction Request:
Traffic Safety Conditions:__________________________________________
Worker Safety Conditions:_________________________________________
Bicycles, Pedestrians, Others:_______________________________________
Work Zone Actions Considered?
☐ Speed Study ☐ WSP Enforcement
☐ Vicinity map and Traffic Control Plan attached

Justification statement for speed reduction:

Project Engineer Concurrence:________________________
Comments:_________________________________________________________________

Traffic Engineer Concurrence:____________________ Disapproval:___________
Comments:_________________________________________________________________

Figure 5.B-1.doc
If additional space is necessary for responses, attach a supplemental sheet

Speed Limit Reduction Worksheet
Figure 5.B-1
NOTICE OF SPEED LIMIT REDUCTION

Limits of speed reduction
SR 19 MP 1.67 to MP 9.50  SR 116 MP 2.92 to MP 9.83

Notice is hereby given by the Washington State Department of Transportation that the posted speed limit of 50 MPH on the above listed route and mile posts will be reduced to a legal speed limit of 35 MPH and will be signed accordingly, beginning June 2009.

This speed reduction is necessary to ensure safe traffic operations during BST paving operations. The legal speed limit will be returned to 50 MPH once final pavement markings are installed.

Washington State Department of Transportation

[Signature]

Kevin Dayton
Olympic Region Administrator

Example Notice of Speed Limit Reduction

Figure 5.B-2
Example Notice of Speed Limit Reduction

*Figure 5.B-2 (continued)*
Memorandum

Date

EXAMPLE

TO: Regional Administrator

THRU: Regional Traffic Engineer

FROM: Title/Project manager

SUBJECT: SR XX Work Zone Speed Limit Reduction

Per Secretary’s Executive Order E 1060.00, we are requesting that the posted regulatory speed limit within the above referenced location be reduced to XX MPH.

This temporary work zone speed limit change is being requested for the following reasons: (list applicable conditions and justification from the Work Zone Speed Limit Reduction Worksheet)

•

•

•

This posted speed reduction will be in effect from Date to Date, between Milepost XX to Milepost XX. The posted speed reductions will be in effect (During Actual Work Hours or Continuously). The dates and the locations may vary based on where the work activities that involve the safety issues listed above are present. (#ask Frank if this sentence is correct?)

Approved:

__________________                  ____________
Regional Administrator                  Date

cc: State Traffic Engineer
    Area Maintenance Superintendent
    WSP District Captain
    Traffic file
    Contract file

Attachment: Supporting Documents

G:\Engineering Manuals\Traffic Manual\Figure 5.B-3.doc
Traffic Control Plan

Figure 5.B-4b
Traffic Control Plan

Figure 5.B-4c