

RULE on **WORK ZONE**
Safety and Mobility

23 CFR 630 Subpart J



Implementing the Rule on Work Zone Safety and Mobility



U.S. Department of Transportation
Federal Highway Administration

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16. Abstract In September 2004, the Federal Highway Administration (FHWA) published updates to the work zone regulations at 23 CFR 630 Subpart J. The updated rule is referred to as the Work Zone Safety and Mobility Rule (Rule) and applies to all State and local governments that received Federal-aid highway funding. Transportation agencies are required to comply with the provisions of the Rule by October 12, 2007. The changes made to the regulations broaden the former rule to better address the work zone issues of today and the future. Growing congestion on many roads, and an increasing need to perform rehabilitation and reconstruction work on existing roads already carrying traffic, are some of the issues that have lead to additional, more complex challenges to maintaining work zone safety and mobility. To help address these issues, the Rule provides a decision-making framework that facilitates comprehensive consideration of the broader safety and mobility impacts of work zones across project development stages, and the adoption of additional strategies that help manage these impacts during project implementation. The Rule requires agencies to develop an agency-level work zone safety and mobility policy to support systematic consideration and management of work zone impacts across all stages of project development. Based on the policy, agencies will develop standard processes and procedures to support implementation of the policy. The third primary element of the Rule calls for the development of project-level procedures to address the work zone impacts of individual projects. To help transportation agencies understand and implement the provisions of the Rule, FHWA has been developing four guidance documents. This Guide is the main Rule Implementation Guide and provides a general overview of the Rule and overarching guidance for implementing the provisions of the Rule. This document includes guidelines and sample approaches, examples from transportation agencies using practices that relate to the Rule, and sources for more information. While this Guide covers aspects of the Rule, it also contains information that can be useful to agencies in all of their efforts to improve safety and mobility in and around work zones, and thereby support effective operations and management of our transportation system.					
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List of Acronyms

AASHTO – American Association of State Highway and Transportation Officials

ADT – Average Daily Traffic

CBD – Commercial Business District

CCTV – Closed-Circuit Television

CMAQ – Congestion Mitigation and Air Quality

CMS – Changeable Message Sign

DOT – Department of Transportation

FHWA – Federal Highway Administration

HAR – Highway Advisory Radio

HCM – Highway Capacity Manual

HOV – High Occupancy Vehicle

IDAS – ITS Deployment Analysis System

IM – Interstate Maintenance

ITS – Intelligent Transportation System(s)

LOS – Level of Service

LTAP – Local Technical Assistance Program

MOT – Maintenance of Traffic

MOU – Memorandum of Understanding

MPO – Metropolitan Planning Organization

MUTCD – Manual on Uniform Traffic Control Devices

NEPA – National Environmental Policy Act

NHI – National Highway Institute

NHS – National Highway System

PI – Public Information

PS&Es – Plans, Specifications, and Estimates

RSA – Road Safety Audit

SAFETEA-LU – Safe, Accountable, Flexible, Efficient Transportation Equity Act:
A Legacy for Users

STIP – Statewide Transportation Improvement Program

STP – Surface Transportation Program

TCP – Traffic Control Plan

TIM – Traffic Incident Management

TIP – Transportation Improvement Program

TMA – Transportation Management Area

TMC – Transportation Management Center

TMP – Transportation Management Plan

TO – Transportation Operations

TTC – Temporary Traffic Control

WZSA – Work Zone Self Assessment

Executive Summary

In September 2004, the Federal Highway Administration (FHWA) published updates to the work zone regulations at 23 CFR 630 Subpart J. The updated rule is referred to as the Work Zone Safety and Mobility Rule (Rule) and applies to all State and local governments that receive Federal-aid highway funding. Transportation agencies are required to comply with the provisions of the Rule by October 12, 2007. The changes made to the regulations broaden the former rule to better address the work zone issues of today and the future.

Growing congestion on many roads, and an increasing need to perform rehabilitation and reconstruction work on existing roads already carrying traffic, are some of the issues that have lead to additional, more complex challenges to maintaining work zone safety and mobility. To help address these issues, the Rule provides a decision-making framework that facilitates comprehensive consideration of the broader safety and mobility impacts of work zones across project development stages, and the adoption of additional strategies that help manage these impacts during project implementation. At the heart of the Rule is a requirement for agencies to develop an agency-level work zone safety and mobility policy. The policy is intended to support systematic consideration and management of work zone impacts across all stages of project development. Based on the policy, agencies will develop standard processes and procedures to support implementation of the policy. These processes and procedures shall include the use of work zone safety and operational data, work zone training, and work zone process reviews. Agencies are also encouraged to develop procedures for work zone impacts assessment. The third primary element of the Rule calls for the development of project-level procedures to address the work zone impacts of individual projects. These project-level procedures include identifying projects that an agency expects will cause a relatively high level of disruption (referred to in the Rule as significant projects) and developing and implementing transportation management plans (TMPs) for all projects.

To help transportation agencies understand and implement the provisions of the Rule, FHWA has been developing four guidance documents. This Guide is the main Rule Implementation Guide and provides a general overview of the Rule and overarching guidance for implementing the provisions of the Rule. Three technical guidance documents, available starting in Fall 2005, cover specific aspects of the Rule: work zone impacts assessment, TMPs for work zones, and work zone public information and outreach strategies. All four of the guides include guidelines and sample approaches, examples from transportation agencies using practices that relate to the Rule, and sources for more information. The examples help illustrate that many transportation agencies already use some policies and practices that the Rule either encourages or requires, and that there is more than one way to achieve compliance with the Rule. While what these agencies are doing may not yet be fully compliant with the Rule, their current practices still serve as good examples of how to work toward Rule implementation. While these guides cover aspects of the Rule, they also contain information that can be useful to agencies in all of their efforts to improve safety and mobility in and around work zones and thereby support effective operations and management of our transportation system.

State and local transportation agencies and FHWA are partners in trying to bring about improved work zone safety and mobility. Consistent with that partnership, the Rule advocates a partnership between agencies and FHWA in Rule implementation and compliance. Staff from the respective FHWA Division Offices, Resource Center, and Headquarters will work with their agency counterparts to support implementation and compliance efforts. This guidance document is one key element of that support.

Contents of this Guide

This Guide begins with a brief discussion of the goals and expected benefits of the Rule, the purpose of the Guide, and the intended audience for the Guide. *The intended audience for this Guide includes transportation agency technical staff (planners, designers, construction and traffic engineers), management and executive-level staff responsible for setting policy and program direction, field staff responsible for building for building projects and managing work zones, and agency personnel responsible for assessing performance in these areas; FHWA staff, particularly those with oversight responsibilities; and other partners such as contractors, highway workers, consultants, and law enforcement officials.* Section 2 of this Guide provides an overview of the Rule and the key differences between the former rule and the updated rule, and a brief discussion of how the provisions of the Rule fit in with commonly used project delivery processes. Sections 3 to 6, respectively, cover major aspects of the Rule: developing and implementing a work zone policy, implementing agency-level processes and procedures, identifying significant projects, and developing TMPs for projects. Each section begins with the related provisions in the Rule and provides approaches that could be used to implement the provisions. The content of Sections 3 to 6 is described in more detail below.

Section 3 describes possible components that agencies may consider when developing or updating their work zone policy. The components covered include a statement of the agency's vision/overall policy for considering and managing work zone impacts; goals and objectives to help an agency attain its vision; specific policy provisions, such as methods of classifying projects or work zone performance standards; and roles and responsibilities. Section 3 also addresses who might be involved in developing and implementing an agency's work zone policy.

Section 4 covers the four areas of work zone agency-level processes and procedures mentioned in the Rule: use of safety and operational data, training, process reviews, and impacts assessment. For each area the Guide discusses why conducting these activities is important and who might be involved in carrying out these activities, and provides guidance to assist agencies in developing and implementing these procedures. For example, the work zone data discussion covers why work zone data are relevant, possible ways to use work zone data at the project level and process level, and maintaining data and information resources.

Section 5 discusses significant projects, including how the Rule defines significant project, the purpose of identifying significant projects, recommended timing for identifying these projects, and some guidance to assist agencies in identifying significant projects. The Rule provides some flexibility in how an agency defines significant projects, so the Section provides ideas of possible criteria and methods agencies might use in identifying such projects. The Section also discusses how agencies might apply for an exception for projects or classes of projects that meet the Rule definition of a significant project but an agency believes will not have a high level of work zone impacts.

Section 6 addresses the development of TMPs. It defines what a TMP is and provides guidance on how and when TMPs should be developed, implemented, and evaluated. The Rule and the Guide encourage agencies to begin TMP development early in the project delivery process during systems planning and further develop and refine the TMP as more information becomes available during design. Section 6 describes some possible steps for TMP development, implementation, and evaluation and explains how they could fit in with existing project delivery processes. The Section also discusses potential components of a TMP and provides a table of some work zone management strategies that could be included in TMPs.

The Guide closes with a discussion on implementation and compliance in Section 7. This Section discusses how agencies and FHWA are partners in trying to bring about improved work zone safety and mobility, and how the Rule advocates this partnership approach for Rule implementation and compliance. Section 7 addresses conformance review and reassessment; incorporation of Rule requirements, as applicable, in stewardship agreements; a process for applying for a variance from compliance requirements for projects that are in later stages of development at the compliance date and would be significantly impacted by the Rule; a possible timeline to assist agencies in planning for implementation and compliance; and other possible resources that can support agencies with implementing the Rule.

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1.0 Introduction

As we experience increased travel on our roads, there is a growing need for efforts to preserve and improve safety and mobility. Roadway construction, operations, and maintenance are integral in these efforts. Effectively managing the work zone impacts of road construction and maintenance is a key part. In support of these efforts, the Federal Highway Administration (FHWA) published the Work Zone Safety and Mobility Rule (the Rule) on September 9, 2004 in the Federal Register (69 FR 54562). This Rule updates and renames the former regulation on “Traffic Safety in Highway and Street Work Zones” in 23 CFR 630 Subpart J. All State and local governments that receive Federal-aid highway funding are affected by this updated Rule, and are required to comply with its provisions no later than October 12, 2007. While the Rule applies specifically to Federal-aid highway projects, agencies are encouraged to apply the good practices that it fosters to other road projects as well.

The changes to the regulation will facilitate comprehensive consideration of the broader safety and mobility impacts of work zones through a project’s life cycle, and the implementation of appropriate strategies to help manage these impacts. The phrase “broader safety and mobility impacts of work zones” emphasizes that work zone impacts may extend beyond the physical location of the work zone itself. Impacts may be felt on the roadway on which work is being performed, other highway corridors, other modes of transportation, and the transportation network. The provisions in the updated Rule recognize that traffic and worker safety and control are essential, but that work zone impacts management should also address transportation operations and public information, as appropriate to the needs of the project. FHWA will work in partnership with State Departments of Transportation (DOTs) and other affected transportation agencies to implement the provisions of the Rule.

The verbatim language of the updated Rule is provided in Appendix A of this implementation guide.

The Rule was updated to:

- Address the issues of more work zones, growing traffic volumes and congestion, very little growth in roadway capacity, work zone safety concerns, more work being performed under traffic, and public frustration with work zones.
- Facilitate consideration of the broader safety and mobility impacts of work zones, and the development and implementation of management strategies to reduce these impacts.
- Develop provisions that are sufficiently flexible to be applied to address both current and future work zone issues.

Applicability of the Rule:

All State and local governments that receive Federal-aid highway funding are affected by this updated Rule and need to comply with its provisions. The provisions of this regulation apply to all highway construction projects financed in whole or in part with Federal-aid highway funds.

1.1 Goals and Expected Benefits of the Updated Rule

Over the years, highway professionals have devised and implemented strategies and innovative practices for minimizing the disruption caused by work zones, while ensuring successful project delivery. However, the current and expected level of investment activity in highway infrastructure, a growing portion of which is for maintenance and reconstruction of existing roadways, means that work will increasingly be done on roads while maintaining traffic flow through the work zone. Therefore, it is important that transportation agencies broaden their understanding of work zone impacts and develop comprehensive mitigation measures that address both work zone safety and mobility. The provisions of the updated Rule are meant to help agencies do so.

1.1.1 Goals

The over-arching goal of the updated Rule is to reduce crashes and congestion due to work zones. The provisions of the updated Rule encourage:

- **Expanding planning beyond the project work zone itself** to address corridor, network, and regional issues (e.g., alternate routes and/or modes, truck traffic, special events, etc.) while planning and designing road projects.
- **Expanding work zone management beyond traffic safety and control to:**
 - Address mobility in addition to safety.
 - Address current day issues of operations and management and public information.
- **Innovative thinking in work zone planning, design, and management.** Thinking outside of the traditional traffic safety and management box and considering alternative/innovative design, construction, contracting, and transportation management strategies can bring additional solutions to light.

Therefore, the updated Rule is intended to facilitate the systematic consideration of the safety and mobility impacts of work zones, and the development of strategies and plans to reduce work zone impacts.

1.1.2 Expected Benefits

Implementation of the provisions of the updated Rule will help transportation agencies achieve:

- A consistent approach to planning, designing, and constructing road projects and managing the associated work zone safety and mobility impacts.
- Well thought out work zone designs and management strategies.
- Comprehensive and integrated transportation management strategies that address the complex interactions of different aspects of road construction and maintenance.
- Enhanced cooperation and coordination amongst project owners, contractors, and other stakeholders.
- Enhanced management of construction projects and their work zone impacts, facilitated by performance monitoring.

As a result, the implementation of the updated Rule's provisions may be expected to result in a reduction in congestion and crashes due to work zones, and greater public satisfaction.

1.2 Purpose of this Document

FHWA developed this implementation guide to help State Departments of Transportation and other affected transportation agencies (collectively referred to as agencies in this document) implement the provisions of the Rule and attain compliance. However, this document is also intended to provide helpful information and a foundation for other agency efforts to improve work zone safety and mobility that may go beyond the requirements of the Rule.

This implementation guide is not intended to be a step-by-step guide on "how-to" implement the provisions of the Rule. Rather, this implementation guide is intended to provide general guidance, layout some fundamental principles, and present agencies with some options to implement the provisions of the Rule. It is not the only approach to implement the provisions of the Rule. Wherever possible, this document also provides examples and best practices of what some agencies are doing (or have done in the past), along with links to locations where more information may be obtained.

1.3 Audience

The intended audience for this implementation guide includes:

- Technical staff, including planners, engineers, designers, construction engineers, and traffic engineers.
- Management-level and executive-level staff who are responsible for formulating policies, identifying program vision, goals, and objectives, and setting program-level priorities.
- Field staff, including construction managers, project engineers, construction and safety inspectors, and highway maintenance workers, who are responsible for building road projects in the field and for managing work zones during construction and maintenance.
- Appropriate representatives from the above areas who are responsible for assessing the performance of work zones and developing recommendations for improving policies, practices, and procedures.
- FHWA staff, particularly those with oversight responsibilities for Federal-aid highway projects.
- Appropriate non-agency staff that partner with, or are contracted by the agency, to plan, design, and build road projects, such as consultant staff, contractor staff, other highway workers, and law enforcement officials.

2.0 Overview of the Updated Rule

2.1 Outline of the Updated Rule

The updated Rule (the Rule) advocates a systematic approach to managing work zone safety and mobility. It is flexible, taking into account the needs for different project types and classes, and the differences in the operating circumstances and priorities for Departments of Transportation (DOTs) in different parts of the country. The primary components of the Rule fit into three categories: policy, agency-level processes and procedures, and project-level procedures. As shown in Figure 2.1, the Rule encourages continual feedback from one level to the other for the overall improvement of work zone practices, procedures, processes, and policies. The policy the agency develops will guide agency- and project-level processes and procedures. In turn, as the agency sees how certain project-level efforts perform in the field, it can use that information over time to refine its work zone policy and agency-level processes and procedures.

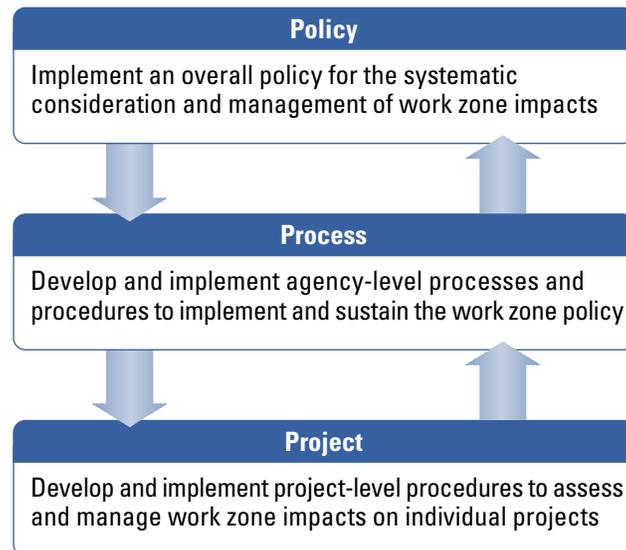


Figure 2.1 Structural Outline of the Updated Rule

In a nut-shell, within these components are the following key provisions, as stated in the updated Rule:

2.1.1 Policy-Level Provisions (Section 630.1006)

- Implement an overall policy that facilitates the systematic consideration of work zone safety and mobility.
- Work in partnership with the Federal Highway Administration (FHWA) to develop and implement the policy.

2.1.2 State/Local Agency-Level Processes and Procedures (Section 630.1008)

- Develop and implement processes/procedures for work zone impact assessment and management.
- Use work zone safety and mobility information and data to manage impacts on ongoing projects and to conduct performance assessments at the completion of projects to improve State work zone procedures.
- Require training for personnel involved in work zone planning, design, implementation, management, and enforcement.
- Conduct process reviews to assess wide scale performance of work zones with the goal of improving work zone processes and procedures.

2.1.3 Project-Level Provisions (Sections 630.1010 and 630.1012)

- Identify significant projects early in the project development process. Significant projects are those anticipated to cause sustained work zone impacts greater than what is considered tolerable based on State policy and/or engineering judgment.
- Develop transportation management plans (TMP) that focus on safety and mobility.
 - TMPs for significant projects shall consist of a temporary traffic control (TTC) plan that addresses traffic safety and control through the work zone. The TMPs shall address transportation operations (TO) strategies that will be used to ease work zone impacts. They shall also address public information (PI) strategies to inform those affected by the project of the expected work zone impacts and changing conditions.
 - TMPs for all other projects shall consist at least of a TTC plan and may include TO and PI strategies as well.
- Include appropriate TMP provisions in the Plans, Specifications, and Estimates (PS&Es).
- In the PS&Es, include appropriate pay item provisions for implementing the TMP.
- Assign “responsible persons” (State and contractor) to monitor the TMP and other safety and mobility aspects of the project.

The above key provisions and the other provisions of the updated Rule are discussed in detail in subsequent chapters of this implementation guide.

2.2 An Overview of Key Differences Between the Former Rule and the Updated Rule

The essential difference between the two rules is that the updated Rule expands the concept of “work zone traffic control” to “work zone transportation management.” It consists of requirements and guidance that address mobility as well as safety. It provides for the systematic consideration of work zone impacts of road projects, and the development of appropriate TMPs that help manage those impacts during implementation. The focus of the former Rule was on the development of Traffic Control Plans (TCPs) for road projects, and providing for the safety of motorists and workers. The updated Rule emphasizes the importance of safety but also adds a focus on providing for mobility, and takes into account current issues like transportation operations and public information.

The key differences between the former Rule and the updated Rule are briefly summarized below.

2.2.1 Key Differences in Policy-Level Provisions

- **Former Rule.** The former Rule did not specifically require a work zone policy. It required each State DOT to develop and implement procedures consonant with the requirements of the regulation.
- **Updated Rule.** The updated Rule requires each agency to implement a work zone policy and emphasizes that the policy facilitate the systematic consideration and management of work zone impacts throughout the various stages of project development and construction.

2.2.2 Key Differences in Process-Level Provisions

The structure of the former Rule did not distinctly separate process-level provisions from project-level provisions. The updated Rule has separate process-level and project-level provisions, which help clearly delineate the provisions and facilitate systematic application at both the process and project-levels. Expanding beyond the former focus on individual projects should increase the coordination among projects, and consistency of application across projects, to more broadly assess and address work zone impacts on a system-wide basis.

Some of the key differences are:

- Work Zone Assessment and Management Procedures.
 - **Former Rule.** The former Rule did not have such a provision.
 - **Updated Rule.** The updated Rule consists of a provision that recommends that agencies develop and implement systematic procedures to assess and manage the work zone impacts of projects.
- Work Zone Data.
 - **Former Rule.** The former Rule required construction zone crashes and crash data to be analyzed to continually correct deficiencies which are found to exist on individual projects, and to improve the content of future traffic control plans.
 - **Updated Rule.** The updated Rule requires agencies to use available work zone information and data to manage work zone impacts for specific projects during implementation. It expands work zone data to include mobility/operational data in addition to safety/crash data. It also requires agencies to pursue ongoing improvement of their work zone processes and procedures by analyzing work zone crash and operational data from multiple projects.

- Work Zone Training.
 - **Former Rule.** The former Rule had a training requirement that specified that all persons responsible for the development, design, implementation, and inspection of traffic control shall be adequately trained.
 - **Updated Rule.** The updated Rule also has a training provision similar to that of the former Rule, but the scope of the training is expanded to include work zone transportation management in addition to work zone traffic control. It also eliminates the ambiguity that existed in the old language by clearly stating the responsibility of agencies, and also by incorporating a provision to indicate that the training ought to be appropriate to the job-decisions that each individual is required to make.
- Process Reviews.
 - **Former Rule.** The former Rule had a requirement for States to conduct an annual process review of selected projects for the purpose of assessing the effectiveness of its procedures. It also required the results of the review to be forwarded to the FHWA Division Administrator for review and approval of the State’s annual traffic safety effort.
 - **Updated Rule.** The updated Rule also requires agencies to conduct process reviews, but the requirement has been changed from annual reviews to bi-annual reviews. The Rule states that the ultimate objective of the process reviews is to enhance efforts to address safety and mobility on current and future projects. It does not require that the results of the review be forwarded to the FHWA Division Administrator for approval, but does encourage the DOT to include FHWA in the review.

2.2.3 Key Differences in Project-Level Provisions

The essential difference between the two rules at the project-level is that the updated Rule requires TMPs for projects, while the former Rule requires TCPs. The updated Rule recognizes current and future work zone safety and mobility needs, and expands the notion of “work zone traffic safety and control” to “work zone transportation management.” Some of the specific differences are:

- Traffic Control Plan (TCP) vs. Transportation Management Plan (TMP).
 - **Former Rule.** The former Rule required the development of TCPs for projects. A TCP is a plan for handling traffic through a specific highway or street work zone or project. It recognized that TCPs may vary in scope from a very detailed TCP designed solely for a project, to a reference to standard plans, a section of the MUTCD, or a standard highway agency manual; and that the degree of detail in the TCP would depend on the project complexity and traffic interference with construction activity.
 - **Updated Rule.** The updated Rule requires TMPs to be developed and implemented for projects based upon the expected work zone impacts.
 - » A TMP consists of strategies to manage the work zone impacts of a project. The possible components that constitute a TMP are: the Temporary Traffic Control (TTC) plan, the Transportation Operations (TO) component, and the Public Information (PI) component.

- » The distinguishing factor in the TMP requirements for different projects is based on whether a project is a significant project or not. Simply stated, a significant project is a project that the agency expects will cause a relatively high level of disruption. The Rule provides a more detailed definition of significant project, and specifically includes certain projects on the Interstate system. Agencies are required to identify future projects that are expected to be significant, so that they may develop appropriate TMPs.
- » TMPs for significant projects consist of all the three TMP components, namely the TTC plan, the TO component, and the PI component. TMPs for projects determined to have less than significant work zone impacts may consist of only a TTC plan; however, agencies are encouraged to consider including TO and PI components, depending on the impacts of the project.
- Responsible Person.
 - **Former Rule.** The former Rule required States to designate a qualified person at the project-level who would have primary responsibility and sufficient authority for assuring that the TCP and other safety aspects of the contract are effectively administered.
 - **Updated Rule.** The updated Rule requires the agency and the contractor to both designate a trained person (as specified in the Rule) at the project-level to implement the TMP and other safety and mobility aspects of the project.
- Pay Items.
 - **Former Rule.** The former Rule suggested that the PS&Es consist of unit pay items for implementing all aspects of the work zone traffic control, as required in the TCP. It also suggested that lump-sum payment be used only to cover very small projects, projects of short duration, contingency, and general items. It discouraged paying for traffic control as incidental to other items of work.
 - **Updated Rule.** The updated Rule allows for both method-based and performance-based specifications. It provides individual pay items, lump sum payment, or a combination of the two as options for method-based specifications. For performance-based specifications, it provides examples of criteria that may be used.

2.3 Applying the Updated Rule to the Project Delivery Process

The process of applying the updated Rule to the project delivery process starts with policy and process implementation, and progresses through the different stages of project delivery, to include: systems planning; preliminary engineering and investigation; design, PS&E, and contracting; construction; performance assessment; and operations and maintenance. The following steps may be considered as a framework for applying the provisions of the updated Rule to the project-delivery process:

1. Establish and implement overall work zone safety and mobility policy.
2. Develop and implement State/local agency-level processes and procedures.
3. During systems planning (Transportation Improvement Program (TIP)/Statewide Transportation Improvement Program (STIP)), anticipate the potential work zone impacts of projects at a conceptual level.
4. During preliminary engineering, conduct a preliminary identification of work zone impacts at the individual project-level.
5. During design, conduct a more detailed design-level assessment of the work zone impacts of individual projects and develop appropriate TMPs.
6. During construction, implement TMP and monitor and manage work zone impacts.
7. During and/or after construction, conduct process reviews.
8. After construction, conduct post-construction performance assessment.

Existing agency program delivery efforts will support implementation of the provisions. For example, alternatives analysis and impact mitigation done as part of the NEPA process support the work zone impacts assessment encouraged by the Rule. The above steps are graphically illustrated in Appendix B – Applying the Rule to the Project Delivery Process. Agencies are encouraged to work in coordination with FHWA, as appropriate, in implementing the provisions.

2.4 Assistance with Implementation of the Updated Rule

FHWA will coordinate with their respective States to implement the provisions of the updated Rule. They will provide guidance on implementing an overall work zone safety and mobility policy, establishing State-level processes and procedures, and in applying the provisions to specific projects.

The FHWA will also provide technical assistance on specific aspects, such as the use of Intelligent Transportation Systems (ITS) in work zones or developing suitable public information plans for projects.

The following are the specific responsibilities of the FHWA:

- **Policy-Level.** FHWA staff will coordinate with the agency in implementing an overall work zone policy that best suits the needs of the agency.
- **Process-Level.** FHWA staff will coordinate with the agency in developing the agency's work zone processes and procedures, implementing them, and in conducting process reviews.
- **Project-Level.** FHWA staff will work with the agency to identify significant projects. They will also work with the agency to review exception requests for the significant projects requirement, as applicable to Interstate System projects. FHWA staff will work with the agency (as requested by the agency) to assist the agency in its efforts to assess and manage work zone impacts of specific projects, and develop and implement suitable TMPs that help manage these impacts.
- **Rule Implementation and Compliance.** FHWA staff will work in partnership with the agency to implement the agency's work zone policies and procedures. The FHWA will review the agency's policies and procedures to assess conformance and compatibility with the requirements of this updated Rule; and also help reassess the agency's implementation of its procedures at appropriate intervals. The FHWA will also work with the agencies to address the incorporation of this Rule into their stewardship agreements.

Further, to supplement this overall Implementation Guidance document, FHWA has developed a suite of companion guidance documents that provide more detail on the following related topics:

- **Work Zone Impacts Assessment.** Guidance on developing procedures to assess work zone impacts of projects.
- **Work Zone Transportation Management Plans (TMPs).** Guidance on developing TMPs for managing work zone impacts of projects.
- **Work Zone Public Information and Outreach Strategies.** Guidance on the development of communications strategies that seek to inform affected audiences about construction projects, the expected work zone impacts, and the changing conditions on projects.

A quick overview of these guidance documents is provided in Appendix C of this implementation guide. Additional resources to support Rule implementation are described in Section 7.0 of this document.

3.0 Developing and Implementing a Work Zone Policy

Addressing work zone safety and mobility at the policy level and applying the policy at the various stages of program delivery will facilitate streamlined decision-making and consistency. Policies can help standardize work zone practices and serve as a guide for planning, designing, and constructing road projects. In addition, a policy-based approach to work zone safety and mobility facilitates buy-in and support from management.

The updated Rule (the Rule) promotes the consideration and management of work zone safety and mobility through three main elements – the policy, process, and project elements. The policy element requires State Departments of Transportation (DOTs) and local transportation agencies¹ to implement a policy for the systematic consideration and management of work zone impacts. Many agencies have pre-existing work zone policies. The policy provision in the Rule is intended to help agencies update and/or enhance their existing policies to incorporate the concepts and principles advocated by the Rule. This Section provides general guidance on developing and implementing an overall work zone policy.

3.1 Related Provisions in the Rule

The policy provision is provided in Section 630.1006 “Work Zone Safety and Mobility Policy” of the Rule. This provision:

- Requires agencies to implement a policy for the systematic consideration and management of work zone impacts on all Federal-aid highway projects.
- Requires the policy to address work zone impacts throughout the various stages of the project development and construction. This facilitates consideration of work zone impacts during project development, management of work zone impacts during construction, and assessment of work zone performance after implementation.
- Allows for flexibility in the form the policy may take, including processes, procedures, or guidance. Some agencies may use policy requirements whereas others may prefer policy guidance.
- Recognizes that the policy may vary based on the characteristics and expected work zone impacts of individual projects or classes of projects, as they have different work zone management needs. For example, routine roadside maintenance work may not require the same level of work zone impacts considerations as that for a major bridge project.
- Recommends that agencies institute this policy using a multi-disciplinary team and in coordination with the Federal Highway Administration (FHWA).
- Encourages agencies to implement the policy for non-Federal-aid projects and programs (e.g., work done as part of road maintenance programs) as well. This reflects the Rule’s overall goal to improve safety and mobility for all work zones.

¹ Hereinafter referred to as agencies.

3.2 Key Components of a Work Zone Policy

Many agencies have existing work zone policies. These policies should be reviewed and updated as needed. In the absence of a pre-existing policy, a new work zone policy will need to be developed and implemented. This Section provides a discussion on the possible components that agencies may consider when developing or revising their work zone safety and mobility policy. Key components for consideration in a work zone safety and mobility policy are:

- Vision.
- Goals and objectives.
- Specific policy provisions for application during project delivery.

3.2.1 Vision

This is an overall policy statement that supports the systematic consideration and management of work zone safety and mobility impacts on road projects, and lays out the agency's vision for providing safe and efficient travel for road users, worker safety, and quality of construction. Many agencies have an overall policy or vision statement that reflects their commitment to managing the safety and mobility impacts of work zones.



The New York State DOT (NYSDOT) objectives for managing traffic during highway construction are to:

- Provide a high level of safety for workers and the public.
- Minimize congestion and community impacts by maintaining levels of service at close 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.

Source: New York State Department of Transportation (NYSDOT), ENGINEERING INSTRUCTION EI – 96-027, Nighttime Construction, Issued - 04/25/96, URL: <http://www.dot.state.ny.us/cmb/consult/eib/files/ei96027.pdf> (Accessed 8/16/05)



The Maryland State Highway Administration's (MD SHA's) Business Plan Goal for Work Zone Traffic Control states the following vision: "To maintain optimum worker safety and have traffic traveling smoothly and safely through work areas at all times."

Source: http://www.sha.state.md.us/safety/oots/trafficsignalsandlaws/otr_workzone.asp (Accessed 7/12/05)

3.2.2 Goals and Objectives

Strategic goals and performance objectives help agencies attain their work zone safety and mobility vision. Performance objectives can serve as the basis for developing and implementing actions designed to meet the goal(s) in a specified timeframe.

Some examples of potential work zone goals and objectives include:

- **Goal:** Reduce work zone induced delays by 15% within the next 5 years.
Objective: Implement a comprehensive public information program to advise the public of upcoming projects, planned lane closures, and alternate routes.
- **Goal:** Reduce work zone related crashes by 25% within the next 5 years.
Objective: Reduce secondary crashes by improving work zone traffic incident management. Implement work zone traffic incident management plans for all road projects in urbanized areas with heavy congestion for the next Statewide Transportation Improvement Program (STIP) implementation cycle.
- **Goal:** Improve work zone procedures over time by using knowledge and observations gained from past work zones.
Objective: Conduct field evaluations for 50% of all work zones in the State, at least once during the construction phase of each project over the next 5 years.



The Texas DOT (TxDOT) adopted the following goal for its accelerated construction program: “Improve project delivery from project conception to ribbon cutting, on average, by 15 percent within 5 years.” In order to achieve this acceleration goal, designers must perform a thorough analysis of the time needed for construction and use contracting strategies that emphasize timely completion. Acceleration provisions will be required on all projects that disrupt traffic.

Source: Texas DOT (TxDOT) Accelerated Construction Strategies Guidelines,
URL: http://www.dot.state.tx.us/cst/construction_strategies.htm (Accessed 7/12/05)

3.2.3 Specific Policy Provisions

Many agencies have policy provisions that address specific aspects of decision-making during project delivery. Specific policy provisions help implement and sustain the overall work zone policy and may consist of processes, procedures, criteria, or guidance for work zone related decision-making. Agencies may choose to develop and implement policy provisions in the form of mandated requirements and/or in the form of policy guidance, as appropriate to their individual operating environments.

The following describes some of the issues that may be addressed in the development and implementation of specific work zone policy provisions.

Classification of Projects Based on Expected Work Zone Impacts

A project classification system separates road projects into different types based on the severity of expected work zone impacts. Such classification enables agencies to apply policies and practices that are best suited to each type of project. Some of the parameters that affect work zone impacts of projects include:

- Roadway functional classification – e.g., Interstate, expressway, principal arterial, major arterial, minor arterial, collector.
- Area type – e.g., urban, suburban, rural.
- Traffic demand and travel characteristics – e.g., lanes affected, average daily traffic (ADT), expected capacity reduction, level of service (LOS).
- Type of work – e.g., new construction, reconstruction, rehabilitation, maintenance, bridge work, equipment installation/repair.

- Complexity of work – e.g., duration, length, intensity.
- Climate of the region.
- Level of traffic interference with construction activity.
- Potential impacts on local network and businesses.

Project classifications can range from a simple scheme (e.g., high, medium, and low-impact projects) to a multidimensional matrix of projects that recommends appropriate work zone management strategies for the various types of projects. Classification systems will vary based on an agency's needs. In general, a simple classification system that is practical and easy to adopt and apply is recommended. Project classification can be helpful for identifying significant projects, which is discussed in Section 5.3 of this document.



The British Columbia Ministry of Transportation classifies projects according to five categories. The guidelines contain specific requirements, standards, and step-by-step procedures for transportation management plans. This classification scheme allows “staff to quickly and consistently identify minimum traffic management plan requirements.”

Source: British Columbia Ministry of Transportation, Traffic Management Guidelines for Work on Roadways, September 2001, URL: http://www.th.gov.bc.ca/publications/eng_publications/geomt/traffic_mgmt_guidelines.pdf (Accessed 07/12/05)

Agencies may use a project classification scheme to provide guidance on transportation management strategies that best suit specific types of projects.



The California DOT (Caltrans) uses three categories of transportation management plans (TMPs) based on the expected work zone impacts of projects.

- The first category is a “**Blanket TMP**.” This applies to projects where work is done on low volume roads during off peak hours and no delays are expected. It also applies for moving lane closures. Typical TMP strategies for such projects include portable Changeable Message Signs (CMS), freeway service patrols (FSP), travel management techniques (TMT), and work during off-peak hours.
- The second category is a “**Minor TMP**.” The majority of Caltrans road projects fall under this category. Generally such projects cause minimal impacts. Lane closure charts and some mitigation measures are required. Typical TMP strategies for such projects include, night work, portable and fixed CMS, construction zone enhanced enforcement program (COZEEP), TMT, highway advisory radio (HAR), FSP, gawk screens, etc.
- The third category is a “**Major TMP**.” About 5% of Caltrans road projects fall under this category. Generally such projects cause significant work zone impacts, and may require multiple TMP strategies and multiple contracts. Typical TMP strategies for such projects include, public awareness campaigns, fixed CMS, extended closures, moveable barriers, COZEEP, detours, reduced lane widths, web site, helicopter traffic reports, etc.

Source: Transportation Management Plans Effectiveness Study, Robert Copp, Caltrans, TRB 2004 Annual Meeting, Session 526: Work Zone Impacts – A New Frontier.

Work Zone Performance Standards/Requirements

Performance standards establish safety and mobility performance requirements for work zones. They may be used in project planning and design to identify work zone transportation management strategies that help achieve the desired performance. Further, performance standards facilitate consistent thinking across project development stages and help minimize design alterations and change orders during construction.

Performance standards can be implemented as specific performance objectives that address work zone safety, mobility, and constructability. For example, maintaining the crash rate during construction at the same level or lower than what existed prior to construction can be used as a safety performance objective. An example of a mobility performance objective is to maintain a specific average travel time through a work zone over a certain time-period.



The Indiana DOT (INDOT) uses a lane closure policy for Interstate highways. The policy specifies times that lane(s) may be closed. If an operation will restrict or extend lane closures outside of the allowable times, the designer/planner must complete a quantitative analysis of work zone impacts, and develop a traffic management plan with the request for an exception. The criteria used to assess the work zone impacts is queue length. QuickZone, Quewz, Synchro, CORSIM, or other computer programs may be used to estimate the queues. For queues less than 1.0 mile, impacts are acceptable. For queues greater than 1.0 mile and less than 1.5 miles, impacts are acceptable if the queue exceeds 1.0 miles for two hours or less. Queues longer than 1.0 mile for more than two hours, and queues longer than 1.5 miles for any period of time, are considered unacceptable work zone impacts.

Source: Indiana Department of Transportation, Interstate Highways Lane-Closure Policy, July 2003, URL: <http://www.state.in.us/dot/div/contracts/standards/memos/0308-pc.pdf> (Accessed 07/12/05)

Performance standards can also be implemented indirectly through work zone management requirements for specific project types. For example, a traffic management policy may drive decision-making on lane-closures (e.g., whether lanes may be closed, when they may be closed, how many lanes may be closed), delay and queue thresholds, and work hour restrictions.



The Florida Department of Transportation (FDOT) employs a Lane Closure Policy for road projects on Interstate highways. The policy is that the work zone design plans maintain the existing number of lanes for the various work phases. No lane closures will be permitted on Interstate construction where only two travel lanes normally exist. In all cases, traffic volumes will be analyzed to determine if any lane closures can be permitted for short durations. The use of this policy resulted in reduced driver delay and frustration and better public relations.

Source: FHWA Work Zone Best Practices Guidebook, <http://ops.fhwa.dot.gov/wz/practices/best/Default.htm> (Accessed 07/12/05)

Policy Guidance and Agency Processes and Procedures

Policy guidance and agency processes and procedures help institutionalize, streamline, and standardize work zone safety and mobility practices. Policy guidance and agency processes and procedures may either be incorporated in the agency's policy, or be considered as an extension of the policy. Agency-level guidance, processes, and procedures for addressing work zone issues could streamline decision-making, make project delivery more efficient and effective, and ultimately result in better work zones. The following are examples of topics that can be addressed in such guidance, policies, and procedures:

- Overall policy issues [e.g., establishing a committee to discuss and coordinate agency work zone activities; developing memoranda of understanding (MOUs) with utility operators to coordinate schedules; acceptable levels of work zone performance such as queue thresholds].
- Work zone options (e.g., night work, full-closure, detours).
- System planning strategies (e.g., grouping and sequencing of projects in a corridor; including the costs for work zone management strategies in plans).
- Design strategies (e.g., traffic control, choice of materials, use of positive separation, temporary structures).
- Contracting strategies (e.g., low bid, design-build, lane rental, A+B bidding, incentive/disincentive contracting).
- Work zone management strategies (e.g., use of intelligent transportation systems, traveler information, real-time work zone monitoring, traffic incident management, enforcement).
- Agency use of work zone reviews, process reviews, or safety inspections/audits.
- Strategy for use and collection of work zone data.
- Criteria for identifying significant projects.
- Exception criteria and procedures for significant projects.
- Procedures for determining transportation management plan (TMP) needs for projects.

A potential application of policy guidance is for the identification of significant projects. Agencies may develop and implement specific criteria to guide their staff in identifying significant projects. More information related to significant projects, including possible criteria, is provided in Section 5.0 of this document



For example, the California Department of Transportation (Caltrans) provides policy guidance on determining significant traffic impact. As per the guidance, "significant traffic impact is 30 minutes above normal recurring traffic delay on the existing facility or the delay threshold set by the District Traffic Manager (DTM), whichever is less."

Source: California Department of Transportation (Caltrans), Transportation Management Plan Guidelines, July 1, 2001. Also available in the Caltrans Deputy Directive DD-60, Transportation Management Plans, June 2000, URL: <http://www.valleyair.org/Workshops/postings/3-25-2002/caltrans/dd-60.pdf> (Accessed 08/16/05)

Agency-level processes and procedures for work zone assessment and management; use of work zone data; work zone related training; and conducting process reviews are specifically addressed in the Rule. These are described in Section 4.0 of this document. An agency may choose to address these elements in its policy.

3.3 Additional Policy Components

The following components may also be helpful to include in the work zone policy.

- **Definitions and Explanation of Terms.** Agencies may find it helpful to provide definitions and appropriate explanations for the key terms used in their policies. Many agencies have definitions in place for the different terms that they use in their work zone policies.
- **Stakeholder and Team Information.** The Rule encourages agencies to develop their policies using a multi-disciplinary team, and in partnership with the FHWA. The policy team may comprise agency staff, FHWA representative(s), and other regional stakeholder representatives as appropriate. It may be useful to provide information on the stakeholders that are responsible for development, implementation, and update of the policy and their respective contact information and role on the team/area of expertise.
- **Roles and Responsibilities.** Roles and responsibilities are generally specific to the policy functions that individual entities are responsible for. For example, an agency's policy may state that the traffic engineering division in the central office is responsible for providing training to staff responsible for planning, designing, and constructing road projects. Describing clear lines of communication and authority are helpful. Information on who is responsible for what aspects of the policy could be useful for project planners, designers, and construction personnel during project development and implementation. Roles and responsibilities can be identified for agency staff (i.e., headquarters, divisions/districts, planning, design, and construction), and other applicable non-agency staff including FHWA, consultant/contractor, and other agency staff.



The Ohio Department of Transportation (ODOT) work zone traffic management policy lays out specific policy responsibilities for the district work zone traffic manager, county managers, multi-lane coordinator, office of traffic engineering, and the maintenance of traffic exception committee.

Source: Ohio Department of Transportation (ODOT) policy on Traffic Management in Work Zones Interstate and Other Freeways, Policy No.: 516-003(P), July 18, 2000, URL: <http://www.dot.state.oh.us/Policy/516-003p.pdf> (Accessed 09/08/05)

- **Contact Person(s).** This includes contact information for the primary person(s) / position(s) responsible for maintenance and upkeep of the agency's work zone policy. Generally such responsibility is limited to agency personnel.
- **Policy Exemption Criteria and Process.** Not all projects and circumstances will lend themselves to direct application of the agency's policy. In order to accommodate such situations, the agency may establish a policy exemption process supported by appropriate criteria for decision-making.



ODOT's policy contains a Permitted Lane Closure Map (PLCM) that lays out a schedule of times lanes can be closed on interstates and other freeways. Any project that will violate the PLCM lane closure times requires the ODOT district to perform an analysis of the project's impact on traffic. If the analysis shows that expected queues violate the allowable queue thresholds of the policy the district must submit an exception request to the Maintenance of Traffic Exception Committee (MOTEC). Submitted with the exception request is a comparison of alternative work zone strategies, including costs, schedule, and estimated traffic queues for each alternative. The MOTEC will accept or deny the recommendations and can require further alternative recommendations or analysis from project personnel. The goal of the MOT policy and MOTEC review is to encourage project personnel and contractors to think creatively when considering and mitigating the impacts of work zones on congestion.

Source: FHWA Work Zone Best Practices Fact Sheet 8: Ohio Keeps Motorists and Road Rehabilitation Moving Forward (FHWA-OP-03-190) (2003). Also available in Ohio Department of Transportation (ODOT) policy on Traffic Management in Work Zones Interstate and Other Freeways, Policy No.: 516-003(P), July 18, 2000. Available online in the Policy section of ODOT's web site. URL: <http://www.dot.state.oh.us/Policy/516-003p.pdf> (Accessed 09/08/05)

3.4 Who Develops and Implements the Policy?

Development and implementation of the work zone policy is generally a function of internal agency management. In some cases, agencies may decide to work together. For example, the DOTs for several neighboring states might choose to hold a joint workshop to develop a basic policy that they can each then tailor as needed for their respective State. The Rule recommends that the policy be instituted using a multi-disciplinary team and in partnership with the FHWA. The following provides some general guidance on who might participate in the various aspects of the process:

- **Primary Responsibility for Policy Development and Implementation.** Management-level agency staff from both executive and technical areas should be the primary developers and implementers of the policy. They may be assisted by other technical staff, specialists, and field staff representing the agency's primary work zone functions including, planning, engineering/design, construction, maintenance, operations, and public information.
- **Multi-disciplinary Approach.** The composition of the multi-disciplinary team will vary from agency to agency. The core team should consist of agency staff representing the primary agency functions mentioned above. Primary external team members to consider include FHWA, law enforcement, the contracting industry, and regional associations. It may be helpful to include team members from other external partners, such as transit providers and other transportation agencies, local jurisdictions, fire and emergency medical services, regional transportation management centers, community and business representatives, other industry associations, and media agencies, as appropriate. Such a multidisciplinary team may also serve as a standing committee of experts on work zones, and may help make decisions during the appropriate stages of program delivery on how best to design and build projects, and manage the impacts of work zones.



For example, the Maryland State Highway Administration (MD SHA), in keeping with their stated vision, instituted a Temporary Traffic Control Safety and Mobility Council, consisting of members from various SHA offices, Maryland State Police, FHWA, industry, and consulting engineering firms.

Source: http://www.sha.state.md.us/safety/oots/trafficsignalsandlaws/otr_workzone.asp
(Accessed 7/12/05)

- **Ongoing Feedback.** Over time there will likely be a need for the agency to update its policy as situations change, knowledge is gained, and new trends and issues are identified. Feedback and information from personnel representing the different areas within the agency will serve as input for policy updates. This does not necessarily imply that all the staff come together at a common forum to provide the input; rather, their inputs are accounted for as part of ongoing program delivery. Agency personnel should be aware of the person or office in the agency that should receive the input and will make the updates.

3.5 Policy Development and Implementation Process

The policy development and implementation process is illustrated in Figure 3.1.

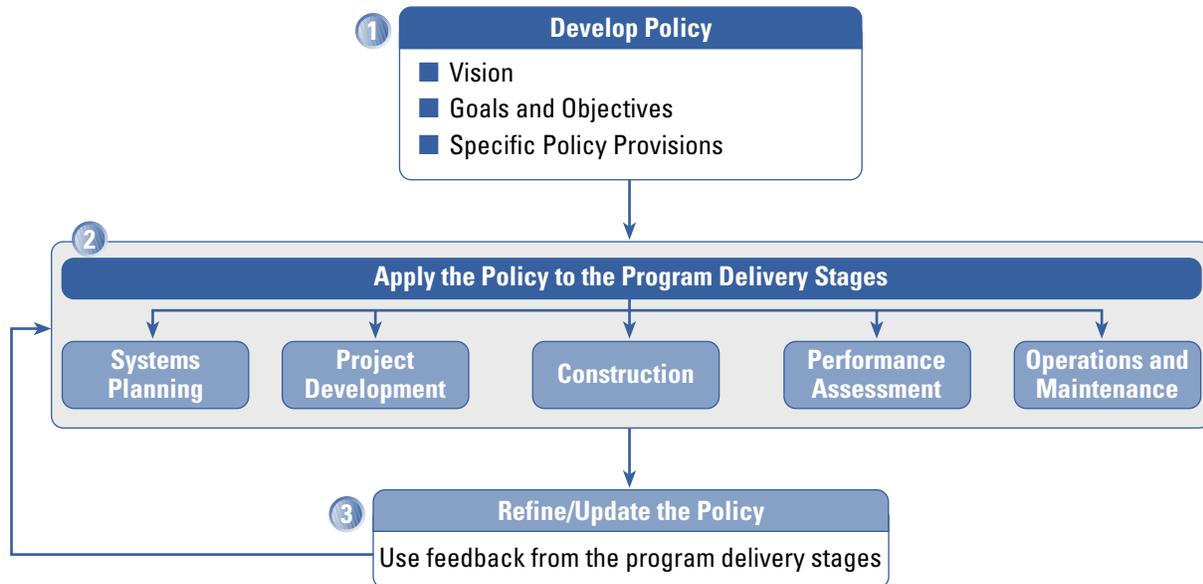


Figure 3.1 Policy Development and Implementation Process

The steps shown in Figure 3.1 are briefly described below.

Step 1: Develop Policy

The objective of this step is to develop the agency’s work zone policy. Suggested components of the policy were discussed in Section 3.2.

The following are the considerations for policy development:

- **Multi-disciplinary team.** The Rule encourages agencies to develop their policies using a multi-disciplinary team. Many agencies have pre-existing teams to address work zone policy. In the absence of such a team, the agency may institute a team as discussed in Section 3.4.
- **Pre-existing work zone policy.** Many agencies have pre-existing work zone policies and may not need to develop an entirely new policy. They should review their pre-existing work zone policy(s) and revise and update them as needed to incorporate the new principles and concepts advocated by the Rule, to reflect changing industry/ agency practices, or to incorporate technological advances. For example, an agency may incorporate criteria, processes, and procedures for identifying significant projects and for developing TMPs, both of which are new requirements in the Rule. The following should be identified before revising and updating the policy:
 - Existing vision, goals, and specific policy provisions;
 - Additional work zone safety and mobility issues the agency is considering; and
 - Other agency-level priorities and focus issues that drive the implementation of work zone policy provisions.

In the absence of a pre-existing policy, a new work zone policy needs to be developed.

Step 2: Apply the Policy to the Program Delivery Stages

This step represents the ongoing application of the overall policy and the policy provisions to the program delivery stages (i.e., systems planning, project development, construction, performance assessment, and operations and maintenance).

This may be accomplished by:

- Assigning specific policy implementation roles and responsibilities to different departments and personnel/positions within the agency.
- Educating the agency staff from the different departments and divisions on the overall policy and the policy provisions.
- Educating other applicable regional stakeholders, contractors and consultants, the media, community and business representatives, and industry trade associations regarding the agency's policies and policy provisions.
- Including the policy provisions in agency manuals, standard procedures and practices, standard drawings, and specification manuals and documents that apply to the different stages of program delivery;
- Providing training and/or certification for agency staff responsible for planning, designing, implementing, and evaluating road projects.
- Providing training and/or certification for contractors and consultants who partner with the agency in planning, designing, constructing, and evaluating road projects.



The Ohio DOT (ODOT) provides training for implementing its work zone policy provisions. The training addresses application of their work zone policy, the use of QUEWZ modeling software, and work zone traffic control and inspection requirements. The work zone training class is one of the many required classes for ODOT highway workers, project inspectors, etc. Consultants are also required to attend the work zone design training class as part of their prequalification. As part of this training, testing and certification are also required for both ODOT and consultant staff.

Source: Ohio Department of Transportation (ODOT) policy on Traffic Management in Work Zones Interstate and Other Freeways, Policy No.: 516-003(P), July 18, 2000. Available online in the Policy section of ODOT's web site. URL: <http://www.dot.state.oh.us/Policy/516-003p.pdf> (Accessed 09/08/05).

Step 3: Refine/Update the Policy

The final step in the policy implementation process entails using feedback from the different stages of program delivery to improve and refine the policy over time. The purpose is to improve work zone programs, processes, and practices, leading to effective management of work zone safety and mobility. Input and feedback may also be obtained from stakeholders, public and community outreach processes, contracting community, industry trade associations, and others.

Some considerations in refining or updating the policy include:

- Determining whether the policy and policy provisions serve the purpose of increasing safety, and minimizing the mobility impacts of work zones;
- Determining whether the policy and policy provisions are relevant, practical, and easy to use for decision-making in real-world situations;
- Determining whether the goals, objectives, and performance requirements of the agency are being attained through the policy;
- Determining whether the policy and the policy provisions need to be updated or refined to reflect changing times, changing industry practices, or advances in technology;
- Capturing specific feedback from any of the program delivery areas that recommend refinement of the policy; and
- Capturing specific feedback from non-agency stakeholders, the public, business and community representatives, the contracting community, and industry trade associations or others that recommend refinement of the policy.

For example, a designer may observe that the agency is increasingly using work zone traffic incident management systems for road projects in urbanized areas with heavy congestion. The project-level decision to use them may be arrived at after extensive deliberation and debate, even though most projects for which traffic incident management is used as a management strategy exhibit some common characteristics and operating circumstances. This designer may suggest to management that the agency develop policy guidelines for the project situations that warrant work zone traffic incident management systems. The guidelines could end up being implemented through a revision to the agency's work zone policy.

4.0 Implementing Agency-Level Processes and Procedures

The updated Rule (the Rule) advocates a systematic approach for managing work zone safety and mobility, and has three main elements – the policy, process, and project elements. While the policy element of the Rule helps State and local transportation agencies¹ implement an overall work zone safety and mobility policy, the process element consists of agency-level processes and procedures that help agencies apply and sustain their respective work zone policies. Agency processes and procedures help institutionalize, streamline, and standardize work zone safety and mobility practices that support decision-making during the different stages of program and project delivery.

The Rule specifically addresses agency processes and procedures for:

- Work zone assessment and management.
- Use of work zone data.
- Work zone related training.
- Conducting process reviews.

Many agencies already have some work zone processes and procedures in-place. The provisions in the Rule are intended to help agencies update and enhance their existing processes and procedures to incorporate the new concepts and principles advocated by the Rule. For example, developing transportation management plans (TMPs) for road projects is a new requirement that some agencies may not be familiar with. Therefore, their work zone management processes and procedures may need to be expanded to address TMP development and incorporate the consideration of all the TMP components, including transportation operations (TO) and public information (PI) strategies, in their plans and programs (Section 6.0 contains information on TMPs.). Agencies may choose to incorporate the processes and procedures in their overall work zone safety and mobility policy or consider them as an extension of the policy.

The following sections provide an overview and general guidance on implementing agency processes and procedures.

4.1 Work Zone Assessment and Management Procedures

4.1.1 Related Provisions in the Rule

The provision that addresses procedures for work zone assessment and management is provided in Section 630.1008(b) of the Rule.

This provision:

- Encourages agencies to develop and implement procedures to assess work zone impacts in project development, and to manage safety and mobility during project implementation.
- Requires that the scope of the work zone assessment and management procedures be based on the characteristics of projects or project-classes. This aspect of the provision is intended to account for the variation that exists in project types, characteristics, and complexity.

¹ Hereinafter referred to as agencies.

4.1.2 Why Work Zone Assessment and Management Procedures?

The Rule brings about a new focus and new requirements to address work zone safety and mobility impacts. An important aspect of the Rule is that it advocates **(1)** the comprehensive and systematic consideration of the broader safety and mobility impacts of work zones through a project's life cycle; and **(2)** the development and implementation of appropriate management strategies that help manage these impacts. Agency work zone assessment and management procedures are intended to guide these efforts.

Work zone assessment and management procedures can provide a framework within existing project development processes to help agencies:

- Identify and understand the work zone safety and mobility impacts of road projects, starting at the policy level, through systems planning, and project development.
- Understand the work zone safety and mobility implications of alternative project options and design strategies.
- Identify significant projects (discussed in Section 5) and better allocate work zone management resources to those projects likely to have greater work zone impacts.
- Identify transportation management strategies to manage the expected work zone impacts of a project.
- Estimate costs and allocate appropriate resources for the implementation of the work zone management strategies.
- Implement the strategies and monitor and manage work zone impacts during construction, maintenance, or utility work, and adjust the TMP if needed.
- Conduct post-construction work zone performance assessment for assessing the performance of work zones and to improve work zone policies, practices, and procedures.

The information provided here and in the other guidance documents is intended to assist agencies in developing and implementing their own procedures that best suit their needs.

4.1.3 Considerations for Implementing Work Zone Assessment and Management Procedures

Many agencies have some existing guidance and procedures for work zone impacts assessment and management. As agencies review these existing procedures, they may identify the need to revise and update them to incorporate the new concepts advocated by the Rule and support effective work zone impacts assessment and management throughout project development and delivery. For example, many agencies use standard traffic control plan (TCP) sheets that suit certain types of projects. The standard TCP sheets are generally developed over time using engineering judgment and analyses to determine the best traffic safety and control strategies for specific types of projects. The work zone assessments used to develop the standard TCP sheets may need to be revisited to determine whether to expand these assessments to consider operational and public information strategies.



The Massachusetts Highway Department (MassHighway) employs a Twelve-Minute Delay Rule for work zone delay. The Department identified the need for a design practice to help identify ways to reduce congestion through work zones. Analyses are performed during design based on volume and reduced capacity due to the work zone. If the expected delay approaches or exceeds 12 minutes, other design alternatives or work hours are considered. This analysis helps with understanding congestion issues and assessing options for construction staging and allowable work hours. This practice applies to all types of facilities, locations, and work. As a result of this practice, work zone queuing can be reduced and extra work orders for adjusting staged construction can be eliminated.

Source: FHWA Work Zone Best Practices Guidebook, <http://ops.fhwa.dot.gov/wz/practices/best/Default.htm> (Accessed 8/16/05)

Similarly, many agencies are increasingly using work zone traffic incident management (TIM) systems to minimize traffic incident related delays during construction. Over time, information may become available on specific project characteristics that trigger the consideration of a work zone TIM system. This information may then be used to develop procedures to determine the need for such systems during project planning and development. For example, road projects in heavily congested urban areas that experience a high level of traffic incidents are good candidates for deploying work zone TIM systems. Available performance measures that are already in use (e.g., traffic volume, travel time, delay, queue lengths, Level of Service (LOS)) and associated criteria may be included in work zone assessment and management procedures.

Examples of work zone impacts assessment and management procedures include:

- **Procedures for work zone impacts assessment with varying rigor and intensity of assessment based upon the expected impacts of projects.** For example, a large complex project may warrant several levels of work zone impacts assessment using quantitative tools, whereas for a less complex project it may be sufficient to qualitatively assess the potential work zone impacts.
- **Procedures and criteria for identifying and categorizing significant projects.** For example, more qualitative criteria may be used during systems planning to identify significant projects. Examples of this type of criteria include type of work, expected project duration, project length, location – urban or rural, congestion and crash experience at project location, and whether project is expected to be regionally significant.
- **Procedures and project criteria that trigger the consideration of certain types of project options and management strategies.** For example, agencies may develop a routine to determine whether or not night work is suitable for projects or whether a total road-closure may be considered.



The Texas Department of Transportation (TxDOT) employs many accelerated construction strategies including incentive/disincentive contracting, lane rental, and A+B provisions. The TxDOT Accelerated Construction Strategies Guideline provides information on the project types that best suit the different strategies; and standard specifications, issues, and procedures to be considered for the various strategies.

Source: Texas Department of Transportation, Accelerated Construction Strategies Guideline, September 2003, URL: http://www.dot.state.tx.us/cst/construction_strategies.htm (Accessed 7/12/05)

- **Procedures for developing TMPs based upon certain categories or intensity of work zone impacts.** For example, an agency may use a work zone induced delay threshold that triggers the consideration of TO and/or PI strategies for projects.
- **Procedures for monitoring TMP and work zone performance during construction.** For example, agencies may have criteria (e.g., if a project involves multiple lane closures) for using a system/approach to monitor work zone induced delay during construction.
- **Procedures for post-construction performance assessment for process and procedural improvement.** For example, agencies may develop post-construction performance assessment requirements for projects that exceed a certain dollar value and/or a certain degree of complexity.

The above discussions provide an overview of issues that could be considered in implementing work zone assessment and management procedures. **Work Zone Impacts Assessment: An Approach to Assess and Manage Work Zone Safety and Mobility Impacts of Road Projects**² provides further suggestions for addressing work zone impacts assessment during all stages of project delivery, including policy, systems planning, project development, construction, performance assessment, and maintenance and operations.

4.2 Use of Work Zone Data

4.2.1 Related Provisions in the Rule

The provision that pertains to use of work zone data is provided in Section 630.1008(c) of the Rule. This provision:

- Requires agencies to use work zone data at both the project and process-levels to manage and improve work zone safety and mobility. The Rule does not require the reporting or submission of work zone data.
- At the project-level, requires agencies to use field observations, available work zone crash data, and operational information to manage the work zone impacts of individual projects while the projects are underway in the field.
- At the process-level, requires agencies to analyze work zone crash and operational data from multiple projects to improve agency processes and procedures, and in-turn continually pursue the improvement of overall work zone safety and mobility.
- Recommends that agencies maintain elements of the data and information resources that are necessary to support the use of work zone data for the above two activities.



The Utah Department of Transportation (UDOT) implemented project-specific customer surveys as part of the I-15 reconstruction contract. The surveys actually began shortly after construction began. Mail-out surveys and central location surveys acquired input from the traveling public on the effectiveness of the maintenance of traffic measures used on the project. Changes were made if problem areas were identified by the surveys. The surveys resulted in extensive public input into the traffic control measures as well as modifications based on input received.

Source: FHWA Work Zone Best Practices Guidebook, <http://ops.fhwa.dot.gov/wz/practices/best/Default.htm> (Accessed 8/16/05)

4.2.2 Why Are Work Zone Data Relevant?

Work zone data are necessary to make an informed assessment of the success of efforts to manage work zones and their impacts. Work zone field data also enable agencies to assess how well planning and design estimates of anticipated impacts match what actually happens in the field. Work zone data support performance assessments at both the project and program-levels. Available data and information provide the basis for assessing performance and taking appropriate actions to improve performance on individual projects as well as overall processes and procedures. Work zone data also support the process review provision in Section 630.1008(e) of the Rule.

4.2.3 Using Work Zone Data at the Project-Level

At the project-level, the Rule requires agencies to use field observations, available work zone crash data, and operational information to manage work zone impacts for specific projects during implementation. Use of work zone data should support efforts to:

- Manage the safety and mobility impacts of projects more effectively during implementation.
- Develop a basis for procedures to assess work zone impacts in project development.

This provision does not require additional data collection during project implementation, but rather, requires the use of available information.

For example, most agencies maintain field diaries for construction projects. These field diaries are intended to provide a log of problems, decisions, and progress made over the duration of a project. In many states, these diaries log incidents and actions such as the need to replace channelization devices into their proper positions after knockdown by an errant vehicle, or to deal with severe congestion that occurred at some point during the day. These log notes, when considered over time during project implementation, may provide indications of safety or operational deficiencies. The deficiencies may then be appropriately addressed, for example by improving the delineation through the work zone to prevent future occurrences of knockdown events, or by altering work schedules to avoid the congestion that recurs due to local traffic generation phenomena.

Work zone reviews can be a valuable source of work zone data and information. Agencies use different names to refer to these types of reviews, such as work zone field reviews, traffic control reviews, and quality assurance inspections for work zone traffic management. These reviews can provide information about work zone management practices currently being used on an agency's projects. The reviews may also provide an indication of how consistently various work zone management practices are being implemented and how well they are working. Conducting some reviews during daylight and some as night inspections can help identify any variations or special concerns specific to these conditions. These reviews often cover aspects of work zone traffic control, such as signage, traffic control devices and layout, overall traffic control management, pavement markings, and speed limits. Reviews may also cover work zone traffic impacts, such as the presence of delays, and the use of impact mitigation strategies, such as the use of alternate route signing and intelligent transportation systems (ITS).

Many areas have ITS in place, and others are implementing specific ITS deployments to manage traffic during construction projects. Both real-time and archived data from such systems can be used to identify safety and mobility issues and trends and take

appropriate action as necessary. However, the data formats and information may need to be enhanced to account for work zone issues.

Police crash reports are useful tools for evaluating work zone practices. Many agencies receive crash reports from the police jurisdiction or enforcement agency through established operating agreements. Project personnel may also respond immediately to the project site when notified by an enforcement agency of a work zone incident or crash. The notification process may also be established through operating agreements with the enforcement agency.

The above applications do not necessarily require that agencies gather new data, but there may be a need to improve processes to forward such reports to the appropriate staff member for review during project implementation and/or to provide guidance or training to facilitate interpretation of these reports. Agencies may choose to enhance the data they capture to improve the effectiveness of these processes by following national crash data enhancement recommendations and/or linking it with other information (e.g., enforcement actions, public complaints, contractor claims).



The New Mexico Department of Transportation (NMDOT) installed an intelligent transportation system (ITS) to help with traffic and incident management during its reconstruction of the Big I, the interchange between I-25 and I-40 in Albuquerque. The work zone ITS included a series of cameras that allowed NMDOT to simultaneously make field observations of several areas in the large work zone. NMDOT staff monitored the camera displays from a nearby temporary traffic management center to quickly identify and respond to incidents. The camera displays also enabled NMDOT to observe work zone conditions and see areas where drivers were having difficulty navigating the work zone. NMDOT used these field observational information to make work zone configuration changes to improve traffic flow.

Source: Intelligent Transportation Systems in Work Zones: A Case Study. Work Zone Traffic and Incident Management System (FHWA-OP-04-072) (2004), URL: <http://www.ops.fhwa.dot.gov/wz/its/index.htm> (Accessed 8/16/05)

4.2.4 Using Work Zone Data at the Process-Level

At the process-level, the Rule requires agencies to continually pursue improvement of work zone safety and mobility by analyzing work zone crash and operational data from multiple projects to improve agency processes and procedures. The same project-level data and information from multiple projects may be compiled and analyzed to identify trends and determine if there are common problems that could be remedied by a change in policy or practices. Work zone data may be used to conduct post-construction evaluations, support process reviews, develop lessons learned, and ultimately improve agency policies and procedures. This data and information typically becomes available during project implementation and it needs to be retained and maintained for post-construction analyses.



The Ohio Department of Transportation (ODOT) embarked on a data analysis effort to determine if an increased number of work zones was causing more crashes, and if so, what could be done to prevent the increase in crashes. Using data collected during construction and prior to construction, ODOT performed a before/after comparison of crash rates on major Interstate work zones. The analysis showed a significant increase in crashes when work zones were in place, so ODOT further analyzed the data to determine what caused the increase. The analysis showed two primary causes – geometrics and speed. The geometric issues were inadequate off-ramp capacity, inadequate ramp merges, and insufficient paved shoulders. To prevent similar problems from occurring on future projects, ODOT made several changes to its work zone procedures. ODOT began explicitly checking off-ramp capacity in its maintenance of traffic alternatives analysis; created new standards for work zone on-ramp merges and required merges to be detailed in plans; and created a desired cross-section that requires a 2-foot paved shoulder.

Source: “How One State DOT is Addressing WZ Impacts,” presented by Dave Holstein, Ohio DOT, Transportation Research Board (TRB), 84th Annual Meeting, Session 476: Work Zone Impacts and Mitigation Efforts, Work Zone Traffic Control Committee, January 11, 2005.

4.2.5 Maintaining Data and Information Resources

The Rule recommends that agencies maintain the data and information resources that are necessary to support the use and analysis of work zone data. Most of the data needed to conduct work zone performance monitoring during implementation as well as post-implementation assessments should be readily available from pre-existing sources. However, data collection or data storage and retrieval systems may need to be altered to take full advantage of available information resources.

For example, traditional analyses of work zone crashes before, during, and after construction projects can be useful in highlighting which types of projects, work activities, traffic situations, or traffic control schemes result in the least crash risk. But crash record systems generally do not contain information about specific projects and work zone attributes. The value of such analyses is enhanced when crash reports offer greater detail, operational data allows the computation of crash rates, or means exist to link crashes to work zone features or construction phases.



The Indiana DOT (INDOT) established work zone baselines, benchmarks, and performance goals for fatalities and injuries. This performance-based process is used to measure effectiveness in work zones and was begun by Indiana in 1996. The benchmarks (10 years of data) provide a statistical picture of Indiana’s traffic safety challenges. The baselines, benchmarks, and performance goals are used in Indiana’s traffic safety action plan.

Source: FHWA Work Zone Best Practices Guidebook, <http://ops.fhwa.dot.gov/wz/practices/best/Default.htm> (Accessed 8/16/05)

Developing new data and information resources or modifying existing resources to support the effective use and analysis of work zone data will likely be an evolutionary process that occurs over time. As the data are used more to assess and improve work zone procedures and practices, an agency may find better ways to store and manage data, or identify additional data elements that would be useful to incorporate into data systems. Systems may also need to be adapted or expanded as more data and data sources become available, such as through broader deployment of ITS in an area. While maintaining data and information resources for work zones will entail some effort, these resources greatly increase the ability to identify work zone issues, detect patterns or trends associated with recurring issues, and determine potential improvements.

4.3 Implementation of Training

4.3.1 Related Provisions in the Rule

The provision that pertains to training is provided in Section 630.1008(d) of the Rule. This provision:

- Specifies that agencies require appropriate training for personnel involved in the development, design, implementation, operation, inspection, and enforcement of work zone related transportation management and traffic control. Further, the Rule also states that agencies require periodic training updates for these personnel. These periodic training updates are to reflect changing industry practices and agency processes and procedures.
- Clarifies appropriate training as training that is relevant to the job decisions that each individual is required to make.

4.3.2 Who Needs to be Trained?

Personnel involved in the development, design, implementation, operation, inspection, and enforcement of work zone related transportation management and traffic control need to be trained. This includes transportation planners, design engineers, traffic and safety engineers, temporary traffic control designers and program managers, regional construction managers, construction project staff, maintenance staff, and contractor and utility staff. This may also include executive-level decision-makers, policy makers, senior managers, information officers, and law enforcement and incident responders.



Today a significant portion of work is contracted to consultants and it may be advantageous to include consultants in agency training programs. The Maryland State Highway Administration (MDSHA) offers two Work Zone Safety Training classes – the Temporary Traffic Control Traffic Manager’s Training (TTCTM) Course and the Maryland Approved Flagger’s Course. Within the last four to five years over 10,000 highway workers have taken the TTCTM Course and over 65,000 highway workers have taken the Maryland Approved Flagger’s Course. MDSHA worked with various public and private agencies to reach the 80,000 highway workers through the Train-the-Trainer program. The MDSHA is working with the Maryland Highway Contractors association to provide the traffic managers training course to contractors at a reduced fee.

Ohio DOT (ODOT) provides training to its staff responsible for planning, designing, and implementing work zones. This training is also made available to consultant and contractor staff for a fee. Further, the ODOT pre-qualification policy requires that appropriate consultant and contractor staff undergo the work zone training in order to attain pre-qualification status.

Sources: Maryland Quality Initiative Web Site, Key Initiatives of Recent Years Page, URL: <http://mdqi.org/initiatives.asp> (Accessed 08/12/05)

Maryland State Highway Administration (SHA), Work Zone Traffic Control Page, Temporary Traffic Control Training Program, URL: http://www.sha.state.md.us/Safety/oots/trafficsignalsandlaws/otr_workzone.asp#TTC (Accessed 8/12/05)

Ohio Department of Transportation (ODOT) policy on Traffic Management in Work Zones Interstate and Other Freeways, Policy No.: 516-003(P), July 18, 2000. Available online in the Policy section of ODOT’s web site. URL: <http://www.dot.state.oh.us/Policy/516-003p.pdf> (Accessed 09/08/05).

The training needs to be appropriate to an individual’s job responsibilities and to the job decisions that each individual needs to make. So, a flagger need not be trained in principles of TMP development but a designer should be. Training for senior managers would be less detailed than training for designers.

Agencies may have both internal and external training needs. External needs include those for project development (design or engineering service consultants) and those for construction activities. Each agency needs to consider these needs and identify appropriate means to ensure that external partners develop the necessary knowledge and skills.

In addition to training, some agencies require certification for certain personnel, such as flaggers and traffic control supervisors.



The Oregon DOT (ODOT) selects certain projects that require a traffic control supervisor (TCS). The person identified for this position must possess appropriate certification. The certification requires training. The national specification database (<http://fhwapap04.fhwa.dot.gov/nhswp/index.jsp>) shows a TCS specification for more than 10 states.



Most DOTs require certified flaggers on highway construction projects.

Source: Traffic Control Supervisor (TCS) specification is available on the ODOT Specifications Web Page at: <http://www.oregon.gov/ODOT/HWY/SPECS/docs/unique/U225-traffic-control-supervisor.doc> (Accessed 8/12/05)

Information about the TCS course and certification may be obtained at the Evergreen Safety Council's web site at: <http://www.esc.org/content/04%20Roadway%20Work%20Zone%20Training/01%20Traffic%20Control%20Supervisor.htm> (Accessed 8/12/05)

4.3.3 Who Provides the Training?

Agencies are not solely responsible for providing training. The responsibility of the agency is to require that appropriate personnel that are involved in planning, designing, and implementing work zone transportation management and traffic control are trained so that they have the necessary skill, knowledge, and abilities. Training is a means to developing a knowledgeable workforce. The agency is also not solely responsible for updating all training courses to reflect changing industry practices; however, it is responsible for requiring that personnel receive updated training on a periodic basis.

For engineering consultant contracts, agencies may identify needs and requirements through the proposal or consultant procurement process. Professional engineering registration requirements as regulated through the individual states will need to be considered. Existing policies and regulatory controls may already provide that a practicing engineer be competent and maintain currency with training for designing work zone traffic control. For construction contracts, states may impose requirements through contract provisions.

4.3.4 Training Resources

Work zone training is available from various sources, some or all of which the agency may already use.

Examples of some of the available training sources include the following:

- The Federal Highway Administration's (FHWA) National Highway Institute (NHI) provides several work zone training courses, including courses on work zone traffic control and work zone management and design. These courses can help develop skills and knowledge on the technical and non-technical aspects of work zone traffic control and transportation management practices. NHI's URL is <http://www.nhi.fhwa.dot.gov/>.

- The National Work Zone Safety Information Clearinghouse hosted by the Texas Transportation Institute provides an extensive National database of available work zone training. The URL is <http://wzsafety.tamu.edu/>.
- Agency specific and/or locally customized training courses and programs, such as local technical assistance program (LTAP)/technology transfer (T2) courses or university courses are also available. For example, “A Guide to Establishing Speed Limits in Highway Work Zones,” is provided by the Minnesota DOT, and the Ohio LTAP Center provides a guide on “Hazards to Motor Vehicles and Pedestrians at Urban Construction Projects.”
- Transportation organizations, such as the American Traffic Safety Services Association (ATSSA) and the Institute of Transportation Engineers (ITE), offer some work zone training and certification programs. ATSSA’s URL is <http://www.atssa.com>, and ITE’s URL is <http://www.ite.org>.

4.3.5 Considerations for Implementing an Overall Training Program

Some issues for agencies to consider in developing and implementing an overall work zone training program are:

- Identification of target audience for the training.
- Identification of training needs and core competencies for the target audience.
- Identification of pre-existing training programs and courses that meet the training needs of the target audience.
- Update and/or development of agency-specific or local training programs to augment pre-existing courses.
- Development and implementation of training programs for training professionals within the agency.
- Identification of typical refresher course requirements for the target audience.
- Whether to include training requirements in the agency’s work zone policy.
- Record-keeping and facilitation of training updates.
- Funding sources for the training program.
- Timeline for offering initial training and sustained training.
- Contractor, consultant, and other private sector involvement.

4.4 Work Zone Process Reviews

4.4.1 Related Provisions in the Rule

The provision that pertains to process reviews is provided in Section 630.1008(e) of the Rule.

This provision:

- Requires agencies to perform a process review at least every two years to assess the effectiveness of their work zone safety and mobility procedures.

- Provides two options for agencies to conduct the process review. The first option is to evaluate work zone data at the agency level, and the second option is to review randomly selected projects across their jurisdictions. A combination of these approaches can also be used.
- Recommends that appropriate personnel, who represent the project development stages and the different offices within the agency, as well as the FHWA, participate in the process reviews.
- Allows the participation of other non-agency stakeholders in the reviews as appropriate.
- Explains that the process review results are intended to lead to improvements in agency work zone processes and procedures, data and information resources, and training programs, that ultimately enhance efforts to address safety and mobility on current and future projects.

4.4.2 Why Process Reviews?

Periodic evaluation of work zone policies, processes, procedures, and work zone impacts aids in the process of addressing and managing the safety and mobility impacts of work zones. Reviews help assess the effectiveness of a program or a set of processes and procedures. They enable the agency and respective FHWA Division Office to confirm that a problem does not exist, and to make recommendations to improve situations where shortcomings might exist.

The following are examples of questions that the process reviews may help answer:

- How are work zones performing with respect to mobility and safety?
- Are the best possible decisions in planning, designing, and implementing our work zones being made?
- Are customer expectations being met with respect to maintaining safety and mobility and minimizing business and community impacts both through, and in and around the work zone?
- Can areas for improvement be identified?
- How have areas for improvement that were identified in the past been addressed?
- What has both worked and not worked – which strategies have proven to be either more or less effective in improving the safety and mobility of work zones?
- What other strategies can be considered for implementation?
- Are there certain combinations of strategies that seem to work well?
- Can any work zone safety and mobility trends be identified, at the national level or local level? What can be done to advocate characteristics associated with good trends? What can be done to remedy the problems associated with bad trends?
- How do work zone performance, the effectiveness of strategies, or areas of improvement vary between day work and night work?
- Should policies or agency procedures be adjusted based on what has been observed or measured?
- Can consistency be brought about in the identification of such trends, issues, and problems and in the standardization of tools and guidelines for application at the agency, State, and/or national level?



In 1997, the Virginia DOT (VDOT) developed and implemented a work zone safety checklist form for reviewing and documenting the status/condition of work zones for construction/maintenance/utility/permit operations. The form was developed to: develop a statewide standardized form for conducting and documenting work zone safety reviews; provide contractors, in writing, a list of work zone deficiencies; and improve the appearance and function of work zone traffic control. The form is required to be filled out a minimum of once a week by construction inspectors, with every other review performed at night. The contractor is given a copy for correcting work zone deficiencies, and a copy is filed with the project records. The use of this form resulted in: consistent reviews of work zones by construction inspectors and district work zone safety personnel; improved documentation of work zone conditions; and improved response time to work zone deficiencies by contractors.

Source: FHWA Work Zone Best Practices Guidebook, <http://ops.fhwa.dot.gov/wz/practices/best/Default.htm> (Accessed 8/16/05)

4.4.3 Work Zone Performance Aspects

Work zone performance assessment aspects addressed in the process reviews may involve two tracks: (1) the overall work zone management process and (2) work zone field performance and management strategies.

This may include:

- Collection of data including project related information as well as public and stakeholder perception.
- Synthesis and analysis of data at multiple levels (project, local, regional, State, and national) and comparison of findings to performance metrics.
- Application of the analysis results toward continually improving work zone practices, policies, processes, and procedures.

Four performance measure areas of interest for the work zone process review are safety, mobility, construction efficiency and effectiveness, and public perception and satisfaction.

More detail on work zone performance aspects is provided in the Performance Assessment Chapter of **Work Zone Impacts Assessment: An Approach to Assess and Manage Work Zone Safety and Mobility Impacts of Road Projects**.³

4.4.4 Conducting Process Reviews

The Rule allows the following methods, alone or in combination, for conducting the process review:

- Evaluation of work zone data at the agency-level.
- Review of randomly selected projects across a variety of jurisdictions.

³ Available at http://www.ops.fhwa.dot.gov/wz/resources/final_rule.htm

Often times, there may be a necessity to use a combination of the two approaches to conduct the process reviews. Evaluation of work zone data at the agency-level involves synthesis and analysis of data from multiple projects. This lends itself to creative clustering and categorization of data and the development of aggregate results to identify trends and develop categorical statistics. Reviewing individual projects helps gain an in-depth understanding of individual project circumstances, the different decision-trees that were involved, the actual impacts, and the performance of the project's work zone transportation management strategies. In either case, reviews should include projects that represent a range of characteristics, such as day and night work; type of work being done; duration of the project; local traffic characteristics; and/or transportation management strategies used.

The agency and the FHWA Division Office generally work together to identify the scope of review, based on the Stewardship Agreement and a risk assessment. Also, FHWA Division Offices are frequently involved in project inspections on major construction projects. For these projects, it would be beneficial to periodically review the collection and use of work zone mobility and safety data.

Conducting process reviews may include the following action items:

- Assemble multi-disciplinary team.
- Develop review objectives.
- Determine review methods.
- Conduct review.
- Analyze and interpret results.
- Develop inferences, recommendations, and lessons learned.
- Prioritize recommendations and lessons learned.
- Set performance objectives for next review.
- Apply recommendations and lessons learned.

It may be helpful and appropriate to include some key stakeholders in process reviews. For example, the workers responsible for implementing and monitoring a TMP in the field are generally following the plan that was developed earlier by agency design or traffic engineering staff, or consultants. Including designers and consultants in some process reviews may help them improve future TMPs. The multidisciplinary team for a process review may be the same team that implements the overall policy and the agency processes and procedures.



The following technical resources may be used for conducting process reviews:

- Conducting Reviews That Get Results, FHWA, NHI Course No. 310111, URL: www.nhi.fhwa.dot.gov/coursedesc.asp?coursenum=1146.
- Generic Construction Related Review Guidelines, FHWA, Office of Asset Management, URL: www.fhwa.dot.gov/construction/reviews.htm.
- Work Zone Impacts Assessment Process Guidance, FHWA Office of Operations – Work Zone Program, URL: www.ops.fhwa.dot.gov/wz/resources/final_rule.htm.

5.0 Significant Projects

Some projects are likely to have much greater effects on traffic conditions in and around their work zones than other projects will. So it is reasonable to pay more attention to the effects of certain projects, such as those that we think will cause greater congestion, compromise road safety, or greatly reduce access to businesses or event venues (e.g., stadiums, arenas). Recognizing that not all road projects cause the same level of work zone impacts, the updated Rule (the Rule) establishes a category of projects called “significant projects.” This Section provides an overview and general guidance for identifying significant projects.

5.1 Overview

5.1.1 What Is a Significant Project?

Simply stated, a significant project is a project that a State or local transportation agency¹ expects will cause a relatively high level of disruption.

The Rule provides a specific, more detailed definition of significant project in § 630.1010:

- A significant project is defined as one that, alone or in combination with other concurrent projects nearby, is anticipated to cause sustained work zone impacts² that are greater than what is considered tolerable based on State policy and/or engineering judgment.

While the Rule gives agencies flexibility in determining their own definitions for significant project, the Rule does specifically state that projects meeting a certain set of criteria are automatically classified as significant projects. The Rule does allow for agencies to apply for and Federal Highway Administration (FHWA) Division Offices to grant exceptions to the requirements triggered by the automatic classification. The Rule states that, in addition to projects meeting the agency’s own definition of significant:

- 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. For an Interstate system project or categories of Interstate system projects that are classified as significant through the application of this provision, but in the judgment of the State they do not cause sustained work zone impacts, the State may request from the FHWA, an exception to the requirements triggered by the classification. Exceptions to these provisions may be granted by the FHWA based on the State’s ability to show that the specific Interstate system project or categories of Interstate system projects do not have sustained work zone impacts.

¹ Hereinafter referred to as agencies.

² § 630.1004 of the Rule defines work zone impacts as work zone-induced deviations from the normal range of transportation system safety and mobility. The extent of the work zone impacts may vary based on factors such as, road classification, area type (urban, suburban, and rural), traffic and travel characteristics, type of work being performed, time of day/night, and complexity of the project. These impacts may extend beyond the physical location of the work zone itself, and may occur on the roadway on which the work is being performed, as well as other highway corridors, other modes of transportation, and/or the regional transportation network.

5.1.2 Related Provisions in the Rule

The Rule requires that agencies identify significant projects. The requirements for significant projects, outlined in § 630.1010, state that:

- The agency must identify upcoming projects that are expected to be significant.
- This identification of significant projects should be done as early as possible in the project delivery and development process, and in cooperation with the FHWA.
- The agency's work zone policy provisions, the project's characteristics, and the magnitude and extent of the anticipated work zone impacts should be considered when determining if a project is significant or not.

Whether or not a project is considered to be significant determines which transportation management plan (TMP) requirements apply to the project. TMP requirements are discussed in Section 6.0 of this document.

5.1.3 What Is the Purpose of Identifying Significant Projects?

The classification of certain projects as significant is intended to help agencies allocate resources more effectively to projects that are likely to have greater impacts. The classification process is also intended to help agencies think through project coordination and scheduling issues. A project that is expected to cause greater work zone impacts may warrant additional attention during the project delivery process and additional funding for transportation management strategies that help manage the work zone impacts of the project. Since decisions on project budgets, the sequencing of projects, and major design decisions are generally made early in the program delivery process, the classification of projects should be made as early as possible when the most options are available.

Classifying projects as early as possible in program delivery will help answer questions like:

- What are the potential work zone impacts of identified projects? Do the work zone aspects of the project warrant particular attention during the project delivery process? Are the expected work zone impacts for a project great enough that the project should be considered a significant project?
- What are the cumulative work zone impacts of multiple road projects taking place at the same time on transportation system safety and mobility?
- What are the coordination issues, if any, that need to be accounted for in planning and scheduling multiple projects in the vicinity of each other?
- What are the potential work zone management strategies that may be used for a project?
- What is the likely range of costs of the potential strategies to manage the work zone impacts of the project?
- What are the design implications and effects on project scheduling/phasing/staging of the potential management strategies?

5.2 When in Program Delivery Should Significant Projects be identified?

Significant projects should be identified during the systems planning phase of project delivery, when Statewide Transportation Improvement Programs (STIPs) and regional Transportation Improvement Programs (TIPs) are developed. This stage of project delivery involves the identification of needs and deficiencies in the transportation system for both the long term and the short term, and the development of appropriate improvement recommendations. Long-term transportation plans are usually projected out 20 to 25 years, while short-term plans are smaller packages of projects that cover timeframes ranging from two to six years. Systems-level planning can be performed at several levels: statewide, regional, metropolitan, and local jurisdiction (city, county, township, village, highway district, etc.). The process is interactive, with participation and feedback from concerned agencies, interested parties, and the public.

Consideration of the impacts of work zones at the systems-planning level (either on a network-wide basis or corridor basis) can have several positive effects. For example, in cost estimation and budgeting for projects, an understanding of the expected level of work zone impacts of the road project will help in deciding what transportation management strategies are likely. This understanding can then serve as the basis for developing reasonable cost estimates that are commensurate with the impacts of the project. Further, the analysis of the cumulative impacts of concurrent road projects will help better schedule construction thereby minimizing the impacts on road users, businesses, and other affected parties.

Currently, work zone considerations are not always accounted for in the systems planning processes, although State Departments of Transportation (DOTs), Metropolitan Planning Organizations (MPOs), and other agencies generally realize the potential value of such considerations. Where work zone considerations are not considered in the systems planning process, systems planning processes should be amended to incorporate work zone considerations.

While making the initial identification of significant projects during systems planning is recommended, an agency may need to reconfirm whether a project is significant or not during subsequent project development stages. During actual project development more project specific information becomes available for making project-specific decisions. As a result, certain projects that were thought to be significant may no longer be significant as a result of change in certain circumstances, and vice-versa.

For example:

- A project's design may have changed, resulting in different project staging that affects traffic conditions differently.
- Another project nearby may have been accelerated a year to address critical safety issues, causing two nearby projects to now be concurrent. Their cumulative effects may now mean the projects should be considered significant.
- Project schedules change. Changing delivery dates may cause a change in expected work zone impacts that leads to a change in whether a project is significant or not.

5.3 Identifying Significant Projects

As noted previously, the Rule gives agencies some flexibility in determining their own criteria for significant projects. While the Rule specifies that Interstate projects meeting certain criteria are automatically considered significant, there are many other road projects on State and local roads, as well as many Interstate projects, that do not fall under those criteria. Agencies will need to develop their own definitions and include those definitions in agency policy or procedures so they can be applied consistently. The agency policy or procedures should also define who determines significant project classifications.

The process of identifying significant projects may either be qualitative or quantitative. During systems planning, most of the assessment is primarily qualitative based on available information and engineering judgment. During the subsequent stages of project development, including preliminary engineering and design, the agency may choose to reconfirm a project's significance by conducting more detailed quantitative analyses. The agency and its project partners, including the FHWA, and other appropriate regional stakeholders, ideally should work together as a multi-disciplinary team to identify significant projects.

5.3.1 Possible Criteria for Identifying Significant Projects

The Rule encourages agencies to make significant project determinations based on their work zone policy provisions, a project's characteristics, and the magnitude and extent of the anticipated work zone impacts for a project. A combination of qualitative and quantitative criteria should be used, as appropriate, to identify significant projects. An essential aspect in using criteria for significant projects is to realize that different projects have unique circumstances and needs, and any set of criteria should be applied taking this into account.

Qualitative criteria are subjective, and leave much room for interpretation along different perspectives. This can both be an advantage and a disadvantage. But in most cases, during systems planning, which is when the initial identification of significant projects is conducted, adequate information may not be available to quantitatively assess whether a project is significant.

Quantitative methods to identify significant projects during systems planning may be appropriate for major projects. Quantitative criteria for significant projects are best suited for reconfirming project significance during the subsequent stages of project development, especially during design. For example, they can be used to identify whether a project that was previously not considered significant, becomes significant as a result of combining it with another concurrent project. Quantitative criteria will facilitate the use of thresholds for hard numbers like expected delay, queue length, and user-cost for determining project significance.

The following are some of the possible elements to consider in identifying which projects are significant.

Project Characteristics, including:

- Project type.
- Project size, extent/length, duration, cost, and complexity.
- Type of work being performed.
- Type of work zone (full closure, lane reduction, cross-over, night work, etc.).
- Project schedule.
- Planned lane closures.
- Roadway classification.
- Area type (urban, suburban, rural).

Travel and Traffic Characteristics, including:

- Traffic volumes.
- Seasonal and temporal variations in volumes (hourly, daily, or weekly).
- Percentages of different vehicular volumes (cars, trucks, or buses).
- Type of travel (commuter or tourist), freight corridor, transit corridor.
- Public and private facility access issues (e.g., park and ride lots, manufacturing plants with shift changes).
- Occurrence of special events (e.g., concerts, parades).
- Potential impacts of weather.

Work Zone Characteristics, including:

- Impacts of the project at both the corridor and network levels to include parallel corridors, alternate routes, the transportation network, and other modes of transportation, impacts of other concurrent work zones in the vicinity of the project, either at the corridor level or the network level. For example, will the project impact the traveling public at the metropolitan level, or the regional level, or the statewide level?
- Capacity issues (lane reductions, lane configurations).
- Level of public interest in the project.
- Number of travelers that will be impacted and/or level of user cost impacts.
- Expected safety impacts.
- Expected delay and travel time/delay and travel time thresholds.
- Impacts on nearby transportation infrastructure, such as, key intersections and interchanges, railroad crossings, public transit junctions, and other junctions in the transportation network.
- Impacts on evacuation routes in the vicinity of critical transportation or other infrastructure.
- Impacts on affected public properties, including schools, parks, recreational facilities, fire stations, police stations, and hospitals.
- Impacts of the project on affected private properties, including businesses and residences.

A combination of the above criteria can be used to form a framework for identifying and categorizing significant projects. For example, one possible framework is to use criteria such as whether a project, alone or in combination with other concurrent projects nearby, is anticipated to have one or more of the following characteristics:

- It will impact the traveling public at the metropolitan or regional level (and possibly more broadly).
- It has a high level of public interest.
- It will directly impact a moderate to high number of travelers.
- It will have high user cost impacts.
- The duration is moderate to long.

Another example of a possible framework for identifying and categorizing significant projects is from FHWA's Work Zone Self Assessment (WZSA)³. The WZSA divides projects into four different categories using qualitative criteria. With a project classification framework such as the one in the WZSA, an agency can designate certain project categories as significant projects (e.g., all projects falling into the Type I and Type II project categories are considered significant).

- **Type I.** Work impacts the traveling public at the metropolitan, regional, intrastate, and possibly at the Interstate level. It has a very high level of public interest. It will directly impact a very large number of travelers. It will have significant user cost impacts and the duration is usually very long. Examples of this work type would be: Central Artery/Tunnel in Boston, Massachusetts; Woodrow Wilson Bridge in Maryland/Virginia/District of Columbia; Springfield Interchange "Mixing Bowl", Springfield, Virginia; and I-15 reconstruction in Salt Lake City, Utah.
- **Type II.** Work impacts the traveling public predominately at the metropolitan, and regional level. It has a moderate to high level of public interest. It will directly impact a moderate to high number of travelers. It will have moderate to high user cost impacts and the duration is usually moderate to long. Examples of this work type would be: major corridor reconstruction, high impact interchange improvements, full closures on high volume facilities, major bridge repair, repaving projects that require long term lane closures, etc.
- **Type III.** Work impacts the traveling public at the metropolitan or regional level. Has a moderate level of public interest. It will directly impact a low to moderate level of travelers. It will have low to moderate user cost impacts, and can include lane closures for a moderate duration. Examples of this work type would be: Repaving work on roadways and the National Highway System (NHS) with moderate average daily traffic (ADT), minor bridge repair, shoulder repair and construction, minor interchange repairs, etc.
- **Type IV.** Work impacts the traveling public to a small degree. Public interest is low. Duration of work is short to moderate. Work zones are usually mobile, and typically this work is recurring. Examples of this work type would be: Certain low impact striping work, guardrail repair, minor shoulder repair, pothole patching, very minor joint sealing, minor bridge painting, sign repair, mowing, etc.



The design chapter of Wisconsin DOT (WIDOT) Facilities Development Manual provides guidance to assist designers through the process of anticipating serious congestion on the Wisconsin freeway system. Guidance like this can be used in developing criteria for significant projects. The following are excerpts of some of the guidance:

User delay greater than 30 minutes above what is considered usual delay for the specific project is unacceptable and needs to be addressed when that project is on the C2020 system.

Rural drivers are typically less tolerant of delay than urban drivers. Likewise northern Wisconsin drivers will generally be less tolerant of delay than drivers in southeastern Wisconsin.

A 1-mile queue of traffic will take approximately 10-15 minutes to dissipate. Therefore, a queue greater than 2-3 miles is unacceptable and mitigation measures must be taken.

In general, if a freeway experiences greater than 25,000 ADT (2-way) and only one lane of traffic is provided in each direction, serious traffic delays will result. If the freeway project in question will have one lane in each direction and experiences between 20,000 and 25,000 ADT (2-way) it may have congestion problems and serious delays on summer weekends.

Source: State of Wisconsin, Department of Transportation, Facilities Development Manual, Procedure 11-50-22, Chapter 11 Design, Section 50 General Design Considerations, Subject 22 Work Zone Traffic Congestion and Mitigation, February 2003.

5.3.2 Use of Analytical Tools

Analytical tools can be helpful for assessing whether a project meets an agency's quantitative criteria for significant projects. These tools can be used to help an agency assess whether there is adequate capacity to handle the expected traffic volumes through the project, and whether any queues are likely to form. They can also provide estimates of the most likely times when any queues would form and how long they might be. For an agency that chooses to use queue length as part of its criteria for significant projects, analytical tools would be valuable for evaluating this criterion. They can also be used to assess how a project will likely impact nearby areas, such as alternate routes or access to a local business district.

Analytical tools can also be used to identify, and evaluate the likely effects of, potential work zone management strategies, such as changing the allowable work hours on a project.

Some tools that can be used alone or in combination are:

- Sketch-planning and systems planning analysis tools like travel demand modeling tools, the ITS Deployment Analysis System (IDAS), etc.;
- Higher-level project impacts analysis tools like Highway Capacity Manual (HCM)-based tools, QuickZone, QUEWZ, Micro-BenCost, etc.; and
- Operational-level traffic analysis and simulation tools like VISSIM, PARAMIX, CORSIM, NETSIM, etc.

5.4 Exception Process

The Rule specifies that 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. FHWA recognizes that not all projects that fall in this category will cause a high level of disruption, even though they are on major facilities or involve lengthy closures. For example, if the lane-closure occurs at night, or if the lane-closure is only during off-peak and weekend hours, or if the type of work is minor maintenance work, or if the roadway capacity significantly exceeds the traffic volumes, the project may not have a high level of work zone impacts. Therefore, the Rule provides for an exception clause for those Interstate system projects, or classes of projects, that are deemed to be significant according to the Rule, but in reality, may not have a high level of sustained work zone impacts. For such projects that are classified as significant through the application of this provision, but in the judgment of the agency they do not cause sustained work zone impacts, the agency may request an exception, from the FHWA Division Office, to the requirements triggered by the classification. Exceptions to these provisions may be granted by the FHWA Division Office based on the agency's ability to show that the specific Interstate system project or categories of Interstate system projects do not have sustained work zone impacts.

The agency may use either qualitative or quantitative criteria and methods (or a combination of both) to illustrate that the specific project or categories of projects will not have sustained work zone impacts. The agency can submit an appropriate exception request to the FHWA Division Office, which will then work with the agency to review the request and take appropriate action.

Blanket exceptions for certain categories of projects may be sought by the agency if the agency determines that such projects will not have sustained impacts, and can demonstrate the same to the FHWA. Some examples of Interstate system projects that might qualify for blanket exceptions include:

- Road work on Interstate projects where the capacity far exceeds the demand (e.g., single lane closures on highways that have low volumes of traffic;)
- Night work on certain Interstate routes; and
- Off-peak and weekend lane-closures on certain Interstate routes.
- Short-term, moving operations (e.g., striping) on certain Interstate routes.

5.4.1 Process for Requesting Exceptions

The process for exception requests may include the following actions:

1. Assess the work zone impacts of the specific Interstate project or categories of projects using appropriate methods (qualitative, quantitative, or combination of both).
2. Compare the expected work zone impacts with the agency's policy provisions and determine whether the project is expected to have sustained work zone impacts.
3. If the project appears to meet the conditions for an exception, prepare an exception request and submit it to the FHWA Division Office. Blanket exceptions for certain categories of projects that meet certain criteria may be requested on an ongoing basis.

4. FHWA reviews the exception request.
5. Take appropriate action based on the results of the review – either reassess the impacts (go back to Step 1) or implement an appropriate TMP based on whether the exception request is approved or not.

The agency should work with the FHWA Division Office, as appropriate, throughout the process.

5.4.2 Contents of an Exception Request

The contents and degree of detail in an exception request will vary based on the type, complexity, and expected impacts of a project. For projects that are not complex and are of small size or short duration, the exception request may be very simple. For more complicated projects, the exception request may be more detailed yet is not intended to be lengthy. The main element of an exception request will be the agency's assessment of the expected work zone impacts, and may include a description of the project and local conditions.

6.0 Developing TMPs for Projects

One of the goals of the updated Rule (the Rule) is to expand work zone impacts management beyond traffic safety and control by using transportation management strategies, as applicable to a project. Inclusion of these strategies helps to reduce traffic and mobility impacts, improve safety, and promote coordination within and around the work zone. One way to do this is through the development of transportation management plans (TMPs) for road projects. TMPs are required by the Rule for all Federal-aid highway projects. Work zone impacts and issues vary, so State and local transportation agencies¹ need to develop and implement TMPs that best serve the mobility and safety needs of their road users, construction workers, businesses, and community. This Section provides an overview on developing and implementing TMPs.

6.1 Overview

6.1.1 What Is a TMP?

A TMP lays out a set of coordinated strategies and describes how these strategies will be used to manage the work zone impacts of a project. The scope, content, and level of detail of a TMP may vary based on the agency's work zone policy and the anticipated work zone impacts of the project. The type of TMP needed for a project is based on whether the project is determined to be a "significant project²" (as described in detail in Section 5.0 of this document).



Careful consideration of the TMP should result in minimizing confusion and delays to motorists and pedestrians, as well as reduce crashes, provide greater safety to the various parties involved in the project, and improve the image of Mn/DOT and the construction industry.

Source: Minnesota Department of Transportation, Traffic Engineering Manual (Chapter 8: Work Zone Traffic Control), June 2000, URL: <http://www.dot.state.mn.us/trafficeng/otepubl/tem/Chap-8-2000.pdf> (Accessed 6/15/05)

6.1.2 Related Provisions in the Rule

The Rule requires TMPs for all Federal-aid highway projects. The requirements for TMPs are provided in § 630.1012 of the Rule and are summarized as follows:

- For significant projects, the TMP shall consist of a Temporary Traffic Control (TTC) plan as well as transportation operations (TO) and public information (PI) components. A TTC plan addresses traffic safety and control through the work zone.

¹ Hereinafter referred to as agencies.

² 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 the respective agency's policy and/or engineering judgment.

- The TO component addresses sustained operations and management of the work zone impact area, and the PI component addresses communication with the public and concerned stakeholders.
- For projects that are not classified as significant projects, the TMP may consist only of a TTC plan. However, agencies are encouraged to consider TO and PI issues for these projects as well.
- A TTC plan shall be consistent with the provisions under Part 6 of the Manual on Uniform Traffic Control Devices (MUTCD) and with the work zone hardware recommendations in Chapter 9 of the American Association of State Highway and Transportation Officials (AASHTO) Roadside Design Guide.³ The TTC plan may be incorporated in the TMP by reference, such as reference to elements in the MUTCD or approved standard agency plans or manuals. TTC plans may also be specifically designed for individual projects. In developing and implementing the TTC plan, the Rule requires that pre-existing roadside safety hardware be maintained at an equivalent or better level than existed prior to project implementation.
- Agencies should coordinate with appropriate stakeholders in developing a TMP.
- The provisions for a TMP shall be included in the project's Plans, Specifications, and Estimates (PS&Es). The PS&Es shall either contain all the applicable elements of an agency-developed TMP, or include provisions for a contractor to develop a TMP at the most appropriate project phase, as applicable to the agency's chosen contracting methodology for the project. In the case of contractor-developed TMPs, it is expected that the contractor would incorporate the minimum TMP requirements already developed by the agency during the planning process. For example, the PS&Es for a design-build project may include the skeleton for a TMP, as developed by the agency in its planning process, and the provisions for completing TMP development under the contract. The agency must approve contractor developed TMPs and they cannot be implemented until approved.
- Pay item provisions for implementing the TMP shall be included in PS&Es, either through method-based (pay items, lump sum, or combination) or performance-based specifications (performance criteria and standards). Examples of potential performance criteria include number of crashes in the work zone, incident response or clearance time, travel time through the work zone, delay, queue length, and/or traffic volume.
- The agency and the contractor shall each designate a trained person at the project-level who has the primary responsibility and sufficient authority for implementing the TMP. The designated personnel have to be appropriately trained (per § 630.1008(d) of the Rule).

³ MUTCD URL: <http://mutcd.fhwa.dot.gov>

Roadside Design Guide, Chapter 9 – Traffic Barriers, Traffic Control Devices, and Other Safety Features for Work Zones, AASHTO, 2002, URL: <http://bookstore.transportation.org>

6.2 How and When Should TMPs be Developed, Implemented, and Evaluated?

TMP development begins during systems planning and progresses through the design phase of a project. Existing project development processes can provide valuable information to guide TMP development. For example, the National Environmental Policy Act (NEPA) process during project planning can be a primary source of constraints or inputs for the project. Developing the TMP will involve identifying applicable strategies to manage the impacts of the work zone. The costs for the management strategies need to be incorporated in early project estimates and the budgeting process to ensure that funding is available for TMP implementation.

The TMP development process is iterative and evolves during the development of the project design. As the TMP evolves, it is important to reassess the management strategies to confirm that the work zone impacts are addressed and the necessary budget for the project is still available. The TMP may be re-evaluated and revised prior to and during implementation and monitoring. Finally, both project-level and program-level assessments of TMPs are recommended to evaluate the effectiveness of the management strategies and improve TMP policies, processes, and procedures. Figure 6.1 presents a general process diagram for TMP development. The example process in the diagram shows three types of TMPs (Basic, Intermediate, and Major). Agencies may elect to develop a different number of categories of TMPs than what is described here.

The remainder of Section 6.2 provides an overview of the steps contained in Figure 6.1. Additional detail can be found in **Developing and Implementing Transportation Management Plans (TMPs) for Work Zones** and **Work Zone Impacts Assessment: An Approach to Assess and Manage Work Zone Safety and Mobility Impacts of Road Projects**⁴.

⁴ Available at http://www.ops.fhwa.dot.gov/wz/resources/final_rule.htm

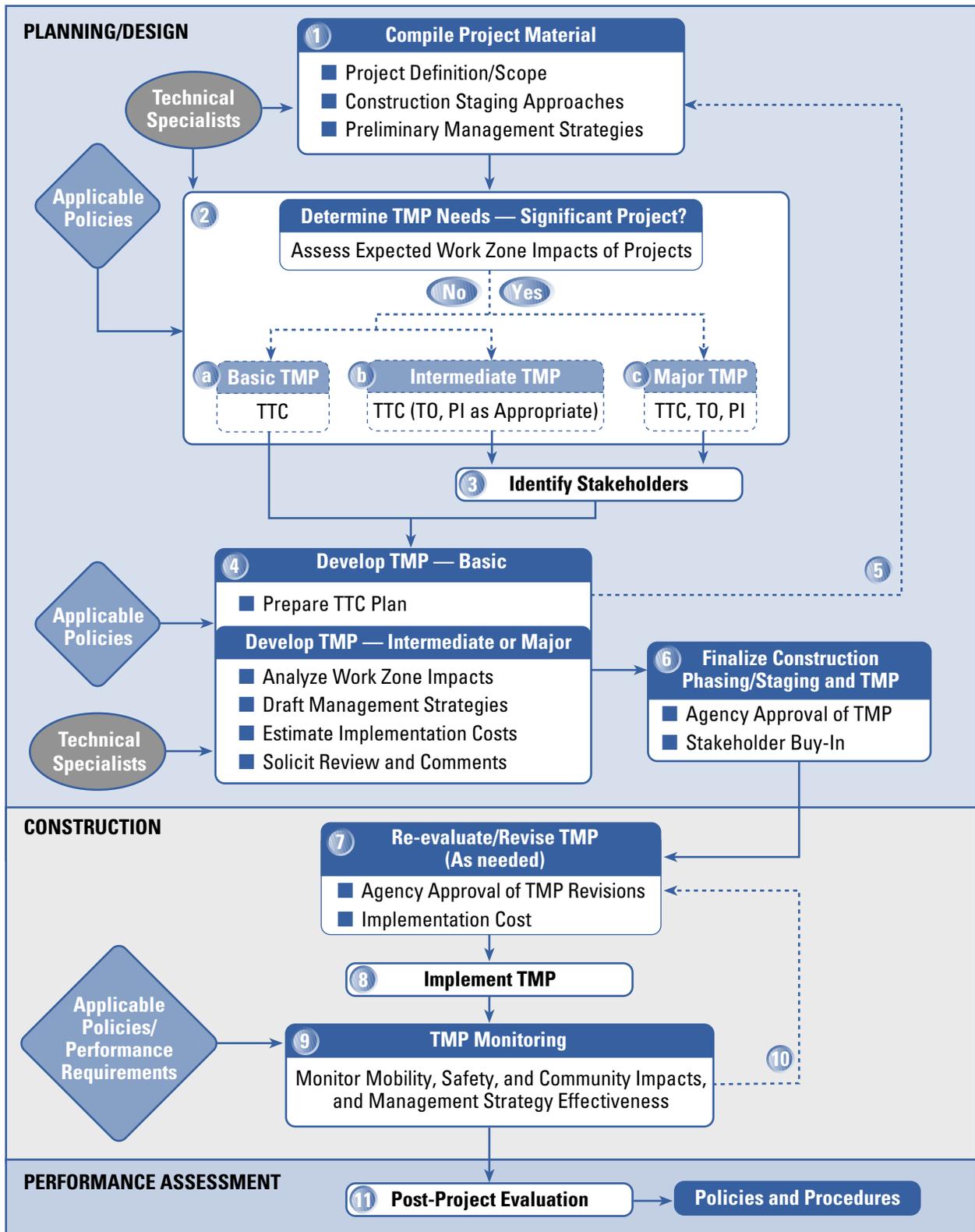


Figure 6.1 TMP Development

6.2.1 TMP Development During Planning, Preliminary Engineering, and Design

Two of the keys to a successful TMP are:

- Developing it as early as possible.
- Using a multidisciplinary approach.

Although a full TMP document is not developed until design, conducting some TMP analyses during systems planning⁵ and preliminary engineering will help ensure adequate implementation costs are included in the project budget. At this early stage, more alternatives for addressing work zone impacts are available, so a broader range of strategies can be chosen. For example, at this stage one available strategy is scheduling and coordinating projects to minimize the cumulative impacts of multiple projects in a corridor or region. Another strategy available in the earlier stages of project development is to consider work zone impacts in the evaluation and selection design alternatives. For some projects it may be possible to choose a design alternative that alleviates many work zone impacts. These broader strategies cross various disciplines and highlight the need for a multidisciplinary approach. Steps towards TMP development that might occur during planning, preliminary engineering, and design are described below.



Where a series of proposed projects are along the same corridor or along corridors of close proximity, a single TMP covering all projects should be used. If circumstances prohibit a single TMP, the individual TMPs should be coordinated.

Source: Indiana Department of Transportation, Chapter 81 of the Indiana Design Manual, Transportation Management Plans, URL: <http://www.in.gov/dot/div/contracts/standards/dm/Part%208/Ch%2081/Ch81.pdf> (Accessed 8/16/05)

Step 1 – Compile Project Material

The project design team begins by compiling available project materials such as:

- Project definition (project scope, roadway and traffic characteristics, other factors such as public outreach, community information, etc.).
- Construction phasing/staging approaches and plans.
- Preliminary work zone management strategies.
- Preliminary cost estimates for strategy implementation (when available).

Information from other projects in the corridor to evaluate the combined or cumulative impact of the projects.

The design team should work with appropriate technical specialists to develop the best combination of design, construction staging, and work zone management strategies. As more information and data become available, the management strategies and their costs should be refined.

⁵ Systems planning is the stage of project delivery when short- and long-term transportation needs and deficiencies are identified, and appropriate projects are recommended and programmed.

Step 2 – Determine TMP Needs

The elements of a TMP needed for a project are based on whether the project is determined to be significant. Section 5.0 of this document provides guidance for identifying significant projects. If a project is expected to be significant, the TMP will consist of a TTC as well as a TO component and a PI component. For projects that are not classified as significant projects, the TMP needs to contain a TTC plan. While TO and PI components are optional for non-significant projects, agencies are encouraged to consider including them.

2A – Basic TMP (TTC)

Basic TMPs are typically applied on construction or maintenance projects with minimal disruption to the traveling public and adjacent businesses and community. These projects typically only involve the development of a TTC plan, often known as a Traffic Control Plan (TCP) or Maintenance of Traffic (MOT) plan. TTC plans need to be consistent with provisions under Part 6 of the MUTCD and with the work zone hardware recommendations in Chapter 9 of AASHTO's Roadside Design Guide. Depending on how the agency decides to develop TTCs, basic TMPs may consist of one- or two-page forms that provide information on the project's location and schedule, plus what is traditionally done by agencies for a TCP or MOT.

2B – Intermediate TMP (TTC, and some optional TO and/or PI)

Intermediate TMPs are likely to be used for construction or maintenance projects that are anticipated to have more than minimal disruption, but have not been identified as significant projects. For example, these projects may be expected to impact a moderate number of travelers and have moderate public interest, such as single lane closures in urban areas or commercial business districts (CBDs). Intermediate TMPs provide more detailed mitigation strategies. In addition to a TTC, intermediate TMPs would also include some element of public information (PI) and/or traffic operations (TO) strategies, as well as cost estimates.

2C – Major TMP (TTC/TO/PI)

Major TMPs are intended for significant projects. These projects, such as multiple lane-closures or total closure of a vital corridor in an urban area or CBD, typically have moderate to high impacts on traffic and the local area and generate public interest. Major TMPs consist of a TTC plan, and also address PI and TO components. In addition to the TMP components required by the Rule, TMPs may also contain cost estimates, coordination strategies between stakeholders, secondary mitigation strategy(s), analysis of potential impacts on detour routes, and analysis of the potential impacts of the management strategies. The consideration and incorporation of these additional items may help agencies develop and implement a TMP that effectively manages the work zone impacts of the project, and serves the need of the agency, the traveling public, workers, and other parties affected by the project.

Guidance for TMP components can be found in Section 6.3 of this document.



The British Columbia Ministry of Transportation develops a Traffic Management Strategy that defines the Ministry's requirements for traffic management for a project. The strategy defines requirements for a Traffic Management Plan, which includes some of all of the following: traffic control plan, public information plan, incident response/management plan, and an implementation plan. For example, a Public Information Plan identifies actions and procedures to inform the traveling public, project stakeholders and the Ministry of current and planned changes to traffic operations. A Public Information Plan shall be modified throughout the project life cycle to address issues as they arise.

Source: British Columbia Ministry of Transportation, Traffic Management Guidelines for Work on Roadways, September 2001, URL: http://www.th.gov.bc.ca/publications/eng_publications/geom/traffic_mgmt_guidelines.pdf (Accessed 8/16/05)

Step 3 – Identify Stakeholders

This step involves the identification of stakeholders that can provide valuable input to the agency on what strategies to include in the TMP to help manage the work zone impacts of a project. This is generally intended for the development of intermediate and major TMPs. Stakeholders should represent different perspectives and will vary depending on the nature of the project.

Stakeholders may include internal agency staff from planning, design, safety, construction, operations, maintenance, public affairs, public transportation, pavement, bridge, and other technical specialists; and external stakeholders such as local government (county, city, regional), FHWA, public transportation providers, contractors, regional Transportation Management Centers (TMCs), railroad agencies/operators, freight operators, enforcement agencies, utility providers, emergency services, local businesses, community groups, and schools.

It is recommended that a TMP team be developed for major TMP efforts to see the project through from design to final assessment.

Step 4 – Develop TMP

The essence of the TMP development process lies in developing and evaluating the best combination of construction staging, project design, TTC plan, TO strategies, and PI strategies, hand-in-hand with each other. Work zone management strategies should be identified based on the project constraints, construction staging plan, type of work zone, and anticipated work zone impacts. Some agencies use strict lane closure strategies or permissible lane closure times that must be followed. Other agencies use analysis tools (e.g., simulation models, queue analysis spreadsheets) to predict delays, queues, and impacts of detours on the city arterials of various strategies. Cost is often a constraint for the development of a TMP, particularly for major TMPs. Finally, the TMP needs to include appropriate pay item provisions for implementation.



In Illinois, project designers or the Traffic Management Analysis team must compare the benefits and costs of each option to address traffic issues during construction. Right-of-way costs, additional construction costs, environmental effects, vehicular delay, user costs, business and community impacts, crash potential, and detour costs are considered.

Source: Illinois Department of Transportation, Chapter 13 of the Bureau of Design and Environmental Manual, Work Zone Traffic Management Studies, Traffic Management Analysis (TMA) Report, December 2002, URL: <http://www.dot.state.il.us/desenv/BDE%20Manual/BDE/pdf/chap13.pdf> (Accessed 8/16/05)

For basic TMPs, the TMP development process will largely consist of developing a TTC or MOT plan. The TTC or MOT plan shall be either a reference to specific TTC elements in the MUTCD, approved standard TTC plans, agency transportation department TTC manual, or can be designed specifically for the project.

Step 5 – Update/Revise TMP

This step represents the iterative aspect of TMP development. The TMP is a ‘dynamic document’ that is maintained and revised by the TMP team as the project progresses and when more information becomes available. This step may include the possible reclassification of a project as significant or not significant.

Step 6 – Finalize Construction Phasing/Staging and TMP

The PS&Es shall include either all the applicable elements of a TMP, or the provisions for a contractor to develop a TMP.⁶ FHWA encourages agencies to begin TMP development early in the project development process, so in many cases agencies will have begun TMP development prior to project letting, even for design-build projects. FHWA envisions that in cases where contractors will develop TMPs, the PS&Es are likely to contain the skeleton/outline of a TMP developed by the agency during its planning process, and the provisions for completing TMP development under the contract. For example, if an agency uses performance-based specifications for a project, the performance requirements are laid out in the contract documents with the contractor being responsible for developing a TMP (working from any agency-provided skeleton) that best meets the performance specifications. TMPs are subject to agency approval, with input from stakeholders, as appropriate. Once approved, the TMP and the phasing/staging plans are finalized.

6.2.2 TMP Implementation, Monitoring, and Revisions During Construction

Step 7 – Re-Evaluate/Revise TMP

If alternative construction phasing/staging plans or other management strategies have been suggested, the contractor or agency needs to review the TMP to see if changes are needed. TMPs developed or revised during contracting or construction are approved by the agency prior to implementation.

Step 8 – Implement TMP

The TMP is implemented. Some components of the TMP may need to be implemented prior to construction (e.g., public relations campaign, improvements to detour routes).

Step 9 – TMP Monitoring

Monitoring the performance of the work zone and that of the TMP during the construction phase is important to see if the predicted impacts closely resemble the actual conditions in the field and if the TMP is working effectively. Examples of possible performance measures for TMP monitoring include volume, travel time, queue length, delay, number of incidents, incident response and clearance times, contractor incidents, community complaints, user costs, and cumulative impacts from adjacent construction activities. Performance monitoring requirements and measures should be based on agency policies, standards, and procedures, and should be included in the project contract documents when appropriate. TMP monitoring and assessment are best written into the TMP during TMP development, rather than devised after the fact.

Step 10 – Update/Revise TMP Based on Monitoring

If performance requirements are not met, the agency and/or contractor should revisit the TMP and consider alternate management strategies and/or staging approach(es) that meet the approval of the agency.



In order to effectively evaluate and revise a program, performance measures should be developed that reflect the specific goals and objectives of the program. For example, if quick clearance is a goal, measurements of how long it takes to respond to and clear an incident should be obtained. These can be built into the contract as incentives to encourage the contractor to deliver and document effective incident management procedures.

Source: Colorado Department of Transportation, Guidelines for Developing Traffic Incident Management Plans for Work Zones, September 2003, URL: http://www.dot.state.co.us/Traffic_Manuals_Guidelines/incident_management_guidelines/incident_management_guidelines_20030919.pdf (Accessed 8/16/05)

6.2.3 TMP Performance Assessment

Step 11 – Post-Project TMP Evaluation

Following construction completion, it is a good idea, particularly for significant projects, to prepare a short report that contains an evaluation of the TMP. Elements to consider including in the post-project evaluation are successes and failures, changes made to the TMP and results of those changes, any feedback received from the public, actual measures of conditions versus what was predicted, cost for implementation of the strategies, and suggested improvements. The findings can be used to help in the development and implementation of future TMPs.

TMP performance assessment can aid in addressing the following concerns:

- Which management strategies have proven to be either more or less effective in improving the safety and mobility of work zones?
- Are there combinations of strategies that seem to work well?
- Should TMP policies, processes, procedures, standards, and/or costs be adjusted based on what has been observed or measured?
- Are the best decisions in planning, designing, implementing, monitoring, and assessing work zones being made?

6.3 Potential TMP Components

Table 6.1 summarizes the components for agencies to consider for their TMPs. This list is intended to serve as guidance. The components included, terminology used, and the level of detail of the TMP depend on the project details and whether a project is classified as significant; agency policies, procedures, and guidelines; and the potential work zone impacts of the project. While an agency may include many of these components in a major TMP, it is not expected that agencies would include many of them in a basic TMP.

TMP components may also be described in other existing project reports. For example, an agency may have a detailed project design report with sections for geotechnical, bridge, drainage, and pavement. In this case, some of the items listed below may be unnecessary. In such cases, an agency may decide to include a summary of these items or a reference to such items in the TMP for coordination purposes.

More detailed information on the TMP components is provided in Section 3.0 of **Developing and Implementing Transportation Management Plans (TMPs) for Work Zones.**⁷

TMP Component	Brief Description
1 Introductory Material	Cover page, Licensed Engineer stamp page (if required by the agency), table of contents, list of figures, list of tables, list of abbreviations and symbols, and terminology
2 Executive Summary	Overview of each of the TMP components
3 TMP Roles and Responsibilities	TMP manager, stakeholders/review committee, approval contact(s), TMP implementation task leaders (e.g., public information liaison, incident management coordinator, etc.), TMP monitoring, and emergency contacts
4 Project Description	Information such as project type, project background, project area/corridor, project goals and constraints, proposed construction staging, general schedule and timeline, and related projects
5 Existing and Future Conditions	For the project area, including data collection and modeling approach, existing roadway characteristics (history, roadway classification, number of lanes, geometrics, urban/suburban/rural), existing and historical traffic data (volumes, speed, capacity, volume/capacity, percent trucks, queue length, peak traffic hours), existing traffic operations (signal timing, traffic controls), incident and crash data, local community and business concerns/issues, traffic growth rates (for future construction dates), and traffic predictions during construction (volume, delay, queue)
6 Work Zone Impacts Assessment	Depending on the type of TMP, could just be a qualitative assessment of the potential work zone impacts and the effect of the chosen management strategies; or a detailed analysis of the same, or both.
7 Work Zone Impacts Management Strategies	For the mainline and detour routes by construction staging, including TC strategies, PI strategies, and TO strategies. Findings and recommendations.
8 TMP Monitoring Requirements	TMP monitoring requirements and what the evaluation report of the TMP successes and failures should include
9 Contingency Plans	Potential problems and corrective actions to be taken, standby equipment or personnel
10 TMP Implementation Costs	Itemized costs, cost responsibilities/sharing opportunities, and funding source(s)
11 Special Considerations	As needed
12 Attachments	As needed

Table 6.1 Potential TMP Components

6.4 Work Zone Impact Management Strategies to Consider

Many work zone impact management strategies can be used to minimize traffic delays, improve mobility, maintain or improve motorist and worker safety, complete road work in a timely manner, and maintain access for businesses and residents. Table 6.2 presents various work zone management strategies by category. This set of strategies is not meant to be all-inclusive, but offers a large number to consider, as appropriate, in developing TMPs. Descriptions for each of the work zone management strategies and guidance on when and how to apply them are located in Section 4.0 and Appendix B of **Developing and Implementing Transportation Management Plans (TMPs) for Work Zones**.⁸

⁸ Available at http://www.ops.fhwa.dot.gov/wz/resources/final_rule.htm

Temporary Traffic Control (TTC)			Public Information (PI)	
Control Strategies	Traffic Control Devices ⁹	Project Coordination, Contracting and Innovative Construction Strategies	Public Awareness Strategies	Motorist Information Strategies
<ul style="list-style-type: none"> ■ Construction phasing/staging ■ Full roadway closures ■ Lane shifts or closures <ul style="list-style-type: none"> - Reduced lane widths to maintain number of lanes (constriction) - Lane closures to provide worker safety - Reduced shoulder width to maintain number of lanes - Shoulder closures to provide worker safety - Lane shift to shoulder/median to maintain number of lanes ■ One-lane, two-way operation ■ Two-way traffic on one side of divided facility (crossover) ■ Reversible lanes ■ Ramp closures/relocation ■ Freeway-to-freeway interchange closures ■ Night work ■ Weekend work ■ Work hour restrictions for peak travel ■ Pedestrian/bicycle access improvements ■ Business access improvements ■ Off-site detours/use of alternate routes 	<ul style="list-style-type: none"> ■ Temporary signs <ul style="list-style-type: none"> - Warning - Regulatory - Guide/information ■ Changeable Message Signs (CMS) ■ Arrow panels ■ Channelizing devices ■ Temporary pavement markings ■ Flaggers and uniformed traffic control officers ■ Temporary traffic signals ■ Lighting devices 	<ul style="list-style-type: none"> ■ Project coordination <ul style="list-style-type: none"> - Coordination with other projects - Utilities coordination - Right-of-way coordination - Coordination with other transportation infrastructure ■ Contracting strategies <ul style="list-style-type: none"> - Design-build - A+B bidding - Incentive/disincentive clauses - Lane rental ■ Innovative construction techniques (precast members, rapid cure materials) 	<ul style="list-style-type: none"> ■ Brochures and mailers ■ Press releases/media alerts ■ Paid advertisements ■ public information center ■ Telephone hotline ■ Planned lane closure web site ■ Public meetings/hearings ■ Community task forces ■ Coordination with media/schools/businesses/emergency services ■ Work zone education and safety campaigns ■ Rideshare promotions ■ Visual information (videos, slides, presentations) for meetings and web 	<ul style="list-style-type: none"> ■ Traffic radio ■ Changeable Message Signs (CMS) ■ Temporary motorist information signs ■ Dynamic speed message sign ■ Highway Advisory Radio (HAR) ■ Extinguishable signs ■ 511 traveler information systems (wireless, handhelds) ■ Freight travel information ■ Transportation Management Center (TMC)

Table 6.2 Work Zone Management Strategies by Category

⁹ A wide range of other safety devices are described in Part 6 of the MUTCD and are widely used to enhance safety and mobility in highway work zones. These devices, such as temporary traffic barriers and crash cushions, are included in the Work Zone Safety Management Strategies category.

Transportation Operations (TO)

Demand Management Strategies	Corridor/Network Management Strategies	Work Zone Safety Management Strategies	Traffic/Incident Management and Enforcement Strategies
<ul style="list-style-type: none"> ■ Transit service improvements ■ Transit incentives ■ Shuttle services ■ Ridesharing/carpooling incentives ■ Park-and-ride promotion ■ High-occupancy vehicle (HOV) lanes ■ Toll/congestion pricing ■ Ramp metering ■ Parking supply management ■ Variable work hours ■ Telecommuting 	<ul style="list-style-type: none"> ■ Signal timing/coordination improvements ■ Temporary traffic signals ■ Street/intersection improvements ■ Bus turnouts ■ Turn restrictions ■ Parking restrictions ■ Truck/heavy vehicle restrictions ■ Separate truck lanes ■ Reversible lanes ■ Dynamic lane closure system ■ Ramp metering ■ Temporary suspension of ramp metering ■ Ramp closures ■ Railroad crossings controls ■ Coordination with adjacent construction site(s) 	<ul style="list-style-type: none"> ■ Speed limit reduction/variable speed limits ■ Temporary traffic signals ■ Temporary traffic barrier ■ Movable traffic barrier systems ■ Crash-cushions ■ Temporary rumble strips ■ Intrusion alarms ■ Warning lights ■ Automated Flagger Assistance Devices (AFADs) ■ Project task force/committee ■ Construction safety supervisors/inspectors ■ Road safety audits ■ TMP monitor/inspection team ■ Team meetings ■ Project on-site safety training ■ Safety awards/incentives ■ Windshield surveys 	<ul style="list-style-type: none"> ■ ITS for traffic monitoring/management ■ Transportation Management Center (TMC) ■ Surveillance (Closed-Circuit Television (CCTV), loop detectors, lasers, probe vehicles) ■ Helicopter for aerial surveillance ■ Traffic screens ■ Call boxes ■ Mile-post markets ■ Tow/freeway service patrol ■ Photogrammetry ■ Coordination with media ■ Local detour routes ■ Contract support for incident management ■ Incident/emergency management coordinator ■ Incident/emergency response plan ■ Dedicated (paid) police enforcement ■ Cooperative police enforcement ■ Automated enforcement ■ Increased penalties for work zone violations

7.0 Implementation and Compliance

State and local transportation agencies¹ and the Federal Highway Administration (FHWA) are partners in trying to bring about improved work zone safety and mobility. Consistent with that partnership, the updated Rule (the Rule) advocates a partnership between agencies and FHWA in Rule implementation and compliance. Staff from the respective FHWA Division Offices, Resource Center, and Headquarters will work with their agency counterparts to support implementation and compliance efforts, including:

- Review the agency's existing work zone policies and procedures to assess conformance and compatibility with the provisions of the Rule.
- Support the agency in writing or revising its policies, agency-level procedures, and project-level procedures that conform to the Rule.
- Reassess the agency's implementation of its work zone procedures at appropriate intervals.
- Help incorporate the provisions of the Rule in their respective stewardship agreements.²

The Rule contains specific provisions regarding implementation and compliance. The implementation provisions are provided in Section 630.1014:

- Agencies are required to work in partnership with the FHWA to implement their respective work zone policies and procedures.
- At a minimum, FHWA shall review the conformance of the agency's policies and procedures with the Rule, and reassess the agency's implementation of its procedures at appropriate intervals.
- Agencies are encouraged to address implementation of the Rule in their respective stewardship agreements with the FHWA.

The compliance provisions are provided in Section 630.1016:

- Agencies are required to comply with all the provisions of the Rule by October 12, 2007.
- Agencies may request variances from the compliance requirement on a project-by-project basis:
 - For projects that are in the later stages of development at or about the compliance date, and
 - If it is determined that the delivery of those projects would be significantly impacted as a result of the Rule's provisions.

¹ Hereinafter referred to as agencies.

² A stewardship agreement defines how the agency and the FHWA will work together to oversee Federal-funded projects and programs.

7.1 Conformance Review and Reassessment

FHWA Division staff are responsible for reviewing and reassessing individual agencies' conformance with applicable regulations. FHWA Division staff are supported by the FHWA Resource Center and Headquarters staff as appropriate. The review and reassessment of conformance may be incorporated into pre-existing coordination and review processes between agencies and their respective FHWA Divisions.

After suitable update or development, the respective FHWA Division will officially review the agency's work zone policies and procedures to assess their conformance with the provisions of the Rule. Based on this review, the FHWA may either find that the agency's work zone policies and procedures meet the requirements of the Rule, or provide recommendations for further enhancement or revision. If further enhancement or revision is needed, FHWA will offer to work together with the agency to help it meet the requirements. While FHWA Division Office staff will have some flexibility in determining compliance, this implementation guide is intended to provide some helpful guidance not only to implementing agencies but also to FHWA Divisions in assessing compliance.

Agencies and their respective FHWA Divisions need to work together to establish an appropriate interval for reassessment of the agency's implementation of its work zone policies and procedures. These assessments might include elements such as review of documentation regarding the identification of significant projects or the use of work zone data. For example, review of an agency's use of work zone data might involve reviewing documentation of work zone reviews done by agency staff during day and night conditions and how those field observations were used to address any issues identified. Some considerations for determining an appropriate interval are increases in the number of projects, changes in the types of projects (e.g., begin using design-build), findings from process reviews, and changes in staff. Such reassessment may also be performed as part of the bi-annual process review required by the Rule (discussed in Section 4.4 of this document).



The Washington Division of the FHWA is responsible for stewardship and oversight of the Federal-aid highway funds allocated to the State of Washington. The Washington Division conducts annual project inspections, program evaluations, systematic reviews, and financial audits of the Washington State DOT (WSDOT), and cities and counties. Full reports of these annual reviews are available at the Division office. In fiscal year (FY) 2004, the following work zone specific issues were addressed: construction inspections; annual regional work zone reviews; Federal-aid billing review; design stewardship review; and project construction costs tracking. Based on the inspections, reviews, program evaluations, audits, and specific project involvement conducted in FY 2004, the Division administrator concluded that WSDOT complied with Federal laws and regulations in expending the Federal-aid highway funds allocated to the State of Washington.

Source: FHWA Washington Division, Synopsis of the FY 2004 performance Report,
URL: <http://www.fhwa.dot.gov/wadiv/preports/fy04.htm> (Accessed 8/16/05)

7.2 Incorporation in Stewardship Agreements

Stewardship agreements establish the roles and responsibilities of the respective agency and the FHWA in providing oversight to Federal-aid Highway Program activities. Most State Departments of Transportation (DOTs) currently have stewardship agreements in-place with their respective FHWA Division Office. Current stewardship agreements address a variety of topics and regulations that govern Federal-aid highway project delivery, including project approval and oversight, finance accounting, planning and programming, environment, right-of-way, design, construction and maintenance. For each of these topics further information may be provided on: applicable laws, regulations, and procedures; program approval actions; project approval actions; monitoring and review actions; and project completion/closure requirements.

Work zone requirements may be incorporated into appropriate sections of existing stewardship agreements. Following are examples of issues to consider as the agency and FHWA work together in updating stewardship agreements:

- Incorporation of the policies, processes, and procedures developed by the agency to implement the Rule.
- Assignment of respective implementation roles and responsibilities for the FHWA Division Office and the agency.
- Removal or modification of prior policies, processes, and procedures that apply to the former Rule and may be voided by the implementation of the updated policies and procedures.
- Development and implementation of program-level and project-level actions and responsibilities that help implement the provisions of the Rule.
- Procedures for conducting periodic process reviews to update and/or enhance work zone policies, processes, and procedures.

For example, the agency and FHWA may decide to incorporate the requirement to identify upcoming significant projects (discussed in Section 5.0 of this document) into the “planning and programming” section of the existing stewardship agreement.



The current stewardship agreement between Colorado DOT (CDOT) and FHWA lays out different roles for traffic control reviews. It requires Area Engineers and Operations Engineers to conduct annual traffic control reviews to monitor traffic control on construction projects to ensure conformance with established policies, procedures, and guidelines. The Area Engineers, with the support of the FHWA Safety Program Manager, will comply with Section 23 CFR 630.1010 (e) (1) (of the former Rule) which states that “the results of this review are to be forwarded to the FHWA Division Administrator for his review and approval of the highway agency’s annual traffic safety effort.

Source: Stewardship Agreement, Federal Highway Administration – Colorado Division and the Colorado Department of Transportation, Revised January 2004, URL: <http://www.fhwa.dot.gov/codiv/stewardjan04.htm> (Accessed 7/16/05)

7.3 Variances from Compliance Requirements

Agencies shall comply with the Rule by October 12, 2007. FHWA recognizes that project development can begin many years before construction or even final design occurs. This may be particularly true for projects with complex environmental or right-of-way issues. FHWA has provided agencies with an opportunity to request a variance from the compliance requirements, on a project-by-project basis, for certain projects. Agencies may submit requests for an exception for individual projects that meet the following criteria:

- Projects that are in the later stages of development at or about the compliance date, and
- If it is determined that the delivery of those projects would be significantly impacted as a result of this Rule's provisions.

The process for exception requests may include the following actions:

1. Identify projects that will be in the later stages of development at or about the compliance date.
2. Assess the feasibility of applying the provisions of the Rule to those projects. If it is determined that the delivery of some projects may be significantly impacted as a result of the Rule's provisions, then submit an exception request to the FHWA Division Office.
3. Work with the FHWA to review the exception request.

The FHWA Division Office will work with the agency to determine the information necessary for an exception request. The types of information that may be addressed include:

- a. Project description – objectives, characteristics, cost, duration, location, length, etc.
- b. Status of project development (how close project development is to completion).
- c. Qualitative and/or quantitative rationale and justification for why the project's delivery may be affected, and why an exception is sought. Examples include:
 - i. Potential for substantial cost over-runs or project delays, supported by benefit-cost analysis.
 - ii. Project implementation vital to the region's transportation sustainability.

7.4 Implementation and Compliance Timeline

The following may be used as a high-level implementation/compliance timeline for the Rule:

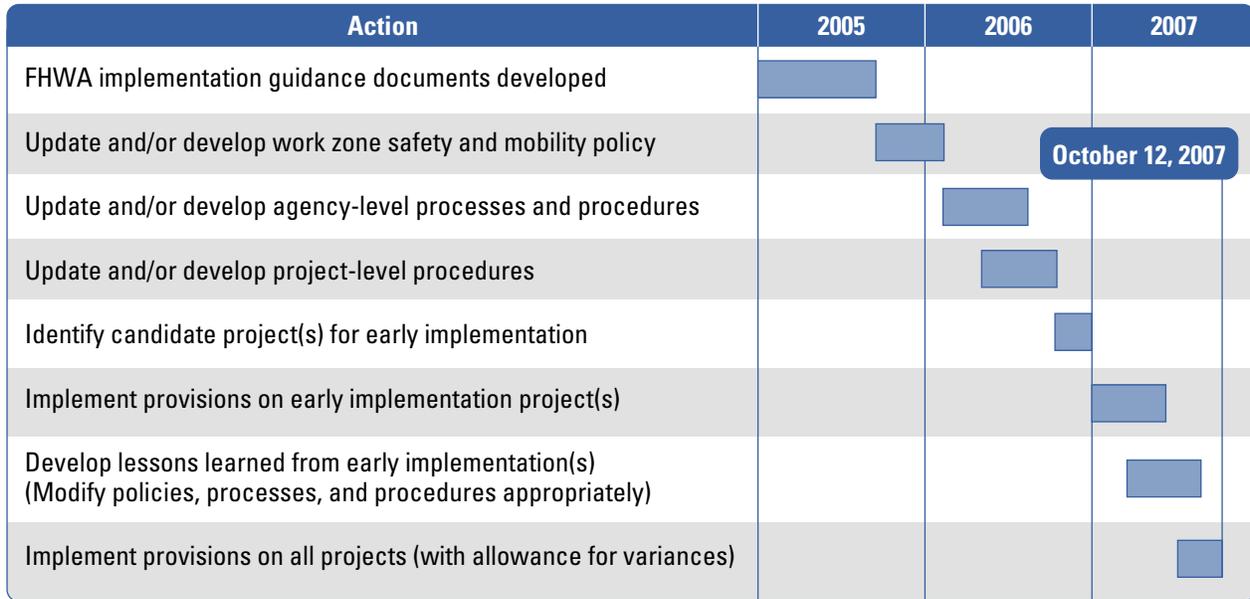


Figure 7.1 Rule Implementation/Compliance Timeline

7.5 Implementation Resources

7.5.1 Informational Resources

In addition to this Final Rule Implementation Guidance, FHWA has developed companion guidance documents that amplify the following aspects of the Rule:

- **Work Zone Impacts Assessment: An Approach to Assess and Manage Work Zone Safety and Mobility Impacts of Road Projects.** Provides guidance on developing procedures to assess the work zone impacts of road projects.
- **Developing and Implementing Transportation Management Plans (TMPs) for Work Zones.** Provides guidance on developing TMPs for managing work zone impacts of projects.
- **Work Zone Public Information and Outreach Strategies.** Provides guidance on developing communications strategies to inform affected audiences about construction projects, their expected work zone impacts, and the changing conditions on projects.

These Guides are described in more detail in Appendix C.

These documents are available on the FHWA work zone web site at http://www.ops.fhwa.dot.gov/wz/resources/final_rule.htm.

In addition to guidance directly related to the Rule, FHWA has developed the following documents and tools that provide additional information and guidance on related topics:

- **Road Safety Audits (RSAs).** A formal safety performance examination of an existing or future/improved road or intersection by an independent audit team. The main objective of an RSA is to address the safe operation of intersections and roadways to ensure a high level of safety for all road users. RSAs can be used in any phase of project development (planning, preliminary engineering, design, construction) and can also be used on any size project, from minor intersection and roadway retrofits to mega-projects. Guidance on performing RSAs is available at http://safety.fhwa.dot.gov/state_program/rsa/.
- **QuickZone Traffic Impact Analysis Tool.** A tool that can be used to estimate work zone delays, allowing road owners and contractors to analyze and compare project alternatives, such as the effects of doing highway work at night instead of during the day, or of diverting the traffic to different roads at various stages of construction. Information on the tool is available at <http://www.tfsrc.gov/its/quickzon.htm>.
- **Full Road Closure for Work Zone Operations.** A series of publications that provides a summary of how several State DOTs used a full road closure approach to conduct a road rehabilitation/reconstruction project. The documents are available at http://www.ops.fhwa.dot.gov/wz/construction/full_rd_closures.htm.
- **Innovative Contracting Guidance.** Resources for innovative contracting methods, including an online knowledge exchange, are available at <http://www.ops.fhwa.dot.gov/wz/contracting/index.htm>.
- **ITS in Work Zones.** A series of documents to raise awareness among maintenance and construction engineers and managers of the applications and benefits of ITS in work zones. These documents are available at <http://www.ops.fhwa.dot.gov/wz/its/index.htm>.
- **Work Zone Training Courses.** FHWA's National Highway Institute (NHI) provides several work zone training courses. A new NHI course, Advanced Work Zone Management and Design (#380072A), will provide planners, designers, construction managers, and other transportation professionals with the skills and knowledge of both the technical and non-technical aspects of work zone traffic control and transportation management practices. More information on this course is forthcoming and may be obtained at the NHI web site (when available) at <http://www.nhi.fhwa.dot.gov/>.
- **Manual on Uniform Traffic Control Devices (MUTCD).** Contains requirements and guidance on the use of traffic control devices. Part 6 covers Temporary Traffic Control for work zones. The MUTCD can be accessed at <http://mutcd.fhwa.dot.gov/>.
- **Traffic Control Handbook for Mobile Operations at Night.** A synthesis of current practices for performing mobile highway operations at night. This publication (number FHWA-SA-03-026) is available from the FHWA Headquarters Office of Safety.

7.5.2 Possible Funding Sources

Some existing sources of funding may be applied toward implementing elements of the Rule. Current funding sources for deploying certain transportation management strategies could include use of National Highway System (NHS), Interstate Maintenance (IM), Surface Transportation Program (STP), STP set-aside, Congestion Mitigation and Air Quality (CMAQ) Improvement Program, Intelligent Transportation System (ITS), and 402 funds. One example would be using temporary ITS deployments in work zones that could be converted to permanent use, thereby securing funding from the region for their deployment. Another example would be the use of 402 funds or possibly 408 funds to gather and analyze traffic safety data related to work zones. Developing and performing work zone safety training for law enforcement officers may also be eligible for 402 funds. Some work zone safety training may also be eligible for funding through a new Work Zone Safety Grants program established in the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU).

Other sources of funding, albeit on a smaller scale, could include use of Technology Transfer, Local Technical Assistance Program (LTAP), and FHWA Operations Support Program funds. These types of funding sources could be used for such items as local training courses or workshops. Through innovative partnership, each LTAP center matches every Federal dollar it receives with local funds.

Appendix A – Rule Language

DEPARTMENT OF TRANSPORTATION

Federal Highway Administration

23 CFR Part 630

[FHWA Docket No. FHWA–2001–11130]

RIN 2125–AE29

Work Zone Safety and Mobility

AGENCY: Federal Highway Administration (FHWA), DOT.

ACTION: Final rule.

SUMMARY: The FHWA amends its regulation that governs traffic safety and mobility in highway and street work zones. The changes to the regulation will facilitate comprehensive consideration of the broader safety and mobility impacts of work zones across project development stages, and the adoption of additional strategies that help manage these impacts during project implementation. These provisions will help State Departments of Transportation (DOTs) meet current and future work zone safety and mobility challenges, and serve the needs of the American people.

DATES: Effective Date: October 12, 2007.

The incorporation by reference of certain publications listed in this rule is approved by the Director of the Federal Register as of October 12, 2007.

FOR FURTHER INFORMATION CONTACT:

Mr. Scott Battles, Office of Transportation Operations, HOTO–1, (202) 366–4372; or Mr. Raymond Cuprill, Office of the Chief Counsel, HCC–30, (202) 366–0791, Federal Highway Administration, 400 Seventh Street, SW., Washington, DC 20590–0001. Office hours are from 7:45 a.m. to 4:15 p.m., e.t., Monday through Friday, except Federal holidays.

SUPPLEMENTARY INFORMATION:

Electronic Access

This document and all comments received by the U.S. DOT Docket Facility, Room PL–401, may be viewed through the Docket Management System (DMS) at <http://dms.dot.gov>. The DMS is available 24 hours each day, 365 days each year. Electronic submission and retrieval help and guidelines are available under the help section of this Web site.

An electronic copy of this document may be downloaded by using a computer, modem, and suitable communications software from the Government Printing Office's Electronic Bulletin

Board Service at (202) 512–1661. Internet users may reach the Office of the Federal Register's home page at: <http://www.archives.gov> and the Government Printing Office's Web site at: <http://www.access.gpo.gov/nara>.

Background

History

Pursuant to the requirements of Section 1051 of the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), (Pub. L. 102–240, 105 Stat. 1914; Dec. 18, 1991), the FHWA developed a work zone safety program to improve work zone safety at highway construction sites. The FHWA implemented this program through non-regulatory action by publishing a notice in the **Federal Register** on October 24, 1995 (60 FR 54562). This notice established the National Highway Work Zone Safety Program (NHWZSP) to enhance safety at highway construction, maintenance, and utility sites. In this notice, the FHWA indicated the need to update its regulation on work zone safety (23 CFR 630, Subpart J).

As a first step in considering amendments to its work zone safety regulation, the FHWA published an advance notice of proposed rulemaking (ANPRM) on February 6, 2002, at 67 FR 5532. The ANPRM solicited information on the need to amend the regulation to better respond to the issues surrounding work zones, namely the need to reduce recurrent roadwork, the duration of work zones, and the disruption caused by work zones.

The FHWA published a notice of proposed rulemaking (NPRM) on May 7, 2003, at 68 FR 24384. The regulations proposed in the NPRM were intended to facilitate consideration and management of the broader safety and mobility impacts of work zones in a more coordinated and comprehensive manner across project development stages, and the development of appropriate strategies to manage these impacts. We received a substantial number of responses to the NPRM. While most of the respondents agreed with the intent and the concepts proposed in the NPRM, they recommended that the proposed provisions be revised and altered so as to make them practical for application in the field. The respondents identified the need for flexibility and scalability in the implementation of the provisions of the proposed rule; noted that some of the terms used in the proposed rule were ambiguous and lent themselves to subjective interpretation. Respondents also commented that the documentation requirements in the proposal would impose undue time and resource burdens on State DOTs.

In order to address the comments received in response to the NPRM, the FHWA issued a supplemental notice of proposed rulemaking (SNPRM) on May 13, 2004, at 69 FR 26513. The SNPRM addressed the comments related to flexibility and scalability of provisions, eliminated ambiguous terms from the language, and reduced the documentation requirements. We received several supportive comments in response to the SNPRM. Most respondents noted that the SNPRM addressed the majority of their concerns regarding the originally proposed rule. However, they did offer additional comments regarding specific areas of concern. In the final rule issued today, the FHWA has addressed all the comments received in response to the SNPRM that are within the scope of this rulemaking.

The regulation addresses the changing times of more traffic, more congestion, greater safety issues, and more work zones. The regulation is broader so as to recognize the inherent linkage between safety and mobility and to facilitate systematic consideration and management of work zone impacts. The regulation can advance the state of the practice in highway construction project planning, design, and delivery so as to address the needs of the traveling public and highway workers. The key features of the final rule are as follows:

- A policy driven focus that will institutionalize work zone processes and procedures at the agency level, with specific language for application at the project level.
- A systems engineering approach that includes provisions to help transportation agencies address work zone considerations starting early in planning, and progressing through project design, implementation, and performance assessment.
- Emphasis on addressing the broader impacts of work zones to develop transportation management strategies that address traffic safety and control through the work zone, transportation operations, and public information and outreach.
- Emphasis on a partner driven approach, whereby transportation agencies and the FHWA will work together towards improving work zone safety and mobility.
- Overall flexibility, scalability, and adaptability of the provisions, so as to customize the application of the regulations according to the needs of individual agencies, and to meet the needs of the various types of highway projects.

Summary Discussion of Comments Received in Response to the SNPRM

The following discussion provides an overview of the comments received in response to the SNPRM, and the FHWA's actions to resolve and address the issues raised by the respondents.

Profile of Respondents

We received a total of 33 responses to the docket. Out of the 33 total respondents, 27 were State DOTs; 4 were trade associations; and 2 provided comments as private individuals. The 4 trade associations were namely, the Laborers' Health and Safety Fund of North America (LHSFNA), the American Traffic Safety Services Association (ATSSA), the Associated General Contractors (AGC) of America, and the Institute of Transportation Engineers (ITE). We classified the American Association of State Highway and Transportation Officials (AASHTO) as a State DOT because they represent State DOT interests. The AASHTO provided a consolidated response to the SNPRM on behalf of its member States. Several State DOTs provided their comments individually.

The respondents represented a cross-section of job categories, ranging from all aspects of DOT function, to engineering/traffic/safety/design, to construction and contracting.

Overall Position of Respondents

We received several supportive comments in response to the SNPRM. Most State DOTs, the AASHTO, and all private sector respondents greatly appreciated the FHWA's continued effort to receive input during the development of the proposed rule, and particularly in issuing the SNPRM. Most respondents also noted that the SNPRM addressed the majority of their concerns regarding the originally proposed rule.

The respondents also offered comments on specific areas of concern, and recommended changes to improve the rule's language. The State DOTs and the AASHTO offered comments, which relate to their continued concern that the rule allow for adequate flexibility and scalability while limiting unintended liability and cost. Private sector respondents also offered specific comments on certain areas of concern. Details regarding these issues and FHWA's specific response are discussed in the following section, which provides a section-by-section analysis of the comments.

The level of support for the SNPRM is indicated by the fact that 23 of the 33 respondents expressed overall support for the provisions proposed in the SNPRM. It is to be noted that these respondents were not necessarily supportive of all the provisions, but rather that, their overall position on the SNPRM

was supportive. Many of these respondents provided suggestions on modifications and revised language for specific provisions as they deemed appropriate. Of the 23 respondents who were supportive, 21 represented State DOTs and 2 represented trade associations.

Of the remaining respondents, 2 opposed the issuance of the rule, 2 agreed with the intent and the concepts but did not agree with many of the mandatory provisions, and the remaining 6 did not expressly indicate their overall position.

One of the two respondents who opposed the issuance of the rule was the Iowa DOT. It expressed that it supports the goals of improved safety and reduced congestion, but opposes the proposed rule as it would not necessarily help achieve these goals. It believes that its current work zone policies are sufficient to provide for a high standard of safety and mobility. It noted that the rule is not flexible enough, and that it would require significant commitments from its limited staff.

The other respondent that opposed the rule was the Kansas DOT. It suggested that the FHWA retract the rule and, instead, issue the information on work zone safety and mobility as a guide for use by State DOTs. It believes that encouraging State DOTs to review and improve their current practices on work zone safety and mobility, through closer contact with FHWA and other partners, would be more effective than mandating specific processes. It also suggested changes to specific sections, and recommended that the FHWA implement the AASHTO's recommendations, if retraction of the rule was not an option.

Section-by-Section Analysis of SNPRM Comments and FHWA Response

Section 630.1002 Purpose

There were no major comments in response to this section. The overall sentiment of the respondents was supportive of the language as proposed in the SNPRM, and therefore, we will retain the language as proposed in the SNPRM.

Section 630.1004 Definitions and Explanation of Terms

Most respondents were supportive of this section. Some respondents offered specific comments on some of the definitions proposed in the SNPRM. They are discussed as follows:

- Definition for "Mobility." The AGC of America remarked that the definition for mobility seems to imply a greater emphasis on mobility than on safety. It recommended that we change the second sentence of the definition to imply that work zone mobility should be achieved without compromising the safety of highway workers or road users.

To address this comment the FHWA has amended the definition by adding the words, "while not compromising the safety of highway workers or road users" at the end of the second sentence. In addition, the word "smoothly" after the phrase, "mobility pertains to moving road users," has been replaced by the word "efficiently."

- Definition for "Safety." The AASHTO and several DOTs recommended that the term, "road worker(s)" be changed to "highway worker(s)" for the sake of consistency. We agree with this observation, and made this change. The Georgia DOT recommended that the term "danger" be changed to "potential hazards" to reduce potential liability. We agree with this recommendation, and therefore, replaced the word "danger" with "potential hazards" in the first sentence. In the second sentence, we rephrased "minimizing the exposure to danger of road users" with "minimizing potential hazards to road users."
- Definition for "Temporary Traffic Control (TTC) Plan." We moved the definition for the TTC plan from § 630.1004, Definitions and Explanation of Terms, to § 630.1012(b), Transportation Management Plan (TMP), where the requirements for the TTC plan are laid out. This is in response to a comment from the Georgia DOT that the language under the TTC plan section of § 630.1012(b) was not consistent with the Manual On Uniform Traffic Control Devices (MUTCD).¹ Since the definition for the TTC plan was referenced from the MUTCD, it was removed from the definitions section and placed in § 630.1012(b)(1), where TTC plans are discussed.
- Definitions for "Work Zone" and "Work Zone Crash." There were several comments recommending changes to certain terminology in both these definitions. For example, the AASHTO

¹ The MUTCD is approved by the FHWA and recognized as the national standard for traffic control on all public roads. It is incorporated by reference into the Code of Federal Regulations at 23 CFR part 655. It is available on the FHWA's Web site at <http://mutcd.fhwa.dot.gov> and is available for inspection and copying at the FHWA Washington, DC Headquarters and all FHWA Division Offices as prescribed at 49 CFR part 7.

and several DOTs suggested that the term, “traffic units,” in the first sentence of the Work Zone Crash definition be changed to “road users.” However, we have decided not to adopt the changes in order to maintain consistency with other industry accepted sources—the definition for “work zone” being referenced from the MUTCD, and that for “work zone crash,” from the Model Minimum Uniform Crash Criteria Guideline (MMUCC).²

Section 630.1006 Work Zone Safety and Mobility Policy

The majority of the respondents supported the proposed language in this section. The AASHTO and several DOTs recommended the removal of the second clause in the second to last sentence, “representing the different project development stages.” These respondents believe that this change would grant the States maximum flexibility to implement the most appropriate team for each project. The FHWA agrees with this observation and has deleted the phrase in question.

The ATSSA recommended that we specifically include or encourage the participation of experienced industry professionals in the multi-disciplinary team referenced in the second to last sentence. The FHWA believes that States will solicit the participation of industry representatives if required for the specific project under consideration.

The Kansas DOT commented that the use of the words “policy” and “guidance” in the same sentence could be confusing, as policies usually carry more weight than guidance. This comment refers to the second sentence, the first part of which reads, “This policy may take the form of processes, procedures, and/or guidance * * *” The FHWA disagrees because we believe that policies do not necessarily have to be mandates. For example, it may be a State DOT policy that it “shall” consider and manage work zone impacts of projects, but the actual methods to do so may be provided as guidance to its district/region offices which may vary according to the different types of projects that they encounter. The underlying purpose of the work zone safety and mobility policy section is to require State DOTs to implement a policy for the systematic consideration and management of work zone impacts, so that such consideration and management becomes a part of the mainstream of DOT activities. How a State chooses to implement the policy is its prerogative—and it may take the form of processes, procedures, and/or guidance, and may vary upon the work zone impacts of projects.

The Virginia DOT commented on the second sentence of this section that it does not agree with the “shall” requirement to address

work zone impacts through the various stages of project development and implementation. It justified its objection by saying that “addressing work zone impacts through the various stages of project development and implementation” will not work from a practical standpoint due to unforeseen field conditions and circumstances, and that the shall clause could result in potential litigation. The FHWA disagrees with the Virginia DOT. We would like to mention that the second sentence by itself, when taken out of context, doesn’t quite convey the message of the entire section. The preceding sentence and the following sentence need to be considered in interpreting what the second sentence means. The first sentence requires that State DOTs implement a policy for the systematic consideration and management of work zone impacts on all Federal-aid highway projects. The second sentence further qualifies the term “systematic” by saying that the policy shall address work zone impacts throughout the various stages of project development and implementation—this implies that the consideration and management of work zone impacts progresses through the various stages. The third sentence further clarifies that the methods to implement this policy may not necessarily be absolute requirements, but rather be implemented through guidance. Further, the third sentence provides a more specific delineator by saying that the implementation of the policy may vary based upon the characteristics and expected work zone impacts of individual projects or classes of projects.

Section 630.1008 Agency-Level Processes and Procedures

The AASHTO and several State DOTs remarked that there is inconsistency with the use of “Agency” and “State Agency,” and that this needs to be resolved. Further, a few State DOTs sought clarification as to whether “agency” applies to the State transportation agency or other entities that might be involved in the project development process (i.e., county and/or local governments and authorities). In response to this comment, we changed all instances of the terms “State Agency” and “Agency” in the entire subpart to the term “State,” as referenced in the rule.

Section 630.1008(a), Section Introduction. There were no specific comments in response to the language in this paragraph. In the second sentence, to remove ambiguity and for clarity, we replaced the words “well defined data resources” with the words, “data and information resources.”

The North Carolina DOT observed that the language in this paragraph is an introduction to the section, and that it should not be labeled as

“(a).” We did not make this change because the Office of the Federal Register (OFR) requires paragraph designations on all text in a rule.

Section 630.1008(b), Work Zone Assessment and Management Procedures. Most respondents were supportive of the language in this paragraph.

Section 630.1008(c), Work Zone Data. Most State DOTs and the AASHTO opposed the mandatory requirement to use work zone crash and operational data towards improving work zone safety and mobility on ongoing projects, as well as to improve agency processes and procedures. One of the key reasons cited for this opposition was the difficulty and level of effort involved in obtaining and compiling data quickly enough to take remedial action on ongoing projects. A few DOTs also stated that using data to improve State-level procedures was feasible but not at the individual project level. The AASHTO also observed that there is already a reference to data in § 630.1008(e), “Process Review,” where the use of data is optional and not mandatory. Some States recommended that we clarify the term “operational data,” whether it is observed or collected data. They also noted that the “shall” clauses in the first two sentences are inconsistent with the “encouraged to” in the last sentence, and questioned as to how the use of data can be mandated when the data resources themselves are optional. The California Transportation Department (CalTrans) questioned the objective of developing TMPs and conducting process reviews if appropriate performance measures and data collection standards are not identified for determining success.

² “Model Minimum Uniform Crash Criteria Guideline” (MMUCC), 2d Ed. (Electronic), 2003, produced by National Center for Statistics and Analysis, National Highway Traffic Safety Administration (NHTSA). Telephone 1-(800)-934-8517. Available at the URL: <http://www-nrd.nhtsa.dot.gov>. The NHTSA, the FHWA, the Federal Motor Carrier Safety Administration (FMCSA), and the Governors Highway Safety Association (GHSA) sponsored the development of the MMUCC Guideline which recommends voluntary implementation of the 111 MMUCC data elements and serves as a reporting threshold that includes all persons (injured and uninjured) in crashes statewide involving death, personal injury, or property damage of \$1,000 or more. The Guideline is a tool to strengthen existing State crash data systems.

The FHWA provides the following comments and responses to the above stated concerns:

- The purpose of the provisions in this section is not to require States to collect additional data during project implementation, but rather, to improve the use of available work zone field observations, crash data, and operational information to: (1) Manage the safety and mobility impacts of projects more effectively during implementation; and (2) provide the basis for systematic procedures to assess work zone impacts in project development.

For example, most agencies maintain field diaries for construction projects. These field diaries are intended to provide a log of problems, decisions, and progress made over the duration of a project. In many States, these diaries log incidents and actions such as the need to replace channelization devices into their proper positions after knockdown by an errant vehicle, or to deal with severe congestion that occurred at some point during the day. These log notes, when considered over time, may provide indications of safety or operational deficiencies. To address such deficiencies, it may be necessary and prudent to improve the delineation through the work zone to prevent future occurrences of knockdown events, or to alter work schedules to avoid the congestion that recurs at unexpected times due to some local traffic generation phenomena.

Police reports are another example of an available source of data that may be useful in increasing work zone safety. Provisions are made in many agencies for a copy of each crash report to be forwarded to the engineering section immediately upon police filing of the crash report. Where a work zone is involved, a copy of this report should be forwarded as soon as possible to the project safety manager to determine if the work zone traffic controls had any contribution to the crash so that remedial action can be taken.

These applications do not necessarily require that agencies gather new data, but there may be a need to improve processes to forward such reports to the appropriate staff member for review during project implementation and/or to provide guidance or training to facilitate interpretation of these reports. Agencies may choose to enhance the data they capture to improve the effectiveness of these processes by following national crash data enhancement recommendations and/or linking it with other information (e.g., enforcement actions, public complaints, contractor claims). This same data and information can be gathered for multiple projects and analyzed by the agency to determine if there are common problems that

could be remedied by a change in practices. The information may also be used for process reviews.

- The first sentence of this paragraph was revised to convey that States are required to use field observations, available work zone crash data, and operational information at the project level, to manage the work zone impacts of specific projects during project implementation. This provision requires States to use data and information that is available to them, so as to take appropriate actions in a timely manner to correct potential safety or mobility issues in the field. Operational information refers to any available information on the operation of the work zone, be it observed or collected. For example, many areas have Intelligent Transportation Systems (ITS) in place, and many others are implementing specific ITS deployments to manage traffic during construction projects. The application of this provision to a project where ITS is an available information resource, would result in the use of the ITS information to identify potential safety or mobility issues on that project.
- The second sentence was also revised to convey that work zone crash and operational data from multiple projects shall be analyzed towards improving State processes and procedures. Such analysis will help improve overall work zone safety and mobility. Data gathered during project implementation needs to be maintained for such post hoc analyses purposes. Such data can be used to support analyses that help improve State procedures and the effectiveness of future work zone safety and mobility assessment and management procedures.
- The respondents indicated that the use of “encouraged to” in the last sentence is inconsistent with the “shall” clauses in the first two sentences. Further, the phrase, “establish data resources at the agency and project levels” does not clearly convey the message of the provision. This provision does not require States to embark on a massive data collection, storage, and analysis effort, but rather to promote better use of elements of their existing/ available data and information resources to support the activities required in the first two sentences. Examples of existing/ available data and information resources include: Project logs, field observations, police crash records, operational data from traffic surveillance devices (e.g., data from traffic management centers, ITS devices, etc.), other monitoring activities (e.g., work zone speed enforcement or citations), and/or public complaints. We revised the last sentence to

convey that States should maintain elements of their data and information resources that logically support the required activities.

- In response to CalTrans’ comment regarding establishing performance measures and data collection standards, we appreciate the value of the input, but we believe that we do not have adequate information at this time to specify performance measures for application at the National level. State DOTs may establish such performance measures and data collection standards as applicable to their individual needs and project scenarios. For example, the Ohio-DOT mandates that there shall always be at least two traffic lanes maintained in each direction for any work that is being performed on an Interstate or Interstate look-alike. We believe that such policies need to be developed and implemented according to individual State DOT needs, and hence we maintain a degree of flexibility in the rule language.

Section 630.1008(d), Training. Most State DOTs and the AASHTO opposed the mandatory requirement that would require training for the personnel responsible for work zone safety and mobility during the different project development and implementation stages. These respondents noted that the proposed language implied that State DOTs would be responsible for training all the listed personnel, including those who do not work for the DOT itself, and that this would create a huge resource burden, as well as increase the liability potential for the DOTs. These commenters also ratified their opposition by quoting the MUTCD training requirement, which does not mandate training, but suggests that personnel should be trained appropriate to the job decisions that they are required to make. Some DOTs, including the New York State DOT (NYSDOT), requested that the reference to personnel responsible for enforcement of work zone related transportation management and traffic control be clarified as to whether it refers to law enforcement officers or to field construction/safety inspectors.

The FHWA provides the following comments and responses to the above stated concerns:

- The FHWA agrees that the first sentence in the training section seems to imply that the State would be responsible for training all mentioned personnel; therefore, we changed the sentence to convey that the State shall “require” the mentioned personnel be trained. This change will require the State to train direct State employees only, and takes away the burden from the State to train personnel who are not direct employees. We believe that personnel responsible for the development, design, operation, inspection, and

enforcement of work zone safety and mobility need to be trained, and this requirement will allow for training to be provided by the appropriate entities. The responsibility of the State would be to require such training, either through policy or through specification. For example, the Florida DOT has developed and required work zone training of their designers and contractors by procedure and by specifications. Similarly, the Maryland State Highway Administration (MD-SHA) provides a maintenance of traffic (MOT) design class to personnel responsible for planning and designing work zones, including consultants and contractors.

- Further, in keeping with the MUTCD language on training, we added the phrase, “appropriate to the job decisions each individual is required to make” to the end of the first sentence. This clarifies that the type and level of training will vary according to the responsibilities of the different personnel. For example, Maryland State Highway Police officers attend a 4-hour work zone safety and traffic control session at the Police Academy.
- We also revised the second sentence to convey that States shall require periodic training updates that reflect changing industry practices and State processes and procedures. Since we revised the first sentence to convey that training of non-State personnel is not a State responsibility, in the second sentence, we deleted the phrase, “States are encouraged to keep records of the training successfully completed by these personnel.”
- In response to the request that “personnel responsible for enforcement” of work zone related transportation management and traffic control be clarified, we believe that this group is inclusive of both law enforcement officers and field construction/safety inspectors.

Section 630.1008(e), Process Review. Most respondents were supportive of the language in this section. The AASHTO and several State DOTs recommended that States should have maximum flexibility to implement the most appropriate team for each project. These commenters suggested that the fourth and the fifth sentences of the section be deleted, and that the clause, “as well as FHWA” be added to the end of the third sentence.

The FHWA agrees with the observation made by the AASHTO and State DOTs that States should have maximum flexibility to implement the most appropriate review team for each project. Therefore, as suggested, we deleted the fourth and the fifth sentence of the section, and added the clause, “as well as FHWA” to the end of the third sentence. Further, in the third

sentence, we changed the phrase “are encouraged to” to “should.”

Section 630.1010 Significant Projects

All respondents agreed with the concept of defining significant projects, and the requirement to identify projects that are expected to have significant work zone impacts; however, most State DOTs and the AASHTO opposed the requirement to classify Interstate system projects that occupy a location for more than three days with either intermittent or continuous lane closures, as significant. They cited that all Interstate system projects that occupy a location for more than three days would not necessarily have significant work zone impacts, particularly on low-volume rural Interstate sections. Several DOTs remarked that designation of significant projects purely based on the duration would not be prudent, and that the volume of traffic on that Interstate should be taken into account. They also noted that such classification is not consistent with the MUTCD. They remarked that this provision could not be effectively applied to routine maintenance activities performed by State DOT maintenance crews, and that requesting exceptions to such routine work would be unreasonably arduous.

These respondents also objected to the associated exemption clause for the same provision, commenting that it would be very cumbersome to implement. Some States also requested clarification on whether general exceptions would be granted for work categories for defined segments of Interstate projects where the work would have little impact.

The DOTs of Idaho, Montana, North Dakota, South Dakota, and Wyoming commented that the threshold for designating the reference Interstate projects as significant was too low. They suggested that low volume Interstates and rural Interstates should be excluded, and that, the duration should be extended well above the three-day duration.

The AASHTO and the State DOTs also remarked that the identification of significant projects in “cooperation with the FHWA” should be changed to “in consultation with the FHWA.”

The FHWA provides the following responses and proposed action in response to the referenced concerns:

- We agree with the majority of the concerns raised by the respondents.
- We changed the significant projects clause as applicable to Interstate system projects, to require States to classify as significant projects, 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. We believe that this change addresses all the concerns raised by the respondents. The delineation of projects by the boundaries of a designated TMA will address the work zone impacts of lane-closures on Interstate segments in the most heavily traveled areas with recurring congestion problems. We believe that in general, areas with recurring congestion tend to be severely impacted by lane closures as compared to those without recurring congestion. We also believe that the areas that are already designated as TMAs tend to exhibit patterns of recurring congestion on their Interstates due to heavy traffic demand and limited capacity. This revision, in most cases, would also not require low-volume rural Interstate segments to be classified as significant projects.

- We revised the exemption clause provisions related to the applicable Interstate system projects to allow for exemptions to “categories of projects.” This will provide for blanket exemptions for specific categories of projects on Interstate segments that are not expected to have significant work zone impacts. This will eliminate the burdensome procedural aspect of seeking exemptions for Interstate projects on an individual project basis.
- We also reorganized this section to consist of paragraphs (a), (b), (c), and (d). Paragraph (a) provides the general definition for a significant project, with no changes in language from what was proposed in the SNPRM. Paragraph (b) enumerates the purpose of classifying projects as significant, and lays out the requirements for States to classify projects as significant. This language is also the same as what was proposed in the SNPRM. Paragraph (c) provides the revised definition of significant projects as applicable to Interstate system projects. Paragraph (d) provides the revised exemption clause as applicable to significant projects on the Interstate system.
- In keeping with the overall recommendation of respondents, we changed all instances of “Agency” and “State Agency” to “State.”
- We do not agree with the recommendation that the identification of significant projects should be done in “consultation” with the FHWA rather than “cooperation with the FHWA.” We believe that this is a cooperative process, rather than requiring just consultation. Therefore, we did not make any change to this terminology.

Section 630.1012 Project-Level Procedures

Section 630.1012(a). The North Carolina DOT observed that the language in this section is an introduction to the section, and that it should not be labeled as “(a).” We did not make this change because the OFR requires paragraph designations on all text in a rule.

The ITE recommended that the FHWA should encourage consideration of work zone impacts prior to project development, at the corridor and Transportation Improvement Program (TIP) and program development stage. It provided examples of decisions that would be made at the earlier stages, such as, life-cycle cost decisions, and project scheduling decisions. We appreciate ITE’s input and agree with the general intent of its suggested content. We believe that the language in § 630.1002, Purpose and 630.1010, Significant Projects covers some of the issues to which the ITE refers. Specifically, the following two sentences from the respective sections address the ITE’s concerns:

- From § 630.1002, Purpose: “Addressing these safety and mobility issues requires considerations that start early in project development and continue through project completion.”
- From § 630.1010, Significant Projects: “This identification of significant projects should be done as early as possible in the project delivery and development process, and in cooperation with the FHWA.”

Section 630.1012(b), Transportation Management Plan (TMP). Most respondents were supportive of the provisions in this section.

The Florida DOT requested further definition for the phrase “less than significant work zone impacts.” We believe that the definition for “work zone impacts” as provided in § 630.1004 and the clauses for identification of projects with significant work zone impacts, as stated in § 630.1010 adequately describe the phrase “less than significant work zone impacts.” We did not take any action in response to this comment.

The New Jersey DOT recommended that, in order to facilitate maximum flexibility to States, the term “typically” be introduced before the word “consists” in the third sentence of this section. We do not agree with the suggested edit because for significant projects, a TMP shall always consist of a TTC plan, and address Transportation Operations (TO) and Public Information (PI) components, unless an exemption has been granted for that project. We did not take any action in response to this comment.

Section 630.1012(b)(1), Temporary Traffic Control (TTC) Plan. In general, most respondents were supportive of the provisions in this section, except the provision regarding maintenance of preexisting roadside safety features.

Most State DOTs and the AASHTO were opposed to the provision, which required the maintenance of pre-existing roadside safety features in developing and implementing the TTC plan. They recommended that the FHWA either remove the requirement or change the mandatory “shall” to a “should.”

Several DOTs stated that maintenance of all pre-existing roadside safety features would be very difficult, especially, in urban areas. Other DOTs requested clarification on what “preexisting roadside safety features” would entail—whether it would include items like signs, guardrail, and barriers, or it would include features like shoulders, slopes and other geometric aspects. On that note, several DOTs mentioned that maintenance of pre-existing roadside safety “hardware” would be more practical than maintaining pre-existing roadside safety features.

The Laborers Health and Safety Foundation of North America (LHSFNA) continued to stress the requirement for Internal Traffic Control Plans (ITCPs) for managing men and materials within the work area, so as to address worker safety issues better, and to level the playing field for contractors.

The FHWA offers the following in response to the comments and concerns raised above:

- The FHWA agrees with most of the concerns raised by the respondents.
- In the fourth sentence of paragraph (b)(1), we changed the term “pre-existing roadside safety *features*,” to “pre-existing roadside safety *hardware*.” We believe that this change will address all the concerns raised by the respondents, and eliminate ambiguity and subjectivity from the requirement.
- In response to the LHSFNA’s comment regarding ITCPs, we agree that ITCPs are important for providing for worker safety inside the work area, but we still believe that this issue is outside the purview of this rulemaking effort and this subpart.
- In order to be consistent with the remaining sections of this subpart, and to eliminate ambiguity, we deleted the first sentence of this section, and replaced it with the definition for TTC plan as stated in § 630.1004. Consequently, we removed the definition for TTC plan from § 630.1004.

Section 630.1012(b)(2), Transportation Operations (TO) Component. Most respondents were supportive of the provisions in this section. The AASHTO and several DOTs suggested that “traveler information” be removed as a typical TO strategy because “traveler information” fits more logically in the PI component. The New Jersey DOT recommended that the phrase “transportation operations and safety *requirements*” be changed to “transportation operations and safety *strategies*,” so as to soften the tone of the language.

We agree with both of the above observations; therefore, we removed “traveler information” from the listing of typical TO strategies in the second sentence. We also changed the phrase “transportation operations and safety *requirements*” to “transportation operations and safety *strategies*” in the last sentence.

Section 630.1012(b)(3), Public Information Component. Most respondents were supportive of the provisions in this section. The AASHTO and several DOTs suggested that “traveler information” be included as a typical PI strategy rather than a TO strategy, because “traveler information” fits more logically in the PI component. The New Jersey DOT recommended that the phrase “public information and outreach *requirements*” be changed to “public information and outreach *strategies*,” so as to soften the tone of the language.

We agree with both of the above observations; therefore, we added a new sentence after the first sentence, to indicate that the PI component may include traveler information strategies. We also changed the phrase “public information and outreach requirements” to “public information and outreach *strategies*” in the third sentence.

Section 630.1012(b)(4), Coordinated Development of TMP. Most respondents were supportive of the provisions in this section. The AASHTO and several DOTs recommended that the terminology, “coordination and partnership” in the first sentence, be changed to “consultation,” so that it doesn’t imply active and direct participation from all the subjects. They explained that the term “coordination” implies that all participants have veto/negative powers which may delay project delivery as it is impossible to satisfy everybody. Further, the DOTs of Idaho, Montana, North Dakota, South Dakota, and Wyoming commented that the use of “*i.e.*” for the list of stakeholders implies that all those stakeholders are required for all projects. So they recommended that we change the “*i.e.*” to “*e.g.*” so that it would

imply that the list provides examples of possible stakeholders, and that all of them need not be involved in all projects.

The FHWA agrees with both of the above observations and recommendations; therefore, we changed the phrase “partnership and coordination” to “consultation” in the first sentence of this section. We also changed “*i.e.*” to “*e.g.*” for the list of stakeholders.

Section 630.1012(c), Inclusion of TMPs in Plans, Specifications, and Estimates (PS&Es). Most respondents were supportive of the provisions in this section. The DOTs of Idaho, Montana, North Dakota, South Dakota, and Wyoming noted that the last sentence in this section could imply that the State shall approve any TMP that is developed by the contractor, irrespective of whether it meets the standards or not. They recommended that the sentence be revised for clarity.

The FHWA agrees with the above observation. We revised the last sentence of this section to convey that contractor developed TMPs shall be subject to the approval of the State, and that the TMPs shall not be implemented before they are approved by the State. This clarifies the language and explicitly states the notion that it is the State that is ultimately responsible for approving any contractor developed TMP.

Section 630.1012(d), Pay Items. Most respondents were supportive of the provisions in this section. However, the ATSSA and the AGC of America opposed the option in § 630.1012(d)(1) for States to use lump sum pay items for implementing the TMPs. The ATSSA believes that unit bid items provide greater specificity and are a better indicator of the direct cost of work zones. Conversely, the use of a lump sum pay item provides less comprehensive data, and may, in some cases, limit, or eliminate the contractor’s ability to make a profit on certain projects due to unknown equipment or device requirements either during bidding or project implementation. It cited that unit pay items, especially for the TTC plan, would require that all the identified work zone safety and mobility strategies/equipment/devices be provided for by the contractor. This would level the playing field, and not place conscientious contractors (those who lay emphasis on work zone safety and mobility and include them in their bids) at a disadvantage.

The FHWA recognizes ATSSA’s and AGC’s concerns, but we believe that States have the required understanding of when to use unit pay items and when not to, and that the requirement for unit pay items on all projects is not practical

for real-world application. Therefore, we did not remove the option for DOTs to use lump sum contracting.

We changed “*i.e.*” to “*e.g.*” for the list of possible performance criteria for performance specifications in § 630.1012(d)(2), to remove the implication that the list is an exhaustive list of performance criteria.

Section 630.1012(e), Responsible Persons. Most respondents were supportive of the provisions in this section. A few State DOTs remarked that the terms “qualified person,” “assuring,” and “effectively administered,” in § 630.1012(e) were ambiguous and lent themselves to subjective interpretation.

The FHWA agrees with the above observations. We changed the term “qualified” to “trained,” as specified in § 630.1008(d) so as to clarify the requirement for the responsible person. We also changed the phrase “assuring that” to “implementing,” and deleted the phrase, “are effectively administered.”

Section 630.1014 Implementation

Most respondents were supportive of the provisions in this section. We did not make any changes to the language in this section.

Section 630.1016 Compliance Date

Most respondents were supportive of the provisions in this section. We did not make any changes to the language in this section.

Rulemaking Analyses and Notices

Executive Order 12866 (Regulatory Planning and Review) and U.S. DOT

Regulatory Policies and Procedures

The FHWA has determined that this action is not a significant regulatory action within the meaning of Executive Order 12866 or significant within the meaning of the U.S. Department of Transportation regulatory policies and procedures.

This final rule is not anticipated to adversely affect, in a material way, any sector of the economy. In addition, these changes will not create a serious inconsistency with any other agency’s action or materially alter the budgetary impact of any entitlements, grants, user fees, or loan programs; nor will the changes raise any novel legal or policy issues. Therefore, a full regulatory evaluation is not required.

Regulatory Flexibility Act

In compliance with the Regulatory Flexibility Act (RFA) (Pub. L. 96–354, 5 U.S.C. 601–612), the FHWA has evaluated the effects of this final rule on small entities and has determined that it will not have a significant economic impact on a substantial number of small entities.

This rule applies to State departments of transportation in the execution of their highway program, specifically with respect to work zone safety and mobility. The implementation of the provisions in this rule will not affect the economic viability or sustenance of small entities, as States are not included in the definition of small entity set forth in 5 U.S.C. 601. For these reasons, the RFA does not apply and the FHWA certifies that the final rule will not have a significant economic impact on a substantial number of small entities.

Unfunded Mandates Reform Act of 1995

This final rule will not impose unfunded mandates as defined by the Unfunded Mandates Reform Act of 1995 (Pub. L. 104–4, March 22, 1995, 109 Stat. 48). The final rule will not result in the expenditure by State, local, and tribal governments, in the aggregate, or by the private sector, of \$120.7 million or more in any one year (2 U.S.C. 1532).

Executive Order 13132 (Federalism)

This action has been analyzed in accordance with the principles and criteria contained in Executive Order 13132, dated August 4, 1999, and it has been determined that this action does not have a substantial direct effect or sufficient federalism implications on States that would limit the policymaking discretion of the States. Nothing in this document directly preempts any State law or regulation or affects the States’ ability to discharge traditional State governmental functions.

Executive Order 12372 (Intergovernmental Review)

Catalog of Federal Domestic Assistance Program Number 20.205, Highway Planning and Construction. The regulations implementing Executive Order 12372 regarding intergovernmental consultation on Federal programs and activities apply to this program.

Paperwork Reduction Act of 1995

Under the Paperwork Reduction Act of 1995 (PRA) (44 U.S.C. 3501, et seq.), Federal agencies must obtain approval from the Office of Management and Budget (OMB) for each collection of information they conduct, sponsor, or require through regulations.

The FHWA has determined that this final rule contains a requirement for data and information to be collected and maintained in the support of design, construction, and operational decisions that affect the safety and mobility of the traveling public related to highway and roadway work zones. This information collection requirement was submitted to and approved by the OMB, pursuant to the provisions of the PRA. In this

submission, the FHWA requested the OMB to approve a single information collection clearance for all of the data and information in this final rule. The requirement has been approved, through July 31, 2007; OMB Control No. 2125–0600.

The FHWA estimates that a total of 83,200 burden hours per year would be imposed on non-Federal entities to provide the required information for the regulation requirements. Respondents to this information collection include State Transportation Departments from all 50 States, Puerto Rico, and the District of Columbia. The estimates here only include burdens on the respondents to provide information that is not usually and customarily collected.

Executive Order 13175 (Tribal Consultation)

The FHWA has analyzed this action under Executive Order 13175, dated November 6, 2000, and believes that this action will not have substantial direct effects on one or more Indian tribes; will not impose substantial direct compliance costs on Indian tribal governments; and will not preempt tribal law. This rulemaking primarily applies to urbanized metropolitan areas and National Highway System (NHS) roadways that are under the jurisdiction of State transportation departments. The purpose of this final rule is to mitigate the safety and mobility impacts of highway construction and maintenance projects on the transportation system, and would not impose any direct compliance requirements on Indian tribal governments and will not have any economic or other impacts on the viability of Indian tribes. Therefore, a tribal summary impact statement is not required.

Executive Order 13211 (Energy Effects)

The FHWA has analyzed this action under Executive Order 13211, Actions Concerning Regulations that Significantly Affect Energy Supply, Distribution or Use. We have determined that this is not a significant energy action under that order because it is not a significant regulatory action under Executive Order 12866 and is not likely to have a significant adverse effect on the supply, distribution, or use of energy. Further, we believe that the implementation of the final rule by State departments of transportation will reduce the amount of congested travel on our highways, thereby reducing the fuel consumption associated with congested travel. Therefore, the FHWA certifies that a Statement of Energy Effects under Executive Order 13211 is not required.

National Environmental Policy Act

The FHWA has analyzed this action for the purposes of the National Environmental Policy Act of 1969 (42 U.S.C. 4321–4347 et seq.) and has determined that this action will not have any effect on the quality of the environment. Further, we believe that the implementation of the final rule by State departments of transportation will reduce the amount of congested travel on our highways. This reduction in congested travel will reduce automobile emissions thereby contributing to a cleaner environment.

Executive Order 12630 (Taking of Private Property)

The FHWA has analyzed this final rule under Executive Order 12630, Governmental Actions and Interference with Constitutionally Protected Property Rights. The FHWA does not anticipate that this action will affect a taking of private property or otherwise have taking implications under Executive Order 12630.

Executive Order 12988 (Civil Justice Reform)

This action meets applicable standards in sections 3(a) and 3(b)(2) of Executive Order 12988, Civil Justice Reform, to minimize litigation, eliminate ambiguity, and reduce burden.

Executive Order 13045 (Protection of Children)

The FHWA has analyzed this action under Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks. The FHWA certifies that this action will not cause an environmental risk to health or safety that may disproportionately affect children.

Regulation Identification Number

A regulation identification number (RIN) is assigned to each regulatory action listed in the Unified Agenda of Federal Regulations. The Regulatory Information Service Center publishes the Unified Agenda in April and October of each year. The RIN contained in the heading of this document can be used to cross reference this action with the Unified Agenda.

List of Subjects in 23 CFR Part 630

Government contracts, Grant programs—transportation, Highway safety, Highways and roads, Incorporation by reference, Project agreement, Traffic regulations.

Issued on: September 1, 2004.

Mary E. Peters,
Federal Highway Administrator.

- In consideration of the foregoing, the FHWA amends title 23, Code of Federal Regulations, Part 630, as follows:

PART 630—PRECONSTRUCTION PROCEDURES

- 1. The authority citation for part 630 continues to read as follows:
Authority: 23 U.S.C. 106, 109, 115, 315, 320, and 402(a); 23 CFR 1.32; and 49 CFR 1.48(b).

- 2. Revise subpart J of part 630 to read as follows:

Subpart J—Work Zone Safety and Mobility

Sec.

630.1002 Purpose.

630.1004 Definitions and explanation of terms.

630.1006 Workzone safety and mobility policy.

630.1008 State-level processes and procedures.

630.1010 Significant projects.

630.1012 Project-level procedures.

630.1014 Implementation.

630.1016 Compliance date.

§ 630.1002 Purpose.

Work zones directly impact the safety and mobility of road users and highway workers. These safety and mobility impacts are exacerbated by an aging highway infrastructure and growing congestion in many locations. Addressing these safety and mobility issues requires considerations that start early in project development and continue through project completion. Part 6 of the Manual On Uniform Traffic Control Devices (MUTCD)¹ sets forth basic principles and prescribes standards for the design, application, installation, and maintenance of traffic control devices for highway and street construction, maintenance operation, and utility work. In addition to the provisions in the MUTCD, there are other actions that could be taken to further help mitigate the safety and mobility impacts of work zones. This subpart establishes requirements and provides guidance for systematically addressing the safety and mobility impacts of work zones, and developing strategies to help manage these impacts on all Federal-aid highway projects.

¹ The MUTCD is approved by the FHWA and recognized as the national standard for traffic control on all public roads. It is incorporated by reference into the Code of Federal Regulations at 23 CFR part 655. It is available on the FHWA's Web site at <http://mutcd.fhwa.dot.gov> and is available for inspection and copying at the FHWA Washington, DC Headquarters and all FHWA Division Offices as prescribed at 49 CFR part 7.

§ 630.1004 Definitions and explanation of terms.

As used in this subpart:

Highway workers include, but are not limited to, personnel of the contractor, subcontractor, DOT, utilities, and law enforcement, performing work within the right-of-way of a transportation facility.

Mobility is the ability to move from place to place and is significantly dependent on the availability of transportation facilities and on system operating conditions. With specific reference to work zones, mobility pertains to moving road users efficiently through or around a work zone area with a minimum delay compared to baseline travel when no work zone is present, while not compromising the safety of highway workers or road users. The commonly used performance measures for the assessment of mobility include delay, speed, travel time and queue lengths.

Safety is a representation of the level of exposure to potential hazards for users of transportation facilities and highway workers. With specific reference to work zones, safety refers to minimizing potential hazards to road users in the vicinity of a work zone and highway workers at the work zone interface with traffic. The commonly used measures for highway safety are the number of crashes or the consequences of crashes (fatalities and injuries) at a given location or along a section of highway during a period of time. Highway worker safety in work zones refers to the safety of workers at the work zone interface with traffic and the impacts of the work zone design on worker safety. The number of worker fatalities and injuries at a given location or along a section of highway, during a period of time are commonly used measures for highway worker safety.

Work zone² is an area of a highway with construction, maintenance, or utility work activities. A work zone is typically marked by signs, channelizing devices, barriers, pavement markings, and/or work vehicles. It extends from the first warning sign or high-intensity rotating, flashing, oscillating, or strobe lights on a vehicle to the END ROAD WORK sign or the last temporary traffic control (TTC) device.

Work zone crash³ means a traffic crash in which the first harmful event occurs within the boundaries of a work zone or on an approach to or exit from a work zone, resulting from an activity, behavior, or control related to the movement of the traffic units through the work zone. This includes crashes occurring on approach to, exiting from or adjacent to work zones that are related to the work zone.

Work zone impacts refer to work zone-induced deviations from the normal range of transportation system safety and mobility. The extent of the work zone impacts may vary based on factors such as, road classification, area type (urban, suburban, and rural), traffic and travel characteristics, type of work being performed, time of day/night, and complexity of the project. These impacts may extend beyond the physical location of the work zone itself, and may occur on the roadway on which the work is being performed, as well as other highway corridors, other modes of transportation, and/or the regional transportation network.

§ 630.1006 Work zone safety and mobility policy.

Each State shall implement a policy for the systematic consideration and management of work zone impacts on all Federal-aid highway projects. This policy shall address work zone impacts throughout the various stages of the project development and implementation process. This policy may take the form of processes, procedures, and/or guidance, and may vary based on the characteristics and expected work zone impacts of individual projects or classes of projects. The States should institute this policy using a multi-disciplinary team and in partnership with the FHWA. The States are encouraged to implement this policy for non-Federal-aid projects as well.

§ 630.1008 State-level processes and procedures.

(a) This section consists of State-level processes and procedures for States to implement and sustain their respective work zone safety and mobility policies. State-level processes and procedures, data and information resources, training, and periodic evaluation enable a systematic approach for addressing and managing the safety and mobility impacts of work zones.

(b) Work zone assessment and management procedures. States should develop and implement systematic procedures to assess work zone impacts in project development, and to manage safety and mobility during project implementation. The scope of these procedures shall be based on the project characteristics.

(c) Work zone data. States shall use field observations, available work zone crash data, and operational information to manage work zone impacts for specific projects during implementation. States shall continually pursue improvement of work zone safety and mobility by analyzing work zone crash and operational data from multiple projects to improve State processes and procedures. States

should maintain elements of the data and information resources that are necessary to support these activities.

(d) Training. States shall require that personnel involved in the development, design, implementation, operation, inspection, and enforcement of work zone related transportation management and traffic control be trained, appropriate to the job decisions each individual is required to make. States shall require periodic training updates that reflect changing industry practices and State processes and procedures.

(e) Process review. In order to assess the effectiveness of work zone safety and mobility procedures, the States shall perform a process review at least every two years. This review may include the evaluation of work zone data at the State level, and/or review of randomly selected projects throughout their jurisdictions. Appropriate personnel who represent the project development stages and the different offices within the State, and the FHWA should participate in this review. Other non-State stakeholders may also be included in this review, as appropriate. The results of the review are intended to lead to improvements in work zone processes and procedures, data and information resources, and training programs so as to enhance efforts to address safety and mobility on current and future projects.

2 MUTCD, Part 6, "Temporary Traffic Control," Section 6C.02, "Temporary Traffic Control Zones."

3 "Model Minimum Uniform Crash Criteria Guideline" (MMUCC), 2d Ed. (Electronic), 2003, produced by National Center for Statistics and Analysis, National Highway Traffic Safety Administration (NHTSA). Telephone 1-(800)-934-8517. Available at the URL: <http://www-nrd.nhtsa.dot.gov>. The NHTSA, the FHWA, the Federal Motor Carrier Safety Administration (FMCSA), and the Governors Highway Safety Association (GHSA) sponsored the development of the MMUCC Guideline which recommends voluntary implementation of the 111 MMUCC data elements and serves as a reporting threshold that includes all persons (injured and uninjured) in crashes statewide involving death, personal injury, or property damage of \$1,000 or more. The Guideline is a tool to strengthen existing State crash data systems.

§ 630.1010 Significant projects.

(a) A significant project is one that, alone or in combination with other concurrent projects nearby is anticipated to cause sustained work zone impacts (as defined in § 630.1004) that are greater than what is considered tolerable based on State policy and/or engineering judgment.

(b) The applicability of the provisions in § 630.1012(b)(2) and 630.1012(b)(3) is dependent upon whether a project is determined to be significant. The State shall identify upcoming projects that are expected to be significant. This identification of significant projects should be done as early as possible in the project delivery and development process, and in cooperation with the FHWA. The State's work zone policy provisions, the project's characteristics, and the magnitude and extent of the anticipated work zone impacts should be considered when determining if a project is significant or not.

(c) 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.

(d) For an Interstate system project or categories of Interstate system projects that are classified as significant through the application of the provisions in § 630.1010(c), but in the judgment of the State they do not cause sustained work zone impacts, the State may request from the FHWA, an exception to § 630.1012(b)(2) and § 630.1012(b)(3). Exceptions to these provisions may be granted by the FHWA based on the State's ability to show that the specific Interstate system project or categories of Interstate system projects do not have sustained work zone impacts.

§ 630.1012 Project-level procedures.

(a) This section provides guidance and establishes procedures for States to manage the work zone impacts of individual projects.

(b) Transportation Management Plan (TMP). A TMP consists of strategies to manage the work zone impacts of a project. Its scope, content, and degree of detail may vary based upon the State's work zone policy, and the State's understanding of the expected work zone impacts of the project. For significant projects (as defined in § 630.1010), the State shall develop a TMP that consists of a Temporary Traffic Control (TTC) plan and addresses both Transportation Operations (TO) and Public Information (PI) components. For individual projects or classes of projects that the State determines to have

less than significant work zone impacts, the TMP may consist only of a TTC plan. States are encouraged to consider TO and PI issues for all projects.

(1) A TTC plan describes TTC measures to be used for facilitating road users through a work zone or an incident area. The TTC plan plays a vital role in providing continuity of reasonably safe and efficient road user flow and highway worker safety when a work zone, incident, or other event temporarily disrupts normal road user flow. The TTC plan shall be consistent with the provisions under Part 6 of the MUTCD and with the work zone hardware recommendations in Chapter 9 of the American Association of State Highway and Transportation Officials (AASHTO) Roadside Design Guide. Chapter 9 of the AASHTO Roadside Design Guide: "Traffic Barriers, Traffic Control Devices, and Other Safety Features for Work Zones" 2002, is incorporated by reference in accordance with 5 U.S.C. 552(a) and 1 CFR part 51 and is on file at the National Archives and Record Administration (NARA). For information on the availability of this material at NARA call (202) 741-6030, or go to http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html. The entire document is available for purchase from the American Association of State Highway and Transportation Officials (AASHTO), 444 North Capitol Street, NW., Suite 249, Washington, DC 20001 or at the URL: <http://www.aashto.org/bookstore>. It is available for inspection from the FHWA Washington Headquarters and all Division Offices as listed in 49 CFR Part 7. In developing and implementing the TTC plan, pre-existing roadside safety hardware shall be maintained at an equivalent or better level than existed prior to project implementation. The scope of the TTC plan is determined by the project characteristics, and the traffic safety and control requirements identified by the State for that project. The TTC plan shall either be a reference to specific TTC elements in the MUTCD, approved standard TTC plans, State transportation department TTC manual, or be designed specifically for the project.

(2) The TO component of the TMP shall include the identification of strategies that will be used to mitigate impacts of the work zone on the operation and management of the transportation system within the work zone impact area. Typical TO strategies may include, but

are not limited to, demand management, corridor/network management, safety management and enforcement, and work zone traffic management. The scope of the TO component should be determined by the project characteristics, and the transportation operations and safety strategies identified by the State.

(3) The PI component of the TMP shall include communications strategies that seek to inform affected road users, the general public, area residences and businesses, and appropriate public entities about the project, the expected work zone impacts, and the changing conditions on the project. This may include traveler information strategies. The scope of the PI component should be determined by the project characteristics and the public information and outreach strategies identified by the State. Public information should be provided through methods best suited for the project, and may include, but not be limited to, information on the project characteristics, expected impacts, closure details, and commuter alternatives.

(4) States should develop and implement the TMP in sustained consultation with stakeholders (e.g., other transportation agencies, railroad agencies/operators, transit providers, freight movers, utility suppliers, police, fire, emergency medical services, schools, business communities, and regional transportation management centers).

(c) The Plans, Specifications, and Estimates (PS&Es) shall include either a TMP or provisions for contractors to develop a TMP at the most appropriate project phase as applicable to the State's chosen contracting methodology for the project. A contractor developed TMP shall be subject to the approval of the State, and shall not be implemented before it is approved by the State.

(d) The PS&Es shall include appropriate pay item provisions for implementing the TMP, either through method or performance based specifications.

(1) For method-based specifications individual pay items, lump sum payment, or a combination thereof may be used.

(2) For performance based specifications, applicable performance criteria and standards may be used (e.g., safety performance criteria such as number of crashes within the work zone; mobility performance criteria such as travel time through the work zone, delay, queue length, traffic volume; incident response and clearance criteria; work duration criteria).

(e) Responsible persons. The State and the contractor shall each designate a trained person, as specified in § 630.1008(d), at the project level who has the primary responsibility and sufficient authority for implementing the TMP and other safety and mobility aspects of the project.

§ 630.1014 Implementation.

Each State shall work in partnership with the FHWA in the implementation of its policies and procedures to improve work zone safety and mobility. At a minimum, this shall involve an FHWA review of conformance of the State's policies and procedures with this regulation and reassessment of the State's implementation of its procedures at appropriate intervals. Each State is encouraged to address implementation of this regulation in its stewardship agreement with the FHWA.

§ 630.1016 Compliance Date.

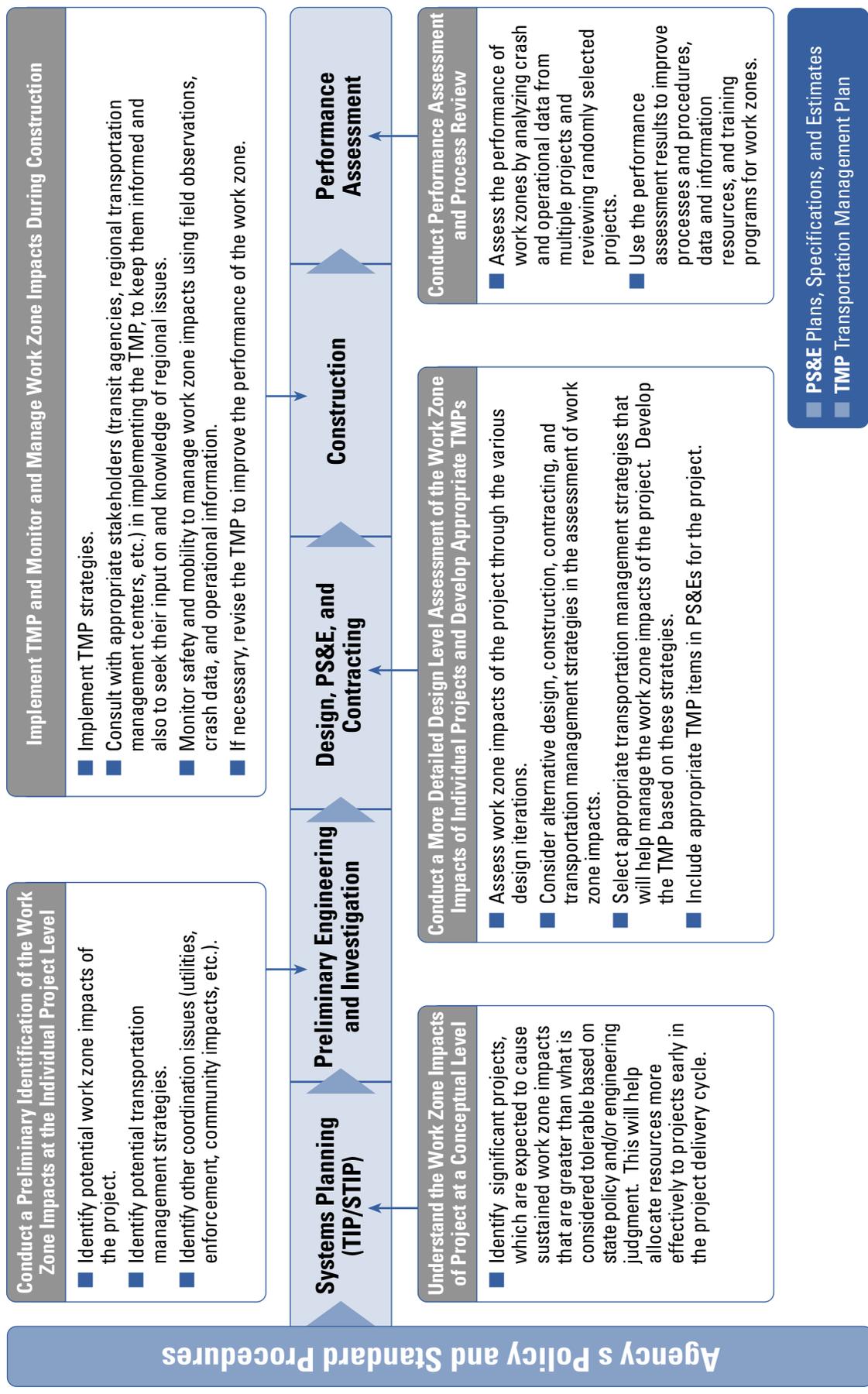
States shall comply with all the provisions of this rule no later than October 12, 2007. For projects that are in the later stages of development at or about the compliance date, and if it is determined that the delivery of those projects would be significantly impacted as a result of this rule's provisions, States may request variances for those projects from the FHWA, on a project-by-project basis.

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Appendix B – Applying the Rule to the Project Delivery Process

The chart below illustrates how the provisions of the Rule may be applied to the stages of a typical project delivery process for road projects. An agency's work zone policy and its processes and procedures will influence how this diagram looks for a given agency.



Appendix C – Information on Companion Guidance Documents

To supplement this Rule Implementation Guide, FHWA has also developed a suite of companion guidance documents that provide more detail on the following aspects of the updated work zone Rule (the Rule):

- Work Zone Impacts Assessment
- Work Zone Transportation Management Plans (TMPs)
- Work Zone Public Information and Outreach Strategies

Starting in late 2005, these documents will be available in hard copy and can also be downloaded from http://www.ops.fhwa.dot.gov/wz/resources/final_rule.htm.

A synopsis of each of the Guides follows.

Work Zone Impacts Assessment: An Approach to Assess and Manage Work Zone Safety and Mobility Impacts of Road Projects

This Guide offers some guiding principles and a general approach for assessing the potential safety and mobility impacts of road projects and developing strategies to manage the expected impacts. The Rule encourages agencies to develop and implement procedures for work zone impacts assessment. The Guide is intended to assist agencies with developing and/or updating their own procedures for assessing and managing work zone impacts.

The approach used in the Guide is structured to mirror the program delivery process commonly used by Departments of Transportation (DOTs). The Guide presents the work zone impacts assessment process activities organized according to the program delivery stages, as follows:

- Developing and implementing an overall work zone safety and mobility policy at the policy-level.
- Conducting a first-cut work zone impacts assessment at the systems planning-level.
- Conducting a preliminary project-level work zone impacts assessment during preliminary engineering.
- Conducting detailed project-level work zone impacts assessment during design.
- Monitoring and managing work zone impacts during construction.
- Conducting post-construction work zone performance assessments.
- Incorporating work zone impacts assessment procedures in ongoing management, operations, and maintenance.

Within this Guide, a variety of methods are used to describe how work zone impacts assessment may be incorporated into the respective program delivery stages, including:

- Process diagrams.
- Work flow explanations.
- Real-world examples.
- Links to more detailed information about each example.

Developing and Implementing Transportation Management Plans (TMPs) for Work Zones

A TMP lays out a set of coordinated strategies and describes how these strategies will be used to manage the work zone impacts of a road project. The Rule requires the development and implementation of a TMP for all Federal-aid highway projects. The TMP requirement in the Rule helps to expand mitigation of work zone impacts beyond traffic safety and control to other transportation management strategies that address operations and management of the work zone and public information. The scope, content, and level of detail of a TMP will vary based on the agency's work zone policy, the anticipated work zone impacts of the project, and whether the project is determined to be a significant project.¹

This Guide is a resource to help agencies develop, implement, and monitor TMPs. The Guide recognizes that work zone objectives, needs, and issues vary from project to project, and that it is ultimately up to the agency to establish and implement TMPs that best serve the safety and mobility needs of the motoring public, highway workers, businesses, and community.

The Guide covers:

- What a TMP is and the benefits TMPs can provide.
- Recommendations of how and when to develop a TMP.
- A list of components to consider for inclusion in TMPs.
- A matrix of strategies for managing work zone impacts.
- Examples of current TMP practices from several DOTs.
- A list of TMP resources.

Work Zone Public Information and Outreach Strategies

A public information and outreach campaign involves communicating to road users, the general public, area residents and businesses, and appropriate public entities about a road project, the impacts expected from the project's work zone, and changing conditions on the project. A typical campaign will include traveler information strategies for providing information about what to expect in and around the work zone—such as lane and shoulder closings, new traffic patterns, and traffic delay—and available travel alternatives such as different routes and travel modes. For a significant project, the TMP for the project must include public information and outreach strategies to inform those affected by the project of expected work zone impacts and changing conditions.²

¹ Significant projects are described in Sections 5.0 and 6.0 of this Rule implementation Guide.

² Significant projects are described in Sections 5.0 and 6.0 of this Rule implementation Guide.

To help states develop and implement public information and outreach strategies, the Public Information and Outreach Strategies Guide presents information based on a review of approximately 30 project-specific work zone public outreach campaigns used around the country, as well as other available information. The campaigns reviewed were for projects ranging from a major, multi-year Interstate reconstruction project, to an Interstate rehabilitation project done over two weekends, to a street widening project in the downtown of small city.

The underlying theme of the Guide is that successful public information and outreach campaigns are typically well thought out by the project partners and planned well in advance of work zone deployment. For highway officials planning a public information and outreach campaign, the Guide provides tips, examples, and practices on a range of topics including:

- The information and resources needed to plan and evaluate a campaign.
- The different audiences that need to be reached.
- The types of information that need to be conveyed to the various audiences (e.g. project duration, details of lane closures, up-to-the minute traffic delay information, alternative routes or methods of transportation);
- Methods of communication (e.g. newspaper advertisements, brochures, interactive web pages, dynamic message signs).
- When to begin a public information and outreach campaign.
- Evaluating the effectiveness of a public information and outreach campaign.

The Guide also provides a checklist and a set of templates to help agencies with developing a campaign and putting together a public information and outreach plan to implement the campaign.



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