HIGHWAY FACTORS GROUP CHAIRMAN'S FACTUAL REPORT

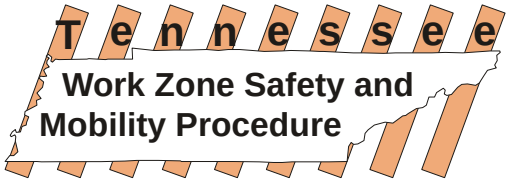
Highway Attachment 3 – TDOT Work Zone Safety and Mobility Manual, Special Provision 712 PTQ, and Transportation Management Plan for CNN 306 Contract

Chattanooga, Tennessee

HWY15MH009

(118 pages)

TDOT WORK ZONE SAFETY & MOBILITY MANUAL



TDOT

November 29, 2007

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TDOT WORK ZONE SAFETY AND MOBILITY MANUAL

Overview

OVERVIEW

Maintaining safety and mobility within Tennessee's roadway work zones is emerging as a new challenge for the state. This challenge has resulted from a rise in essential rehabilitation and reconstruction work combined with growing congestion on the state's roadways.

The Tennessee Department of Transportation (TDOT) is committed to the planning and operation of all work zones under its authority in a manner that provides the highest level of safety for both motorists and workers while also promoting minimum travel delays with the least adverse impacts to local communities.

Purpose of Document

In September 2004, the Federal Highway Administration of the USDOT published 23CFR630 Subpart J, the Work Zone Safety and Mobility Rule (the Final Rule). The Final Rule, applicable for any agency involved in Federal Aid project development, requires development of a multi-level process whereby the safety and operational aspects of every work zone are emphasized. State and local transportation agencies are required to comply with the Final Rule by October 12, 2007. The Final Rule is included as Appendix A.

The purpose of the TDOT Work Zone Safety and Mobility Manual is as follows:

1. It serves as a record of compliance with the Final Rule by promoting safety and mobility within work zones having TDOT oversight.
2. It defines the process by which major aspects of applicable work zones shall be established.
3. It serves to promote coordination between all organizations involved in work zone development, both interagency divisions and parties external to TDOT.
4. It provides guidance for the required completion of the work zone process by providing detailed instruction for completion of Traffic Management Plans.

Transportation Management Plans (TMP's) will be used to plan transportation management strategies to meet both TDOT's goals and the requirements of the Final Rule. The impacts that a work zone are excepted to have on a roadway or a community vary from project to project, so no two TMP's will be exactly the same. The level of planning required for an individual TMP will depend on the project's anticipated impacts. The first step in developing a TMP for a work zone is to determine the appropriate level of TMP to be utilized. Projects can be divided into three separate groups:

- **Significant TMP Projects** require a higher level of work zone impact mitigation and require consideration of various TMP strategies to help mitigate the impacts of a significant project.

- **Intermediate TMP Projects** require additional planning, coordination, etc. beyond a basic Temporary Traffic Control (TTC) plan, but not to the level of a Significant TMP.
- **Basic TMP Projects** require no additional TMP Strategies beyond a typical TTC plan.

TDOT Work Zone Safety and Mobility Manual

This Manual provides guidance in determining the level of work zone planning required for individual projects. The Manual is organized in the following manner:

Part 1: Purpose and Commitment - This section defines TDOT's commitment to comprehensive work zone development. Broad level topics such as procedural goals and objectives and program administration are addressed.

Part 2: TDOT Procedures and Initiatives - This section describes the organizational procedures necessary to fulfill the Final Rule requirements. It outlines systematic procedures to manage, implement and assess the Work Zone Safety and Mobility initiatives. It describes, in detail, the process to be followed and roles for each TDOT Division.

Part 3: Project Significance Assessment - This section details the process of developing a work zone strategy for specific projects. The strategies implemented for a specific project vary depending on the significance of the project. A project that is deemed "significant" requires a high level of work zone impact mitigation including Temporary Traffic Control Strategies, Transportation Operations Strategies and Public Information Strategies. Part 3 reviews the procedures to be used in determining the significance of a project.

Part 4: Transportation Management Plan (TMP) Development - Part 4 describes the procedures required by TDOT's Work Zone Safety and Mobility Process for the development of a TMP for a project. The TMP is the tool used to itemize and describe mitigation strategies for every work zone having TDOT oversight. A TMP Workbook has been developed to serve as the decision-making platform for TMP's and will serve as the documentation of its development.

Appendix - The Appendix contains TMP forms and other referenced documentation.

TDOT WORK ZONE SAFETY AND MOBILITY MANUAL

PART 1: Purpose and Commitment

PART 1: Purpose and Commitment

1.1 Purpose

Maintaining safety and mobility within Tennessee's roadway work zones is emerging as a new challenge for the state. This challenge has resulted from a rise in essential rehabilitation and reconstruction work combined with growing congestion on the state's roadways. In September 2004, the Federal Highway Administration (FHWA) of the United States Department of Transportation published 23CFR630 Subpart J, the Work Zone Safety and Mobility Rule (the Final Rule). The Final Rule, applicable for any agency involved in Federal Aid project development, requires development of a multi-level process whereby the safety and operational aspects of every work zone are emphasized. The purpose of this manual is to outline processes and procedures to address the challenges of maintaining work zone safety and mobility on today's increasingly congested roadways and to meet the requirements of the Final Rule.

1.2 Statement of Commitment

The Tennessee Department of Transportation (TDOT) is committed to the planning and operation of all work zones under its authority and oversight in a manner that provides the highest level of safety for both motorists and workers while also promoting minimum travel delays with the least adverse impacts to local communities.

1.3 Agency Vision

TDOT intends for the Work Zone Safety and Mobility initiative to further highlight and promote the Department's commitment to plan, design and implement its projects in a manner that considers its impact, direct or indirect, on motorists, the environment and the public at-large. This program is to take a holistic and systematic approach to work zone management and implementation.

1.4 Statement of Authority

Legal authority for this Work Zone Safety and Mobility Manual and its procedures is derived from adherence to §630.1006 in 23CFR630 Subpart J which states "Each State shall implement a policy for the systematic consideration and management of work zone impacts on all Federal-aid highway projects." TDOT will implement the processes and procedures within this manual for all federal-aid projects. The same requirements should be extended to all other projects for which the Department has authority.

1.5 Program Goals and Objectives

Goal 1: Maximize safety in all work zones having TDOT oversight by reducing fatality, injury, and property damage crashes statewide.

Objectives:

- Mandate regular inspection of work zone sites and influence areas.
- Promote a presence of enforcement.
- Establish required training for all work zone implementation personnel.
- Meet or exceed all recognized work zone related design standards.

Goal 2: Minimize delay and other negative operational aspects of work zones, whether real or perceived.

Objectives:

- Provide motorist information prior to and through work zones.
- Allow sufficient capacity throughout the construction process.
- Establish creative and flexible construction methods to minimize user delay.
- Recognize the importance of alternate route provision and promotion.
- Collect and review operational data to determine improvement areas.
- Minimize travel delay and vehicular queuing associated with work zones.
- Minimize crashes or other incidents having significant adverse effects on work zone operations.

Goal 3: Promote consistency in all phases of work zone development including planning, design, implementation, and operation.

Objectives:

- Develop a TMP for all applicable work zones.
- Integrate project TMP's into the overall project development process.
- Increase focus on work zone inspections and oversight efforts.
- Ensure regional compliance with statewide work zone procedures.
- Regularly review all required training programs to ensure conformity to current TDOT methods.
- Establish regular and consistent channels of motorist information.

TDOT WORK ZONE SAFETY AND MOBILITY MANUAL

PART 2: TDOT Procedures and Initiatives

PART 2: TDOT Procedures and Initiatives

2.1 Introduction

Part 2 of the manual describes the organizational procedures that are required by TDOT to fulfill the guidelines set forth in the Final Rule. The Final Rule states that DOT's should develop and implement systematic procedures to manage, implement and assess the Work Zone Safety and Mobility initiatives.

The Final Rule specifically addresses the following procurement and management activities:

- Organizational **Roles and Responsibilities**. This defines which TDOT division or position has responsibility for a TMP task assignment and when that action should occur. Because of the diversity of TDOT projects, the exact scope and timeline of TMP development will vary based on the type of project.
- Personnel **Technical Training/Continuing Education**. The Final Rule addresses the need to ensure that all those involved in work zone design, implementation and management be technically qualified. This section describes TDOT's approach to promote competency of staff and agents.
- Work Zone **Performance Assessment**, including the use of **Work Zone Data**. The Final Rule states that DOT's should implement procedures to consider work zone impacts during project development. The proposed mitigation strategies are to be based on the scope and extent of the anticipated impacts. This section outlines TDOT's goal of implementing procedures to monitor work zone conditions and use of field data to track work zone trends and performance.
- **Agency Process Review**. The Final Rule requires that all DOT's conduct a review of its Work Zone Safety and Mobility Program at least once every two (2) years. This section describes TDOT's approach to implementing this initiative and identifies those responsible for this task.

2.2 Roles and Responsibilities

TDOT's Work Zone Safety and Mobility Manual highlights and promotes the Department's commitment to efficiently plan, design and implement its projects. To accomplish this, it is important to identify TDOT Divisions that will have a role in the Work Zone Safety and Mobility initiative, what their tasks will be, and when their respective tasks shall be conducted. Regardless of which Division initiates a project and the staff positions that are responsible for its development, the fundamental objective is to determine the type ("significance") and scope ("strategies") of a TMP required for a project. In general, this process consists of two (2) steps:

- Project Significance Determination (See Part 3), and
- Project TMP Development (See Part 4).

Specific explanation and methodology to conduct these tasks may be found in the referenced sections of the Manual.

Purpose of Roles and Responsibilities

- Based on the project origin, identify the **Division** responsible for Project Significance Determination and TMP Development,
  - Define the **staff position** responsible for **developing** the Project Significance Determination and Project TMP.
  - Define the **staff position** responsible for **reviewing/approving** Significance Determination and Project TMP.
  - Recommend **timeline/schedule** for conducting Project Significance Determination and TMP Development.
- Identify **initial list of exempt projects** that TDOT wishes to exclude from the TMP process due to anticipated minimal adverse impact to motorists and local communities.
- Identify **routine, recurring projects within the Department** that are proposed to be considered not "significant", but shall follow standard TDOT protocol for blanket or "standing" TMP's.

Authority

Division and Regional Directors shall have the authority to interpret policies and procedures outlined in this Manual. Included in that authority are decisions concerning appropriateness of projects for consideration as EXEMPT or being eligible for STANDING TMP's.

"PPRM" Projects

Program, Project and Resource Management (PPRM) projects are traditional types of projects that involve multiple TDOT Divisions. Usually involving major construction activities, this type of project is characterized by in-depth conceptual project planning, and may include extensive environmental planning and public involvement. Typically, these projects originate in the Planning Division, move to the Environmental, Design, Structures, and ROW Divisions for project engineering and finally are administered by the Construction Division.

Typically, the Significance Determination and TMP Development steps for projects of this type have been assigned to occur within the progression of TDOT's PPRM work flow. The following outlines the roles and responsibilities for projects following the typical "PPRM" methodology:

PROJECT SIGNIFICANCE DETERMINATION

Division Responsible:	DESIGN
Staff Position In-Charge of Development:	DESIGN MANAGER I
Staff Position In-Charge of Review/Approval:	DESIGN MANAGER II
Timeline:	After ALIGNMENT SELECTION, Before SURVEY completion

PROJECT TMP DEVELOPMENT

Division Responsible:	DESIGN
Staff Position In-Charge of Development:	DESIGN MANAGER I
Staff Position In-Charge of Review/Approval:	DESIGN MANAGER II
	Timeline: During ROW PLANS DEVELOPMENT

Support: PLANNING & ENVIRONMENTAL DIVISIONS – Provide project information and data.
PROJECT MANAGEMENT – Provide project organization/tracking.

The process for "PPRM" projects is further illustrated in Figure 2.1.

Design Division Projects

These projects differ from the "PPRM" projects in that they originate within and are exclusively managed by Design Division staff. Examples include State Industrial Access, intersection improvement, signalization, and lighting projects. The primary distinguishing factors are that these projects are relatively smaller and do not begin in the Planning Division.

PROJECT SIGNIFICANCE DETERMINATION

Division Responsible:	DESIGN
Staff Position In-Charge of Development:	DESIGN MANAGER I
Staff Position In-Charge of Review/Approval:	DESIGN MANAGER II
	Timeline: During PRELIMINARY PLAN DEVELOPMENT

PROJECT TMP DEVELOPMENT

Division Responsible:	DESIGN
Staff Position In-Charge of Development:	DESIGN MANAGER I
Staff Position In-Charge of Review/Approval:	DESIGN MANAGER II
	Timeline: During FINAL PLAN DEVELOPMENT

Support: PLANNING & ENVIRONMENTAL DIVISIONS – Provide project information and data, when applicable.

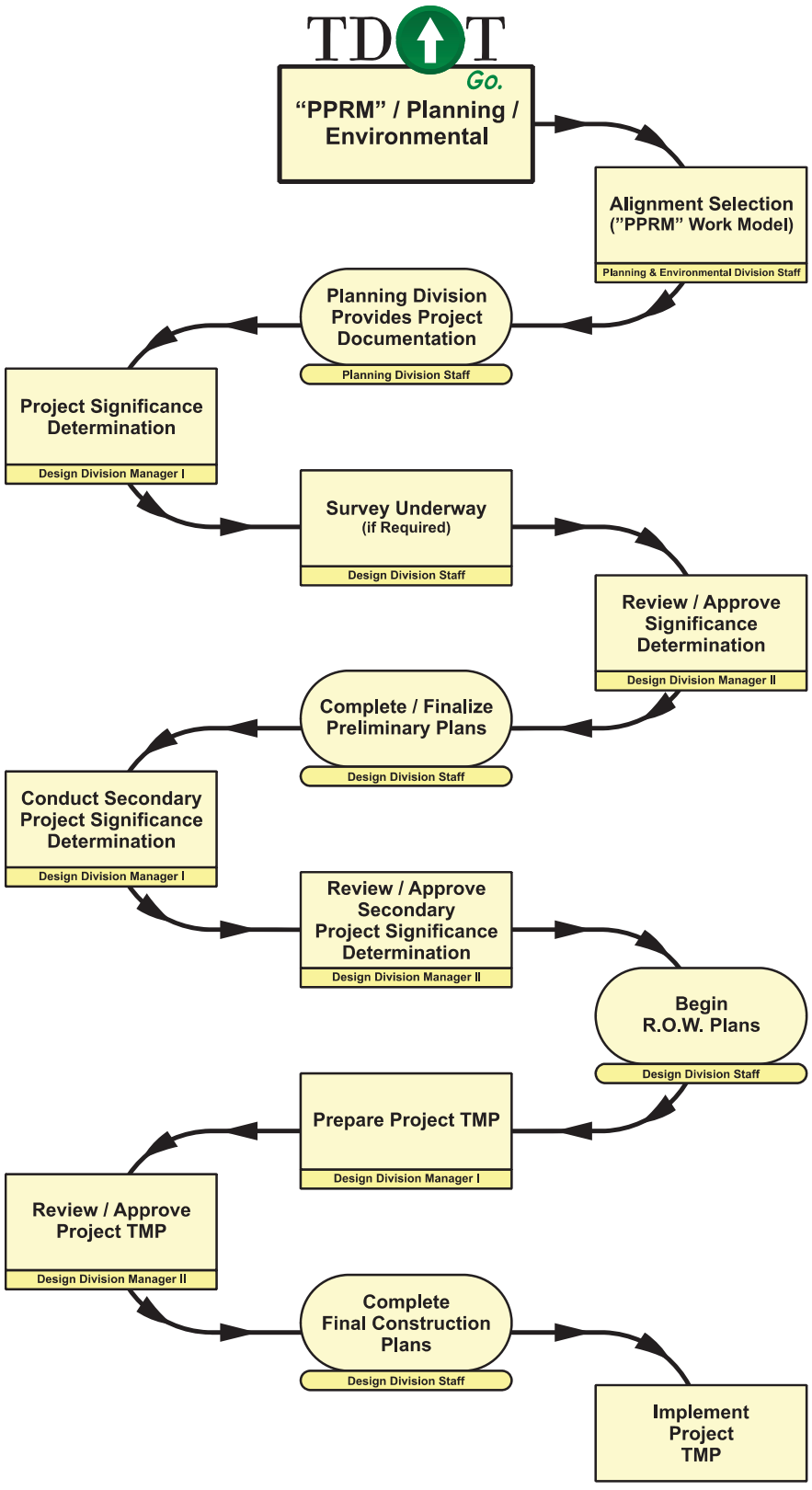

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Figure 2.1
TMP Workflow - "PPRM" Project

"Standing" TMP for Routine, Recurring Activities/Projects

This additional class of activities/projects has been identified as those that are typical and routinely performed by Design staff or contracted workforces. The projects are characterized as having the potential to impact traffic operations due to required lane closures or roadside/shoulder work. They may include, but are not limited to Resurfacing, Noise Wall and Slope Repair projects. The "standing" TMP will be implemented by TDOT staff or agents.

The "standing" TMP methodology **SHALL NOT** be considered for a project/activity that meets the following conditions:

- On an Interstate system route within a Transportation Management Area (TMA), AND
- Having a project/activity duration longer than three days, AND
- Includes use of lane closures (intermittent or continuous).

If a project/activity developed by the Design Division or Regional Design Office meets the above criteria, the project shall follow TDOT's TMP procedures for Design Division projects as previously described.

Otherwise the "standing" TMP will consist of the following:

A) **Temporary Traffic Control Plans** per current TDOT standard drawings which should follow the current version of the Manual on Uniform Traffic Control Devices, Part VI (a custom traffic control plan may be developed as deemed necessary).

B) **Work Zone Standard General Notes** shall be considered and followed per current TDOT procedures.

C) Where lane closures will be necessary as part of work effort, **Public Information Outreach** and/or **Time-of-Day Restrictions** on lane closures should be considered. The decision to utilize these strategies will be considered by the Department as part of its lane closure procedure.

An opportunity occurs later in the project development process for a project's significance determination to be verified. Projects that are the responsibility of TDOT's Design Division, including PPRM projects, are to undergo a secondary significance determination since there is potential for a project's scope to change during preliminary design. A project's original significance determination shall be reviewed again before or concurrently with the beginning of right-of-way plan development. This is to be completed and approved by the appropriate Manager I and Manager II, respectively. See Figures 2.1 and 2.2 for further illustration.

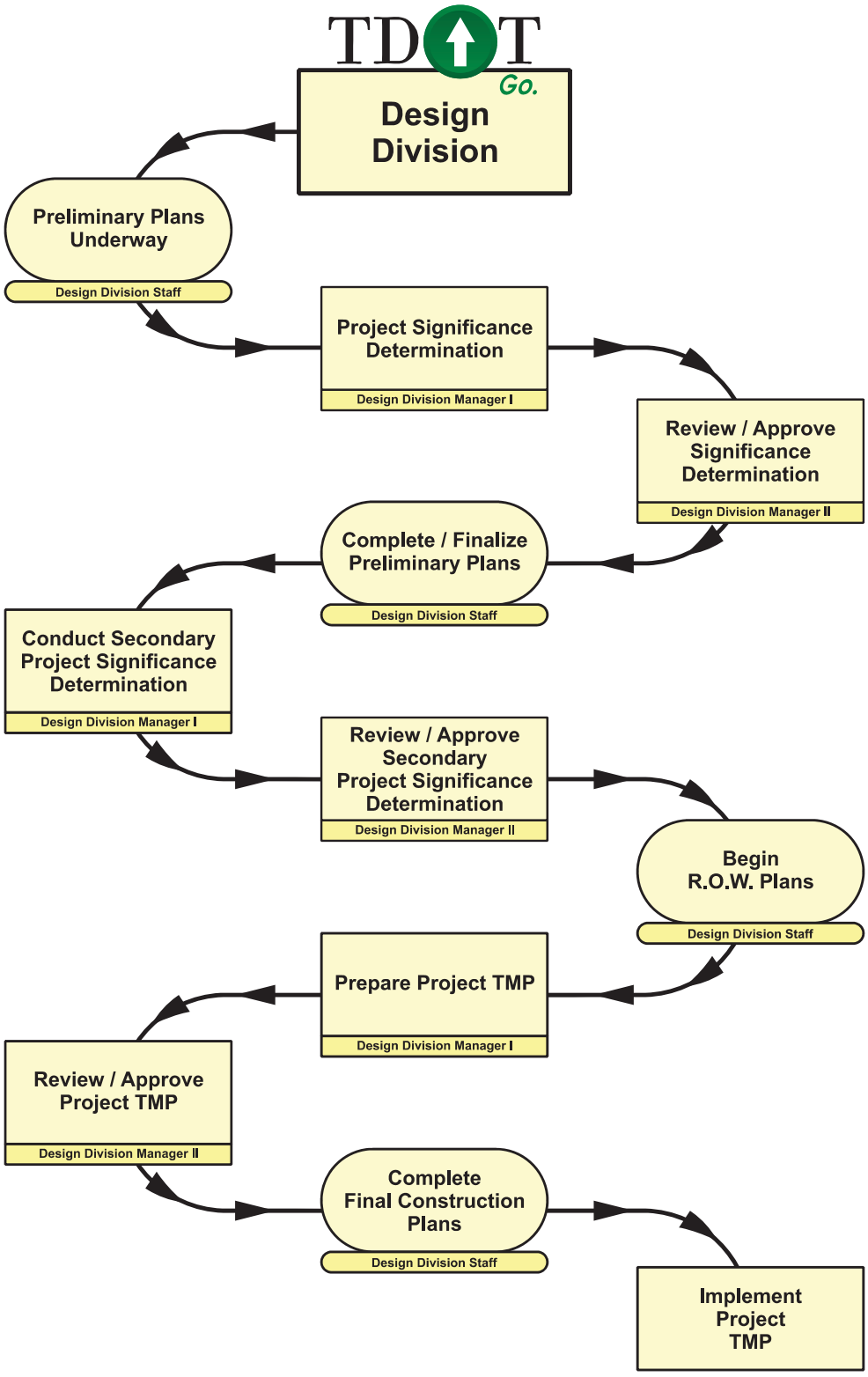

Figure 2.2
TMP Workflow - Design Division Project

Structures Division Projects

These projects originate within and are managed by Structures Division staff. In most cases, a project field visit is conducted by Structures staff to initiate the project. Whether being designed in-house or by consultant engineers, the Structures Manager I will be given the project information, field data and will then conduct the Significance Determination.

PROJECT SIGNIFICANCE DETERMINATION

Division Responsible:	STRUCTURES
Staff Position In-Charge of Development:	STRUCTURES MANAGER I
Staff Position In-Charge of Review/Approval:	STRUCTURES MANAGER II
	Timeline: During PRELIMINARY PLAN DEVELOPMENT

PROJECT TMP DEVELOPMENT

Division Responsible:	STRUCTURES
Staff Position In-Charge of Development:	STRUCTURES MANAGER I
Staff Position In-Charge of Review/Approval:	STRUCTURES MANAGER II
	Timeline: During FINAL PLAN DEVELOPMENT

Support: PLANNING, ENVIRONMENTAL, & DESIGN DIVISIONS – Provide project information and data, when applicable.

"Standing" TMP for Routine, Recurring Activities/Projects

This additional class of activities/projects has been identified as those that are typical and routinely performed by Structures staff or contracted workforces. The projects are characterized as having the potential to impact traffic operations due to required lane closures or roadside/shoulder work. They may include, but are not limited to Bridge Inspection, Bridge Painting, Deck Patching, and Joint Repair. The "standing" TMP will be implemented by TDOT staff or agents.

The "standing" TMP methodology **SHALL NOT** be considered for a project/activity that meets the following conditions:

- On an Interstate system route within a Transportation Management Area (TMA), AND
- Having a project/activity duration longer than three days, AND
- Includes use of lane closures (intermittent or continuous).

If a project/activity developed by the Structures Division meets the above criteria, the project shall follow TDOT's TMP procedures for Structures Division projects as previously described.

Otherwise the "standing" TMP will consist of the following:

D) **Temporary Traffic Control Plans** per current TDOT standard drawings which should follow the current version of the Manual on Uniform Traffic Control Devices, Part VI (a custom traffic control plan may be developed as deemed necessary).
E) **Work Zone Standard General Notes** shall be considered and followed per current TDOT procedures.
F) Where lane closures will be necessary as part of work effort, **Public Information Outreach** and/or **Time-of-Day Restrictions** on lane closures should be considered. The decision to utilize these strategies will be considered by the Department as part of its lane closure procedure.

The process for Structures Division projects is further illustrated in Figure 2.3.

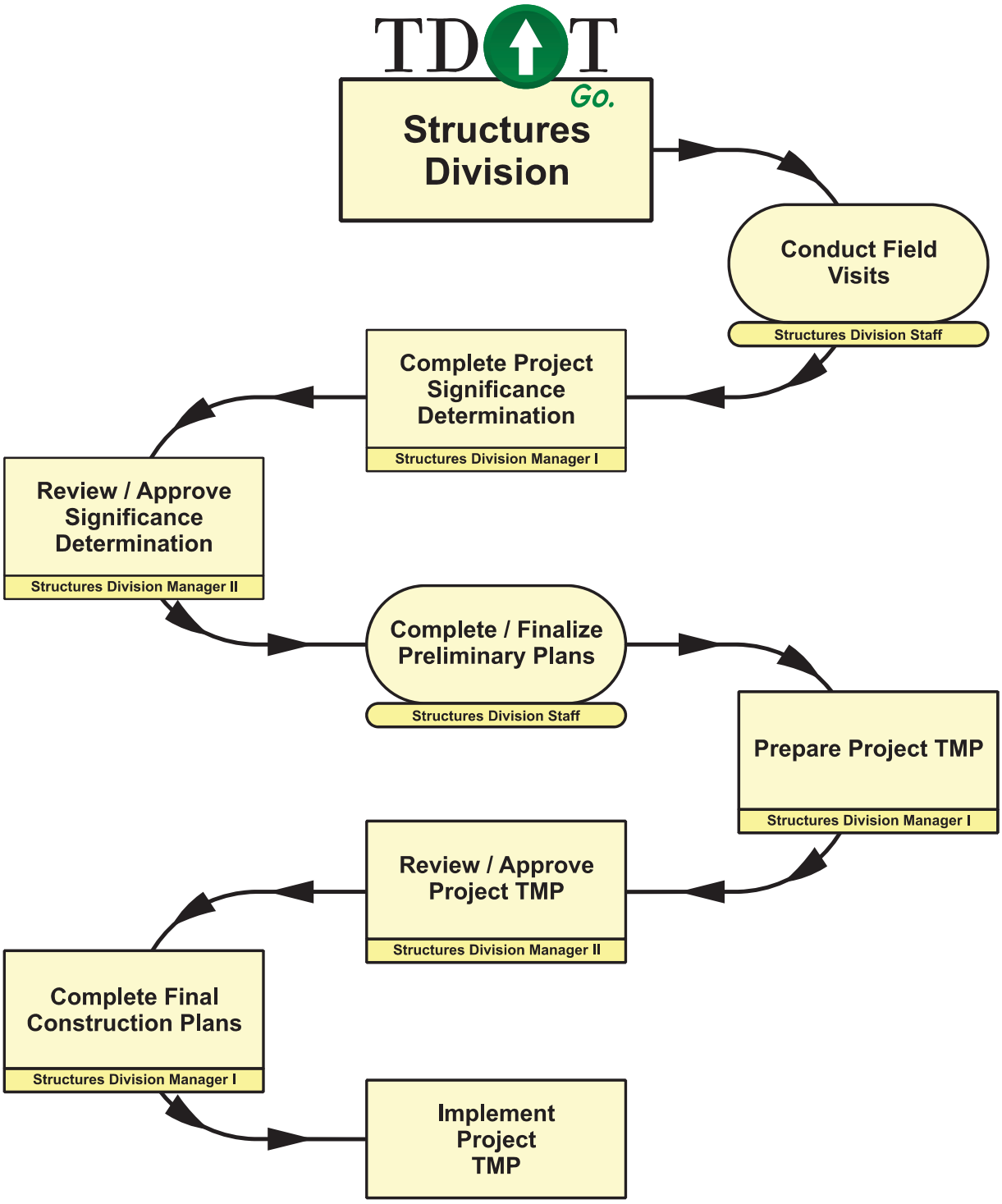

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Figure 2.3
TMP Workflow - Structures Division

Maintenance Division or Regional Maintenance Office Projects/Activities

It has been determined that projects originating within the Maintenance Division or Regional Maintenance Office should have a different approach. This is because of the repetitive nature of much of the work and the fact that many of the activities are not considered actual “projects” with planning and design phases. Many Maintenance Division or Regional Maintenance Office activities have minimal impact on motorists. In addition, there are many instances where repair and rehabilitation activities must be completed within a short period of time.

To address these issues, two groups of activities/projects have been identified that will either be exempt from the TMP process or be covered by existing Temporary Traffic Control and Public Outreach procedures. The latter will be addressed using a "Standing TMP" approach.

Exempt Activities

The following list of TDOT Maintenance activities identifies typical work that is exempt from the TMP requirement. This list may be revised by adding or removing activities as the department deems appropriate.

The following maintenance activities are proposed for exclusion; *project significance determination and TMP development not required*:

Brush Control/Mulching (Roadside)
Litter Removal
Fence Repair
Drainage Structure Repair
Brine/Snow Removal
Vegetation Spraying (Roadside)
Sweeping/Debris Removal
Erosion Control
Ditch Repair
Mowing

For all exempted projects/activities, TDOT will implement appropriate temporary traffic control and advanced warning signage per existing Department processes and procedures for a given project. Due to their short-term nature and relative low impact on highway operations, the exempt projects will not require Significance Determination or TMP Development.

In certain cases, projects which are normally exempt may require development of an original TMP. An example of this case is a culvert replacement, which may be considered drainage structure repair, which requires closing a road. In special cases such as these, the significance determination should be completed and a TMP developed. The Division or Regional Director will be responsible for making this judgment.

“Standing” TMP for Routine, Recurring Activities/Projects

This class of activities/projects has been identified as those that are typical and routinely performed by Maintenance staff or contracted workforces. The projects are characterized as having the potential to impact traffic operations due to required lane

closures or roadside/shoulder work. The “standing” TMP will be implemented by TDOT staff or agents.

The “standing” TMP methodology **SHALL NOT** be considered for a project/activity that meets the following conditions:

- On an Interstate system route within a Transportation Management Area (TMA), AND
- Having a project/activity duration longer than three days, AND
- Includes the use of lane closures (intermittent or continuous).

If a project/activity managed by the Maintenance Division or Regional Maintenance Office meets the above criteria, the project should follow TDOT’s TMP procedures for “Special” Maintenance projects as described in the following section.

Otherwise, non-exempted maintenance projects/activities will implement a “standing” project TMP. The “standing” TMP will consist of the following:

A) **Temporary Traffic Control Plans** per current TDOT standard drawings which should follow the current version of the Manual on Uniform Traffic Control Devices, Part VI (a custom traffic control plan may be developed as deemed necessary).

B) **Work Zone Standard General Notes** shall be followed per current TDOT procedures.

C) Where lane closures will be necessary as part of the work effort, **Public Information Outreach** and/or **Time-of-Day Restrictions** on lane closures will be considered by the Department as part of the lane closure and public information decision making procedures.

The following maintenance activities are examples of ROUTINE, RECURRING projects/activities that may qualify for “standing” TMP consideration:

Pavement Patching/Pot-Hole Repair
Pavement Marking Work
Attenuator Installation/Repair
Shoulder Repair/Construction
“On Call” Contract Activities
Joint Repair
Sign Repair/Replacement
Guardrail Installation/Repair
“No Plans” Contract Activities
Tunnel Maintenance

These types of projects will not require completion of the Project Significance Determination or TMP development. A custom TMP for each occurrence of these activities will not be required. However, these projects/activities must include provisions for appropriate Temporary Traffic Control Plans as outlined and shall follow TDOT’s Public Involvement Plan where deemed necessary by the Regional Maintenance Supervisor and interested division managers (particularly where lane closures are implemented).

"Special" Maintenance Division or Regional Maintenance Office Projects

These projects are outside the routine activities completed by the Maintenance Division. In general, these projects have greater scopes and last for longer durations. Consequently, these projects may have greater impact on motorists and traffic operations.

"Special" projects include road lane additions, intersection modifications, major pavement construction/repair (i.e. interstate concrete pavement installation/repair), individually-contracted/site specific projects, etc.

The projects described above and other projects that are identified as "Special" by TDOT Maintenance Division or Regional Maintenance Offices shall be analyzed by TDOT's TMP process as follows:

PROJECT SIGNIFICANCE DETERMINATION

Division Responsible:	MAINTENANCE/REGIONAL MAINTENANCE OFFICE
Staff Position In-Charge of Development:	ASST. REGIONAL MAINTENANCE SUPERVISOR/ MANAGER I
Staff Position In-Charge of Review/Approval:	REGIONAL MAINTENANCE SUPERVISOR/MANAGER II
	Timeline: DURING PROJECT DEVELOPMENT

PROJECT TMP DEVELOPMENT

Division Responsible:	MAINTENANCE/REGIONAL MAINTENANCE OFFICE
Staff Position In-Charge of Development:	ASST. REGIONAL MAINTENANCE SUPERVISOR/ MANAGER I
Staff Position In-Charge of Review/Approval:	REGIONAL MAINTENANCE SUPERVISOR/MANAGER II
	Timeline: PRIOR TO PROJECT IMPLEMENTATION

The process for Maintenance Division projects is further illustrated in Figure 2.4.

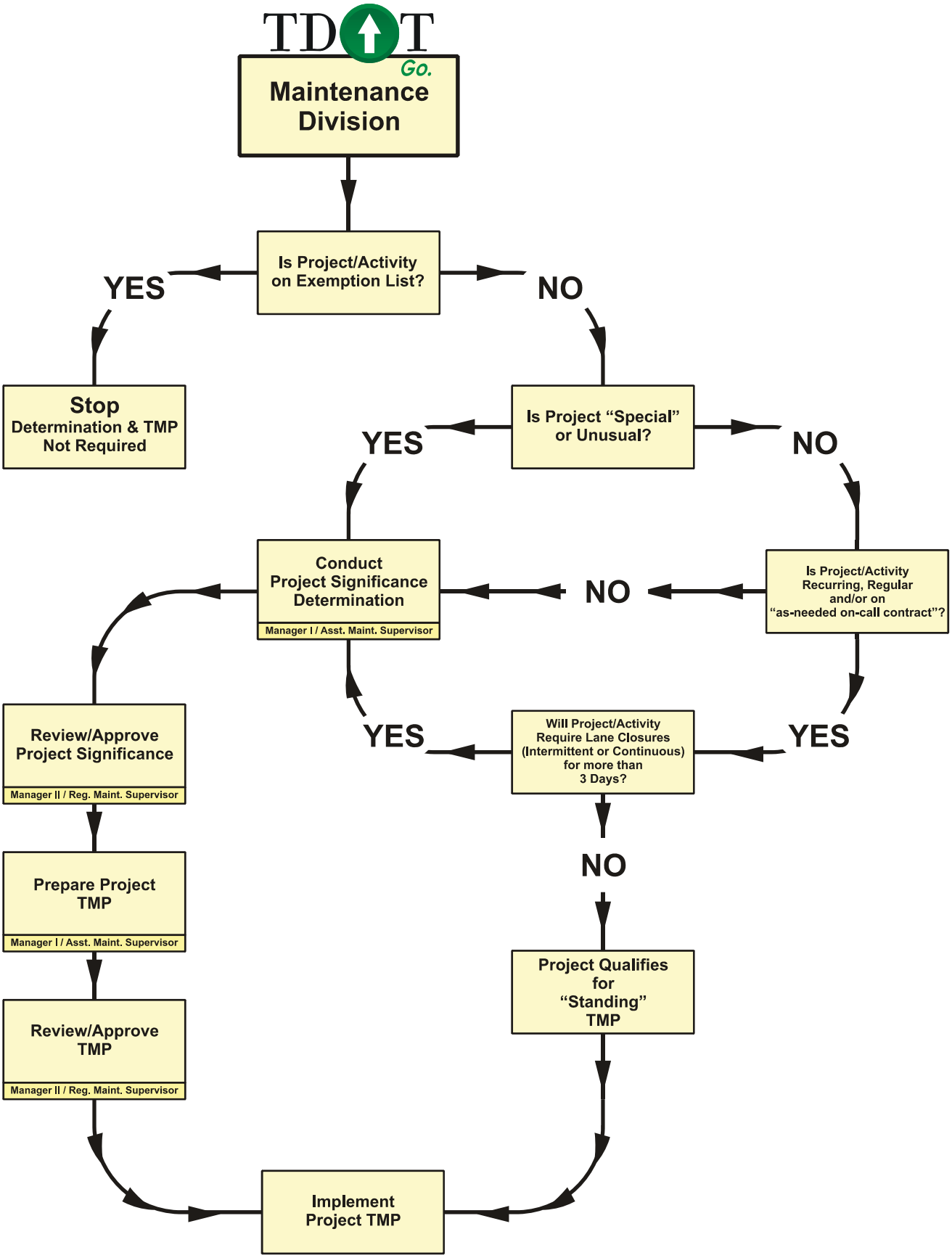

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Figure 2.4
TMP Workflow - Maintenance Division

2.3 Training Initiatives

The Final Rule stipulates that states shall require personnel involved in the development, design, implementation, operation, inspection and enforcement of work zone related transportation management and traffic control to be trained. Furthermore, the training shall be appropriate to each individual's role or responsibility. States shall require that these personnel undergo updated (recurring) training so that individuals may be exposed to changing practices and technology.

TDOT has determined it would be advantageous for all personnel involved in the work zone related transportation management and traffic control to be trained appropriate to the job decisions each individual is required to make, per the Final Rule.

The following shows current and prospective initiatives that TDOT views as avenues to develop and maintain the technical knowledge of all those involved in work zone issues:

- TDOT has established a comprehensive training program for all employees. This will include training for all employees involved in the design, implementation, operation, inspection and enforcement of work zone traffic control. All involved parties shall complete a training program approved by the Department such as NHI, ATSSA, or TTAP. The Department's Human Resources Office, along with the respective divisional director and associated managers, will identify each employee whose job responsibilities are such that he or she is significantly involved in the area of work zones, and will structure a tailored training program appropriate to that employee's position. The Department will assist these employees by directing them in identifying and providing access to the preferred training opportunities.
- The Standing Committee on Work Zones shall require the training of contractors, consultants and uniformed law enforcement. Potential options include incorporating training, continuing education, licensure and/or certification levels into the Department's pre-certification process or project contract requirements.
- Currently the Construction and Maintenance Divisions require its staff and contractors' staff to have training and/or certification in Flagman Operation, Traffic Control Technician, and Traffic Control Supervisor positions. The Standing Committee on Work Zones shall require all aforementioned staff to complete a training course appropriate to their job description. Such courses may be offered through NHI, ASTA, TTAP, or other Division-approved provider.

2.4 Performance Assessment

The Final Rule requires states to utilize work zone data and field observations to actively manage and evaluate work zone impacts. States shall continually pursue improvement of work zone safety and mobility by analyzing the data obtained from multiple projects.

TDOT currently reviews active and completed work zones for performance and operational information. TDOT will utilize this and new initiatives to better enable the Department to analyze, evaluate, and act on work zone performance.

- A Standing Committee on Work Zones consisting of appropriate personnel has been formed to procure the work zone assessment. The committee will meet regularly to review work zone related issues and performance. This committee will work toward establishing acceptable bench marks to measure the effectiveness of work zone procedures.
- TDOT collects traffic crash data from incidents within work zones. This initiative is being improved to provide a means for Department work zone managers and decision-makers to have near real-time access to this information. The Standing Committee on Work Zones will compile relevant work zone crash data provided by the Planning Division with guidance from Headquarters' Traffic Engineering Office. This information will then be used by TDOT officials at the project and agency process levels to make adjustments to active work zones and/or agency procedures.
- TDOT conducts post-construction meetings on select projects involving DOT staff, contractors and consultants. This provides an opportunity to obtain de-briefing information, including thoughts and lessons-learned on the work zone methodology. The Standing Committee on Work Zones will consider options on how to better utilize and obtain feedback from these meetings for use in the evaluation process.
- The Department's "Record-A-Comment" program may also be used as a source of work zone data and feedback. This is considered important information since the source of this information is the public driving through the work zone area. The Standing Committee on Work Zones envisions coordination with TDOT's Community Relations Office to streamline the exchange of the input received from the "Record-A-Comment" program.
- The information collected and the resulting evaluation by the Standing Committee on Work Zones will be used as guidance and input into the Agency Process Review.

2.5 Agency Process Review

The Final Rule requires that states conduct a review of its overall work zone safety and mobility program at least once every two years. The purpose is to assess the effectiveness of the program's processes and procedures. Current practices may be modified or replaced, and new initiatives may be implemented. As part of this program review, states may select individual representative projects to review or it may analyze and evaluate data from multiple projects. The intent is for the program-wide review to lead the Department toward continual improvement and self-examination.

A systems-level approach will be used by TDOT to implement its Agency Review Procedures:

- The Standing Committee on Work Zones will provide the framework for reviewing the overall agency process. The Process Review is anticipated to take place annually, and at a minimum every two years. The committee will develop an agenda and prioritization for implementing recommendations.
- The Standing Committee on Work Zones will consider the various initiatives that make up the program. The committee will focus its annual review on those tasks or initiatives that have been previously identified for discussion or possible change. These issues include, but are not limited to,
    - Significance Determination Procedures,
    - TMP Development Strategies,
    - Work Zone Personnel Training Requirements/Procedures,
    - Process Roles and Responsibilities,
    - Work Zone Assessment Procedures,
    - Work Zone Delay
    - Work Zone Crashes (fatalities)
    - Work Zone Data Collection.
- Evaluations and conclusions resulting from the Performance Assessment initiative will be used to determine potential modifications to the agency process. This may include work zone data from individual or multiple completed projects.
- The Agency Process Review will encourage participation from internal and external stakeholders.

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PART 3: Project Significance Assessment

PART 3: Project Significance Assessment

Part 3 describes the project-level procedures or mechanisms by which TDOT personnel can become aware of and manage the work zone impacts of individual projects. These procedures include the determination of project significance and the completion of the TMP. In accordance with the Final Rule and TDOT's objectives, all projects necessitating work zone establishment under TDOT jurisdiction and oversight shall follow the procedures in this Manual. A project that is deemed "significant" requires a high level of work zone impact mitigation including Temporary Traffic Control Strategies, Transportation Operations Strategies, and Public Information Strategies. A project that is not found to be "significant" requires fewer mitigation strategies. The most basic projects require only a work zone traffic control plan.

The first step in developing a Transportation Management Plan (TMP) for a work zone is to determine the level of TMP to be applied. This is referred to as the Project Significance Determination. This procedure determines whether a project is defined as Significant or Non-Significant. It should be noted that if a project is determined to be Significant, it does not necessarily mean that the development of the TMP will be a time-consuming or exhausting effort. If a project is determined to be Significant, it simply means that additional mitigation strategies should be implemented to reduce congestion and improve safety within the work zone. Often, these strategies are things that TDOT is already doing for many work zones. Excluded projects and types of work for which standing TMP's may be used are discussed in Part 2.

Once the Significance Determination has been completed (and verified with a follow-up review), the next step is to develop the project's TMP. The TMP Workbook, including the Significance Determination Form, is included in Appendix B. In order to complete the TMP, the project is categorized into one of three separate groups:

Significant Project - Requires a high level of work zone impact mitigation. Requires consideration and use of all three TMP strategies to help mitigate the impacts of a significant project:

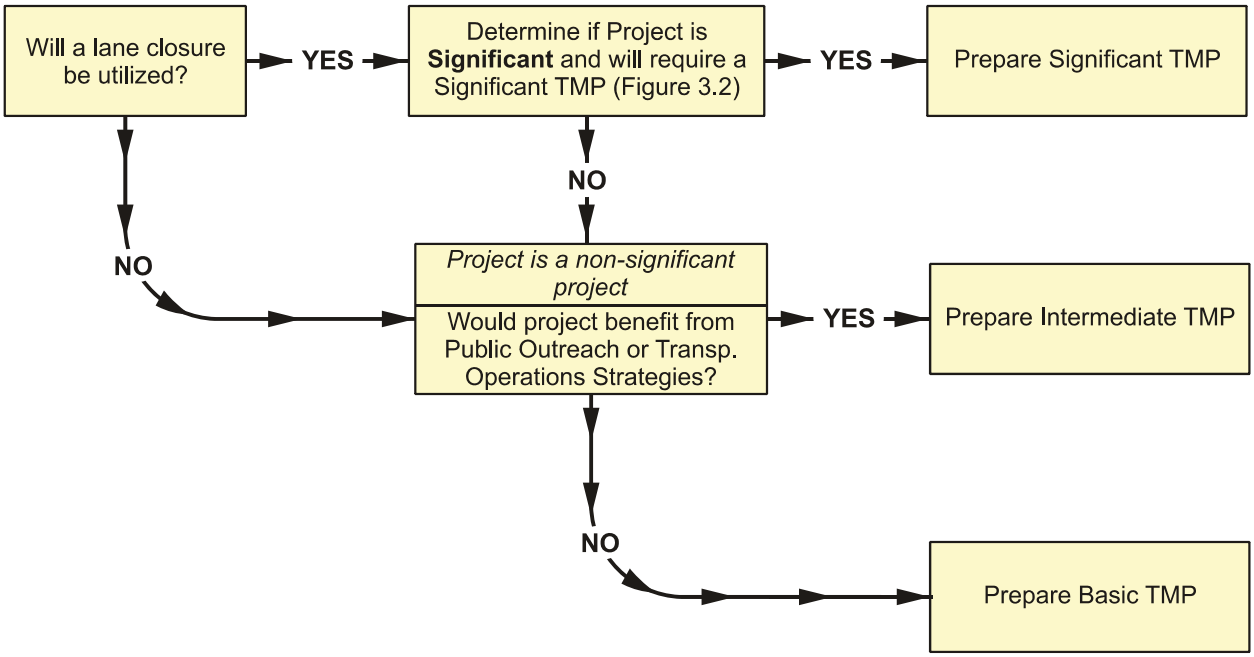
- Temporary Traffic Control Strategies (TTC)
- Transportation Operations Strategies (TO)
- Public Information Strategies (PI)

Intermediate Project - Requires additional planning, coordination, etc, but not required to be at the same level of a Significant TMP. Requires one or more TMP strategies beyond a basic TTC plan.

Basic Project - Typical work zone TTC plan is implemented alone. Refer to TDOT standard drawings, standard notes, and MUTCD. No additional TMP strategies required.

The basic process of significance determination is outlined in Figure 3.1. The remaining sections in Part 3 are a guide through this determination process.

Figure 3.1 - Transportation Management Plan (TMP) Development Process



3.1 Determination of Project Significance

In order to effectively manage the impacts of the work zones, a project's characteristics are reviewed and judged against minimum criteria to determine if it is to be designated a "significant" project..

If a project's traffic control will not involve a lane closure, the project will not be considered significant. In this case, the project is non-significant and will either be an Intermediate project or a Basic project. If the project is expected to benefit from public information or transportation operation strategies, an Intermediate TMP is to be developed per TDOT procedures. Otherwise, the project will utilize a Basic TMP consisting of only a TTC plan.

A Significant Project is one for which any of the following criteria exist:

(a) Any project on the interstate system located within a recognized Transportation Management Area (TMA) that occupies a given location for at least three days duration with either continuous or intermittent lane closures.

(b) Any project of any duration on an interstate route or any route with an AADT of at least 50,000 vehicles per day for which all lanes in one direction will be closed to traffic.

(c) Any project for which the delay through the limits of the work zone is at least 30 minutes above the normal delay under typical non-work conditions.

(d) Any project deemed Significant by extraordinary qualitative characteristics. This determination may be made on the basis of conditions such as high levels of public interest, business/community impacts, or long work zone duration. All Significant Projects defined in this manner shall only be done with careful consideration and strategic decision making.

In reference to the definition above, items (a) and (b) are presented as Major Route Criteria, item (c) defines the Delay Criteria, and item (d) defines the Qualitative Criteria.

3.1A Significance Determination Decision Chart

Visual representation of the definition of a Significant Project and how to define a project as such is provided as Figure 3.2

3.1B Defining Significance Using Major Route Criteria

Because certain routes serve major regional, intrastate, or interstate traffic flows, special consideration should be made for work zones established on these routes. Interruptions to normal traffic operations on these routes often present especially critical impacts to a large number of system users. Major routes are covered in parts (a) and (b) of Section 3.1.

In part (a), Tennessee's TMA's are currently identified as the census-defined Urbanized Areas of Memphis, Nashville, Chattanooga, and Knoxville. The TDOT Long-Range Planning Division can provide guidance on specifically defining the limits of the TMA's. However, for the purposes of this Manual, it is assumed that the TMA consists of the following counties: Blount, Bradley, Carter, Davidson, Fayette, Grainger, Hamblen, Hamilton, Hawkins, Jefferson, Knox, Loudon, Madison, Maury, Montgomery, Robertson, Rutherford, Sevier, Shelby, Sullivan, Sumner, Washington, Williamson, Wilson. A lane closure refers to the closure of a mainline through lane open to traffic under normal conditions. This definition may exclude work on ramps or on the shoulder where no lane closures are required.

Part (b) requires the Significance definition to apply when a total directional closure occurs on a major route. Due to the high level of impact this creates, a project which includes a total closure of any duration is considered a Significant Project. Work methods having the same basic methodology as a total closure (such as a "rolling roadblock") should also be considered Significant under this definition.

To determine if the work zone on a major route constitutes a Significant Project:

(1) Properly identify the major route affected as well as the type and duration of the expected lane closure(s).
(2) Complete a Work Zone Significance Determination Form to document the conclusion.

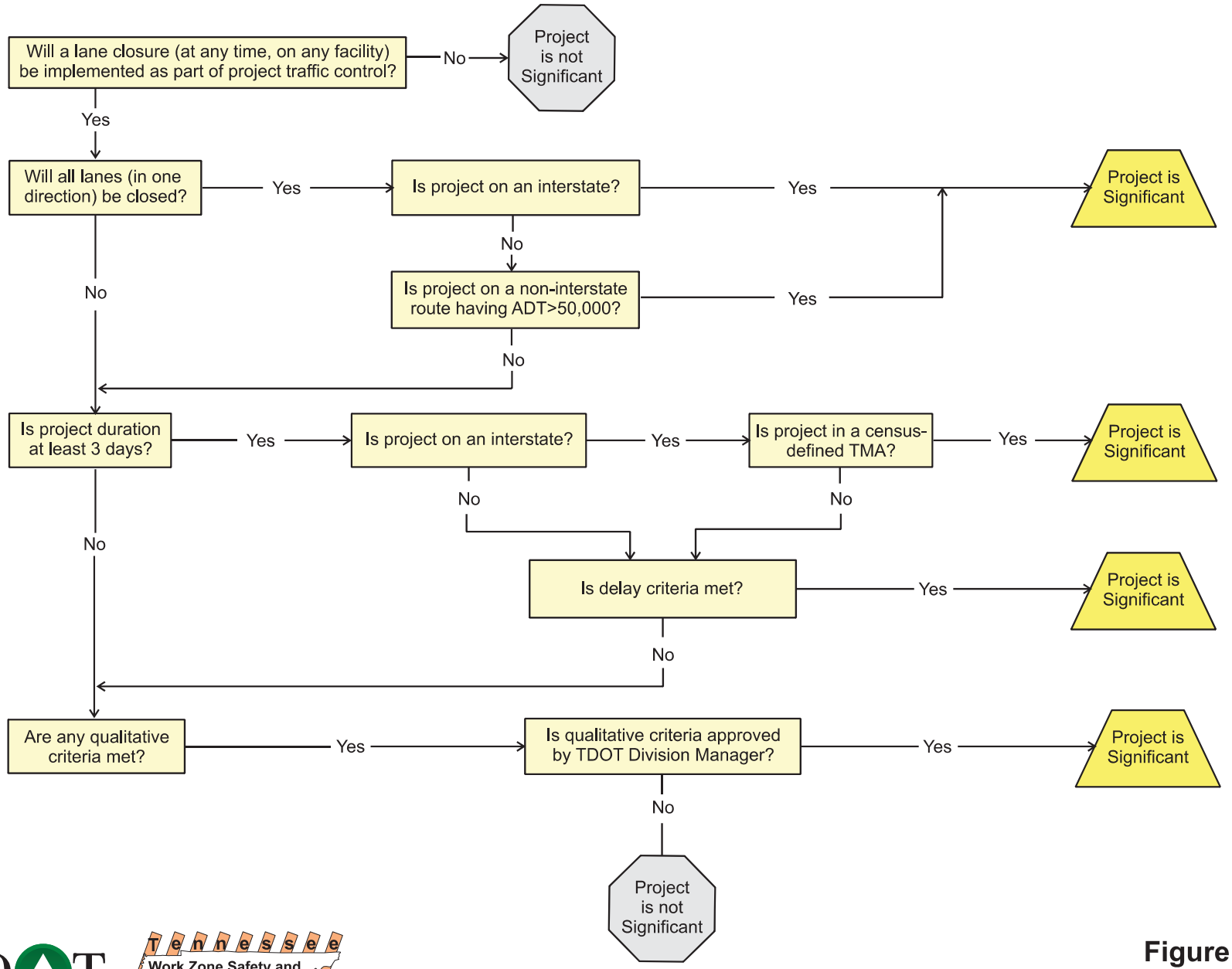


Figure 3.2
Significance Determination Diagram

3.1C Defining Significance by Work Zone Delay

In order to determine if a project's work zone delay characteristics classify it as a Significant Project, an estimate of the expected work zone delay must be made. In order to make this delay estimate, the analyst must know the following information concerning the work zone:

- Project setting (roadway classification and urban/rural characteristics),
- Two-way, 24-hour average daily traffic,
- Minimum number of lanes to remain open through and in the direction of travel within the work zone, and
- Signalized intersections that will be affected.

Using this information and the Delay Criteria Reference Table provided in Table 3.1, the project significance can be determined based on the maximum AADT listed. The maximum AADT's in this table are based on a theoretical delay of 30 minutes.

The presence of a signalized intersection within the area affected by the work zone will generally increase the delay impacts of the work zone. Therefore, the maximum allowable AADT should be decreased by 30-70%, depending on the type of intersection, when a signalized intersection affects the operation of the work zone. The appropriate factor from the Delay Criteria Reference Table shall be used.

To determine if the work zone constitutes a Significant Project on the basis of delay:

(1) Use the Delay Criteria Reference Table (Table 3.1) to determine the maximum AADT based on the area type, roadway classification, and minimum number of lanes in one direction to be open continuously throughout the entire length of the work zone. If applicable, consider impacts created by signalized intersections.
(2) Compare the two-way bi-directional project AADT. If greater than the maximum provided in the table, the project is considered Significant.
(3) A Work Zone Significance Determination Form shall be completed.

The delay tool described above is a simplified method for determining if the expected delay will exceed 30 minutes. This method can be used for all types of routes. Any delay estimation tool deemed appropriate by the Department may be alternatively substituted to determine if the delay on the work zone route will exceed 30 minutes.

It should be noted that Table 3.1 is presented as a qualitative estimating tool for predicting the "significance" of a project as it relates to TDOT's TMP process. It is not intended for other purposes and/or as a direct measure of travel delay based on travel volumes. Table 3.1 was developed using guidance and principles from ITE and the Highway Capacity Manual.

Table 3.1 - Delay Criteria Reference Table

(Based on 30 minute additional delay)

Number of Lanes in one direction[A]			Maximum Allowable 2-Way AADT[B]					
Total	Open	Closed[C]	Urban Freeway	Rural Freeway	Urban Arterial	Rural Arterial	Urban Other	Rural Other
1	1	0			31,000	17,000	33,000	24,000
	0	1[D]			20,000	14,000	16,000	11,000
2	2	0	89,000	87,000	83,000	59,000	67,000	45,000
	1	1	45,000	43,000	41,000	29,000	34,000	21,000
3	3	0	131,000	130,000	124,000	88,000	101,000	64,000
	2	1	87,000	87,000	83,000	59,000	67,000	40,000
	1	2	44,000	43,000	41,000	29,000	34,000	40,000
4	4	0	174,000	173,000				
	3	1	131,000	130,000				
	2	2	87,000	87,000				
	1	3	44,000	43,000				
5	5	0	218,000					
	4	1	174,000					
	3	2	131,000					
	2	3+	87,000					
≥6	6	0	254,000					
	5	1	212,000					
	4	2	169,000					
	3	3	127,000					
	2	4+	85,000					

Intersection Factors

Work zone on...	Affects a signalized intersection with...	Multiply max AADT by...
Urban arterial	Another arterial	0.5
Urban arterial	A non-arterial	0.65
Rural arterial	Another arterial	0.5
Rural arterial	A non-arterial	0.7
Urban other	An arterial	0.45
Urban other	Another non-arterial	0.5
Rural other	An arterial	0.3
Rural other	Another non-arterial	0.5

[A] Lane configuration is presented for one direction of travel (that direction being affected by the work zone).

[B] AADTs are presented as typical 2-way, 24-hour volumes.

[C] Zero lanes closed designates shoulder or roadside work where all travel lanes remain open.

[D] Represents configuration of a 2-lane roadway with one lane closed and flagger/temp. signal in operation.

Note: Table 3.1 is presented as a qualitative estimating tool for predicting the “significance” of a project as it relates to TDOT’s TMP process. It is not intended for other purposes and/or as a direct measure of travel delay based on travel volumes.

3.1D Determining Significance by Qualitative Characteristics

A project that presents extraordinary work zone impacts but does not meet the established Major Route Criteria or the Delay Criteria may still be considered a Significant Project. In this situation, the TDOT Project Manager (or assigned project analyst) must carefully consider the project's qualitative impacts, complete the qualitative criteria portion of the Significance Determination Form, and forward a recommendation to the responsible TDOT Division Director for final consideration.

NOTE: Careful consideration should be given when defining a project as Significant based solely on qualitative criteria. Intangible impacts of any work zone not meeting the delay criteria must be extraordinary to be considered Significant.

3.2 Role of the Significance Definition

Following the guidelines of Section 3.1, all projects requiring work zones will be classified as either Significant or Non-Significant. These two broad classifications provide the basis upon which the project's work zone requirements are to be based. Having defined a project as either Significant or Non-Significant will help determine what mitigation of work zone impacts should be considered.

The TDOT Work Zone Safety and Mobility Manual uses a TMP to define the strategies to be used in the mitigation of work zone impacts. Whether defined as Significant or Non-Significant, a TMP must be completed for all projects having a work zone, unless classified as exempt (see Part 2). The Significance determination helps to ensure the appropriate level of TMP strategies to be applied to each work zone.

3.2A Meaning of Significant Project

Classification as a Significant Project distinguishes a project as one requiring a high degree of work zone impact mitigation. Having met the criteria given in Section 3.1, the project is anticipated to affect large numbers of roadway users, cause excessive delays, and/or present at least one of several qualitative impacts to the transportation system or affected community. Due to the impacts introduced by a Significant Project, special consideration must be made to minimize its negative effects.

This special consideration translates into specific efforts that must be made in a Significant Project's TMP. Identified as a Significant TMP, designers are required to establish and plan for the safe temporary control of traffic, methods for promoting efficient traffic operations, and ways to best inform the public of the work. Guidance for the development of a project TMP can be found in Part 4 of this manual.

3.2B Projects not Assigned a Significant Designation

When a project fails to meet the criteria of Section 3.1, the project will not be categorized as being a Significant project. This designation does not mean that its work zone impacts are unimportant or should be disregarded. Rather, the TMP of a Non-

Significant project will generally not provide mitigation strategies at the same level as the Significant TMP. Additionally, some components of a Non-Significant project's TMP may be pre-defined or standardized to simplify the TMP development for common small-scale work zones.

For a Non-Significant Project, either a Basic TMP or Intermediate TMP will be developed. A **Basic TMP** is to be used when only a TTC plan is needed to successfully implement a safe and efficient work zone. An **Intermediate TMP** adds some additional measures to address improved mobility and/or public information when called for. Guidance for the development of the Basic and Intermediate TMP's can be found in Part 4 of this manual.

3.2C Exclusion of Projects from TMP Development Process

The FHWA's Final Rule allows a project defined as a Significant Project to be excluded from the requirements of a Significant TMP. If a project meets the definition of a Significant Project, but careful consideration of either qualitative or quantitative work zone characteristics predicts minor impacts, completion of a TMP may not be required. A TMP exclusion may be initiated by the Project Manager and corroborated by the Division Manager.

FHWA approval is required for all Federal Aid Highway projects classified as Significant and proposed to be exempt. For a Significant Project to be exempt from TMP completion, a written request must be submitted to FHWA's Tennessee Division office. This request should come from the appropriate TDOT Division Manager and detail the expected impacts of the work zone and an explanation of why the project will not have sustained work zone impacts. The justification should include specific and quantifiable measures of effectiveness documenting how the project would not be expected to create sustained work zone impacts.

For multiple projects of the same type that are not expected to exhibit considerable safety or mobility impacts, a blanket exemption request may be submitted. A blanket exemption should be filed in the same manner as an individual project request.

See Part 2 for a list of exemptions and blanket TMP's.

3.3 Project-Level Procedures Sequencing

3.3A Project-Level Procedures Diagram

Visual representation of the project-level procedure sequencing is provided in Figure 3.3.

3.3B Initial Determination

One intent of the TDOT Work Zone Safety and Mobility Manual is to recognize and plan for various aspects of work zone implementation early in the development of a project. For this reason, project developers should make an initial determination of the project's significance as early as possible. In most cases, this initial determination can be made soon after identifying the location and type of work to be done. However, because of the varying means of development, the point at which this determination is made will vary. Project leaders in the TDOT Division in which the project originates should make this significance determination when appropriate.

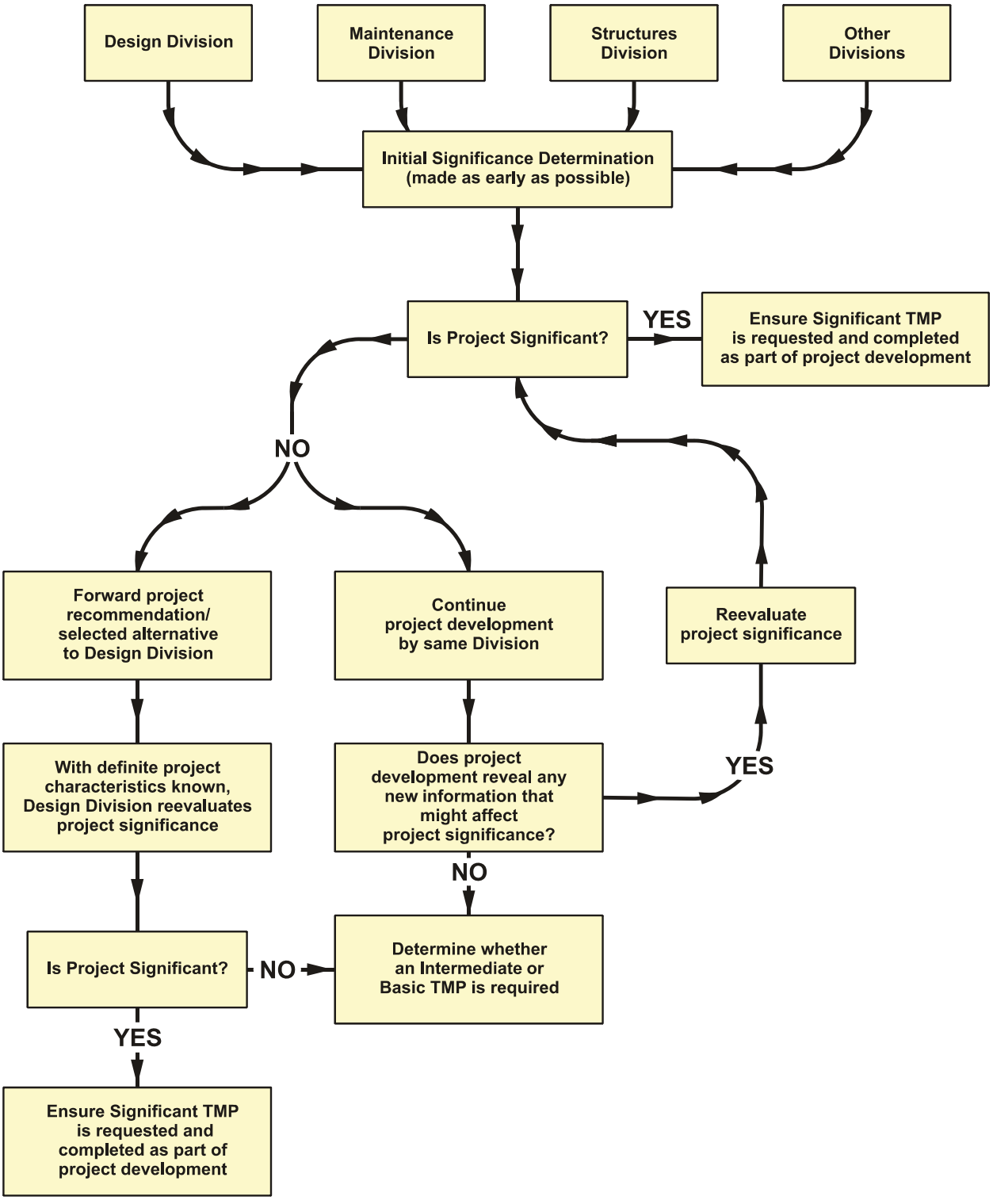


Figure 3.3
Project-Level Procedures Diagram

For projects following the standard TDOT project development process, initial significance determination and general work zone considerations should be made as part of any early, formal planning. This may mean that a recommendation that a project be defined as Significant or Non-significant may be made as part of a Road Safety Audit Report (RSAR), NEPA documentation, or Transportation Planning Report (TPR). Also, projects of this type often are assigned to a Project Manager. If this is the case, work zone considerations should be part of project team meeting discussions during the planning and environmental process. However, formal significance determination will be made according to the process outlined in section 2.2.

For projects not originating in the Project Planning Division, initial significance determination must be incorporated into the early stages of the existing project development process. For some common types of projects, likely points for the significance determination are given as examples.

Project Type	TDOT Division	Initial Significance Determination
Bridge rehabilitation	Structures	Made after bridge is identified
Utility work	Maintenance	Made once notification of work is received by TDOT
Roadside maintenance	Maintenance	Made after work location is identified
Resurfacing	Maintenance	Made after paving limits are set

Once the initial significance determination is made, development of the project should continue with consideration of the requirements for an appropriate TMP. For many projects, this initial determination of project significance will remain unchanged. For some projects, however, a second consideration of project significance will allow consideration of changes in a project's scope and allow for more effective TMP strategies.

3.3C Secondary (Follow-Up) Determination

Particularly for large-scale projects originating in TDOT's Project Planning Division, an early determination of significance, while essential, may also mean an initial determination based upon incomplete or preliminary information. For this reason, a secondary determination of the project's significance should be made. Again, depending on the project type, this analysis should be made in the design phase or at the earliest point at which all pertinent data used in the significance determination is known. This secondary determination of a project's Significance or Non-Significance should rarely differ from the initial determination; when it does, redevelopment and/or revision of a TMP already undertaken shall commence.

TDOT WORK ZONE SAFETY AND MOBILITY MANUAL

PART 4: Transportation Management Plan Development

PART 4: Transportation Management Plan Development

Part 4 describes the procedures required by TDOT's Work Zone Safety and Mobility Process for the development of a TMP. A TMP is required for projects that are expected to impact traffic as a result of an established work zone. The TMP is simply a document illustrating how a coordinated set of transportation management strategies will be used to mitigate work zone impacts. Once a project's significance has been determined, as outlined in Part 3, the TMP can be developed.

Three types of TMP's are defined in this Work Zone Safety and Mobility Manual.

> A **Basic TMP** is required for a project which causes minimal work zone impact and/or a project for which all traffic operation and public information strategies have been found to be unnecessary. Only a TTC Plan is required as part of the Basic TMP.
>
> An **Intermediate TMP** is required for a project which is not defined as a Significant Project (described in Part 3), but for which additional traffic operation and/or public information strategies should be utilized. For the Intermediate TMP, a TTC Plan and either a Transportation Operations Plan or a Public Information Plan, or both, are utilized.
>
> A **Significant TMP** is required for any Significant Project (as defined in Section 3.1). All three strategy sets (TTC, Transportation Operations, and Public Information) are required as part of a Significant TMP.

Part 4 of the TDOT Work Zone Safety and Mobility Manual outlines the strategies to be used and/or considered for each of these three types of TMP's.

4.1 General TMP Development Considerations

Several aspects of work zone development should be considered as part of the early planning of each project. This early recognition of work zone impacts is a goal of the TDOT Work Zone Safety and Mobility Manual and facilitates the beginning of an effective TMP for the project. Some general considerations to be made early in the process are:

- What are some likely impacts of the work zone and how can these be minimized?
- What type of strategies does TDOT already have in place to help mitigate work zone impacts?
- What are the typical work zone methods for projects of this type?

Once some attention has been given to such questions, project leaders will recognize the underlying foundation of the TMP and begin thinking about its development. This section provides guidance to project leaders in fundamental TMP considerations like TMP development timeframe and responsibilities.

4.1A TMP Development Timeframe

Because different project types take different paths through planning, design, and construction, not every TMP will be completed by the same process. Regardless of the specific project timeline, most TMP's will begin during the late planning/early design stage of the project. At this time, most of the information needed to begin the TMP will be available. As additional project information becomes available, the TMP can progress in increasing detail. The TMP should generally be completed as part of the design process and should be finalized along with the final set of design plans and available at the time the construction bid documents are prepared.

Some TMP's, because of the standard and repetitive project development process used, can be fully completed soon after the project location is identified. Other TMP's will require additional efforts to complete.

4.1B TMP Development Responsibilities

The TMP workbook is organized such that anyone with an understanding of work zone operation and the construction needs of a particular project can complete it. This includes TDOT project staff and design consulting organizations. It is not expected, however, that one person can successfully complete the TMP without the input and coordination of other project stakeholders. Particularly for Intermediate and Significant TMP's, responsibility for completion of the plan will be a joint effort among several TDOT Divisions and possibly consultants working with the Divisions.

The TMP manager (individual responsible for completion of TMP – typically a Manager I) should have knowledge of construction procedures and be able to coordinate input from other resources (from within and outside TDOT) to progress through the TMP structure. The manager should also have the authority to make decisions on certain aspects of the work zone management plan and document the strategies to be used in the TMP. The TMP Manager will be the facilitator of the TMP process and will oversee all activities.

Some examples of internal TDOT coordination required from the TMP manager might include:

- Coordination with the Construction Division to determine effective channelization devices
- Coordination with the Design Division to determine the possible use of shoulders as temporary traffic lanes

- Coordination with the Materials and Tests Division to determine the availability of precast members to speed construction
- Coordination with the Community Relations Division to determine the appropriate avenues to inform the public of project information

Some examples of external coordination required from the TMP manager might include:

- Coordination with local law enforcement for availability of a presence vehicle
- Coordination with local authorities to authorize retiming of a signal adjacent to the project
- Coordination with a local school to determine access needs and times
- Coordination with a local newspaper to disseminate construction schedules

Figure 4.1 shows how a TMP will incorporate other resources to ensure a comprehensive and effective work zone management plan.

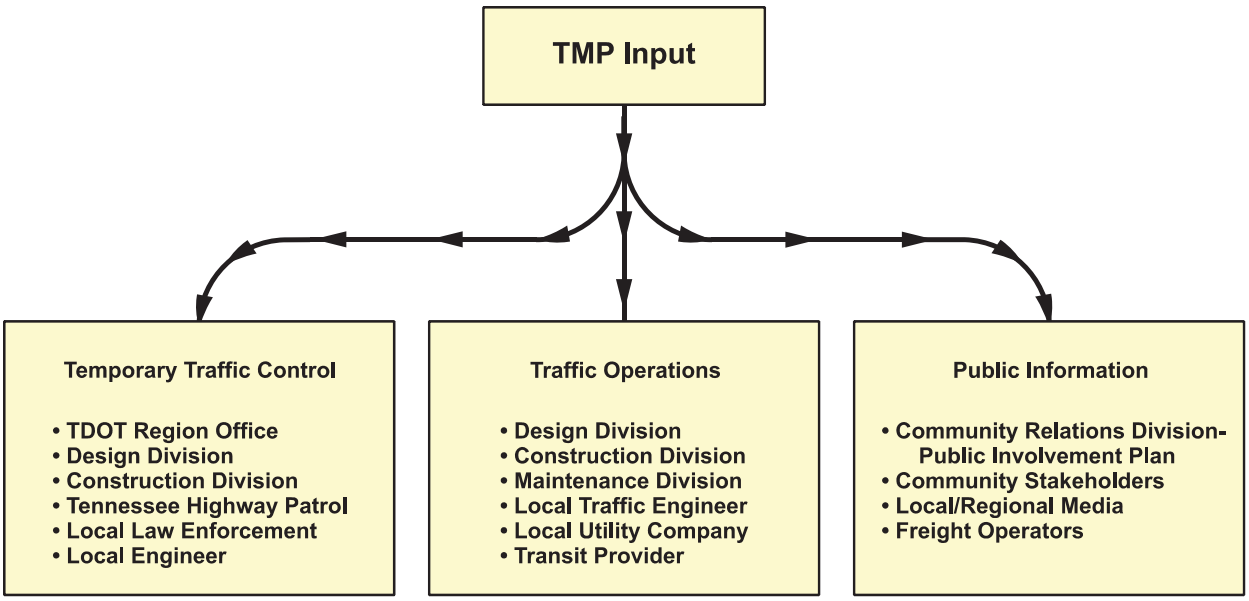


Figure 4.1
TMP Diagram

4.2 TMP Strategy Guidance

TMP strategies are divided into three groups and each group has a variety of individual strategies that should be considered. Those responsible for creating and managing TMPs are to be mindful of the following Final Rule requirements:

- Roadside safety hardware implemented as part of the TTC shall be maintained at equivalent or better levels than existed prior to the project.
- Construction plans and documents shall include the use of pay item provisions (individual or lump sum) to procure the implementation of the TMP strategies. These provisions may be implemented through use of method or performance-based specifications. Examples of performance-based requirements include, but are not limited to, incident response times, vehicle queue lengths, and work duration.

Temporary Traffic Control (TTC) Strategies

- Work Zone Construction Strategies
- Traffic Control and Safety Device Strategies
- Coordination and Contracting Strategies
- Advanced Material and Methodology Strategies

Transportation Operations (TO) Strategies

- Travel Demand Management Strategies
- Corridor/Network Management Strategies
- Work Zone Safety Management Strategies
- Traffic/Incident Management Strategies
- Enforcement Strategies
- Personnel/Stakeholder Utilization Strategies

Public Information (PI) Strategies

- Public Awareness Strategies
- Motorist Information Strategies

Each of the individual strategies listed above is discussed in detail in the following sections. Where applicable, references are noted for each of the individual strategies. A Significant TMP shall have strategies from each of the three strategy groups, while an Intermediate TMP shall have strategies from the TTC group and at least one from either the TO or PI strategies, or both.

A TMP workbook has been developed (included as Appendix B) to guide the drafting of the plan and encourage consideration of various types of impact mitigation strategies. Once complete, the TMP Workbook becomes the official documentation of the project's

TMP decision making process. A copy of the entire Workbook shall be filed for future reference. The TMP then exists within and becomes part of the project as the TMP strategies shall be incorporated into and made part of the project's construction plans and contract documents.

In completing the TMP, the TMP manager should carefully consider, in addition to the standard TDOT procedures, each of the strategies presented for applicability and effectiveness. Many of the strategies presented will not be applicable. The various strategies are not intended to be all inclusive, but rather provide a range of possible strategies which might be considered.

The following sections provide guidance for the completion of the TMP. A TMP shall be developed in accordance with the following references:

- *Manual on Uniform Traffic Control Devices (MUTCD)*
- *American Association of State and Highway Transportation Officials - A Policy on Geometric Design of Highways and Streets ("Green Book")*
- *AASHTO Roadside Design Guide*
- *TDOT Design Guidelines*
- *TDOT Public Involvement Plan*
- *TDOT Circular letters (those referenced are included as Appendix C)*

Sample completed TMP Workbooks are included as Appendix D.

4.2A Temporary Traffic Control (TTC) Strategies

WORK ZONE CONSTRUCTION STRATEGIES

Construction phasing and/or equipment staging: Using a thoughtful approach to positioning equipment and materials and sequencing construction tasks can prevent unnecessary traffic impacts. Use this strategy to specify special staging areas, construction phasing, warnings against careless material placement, etc.

Full roadway closure: This strategy trades a shorter-term full road closure for a longer-term partial road closure. Work can usually be completed more quickly and in a safer way, but with significant short-term impacts to traffic. A full closure requires extraordinary coordination with other stakeholders and consideration of detour routes. Except for extremely short closure durations, this strategy should not be specified as part of a Basic TMP. If used, specify closure limits, duration, and reference coordination strategies in detail.

Narrow lane/shoulder widths to maintain existing number of lanes: Consider that while the number of through lanes remains unchanged, capacity through the work zone will likely drop due to narrowing lane widths, associated lane shifts, and other work zone features. Lanes should not be narrowed so as to create unsafe conditions or unduly restrict capacity. If shoulder is removed for long distances, consider incorporating emergency pull-outs.

Full closure of lane/shoulder: The impact to the roadway is appreciable, but this strategy provides a high degree of worker safety and is relatively easy to implement.

Reference: Current TDOT Instructional Bulletin and Design Guidelines

Lane shift to shoulder/median: Generally used where an improved median or shoulder exists, a shoulder or median may also be constructed as part of the project to allow its use as a temporary traffic lane. Project officials should recognize the potential localized loss of capacity due to a lane shift.

One-lane, two-way operation: Generally used on two-lane roadways where one lane requires closure, this strategy is best for short-term projects. Give special attention to advance motorist warning of such a condition, particularly in areas of limited sight distance.

Two-way traffic on one side of divided roadway: Used for major maintenance or reconstruction efforts, capacity of the roadway should be expected to drop to less than one-half. Special consideration should be given to transition areas at project termini, driveways, and public street intersections. Additional construction may be required to maintain access along the divided roadway. Communication of the two-way operation on the typically one-way roadway is also of high importance.

Reversible lanes: This strategy might be used in areas having a high directional distribution during predictable periods of the day. This would likely be used on projects of longer duration due to the signal equipment needing to be installed along the project limits.

Ramp closure/relocation: When warranted by substantial ramp work, these ramp modifications will significantly impact the controlled-access roadway. A high degree of information must be communicated to the motorist regarding the ramp status. If closed, traffic may be rerouted to another ramp in the intersection (ramp intersection modifications would be required), or rerouted to another interchange altogether. If the ramp to be closed is part of a directional interchange on the interstate system, substantial off-interstate detour routing should be planned.

Directional interchange closure: This strategy would likely require large scale detour planning off of the interstate system. Local transportation officials should be consulted in determining detour routes.

Work hour restrictions (off-peak, night, weekend): Working during periods having lower traffic demand can benefit mobility and safety. TDOT's *Freeway Work Zone Capacity Tables* should be consulted. Derived from the Highway

Capacity Manual, traffic capacity limits have been developed based on AADT volumes and the number of original and proposed lane closures. The reference charts provide guidance in determining when it may be necessary to restrict lane closures to certain times of day (i.e. weekend only, night only, etc.).

Reference: Current TDOT Instructional Bulletin and Design Guidelines

Bike/Ped access maintenance: Temporary facilities may be required to be constructed. Particular attention should be paid to proper management of sidewalk closures and accessible navigation.

Private property/business access maintenance: The TMP may require construction of temporary private property access and/or special information to direct motorists to relocated access points. Communication with local businesses to better understand how work zones affect their interests and incorporation of work zone elements into the TMP to address those issues should be considered.

Off-site detour/alternate routes: Routing traffic onto roadways maintained by other agencies should be done in coordination with those affected agencies. An additional operational assessment of the detour route(s) should be made. Also, temporary traffic control plans should identify detour signing throughout the limits of the detour and utilize appropriate advance notice techniques.

TRAFFIC CONTROL AND SAFETY DEVICE STRATEGIES

All strategies in this section identified by the TMP should conform to Part 6 of the MUTCD.

Temporary guidance/informational signs: Temporary signing will be used in most projects. Special applications or specific considerations should be included as part of the TMP. Temporary signing typically includes the following sign types: Warning, Regulatory and Guide/Informational. TDOT standard drawings and standard notes should be reviewed for necessary applications. TDOT also provides specific guidance in the current instructional bulletin for the use of guidance and directional signing on temporary traffic control plans.

Reference: Current TDOT Instructional Bulletin and Design Guidelines
TDOT Standard Drawings and Notes
Part VI of the MUTCD

Portable changeable message signs: These may be portable or fixed as part of an ITS system in an urban area. Note in the TMP the expected location of the sign(s) and the type of message(s) to be displayed. Portable changeable message signs should be located far enough in advance to provide sufficient warning and/or notice.

Flashing arrow boards: Used in merging situations, these panels may be free standing or truck mounted. Note in the TMP the expected location of the panel(s).

Flaggers/uniformed traffic control personnel: The position and duty of such personnel should be considered and noted in the TMP when proposed.

Temporary traffic signals: Perhaps used in lieu of flagging personnel, this strategy calls for either fixed or portable temporary signals. Location of the temporary signal should be noted. This may also include the use of special traffic signal technology conducive for temporary installations, i.e. video detection actuation in lieu of pre-timed operation. Appropriate signing should also be used in conjunction with these signals, i.e. “Maintain 20 mph”, “Stop Here on Red”.

Warning lighting devices: The specific type and purpose of lighting to be used should be included. These may be utilized for both daytime and night work.

References: TDOT Supplemental Standard Specifications - Section 712.04
TDOT Roadway Design Guidelines - Section 4-712.00

COORDINATION AND CONTRACTING STRATEGIES

Coordination with other construction projects: This strategy involves coordination, scheduling, and sequencing of nearby projects to minimize associated impacts. References to other projects and details on different aspects of coordination should be included. Particular emphasis should be made toward coordinating construction signing between adjacent work zones.

Coordination with other utility projects: By involving area utility providers in project planning, impacts from repetitive work zones can be avoided. Another aspect of utility coordination is to include future roadway needs (i.e. spare conduit and easement needs) into the current project.

Coordination of existing/future right-of-way needs: If phased or future improvements would require additional right-of-way, this consideration should be made as part of the current project.

Coordination with other non-highway transportation facilities: Where roadway projects affect transit centers, airports, rail stations, or other transportation facilities, care should be taken to avoid undue impact. Agencies having oversight of these non-highway facilities should be part of the work zone planning.

Incentive/disincentive: Either used as a reward or punitive treatment, monetary amounts may be stipulated to encourage projects to be completed within a

certain timeframe or deadline. This is utilized in an attempt to minimize the duration of a work zone.

ADVANCED MATERIAL AND METHODOLOGY STRATEGIES

Innovative construction techniques/materials: This may include the use of special, new or innovative materials or construction methods to reduce construction time. The TMP may suggest or propose certain methods to be considered (i.e. quick cure concrete or pre-cast elements).

4.2B Transportation Operations Strategies

TRAVEL DEMAND MANAGEMENT STRATEGIES

Transit service addition/improvement: This technique attempts to alleviate the impact of work zones by more efficiently managing the vehicular demand traveling through the area. Where appropriate, the temporary creation or modification of existing transit service may aid in this effort. This may include the promotion and implementation of express bus routes or park-and-ride lots. It may also entail the re-routing of existing transit routes outside the work zone influence area.

Transit incentives: Transit incentives could include financial incentives or reimbursement if certain ridership benchmarks are proposed and met during construction. This may also include subsidies for employer-sponsored transit programs or guaranteed ride home programs. It may be advantageous to seek partnerships with existing local programs.

Shuttle services: This strategy may include commuter focused to/from work initiatives or possibly the introduction of lunch-time shuttles to move persons within high-density employment areas for those eating meals and/or running midday errands.

Ridesharing/car pooling incentives: Another potential strategy to decrease the number of vehicles traveling through work zones during peak hours. Consider partnerships with private businesses where businesses may distribute special offers/discounts for using the program.

Park-and-ride promotion: A directed campaign to provide new or encourage increased use of existing park-and-ride locations. Funding to supplement equipment or operations costs may be considered.

HOV lane addition/promotion: The TMP may include the dedication of new or preservation of existing HOV lanes. These high-occupancy lanes may be only temporary during construction or may become permanent at the conclusion of the project.

Ramp metering: This demand management tool regulates the introduction of vehicles into free-flow traffic through the use of signalization. Typically located on on-ramps to freeway or expressway facilities, this strategy attempts to preserve free-flow conditions on the main highway. Its desired effects are to decrease demand on a higher functional roadway by controlling entering vehicles while matching the flow of entering traffic to the availability of gaps on the mainline facility.

Variable work hour incentives: This strategy attempts to reduce peak hour demand by encouraging commuters and employers to stagger or offset work times.

CORRIDOR/NETWORK MANAGEMENT STRATEGIES

Signal timing/coordination improvements: The TMP development process should consider the benefit of implementing updated signal timing and/or coordinated signal timing plans. When work zones are located within signalized corridors, provisions to implement signal coordination may significantly improve traffic flow and reduce driver delay. Including temporary signal equipment (video actuation, radio-based signal communication) in a TMP to facilitate efficient signal operation and/or coordination may be a viable option. In addition, signal timing parameters (i.e. phase splits and clearance intervals) should be reviewed.

Temporary traffic signals: This strategy employs the use of traffic signals to manage intersection traffic flow during construction. This may be a preferred method over stop signs or the use of flaggers. The need to interconnect new, temporary signals with existing ones should be considered. In addition to intersections, this strategy is often utilized during bridge construction/rehabilitation projects where only one lane is open to traffic flow.

Other street/intersection improvements: Temporary work zones may require geometric improvements to maintain efficient traffic flow. Elements such as additional turn lanes, shoulders or improved turning radii are examples. These measures could significantly improve a roadway's capacity and operational performance.

Bus/delivery turnouts: Vehicle turnouts, or pull-over areas, provide a refuge for these vehicles by removing them from the traffic stream. In addition to improved traffic flow, these elements may provide a safety benefit for drivers and passengers. These may be located in close proximity to existing bus stops or loading zones, particularly where work zones may disrupt their existing use or location.

Turn restrictions: Turning movements at intersections or driveways may be prohibited to allow for construction activities. This may be completed in

combination with detours. Turn restrictions may be implemented on a short-term (staged or phased) basis or throughout the duration of the work zone.

Parking restrictions: This strategy involves the removal of parking within a work zone to allow for construction work and/or for the benefit of worker or driver safety. Temporary removal of on-street parking may be implemented to preserve the use of a travel lane for traffic flow.

Truck/heavy vehicle restrictions: Due to either safety precautions or construction management strategies, large vehicles may be prohibited and/or detoured around the work zone. Roadway geometrics during construction may restrict the ability for oversized vehicles or large trucks from safely traveling through the work zone. Sufficient warning and advance notice is recommended in these cases.

Separate truck lanes: For worker safety, geometric limitations or other reasons, it may be advantageous to restrict trucks to certain lanes. The provisions listed in 23 CFR Part 658.11 (d) (1) and (g) must be followed under these conditions.

Reversible lanes: Sometimes referred to as contra-flow lanes, this strategy utilizes the same lane but for different directions of travel during different times of the day. Usually implemented during peak periods, a lane may be utilized for inbound travel in the morning and then outbound for the evening commute. Proper signing and signalization need to be considered.

Ramp closures: The closure of existing ramps may be necessary to allow for access to the work zone area or improve performance of the mainline flow. This may be completed in coordination with detours. Sufficient warning and advanced notice is recommended in these cases.

Railroad crossing controls: Where a railroad crossing is located within or near a work zone, special attention may be required to preserve traffic flow and address safety concerns. Coordination should be maintained with the railroad owner. Signal preemption, signing and pavement markings are some of the issues that should be considered.

WORK ZONE SAFETY MANAGEMENT STRATEGIES

Speed limit reduction/variable speed limits: The reduction of speed limits within work zones is a common strategy to promote safety and driver awareness with road work areas. The TMP may consider implementing speed reduction zones throughout the entire work area, or only within areas of the work zone where active work is taking place. Work zone speed limit advisories require appropriate signage and advance driver notice. TDOT addresses establishment of work zone speed limits in a memorandum entitled *Guidelines for Establishing*

Work Zone Speed Limits dated February 25, 2002. This guidance should be utilized to formulate a project's TMP speed limit recommendations.

References: TDOT Work Zone Speed Limit Memo
"TDOT Guidelines for Establishing Work Zone Speed Limits" (02/25/2002)
"Typical Placement for Speed Limit Signs in Work Zones"
NCHRP Research Digest No. 192
TDOT Circular Letter 712.04-01 (05/15/2002)

Temporary Traffic Signal: A temporary traffic signal may be implemented as part of a work zone. Based on changes in alignment, geometric or traffic control circumstances, a traffic signal may be an advantageous safety measure (i.e. traffic control for one-lane bridge conditions). Also see temporary traffic signal strategy under Temporary Traffic Control plan strategies.

Temporary movable/traffic barrier system: Traffic barriers provide a significant and rigid barrier of protection for workers and motorists. They may be installed adjacent to the work area or to separate opposing lanes of traffic. Required delineation and shoulder space should also be considered when using the barriers. Moveable barrier systems allow for a quick change or adjustment to the barrier system.

Crash cushions: This strategy is a safety device mounted on fixed or mobile objects to protect both motorists and construction personnel. Also known as impact attenuators, these instruments are a proven safety device by transferring the kinetic energy of moving objects (vehicles) to the crash cushion. These devices are most commonly used at the terminal ends of rigid barrier walls and also mounted on the rear of moving (mobile) work vehicles.

Temporary rumble strips: This strategy may be implemented to better gain motorists' attention to changing conditions. They are used to alert motorists that they are approaching a traffic control device or change in the work zone layout (i.e. presence of downstream work zones, traffic signal, stop signs or speed limit reductions). They may also be used longitudinally to delineate edges of the travel way, barriers or other roadside obstacles.

Intrusion alarms: In areas where it is desired to provide additional safety measures to work zone personnel, an intrusion alarm is an additional measure that may be used. Sensors are placed in locations where vehicles could potentially leave the designated travel way and enter the work zone. When the sensors detect an intrusion, audible alarms and/or lights are triggered alerting workers of the situation.

Warning lights: Warning lights may be used to delineate or alert motorists to work zone signs, barriers or other elements. TDOT standard specifications and

design guidelines on the application and implementation of lighting devices shall be followed when deploying this strategy.

Automated flagger assistance devices (AFAD's): These instruments allow for remotely controlling the assignment of vehicle right-of-way during short-term lane closures on two-lane highways. MUTCD provisions on the use of AFAD's should be strictly followed.

Road safety audits: Qualified personnel may perform a road safety audit prior to or during an active work zone. The audit may outline or highlight previously unknown safety issues that may be remedied through corrective measures or strategies implemented through the project planning and design process.

On-site safety training: Safety of workers and travelers within work zones may be enhanced by conducting safety training in the field. As part of the work zone management plan, training may be held to update workers on new technology or practices. Training may also be conducted as part of an on-going training requirement.

Safety award/incentives: This strategy utilizes awards, rewards or other recognition for the use of or successful completion of safety measures. Employees or contractors may be recognized for meeting specified safety goals or performance measures.

Windshield safety surveys: This strategy could involve the use of trained department staff or consultants in making on-site field visits (scheduled or random) to review performance of work zone traffic control and its adherence to project and contract standards and specifications. This could coincide as part of a regular work zone inspection program for the duration of the project or work zone event.

TRAFFIC/INCIDENT MANAGEMENT STRATEGIES

ITS for traffic monitoring/management: The implementation of ITS field devices may be included in a project TMP to promote real-time identification and mitigation of incidents within work zones. If a work zone occurs within an area already covered by an ITS system, provisions should be made for the existing ITS system to be incorporated and utilized within the work zone. Measures may be taken to relocate or install temporary instruments as needed. Conversely, a temporary, stand-alone ITS system may be included as part of the TMP. Items like traffic flow detectors and closed-circuit television (CCTV) cameras could be deployed to assist in the surveillance and communication of work zone conditions.

Transportation management centers: Often used in conjunction with ITS field devices, a management center could be used to accommodate personnel

overseeing the ITS equipment. Often an existing center may be used to organize and operate the system. In other situations, it may be desirable to establish a temporary location (i.e. a leased trailer) near the work zone site.

Traffic surveillance: This strategy is a subset of the overall ITS monitoring strategy and is used specifically for the monitoring of traffic flow and real-time conditions. Field devices such as CCTV cameras, loop detectors, video detection equipment as well as other technology may be deployed.

Traffic screens: Traffic screens may be installed within work zones to help prevent motorists from being distracted by the work zone. The intent of the screens is to aid in keeping motorists' focus on the roadway. They are typically mounted on the rigid traffic barriers. They may also be used to minimize glare from headlights of opposing traffic.

Assistance call boxes: The use of existing or installation of temporary call boxes may be included in the TMP. They provide travelers a way to contact officials for assistance. This would aid in the removal of blockages or incidents in work zones. These may be used in combination with vehicle "pull over" or refuge areas designated along a work zone.

Temporary location mile markers: These signs enable drivers to accurately report their location in the event of an incident. Mile markers are typically located outside the shoulder or within the median. Adjustments should be allowed as construction activities change.

Tow/freeway service patrol: This strategy uses on-site or nearby patrol vehicles or service vehicles that are given the primary objective of responding to needs within the work zone. This is particularly beneficial in aiding vehicle breakdowns or aiding in crashes. The patrol could be very helpful in work zones where significant congestion or delay could result due to lane blockages.

Incident detour routing: If deemed applicable, the TMP might include a pre-planned detour route that could be efficiently implemented when needed. Arrangements should be made during project development where viable detour entry and exit points may be established and what parties are responsible for initiating an emergency detour. The TMP should include specific detour routing and signing plans.

Contract support for incident management: This strategy allows for the contracting of outside, private service providers to operate identified incident response measures. The TMP should identify the services that might be provided by an outside service. Typical services may include police agencies (off-duty), towing, ITS equipment service/management and sign maintenance.

Incident/emergency response plan: Where more sophisticated emergency plans are needed, the TMP may include a comprehensive incident plan consisting of specific contacts and measures to be taken in response to certain situations. The plan could identify detour routing, contact information, location of staging areas and personnel roles.

ENFORCEMENT STRATEGIES

Dedicated (paid) police enforcement: This measure may be included in a project TMP to allow for the presence of dedicated police enforcement. Police presence may be called for at all times, during a specific time or specific construction activities. The scope and payment of these services may be handled through a contractual agreement. This police presence may begin with the onset of work or as-needed based on driver behavior.

Cooperative police enforcement: This strategy is meant to achieve the same objectives as the dedicated police enforcement except that there is not a separate or exclusive contract agreement. In this case, police enforcement is secured through a cooperative agreement between the police and work zone agency.

Automated enforcement: This provides an option to utilize technology as the means to assisting enforcement and communicating driver behavior back to travelers. The types of automated strategies may range from automatic speed radar/displays to traffic signal violations. The TMP should specifically identify what is to be measured or enforced.

PERSONNEL/STAKEHOLDER UTILIZATION STRATEGIES

Project task force/committee: The TMP may include a recommendation to assign and dedicate an individual or group to oversee and manage specific strategies to be deployed. The TMP should outline the objectives and role of the task force.

Construction safety supervisor/inspector: This strategy utilizes and dedicates an individual or team to conduct regular safety review or inspections of the work zone. The inspection would ensure proper work zone implementation or provide a mechanism to take corrective action in a timely manner.

Incident/emergency management coordinator: A TMP may include the use of an individual to oversee incident management operations. This person could coordinate and prepare for emergency situations as well as on-going incident management strategies (on-site service patrols).

TMP monitor/inspection team: The TMP may include a recommendation to assign and dedicate an individual or group to oversee and manage the implementation and management of the TMP through the life of the work zone.

This would most likely only occur for the most critical or sophisticated projects. The TMP might recommend team leaders or potential TMP contacts.

Team meetings: The TMP may recommend that project task forces and/or TMP teams meet on a regular basis to evaluate all aspects of the work zone and address any issues or previously unidentified elements. TDOT currently holds a post-construction briefing meeting on projects having an original contract amount of $10 million.

Reference: TDOT Circular Letter 105.15-02 (07/01/2004)

4.2C Public Information Strategies

TDOT's "Public Involvement Plan" outlines the Department's official process and procedures for public information strategies. The following presentation and discussion of public information strategies is to be considered in tandem and in reference to TDOT's official public information guidance document.

PUBLIC AWARENESS STRATEGIES

Brochures and mail-outs: Distribution of printed material may be used to reach large numbers of people. The TMP should specifically identify the desired content of the publications, the intended audience and who might be responsible for developing and distributing the material. Example content may include project schedule, project location, contact information where persons may obtain more information, detour routes or description of expected work zone activities. The brochures may be mailed to specific addresses near the work zone or left at area public locations (schools, libraries, post offices, stores, etc.). This strategy may only be done once at the beginning of the project or may be repeated as a mechanism to update the public on the project and/or changing aspects of the work zone.

Press releases/media alerts: This strategy uses the broadness and availability of the television and print media to spread information about specific project information. The TMP should identify what information might be included in the press release and who (division, office or individual) might be responsible for doing these tasks. Existing TDOT protocol and policies should be followed.

Paid advertisements: Paid advertisements or announcements may also be used to broadcast public information on upcoming projects. This may include using radio, television or newspapers. The TMP should identify the content, method and parties responsible for implementing this task.

Public information center: This is a physical building or facility where the public could obtain brochures, information or speak with project officials. In some cases, it may be possible to utilize a nearby public building or office for this

purpose. It is typically located near or adjacent to the work site. The TMP should suggest possible locations and the type of material or information to be made available.

Telephone hotline: This strategy would initiate a toll-free or local telephone number that would broadcast work zone information. Typically, it includes a pre-recorded message that is updated on a regular basis. Sometimes, it allows the public to leave recorded messages. Consideration should be given to if and how the agency will respond to comments. The use of TDOT's "Record-A-Comment" hotline and its associated roadway signage is an example of this.

General TDOT website: The TMP may recommend the use of TDOT's web site and/or TDOT SmartWay to disseminate information. Existing TDOT protocols should be used. The TMP may suggest the content and any schedule of information to be posted on the web site.

Project-specific web site: A web site specific to the project may be created. The TMP should consider the type and organization of the information to be displayed. It is recommended that an individual or committee be established or assigned to manage this task. It may also be preferable to seek an outside contractor to oversee the web site's development and management.

Public meetings/public hearings: The TMP may recommend that public meetings/hearings be held leading up to or during work zone activities. This is an effective way to reach out to the public, especially in the areas immediately in and around the work zone. This may be a tool to identify and address community concerns and input. In this context, the public meetings are held specifically to address work zone issues, not the overall need or scope of the project.

Community task force: This strategy utilizes input from community leaders and concerned citizens likely to be impacted by the work zone. The task force may be used to get feedback on how well certain aspects may or may not be working. Based on this information and public interaction, work zone elements may be fine-tuned or altered. The TMP should state what portions of the community may be most concerned about the impacts of the work zone (i.e. business community, schools, etc.)

Coordination with media/schools/businesses: This TMP strategy focuses on creating a relationship with specific community outlets to spread work zone information. This may include the use of e-mail lists, faxes, community access television channels, telephone calls or mass mailings to these pre-defined target audiences. The intent is to open and maintain channels of communication of ongoing construction activities and make those aware of work zone schedules and activities that might affect them.

Work zone education/safety campaigns: This is a widely used public information strategy. TDOT is currently active in its "Get In the Zone" and "Be Alert, Arrive Unhurt" campaigns. Through media campaigns, driver outreach programs and work zone awareness programs, greater attention may be brought to work zone safety and conditions. The TMP may recommend a specific education or safety outreach for a particular project based on the type of project proposed.

Visual presentation materials: This strategy incorporates the use of visual presentations or videos as part of public meetings or informational sessions. These may be used in conjunction with any of the other suggested strategies such as a repeating video shown at a public information center.

MOTORIST INFORMATION STRATEGIES

Traffic radio broadcasts: The TMP may recommend coordination with local companies responsible for broadcasting traffic reports on local radio stations. The TMP may describe points of contact between the department and the traffic radio providers.

Advance placement, changeable message signs: These may be mobile or fixed, existing or temporary dynamic message signs. Placement of mobile signs and the type of messages should be considered in the TMP. Coordination with local ITS management centers should be sought.

Temporary motorist information signs: These signs include temporary, traditional signs used to alert the motorist of potential hazards or provide information of detours or guidance through the work zone. The signs may be ground-mounted, overhead or on vehicles. The TMP should suggest potential sign needs and possible locations.

Dynamic speed message sign: Either fixed-mounted on the ground or on a portable trailer, this device may be used to enforce reductions of speed limits. Typically these signs are positioned at the beginning of the work zone and also may be located within the work zone. The TMP may recommend the use and placement of these to supplement police enforcement measures.

Highway advisory radio: The TMP may suggest that a local highway advisory radio (HAR) broadcast be implemented. This would alert drivers to information about impending work zone activities, like scheduled lane closures or rolling road blocks. The TMP should state possible responsible parties and typical information to be broadcast.

Listing on Tennessee 511: This strategy would direct work zone coordination with TN 511. Depending on the scope of the work zone, the traveler information system should be identified as a stakeholder in disseminating project information. The TMP may also list points of contact to allow coordination with TN 511.

Freight information: This strategy may be used where there may be an impact to or interaction with freight traffic, including truck companies, parcel companies, etc. The TMP may suggest a recommendation on how to contact and communicate with these groups. Coordination may be implemented through wireless communications or information posted at rest areas, truck stops, etc.

Reference: TDOT Circular Letter 104.04-01 Structure Width Restrictions (07/01/1992)

TDOT WORK ZONE SAFETY AND MOBILITY MANUAL

Appendix A

The Final Rule

FHWA 23 CFR 30 Subpart J

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

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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

[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.

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.

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 constructions 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 pre-existing 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 ''pre-existing 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 ATSAA 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.

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.

§ 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 zone [2] 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 crash [3] 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

[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.

[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.

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.

§ 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.

[FR Doc. 04–20340 Filed 9–8–04; 8:45 am]

BILLING CODE 4910–22–P

DEPARTMENT OF HOMELAND SECURITY

Coast Guard

33 CFR Part 100

[CGD05–04–155]

RIN 1625–AA08

Special Local Regulations for Marine Events; Hampton River, Hampton, VA

AGENCY: Coast Guard, DHS.

ACTION: Notice of implementation of regulation.

SUMMARY: The Coast Guard is implementing the special local regulations at 33 CFR 100.508 during the Hampton Bay Days Festival to be held September 10–12, 2004, on the waters of the Hampton River at Hampton, Virginia. These special local regulations are necessary to control vessel traffic due to the confined nature of the waterway and expected vessel congestion during the festival events. The effect will be to restrict general navigation in the regulated area for the safety of event participants, spectators and vessels transiting the event area.

DATES: 33 CFR 100.508 will be enforced from 12 p.m. e.d.t. on September 10, 2004 through 6 p.m. e.d.t. on September 12, 2004.

ADDRESSES: Comments and material received from the public, as well as documents mentioned in this preamble as being available in the docket, are part of docket CGD05–04–155 and are available for inspection or copying at Coast Guard Group Hampton Roads, 4000 Coast Guard Blvd., Portsmouth, VA 23703–2199.

FOR FURTHER INFORMATION CONTACT: Chief Petty Officer Michael Bowling, at (757) 483–8521.

SUPPLEMENTARY INFORMATION: Hampton Bay Days, Inc. will sponsor the Hampton Bay Days Festival on September 10–12, 2004 on the Hampton River, Hampton, Virginia. The festival will include water ski demonstrations, personal watercraft and wake board competitions, paddle boat races, classic boat displays, fireworks displays and a helicopter rescue demonstration. A fleet of spectator vessels is expected to gather nearby to view the festival events. In order to ensure the safety of participants, spectators and transiting vessels, 33 CFR 100.508 will be enforced for the duration of the festival activities. Under provisions of 33 CFR 100.508, vessels may not enter the regulated area without permission from the Coast Guard Patrol Commander. Spectator vessels may enter and anchor in the special spectator anchorage areas if they proceed at slow, no wake speed. The Coast Guard Patrol Commander will allow vessels to transit the regulated area between festival events. Because these restrictions will be in effect for a limited period, they should not result in a significant disruption of maritime traffic.

In addition to this notice, the maritime community will be provided extensive advance notification via the Local Notice to Mariners, marine information broadcasts, and area newspapers, so mariners can adjust their plans accordingly.

Dated: August 19, 2004.

Ben R. Thomason, III,

Captain, U.S. Coast Guard, Acting Commander, Fifth Coast Guard District.

[FR Doc. 04–20454 Filed 9–8–04; 8:45 am]

BILLING CODE 4910–15–P

DEPARTMENT OF HOMELAND SECURITY

Coast Guard

33 CFR Part 117

[CGD01–04–114]

Drawbridge Operation Regulations: Fore River, ME

AGENCY: Coast Guard, DHS.

ACTION: Notice of temporary deviation from regulations.

SUMMARY: The Commander, First Coast Guard District, has issued a temporary deviation from the drawbridge operation regulations for the Casco Bay Bridge, mile 1.5, across the Fore River between Portland and South Portland, Maine. This temporary deviation allows the bridge owner to require a four-hour advance notice for bridge openings from September 7, 2004 through November 5, 2004. Additionally, this deviation also allows the bridge to remain in the closed position, Monday through Friday, 9 p.m. to 5 a.m. from September 13, 2004 through October 1, 2004, and again, Monday through Friday, 6 a.m. to 6 p.m. from October 4, 2004 through October 22, 2004. This temporary deviation is necessary to facilitate structural modifications at the bridge.

DATES: This deviation is effective from September 7, 2004 through November 5, 2004.

FOR FURTHER INFORMATION CONTACT: John McDonald, Project Officer, First Coast Guard District, at (617) 223–8364.

SUPPLEMENTARY INFORMATION: The bridge owner, Maine Department of Transportation, requested a temporary deviation from the drawbridge operating regulations to facilitate structural modifications designed to improve reliability of the operating system at the bridge. The Coast Guard coordinated these requested closures with the mariners that normally use this waterway in order to minimize any disruption to the marine transit system.

Under this temporary deviation a four-hour advance notice for bridge openings shall be required from September 7, 2004 through November 5,

TDOT WORK ZONE SAFETY AND MOBILITY MANUAL

Appendix B

TMP Workbook

TDOT WORK ZONE SAFETY AND MOBILITY MANUAL

TMP Workbook

Work Zone Significance Determination

State PE Number: _____ Route/From-To: _____

PIN: _____ County: _____

Analyst: _____ Project/Construction AADT: _____

This is an Initial ☐ Secondary ☐ determination of the project's significance.

Major Route Criteria

A project lasting at least three days on an interstate route within a TMA with intermittent or continuous lane closures ☐

A project where all lanes in one direction will be closed on (a) any interstate route or (b) a non-interstate route having an AADT of at least 50,000 vpd ☐

Yes, by the Major Route Criteria, this is a Significant Project.	☐
No, the Major Route Criteria are not met.	☐

Delay Criteria

Urban ☐ Rural ☐ Freeway ☐ Arterial ☐ Collector/Other ☐

No. of lanes (in one direction) to be open in work zone: _____ Max. Allowable AADT (24-hr, two-way) from Table 3.1: _____

Yes, by the Delay Criteria, this is a Significant Project (project AADT > max AADT).	☐
No, the Delay Criteria are not met (project AADT < max AADT).	☐

Qualitative Criteria

Rate the following aspects of the work zone:

	High	*Low*
Business impacts (how many businesses affected?)	☐	☐
Public Interest	☐	☐
Exposure impacts due to long project duration	☐	☐
Impacts due to alternate routes	☐	☐
Impacts due to other concurrent projects nearby	☐	☐
Concurrent project description: _____		
Other: _____	☐	☐

Yes, due to extraordinary Qualitative Criteria, this is a Significant Project.*	☐
No, the Qualitative Criteria are not met.	☐

* "Significance" based solely on Qualitative criteria to be carefully considered and approved by responsible Division Director

FINAL TMP DETERMINATION: Significant Project: Yes ☐ No ☐

TMP Exception

Per FHWA/TDOT guidelines, an EXCEPTION has been applied for and approved by the FHWA Division Office (attach appropriate documentation) ☐

_____ _____

Manager I – Division Level Date

_____ _____

Manager II – Division Level Date

Tennessee Work Zone Safety and Mobility Manual TDOT

Transportation Management Plan

Project Description: _____

Project Location: _____

State PE Number: _____

PIN: _____

County: _____

Project Determined As (Refer to Figure 3.1 and the following sheets for guidance) :

(Check One) ☐ Basic ☐ Intermediate ☐ Significant

TMP Description (Check each Component utilized in Project) **:**

☐ Temporary Traffic Control: (If Basic is selected above, only TTC strategies will be used)

_____

_____

_____

☐ Transportation Operations:

_____

_____

_____

☐ Public Information:

_____

_____

_____

TMP Prepared By (Division/Firm Name): _____

TDOT Manager I: _____

Phone Number: _____

Email Address: _____

Date: _____

TDOT Manager II Approval: _____

Title: _____ Division: _____

Date: _____

Statement of Categories of TMPs

Significant Project - Requires careful consideration of work zone impact mitigation. Requires use of strategies from all three of TMP categories to help mitigate the impacts of a significant project:

- Temporary Traffic Control Strategies (TTC)
- Transportation Operations Strategies (TO)
- Public Information Strategies (PI)

A Significant Project is one for which any of the following criteria exists:

(a) Any project on the interstate system located within a recognized Transportation Management Area (TMA) that occupies a given location for at least three days duration with either continuous or intermittent lane closures. For the purposes of this Manual, it is assumed that the TMA consists of the following counties: *Blount, Bradley, Carter, Davidson, Fayette, Grainger, Hamblen, Hamilton, Hawkins, Jefferson, Knox, Loudon, Madison, Maury, Montgomery, Robertson, Rutherford, Sevier, Shelby, Sullivan, Sumner, Washington, Williamson, Wilson*.

(b) Any project of any duration on an interstate route, or any other route with an ADT of at least 50,000 vehicles per day for which all lanes in one direction will be closed to traffic.

(c) Any project for which the delay through the limits of the work zone is at least 30 minutes above the normal delay under typical non-work conditions.

(d) Any project deemed Significant by extraordinary qualitative characteristics. This determination may be made on the basis of conditions such as high levels of public interest, business/community impacts, or long work zone duration. All Significant Projects defined in this manner shall only be done with careful consideration and strategic decision making.

For a “non-significant” Project, one of two different levels of TMPs may be developed. A **Basic TMP** is to be used when only a TTC plan is needed to successfully implement a safe and efficient work zone. An **Intermediate TMP** is to be completed for “non-significant” projects where public information and/or transportation operation strategies would be beneficial or necessary as determined based on TDOT decision-making practices and procedures.

Intermediate Project - Requires additional planning, coordination, etc., but not required to be at the same level of a Significant TMP. TMP requires use of PI and/or TO strategies beyond the project’s TTC strategies. It is expected that the majority of Intermediate projects will consist of TTC and PI strategies.

Basic Project - Typical work zone TTC plan is implemented alone. Refer to TDOT standard drawings, standard notes, and MUTCD. No additional TMP strategies required.

Temporary Traffic Control Strategies

The Temporary Traffic Control component of the Transportation Management Plan (TMP) is included in the Contract Documents. The various strategies described below are intended for use in developing the final TMP. Although many of these strategies are routinely included in the Temporary Traffic Control Plan, they are provided here for review and consideration.

1. Construction phasing and/or equipment staging
2. Full roadway closure
3. Narrow lane/shoulder widths to maintain existing number of lanes
4. Full closure of lane/shoulder
5. Lane shift to shoulder/median
6. One-lane, two-way operation
7. Two-way traffic on one side of divided roadway
8. Reversible lanes
9. Ramp closure/relocation
10. Directional interchange closure
11. Work hour restrictions (off-peak, night, weekend)
12. Bike/Ped access maintenance
13. Private property/business access maintenance
14. Off-site detour/alternate routes
15. Temporary guidance/informational signs
16. Portable changeable message signs
17. Flashing arrow boards
18. Flaggers/uniformed traffic control personnel
19. Temporary traffic signals
20. Warning lighting devices
21. Coordination with other construction projects
22. Coordination with other utility projects
23. Coordination of existing/future right-of-way needs
24. Coordination with other non-highway transportation facilities
25. Incentive/disincentive clauses
26. Innovative construction techniques/materials

The various TTC Strategies listed above are not intended to be all inclusive, but rather provide a range of possible strategies which might be considered by those persons developing the TMP. Use the space below (and/or attach additional pages) to highlight noteworthy strategies OR strategies which are not routinely used on this type of project.

Notes for Selection of TTC Strategies:

Transportation Operations Strategies

The Transportation Operations Strategies component of the Transportation Management Plan (TMP) is included in the Contract Documents. The various strategies described below are intended for use in developing the final TMP. Although many of these strategies are routinely included, they are provided here for review and consideration.

1. Transit service additions/improvements
2. Transit incentives
3. Shuttle services
4. Ridesharing/carpooling incentives
5. Park-and-ride promotion
6. HOV lane addition/promotion
7. Ramp metering
8. Variable work hour incentives
9. Signal timing/coordination improvements
10. Temporary traffic signals
11. Other street/intersection improvements
12. Bus/delivery turnouts
13. Turn restrictions
14. Parking restrictions
15. Truck/heavy vehicle restrictions
16. Separate truck lanes
17. Reversible lanes
18. Ramp closures
19. Railroad crossing controls
20. Speed limit reduction/variable speed limits
21. Temporary movable/traffic barrier system
22. Crash cushion
23. Temporary rumble strips
24. Intrusion alarm
25. Warning lights
26. Automated flagger assistance devices
27. Road safety audits
28. On-site safety training
29. Safety awards/incentives
30. Windshield safety surveys
31. ITS for traffic monitoring/management
32. Transportation management centers
33. Traffic surveillance
34. Traffic screens
35. Assistance call boxes
36. Temporary location mile markers
37. Tow/freeway service patrol
38. Incident detour routing
39. Contract support for incident management
40. Incident/emergency response plan
41. Dedicated (paid) police enforcement
42. Cooperative police enforcement
43. Automated enforcement
44. Aerial enforcement
45. Project task force/committee
46. Construction safety supervisor/inspector
47. Incident/emergency management coordinator
48. TMP monitor/inspection team
49. Team meetings

The various Transportation Operations Strategies listed above are not intended to be all inclusive, but rather provide a range of possible strategies which might be considered by those persons developing the TMP. Use the space below (and/or attach additional pages) to highlight noteworthy strategies OR strategies which are not routinely used on this type of project.

Notes for Selection of TO Strategies:

Public Information Strategies

The Public Information component of the Transportation Management Plan (TMP) is coordinated by the Department's Communications Office. The Department employs a wide range of standard public information related strategies on all relevant projects. These include, but are not limited to, the 511 Travel Information System, the Dynamic ITS Message Boards, and the TDOT Internet Site.

In addition, lane-closure meetings are held weekly where additional public information strategies are considered and initiated when warranted.

All work zone projects will follow the guidelines set forth in TDOT's Public Involvement Plan. The various strategies described below are intended for use in developing the final TMP and are provided here for review and consideration.

1. Brochures and mail-outs
2. Press releases/media alerts
3. Paid advertisements
4. Public information center
5. Telephone hotline
6. General TDOT website
7. Specific project website
8. Public meetings/hearings
9. Community task force
10. Coordination with media/schools/businesses/etc
11. Work zone education/safety campaign
12. Visual presentation materials
13. Traffic radio broadcasts
14. Advanced placement, changeable message signs
15. Temporary motorist information signs
16. Dynamic speed message sign
17. Highway advisory radio (HAR)
18. Listing on Tennessee 511
19. Freight information

The various Public Information Strategies listed above are not intended to be all inclusive, but rather provide a range of possible strategies which might be considered by those persons developing the TMP. Use the space below (and/or attach additional pages) to highlight noteworthy strategies OR strategies which are not routinely used on this type of project.

Notes for Selection of PI Strategies:

Manager I –Requesting PI Input _____ Date _____

Community Relations Office – (To be sent back to Manager I above) _____ Date _____

ADDITIONAL NOTES/DOCUMENTATION

TDOT WORK ZONE SAFETY AND MOBILITY MANUAL

Appendix C

TDOT Circular Letters

CIRCULAR LETTER

Section: 105.15 Termination of the Contract
Number: 105.15-02
Subject: Post-Construction Review Process
Date: July 1, 2004

In order to determine future construction process improvements and reduce cost overruns, a post-construction review is required on all projects with an original contract amount of $10,000,000 (ten million) or greater. This review shall be conducted as soon as practical following the completion of all work.

Attendees at this review shall include the prime contractor and representatives from the following area when applicable: Construction, Design, Structures, Materials and Tests, Project Management, FHWA, consultant firm (design and inspection). The review shall be facilitated by Regional Construction personnel or the construction inspection consultant when applicable. The participants will identify all significant project problems and make recommendations on how these problems can be avoided on future projects. Items to be reviewed shall include but are not limited to cost overruns, supplemental agreements, plans completeness and accuracy, and contract obligations.

A post-construction review report shall be submitted to the Director of Construction. The report shall provide recommendations on any construction process improvements and how the identified overruns can be eliminated.

CIRCULAR LETTER

Section: **104.04 - Maintenance of Traffic**
Number: **104.04-01**
Subject: **Structure Width Restrictions**
Date: **July 1, 1992**

When routing truck and/or oversize traffic around or detouring through a work zone, the Project Engineer should advise the Region Construction Office approximately two weeks prior to the restriction of width and/or closing of a structure on the State or Interstate Highway System. This will allow the Regional Construction Office and the Permits Section ample time to make advisements of the lane restrictions. Also, once the restriction or closure has terminated, the Project Engineer should advise the Region Construction Office.

The Region Construction Office will relay restrictions on highway lane widths to the Permits Section at the following address:

Permits Section
Tennessee Department of Transportation
Suite 300 James K. Polk Building
505 Deadrick Street
Nashville, TN 37243-0331
Phone: (615)741-3821

Work Zone Speed Limit Procedure

The appropriate speed limit for any highway work zone can be determined from the procedure presented in this section. The procedure is applicable to stationary construction zones, maintenance zones, and utility operations; intermittent moving operations; and continuous moving operations. The recommended procedure has four steps:

- Step 1—Determine the existing speed limit,
- Step 2—Determine the work zone condition that applies,
- Step 3—Determine which factors for the appropriate condition apply to the specific site, and
- Step 4—Select the work zone speed limit.

Each step is discussed below. This procedure is illustrated by the flow chart in Figure 3. Figure 4 illustrates the seven work zone conditions that are addressed in Step 2.

Step 1—Determine the existing speed limit

The first step in the procedure is to determine the existing (preconstruction) speed limit for the work zone. The preconstruction speed limit is usually, but not necessarily, the same as the speed limit upstream of the work zone during the construction period. The preconstruction speed limit serves as the default value for the work zone speed limit. The speed limit in the work zone should be reduced only if such a reduction is warranted by the factors considered in the remainder of the procedure.

Step 2—Determine the work zone condition that applies

The work zone condition is determined by the location of work activities in relation to the traveled way. In general, speed limit reductions are more appropriate for work zones in which work activities take place in or near the traveled way than for work zones where work activities take place in shoulder or roadside areas well removed from the traveled way or behind a positive barrier.

The procedure addresses the following conditions:

1. Activities that are more than 10 ft from the edge of the traveled way (roadside activity),
2. Activities that encroach on the area closer than 10 ft but not closer than 2 ft to the edge of the traveled way (shoulder activity),
3. Activities that encroach on the area from the edge of the traveled way to 2 ft from the edge of the traveled way (lane encroachment),
4. Activities that require an intermittent or moving operation on the shoulder (moving activity on shoulder),
5. Activities that encroach on the area between the centerline and the edge of the traveled way (lane closure),
6. Activities that require a temporary detour roadway (temporary detour), and
7. Activities that encroach on the area on both sides of the centerline of a roadway or lane line of a multilane highway (centerline or lane line encroachment).

The conditions are discussed in greater detail later in this section.

Step 3—Determine which factors for the appropriate condition apply to the specific site

The third step in the procedure is to review the

portion of Table 1 applicable to the condition present in the work zone. Table 1 identifies the factors that should be considered in determining whether a speed limit reduction is appropriate for any given work zone condition. If any of the factors identified in the applicable portion of Table 1 is present, then a work zone speed limit reduction is warranted and may be implemented. Consideration of the factors in Table 1 is especially important at sites where the presence of these factors may not be apparent to motorists.

Step 4—Select the work zone speed limit

The work zone speed limit should be selected considering the factors presented in Table 1. The table includes guidelines on the maximum speed limit reduction that is recommended for each work zone condition. Speed limit reductions larger than the recommended 10-mph maximum should generally be considered only if restricted geometrics with a lower design speed are present in the work zone and modification of the geometrics to a higher design speed is not feasible.

Highway engineers responsible for each work zone should monitor the conditions in the work zone and ensure that the posted speed limit is appropriate for the actual conditions at any given time. For example, the presence of workers in an unprotected position within 10 ft of the traveled way for an extended period of time warrants a speed limit reduction of 10 mph. However, if worker protection is the only warrant for a speed limit reduction, the speed limit should be restored to its original value when the work activity at that location is completed. Use of work zone speed limits that are appropriate for the conditions that actually exist in the work zone is very important in maintaining motorists respect for speed limits. If motorists frequently encounter reduced speed limits that are not appropriate for the actual conditions in the work zone, they may lose respect for all speed limits and, thus, choose a speed that is too high in a situation where reduced speeds are truly necessary.

All work zone traffic controls should be evaluated at the beginning of the project and periodically through the life of the project to determine if the traffic controls are operating as intended. If problems, including traffic accidents, evidence of traffic accidents, such as debris, or near misses are occurring, the responsible person (resident engineer or traffic control specialist) should determine the cause of the problems so that the circumstances causing the problems can be corrected. Correction may require assistance from the traffic control designer, traffic engineer, or other knowledgeable person.

Condition 1

Activities that are more than 10 ft from the edge of the traveled way (roadside activity)

Typical Applications

- Roadway construction
- Cleaning drainage
- Landscaping work
- Structural work
- Utility work
- Reworking ditches
- Fencing work

Reductions to Existing Regulatory Speed Limit

Should not be used*

Suggested Maximum Amount of Speed Reduction

None

Factors

None

The regulatory speed limit shall meet all requirements of the *MUTCD*.

*There should not be a reduction to the existing regulatory speed limit unless unusual situations create hazardous conditions for motorists, pedestrians, or workers.

Condition 2

Activities that encroach on the area closer than 10 ft but not closer than 2 ft to the edge of the traveled way (shoulder activity)

Typical Applications

Roadway construction
Culvert extensions
Guardrail installation
Cleaning drainage
Reworking ditches
Shoulder work
Utility work
Side slope work
Landscaping work
Structural work
Sign installation

Reductions to Existing Regulatory Speed Limit

May be used where Factors exist

Suggested Maximum Amount of Speed Reduction

10 mph

Factors

- Workers present for extended periods within 10 ft of traveled way unprotected by barriers
- Horizontal curvature that might increase vehicle encroachment rate (could include mainline curves, ramps, and turning roadways)

The regulatory speed limit shall meet all requirements of the *MUTCD*.

Condition 3

Activities that encroach on the area from the edge of the traveled way to 2 ft from the edge of the traveled way (lane encroachment)

Typical Applications

Roadway construction
Guardrail installation
Utility work
Shoulder work

Reductions to Existing Regulatory Speed Limit

May be used where Factors exist

Suggested Maximum Amount of Speed Reduction

10 mph

Factors

- Workers present for extended periods within 2 ft of traveled way unprotected by barrier
- Horizontal curvature that might increase vehicle encroachment rate (Could include mainline curves, ramps, and turning roadways.)
- Barrier or pavement edge dropoff within 2 ft of traveled way
- Reduced design speed for stopping sight distance
- Unexpected conditions

The regulatory speed limit shall meet all requirements of the *MUTCD*. Where work zone geometrics with reduced design speeds cannot be avoided, the work zone speed limit should not exceed the design speed, even if this requires a work zone speed limit reduction greater than 10 mph.

Condition 4

Activities that require an intermittent or moving operation on the shoulder (moving activity on shoulder)

Typical Applications

Roadway construction
Widening
Delineator installation
Shoulder and slope work
Utility work
Guardrail installation
Landscape work

Reductions to Existing Regulatory Speed Limit

Should not be used*

Suggested Maximum Amount of Speed Reduction

None

Factors

None

The regulatory speed limit shall meet all requirements of the *MUTCD*.

*There should not be a reduction to the existing regulatory speed limit unless unusual situations create hazardous conditions for motorists, pedestrians, or workers.

Condition 5

Activities that encroach on the area between the centerline and the edge of traveled way (lane closure)

Typical Applications

Roadway construction
Pavement repair
Utility work
Widening
Pavement resurfacing
Pavement marking
Bridge repair

Reductions to Existing Regulatory Speed Limit

May be used where Factors exist

Suggested Maximum Amount of Speed Reduction

10 mph

Factors

- Workers present for extended periods in the closed lane unprotected by barrier
- Lane width reduction of 1 ft or more with a resulting lane width less than 11 ft
- Traffic control devices encroaching on a lane open to traffic or within a closed lane but within 2 ft of the edge of the open lane
- Reduced design speed for taper length or speed change lane length
- Barrier or pavement edge dropoff within 2 ft of the traveled way
- Reduced design speed of horizontal curve
- Reduced design speed for stopping sight distance
- Traffic congestion created by a lane closure
- Unexpected conditions

The regulatory speed limit shall meet all requirements of the *MUTCD*. Where work zone geometrics with reduced design speeds cannot be avoided, the work zone speed limit should not exceed the design speed, even if this requires a work zone speed limit reduction greater than 10 mph.

Condition 6

Activities requiring a temporary detour to be constructed (temporary detour)**

Typical Applications

Roadway construction
Subgrade restoration
Bridge construction
Culvert repair

Reductions to Existing Regulatory Speed Limit

May be used where **Factors** exist

Suggested Maximum Amount of Speed Reduction

10 mph

Factors

- Lane width reduction of 1 ft or more with a resulting lane width less than 11 ft
- Reduced design speed for detour roadway or transitions (radius of curvature, superelevation, and sight distance)
- Unexpected conditions

The regulatory speed limit shall meet all requirements of the *MUTCD*. Where work zone geometrics with reduced design speeds cannot be avoided, the work zone speed limit should not exceed the design speed, even if this requires a work zone speed limit reduction greater than 10 mph.

**Detour and transition geometry with a design speed equal to or greater than the existing regulatory speed limit should be provided whenever possible.

Condition 7

Activities that encroach on the area on both sides of the centerline of a roadway or lane line of a multilane highway (centerline or lane line encroachment)

Typical Applications

Roadway construction
Pavement marking
Pavement resurfacing
Pavement repair
Widening
Crack sealing
Bridge repair

Reductions to Existing Regulatory Speed Limit

May be used where **Factors** exist

Suggested Maximum Amount of Speed Reduction

10 mph

Factors

- Workers present on foot in the traveled way or in the closed lane unprotected by barrier for extended periods
- Remaining lane plus shoulder width is less than 11 ft
- Reduced design speed for taper length or speed change lane length
- Barrier or pavement edge dropoff within 2 ft of the traveled way
- Reduced design speed of horizontal curve
- Reduced design speed for stopping sight distance
- Traffic congestion created by lane closure
- Unexpected conditions

The regulatory speed limit shall meet all requirements of the *MUTCD*. Where work zone geometrics with reduced design speeds cannot be avoided, the work zone speed limit should not exceed the design speed, even if this requires a work zone speed limit reduction greater than 10 mph.

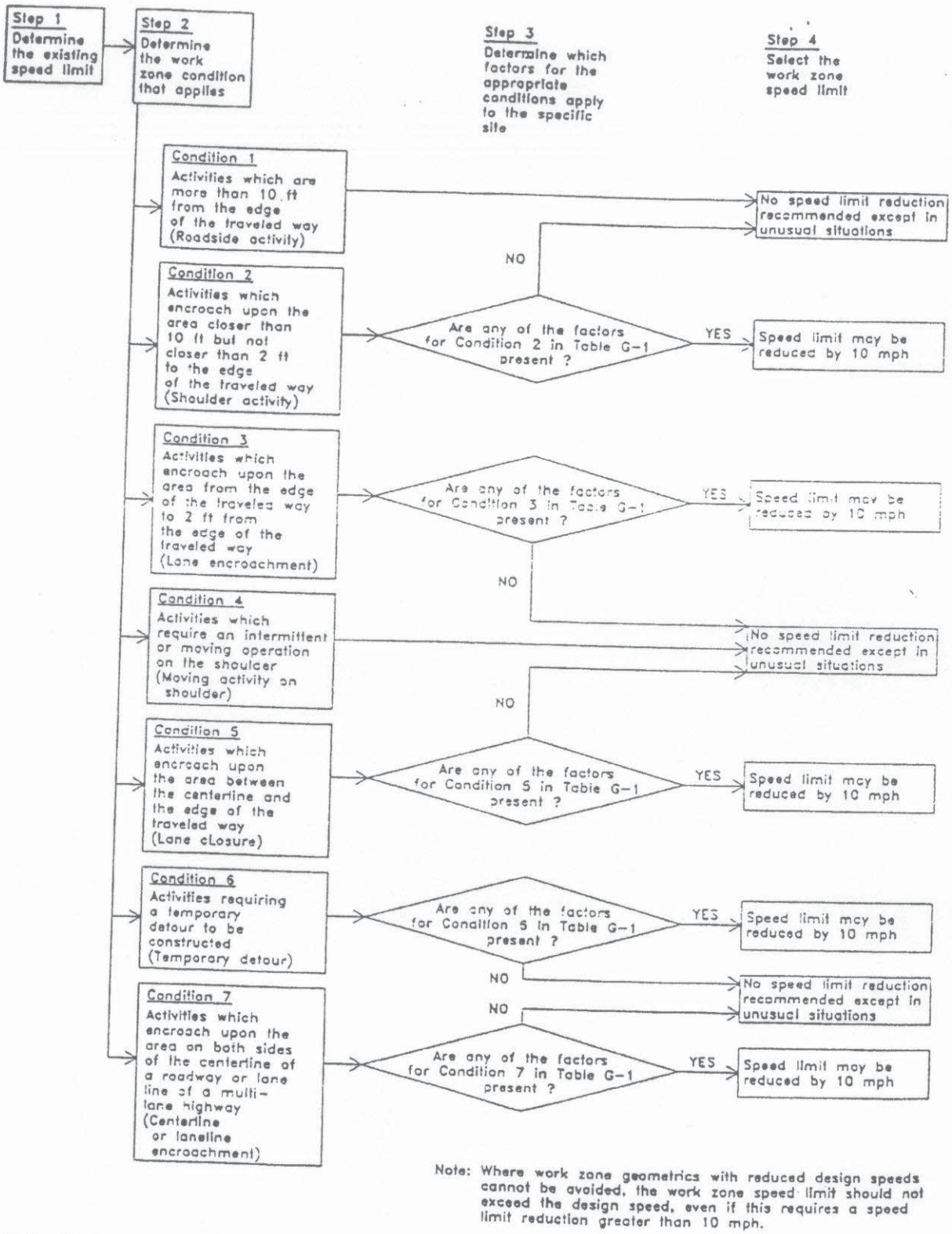


Figure 3. Work zone speed limit procedure flowchart.

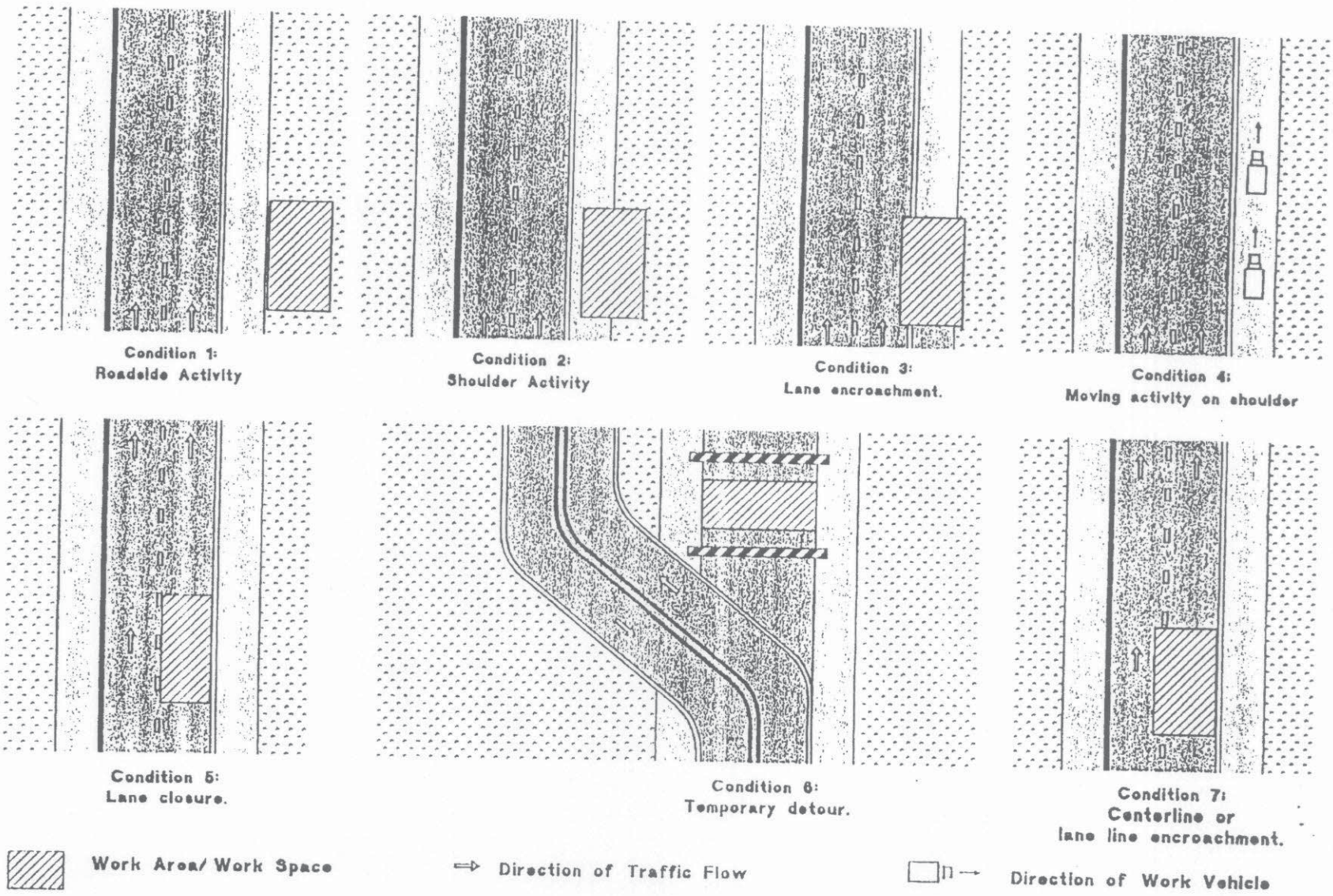


Figure 4. Work zone conditions.

CIRCULAR LETTER

Section: 712.07-Maintenance
Number: **712.07-01**
Subject: Manual on Uniform Traffic Control Devices

Date: May 15, 1994

All construction warning signs are to be placed in accordance with the Manual on Uniform Traffic Control Devices for Highway Construction and Maintenance Operations.

Construction signs should be erected no closer than 50 feet from an existing sign. Construction signs may be moved plus or minus 100 feet from the Plans location in order to avoid conflicts with existing signs, driveways and side streets. The Regional Traffic Engineer should be contacted if this criteria cannot be met.

At the beginning of work on a project, the construction signs and other traffic control devices are to be placed in accordance with the MUTCD and, thereafter, properly maintained and changed as conditions on the project change.

To direct traffic through construction projects safely and expeditiously, it is imperative that adequate and proper signing be maintained for the full duration of the project. Such maintenance includes the cleaning, repositioning, temporary covering, removing of foliage or other needs as warranted. It should be noted that the MUTCD illustrates minimum desirable standards for normal situations. Additional protection must be provided when special complexities and hazards exist.

To be effective, signing must be credulous. To maintain creditability the signing must convey to the motorist exactly what can be expected on the road ahead. This cannot be accomplished with contradictory or improper signing. Signs should be removed or covered when they are not applicable. If a driver observes a sign several times such as "Right Lane Closed" or "Flagmen Ahead", but as he proceeds he finds the situation conveyed by the message to be nonexistent, he will be much more apt to disregard it in the future. In addition, when a series of signs encroach into the area of another series of signs, only the signs conveying the appropriate message should be displayed. For example, if a series of lane closure signs encroach into the advance warning signs, the advance warning signs should be covered or removed until their need is warranted again.

It is important that the responsibility for inspecting the signing be clearly defined. This responsibility may be assigned to one individual on a region wide basis or on a project basis by the designation of a staff member by the Project Engineer.

Signing should be inspected at least once a week or more often if conditions warrant. Inspections should be made periodically during hours of darkness.

Attached is a check list for use in assuring that proper and adequate signing is maintained at all times. The completed check lists should be filed in the project files.

Section 6B-4 of the MUTCD states that all sign installations should be constructed so as to yield upon impact to minimize hazards to motorists. Also, because of the potential hazard to pole climbers and other considerations, traffic control signs are not to be attached to utility poles

CHECK LIST FOR TRAFFIC CONTROL DEVICES

Contract No._____Project No._____County_____

Contractor_____

1.	Have test reports been received on all signing materials?	Yes No N/A
2.	Are all signs and sign supports constructed in accordance with the Tennessee Manual on Uniform Traffic Control Devices?	Yes No N/A
3.	Are all signs, barricades, tapers and transitions placed in conformance with at least the minimum standards of the M.U.T.C.D.?	Yes No N/A
4.	Do stripes on the barricades point in the proper direction?	Yes No N/A
5.	Are all signs and barricades properly supported?	Yes No N/A
6.	Are all traffic control devices clean and clearly visible to the approaching motorist?	Yes No N/A
7.	Has all necessary temporary striping been placed?	Yes No N/A
8.	Have all contradictory permanent traffic control devices been covered or removed?	Yes No N/A
9.	Are all signs that are appropriate only during certain periods being covered or removed when not necessary?	Yes No N/A
10.	Are all flagmen wearing orange vests?	Yes No N/A
11.	Are traffic control devices set-up in advance of the work area to warn the approaching motorists in ample time to make needed adjustments?	Yes No N/A
12.	Are lane closures and the beginning of detours clearly visible to the approaching motorist?	Yes No N/A
13.	Are all traffic control devices being promptly adjusted as changing conditions warrant?	Yes No N/A
14.	Are traffic control devices adequate to safely and expeditiously guide an unfamiliar motorist through the project?	Yes No N/A
15.	Have arrow boards been checked and are the three mode (bright, dim, automatic) selector switches working properly as determined by night time inspection?	Yes No N/A

EXPLAIN ALL "NO" ANSWERS AND ACTION TAKEN:_____

_____

(1) date inspected:_____time inspected_____am/pm
(2) date inspected:_____time inspected_____am/pm
(3) date inspected:_____time inspected_____am/pm
(4) date inspected:_____time inspected_____am/pm

INSPECTOR'S SIGNATURE:_____

cc: Regional Safety Coordinator

CIRCULAR LETTER

Section: 712.04 Temporary Traffic Control - General
Number: **712.04-02**
Subject: Review and Approval of Proposed Traffic Control Prior to Major Disruptions of Existing Traffic Patterns

Date: February 1, 1994

Anytime proposed construction requires major disruption to existing traffic patterns the Regional Traffic Engineer is to be consulted. The Regional Traffic Engineer should be provided details on the proposed disruption including but not limited to advance warning, possible alternate routes, type of disruption, time and length of disruption, Contract Plans, etc. The Regional Traffic Engineer should review, modify if needed, and approve the proposed plan prior to implementation. The Regional Traffic Engineer's guidance is crucial to minimize negative impacts and to maximize safety for the public.

Such major disruptions could include closures of interstate, primary, major arterials and/or secondary highways; lane closures on urban interstates or major arterials; and any other disruptions deemed appropriate.

MEMORANDUM

TO: Regional Engineering Directors
Regional Traffic Engineers
Regional Construction Engineers
Regional Safety Coordinators

FROM: Mike Tugwell
Joseph Sweat
Traffic Engineering Office
Tennessee Department of Transportation

DATE: February 25, 2002

SUBJECT: Guidelines for Establishing Work Zone Speed Limits

The Traffic Engineering Office has developed uniform guidelines for establishing work zone speed limits. The procedures and related guidelines are shown on the following pages.

The guidelines are based on research by the National Cooperative Highway Research Program (NCHRP). (See attached report No. 192). The research was initiated by AASHTO.

The new procedure addresses the problem of speed limits remaining in place during periods when they are no longer warranted.

C: Commissioner Saltsman
Bill Moore
Jim Jeffers
David Donoho
Gerald Gregory
Alex Noble
Don Dahlinger
Karen Brunelle
David Martin
Doc#WSSpeed.doc

TDOT Guidelines for Establishing Work Zone Speed Limits

Note: These guidelines were developed by the Traffic Engineering Office and are based on research by the National Cooperative Highway Research Program (NCHRP). (See attached report No. 192).

This document outlines the general procedures to be used for establishing speed limits in Tennessee work zones. The Tennessee Department of Transportation acting through its construction engineers and regional personnel, are in the best position to decide if a work zone speed limit is appropriate for the conditions at a given work site. These guidelines are intended to aid in applying work zone speed limits in a more uniform manner and to aid TDOT personnel in making decisions, however, they are not a substitute for sound engineering judgement.

Request for speed reductions are currently initiated by contractors and are granted in most cases. Reductions are currently given for the entire length of the work zone (blanket reduction) and generally remain in place for the duration of the project.

Speed limits left in place for the duration of the project are at times unwarranted, particularly near the end of the project, when major aspects of the work, such as paving, are complete. Because of scheduling, there are often significant periods of time when no work is being done and no need for a speed reduction. Unwarranted speed reductions leads to increasing non-compliance by motorists and results in an overall reduction in the safety of the work zone. These procedures address that problem.

Work Zone Speed Limit Procedure:

Refer to attached NCHRP report 192

- Step 1 - Determine the existing speed limit.
- Step 2 - Determine the work zone condition that applies
- Step 3 – Determine which factors for the appropriate condition apply to the specific site, and
- Step 4 – Select the work zone speed limit

Commentary on Procedures:

- The procedures provide a method for considering engineering factors in selecting an appropriate work zone speed limit. The need for a speed limit reduction is

determined in the procedure through consideration of a number of factors related to the actual conditions in a specific work zone.

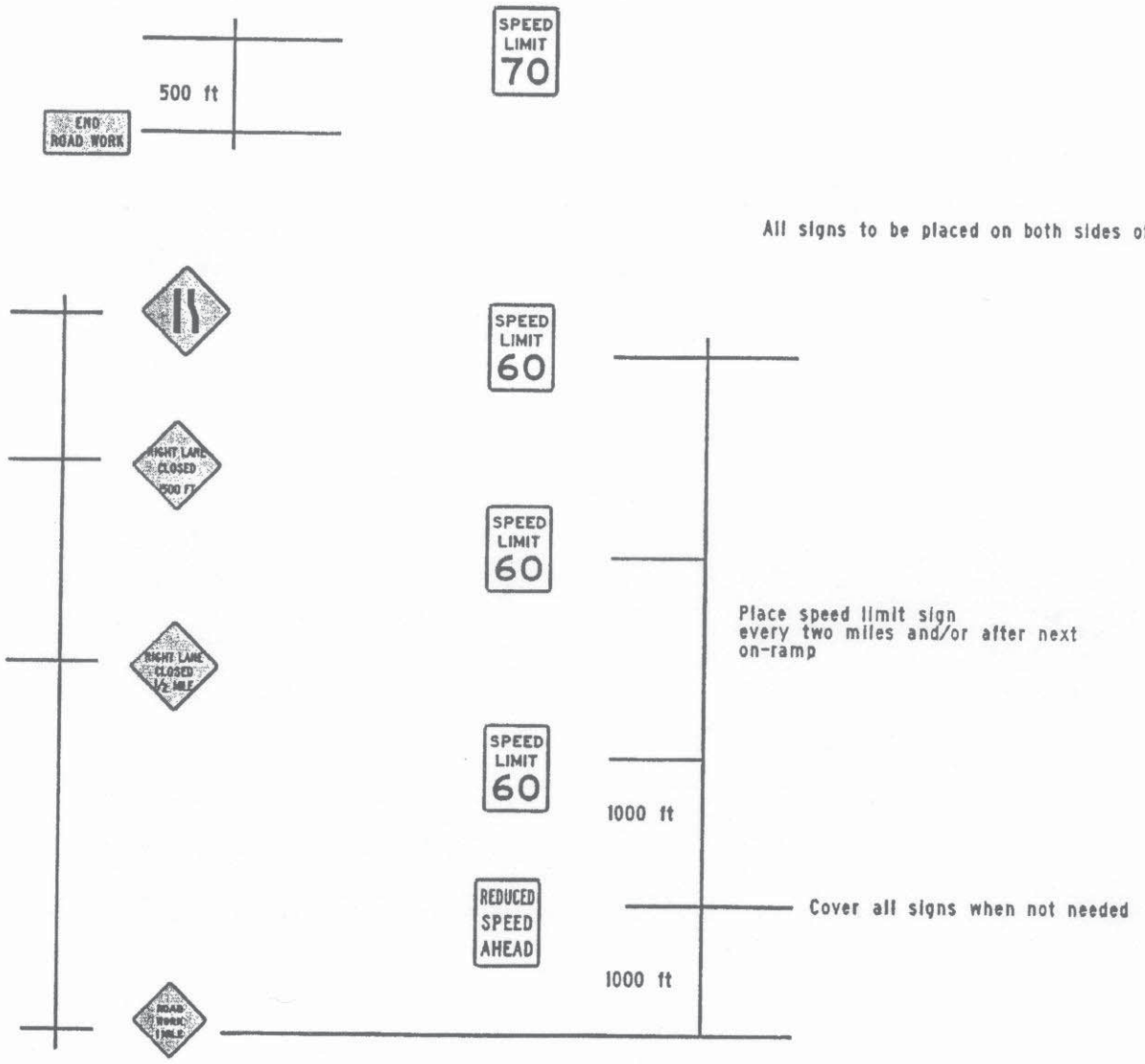
- At such locations where work activities are removed from the edge of the traveled way by 10 ft or more, it is recommended that the work zone speed limit not be reduced.
- When work zone activities are closer than 10' to the edge of the traveled way and where other specific factors are present, as established by NCHRP NO. 192 (see attached report) speed limit reductions **may** be used.
- Work zone speed limit reductions larger than 10 mph are undesirable and should be avoided except where required by restricted geometrics or other work zone features that can not be modified.
- Reduced speed limits are generally most appropriate for project that last at least 72 hours.
- TDOT personnel should review each work zone to determine if a reduced speed is needed. Work zone speed limits may be reduced when factors outlined in NCHRP 192 exist. See attached NCHRP No. 192.
- Reduced speed limits may remain in place when work is ongoing in any 72 hour period.
- If work is halted for more than 72 hours and no factors exist which warrant a speed reduction, then the speed limit should be returned to previous regulatory limits.
- In order to for contractors to easily and quickly change the speed limit within the work zone, the procedure recommends the use of removable plates which will change the speed limit signs by 10 mph increments. A standard regulatory speed limit sign is easily modified to meet this requirement.
- A request by a contractor does not alone constitute a need for a reduced speed zone.

NCHRP procedure for determining work zone speed limits follows this page.

From the NCHRP report No.192:

TDOT Doc no. WSSpeed.doc

Typical Placement For Speed Limit Signs In Work Zones



General Notes :

Distances given above may be field adjusted by direction of the engineer.

On freeways and expressway signs to be 48" x 60"

On conventional highways signs may be 36" x 48"

CIRCULAR LETTER

SECTION: 712.04
NUMBER: **712.04-01**
SUBJECT: Reduction of Speed Limit in Active Construction Zones

DATE: May 15, 2002

In order to enhance safety for both the motoring public and construction personnel the Department will permit, upon written request and written approval by the State Traffic Engineer, the contractor to erect signs for reduced speed limits as warranted by the Guidelines for Establishing Work Zone Speed Limits. The Project Supervisor shall first review the Guidelines to determine if the reduction in speed is warranted before forwarding the request to the State Traffic Engineer.

The intent is to allow a reduction of the legal speed limit for the shortest period warranted in the area of active construction work as outlined in the Guidelines. The reduced speed limit signs are to be furnished, erected, maintained and removed at the contractor's expense. They are to be used only for the immediate area of active construction work.

Enclosed, herewith along with the Guidelines, is a suggested form that may be used for the approval procedure.

Contract No.
Project No.
Project Ref.No.
County

Civil Engineering Supervisor
Tennessee Department of Transportation

Dear Sir:

We _____, prime contractor, on the above captioned project request permission to reduce speed limit from _____MPH to _____ MPH to utilize Speed Limit Reduction Signs as shown on Tennessee Department of Transportation Drawing No. T-S-18. We agree to utilize subject signs only in the immediate area of active construction. We further agree to furnish, erect, maintain and remove them at our expense. The flashing lights will only be operational when active work is being performed.

Thanks for your consideration of this matter.

Prime Contractor

Approved:
Civil Engineering Supervisor

Date:

Copy to Regional Construction Engineer

TDOT WORK ZONE SAFETY AND MOBILITY MANUAL

Appendix D

Sample TMP Workbook

TDOT WORK ZONE SAFETY AND MOBILITY MANUAL

TMP Workbook

Example

Work Zone Significance Determination

Tennessee Work Zone Safety and Mobility Procedure

State PE Number: _____ Route/From-To: I-24 (from SR 96 to SR 210)

PIN: _____ County: Rutherford

Analyst: WZ Committee Project/Construction AADT: 100,000

This is an Initial ☒ Secondary ☐ determination of the project's significance.

Major Route Criteria

A project lasting at least three days on an interstate route within a TMA with intermittent or continuous lane closures	☒
A project where all lanes in one direction will be closed on (a) any interstate route or (b) a non-interstate route having an AADT of at least 50,000 vpd	☐

Yes, by the Major Route Criteria, this is a Significant Project.	☒
No, the Major Route Criteria are not met.	☐

Delay Criteria

Urban ☒ Rural ☐ Freeway ☒ Arterial ☐ Collector/Other ☐

No. of lanes (in one direction) to be open in work zone: 2

Max. Allowable AADT (24-hr, two-way) from Table 3.1: 89,000

Yes, by the Delay Criteria, this is a Significant Project (project AADT > max AADT).	☒
No, the Delay Criteria are not met (project AADT < max AADT).	☐

Qualitative Criteria

Rate the following aspects of the work zone:

	High	*Low*
Business impacts (how many businesses affected?)	☐	☒
Public Interest	☒	☐
Exposure impacts due to long project duration	☒	☐
Impacts due to alternate routes	☐	☒
Impacts due to other concurrent projects nearby	☐	☒
Concurrent project description:		
Other:	☐	☐

Yes, due to extraordinary Qualitative Criteria, this is a Significant Project.*	☒
No, the Qualitative Criteria are not met.	☐

* "Significance" based solely on Qualitative criteria to be carefully considered and approved by responsible Division Director

FINAL TMP DETERMINATION: Significant Project: Yes ☒ No ☐

TMP Exception

Per FHWA/TDOT guidelines, an EXCEPTION has been applied for and approved by the FHWA Division Office (attach appropriate documentation) ☐

_____ _____

Manager I – Division Level Date

_____ _____

Manager II – Division Level Date

Tennessee Work Zone Safety and Mobility Manual TDOT

Transportation Management Plan

Project Description: Widen I-24 from State Route 96 to State Route 210

Project Location: Interstate 24 – Rutherford County

State PE Number:

PIN:

County: Rutherford

Project Determined As (Refer to Figure 3.1 and the following sheets for guidance) :

(Check One) ☐ Basic ☐ Intermediate ☒ Significant

TMP Description (Check each Component utilized in Project) **:**

☒ Temporary Traffic Control: (If Basic is selected above, only TTC strategies will be used)
See TTC plans within construction documents. All instructions and work zone strategies listed in the TTC Plan will be followed.

☒ Transportation Operations:
See attached sheet for list of TO strategies to be employed.

☒ Public Information:
All public information strategies will be followed according to the standard practices listed in TDOT's Public Involvement Plan.

TMP Prepared By (Division/Firm Name): TDOT Design Division

TDOT Manager I: Joe Carpenter

Phone Number: 741-0839

Email Address: joe.carpenter@state.tn.us

Date: 8/15/07

TDOT Manager II Approval: Signature of Carolyn Stonecipher

Title: Assistant Director Division: TDOT Design Division

Date: 8/15/07

Statement of Categories of TMPs

Significant Project - Requires careful consideration of work zone impact mitigation. Requires use of strategies from all three of TMP categories to help mitigate the impacts of a significant project:

- Temporary Traffic Control Strategies (TTC)
- Transportation Operations Strategies (TO)
- Public Information Strategies (PI)

A Significant Project is one for which any of the following criteria exists:

(a) Any project on the interstate system located within a recognized Transportation Management Area (TMA) that occupies a given location for at least three days duration with either continuous or intermittent lane closures. For the purposes of this Manual, it is assumed that the TMA consists of the following counties: *Blount, Bradley, Carter, Davidson, Fayette, Grainger, Hamblen, Hamilton, Hawkins, Jefferson, Knox, Loudon, Madison, Maury, Montgomery, Robertson, Rutherford, Sevier, Shelby, Sullivan, Sumner, Washington, Williamson, Wilson*.

(b) Any project of any duration on an interstate route, or any other route with an ADT of at least 50,000 vehicles per day for which all lanes in one direction will be closed to traffic.

(c) Any project for which the delay through the limits of the work zone is at least 30 minutes above the normal delay under typical non-work conditions.

(d) Any project deemed Significant by extraordinary qualitative characteristics. This determination may be made on the basis of conditions such as high levels of public interest, business/community impacts, or long work zone duration. All Significant Projects defined in this manner shall only be done with careful consideration and strategic decision making.

For a “non-significant” Project, one of two different levels of TMPs may be developed. A **Basic TMP** is to be used when only a TTC plan is needed to successfully implement a safe and efficient work zone. An **Intermediate TMP** is to be completed for “non-significant” projects where public information and/or transportation operation strategies would be beneficial or necessary as determined based on TDOT decision-making practices and procedures.

Intermediate Project - Requires additional planning, coordination, etc., but not required to be at the same level of a Significant TMP. TMP requires use of PI and/or TO strategies beyond the project’s TTC strategies. It is expected that the majority of Intermediate projects will consist of TTC and PI strategies.

Basic Project - Typical work zone TTC plan is implemented alone. Refer to TDOT standard drawings, standard notes, and MUTCD. No additional TMP strategies required.

Temporary Traffic Control Strategies

The Temporary Traffic Control component of the Transportation Management Plan (TMP) is included in the Contract Documents. The various strategies described below are intended for use in developing the final TMP. Although many of these strategies are routinely included in the Temporary Traffic Control Plan, they are provided here for review and consideration.

1. Construction phasing and/or equipment staging
2. Full roadway closure
3. Narrow lane/shoulder widths to maintain existing number of lanes
4. Full closure of lane/shoulder
5. Lane shift to shoulder/median
6. One-lane, two-way operation
7. Two-way traffic on one side of divided roadway
8. Reversible lanes
9. Ramp closure/relocation
10. Directional interchange closure
11. Work hour restrictions (off-peak, night, weekend)
12. Bike/Ped access maintenance
13. Private property/business access maintenance
14. Off-site detour/alternate routes
15. Temporary guidance/informational signs
16. Portable changeable message signs
17. Flashing arrow boards
18. Flaggers/uniformed traffic control personnel
19. Temporary traffic signals
20. Warning lighting devices
21. Coordination with other construction projects
22. Coordination with other utility projects
23. Coordination of existing/future right-of-way needs
24. Coordination with other non-highway transportation facilities
25. Incentive/disincentive clauses
26. Innovative construction techniques/materials

The various TTC Strategies listed above are not intended to be all inclusive, but rather provide a range of possible strategies which might be considered by those persons developing the TMP. Use the space below (and/or attach additional pages) to highlight noteworthy strategies OR strategies which are not routinely used on this type of project.

Notes for Selection of TTC Strategies:

Transportation Operations Strategies

The Transportation Operations Strategies component of the Transportation Management Plan (TMP) is included in the Contract Documents. The various strategies described below are intended for use in developing the final TMP. Although many of these strategies are routinely included, they are provided here for review and consideration.

1. Transit service additions/improvements
2. Transit incentives
3. Shuttle services
4. Ridesharing/carpooling incentives
5. Park-and-ride promotion
6. HOV lane addition/promotion
7. Ramp metering
8. Variable work hour incentives
9. Signal timing/coordination improvements
10. Temporary traffic signals
11. Other street/intersection improvements
12. Bus/delivery turnouts
13. Turn restrictions
14. Parking restrictions
15. Truck/heavy vehicle restrictions
16. Separate truck lanes
17. Reversible lanes
18. Ramp closures
19. Railroad crossing controls
20. Speed limit reduction/variable speed limits
21. Temporary movable/traffic barrier system
22. Crash cushion
23. Temporary rumble strips
24. Intrusion alarm
25. Warning lights
26. Automated flagger assistance devices
27. Road safety audits
28. On-site safety training
29. Safety awards/incentives
30. Windshield safety surveys
31. ITS for traffic monitoring/management
32. Transportation management centers
33. Traffic surveillance
34. Traffic screens
35. Assistance call boxes
36. Temporary location mile markers
37. Tow/freeway service patrol
38. Incident detour routing
39. Contract support for incident management
40. Incident/emergency response plan
41. Dedicated (paid) police enforcement
42. Cooperative police enforcement
43. Automated enforcement
44. Aerial enforcement
45. Project task force/committee
46. Construction safety supervisor/inspector
47. Incident/emergency management coordinator
48. TMP monitor/inspection team
49. Team meetings

The various Transportation Operations Strategies listed above are not intended to be all inclusive, but rather provide a range of possible strategies which might be considered by those persons developing the TMP. Use the space below (and/or attach additional pages) to highlight noteworthy strategies OR strategies which are not routinely used on this type of project.

Notes for Selection of TO Strategies:

For a Significant Project such as this one, several of the strategies listed above are applicable:
#23, #29, #36, #40, #41, #42, #48

Public Information Strategies

The Public Information component of the Transportation Management Plan (TMP) is coordinated by the Department's Communications Office. The Department employs a wide range of standard public information related strategies on all relevant projects. These include, but are not limited to, the 511 Travel Information System, the Dynamic ITS Message Boards, and the TDOT Internet Site.

In addition, lane-closure meetings are held weekly where additional public information strategies are considered and initiated when warranted.

All work zone projects will follow the guidelines set forth in TDOT's Public Involvement Plan. The various strategies described below are intended for use in developing the final TMP and are provided here for review and consideration.

1. Brochures and mail-outs
2. Press releases/media alerts
3. Paid advertisements
4. Public information center
5. Telephone hotline
6. General TDOT website
7. Specific project website
8. Public meetings/hearings
9. Community task force
10. Coordination with media/schools/businesses/etc
11. Work zone education/safety campaign
12. Visual presentation materials
13. Traffic radio broadcasts
14. Advanced placement, changeable message signs
15. Temporary motorist information signs
16. Dynamic speed message sign
17. Highway advisory radio (HAR)
18. Listing on Tennessee 511
19. Freight information

The various Public Information Strategies listed above are not intended to be all inclusive, but rather provide a range of possible strategies which might be considered by those persons developing the TMP. Use the space below (and/or attach additional pages) to highlight noteworthy strategies OR strategies which are not routinely used on this type of project.

Notes for Selection of PI Strategies:

Press release/media alerts – follow Public Involvement Plan

Manager I –Requesting PI Input _____ Date _____

Community Relations Office – (To be sent back to Manager I above) _____ Date _____

ADDITIONAL NOTES/DOCUMENTATION

S T A T E O F T E N N E S S E E

January 1, 2015

SPECIAL PROVISION

REGARDING

TRAFFIC QUEUE PROTECTION

Description: When construction activities are performed on control-access or limited access facilities, the Contractor shall pursue efforts for the protection of traffic queues caused by project operations and clearly demonstrate adequate good faith efforts as described herein. The queue protection truck is expected to alert motorists (inside or outside of project limits) of all stopped traffic caused by construction activities or incidents within the project limits.

Equipment: The contractor shall provide a minimum of one (1) queue protection truck for each traveling direction where traffic flow is reduced. One (1) additional queue protection truck shall be onsite in reserve. The system deployed must fulfill the following minimum requirements:

1. A truck mounted attenuator that meets or exceeds NCHRP TL-3 requirements.
2. Four (4) round yellow strobe lights (with auto-dimmers) positioned rear facing
    - Two (2) mounted under rear bumper
    - Two (2) mounted at cab level
3. One (1) standard cab mounted light bar.
4. A truck mounted message board with a minimum of 3 Lines and 8 Characters per line.
5. Four Hour National Traffic Incident Management (TIM) Responder Training for Queue Truck Operators.

Maintenance of Traffic: The following procedures will be followed until free flow traffic conditions are present:

- The queue protection truck shall be positioned no further than ½ mile upstream from the back of the slow moving traffic.
- The queue protection truck shall be positioned on the shoulder and clear of the traveled way so as not to impede traffic.
- The queue protection truck shall relocate as needed to maintain the minimum ½ mile distance from the back of the slow moving traffic.
- The 2nd queue protection truck shall be held in reserve, on site, and

support the primary truck if conditions prevent repositioning by reverse. This truck shall not be paid for idle time.

- Trucks shall be kept in project limits during planned lane closures and other project activities expected to cause a queue.
- Queue length estimates and traffic conditions shall be reported to the TDOT District Operations Supervisor or designee at the following periods:
    1. At 30 minute intervals
    2. At significant changes
    3. When free flow traffic is achieved

The queue protection truck shall be mobilized as directed by the District Operations Supervisor or designee and shall be de-mobilized when free flow conditions are reached.

Basis of Payment: The queue protection truck, all related equipment, and labor shall be paid for as Item No. 712-08.10, per hour. All costs are to be included in the price bid. Idle time shall not be paid.

TDOT WORK ZONE SAFETY AND MOBILITY MANUAL

TMP Workbook

Work Zone Significance Determination

Tennessee Work Zone Safety and Mobility Procedure

State PE Number: 98023-4113-04 Route/From-To: I-75 Weigh Station to Bancroft Rd

PIN: 104529.01 County: Hamilton/Bradley

Analyst: Robert Rodgers Project/Construction AADT: 58500

This is an Initial ☐ Secondary ☐ determination of the project's significance.

Major Route Criteria

A project lasting at least three days on an interstate route within a TMA with intermittent or continuous lane closures	☒
A project where all lanes in one direction will be closed on (a) any interstate route or (b) a non-interstate route having an AADT of at least 50,000 vpd	☒
Yes, by the Major Route Criteria, this is a Significant Project.	☒
No, the Major Route Criteria are not met.	☐

Delay Criteria

Urban ☐ Rural ☒ Freeway ☒ Arterial ☐ Collector/Other ☐

No. of lanes (in one direction) to be open in work zone: _____

Max. Allowable AADT (24-hr, two-way) from Table 3.1: 43,000

Yes, by the Delay Criteria, this is a Significant Project (project AADT > max AADT).	☒
No, the Delay Criteria are not met (project AADT < max AADT).	☐

Qualitative Criteria

Rate the following aspects of the work zone:

	High	*Low*
Business impacts (how many businesses affected?)	☐	☒
Public Interest	☐	☒
Exposure impacts due to long project duration	☐	☒
Impacts due to alternate routes	☐	☒
Impacts due to other concurrent projects nearby	☐	☒
Concurrent project description:		
Other:	☐	☐

Yes, due to extraordinary Qualitative Criteria, this is a Significant Project.*	☐
No, the Qualitative Criteria are not met.	☒

* "Significance" based solely on Qualitative criteria to be carefully considered and approved by responsible Division Director

FINAL TMP DETERMINATION: Significant Project: Yes ☒ No ☐

TMP Exception

Per FHWA/TDOT guidelines, an EXCEPTION has been applied for and approved by the FHWA Division Office (attach appropriate documentation) ☐

[redacted]

Manager I – Division Level 8/5/14

Date

Manager II – Division Level

Date

Tennessee
Work Zone Safety and Mobility Manual
TDOT

Transportation Management Plan

Project Description: I-75 from North of Weigh Station Exit to North of Bancroft Rd

Project Location: HM LM 4.60 - 7.31 BR LM 0.00 - 2.98 MM 12.78 - 18.60

State PE Number: 98023-4113-04

PIN: 104529.01

County: Hamilton & Bradley

Project Determined As (Refer to Figure 3.1 and the following sheets for guidance) :

(Check One) ☐ Basic ☐ Intermediate ☒ Significant

TMP Description (Check each Component utilized in Project) **:**

☒ Temporary Traffic Control: (If Basic is selected above, only TTC strategies will be used)
Work hours restricited Night Work & no work during Holidays or Local Festivals
Temporary guidance/information signs
Arrow Boards

☒ Transportation Operations:
ITS for traffic monitoring

☒ Public Information:
Press Releases/media alters
General TDOT website
Utilize Overhead Message Signs from Hamilton/Bradley County ITS system

TMP Prepared By (Division/Firm Name): Region 2 Design

TDOT Manager I: [redacted]

Phone Number: 423-510-1138

Email Address: Robert.Rodgers@tn.gov

Date: 8/7/14

TDOT Manager II Approval: _____

Title: _____ Division: _____

Date: _____

Statement of Categories of TMPs

Significant Project - Requires careful consideration of work zone impact mitigation. Requires use of strategies from all three of TMP categories to help mitigate the impacts of a significant project:

- Temporary Traffic Control Strategies (TTC)
- Transportation Operations Strategies (TO)
- Public Information Strategies (PI)

A Significant Project is one for which any of the following criteria exists:

(a) Any project on the interstate system located within a recognized Transportation Management Area (TMA) that occupies a given location for at least three days duration with either continuous or intermittent lane closures. For the purposes of this Manual, it is assumed that the TMA consists of the following counties: *Blount, Bradley, Carter, Davidson, Fayette, Grainger, Hamblen, Hamilton, Hawkins, Jefferson, Knox, Loudon, Madison, Maury, Montgomery, Robertson, Rutherford, Sevier, Shelby, Sullivan, Sumner, Washington, Williamson, Wilson*.

(b) Any project of any duration on an interstate route, or any other route with an ADT of at least 50,000 vehicles per day for which all lanes in one direction will be closed to traffic.

(c) Any project for which the delay through the limits of the work zone is at least 30 minutes above the normal delay under typical non-work conditions.

(d) Any project deemed Significant by extraordinary qualitative characteristics. This determination may be made on the basis of conditions such as high levels of public interest, business/community impacts, or long work zone duration. All Significant Projects defined in this manner shall only be done with careful consideration and strategic decision making.

For a "non-significant" Project, one of two different levels of TMPs may be developed. A **Basic TMP** is to be used when only a TTC plan is needed to successfully implement a safe and efficient work zone. An **Intermediate TMP** is to be completed for "non-significant" projects where public information and/or transportation operation strategies would be beneficial or necessary as determined based on TDOT decision-making practices and procedures.

Intermediate Project - Requires additional planning, coordination, etc., but not required to be at the same level of a Significant TMP. TMP requires use of PI and/or TO strategies beyond the project's TTC strategies. It is expected that the majority of Intermediate projects will consist of TTC and PI strategies.

Basic Project - Typical work zone TTC plan is implemented alone. Refer to TDOT standard drawings, standard notes, and MUTCD. No additional TMP strategies required.

Temporary Traffic Control Strategies

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Notes for Selection of TTC Strategies:

11 Night Work, all lanes open during the day. No Holidays
15
17

Transportation Operations Strategies

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29. Safety awards/incentives
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38. Incident detour routing
39. Contract support for incident management
40. Incident/emergency response plan
41. Dedicated (paid) police enforcement
42. Cooperative police enforcement
43. Automated enforcement
44. Aerial enforcement
45. Project task force/committee
46. Construction safety supervisor/inspector
47. Incident/emergency management coordinator
48. TMP monitor/inspection team
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Notes for Selection of TO Strategies:

31

Public Information Strategies

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12. Visual presentation materials
13. Traffic radio broadcasts
14. Advanced placement, changeable message signs
15. Temporary motorist information signs
16. Dynamic speed message sign
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18. Listing on Tennessee 511
19. Freight information

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Notes for Selection of PI Strategies:

2
6
14 Utilizing Overhead Dynamic Message Boards
18

[redacted]

Manager I –Requesting PI Input — Date 8/6/14

[redacted]

Community Relations Office – (To be sent back to Manager I above) — Date 8/6/14

ADDITIONAL NOTES/DOCUMENTATION