



Guidelines



on Payment for Temporary Traffic Control



This document describes considerations and requirements of payment for temporary traffic control (TTC). The document offers several recommended methods and presents the advantages and disadvantages of each. Also addressed are techniques the agency and the contractor can use to monitor the effectiveness of selected methods.

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Refer to <http://www.workzonesafety.org> for a copy of this document.



Guidelines on Payment for Temporary Traffic Control

The federal regulations pertaining to temporary traffic control (TTC) in work zones (23 CFR 630 Subpart K) specifically address requirements for the payment of temporary traffic control. These regulations were mandated by the U.S. Congress in the “Safe, Accountable, Flexible and Efficient Transportation Equity Act—A Legacy for Users” (SAFETEA-LU). The intent of the regulation is to increase the awareness of, and attention to, the importance of work zone traffic control and safety devices and of the need to “...ensure the availability of funds for these provisions.” In this way, agencies can make sure that contractors are all placing adequate emphasis on safety in project bids.

Introduction

Payment for TTC is first addressed in 23 CFR 630 Subpart J of the regulations (section 1012(d)), where it states that project plans, specifications, and estimates (PS&Es) shall include appropriate pay item provisions for implementing the project Transportation Management Plan (TMP). A TMP consists of all strategies used to manage the impacts of a work zone. The TMP includes a TTC plan that describes the traffic control measures used for facilitating the movement of road users through a work zone in a manner consistent with the national *Manual on Uniform Traffic Control Devices* (MUTCD). A TMP can also include traffic operations and public information components that further mitigate the transportation system impacts of the work zone.

The intent of the regulations is that work zone traffic control shall not be treated as an incidental expense on the project, nor shall it be included in payment for other work items not related to traffic control and safety. Agencies are given the flexibility of using method-based or performance-based specifications for pay items. In addition, the pay items themselves used in method-based specifications can be either lump sum pay items, unit price pay items, or a combination thereof. Separate pay items shall be provided for major categories of traffic control devices, safety features, and work zone safety activities. Examples of these types of items include positive protection devices and uniformed law enforcement activities (when those activities are determined to be necessary for the project).

See *Guidelines on the Use of Law Enforcement in Work Zones* and *Guidelines on the Use of Positive Protection in Temporary Traffic Control Zones* at <http://www.workzonesafety.org>.

Additional details concerning payment for TTC, relevant terms, and how these can be applied to projects are provided below.



Method-Based Versus Performance-Based Specifications

Method-based specifications (sometimes referred to as prescriptive specifications) describe materials or products to be used for TTC, as well as how they are to be installed and/or used. In contrast, performance-based specifications describe the required results or outcomes to be achieved, as well as the criteria that will be used for verifying compliance or success in meeting the outcomes.



A typical TTC plan, which is part of a TMP, is an example of a method-based specification, as it details the types of devices to be used (signs, channelizing devices, etc.) and their locations in advance and through the activity area. For method-based specifications, the specifications and other PS&E documents should provide sufficient details so that the quantity and types of devices and the overall effort required for implementing and maintaining the TMP can be determined. Presently, most agencies use a method-based approach for TTC specifications.

temporary traffic control as long as they meet the specified retroreflectivity values and contrast ratios. Signs must be replaced when they degrade to where they no longer meet the retroreflectivity specification. Eventually, similar performance-based retroreflectivity specifications will be developed for pavement markings as well. Other examples of performance-based specifications are maximum tolerable delay values through the work zone (i.e. the contractor shall keep travel delay through the work zone to less than a determined value such as 10 minutes) and a requirement for the contractor to keep the crash rate during the work zone the same as the historical crash rate without the work zone in place. In both instances, it would be left to the contractor to determine how to achieve these levels of performance. The specification would outline what data would be used to assess whether the specification is met and who would be responsible for collecting the data.

The idea of using performance-based specifications for TTC in work zones is relatively new. One of the major challenges for moving towards performance-based specifications in this area is the lack of data and equipment available to verify compliance. In the first example above, devices for measuring sign retroreflectivity are fairly costly and require personnel trained on how to properly calibrate and use the devices. Most agencies and contractors do not have these devices in sufficient quantities, which would make it difficult to assess or enforce compliance with such a specification. Similarly, a maximum tolerable delay specification would require equipment to measure travel times at the necessary frequency.



Another challenge in using performance-based specifications for work zone traffic control is in ensuring that the specifications are truly indicative of satisfactory outcomes and are under the control of the agency or the contractor. This concern is best illustrated by examining two types of safety specifications:

- a financial contract incentive for a project based on a specification that the highway contractor and subcontractors maintain a worker injury rate on the job that is below the national average for highway workers; and
- an incentive that will be paid if the traffic crash rate during the project is maintained at or below the pre-construction rate.

In the first case, the contractor and subcontractor policies and practices pertaining to worker safety (daily toolbox talks, regular training sessions, etc.) can directly reduce worker injuries (making it a realistic performance specification). In the second case, external influences unrelated to the

work zone temporary traffic control can affect traffic crash rates (such as the weather, special events that create unusually high traffic volumes for short periods of time, or the opening of a large traffic generator that significantly affects travel patterns) and make it difficult for contractors to meet that specification.



Lump Sum Versus Unit Price Pay Item in Method-Based Specifications

Lump sum pay items involve a set amount of funds that are allocated to that particular item or activity, and the amount of that item is not specified. In contrast, unit price pay items involve both an estimate of the amount of the item that will be needed and the price per unit that will be charged for that item.

Agencies may use lump sum pay items, unit price pay items, or some combination of the two for temporary traffic control. According to the regulation, lump sum payment should be limited to items for which an estimate of the actual quantity required is provided in the PS&E or for items where the actual quantity required is dependent upon the contractor's choice of work scheduling and methodology. Current regulations also suggest that a contingency provision be included if lump sum pay items are used so that different payment amounts (either an increase or decrease) can be provided if the nature or quantity of the required work changes due to circumstances beyond the control of the contractor.



“When there is a pay item for moving temporary barriers, do not measure movement of temporary barriers for work access or the convenience of the Contractor.”

The Standard Specifications for the Construction of Roads and Bridges on Federal Highway Projects

In contrast, unit price payment should be provided for those items for which the contractor has little or no control over the quantity and no firm estimate of quantities is provided in the PS&Es, but for which the highway

agency has control of the actual quantity to be required during the project. Furthermore, the payment should be limited to those items actually required by the agency; items (such as the movement of barrier) that exist or are performed for the convenience of the contractor would not be appropriate for payment.

An example of appropriate unit price item could be the provision of dedicated law enforcement at a project during various work activities in and near the roadway as approved by the project engineer. The occasional use of speed display trailers on the approach to a work zone (again as directed by the project engineer) would be another example of an appropriate unit pay item.

Table 1 summarizes the key advantages and disadvantages of lump sum and unit price pay items for temporary traffic control. Lump sum pay items tend to be simpler to use, especially for low-cost projects, and is believed to reduce agency workload to document item usage in the project. However, the use of lump sum for pay items makes the agency TTC review contractual rather than approval related because the plan is tied to the number of items that will be used. Consequently, any significant changes to the TTC quantities during the project will require additional administrative efforts by the agency to modify the contract and increase or decrease the lump sum amount.

Table 1. Advantages and Disadvantages of Lump Sum and Unit Price Pay Items

	Lump Sum Pay Items	Unit Price Pay Items
Advantages	<ul style="list-style-type: none"> • Lowers the demands on agency staff to document item usage • Simple for low-cost, small projects • Can provide an incentive for well-organized contractors who can schedule work efficiently into the smallest work window possible 	<ul style="list-style-type: none"> • Allows the agency to manage how much of a particular pay item is to be used at a work zone • Allows for increased flexibility on high-cost, complex projects • Administrative efforts to adjust quantities as work progresses is minimized
Disadvantages	<ul style="list-style-type: none"> • Makes the agency traffic control plan review contractual rather than approval related, since the plan is tied to the number of items that will be used • An extra administrative burden can be created if changes to quantities are required 	<ul style="list-style-type: none"> • Requires significant agency staff effort to constantly monitor and document pay item usage for payment purpose • May encourage overuse of devices *

* For example, having multiple portable changeable message signs (PCMS) in a project displaying “DRIVE SAFELY” messages so that daily use rental of each PCMS can be collected.

Conversely, the use of unit pay items does offer increased flexibility in the amount of temporary traffic control that is to be used, which can be beneficial on highly-complex projects where field changes may be more common. This increased flexibility does increase agency manpower requirements to monitor and document TTC device usage on a continuous basis. In addition, the use of unit pay items may encourage the overuse of some devices in order to increase payment, and so must be carefully managed by the agency.

Regardless of the basis used for pay items, the specifications and other PS&E documents should provide sufficient details so that the quantity and types of devices required to be compliant with agency standards, and the overall effort required to implement and maintain the TMP, can be determined. Specifications should also clearly indicate how placement, movement/relocation, and maintenance of traffic control devices and safety features will be compensated. Finally, the specifications should include provisions to require and enforce con-

tractor compliance with the contract provisions relative to implementation and maintenance of the project TMP and related traffic control items. Enforcement provisions may include remedies such as liquidated damages, work suspensions, or withholding payment for noncompliance.

Agency Applications of Each Pay Item Category

Nationally, considerable variation exists as to which individual temporary traffic control and other work zone safety items are handled on a unit price basis, and which items are handled on a lump sum basis. Within a



given agency, use of unit price and lump sum pay items for temporary traffic control may also vary on a project-by-project basis. In some cases, all of the temporary traffic control can be bid as a separate lump sum pay item. In other cases, almost all devices are specified on a unit pay item basis. An interesting middle ground has been adopted by the Washington State Department of Transportation (WSDOT). WSDOT lists the following criteria for deciding whether to allow traffic control to be bid on a lump sum versus a unit price per item basis:

- Is the required traffic control plan defined to a level that will produce a consistent bid?
- Is the traffic control plan straightforward?
- Is there at least one definable solution available at the time of bid?
- Can a performance/outcome specification be written to ensure a consistent product?
- Is there a possibility that a contractor's actions could reduce the overall public impact from traffic control?
- Are there likely to be arguments regarding unit item quantities if WSDOT uses standard items?

Certain types of work operations and projects (e.g., mobile operations and asphalt paving operations) naturally lend themselves more easily to treatment of temporary traffic control as a lump sum pay item. For mobile operations, the limited number of devices used for temporary traffic control makes it easy for the contractor to accurately estimate the amount needed. For asphalt paving operations, the amount of temporary traffic control needed will depend heavily on the contractor work processes (i.e., paving rates and sequencing will dictate how much of the roadway will be closed with channelizing devices during each work period).

For guidance purposes, Table 2 on page 6 categorizes various TTC items on the basis of how they are commonly addressed in project bids nationally. In addition to the use of positive protection (i.e., temporary barriers) and law enforcement that are required by the Subpart K regulations, traffic control items that are almost always specified on a unit price basis include:

- PCMS (portable changeable message signs);
- specially designed construction signs;
- speed display trailers;
- crash cushions; and
- temporary pavement markings.



Conversely, mobilization costs and the cost of maintaining temporary traffic control over the life of a project are highly dependent upon contractor and subcontractor decisions and practices (i.e., who is responsible, how it is accomplished, etc.). As a result, these types of costs are almost always bid on a lump sum basis.

Table 2. Typical Treatment of Temporary Traffic Control and Safety Items

Items	
Almost always bid on a unit price basis	<ul style="list-style-type: none"> ● Law-enforcement use (per officer-hour) ● Portable concrete barrier or guardrail (per unit length) ● PCMS (per day) ● Specially-designed construction signs (per unit area) ● Temporary object markers, chevrons, delineators (each, or per unit area) ● Speed display trailers (per day) ● Crash cushions (each) ● Glare screen (per unit length) ● Temporary pavement markings (per unit length)
Bid either as lump sum or as unit prices	<ul style="list-style-type: none"> ● Flaggers ● Standard TTC signs, channelizing devices, barricades ● Advance warning arrow panels ● Warning lights
Almost always bid as lump sum	<ul style="list-style-type: none"> ● Temporary traffic control mobilization ● Miscellaneous maintenance of traffic efforts (cleaning, resetting, etc.) during the project

How Can I Locate More Information Regarding This Topic?

Lump Sum Traffic Control. Washington State Department of Transportation. Available at <http://www.wsdot.wa.gov/Projects/delivery/alternative/LumpSum.htm>

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Developed By:

The Roadway Safety Consortium

202-628-5465

www.workzonesafety.org



Laborers' International Union of North America
Laborers' Health and Safety Fund of North America
LIUNA Training and Education Fund
American Road and Transportation Builders Association
National Asphalt Pavement Association
International Union of Operating Engineers
American Association of State Highway
and Transportation Officials
Texas Transportation Institute
FOF Communications



U.S. Department of Transportation
Federal Highway Administration

This material is based upon work supported by
 the Federal Highway Administration
 under Grant Agreement No. DTFH61-06-G-00007.

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