Chapter 1010 Work Zone Safety and Mobility

# 1010.02 Definitions

The following terms are defined in the Design Manual Glossary:

* Transportation Management Area (TMA)
* Transportation Management Plan (TMP)
* Transportation Systems Management and Operations (TSMO)
* work zone
* work zone impact
* work zone traffic control
* traveling public

# 1010.04 Transportation Management Plans and Significant Projects

## 1010.04(1) Transportation Management Plan (TMP)

A transportation management plan is a set of strategies such as Transportation Systems Management and Operations (TSMO) strategies (such as dynamic lane merge, dynamic speed control, or Smart Work Zone Systems) for managing the corridor-wide work zone impacts of a project. A TMP is required for all projects and is the key element in addressing all work zone safety and mobility impacts. The TMP development begins in the scoping phase of a project by assessing impacts known at the time and then selecting mitigating strategies and design solutions to manage those impacts. It is very important to continue the development of the TMP throughout the project development process.

Not all work zone impacts have to be addressed with traffic control plans only. Many work zone impacts can be reduced or eliminated through project design elements like alignment choice, materials selection, structure types, overbuilding, and phased construction. Work zone impacts related to work duration may be resolved or reduced through innovative bidding and contract administration.

A TMP may recommend temporary modification to design elements that are outside the ranges discussed in the Design Manual. For example, a work zone may temporarily reduce design speed and/or lane and shoulder widths below the thresholds noted in the Design Manual. These temporary design elements are documented in the TMP and in the work zone traffic control plans. They do not require a Design Analysis.

The three major components of a TMP are described below.

### 1010.04(1)(a) Temporary Traffic Control

Temporary Traffic Control (TTC) components are those strategies for directing traffic through the work zone and minimizing the duration of the impacts. These components are to be included in the Plans, Specifications, and Estimates (PS&E) as Traffic Control Plans (TCPs) and contract provisions. The TTC components may include but are not limited to the following strategies:

• TTC strategies such as lane closures or shifts, one-lane two-way operations (flagging and or pilot car), staged construction, or full road closures and detours.

• Traffic Control Devices such as temporary signing, channelizing devices (cones, drums), changeable message signs, arrow boards, temporary signals, and temporary pavement markings.

• Corridor Project Coordination, Contracting Strategies, and Innovative Construction Strategies such as A+B bidding, incentives/disincentives, and precast members or rapid cure materials.

### 1010.04(1)(b) Transportation Systems Management and Operations (TSMO)

The TSMO components are those strategies for improving traffic flow and safety through the work zone. Some of these strategies may be included in the PS&E, but could also be WSDOT-managed elements outside the contract. The TSMO components may include but are not limited to the following strategies:

• Transportation demand management strategies such as Transit service improvements, transit incentives, and park & ride promotion.

• Corridor/Network Management (traffic operations) Strategies such as Signal timing/coordination improvements, temporary signals, bus pullouts, reversible lanes, and truck/heavy-vehicle restrictions.

• Work Zone Safety Management Strategies such as using positive protective devices, speed limit reductions, automated flagger assistance devices, radar speed display signs, and smart work zone systems.

• Traffic/Incident Management and Enforcement Strategies such as Washington State Patrol, tow service, WSDOT Incident Response Team vehicle(s), traffic screens, and emergency pullouts in long work zones with narrowed shoulders.

* Smart Work Zone System uses real time information to optimize the safety and efficiency of traffic through the work zone.

## 1010.04(2) Significant Projects

The FHWA definition of a “significant project” is as follows:

*A significant project is one that, alone or in combination with other concurrent projects nearby, is anticipated to cause sustained work zone impacts that are greater than what is considered tolerable based on state policy and/or engineering judgment.*

*All Interstate system projects within the boundaries of a designated Transportation Management Area (TMA) that occupy a location for more than three days with either intermittent or continuous lane closures shall be considered as significant projects.*

Note: Significant projects require a TMP document addressing safety and mobility impacts with strategies or elements from all three TMP components.

The size and scale of the TMP document will depend on the project’s complexity and impacts. For examples of WSDOT TMP’s see: 🖰 <http://www.wsdot.wa.gov/Safety/WorkZones/resources.htm>

For projects not identified as significant, the Temporary Traffic Control components included in the PS&E will be considered the TMP. Transportation Systems Management and Operations and Public Information components may also be required to properly address the impacts as many projects can have significant work zone safety and mobility impacts, but are not necessarily a significant project as defined under the federal requirements stated above. Consider developing a TMP document for these types of projects as well.

The Project Summary must include a Work Zone Strategy Statement and indicate whether the project is significant in regard to work zone impacts.

Significant projects may require a Value Engineering (VE) study (see Chapter 310) and a Cost Risk Assessment (CRA) or Cost Estimate Validation Process (CEVP) that could help define strategies or identify risks: 🖰 [www.wsdot.wa.gov/projects/projectmgmt/riskassessment/](http://www.wsdot.wa.gov/projects/projectmgmt/riskassessment/)

# 1010.05 Developing TMP Strategies

## 1010.05(2) Impacts Assessment

One of the most important tasks in developing a TMP is assessing all of the project impacts to mobility and safety. Impacts that are not identified and addressed in the TMP will undoubtedly become issues during the construction phase of the project. A designer needs to possess a clear understanding of how project features will be constructed, including work methods, equipment, materials, and duration, to complete the work. Involve the construction PE when making decisions on assessing and addressing impacts.

A complete and accurate impacts assessment will allow for the development of an effective TMP that should only need minor modifications to address construction issues. The *Traffic Manual* provides information on how to determine expected work zone congestion along with mobility management strategies.

An early and ongoing impacts assessment allows time to:

• Develop TTC, TSMO, and PI (see Section 1010.04(1)) strategies to address identified impacts as needed to effectively manage the project.

• Resolve potential work zone impacts within the design features of the project. Decisions that consider work zone impacts during bridge type selection, materials selection, advertisement dates, and others have the potential to resolve or minimize work zone impacts.

• Consider innovative mitigation strategies that may involve many stakeholders.

## 1010.05(6) Transportation Systems Management and Operations (TSMO) Strategies

The following are operational strategies to consider based on project specific needs:

### 1010.05(6)(a) Transportation Demand Management

* Provide transit service improvements and possible incentives to help reduce demand.
* For long-term freeway projects, consider ramp metering.
* Provide a shuttle service for pedestrians and bicyclists.
* Provide local road improvements (signals modifications, widening, and so on) to improve capacity for use as alternate routes.
* Provide traffic screens to reduce driver distraction.

### 1010.05(6)(d) Traffic/Incident Management and Enforcement

* Provide law enforcement patrols to reduce speeding and aggressive drivers.
* Provide incident response patrols during construction to reduce delays due to collisions in the work zone.
* Provide a dedicated tow service to clear incidents.

### 1010.05(6)(e) Smart Work Zone System (SWZS)

* Deploy roadway monitoring technology such as queue length detection, mobile surveillance, and over-dimension vehicle detection.
* Deploy dynamic traffic control technology such as temporary ramp metering, variable speed control, and dynamic lane merge.
* Deploy driver information systems such as portable changeable message signs (PCMS), travel time and congestion information, and integration with third-party trip planning applications.

See Design Manual section 1010.10(5) for more information.

# 1010.06 Work Zone Capacity Analysis

Work zone congestion and delay is a significant issue for many highway projects. At high-volume locations with existing capacity problems, even shoulder closures will increase congestion.

All work zone traffic restrictions need to be analyzed to determine the level of impacts. Short-term lane closures may only require work hour restrictions to address delays; long-term temporary channelization, realignments, lane shifts, and more will require a detailed capacity analysis to determine the level of impact. Transportation System Management and Operation (e.g. Transportation Demand Management) and public information strategies may be required to address delays. Traffic capacity mitigation measures are important since many projects cannot effectively design out all the work zone impacts. Include a [Work Zone & Traffic Analysis](https://ops.fhwa.dot.gov/wz/traffic_analysis.htm) in the TMP.

WSDOT has a responsibility to maintain traffic mobility through and around its projects. The goal is to keep a project’s work zone traffic capacity compatible with existing traffic demands. Maintaining the optimum carrying capacity of an existing facility during construction may not be possible, but an effort must be made to maintain existing traffic mobility through and/or around the work zone.

Maintaining mobility does not rule out innovative strategies such as roadway closures. Planned closures can accelerate work operations, reducing the duration of impacts to road users. These types of traffic control strategies must include Transportation Demand Management and public information plans to notify road users and mitigate and manage the impacts as much as possible.

***1010.06(3) Long-Term Work Zone Traffic Analysis***

For complex strategies that change traffic patterns, a more detailed analysis is required using advanced traffic modeling software. These strategies could include reducing lane and shoulder widths for extended lengths, reducing the number of lanes for extended durations, moving all lanes of traffic onto a temporary alignment, changing access locations to and from the highway, or closures with detours (including public information and traffic operation plans with anticipated reduction in demand). Work with the region Traffic Office for assistance with this level of analysis.

Refer to the [*Traffic Manual*](http://www.wsdot.wa.gov/Publications/Manuals/M51-02.htm) for additional information and guidance.

The following resources are also available to assist with the actual analysis and mitigation strategy development upon request:

HQ Traffic Offices

Region Work Zone Specialist

Region Public Information Office

Training is also available to obtain further knowledge and expertise in traffic analysis (see 1010.12).

### 1010.12(2)(b) Headquarters (HQ) Work Zone Resources

The HQ Traffic Office has a work zone team available to answer questions, provide information, or otherwise assist. The HQ Design and Construction offices may also be able to assist with some work zone issues. They include:

* State Assistant Traffic Design Engineer
* State Work Zone Engineer
* WSDOT Work Zone Web Page
* TSMO Subcommittee on Work Zones

Exhibit 1010-3 Transportation Management Plan Components Checklist (continued)

|  |  |
| --- | --- |
| **TMP Component** | **√** |
| Traffic analysis results (if applicable) |  |
| * Traffic analysis strategies |  |
| * Measures of effectiveness |  |
| * Analysis tool selection methodology and justification |  |
| * Analysis results |  |
| Traffic (volume, capacity, delay, queue, noise) |  |
| Safety |  |
| Adequacy of detour routes |  |
| Business/community impact |  |
| Seasonal impacts |  |
| Cost-effectiveness/evaluation of alternatives |  |
| Selected alternative |  |
| * Construction approach/phasing/staging strategy |  |
| * Work zone impacts management strategies |  |
| **7. Selected Work Zone Impacts Management Strategies** |  |
| Temporary Traffic Control (TTC) strategies |  |
| * Control strategies |  |
| * Traffic control devices |  |
| * Corridor Project coordination, contracting, and innovative construction strategies |  |
| Public Information (PI) |  |
| * Public awareness strategies |  |
| * Motorist information strategies |  |
| Transportation Systems Management and Operations (TSMO) |  |
| * Demand management strategies |  |
| * Corridor/network management strategies |  |
| * Work zone safety management strategies |  |
| * Traffic/incident management and enforcement strategies |  |
| **8. TMP Monitoring** |  |
| Monitoring requirements |  |
| Evaluation report of successes and failures of TMP |  |
| **9. Contingency Plans** |  |
| Trigger points |  |
| Decision tree |  |
| Contractor's contingency plan |  |
| Standby equipment or personnel |  |
| **10. TMP Implementation Costs** |  |
| Itemized costs |  |
| Cost responsibilities/sharing opportunities |  |
| Funding source(s) |  |
| **11. Special Considerations (as needed)** |  |
| **12. Attachments (as needed)** |  |