

## 14. Highway Work Zone Safety and Traffic Control Plans

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### 1400.1. Introduction

Works zones directly impact the safety and mobility of road users and highway workers. Addressing these safety and mobility issues starts early in the project development process and continues through project completion.

This section provides guidance and establishes procedures for developing Traffic Control Plans, Transportation Management Plans, and Traffic Operations Plans in accordance with 23 CFR 630, Subparts J & K, and Department Policy and Procedure (P&P) No. 05.05.015. In highway work zones, it is the Department's policy to:

- Provide a high level of safety for road users and workers.
- Minimize congestion and community impacts by holding road user delay as close as practicable to pre-construction levels.
- Provide the contractor adequate access to the roadway to complete the work efficiently while meeting the quality requirements of the contract.

All parties working on state roads and highways must comply with the requirements of this chapter.

### 1400.2. Definitions

**Positive Protection Devices (PPDs):** Traffic barriers that contain and/or redirect vehicles and meet the crashworthiness evaluation criteria contained in National Cooperative Highway Research Program (NCHRP) Report 350, Recommended Procedures for the Safety Performance Evaluation of Highway Features, 1993.

**Project:** Any work in the highway right of way that may have an impact on traffic.

**Public Information Plan:** A communications plan to inform affected road users, the general public, area residences and businesses, and appropriate public entities of project scope, expected work zone impacts, closure details, and recommended action (if any) to

avoid impacts and changing conditions during construction.

**Significant Project:** A significant project falls into either a Category 1 or Category 2 classification.

A Category 1 significant project occupies a location for more than three days with either intermittent or continuous lane closures on Interstate Highways within a Transportation Management Area

A Category 2 significant project is one that either:

- Occupies a location for more than three days with either intermittent or continuous lane closures on arterials, expressway, or freeways with Average Annual Daily Traffic (AADT) of 30,000 or more,
- Fully closes an arterial for more than one hour at a time with no practical alternate route, or
- Any other project that, alone or in combination with other concurrent projects nearby, is anticipated to require greater than normal attention to traffic control to eliminate sustained work zone impacts greater than what would be considered acceptable.

**Traffic Control Plan (TCP):** A plan identifying what traffic control devices to use and showing their location and operation in a work zone to ensure traffic flow. TCPs also include phased staging and traffic routing plans where needed.

**Transportation Management Area (TMA):**

1) An urbanized area with a population of over 200,000 or 2) any urbanized area for which TMA designation has been requested by the Governor and the area's metropolitan planning organization and granted by the Secretary of the United States Department of Transportation (USDOT.) Currently, Anchorage is the only TMA in Alaska. Its boundary coincides with the Anchorage Metropolitan Area Transportation System boundary. Check with Planning for any changes in TMA designations.

**Transportation Management Plan (TMP):** A plan to manage work zone impacts of a highway project. It includes a Traffic Control Plan and may include Transportation Operations and Public Information Plans. Neither the TMP nor its three component plans are standalone documents. Plan provisions are included in project plans, specifications, or

agreements with other parties and are scaled as appropriate for the complexity of individual projects.

**Transportation Operations Plan (TOP):** A plan to minimize project impacts not covered under a Public Information Plan or TCP. In general, these activities consist of coordination with external agencies, events, projects and systems, and may include:

- Plans for on-project law enforcement and other activities by external agencies
- Coordination with other projects to minimize cumulative impact
- Coordination with agencies that manage signal operations
- Plans to maintain access for emergency vehicles, school buses, transit, etc.
- Plans to minimize impacts to major traffic-generating events

### **1400.3. State & Federally Funded Projects and Work on State Highways**

Every project will have a Transportation Management Plan (TMP). A TMP must include a Traffic Control Plan (TCP) and may contain a Transportation Operations Plan and a Public Information Plan.

The regional design section working in conjunction with the regional construction and traffic sections, and in coordination with external agencies, events, projects, and systems, as necessary, should prepare a project specific TMP.

Emergency incidents are exempt from the requirements of this section, except for development of a TCP, which is done in accordance with section 1400.3.5.

#### **1400.3.1 Determination of “Significant Project”**

Refer to the definitions in Section 1400.2. Determine whether the project is “significant” and document this in the *Preliminary Work Zone Traffic Control* section of the Design Study Report (DSR.)

### **1400.3.2 Transportation Management Plan (TMP)**

#### **Significant Projects**

For non-exempt “significant” projects, prepare a full Traffic Management Plan, including Transportation Operations, Public Information, and Traffic Control Plans.

#### **Exempt Significant Projects**

Some significant projects may be exempt from requiring a full TMP as anticipated traffic impacts are minimal or insignificant. For an exempt significant project, a TCP is still required, but the TOP and Public Information Plans are optional.

For a Category 1 significant project, an exemption is requested in accordance with 23 CFR 630.1010 (d) by the Regional Preconstruction Engineer. He sends a memo to the FHWA Division Administrator requesting an exemption and includes a discussion of the justification. If approved, copy the exemption request and FHWA approval memos to the Chief Engineer.

For a Category 2 significant project, an exemption may be granted by the Regional Preconstruction Engineer.

Project-specific exemptions may be granted if:

- lane-closures occur only at night,
- lane-closures occur only during off-peak and weekend hours, or
- roadway capacity under construction conditions substantially exceeds traffic volumes.

A Category 2 significant project exemption is initiated with a memo from the project manager to the Regional Preconstruction Engineer. If the exemption is approved, provide a copy of the exemption approval letter to the FHWA Division Administrator and the Chief Engineer.

Include a discussion and documentation of exemptions in the *Preliminary Work Zone Traffic Control* section of the Design Study Report (DSR). See Section 450.5.2 for a discussion of DSRs.

#### **All Projects**

For all projects:

1. Involve stakeholders as appropriate.

2. Provide information on potential construction impacts on traffic mobility to the public.
3. Prepare a TCP.
4. Consider whether it is appropriate to include a TOP and/or Public Information Plan or portions thereof.

### **1400.3.3 Transportation Operations Plans (TOPs)**

The design and construction sections share joint responsibility for developing TOPs. Some of these tasks begin in design but are not finalized until the project is under construction. Coordination between design and construction is essential and inclusion of TMPs is important in plan reviews.

Agreements made under the TOP that are not incorporated in project plans or specifications shall be retained in project files. Where appropriate, include them as referenced appendices in construction contracts.

### **1400.3.4 Public Information Plans**

When a Public Information Plan is used, the information may be distributed directly by:

- The contractor's Worksite Traffic Supervisor
- The Department's construction section thru the Department's 511 system  
<http://511.alaska.gov/>
- Television, radio and/or newspaper advertisements
- Other location-specific communication tools

If the Public Information Plan is to be distributed by the contractor, include the requirements in the contract.

### **1400.3.5 Traffic Control Plans (TCPs)**

Traffic control plans are required on all highway projects where work occurs in a State maintained right-of-way.

Develop TCPs for moderate to large and complex projects in coordination with the construction section.

On smaller, simple projects, the designer may choose to require the contractor to develop TCPs as required by Section 643-1.03 of the Standard Specifications.

Do not seal TCPs, except as noted below, as TCPs are commonly field modified during construction.

Seal temporary traffic signal systems and geometric designs for 50 mph posted speed, or higher, detour or bypass routes.

On projects where the work is outside the clear zone but the activities may impact traffic flow, consider whether a TCP is desirable or necessary. Signing and flagging for truck crossings are examples of traffic control that may be desirable or necessary when work is accomplished outside the clear zone only.

### **Scope, Preparation and Detail**

Prepare all TCPs in accordance with the *Alaska Traffic Manual (ATM)*.

The ATM sets forth basic principles and prescribes standards for the application, installation, and maintenance of various traffic control devices for highway and street construction. However, it does not address all potential traffic situations in work zones. Tailor TCPs to specific project conditions and requirements.

The scope and detail of a TCP will depend on project complexity and the extent to which construction interferes with traffic flow. TCPs may include:

- Plans and detail drawings
- Special provisions
- Typical applications from the ATM.

In developing a TCP:

- Consider if there is enough room within the right-of-way for both the construction activity and a travel route. If not, consider obtaining temporary construction permits.
- Verify that any temporary, constructed detours or bypasses meet acceptable geometric standards including grade, cross slope, lane width, superelevation, and clear zone for the posted speed limit. Detours routed onto existing streets do not require this.
- Confirm that any constructed detours or bypasses comply with the environmental document and project permits.
- Verify that traffic volumes can be adequately handled with available lanes at all hours.

- Provide access to businesses, residences and work zones if feasible. If access cannot be provided to businesses or residences, coordinate with the ROW section to see if specific agreements are needed.
- Provide for non-motorized traffic accommodations, including ADA accessible routes when they currently exist.

*Planning Nighttime Highway Construction and Maintenance.”*

For all projects:

1. Establish times and dates, if any, when lane and/or road closures are prohibited. This may include requirements for night and/or weekend work.
2. Provide guidance for mitigation of specific safety concerns.
3. Consider establishing allowable delay/queue standards.
4. Consider whether coordination with the entity that manages traffic signals will be necessary during construction of the project.
5. Consider whether road volumes under anticipated construction conditions need evaluation.
6. Include all appropriate TOP agreements that are not incorporated in project plans or specifications as referenced appendices in construction contracts.
7. Coordinate with local governments on all significant projects or other projects that may conflict with local projects.
8. Coordinate with local transit, school bus, and emergency vehicle operation.
9. To minimize worker exposure to traffic and exposure of road users to construction activities, consider including the following exposure control measures:
  - a. Road or ramp closures
  - b. Detours
  - c. Median crossovers
  - d. Accelerated construction techniques
  - e. Night or off-peak work hours\* (noise permits or variances may be necessary for night work.)

\* A detailed procedure for assessing the feasibility of performing highway work at night is provided in NCHRP Report 475, *“A Procedure for Assessing and*

10. Identify whether and under what conditions to install positive protection devices. In making this determination, consider the following factors:
  - a. Project scope and duration
  - b. Anticipated traffic speeds through the work zone
  - c. Anticipated traffic volumes
  - d. Vehicle mix
  - e. Type of work (as related to worker exposure and crash risks)
  - f. Distance between traffic and workers, and degree of worker exposure
  - g. Escape paths available for workers to avoid vehicle intrusion into the work space
  - h. Time of day the work occurs (e.g., night work)
  - i. Work area restrictions (including impact on worker exposure)
  - j. Consequences from/to road users resulting from roadway departure
  - k. Potential hazard to workers and road users presented by device itself and during device placement and removal
  - l. Geometrics that may increase crash risks (e.g., poor sight distance and sharp curves)
  - m. Access to/from work space
  - n. Roadway traffic volume and speed
  - o. Impacts on project cost and duration

In particular, consider installation of positive protection devices under the following conditions:

- a. Work zones that provide workers no means of escape from motorized traffic (e.g., tunnels, bridges, etc.)
- b. Long duration work zones (e.g., two weeks or more) resulting in substantial worker exposure to motorized traffic
- c. Projects with anticipated operating speeds of 45 mph or greater, especially when combined with high traffic volumes
- d. Work operations that place workers close to travel lanes open to traffic
- e. Roadside hazards, such as drop-offs or unfinished bridge decks, that will remain in place overnight or longer

11. Consider truck mounted attenuators for short duration or mobile work on roads with a posted speed of greater than 45 mph and in other areas as appropriate.
12. Consult with the construction section to determine if and when uniformed police officers should be present on construction projects. Coordinate with construction personnel to make the necessary agreements. In determining whether officers are needed, consider the factors listed in 23 CFR 630.1108(d). Also, consider prearranged regional agreements with police departments, rather than project-by-project agreements.

### **Work Zone Roadside Safety**

Provide direction in the specifications or drawings on

- How to treat roadside slope or obstacle hazards
- Required roadside clear distances
- How to treat pavement drop-offs
- Acceptable channelization devices, barriers, and barrier end treatments

Pre-existing roadside safety hardware should be preserved or improved for use until the progress of construction necessitates its removal. From that time until permanent roadside safety hardware is installed, maintain roadside safety hardware as required in the plans and specifications.

### **Work Zone Speed Limits**

If work zone speed limits are established, set them in accordance with P&P 05.05.020 - "Establishment of Speed Limits and Zones."

### **Oversize/Overweight (O/O) Equipment**

Make provisions in the TCP for special signing, pilot vehicles, or special routing if you anticipate using O/O equipment on the project or if O/O vehicles or equipment will utilize the route during construction.

Coordinate with the Division of Measurement Standards and Commercial Vehicle Enforcement (MSCVE) for existing and pending O/O permits and project specific traffic control measures. Include construction notices pertaining specifically to O/O vehicles in the Public Information Plan.

O/O vehicles are not permitted on bridges unless written approval is obtained from the Chief Bridge Engineer, or the bridge is a temporary structure

designed by the contractor and intended for the O/O vehicles.

Department approval of a traffic control plan allowing oversize or overweight vehicles or equipment waives normal legal size and weight limitations **within the project limits** (see 17 AAC 25.011).

Consider whether allowing oversize/overweight vehicles or equipment will lower construction costs and can be done with reasonable safety without damage to the infrastructure. If so, consider providing a "Notice to Bidders" indicating that oversize or overweight vehicles may be allowed based on approval of an acceptable TCP.

### **1400.3.6 Payment for Traffic Control**

The strategy for traffic control payment can vary depending on project size, duration, and complexity. Consult with construction regarding choice of pay items. It is best to provide flexibility here so the contractor can submit his own TCP based on his sequencing and schedule. The contractor's plan may differ from the TCP preparer's assumptions.

Traffic control devices may be paid for by lump sum, contingent sum, unit price, or a combination thereof. Contingent sum is the most common method of paying for most traffic control items.

Do not make payment for work zone traffic control features and operations incidental to the contract or other items of work not related to traffic control and safety.

### **Traffic Maintenance**

Include a Traffic Maintenance item – either Pay Item 643(1) or 643(2) - on all projects with traffic control, except for lump sum projects, where it is optional. Inclusion of this pay item allows the Contractor to directly allocate costs associated with:

- Providing a Worksite Traffic Supervisor.
- Preparing TCPs.
- Preparing and publishing public information notices.
- Preparing a Construction Phasing Plan.
- Maintaining all roadways, approaches, crossings, intersections and pedestrian and bicycle facilities.
- Providing any traffic control devices required, but not shown on the bid schedule.

## **Lump Sum**

Traffic control, except for positive protection devices (PPDs), may be paid for as lump sum only on projects, or portions thereof, where:

1. Traffic control is not complex,
2. The contractor can readily evaluate the required traffic control work, and
3. The number and placement of traffic control devices is easily determined

Use contingent sum and/or unit price payment strategies on all projects that do not meet these conditions.

When lump sum payment is an option, consider the following when deciding whether to use it:

1. Lump sum traffic control is more difficult to monitor and change because the contractor is not paid for individual traffic control items and it requires closer oversight to ensure all necessary traffic control items are in place.
2. The use of lump sum traffic control payment requires a detailed TCP. All necessary traffic control devices need be shown on the TCP to reduce disagreement between the engineer and the contractor about what is required and to reduce the potential for claims for increased traffic control payments from the contractor.

If the use of lump sum for traffic control is questionable, consult the FHWA Alaska Division for guidance.

## **Positive Protection Devices (PPDs)**

Provide separate pay items for Positive Protection Devices (PPDs) when they are used. Separate payment for PPDs may be either lump sum, unit price or contingent sum. If PPDs are used on a project with lump sum payment for traffic control, PPDs must still be paid for as a separate pay item.

## **Flagging**

Flagging is primarily used for public safety or at the convenience of the contractor to support his operations.

The Department is responsible for paying for flagging required for construction of the project. Contractors should pay for flagging solely for their own convenience, benefit or productivity.

When not included in a lump sum pay item, pay for flagging by contingent sum at the Department's approved rate. See the Statewide Construction Standards Resources webpage for the current rate, <http://www.dot.state.ak.us/stwddes/dcsconst/index.shtml>.

## **Contingent Sum**

Contingent sum (C.S.) pay items include traffic control devices, flagging and traffic price adjustment.

Special consideration should be given in the use of the C.S. Traffic Price Adjustment pay item. Traffic Price Adjustment is a liquidated damage charge assessed for unauthorized contractor activity or traffic control that results in any lane of traffic not being open to full use by the public. Set the bid amount on the bid schedule for this pay item to \$0 (zero).

## **Unit Price**

There are two types of unit price pay items used to pay for traffic control:

- Contractor bid unit price
- Department-set (fixed) unit price

In contractor bid unit price, the contractor establishes the payment price for particular traffic control items. A list of common unit price pay items is contained in the Standard Specification for Highway Construction (SSHC). New pay items are established by special provision for specific or special needs.

When Department-set unit price is used, a Traffic Control Rate Schedule (TCRS) is provided in the special provisions. The TCRS includes a list of all the commonly used traffic control devices and their respective predetermined fixed prices. When using this method of payment, use SSHC Pay Item 643(25) and allocate an appropriate amount of contingent sum money to pay for these devices.

Contractor bid unit price items should be considered when

- The contractor has little control over the bid quantity, or
- There is a firm estimate on the bid quantity, and the Department has control of the actual quantity required during the project, or
- The bid item in question is high cost and likely to have one time or limited use by the contractor.



Use of a TCRS and the inclusion of a 643(25) Pay Item is the most common way to pay for traffic control devices. This reduces the opportunity for bid unbalancing by contractors.

### **Estimates**

Total traffic control costs typically range from 5 to 15% of the total construction cost. The lower end of this range is for rural, low-volume projects with simple traffic control plans and low impacts to traffic, while the upper end represents urban, high-volume projects with complex traffic control.

### **1400.4. References**

1. Code of Federal Regulations 23 CFR 630 Subparts J & K
2. Part 6 of the *Alaska Traffic Manual (ATM)*. The ATM consists of the *Manual on Uniform Traffic Control Devices (MUTCD)* and the *Alaska Traffic Manual Supplement*
3. *Alaska Construction Manual*
4. *Alaska Standard Specifications for Highway Construction*, Section 643
5. Alaska Standard Drawings ("C & G" Series)
6. P&P 05.05.020 - "Establishment of Speed Limits and Zones"

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