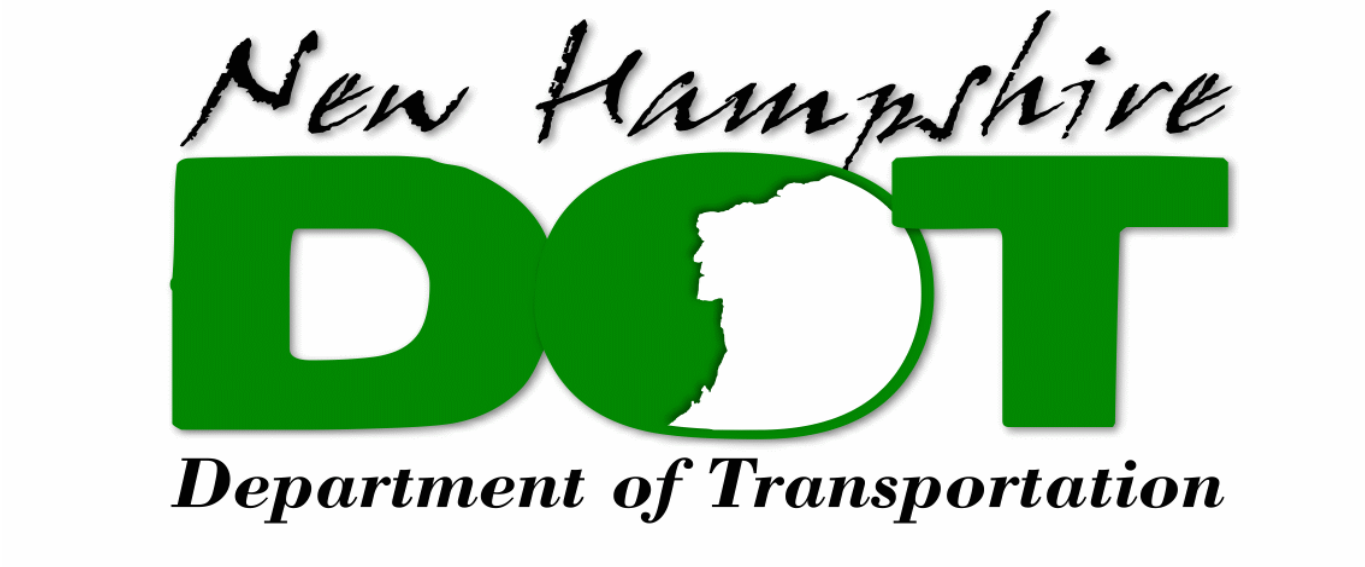

Work Zone Safety and Mobility Manual

Revised: December 21, 2022

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New Hampshire Department of Transportation
Work Zone Safety and Mobility Manual

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SECTION 1

Review of New Hampshire Work Zone Safety and Mobility Manual

Section 1. Review of New Hampshire Work Zone Safety and Mobility Manual

A. Introduction / Overview

On September 9, 2004, the Federal Highway Administration (FHWA) published the Work Zone Safety and Mobility Rule *(the Rule)* in the Federal Register (69 FR 54562). This Rule updates and renames the former regulation on "Traffic Safety in Highway and Street Work Zones" in 23 CFR 630 Subpart J. *The Rule* applies to all state and local governments that receive federal-aid highway funding. Transportation agencies are required to comply with the provisions of *the Rule* by October 12, 2007. The changes made to the regulations broaden the former Rule to better address the work zone issues of today and the future.

In an effort to comply with *the Rule* and develop an agency culture committed to providing safe work zones for all workers and road users while considering mobility and access, the New Hampshire Department of Transportation (NHDOT) has developed its Work Zone Safety and Mobility Manual (the Manual). The intent of this manual is to provide a decision making framework that promotes the systematic consideration and management of work zone impacts related to safety, mobility, and operations, and provide appropriate level training for those implementing the various stages of project development. It will also establish a Department-wide process for project evaluation and implementation to improve overall consistency of, and performance in, work zones. The development of Transportation Management Plan (TMP) components for both federally and non-federally funded activities will address the impacts an activity has on the transportation infrastructure, road users, businesses, and/or local communities during construction and provide mitigation measures to address the impacts. The manual also includes an assessment component to ensure the requirements are effective and that the work zone practices and procedures are continuously reviewed for appropriate updates.

B. New Hampshire Work Zone Safety and Mobility Manual Objectives

The objectives of the New Hampshire Work Zone Safety and Mobility Manual are provided below:

1. Procedures to develop a **Transportation Management Plan** for each project and maintenance activity throughout planning, design, and construction, and
2. A **compilation** of relevant safety and operational data and information, and
3. Work Zone Safety and Mobility **training** for Department staff involved in design, construction and maintenance of the highway system, and
4. A **review** process that evaluates the provisions of the manual and related procedures to identify where improvements can be made.

Each objective and its implementation are outlined in specific sections of this Manual:

1. **Transportation Management Plan** – Section 2
2. **Compilation of Data** – Section 3
3. **Training Requirements** – Section 4
4. **Process Review** – Section 5

C. Purpose of Document

The purpose of this document is to provide guidelines for meeting the Manual objectives. This document provides an outline of the processes and procedures the Department will take to meet these objectives in a systematic manner. It is realized that this is a "living document" that will be revised and amended to meet any changing needs of work zone safety and mobility recognized in the future.

D. Fiscal Acknowledgment

NHDOT believes that it is essential to address public concerns to minimize work zone related delays by increasing mobility and improving safety in the work zone. Furthermore, NHDOT recognizes and accepts that there are project costs, especially for projects designated as "Significant", that will be associated with efforts. These costs will vary in magnitude with each specific project. In an effort to properly plan / budget for overall project costs it is important to acknowledge these costs.

SECTION 2

Work Zone Assessment and Management Techniques

Section 2. Work Zone Assessment and Management Techniques

A. Requirements

From *the Rule, Section 630.1006(b)*:

"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."

A fundamental tool for managing and minimizing work zone impacts is the development of a Transportation Management Plan (TMP).

B. Guidance for Implementation

NHDOT has previously instituted an informal qualitative process that was committed to work zone safety and mobility. *The Rule* requires that this process include the addition of a quantitative approach that facilitates the measurement of work zone impacts anticipated during design in comparison with work zone impacts experienced during construction. The measurement and comparison of these impacts will provide practical information that will be used to adjust future work zone policies and procedures.
Instituting a quantitative approach will perpetuate many of the current NHDOT practices along with providing appropriate documentation.

I. Traffic Control Committee

The Traffic Control Committee (TCC) serves to help provide a Department wide culture committed to providing safe, consistent, work zones for all workers and road users while considering mobility, access, operations, and project construction needs. See TCC Charter in Appendix A. The TCC is an established multi-disciplinary team comprised of representatives from various Bureaus of NHDOT and is tasked with the overall guidance and implementation of *the Rule*. This committee is chaired by the Assistant Director of Project Development and includes personnel from the various stages of project development including but not limited to Planning, Design, Construction, Maintenance, Turnpikes, and Traffic. The members of the TCC should be leaders within NHDOT who are dedicated to improving work zone safety and mobility. Members should encourage growth and advancement of the NH Work Zone Safety and Mobility Policy and Implementation Guidelines. The TCC convenes monthly to, among other tasks, review and decide items associated with the implementation of *the Rule*.

As required in the TCC charter, the TCC, with feedback from various bureaus, will provide the judgment necessary for the following major items:

1. Review and/or approve conceptual Traffic Management Plans.
    a. Determine project Traffic Impact and Level of Significance in accordance with FHWA Work Zone Safety and Mobility Rule (69 FR 54562).

b. Review and/or approve conceptual Level I and Level II Significant Traffic Control Plans, Traffic Management Plans and Public Outreach plans.
c. Review and/or approve conceptual Traffic Control Plans for Non-Significant projects.
d. Ensure the requirements of State and Federal laws, pertaining to work zones, (e.g. Work Zone Mobility Rule, Uniformed Officer and Flagger Training, MUTCD, ADA, etc.) are being adhered to.
e. Develop and manage a process to track, monitor and report on work zone traffic control performance.

2. Review and approve compilation and recommendations of work zone crash reporting.
3. Be a resource for consistent use of temporary traffic control measures.
4. Review and update as necessary the Department's temporary traffic control standards.
5. Seek out and/or consider new technologies or innovation to improve worker and driver safety through work zones (e.g. portable rumble strips, nighttime lighting, etc.)
6. Conduct an annual nighttime and daytime review of NHDOT work zones.

II. Work Zone Impacts

Work zone impacts refer to work zone-induced deviations from the normal range of safety and mobility. The extent of these impacts vary based on many factors such as, road characteristics, type of area (urban, suburban, or rural), traffic volumes and travel characteristics, type of work being performed (construction, maintenance, utility work), time of construction (day/night), and complexity of the project.

The anticipated Work Zone impacts for a proposed project need to be identified and assessed throughout the development of the design. The anticipated impacts may change as details of the design are revised and refined. Identifying anticipated impacts enables the Department to mitigate and manage them by employing a TMP. Determination of significance of anticipated work zone impacts should be developed with consideration of the magnitude, location, duration, and costs of the project.

Discussions should include topics such as the following:

- Safety and Mobility impacts of the project at both the corridor and network levels.
- The combined impacts of projects conducted concurrently in a location near each other oron potential alternate route.
- Impacts on nearby intersections and interchanges, railroad crossings, public transit, and other junctions in the network.
- Impacts on municipal services (EMS, police, schools, bus routes, etc.)
- Impacts on affected public property (parks, recreational facilities, etc.)

- Impacts on affected businesses and residences.
- Impacts on pedestrians and bicyclists.

NHDOT had assessed and managed work zone impacts without a formal set of criteria. A broad, subjective approach to assessing work zone impacts had been established through the use of institutional knowledge and past experience. This approach considered such ideas as lane capacity, the effects of major local events, seasonal fluctuations of traffic, project location, and tolerance of delay by area residents and businesses, as well as thresholds determined by the project design team. This subjective approach led to varying levels of acceptable work zone impacts. Although NHDOT will continue to determine acceptable work zone impacts on a project specific basis, the TCC continues to strive to establish a consistent determination of those impacts. The depth and detail of the work zone assessment should be appropriate for the type and complexity of each project. As experience with work zone impact assessment increases, the TCC will continue to develop clear, consistent criteria and guidelines to aid in future assessment procedures.

III. Determination of Significant Projects – the Rule, Section 630.1010

Given the variety and differing complexity of projects, some projects are likely to have much greater effects on traffic conditions than others. Recognizing that not all projects cause the same level of work zone impacts, it is reasonable to identify those that will have the greatest impacts so that the appropriate resources can be allocated. *The Rule* establishes a category of projects called "Significant Projects". A significant project is defined as one that, alone or in combination with other concurrent projects nearby, is anticipated to cause excessive sustained work zone impacts that are greater than what is considered tolerable based on State policy and/or engineering judgment.

a. What is the purpose of identifying Significant Projects?

Consideration of work zone impacts at or prior to the Preliminary Design level (either on a network-wide basis or corridor basis) can have several positive effects. For example, an understanding of the expected level of work zone impacts of the project will help in deciding what transportation management strategies are likely needed and to what extent a Public Outreach (PO) campaign is required. This understanding can then serve as the basis for developing reliable cost estimates that are commensurate with the impacts of the project. Furthermore, the analysis of the cumulative traffic impacts of concurrent projects will help better manage overlapping construction activities, thereby minimizing the impacts on road users, businesses, and other affected parties.

b. Who is responsible for identifying Significant Projects?

Design / Construction Projects

The TCC will review projects to determine if they are considered significant projects in terms of work zone impacts using the criteria outlined in *Section 2.b.iii. Determination of Significant Projects*. The lead Bureau and section of the project will support the TCC in making this determination by filing a TCC Determination Request Memo (Appendix C),

with a recommendation for the level of significance based on their knowledge of the project and anticipated traffic impacts, and providing appropriate project information for review.

Division of Operations Projects

Districts or Bureaus within the Division of Operations will review maintenance related projects to determine Significant Projects Status. It should be noted that maintenance, or development projects, that are not likely in themselves to be considered significant, may become significant when combined with other projects in a given area. Non-Significant projects are not required to be reviewed by the TCC, whereas Significant Projects should be reviewed by the TCC with input from the sponsoring District or Bureau to determine required TMP strategies.

c. When should Significant Projects be identified?

Significant projects should be identified as early as feasible. During subsequent project development stages, the project determination status, significant or non-significant, should be reconfirmed. As more information becomes available for making project-specific decisions, certain projects that were thought to be significant may no longer be significant as a result of change in certain circumstances, and vice- versa.

d. How is a Significant Project defined?

A "Significant" project/activity is one that, alone or in conjunction with other projects/activities, is anticipated to cause excessive sustained work zone impacts to the road users, businesses, or local communities.

Excessive 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 characteristics, area type, (urban, suburban and rural), traffic volumes and travel characteristics, type of work being performed, time of day/night, and complexity of the project/activity. These impacts may extend beyond the physical location of the work zone itself, and may occur elsewhere on the roadway on which the work is being performed, as well as other highway corridors or other modes of transportation. For large, multi-contract, projects a significance determination should be submitted based upon the entire overall project work area.

Per *the Rule, Section 630.1010*, all Interstate projects/activities that occupy a location for more than three days with either intermittent or continuous lane closures and are within a Transportation Management Area (TMA) shall be considered a "Significant" project/activity. A TMA is defined as an urbanized area with a population greater than 200,000 (See Appendix B for TMA map). As of 2020, Interstates meeting this description in New Hampshire are limited to I-93 from the Massachusetts border to Exit 5, I-95 from the Massachusetts border to the NH88 overpass. For the purpose of this Rule, the NHDOT has also designated the FE Everett Turnpike from the Massachusetts border to southern Bedford town line as an interstate. The limits of the TMA are subject to change every ten years with each United States

Census.

In addition to the FHWA requirement, NHDOT has established two levels of criteria to identify if a project should be considered Significant. The first set of criteria is the Primary Level Criteria. A project must satisfy **all** of the criteria to be considered Significant. The Primary Level Criteria include the following:

1. An estimated construction cost greater than $20 million, and,
2. Within or affecting communities of over 35,000 *, and,
3. On the Interstate or NHS, and,
4. Anticipated to create excessive sustained WZ Impacts, separately or in combination with other activities.

* A cumulative town population total of over 35,000 for a contiguous project (or work area) shall be used. (e.g. Derry-Londonderry Exit 4A has a cumulative total of 59,969 (Derry 33,667 and Londonderry 26,302)). For non-contiguous projects (i.e. paving, guard rail, rumble strip, etc.) the community populations shall not be cumulative.

If a project does not meet the above listed criteria, it may still be considered a Significant Project through the application of the Secondary Level Criteria. The TCC will review the project considering the following Secondary Level Criteria, individually or collectively, to make a determination if the project should be considered significant:

1. Time and duration,
2. Nature of work,
3. Traffic volume,
4. Regional significance,
5. Anticipated to create sustained WZ Impacts, separately or in combination with other activities, and

It is recognized that the listed items above are somewhat subjective and it will require a level of engineering judgment to determine if an item alone, or in combination with others items, may make a project significant. Below is a partial list of the aspects of each item which should be considered:

Time: The time of day construction activities occur, as compared to anticipated traffic volumes during those times. The timing of special events, seasonal traffic and other local activities should be explored. Typically, Significant impacts would be when sustained (24/7) construction activities are in place during peak daily traffic times and/or peak seasonal times.

Duration: The likely duration of construction activities that would affect traffic on any given day. The duration of the overall project itself and/or the duration of activities affecting traffic should also be considered. This item would also include frequent intermittent traffic interruptions that could be a safety concern. Typically, Significant impacts would be when sustained (24/7) construction activities are in place during peak daily traffic times and/or peak seasonal times.

Nature of work: The type of construction work or activities that would likely have a direct, or indirect (e.g., curiosity factor), impact on traffic. This item also includes the required configuration of the work zone geometrics, and such things as lane widths, shy distances, etc.., which impact traffic movement and safety. Typically, Significant impacts would be when sustained (24/7) construction activities are in place that close lanes, create detours and create substantial increase in travel times thru or around the work area. Also, Significant impacts could involve rerouting, closing or impacting access to businesses or residential areas for a sustained timeframe.

Regional Significance: The type of roadway and its significance to the region should be reviewed. Consideration should be given to the availability of alternate routes for traffic to take.

Combination with other Concurrent Projects: Combinations of non-significant, or significant and non-significant, projects in a general area can become a significant traffic issue for the region. This will require the design team to review all projects in their general project area to determine is any other projects having work activities ongoing at the same time, will make the combined projects "significant" to the region.

The determination of whether a project is considered significant should be reviewed during each stage of the design process. A project that was initially considered to be Non-Significant may later be determined as a Significant Project due to changes in the secondary criteria or project design.

The flowchart provided on page 16, entitled *Figure 1 - Determination of a Significant Project*, illustrates the determination process.

e. What happens when a project is identified as a Significant Project?

For significant projects, a TMP shall be developed by the project team to improve the safety and mobility of workers and road users and must consist of the following strategy components:

- Traffic Control Plan (TCP) - provides detailed construction sequencing as well as illustrating measures that will be used to help guide and direct road users through a work zone.
- Transportation Operations (TO) – identification of strategies that will mitigate impacts of the work zone on the Transportation Network. Example strategies may include Intelligent Transportation Systems (using existing ITS) devices, employing Smart Work Zones (SWZ), revised traffic signal timings, and coordination with the Transportation Management Center (TMC).
- Public Outreach (PO) – communication strategies that inform affected road users, the general public, area businesses, and appropriate public entities about the project.

In addition to the strategies listed above, the TMP may also include incident management plans, detailed roles and responsibilities of key personnel, and implementation costs.

Non-Significant Projects are also required to have a TMP, but TMP is only required to contain a TCP. However, such projects may still benefit from the optional incorporation of certain TO and PO strategies, as determined by the applicable parties outlined in this document.

IV. Development and Implementation of Transportation Management Plans - the Rule, Section 630.1012

For all projects, attention must be given to traffic control from the early stages of project development through the completion of construction. Work Zone impacts and issues; vary therefore, it is important to develop a project specific TMP that best serves the safety and mobility needs of the traveling public, communities, and highway workers. A TMP is required for all projects (Significant or Non-Significant) and outlines a set of coordinated strategies that describe how to manage the work zone impacts of the project. The proposed TMP must comply with the current NHDOT Work Zone Policy and its scope, content, and level of detail will vary based on the anticipated work zone impacts of the project. TMP development should begin during project planning (if applicable) and evolve throughout the design process and construction phase. It should be reviewed following the completion ofthe construction to evaluate its success.

Although the final TMP is not completed until Final Design, conducting certain TMP analyses during early design phases will help ensure that the TMP development and implementation costs are included in the project budget. At an early stage in project development, more alternatives for addressing work zone impacts are available, so a broader range of strategies can be chosen. Work zone impacts must be considered during the evaluation and selection of design alternatives. For some projects, it may be possible to choose a design alternative that alleviates many work zone impacts. This is why identification of Significant projects at an early stage is important. Early TMP development efforts will also help with scheduling and coordinating projects to minimize the cumulative work zone impacts of multiple projects along a corridor or ina region.

TMP Documentation / Reporting

Below is a comprehensive list of the components that could be included in a TMP. The order, terminology and inclusion of components may vary from project to project. The level of detail of the TMP will reflect the level of potential work zone impacts of the project.

TMP Components

1. **Introductory Material**
    a. Cover Page
    b. Table of Contents
    c. List of Figures
    d. List of Tables
    e. List of Abbreviations and Symbols
    f. Terminology
2. **Executive Summary**
3. **TMP Roles and Responsibilities**
    a. TMP Coordinator
    b. TMP Team
    c. TMP Implementation Task Leader
    d. Approval Contact(s)
    e. Emergency Contacts
4. **Project Description**
    a. Project Background
    b. Project type
    c. Project Area/Corridor
    d. Project Goals and Constraints
    e. Proposed Constriction Phasing/Staging
    f. General Schedule and Timeline
    g. Need for Detours
    h. Related Projects/Activities
5. **Existing and Future Conditions**
    a. Data Collection and Modeling Approach
    b. Existing Roadway Characteristics (roadway classification, no. lanes, geometry, etc..)
    c. Existing and Historical Traffic Data (volume, speed, capacity, v/c ratio, truck percentages, congestion, peak traffic hours)
    d. Existing Traffic Operations (signal timing, traffic controls)
    e. Crash Data
    f. Stakeholder concerns/issues
    g. Traffic predictions during construction (volume, delay, queues)
6. **Work Zone Impacts Assessment Report**

a. Qualitative summary of anticipated work zone impacts
b. Impacts assessment of alternative project design and management strategies
    i. Construction approach/phasing/staging strategies
    ii. Work zone impacts management strategies
c. Traffic analysis results
    i. Traffic analysis strategies
    ii. Measure of effectiveness
    iii. Analysis tool selection methodology and justification
    iv. Analysis results
d. Selected Alternative
    i. Construction approach/phasing/staging strategy selected
    ii. Work zone impacts management strategies selected

7. **TMP Monitoring**
    a. Monitoring requirements
    b. Evaluation report
8. **Public Information and Outreach Plan**
9. **Incident Management**
    a. Trigger points
    b. Decision and phone tree
    c. Contractor's contingency plan
    d. Standby equipment personnel
10. **TMP Implementation Costs**
    a. Itemized costs
    b. Cost responsibilities/share opportunities
    c. Funding Sources(s)
11. **Special Considerations (as needed)**
12. **Attachments (as needed)**

TMP Development Process

The TCC should utilize information and support provided by different Bureaus to guide the overall TMP development and implementation process. The following steps outline the TMP development process. Note that these steps are part of a cyclical process. As the project progresses through various developmental stages and as more project-specific information becomes available, the type of traffic control selected, work zone impacts, and impact management strategies should be reviewed and revised, as necessary.

Step 1. Compile Preliminary Project Material – (Preliminary Design Phase)

The lead bureau conducting the preliminary design phase of the project will compile available

information for the project. Much of this information should be readily available from the early project development phase. This information is to be provided to the TCC in Step 4. Information should include:

- Project scope of work and limits of construction,
- Existing roadway and traffic characteristics,
- Local issues,
- Existing data such as mapping, traffic data, accident data, right-of-way information, environmental maps, and,
- Any preliminary TMP Strategies.

Also as part of compiling the necessary information for Step 4, the Supplemental Information needed to fill out the table on page 3 of the TCC Determination Memo (see Appendix C) will include:

- Any Planned Detours or Diversions
  - Provide a detour map
  - Will the detour be used during winter, any winter operations issues
  - Will the diversion be used during winter, any winter operations issues
  - How will residential and business use be impacted
  - How will detour route operate with additional traffic.
- Any Intersections that are Impacted
  - Will construction work impact existing intersection operations within the work zone, leading up to the work zone, as well as at any detour routes
- Any Lane Closures planned during construction
  - Time of Day dependent closures
  - Check roadway capacity issues with lane closure
- Any Lane Width Restrictions planned during construction (see additional information below)
  - Will this impact truck routes, oversize vehicle routes,
  - Winter operations if width restrictions go thru winter.
- Any work zone Speed Reduction planned
  - Coordination with the Bureau of Traffic is required for any Speed Reduction
  - Review for both 24/7 reduction as well as only when workers are present reductions.
- Is Night Work planned
- Will construction fall within any holiday periods and will the construction impact holiday travel.
- Do any local, regional, or statewide events go through the work zone
  - These could include annual parades, bike races, running races, NASCAR, etc..
- Are any Schools or Hospitals impacted
  - Emergency vehicle response impacted,
  - School bus routes impacted
- Are other States impacted
  - Do you have Interstate Agreements

- Are you planning to use "Special Traffic Control" measures
  - Measures not routinely used in NH
  - Experimental, research, or first in NH measures
- Are any Emergency/Evacuation Routes impacted
  - Either directly by the work zone or if a detour route is used
- Are pedestrian facilities impacted (see ADA accommodation requirements below)
  - Need to ensure ADA compliance through the work zone
  - Do you need pedestrian detours if existing sidewalks/curb ramps are impacted
  - Are you closing sidewalks in the work zone
- Are permanent ITS installations required (See Appendix J)
  - Need to coordinate with TSMO
- Is Work Zone ITS measures needed (See Appendix J)
  - Need to coordinate with TSMO

Lane Width Restrictions:

Below is some basic information that should be useful in evaluating traffic control measures on our projects concerning lane width restrictions and oversize/overweight permitting.

GENERAL UNDERSTANDING:

RSA -266 : NH Statute – Chapter 266 –Equipment of Vehicles outlines the state laws with respect to this topic.

NHDOT Administrative Rules: Part Tra 304 – Oversize and Overweight Vehicle Permits outlines the Administrative rules for management of the Oversize/Overweight (OSOW)Permit program.

See also the NHDOT Permit Office website for additional information (www.nhdotpermits.org)

More specifically,

1. RSA 266:12 allows up to an 8'-6" width. Beyond this width, a permit is required (under Tra 304).
2. An annual permit can be obtained for vehicles up to 10'-6" wide and 75 ft. long for combination vehicles and 45 ft. long for single unit vehicles.
3. A Special one-time Permit can be obtained for wider loads. Note that most wide loads are 16 ft. and under (mobile homes and modular homes are typically 14 to 16 ft.).

PROCESS:

The TMC is the conduit by which dimensional or weight restrictions are processed into the NHDOT Permits system (i.e., the OSOW Permitting software):

1. The TMC is notified of a restriction/issue by telephone (Emails are not acceptable).

2. The TMC uploads the information to the New England 511 system https://newengland511.org (The 511 system can be accessed through the NHDOT Internet site by hitting on "TMC", which will bring up several options, one of which is "511".) See attached snip highlighting the typical restriction information provided.
3. The 511 system feeds into the NHDOT Permit Office system (database).
4. An Oversize/Overweight permit request comes through NHDOT Permits, which has a "routing and restriction manager" which details the permit route (with associated restrictions). The Permit Office will coordinate further details if necessary, and approvals.
5. Permits are good for 5 days (one way), and 10 days (roundtrip).

OF INTEREST:

1. For NHDOT construction projects, typically, the Contract Administrator will notify the TMC of any restrictions, closures, or any temporary measures restricting existing roadways.
2. Should a temporary restriction be imposed by a construction project for a given day, all permit holders that are permitted for a route during that period that are impacted by the restriction will get an EMAIL notification of the restriction and associated timeframe. (This is performed by a "restriction violator" function in the permitting system that is run once per day at midnight.) The permittee will then have the option of waiting until the restriction is lifted (within his allotted permit period) before moving, or contact the Permit Office for an alternate route.

NOTES/POINTS FROM PERMITS OFFICE:

1. Every attempt should be made to provide for a 10'-6" wide 75 ft. long combination vehicle or 45 ft. long single unit vehicles to negotiate through our construction work zones. These annual permit holders do not spend time looking for route restrictions when traveling for their day to day business.

American's with Disabilities Act accommodations:

An additional TCC review component of the project TMP shall be the project's compliance in meeting the American's with Disabilities Act (ADA). As part of the TMP project significance determination review the designers shall review and mitigate impacts to pedestrian facilities impacted by work activities during construction. See MUTCD guidance in "Chapter 6D.01 Pedestrian Considerations" (also found in Appendix D). Also see "Applying the Americans with Disabilities Act in Work Zones: A Practitioners Guide" published by The American Traffic Safety Services Association – Fall 2012

As a minimum the following guidance should be followed:

1) Sidewalk or Curb Ramp closure:
   a) Develop an alternate route (note any alternate route must be equally ADA complaint as the existing facility).
   b) If a new pedestrian facility is constructed to manage pedestrian traffic it must be built to current ADA complaint standards.

c) Alternate routes need to be signed in advance of the closure with appropriate trail blazing signs.

2) Alternative ADA compliant route is not feasible or reasonable:
   a) Review with community to determine existing pedestrian use
   b) Review pedestrian compliance options with the Front Office
   c) Seek approval of any alternative that doesn't meet 6D.01 requirements.

Step 2. Identify Major Issues – (Preliminary Design Phase)

It is important to identify any existing issues that may affect safety and mobility during construction or that may complicate the construction process. After these issues are identified, additional study; coordination; creative management; design or construction approaches; increased right-of-way or environmental impacts; and/or construction costs may be considered necessary. Major issues should be brought to the attention of the TCC in Step 4. Identifying any major construction issues at this stage is important to avoid costly and time-consuming complications during later steps. Uncovering problem areas prior to developing engineering alternates may also help reduce project costs and potential project delays.

Step 3. Preliminary Determination of Significant Projects – (Preliminary Design Phase)
An initial determination of whether a project is Significant is a useful tool in the selection of TMP strategies, as well as the anticipated level of detail and cost of the TMP. Guidance used to determine Significant Project status is provided in *Section 2.b.iii Determination of Significant Projects*. The Preliminary Determination of Significant Project status for each project will be completed by the lead bureau conducting the preliminary design phase of the project and presented to the TCC in Step 4. The anticipated work zone impacts of a project should be assessed at a ***conceptual level*** during this step.

Step 4. TCC Review – (Preliminary Design Phase)
Information from Steps 1-3 will be provided by the lead bureau conducting the preliminary design phase of the project to the TCC for review and comment. All projects, except short term and mobile maintenance operations, require a TCC Determination of Significance prior to advertising, the earlier a Determination of Significance is made the more time is available for TMP document development.

It will be the responsibility of the lead bureau conducting the preliminary design phase of the project to coordinate the need for a project review with the TCC by requesting time on the TCC meeting agenda. This is accomplished by submitting a completed "TCC TMP Determination Request Memo" to the TCC chairperson and request the project be placed on an upcoming TCC agenda.

As part of the Determination of Significance the project shall be presented at TCC meeting, where an explanation of the traffic control plans and anticipated traffic impacts are explained. Some project types will have minimal impacts to traffic and will not require a presentation to the TCC (a Determination of Significance memo submission is still required), see the "Exempt

from Presentation" criteria below.

TCC Presentation Guidance:

Staff, or consultants, presenting to the TCC should be prepared to address the following in their presentation to the TCC.

- A *brief* overview of the project intent, highlighting the work efforts that will impact traffic,
- Give an overview of the existing traffic information,
- Explain the contents of the "Supplemental Information" table found on page 3 of the Determination Memo,
- Focus should be placed on the construction activities that will impact traffic and how they will be mitigated,
- The presenter should make a recommendation as to whether the project's level of significance should be considered Non-Significant, Level I Significant, or Level II Significant.

The TCC will confirm the level of significance status for the project based on this information, or may request additional information and/or analysis.

For approval of a project submitted as "Exempt from Presentation" the following process will be followed:

a. The Chair, or designee, will review the projects that are requested for presentation exempt classification, and shall either approve or deny the exempt classification.
b. If denied, the project will require presentation to the TCC.
c. At each TCC meeting, the Chair shall provide a list of all approved presentation exempt projects for final level of significance determination by the Committee members.

The following guidance describes the criteria used to determine whether a presentation must be made to the TCC.

TCC Presentation Guidance

a) TCC Presentation Criteria *

All projects that meet any of the following criteria shall be presented to the TCC;

i) 2-lane facilities > 10,000 VPD, or
ii) 4-lane facilities > 20,000 VPD, or
iii) Projects where the *"Nature of Work"*(page 10), for the subject project by itself or in "*Combination with other Concurrent Projects" (page 10),* will have the potential to create a significant traffic impact.

b) TCC Presentation Not Required **

i) Projects involving rest areas, park and rides, and "employee only" access roads to NHDOT facilities that do not impact the roadway, or
ii) Short term and mobile maintenance operations (as defined in the MUTCD) for all roadway tiers.

* Projects that do not meet all the criteria in a) above may be submitted as "Exempt from Presentation"
** These projects also do not need to submit a "TCC TMP Determination of Significance" memo for review to the TCC.

Step 5. Evaluation of Alternatives / Determine TMP needs – (Preliminary Design Phase) Developing and evaluating the best alternative combination of construction phasing/staging, project design options, temporary traffic control, transportation operations strategies, and public outreach strategies will yield a more comprehensive TMP. This evaluation of alternatives should compare work zone options for each design alternate and document maintenance of traffic constraints for each option. This evaluation should address the benefits and problems for each option, and should include recommendations for each design alternative. Before the final alternative is selected, the TCC along with appropriate representatives from other Bureaus should review and comment on it.

During this step, anticipated work zone impacts of a project should be assessed at a ***project specific level*** and the confirmation of Significant Project status should be completed. Work Zone Impacts are assessed using the following process:

- *Maintenance of Traffic Alternative Analysis (MOTAA)* – This qualitative analysis should compare work zone options, including phasing scenarios, lane / road closure, and alternate traffic routes. This analysis should be conducted at the earliest phase to select feasible project alternatives, estimate associated costs, and highlight environmental, right-of-way, and construction issues.
- *Guidelines for Lane Closures* – This guideline would detail a quantitative assessment of work zone impacts by providing a determination process of allowable lane closures beyond the standard 1500 vehicles/hour/lane. These guidelines could establish values for the following:
    - Maximum allowable delays measured in distance or time for different road types with the use of queue length analysis,
    - Minimum Level of Service for work zone intersections and traffic signals,
    - Determination of night work based on traffic, and,
    - Consideration of construction activity (e.g., paving).

  The use of analytical tools may be necessary depending on the degree of impact analysis required. Some tools, such as QuickZone, were specifically designed for work zone related analysis. Other traffic analysis tools, such as Corsim or Synchro, were not designed specifically for work zones but may be useful for analyzing work zone situations.

As NHDOT progresses through the implementation of the Rule, these evaluation processes will require additional guidance as a result of lessons learned and should be formalized into guidelines.

After determining the significant project status, design alternatives, and anticipated work zone impacts, specific TMP strategies for TCP, TO, and PO should be selected. Note that projects designated as Significant require the use of strategies addressing each of these components. Non-Significant Projects only require a TCP component but may benefit from TO and PO strategies.

A detailed listing and description of potential TMP strategies is provided by FHWA and is included in Appendix E (*Appendix B of the 2007 Policy*).

Step 6. Identify Stakeholders for Input on TMP – (Preliminary Design Phase)

Based on the project size, scope and local impacts, the TCC may decide that input from external stakeholders would be beneficial. The identification of external stakeholders should be done with consideration of the major issues identified in Step 2. Potential stakeholders could include, but are not limited to:

- Planner of Major Events (e.g., New Hampshire International Speedway),
- Local Planning Agencies, and,
- Special Interest Groups.

Step 7. Draft TMP – (Preliminary Design Phase)

During this stage of the preliminary design phase, three (3) important factors affect the TMP:

- The project is getting better defined,
- Environmental mitigation elements (which usually include traffic) are being explored, and,
- There is increased interaction with the local jurisdictions and stakeholders as part of the environmental process.

This is an ideal time to refine the TMP elements that were initially identified in Step 4. This can be particularly important for elements requiring long lead times and/or needing to be established prior to the start of construction, such as a public outreach campaign. If there has been a substantial change in design since Step 4, additional work zone impact assessments and analysis should be performed to address these changes.

The lead bureau conducting the preliminary design phase of the project will coordinate with construction, traffic, and public information officers to jointly identify / confirm the work zone impacts and the proposed work zone impact management strategies.

When developing construction phasing and staging plans, the lead bureau conducting the preliminary design phase of the project should consult with NHDOT Construction staff, as construction phasing and staging can greatly affect the safety and mobility of the work zone.

Construction equipment and material access to the site, storage, and staging areas should be addressed at this time, as well as potential infrastructure improvements to accommodate temporarily modified traffic patterns or future projects.

At a minimum, the Draft TMP submittal should include:

- Project summary,
- Anticipated work zone impacts,
- Stakeholders and others impacted by the project,
- Goals and objectives of the TMP,
- Identification of long lead time strategies such as a PO campaign, and,
- Concurrent projects in the vicinity that will require coordination.

Step 8. TCC Review – (Preliminary Design Phase)

The lead bureau conducting the preliminary design phase of the project will provide the TCC with a copy of the Draft TMP for review and approval.

Step 9. Final TMP - (Final Design Phase)

During the final design phase, the TMP is finalized and the Plans, Specifications and Estimates (PS&E) for implementation are developed. It is the responsibility of design team to implement the recommendations set forth in the Draft TMP developed in preliminary design. The design team may be required to collect additional data and conduct additional analysis, as necessary, to reflect any changes in the project design. The TCC should be consulted when design and TCP decisions dictate a revision to the Draft TMP strategies.

During the Preliminary PS&E (PPS&E) phase of design, a detailed estimate for implementing elements of the TMP should be developed to determine how it may affect the overall cost of the project. Individual projects may have varying bid items for implementing TMP strategies through method based specifications depending on size, complexity and location of the work. Work zone impact management strategies should be shown on the plans where applicable. Special provisions for non-standard items should also be developed at this time.

Step 10. TCC Review - (Final Design Phase)

Final Design will provide the TCC with a copy of the Final TMP for review and approval.

Step 11. Implement TMP / Monitor TMP / Revise TMP - (Construction / Maintenance Phase)

The TMP will be implemented during construction (some elements may need to be implemented prior to construction, such as Public Outreach efforts or improvements to detour routes to accept additional traffic volumes). Both NHDOT and the contractor must designate a "Responsible Person", as defined in *the Rule, Section 630.1012(e),* at the project level to implement the TMP and other safety and mobility aspects of the project. For NHDOT this person will most likely be the Contract Administrator (CA). For the contractor the title of this person is expected to vary. The designated "Responsible Persons" are responsible for reviewing traffic operations throughout the project limits, including the condition of all traffic

control devices, on a regular basis.

NHDOT will review and revise applicable standard specifications to address the requirements of the contractor for implementing a TMP including the designation of a "Responsible Person" as part of project development.

Monitoring the performance of the work zone and of the TMP during construction is important to determine whether the predicted impacts closely resemble the actual conditions in the field and if the strategies in the TMP are effectively managing the impacts.

As discussed in *Section 3. Compilation of Work Zone Data,* the CA is responsible for maintaining ongoing documentation regarding the work zone. Issues such as deficiencies in the implementation of the TMP and how and when they were corrected should be documented with the use of the *Traffic Control Checklist* provided in Appendix G. Traffic crashes occurring within the work zone are to be documented using *The Work Zone Traffic Crash Report* provided in Appendix E. Any major changes or notable items should be identified and brought to the attention of the District Construction Engineer (DCE) for discussion at Bureau of Construction meetings. This information shall also be provided to the TCC and design team upon completion of construction in the post-construction evaluation described in Step12 for the purpose of relaying how well the TMP worked as designed or what needed to be modified during construction.

The Traffic Control Checklist may need to be revised to better address the documentation and reporting needs for implementation of the Rule.

Step 12. Evaluate TMP (Post Construction / Maintenance Phase)

TMP evaluation should focus on the performance of both individual TMP strategies and overall performance of the TMP. Upon completion of construction, an evaluation report should be developed by the Bureau personnel responsible for implementation of the TMP. The report should document lessons learned and provide recommendations on how to improve the TMP process and/or modify guidelines. Elements to consider in the post-project evaluation are:

- Overall statement reflecting the usefulness of the TMP,
- Areas of the TMP that were successfully implemented,
- Changes made to the original TMP and results of those changes,
- Successes and failures,
- Public reaction to the TMP,
- Actual cost versus estimated cost, and,
- Suggested improvements or changes for similar future projects.

The Evaluation Report should be collected and compiled by the District Construction Engineer or the District Maintenance Engineer as outlined in *Section 3. Compilation of Work Zone Data* and the results provided to the TCC and design team.

SECTION 3

Compilation of Work Zone Data

Section 3. Compilation of Work Zone Data

A. Requirements

From the Rule, Section 630.1008:
"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."

B. Guidance for Implementation

Work Zone data, as described below, is necessary to make an informed assessment of the success of efforts to manage work zones and their impacts. Work Zone field data also enable agencies to assess how well planning and design estimates of anticipated impacts match what actually happens in the field. Work Zone data supports performance assessments at both the project and state levels. Available data and information provide the basis for assessing performance and taking appropriate actions to improve the performance on projects and maintenance activities as well as overall processes and procedures.

I. Work Zone Traffic Control, Operations, and Safety Inspections

The inspection of work zones continues to be completed by the Contract Administrator (or designee) on a regular basis with an increased effort to formally document these inspections. The inspections should pertain to the placement of traffic control devices, traffic flow through and around the work zone, indications of safety problems, as well as overall work zone operations. General notes of the inspection should be included on the project's daily report including any record of action taken. The intent of the inspections is to communicate and document acceptability of devices, identify where improvements are needed, and ensure the NHDOT's Contractor is properly managing the work zone. Inspections may be completed using the "Project Traffic Control Review" checklist and the more detailed "Traffic Control Checklist" provided in Appendix G.

The Bureau of Construction's Traffic Control Specialist (TC Specialist) provides independent assurance checks by conducting random work zone inspections. Work zone inspections by the TC Specialist are generally done every other week during the prime construction season (May through October) and focuses on Active work zones. Frequency of inspections may vary based on need, location, and number of active work zones at any one time. Project specific inspections may also be done by the TC Specialist upon request of the Contract Administrator or District Construction Engineer. The TC Specialist completes a "Work Zone Traffic Control Inspection" report for each inspection. See Appendix G for a template of the report. This report is submitted to the specific project's Contract Administrator and District Construction Engineer for review, record, and/or action. If action is required, the TC Specialist may conduct a follow-up inspection one week after the initial inspection to confirm compliance. The TC Specialist provides work zone training to the Bureau of Construction during its Annual Construction Seminar. Trends or patterns discovered during the year's project visits help drive the agenda for the training. The TC Specialist also serves on the NHDOT's Traffic Control Committee and is able to provide feedback to the committee and help improve State processes and procedures.

The District Construction Engineers (DCE) should continue to conduct random windshield surveys of projects for compliance with the NHDOT Traffic Standards. Any work zone deficiencies or areas of project specific concern are brought to the immediate attention of the Contract Administrator and/or Contractor for action. Areas of general common concern are brought to the attention of the other DCEs, as well as the Bureau of Construction Administrator, during their scheduled meetings. A minimum of one District Construction Engineer serves on the NHDOT's Traffic Control Committee. The DCEs should review all Traffic Management Plans prior to advertising.

The TCC's designated DCE or TC Specialist will report any general work zone areas of common concern to the TCC and help improve State processes and procedures.

Finally, representatives of the Traffic Control Committee (generally 6 to 9 members) shall conduct a single annual daytime and single annual nighttime field review of NHDOT work zones. For greater exchange of information and feedback it is recommended the review be done with members riding in a single van to allow for discussion and feedback with recommended (but not mandated) representation from the Bureaus of Construction, Highway Design, Bridge Design, Traffic, and Highway Maintenance. FHWA's Safety Engineer is also encouraged to join the review. Generally, the route is planned by the Bureau of Construction with a focus on hitting as many active construction projects as possible. Some maintenance operations may also be observed. If time allows, it is recommended that the TCC van stop and check-in with on-site field personnel (in most cases this would be the Contract Administrator) to get their feedback on

decisions made and offer real-time advice for possible improvement. Minutes of each review are distributed to the Directors, the Chief Project Manager, all TCC members, all

Construction Bureau personnel, and the Prime Contractors whose projects were visited. The minutes should describe the project, the apparent traffic plan, and include comments focused on work zone traffic control device condition, layout, etc.. Comments should include positive comments and examples of best management practices as well as comments on where improvement is required or recommended. An example "*Work Zone Traffic Control, Daytime Review"* report may be found in Appendix G.

II. Work Zone Traffic Crash Reports

NHDOT will continue to complete Work Zone Traffic Crash Reports for any crash that occurs in a NHDOT Work Zone. The online Work Zone Traffic Crash Report may be found at : https://nhtmc.com/crashreport/. The purpose of the reporting is to track NHDOT work zone crashes, evaluate the crashes for any common problems, and make recommendations regarding training and/or changes to NHDOT's Traffic Control plans, specifications, or procedures. Instructions on how to fill out the crash report is provided in Appendix E. A copy of much of the information requested in each work zone crash report is also provided in Appendix G.

The Work Zone Crash Report is to be filled out by the NHDOT designee associated with a specific work zone. For example, if the crash occurred in a Contractor Work Zone overseen by the Bureau of Construction, then the Contract Administrator or their designee shall complete and submit the report. If the crash occurred within a NHDOT Highway Maintenance Operations work zone, then the appropriate Highway Maintenance Foreman or their designee is responsible for filling out the report, etc. Once the report is completed, the form is submitted to the respective supervisor and TSMO for reviewing and compiling data.

The TSMO Bureau will receive the data electronically, collect and collate the data. TSMO will then create a draft report summarizing the data and submit the draft to the Highway Design Safety Section (HDSS).

The HDSS will review and evaluate the crash data collected and collated by TSMO; offer summary observations of the data (e.g. look for trends); make recommendations for safety improvements; and add summary observations and recommendations to TSMO's initial draft report.

This compilation of reports should be reviewed annually for trends such as crash type or common characteristics (month, time of day, location, etc.) and the results of this review

presented to the TCC. The TCC will address any issues resulting from the review of Work Zone Traffic Crash Reports.

Once the report is accepted by the TCC, the report will be distributed to all Department Administrators or Bureau designees.

Various bureaus may use this report to aid in training by highlighting trends and areas of heightened concern in a work zone that may warrant extra attention during design, construction, and maintenance.

III. Transportation Management Center

The Transportation Management Center (TMC) should be engaged to provide quantitative information regarding existing traffic conditions prior to and throughout the completion of the project. All available instruments of the TMC should be reviewed to determine sources of information that can be applied in the assessment of work zone impacts. Intelligent Transportation System (ITS) and Smart Work Zone (SWZ) components such as Changeable Message Signs (CMS), queue length detectors, and traffic cameras should be examined to determine what applicable information can be generated to aid in the implementation of the Rule.

SECTION 4

Training Requirements

Section 4. Training Requirements

A. Requirements

From *the Rule, Section 630.1008(d)*:

The Rule specifies that agencies require appropriate training for personnel involved in the development, design, implementation, operation, inspection, and enforcement of work zone related transportation management and traffic control. *The Rule* also states that agencies require periodic training updates for these personnel, which should reflect changing industry practices and agency processes and procedures. *The Rule* also clarifies "appropriate training" as training that is relevant to the job decisions that each individual is required to make.

B. Guidance for Implementation

NHDOT shall develop comprehensive work zone related transportation management and traffic control training programs to meet the intent of *the Rule*. As such programs are developed, consideration should be given to include our partners (cities, towns, consultants, the construction industry, and law enforcement) in the training.

The training programs should accomplish the following:

- Develop a program or method to educate staff at all levels on the policy
- Document and share initiatives as well as "Lessons Learned"
- Develop a program or method to educate staff on how their timely decisions affect work zone safety and mobility, construction duration, and cost

All projects from the simplest maintenance job to a multi-million dollar construction project require traffic control expertise to make the project as safe as possible for the motorist and workers and provide mobility through the work zone. Therefore, personnel involved in the development, design, implementation, operation, inspection, and enforcement of work zone related transportation management and traffic control need to be trained. This includes transportation planners, design engineers, traffic and safety engineers, temporary traffic control designers and program managers, construction managers, construction project staff, maintenance staff, and contractor and utility staff.
This may also include executive-level decision-makers, policy-makers, senior managers, information officers, and law enforcement and incident responders.

I. Traffic Control Committee (TCC)

The TCC members should be encouraged to receive training on all aspects of work zone safety and mobility. Some aspects of the training may be in addition to the normal scope of their job responsibility such as a Highway Design representative on the TCC may receive training in

aspects customarily given to Construction personnel. Both in-house and external training opportunities may be used to provide the appropriate level of training for TCC members.

II. Highway Design / Bridge Design / Traffic / Planning and Community Assistance

The various bureaus listed above may develop an in-house training program for designers, traffic engineers, safety engineers and others in similar positions that are involved in the design of work zone related transportation management and traffic control.

III. Construction

The Rule, Section 630.1012(e) requires the designation by NHDOT, as well as the contractor, of "Responsible Persons" for each project. The Bureau of Construction, in cooperation with the various Districts, shall develop a training program for construction project personnel involved in the implementation, operation, inspection and/or enforcement of work zone related transportation management and traffic control that adequately addresses the requirements for "Responsible Persons".

All personnel involved with a TMP will receive training based on supervisor's review of employee needs through Construction School Presentations and On the Job Training with personnel more experienced with TMP's. Attendance at external training opportunities, such as available NHI or ATSSA courses, may be used to supplement this training.

IV. Maintenance / Turnpikes / Traffic

The Bureau of Highway Maintenance, the Bureau of Bridge Maintenance, the Bureau of Traffic, and the Bureau of Turnpikes in cooperation with the districts may develop an in-house training program for personnel involved in the implementation, operation, inspection and/or enforcement of work zone related transportation management and traffic control. This would be accomplished through existing annual District Safety training and would be included in the Maintenance Manual which is to be developed in the future.

All Uniformed Officers working on any NHDOT funded project, including municipally managed projects, shall have successfully completed a NHDOT approved course on *The Safe and Effective Use of Law Enforcement Personnel in Work Zones*. The officer shall supply proof of successful course completion upon request. Sources of NHDOT approved training may be found on-line under Doing Business with DOT>Contractors at www.nhdot.com. General Contractors

The Rule, Section 630.1012(e) requires the designation by the contractor, as well as NHDOT, of "Responsible Persons" for each project. Training for contractors should be similar in scope to that of Bureau of Construction and include such activities as implementing or setting up work zone traffic control. NHDOT will not be responsible to train contractors; however, the NHDOT will require contractors to provide "Responsible Persons" through its contracts, by including specifications that require such training.

V. Law Enforcement

All uniformed Officers working on any NHDOT funded project, including municipally managed projects, shall have successfully completed a NHDOT approved course on *The Safe and effective Use of Law Enforcement Personnel in Work Zones*. The officer shall supply proof of successful course completion upon request. Sources of NHDOT approved training may be found on-line under Doing Business with DOT>Contractors at www.nhdot.com. General Contractors.

VI. General Contractors

The Rule, Section 630.1012(e) requires the designation by the contractor, as well as NHDOT, of "Responsible Persons" for each project. Training for contractors should be similar in scope to that of Bureau of Construction and include such activities as implementing or setting up work zone traffic control. NHDOT will not be responsible to train contractors; however, the NHDOT will require contractors to provide "Responsible Persons" through its contracts, by including specification that require such training.

SECTION 5

Work Zone Safety and Mobility Policy and Implementation Guidelines Review Requirements

Section 5. Work Zone Safety and Mobility Policy and Implementation Guidelines Review Requirements

A. Requirements

From *the Rule, Section 630.1008(e)*:

The FHWA requires that the Work Zone Policy / Procedures should be evaluated at least every two years. An evaluation of reported successes and failures of any part to the policy / procedures should be ongoing. Tabulation of this data will be used to help develop and implement future policies / processes. *The Rule* states that the ultimate objective of the process review is to enhance the efforts to address safety and mobility on current and future projects.

From NHDOT – Work Zone Safety and Mobility Policy:

"In order to achieve the provisions of this Policy, the Department shall develop and maintain: A **review** process that evaluates the provisions of this Policy and related procedures to identify where improvements can be made…."

B. Guidance for Implementation

The TCC currently conducts meetings on a monthly basis. These meetings present an opportunity to discuss aspects of implementation of *the Rule* and respond to any immediate issues. However, in accordance with *the Rule*, a Process Review Meeting (PRM) will be conducted once every two (2) years, at a minimum. This meeting, or series of meetings, may be part of the normally scheduled TCC meeting or conducted separately, for the sole purpose of reviewing the current NHDOT Work Zone Safety and Mobility Policy and Guidelines for Implementation.

During the PRM, the TCC should review information and analyses provided by the personnel outlined in
Section 3. Compilation of Work Zone Data which should include information from such areas as:

- *Work Zone Crash Reports* and analyses,
- Work zone operational performance measuring tools such as *Traffic Control Checklists* or windshield survey reports,
- FHWA work zone inspection reports,
- Feedback concerning Public Outreach efforts such as customer satisfaction surveys and website comments,
- "Lessons Learned" regarding implementation of *the Rule.*

Using the information gathered, the TCC should identify areas of the Work Zone Policy and Implementation Guidelines that need revisions or adaptations to be more effective. The four major areas of interest that the review should address are:

- Safety,
- Mobility,
- Construction efficiency and effectiveness, and,
- Public perception and satisfaction.

The following are some questions that the Process Review should attempt to answer:

- Overall, how are work zones performing with respect to safety and mobility?
- Is the process used during the development of a project efficient and effective for the implementation of *the Rule*?
- Should Department Policies or Procedures be adjusted based on what has been observed or implemented?
- Are areas of required improvement readily identifiable?
- Have areas of improvement that have been previously defined been adequately addressed?
- What strategies have succeeded / failed?
- Are there strategies that have not been implemented that should be?

FHWA in conjunction with NHDOT will continue to conduct an annual traffic control review of select work zones throughout the state. These inspections should include work zones that include both daytime and nighttime work operations. Information gathered during these inspections will be used to identify work zone practices and strategies that are successful as well as areas that need improvement.

APPENDIX A

Committee Charter

NH Department of Transportation

Traffic Control Committee Charter

PURPOSE

The Traffic Control Committee (TCC) serves to help provide a Department wide culture committed to providing safe, consistent, work zones for all workers and road users while considering mobility, access, operations, and project construction needs.

RESPONSIBILITIES

1. Review and/or approve conceptual Traffic Management Plans.
    a. Determine project Traffic Impact and Level of Significance in accordance with FHWA Work Zone Safety and Mobility Rule (69 FR 54562).
    b. Review and/or approve conceptual Level I and Level II Significant Traffic Control Plans, Traffic Management Plans and Public Outreach plans.
    c. Review and/or approve conceptual Traffic Control Plans for Non-Significant projects.
    d. Ensure the requirements of State and Federal laws, pertaining to work zones, (e.g. Work Zone Mobility Rule, Uniformed Officer and Flagger Training, MUTCD, ADA, etc.) are being adhered to.
    e. Develop and manage a process to track, monitor and report on work zone traffic control performance.
2. Review and approve compilation and recommendations of work zone crash reporting.
3. Be a resource for consistent use of temporary traffic control measures.
4. Review and update as necessary the Department's temporary traffic control standards.
5. Seek out and/or consider new technologies or innovation to improve worker and driver safety through work zones (e.g. portable rumble strips, nighttime lighting, etc.)
6. Conduct an annual nighttime and daytime review of NHDOT work zones.

DELIVERABLES

Develop and maintain procedures and guidelines for the review of work zone traffic control plans, traffic management plans and work zone public outreach.

1. "Guidelines for Implementation of the Work Zone Safety and Mobility Policy" and staff notification of changes.
2. Approval of Non-Significant, Level I Significant and Level II Significant project determinations.
3. Report on performance measures.
4. Report on construction work zone crashes.
5. Biennial Self-Assessment of processes and procedures in compliance with FHWA requirements.
6. Report and distribute findings of annual nighttime and daytime work zone traffic control review.

AUTHORITY

The committee derives authority from the Policy and Records Workgroup.

MEETINGS

The committee will meet monthly or at the discretion of the Chairperson. In the event that the Chairperson is not available, meetings will be scheduled at the discretion of the Vice Chairperson. Notes from every meeting will be maintained and posted

COMMITTEE CHAIRPERSON

Chairperson responsibilities include, but are not limited to:

1. Call for meetings,
2. Develop and set agenda,
3. Distribute meeting materials,
4. Facilitate meeting discussion, material reviews, and votes,
5. Be Department contact for consultant community interaction,
6. Manage and monitor consultant procurement, administration and management procedures.

STANDING MEMBERS

The Committee will consist of 16 regular members. A quorum is 8 or more members.

Standing Members:

a. Assistant Director of Project Development (Chair),
b. Chief Project Manager (Vice-Chair),
c. Bureau of Highway Design Roadway, Pavement, and Safety Section Chiefs
d. Bureau of Bridge Design – Senior Project Engineer
e. Bureau of Planning and Community Assistance – LPA Project Manager
f. Bureau of Construction – District Construction Engineers (2), Traffic Control Specialist
g. Bureau of Bridge Maintenance – Administrator
h. Bureau of Highway Maintenance – Assistant Maintenance Engineer
i. Bureau of Traffic – Administrator
j. Bureau of Turnpikes – Project Manager
k. Bureau of TSMO – Assistant Administrator
l. Office of Federal Compliance – ADA Coordinator
m. FHWA –Safety & Area Engineer (non-voting)

MEMBER EXPECTATIONS

Committee members are expected to attend meetings and to come prepared to those meetings. Members will have assignments that require independent or collaborative work between meetings. In the event a Standing Member cannot attend, they may designate a replacement from their Bureau senior staff and shall notify the chair prior to the meeting.

DECISION MAKING

Committee decision making will be by majority rule vote with a required quorum of members.

Approved:

	Enter date here.
Workgroup Chairperson	Date

Appendix A

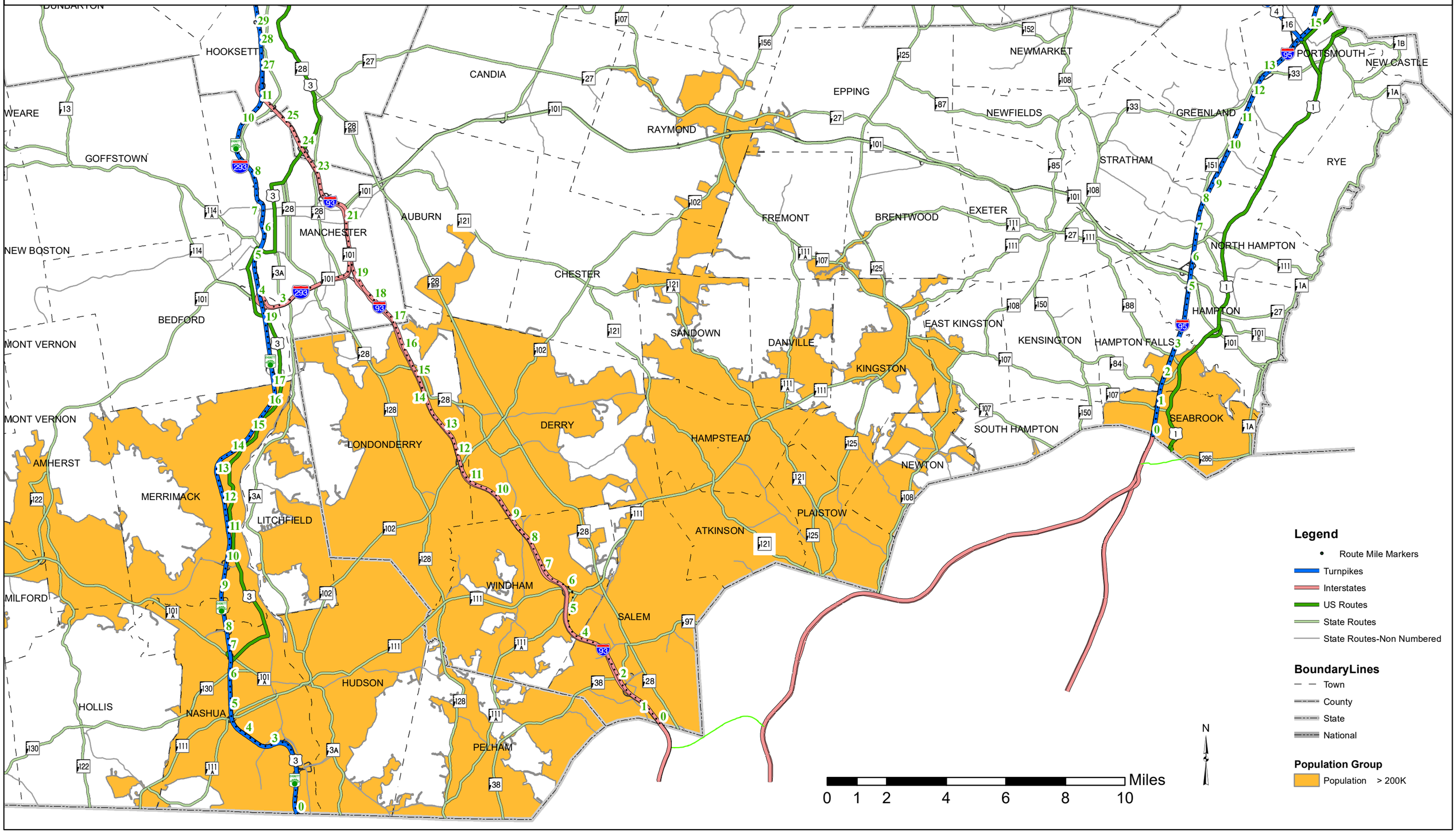
List of Current Committee Members by Name:

1. Bill Oldenburg - Assistant Director of Project Development (Chair)
2. Tobey Reynolds - Chief Project Manager (Vice-Chair)
3. Maggie Baldwin - Bureau of Highway Design - Roadway Section Chief
4. Ron Grandmaison - Bureau of Highway Design - Pavement Section Chief
5. [Vacant] - Bureau of Highway Design - Safety Section Chief
6. Bill Saffian - Bureau of Bridge Design – Senior Project Engineer
7. Kevin Russell - Bureau of Planning and Community Assistance – LPA Project Manager
8. Nickie Hunter - Bureau of Construction – District Construction Engineer
9. Paul Metcalf - Bureau of Construction – District Construction Engineer
10. [Vacant] - Bureau of Construction – Traffic Control Specialist
11. Tim Boodey - Bureau of Bridge Maintenance – Administrator
12. Mark Kirouac – Bureau of Highway Maintenance - Assistant Maintenance Engineer
13. Bill Lambert - Bureau of Traffic – Administrator
14. Sam Newsom - Bureau of Turnpikes – Project Manager
15. Charlie Blackman – Bureau of TSMO – Assistant Administrator
16. Sandt Michener – Office of Federal Compliance – ADA Coordinator
17. Michelle Marshall - FHWA –Safety & Area Engineer (non-voting)

APPENDIX B

TMA Map (population over 200,000)

Transportation Management Area (TMA)



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APPENDIX C

TCC Determination Memo

S T A T E O F N E W H A M P S H I R E

INTER-DEPARTMENT COMMUNICATION

DATE:

FROM: **AT OFFICE:** Bureau of

SUBJECT:

TO: William J. Oldenburg, P.E
Assistant Director of Project Development

MEMORANDUM

The following information is in accordance with the Guidelines for Implementation of the Work Zone Safety and Mobility Policy to the Traffic Control Committee (TCC) for determination of the project's significance.

Consistent with the TCC Work Zone and Mobility Manual Section 2 regarding the need for Traffic Control Committee reviews, this project is:

☐ Exempt from Presentation-

Reason for Exempt Status; [Select]

☐ Requires Presentation

The purpose of this project is: (discuss need, scope of work and public outreach efforts associated with the project).

The project will advertise on: Click or tap to enter a date.

The project will be completed on: Click or tap to enter a date.

Traffic impacts are expected to be: (enter what you anticipate the traffic impacts will be, ie. lane closures, durations, time frames, etc.)

An evaluation of the criteria for determination of a significant project is provided in the table shown below.

FHWA Requirement	**Specific Project Response**
• Will the Project be located within TMA (See Work Zone Safety and Mobility Manual-Section 2) and include Lane Closures 3 days or more	No,
NHDOT – Primary Level of Criteria	**Does the Project meet ALL of the following requirements?"**
• Estimated Construction Cost > $20 M	No
• Within or affecting Communities > 35,000 residents	No *
• On the Interstate or NHS	No
• Anticipated to create sustained WZ impacts, separately or in combination with another project	No

*List each Community Name, Census Year, Population

NHDOT Secondary Level of Criteria	**Do any of the following items, individually or collectively, in the opinion of the TCC, require the project to be Significant?**
• Time and Duration	**No**,
• Nature of Work	**No**,
• Traffic Volume	**No, ADT %Trucks** %
• Regional Significance	**No**,
• Sustained WZ Impacts, separately or in combination with another	**No**,

TRAFFIC CONTROL COMMITTEE SUPPLEMENTAL INFORMATION:

Project Name: **Project Number:**

Concerns	Responses	
Detours or Diversions	Choose an item.	Describe: Choose an item. Choose an item. Duration: Choose an item. Day/Night Remarks: Detour Map Attached: Choose an item. Service Patrol needed? Choose an item.
Intersection Impacts?	Choose an item.	Describe Control: [Select] Duration: [Select] Day/Night [Select]
Lane Closures?	Choose an item.	Which Operations? Time of Day Allowed: [Select] Duration: [Select]
Lane Width Restrictions?	Choose an item.	OSOW restriction to annual permit holders: Choose an item. Min. lane width = feet with shoulder width = feet Min. shoulder width = feet with lane width = feet Which operation(s)? Duration: [Select]
Have Truck Mounted Attenuators been considered?	Choose an item.	If "No" explain why: Remarks:
Speed Reduction During Construction? (Flow Chart Recommendation/ Traffic Bureau Confirmation?)	Choose an item.	☐ Long Term ☐ Work Hours Only From mph to mph Time of day: [Select] Restore Speed in Winter: Choose an item.
Night Work?	Choose an item.	Which Operation(s)? Duration: [Select] Remarks:
Holidays During Project Timeframe?	Choose an item.	Impacts: Select Remarks: [Select]
Special Events?	Choose an item.	Contract Restrictions during Spec. Events? Choose an item. Remarks: List any Special Events:
Schools, Hospitals, etc.?	Choose an item.	Contract Provisions: N/A Choose an item. Additional Provisions: [Select]

Are Other States Involved?	Choose an item.	If Yes, Has Coordination Occurred: [Select] Remarks:
Are Railroads Involved?	Choose an item.	If Yes, Has Coordination Occurred: [Select] Remarks:
Special Traffic Control?	Choose an item.	Type: [Select] Remarks:
Seabrook Evacuation Route Impacted?	Choose an item.	Coordinated w/ Homeland Security? Choose an item. Contract Requirements: Describe: Select
Pedestrian facilities or sidewalks on the project?	Choose an item.	If Yes, are ped facilities being perpetuated? [Select] (MUTCD Section 6D.01 requires accommodations if they exist prior to project). How are they being accommodated? Select Remarks: Project Duration: [Select]
Bike facilities impacted?	Choose an item.	Existing Shoulder Width = feet Min. shoulder width during construction = How are bikes being accommodated? Select Remarks: Project Duration: [Select]
ITS Request for Permanent Installations	Submitted to TSMO? Choose an item.	Any requirements or recommended permanent ITS infrastructure? Choose an item. If yes, describe:
Work Zone ITS Needs Assessments (Temp. Installs During Const.)	Submitted to TSMO? Choose an item.	Any requirements or recommended SWZ or other elements? Choose an item. If yes, describe:

Based on the evaluation of the criteria presented above, I recommend that the TCC classify this project as:

- Significant Level 1 ☐
- Significant Level 2 ☐
- Non-Significant ☐

A Level I classification requires the development of a separate Traffic Management Plan (TMP) document (narrative) that includes detailed discussion of Public Outreach (PO), Traffic Control Plans (TCP) and Transportation Operations (TO). For example, I-93 expansion, Newington-Dover and the Bow-Concord Capital corridor improvements have been identified as Level I Significance.

A Level II classification requires the development of a memorandum that includes discussion of the three components (TCP, TO, PO).

Both the Level I and II documents must be presented to the committee for review and approval.

This Section for use by TCC Only:

Designation (check one): Significant: ☐ Level I ☐ Level II ☐ Non-Significant

Additional Guidance and Direction:_____

_____

_____

_____

_____

Signature:

_____ Click or tap to enter a date.

Chairperson, TCC Date

cc: Project File

Document1

APPENDIX D

MUTCD ADA Guidance

Appendix D

Manual on Uniformed Traffic Control Devices (MUTCD)
2009 Edition Chapter 6D. Pedestrian and Worker Safety

Section 6D.01 Pedestrian Considerations

Support:
01 A wide range of pedestrians might be affected by TTC zones, including the young, elderly, and people with disabilities such as hearing, visual, or mobility. These pedestrians need a clearly delineated and usable travel path. Considerations for pedestrians with disabilities are addressed in Section 6D.02.

Standard:
02 **The various TTC provisions for pedestrian and worker safety set forth in Part 6 shall be applied by knowledgeable (for example, trained and/or certified) persons after appropriate evaluation and engineering judgment.**

03 **Advance notification of sidewalk closures shall be provided by the maintaining agency.**

04 **If the TTC zone affects the movement of pedestrians, adequate pedestrian access and walkways shall be provided. If the TTC zone affects an accessible and detectable pedestrian facility, the accessibility and detectability shall be maintained along the alternate pedestrian route.**

Option:
05 If establishing or maintaining an alternate pedestrian route is not feasible during the project, an alternate means of providing for pedestrians may be used, such as adding free bus service around the project or assigning someone the responsibility to assist pedestrians with disabilities through the project limits.

Support:
06 It must be recognized that pedestrians are reluctant to retrace their steps to a prior intersection for a crossing or to add distance or out-of-the-way travel to a destination.

Guidance:
07 *The following three items should be considered when planning for pedestrians in TTC zones:*

A. *Pedestrians should not be led into conflicts with vehicles, equipment, and operations.*
B. *Pedestrians should not be led into conflicts with vehicles moving through or around the worksite.*
C. *Pedestrians should be provided with a convenient and accessible path that replicates as nearly as practical the most desirable characteristics of the existing sidewalk(s) or footpath(s).*

08 *A pedestrian route should not be severed and/or moved for non-construction activities such as parking for vehicles and equipment.*

09 *Consideration should be made to separate pedestrian movements from both worksite activity and vehicular traffic. Unless an acceptable route that does not involve crossing the roadway can be provided, pedestrians should be appropriately directed with advance signing that encourages*

them to cross to the opposite side of the roadway. In urban and suburban areas with high vehicular traffic volumes, these signs should be placed at intersections (rather than midblock locations) so that pedestrians are not confronted with midblock worksites that will induce them to attempt skirting the worksite or making a midblock crossing.

Support:
10 Figures 6H-28 and 6H-29 show typical TTC device usage and techniques for pedestrian movement through work zones.

Guidance:
11 *To accommodate the needs of pedestrians, including those with disabilities, the following considerations should be addressed when temporary pedestrian pathways in TTC zones are designed or modified:*

A. *Provisions for continuity of accessible paths for pedestrians should be incorporated into the TTC plan.*
B. *Access to transit stops should be maintained.*
C. *A smooth, continuous hard surface should be provided throughout the entire length of the temporary pedestrian facility. There should be no curbs or abrupt changes in grade or terrain that could cause tripping or be a barrier to wheelchair use. The geometry and alignment of the facility should meet the applicable requirements of the "Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADAAG)" (see Section 1A.11).*
D. *The width of the existing pedestrian facility should be provided for the temporary facility if practical. Traffic control devices and other construction materials and features should not intrude into the usable width of the sidewalk, temporary pathway, or other pedestrian facility. When it is not possible to maintain a minimum width of 60 inches throughout the entire length of the pedestrian pathway, a 60 x 60-inch passing space should be provided at least every 200 feet to allow individuals in wheelchairs to pass.*
E. *Blocked routes, alternate crossings, and sign and signal information should be communicated to pedestrians with visual disabilities by providing devices such as audible information devices, accessible pedestrian signals, or barriers and channelizing devices that are detectable to the pedestrians traveling with the aid of a long cane or who have low vision. Where pedestrian traffic is detoured to a TTC signal, engineering judgment should be used to determine if pedestrian signals or accessible pedestrian signals should be considered for crossings along an alternate route.*
F. *When channelization is used to delineate a pedestrian pathway, a continuous detectable edging should be provided throughout the length of the facility such that pedestrians using a long cane can follow it. These detectable edgings should comply with the provisions of Section 6F.74.*
G. *Signs and other devices mounted lower than 7 feet above the temporary pedestrian pathway should not project more than 4 inches into accessible pedestrian facilities.*

Option:
12 Whenever it is feasible, closing off the worksite from pedestrian intrusion may be preferable to channelizing pedestrian traffic along the site with TTC devices.

Guidance:
13 *Fencing should not create sight distance restrictions for road users. Fences should not be constructed of materials that would be hazardous if impacted by vehicles. Wooden railing, fencing, and similar systems placed immediately adjacent to motor vehicle traffic should not be used as substitutes for crashworthy temporary traffic barriers.*

14 *Ballast for TTC devices should be kept to the minimum amount needed and should be mounted low to prevent penetration of the vehicle windshield.*

15 *Movement by work vehicles and equipment across designated pedestrian paths should be minimized and, when necessary, should be controlled by flaggers or TTC. Staging or stopping of work vehicles or equipment along the side of pedestrian paths should be avoided, since it encourages movement of workers, equipment, and materials across the pedestrian path.*

16 *Access to the work space by workers and equipment across pedestrian walkways should be minimized because the access often creates unacceptable changes in grade, and rough or muddy terrain, and pedestrians will tend to avoid these areas by attempting non-intersection crossings where no curb ramps are available.*

Option:
17 A canopied walkway may be used to protect pedestrians from falling debris, and to provide a covered passage for pedestrians.

Guidance:
18 *Covered walkways should be sturdily constructed and adequately lighted for nighttime use.*

19 *When pedestrian and vehicle paths are rerouted to a closer proximity to each other, consideration should be given to separating them by a temporary traffic barrier.*

20 *If a temporary traffic barrier is used to shield pedestrians, it should be designed to accommodate site conditions.*

Support:
21 Depending on the possible vehicular speed and angle of impact, temporary traffic barriers might deflect upon impact by an errant vehicle. Guidance for locating and designing temporary traffic barriers can be found in Chapter 9 of AASHTO's "Roadside Design Guide" (see Section 1A.11).

Standard:
22 **Short intermittent segments of temporary traffic barrier shall not be used because they nullify the containment and redirective capabilities of the temporary traffic barrier, increase the potential for serious injury both to vehicle occupants and pedestrians, and encourage the presence of blunt, leading ends. All upstream leading ends that are present shall be appropriately flared or protected with properly installed and maintained crashworthy cushions. Adjacent temporary traffic barrier segments shall be properly connected in order to provide the overall strength required for the temporary traffic barrier to perform properly.**

23 **Normal vertical curbing shall not be used as a substitute for temporary traffic barriers when temporary traffic barriers are needed.**

Option:
24 Temporary traffic barriers or longitudinal channelizing devices may be used to discourage pedestrians from unauthorized movements into the work space. They may also be used to inhibit conflicts with vehicular traffic by minimizing the possibility of midblock crossings.

Support:
25 A major concern for pedestrians is urban and suburban building construction encroaching onto

the contiguous sidewalks, which forces pedestrians off the curb into direct conflict with moving vehicles.

Guidance:
26 *If a significant potential exists for vehicle incursions into the pedestrian path, pedestrians should be rerouted or temporary traffic barriers should be installed.*

Support:
27 TTC devices, jersey barriers, and wood or chain link fencing with a continuous detectable edging can satisfactorily delineate a pedestrian path.

Guidance:
28 *Tape, rope, or plastic chain strung between devices are not detectable, do not comply with the design standards in the "Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADAAG)" (see Section 1A.11), and should not be used as a control for pedestrian movements.*

29 *In general, pedestrian routes should be preserved in urban and commercial suburban areas. Alternative routing should be discouraged.*

30 *The highway agency in charge of the TTC zone should regularly inspect the activity area so that effective pedestrian TTC is maintained.*

APPENDIX E

TMP Strategy Matrix – FHWA Link

Appendix E

FHWA Work Zone Management Strategies Matrix

For a Listing of TMP Strategies see the FHWA webpage at:

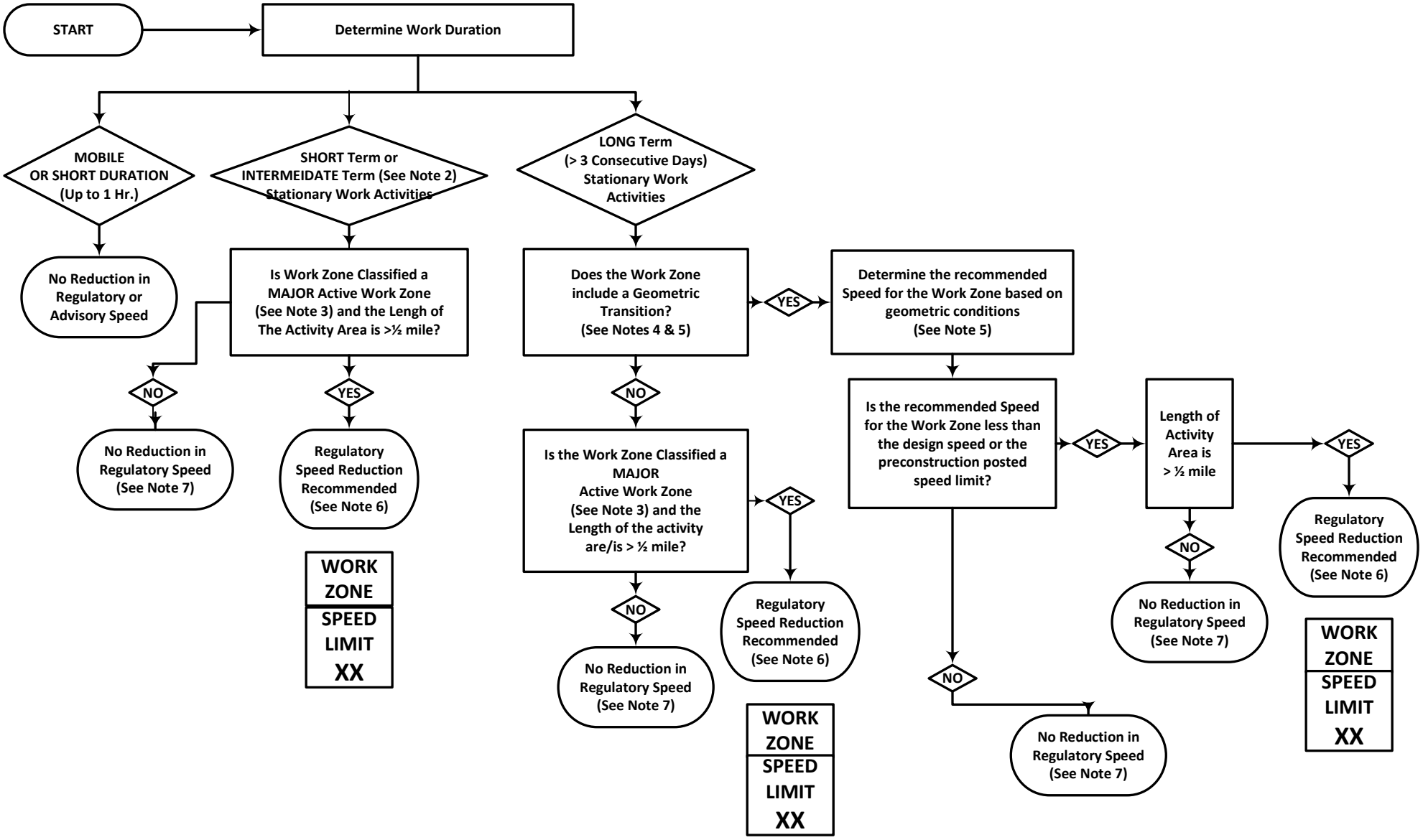
Appendix B - Table B.1 TMP Strategy Matrix – Mobility/Safety Improvement and Considerations for Implementation (dot.gov)

APPENDIX F

Work Zone Speed Limit Flow Charts

EXHIBIT 1 – WORK ZONE REGULATORY SPEED LIMIT REDUCTION FLOW CHART

*Regulatory speeds are not warranted and shall not be used where the work zone consists solely of a shoulder closure.

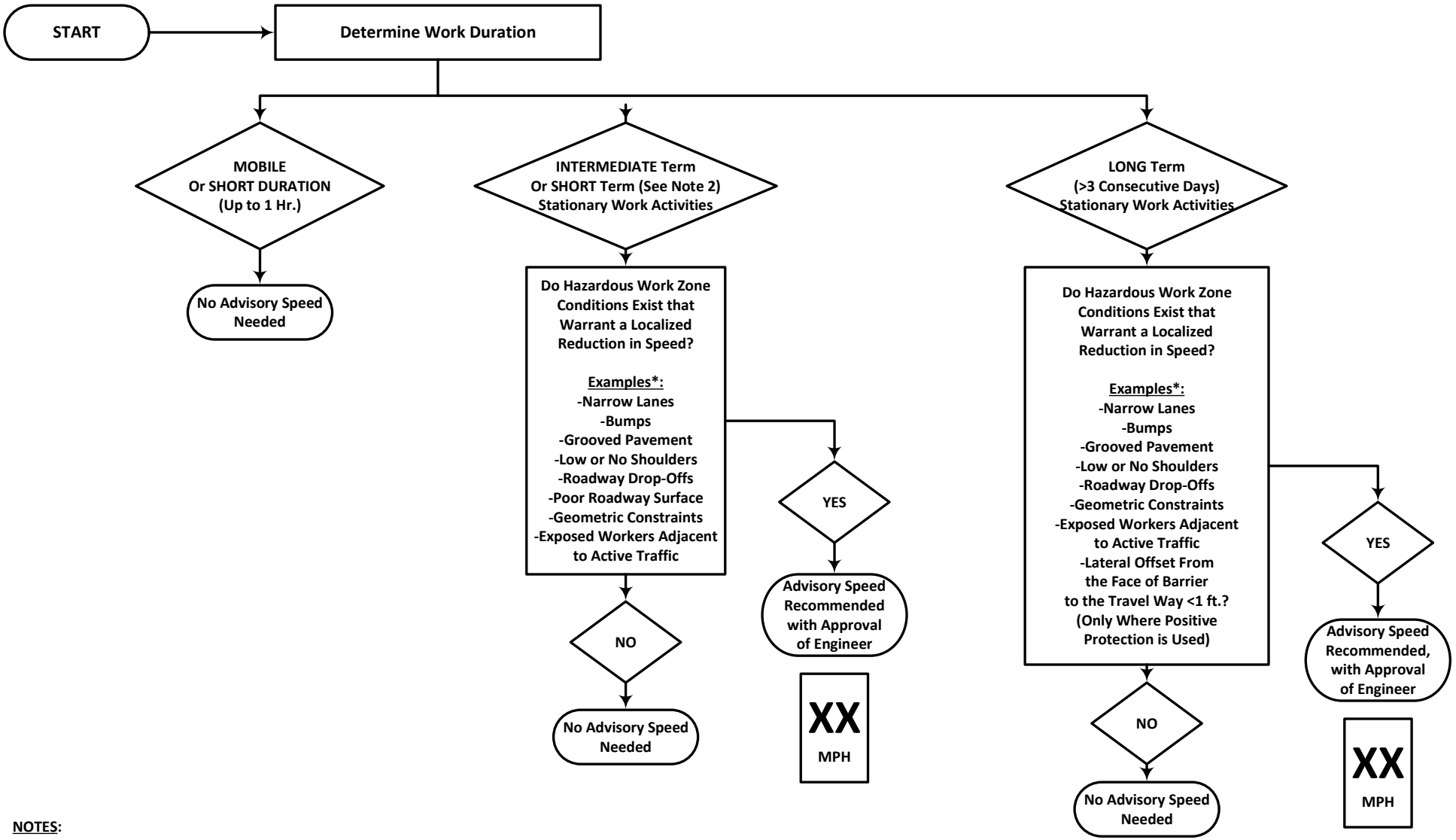


NOTES:

1. This Flow Chart should be used in conjunction with EXHIBIT 2 (WORK ZONE ADVISORY SPEED LIMIT FLOW CHART). Advisory speeds may be needed for hazardous conditions regardless of whether or not Regulatory speed Limit Reductions are Implemented. Exhibit 1 and Exhibit 2 should be used in conjunction with the "Guideline for Establishment of Work Zone Speed Limits" Work Instructions.
2. SHORT Term is defined as more than 1 hour and a maximum of 1 daytime shift. INTERMEDIATE Term is defined as more than 1 daytime shift up to 3 consecutive days or nighttime work lasting more than 1 hour.
3. A "MAJOR Active Work Zone" is defined as a work zone having the following conditions:
   - -Work on a fully controlled access roadway with preconstruction posted speed limit of 55 MPH or greater;
   - -AND- -Workers on foot in the roadway and NOT predominantly separated from traffic by positive protection such as temporary concrete barrier.
4. A GEOMETRIC Transition is defined as a change in the existing horizontal or vertical alignment of the travel lane. A lane shift or lane closure is not considered a geometric transition when appropriate taper lengths are provided.
5. Geometric conditions include, Sight Distance, Lane Width, and Superelevation, etc.
6. The Regulatory speed limit recommended should not be reduced more than 10 MPH below the preconstruction posted speed limit, unless the geometric conditions warrant a greater speed limit reduction. The Traffic Engineer (Bureau of Traffic Administrator) shall be responsible for approving all work zone reduced regulatory speed limits.
7. Review Work Zone Advisory Speed Limit Flow Chart. (See Exhibit 2 – WORK ZONE SPEED ADVISORY FLOW CHART).

EXHIBIT 2 – WORK ZONE ADVISORY SPEED FLOW CHART

***Advisory speeds are not warranted and shall not be used where the work zone consists solely of a shoulder closure.**



NOTES:

1. This Flow Chart should be used in conjunction with EXHIBIT 1 (WORK ZONE REGULATORY SPEED LIMIT REDUCTION FLOW CHART). Exhibit 1 and Exhibit 2 should be used in conjunction with the "Guideline for Establishment of Work Zone Speed Limits" Work Instructions.
2. SHORT Term is defined as more than 1 hour and a maximum of 1 daytime shift. INTERMEDIATE Term is defined as more than 1 daytime shift up to 3 consecutive days or nighttime work lasting more than 1 hour.
3. Round all Advisory Speeds to 5 MPH.
4. All advisory speed limit reductions should be in maximum 10 MPH increments.
5. Speeds may be further reduced for Hazardous conditions using an Advisory Panel within a Work Zone having a regulatory speed limit reduction.

*Not all examples necessarily warrant an advisory speed limit reduction. Decision shall be based on judgment of the Engineer.

APPENDIX G

Work Zone Traffic Control Crash Report Instructions

Work Zone Traffic Control Crash Report Form

THE STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION

Work Zone Traffic Crash Report Instructions

The online work zone crash report can be found at https://nhtmc.com/crashreport/. The purpose of this report is for tracking all NHDOT work zone crashes, evaluating the crashes for any common problems, and making recommendations regarding training and/or changes to NHDOT's Traffic Control Plans or procedures. Once submitted, the data will be received by TSMO, evaluated by Highway Design's Safety Section , and reported to the Traffic Control Committee.

A. The Work Zone Traffic Crash Report should be used whenever there is **any** crash within, or related to, the Work Zone regardless of whether or not there is active work on-going at the time of the crash:

   - The Work Zone is defined as: The beginning and end of a designated project, or portions thereof, typically designated by construction signing or traffic control devices including approaches.

   - This report shall also be filled out whenever a crash occurs outside the Work Zone if the work zone's traffic control could be considered as a factor relating to the crash. (e.g. a rear end collision in traffic backed up beyond any traffic control devices).

   - A report shall be filled out even when the crash is within the work zone and is unrelated to the work zone's traffic control. The report will help provide information about possible contributing factors.

B. If the crash involves an NHDOT employee or NHDOT vehicle, the employee involved must also fill out the necessary vehicle or injury reports.

C. All crash reports must be submitted within 48 hours of the accident. Do not hold off on submitting reports if you don't have a police report. A police report can be submitted later.

D. Do not start the online crash report until you have all the necessary information to complete it. Once you have started the report, it cannot be saved and resumed later. This information includes all necessary roadway information, the daily report saved as a pdf, and any pictures of the incident.

E. Some boxes within the Work Zone Traffic Crash Report that may need more clarification are noted below:

- Box #1 Location of Crash: Use the (+) or (-) buttons in the bottom right hand corner, or the scroll wheel on the mouse, to zoom in to the crash location. Double click the location and the red pointer will move to that location. You can also drag and drop the red pointer to the correct location. After selecting location, move finger or mouse to far right edge of screen to scroll down to Box #2.

- Box #10 Injuries/Fatalities: If unknown, leave blank. Do not write "Unknown" in the box. Only numbers can be entered.

- Box #11 Type of Crash/Collision: Only check the box relevant to the "first harmful event" or initial crash. In other words, if a car hit a temporary concrete barrier and then deflected off the barrier into the opposite lane resulting in a head-on collision with an oncoming vehicle, only check the "fixed object - temporary concrete barrier" boxes. Do not check the "head on" box. The Sketch Required (#30) and Crash Description (#32) should be used to detail both the initial hit of the barrier as well as the resulting head on collision.

- Box #15 Roadway Condition: Rough can be defined as pavement patches, several bumps, or dips.

- Boxes #21 Traffic Control Package, #24 Changeable Message Signs & #28 Police Report: Additional boxes will appear depending on what you select from the drop-down menu. These boxes may be left blank if not applicable.

- Box #29-1 Location Within the Workzone: See MUTCD Figure 6C-1 for illustration of locations (attached):
  - Advance Warning Area – Tells traffic what to expect ahead
  - Transition Area – Moves traffic out of its normal path
  - Activity Area – Where work takes place
  - Termination Area – Lets traffic resume normal operations

- Box #30 Sketch Required: Use the tools on the left side of the window to produce your sketch. The following shall be included:
  - North direction arrow
  - Name of road, bridge, ramp, or other defining feature
  - Location of construction signing & approx. distances to crash
  - Traffic control devices and signs in immediate area
  - Note the location of accident and direction of travel of each vehicle
  - Roadway and/or shoulder width
  - Spacing of traffic control devices
  - Note work operation area
  - Flagger/uniformed officer(s) location

- Fixed objects if pertinent

- Box #31 – Additional Documents: Use the browse button to find and upload necessary documents including daily reports, photos, and police reports.

- Box #32 – Crash Description and any Additional Comments: Describe crash and include information not covered within the form that will be helpful for those not familiar with the work zone to understand the crash event. This information should describe the work zone operation(s) and other activities within the area.

- Box #34 – Supervisor: Enter name and email of the Supervisor that is designated by your Bureau to receive the crash reports. Note: The report will automatically be sent to TSMO for data compilation.

- I'm Not a Robot: Check the box and an image or set of images will appear. Select each image that contains the object described in the text at the top.

- Submit: After reviewing that everything is complete and accurate, click on the "Submit" icon at the bottom of the screen. If it does not work, recheck to make sure all required entries are made.

- Upon Completion, an email will be sent to you with all the information from the report. Save this email to your project or job folder for documentation.

F. Please note that it is everyone's responsibility to help make NHDOT's work zones as safe as possible. This crash reporting is a tool for gathering information statewide for overall review, evaluation, and safety improvement recommendations by Highway Design's Safety Section and the Traffic Control Committee. This review is not immediate. If a particular crash in an individual work zone reveals or creates a safety hazard, the on-site project team should take immediate action to evaluate and mitigate any safety concerns associated with that particular project or work effort.

G. Supervisor's Responsibilities (from Box 34):
- Ensure form is completely filled out, signed, and dated.
- Review the crash event and discuss with the project team any noted discrepancies or issues with the work zone's traffic control.
- If traffic control changes are made as a result of the analysis of the crash event, ensure that the project team documents the changes.

H. TSMO Responsibilities:
- Collect and collate the data received from the crash reporting.
- Create a draft report summarizing the data.
- Submit draft report to Highway Design's Safety Section .

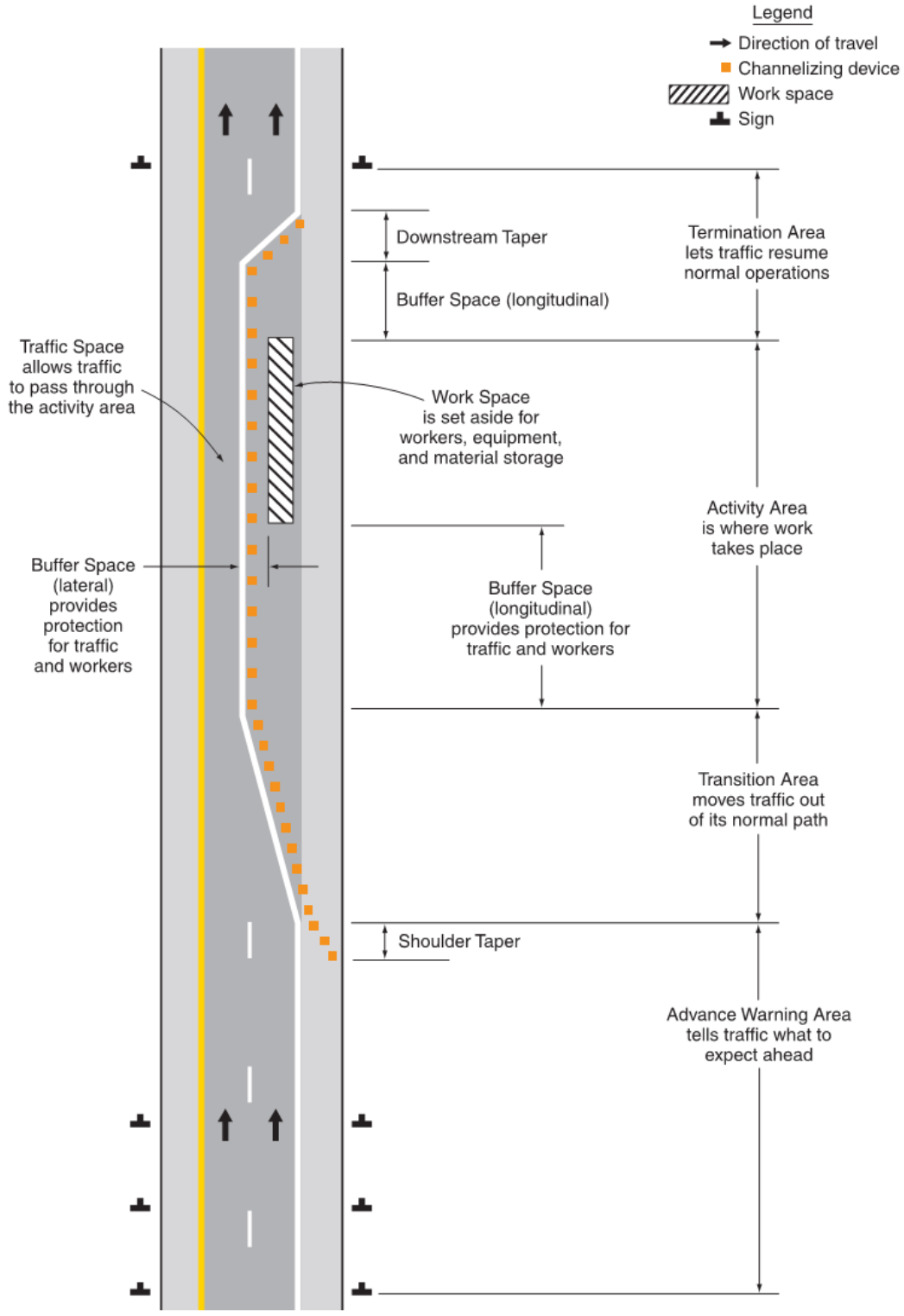
I. Highway Design Safety Section (HDSS) Responsibilities:

- Review and evaluate the crash data collected and collated by TSMO.
- Offer summary observations of the data (e.g. look for trends).
- Make recommendations for safety improvement(s).
- Add summary observations and recommendations to TSMO's initial draft report.
- Submit and present final report to the Traffic Control Committee for review, comment, and/or acceptance.
- Once report is accepted by TCC, distribute report to all Department Administrators or Bureau designees.

J. Traffic Control Committee (TCC) Responsibilities:

- Review, comment, and/or accept the final crash report prepared by TSMO and HDSS.
- Frequency of the reporting and review is to be determined by the TCC with feedback from TSMO and HDSS.

Figure 6C-1. Component Parts of a Temporary Traffic Control Zone



APPENDIX H

Project Traffic Control Review Checklist

TCC Daytime Project Review (Sample)

Traffic Control Checklist

Work Zone Traffic Control Inspection Report

STATE OF NEW HAMPSHIRE
Department of Transportation
Bureau of Construction

PROJECT TRAFFIC CONTROL REVIEW

DATE:

PROJECT: PROJECT NUMBER:

REPORT # TIME OF REVIEW:

WEATHER: ROAD CONDITION:

VISIBILITY: TRAFFIC VOLUME:

REVIEW PERSONNEL:

CONSTRUCTION SIGNS: ACCEPTABLE ☐ NEEDS ATTENTION ☐ N/A ☐
COMMENTS: _____

WARNING DEVICES: ACCEPTABLE ☐ NEEDS ATTENTION ☐ N/A ☐
COMMENTS: _____

CHANNELIZING: ACCEPTABLE ☐ NEEDS ATTENTION ☐ N/A ☐
COMMENTS: _____

PAVEMENT MARKINGS: ACCEPTABLE ☐ NEEDS ATTENTION ☐ N/A ☐
COMMENTS: _____

MESSAGE BOARDS: ACCEPTABLE ☐ NEEDS ATTENTION ☐ N/A ☐
COMMENTS: _____

UNIFORMED OFFICERS: ACCEPTABLE ☐ NEEDS ATTENTION ☐ N/A ☐
COMMENTS: _____

FLAGGERS: ACCEPTABLE ☐ NEEDS ATTENTION ☐ N/A ☐
COMMENTS: _____

LANE CLOSURES: ACCEPTABLE ☐ NEEDS ATTENTION ☐ N/A ☐
COMMENTS: _____

DETOURS: ACCEPTABLE ☐ NEEDS ATTENTION ☐ N/A ☐
COMMENTS: _____

CLEAR ZONE: ACCEPTABLE ☐ NEEDS ATTENTION ☐ N/A ☐
COMMENTS: _____

CRASH CUSHIONS: ACCEPTABLE ☐ NEEDS ATTENTION ☐ N/A ☐
COMMENTS: _____

CONCRETE BARRIER: ACCEPTABLE ☐ NEEDS ATTENTION ☐ N/A ☐
COMMENTS: _____

NIGHT WORK: ACCEPTABLE ☐ NEEDS ATTENTION ☐ N/A ☐
COMMENTS: _____

PEDESTRIAN TRAFFIC: ACCEPTABLE ☐ NEEDS ATTENTION ☐ N/A ☐
COMMENTS: _____

SMART WORK ZONE: ACCEPTABLE ☐ NEEDS ATTENTION ☐ N/A ☐
COMMENTS: _____

TEMPORARY SIGNALS: ACCEPTABLE ☐ NEEDS ATTENTION ☐ N/A ☐
COMMENTS: _____

TRAFFIC BACKUPS: ACCEPTABLE ☐ NEEDS ATTENTION ☐ N/A ☐
COMMENTS: _____

OTHER OBSERVATIONS:

- _____
- _____
- _____
- _____
- _____

_____
NH DOT CONTRACT ADMINISTRATOR

Disclaimer: The Contractor is responsible to keep the project "in a condition that safely and adequately accommodates traffic." This report is intended in good faith to identify potential traffic control issues that were noticed on the date of this report and may not include every possible safety issue present. (See Standard Specifications Section 104.07)

Distribution:
Construction Office: ___ Contractor: ___ File: ___

STATE OF NEW HAMPSHIRE
INTER-DEPARTMENT COMMUNICATION

DATE: August 4, 2021
AT (OFFICE): Department of Transportation
Bureau of Highway Design

FROM: Traffic Control Committee

SUBJECT: 2021 Work Zone Traffic Control, Daytime Review

TO: Peter Stamnas, P.E.
Director of Project Development

MEMORANDUM

A daytime field review of the Work Zone Traffic Control on several construction projects was held by only two people this year because of COVID-19 restrictions on Wednesday August 4, 2021. Attending were:

Ted Kitsis	NHDOT, Construction	(Administrator)
Paul Metcalf	NHDOT, Construction	(District Construction Engineer)
Nickie Hunter	NHDOT, Construction	(District Construction Engineer)
Patrick Colburn	NHDOT, Construction	(Construction Services Engineer)
Michelle Marshall	FHWA	(NH Division Safety & Area Engineer)
Julie Matthews	NHDOT, Traffic	(Traffic Operations Engineer)
Lee Simpson	NHDOT, Construction	(Traffic Control Specialist- scribe)

Review

The following projects were visited beginning at approximately 8:00 am through 4:30 pm. The following are the observations and discussions that followed:

- ☑ "Denotes a positive comment"
- ☒ "Denotes a comment where improvement is required or recommended"
- • "Denotes a general comment"

Central Turnpike Paving 41821

Contractor: Continental Paving, Inc.
Construction Total: $8,263,284.91
Contract Administrator: Jay Levine

Project Description:
Project consists of resurfacing approximately 18.3 centerline miles along the Everett Turnpike mainline in Nashua (MM 5.0-7.3 NB, MM 7.6-5.6 SB); Merrimack (MM 11.6-12.9 NB, MM 12.9-10.9 SB); Merrimack-Bedford (MM 15.8-18.5 NB & SB); Hackett Hill Rd (NH 3A to Pike Industries, Cate Rd); Bedford I-293 SB (MM 4.9-4.0); the Hooksett Campus and I-93 mainline in Concord (MM 36.65-38.44).

Traffic Plan:
Resurfacing work will be done at night during off peak timeframes with normal traffic patterns to be re-established prior to AM travel periods for all locations.

Comments:

- ☑ Temporary tape skips look good!
- ☒ I-93 SB Portable Changeable Message Sign (PCMS) should be raised so the bottom of the board is at least 5' above the pavement grade.
- ☒ Should have "Low Shoulder" or "Uneven Lanes" sign in area where the mainline has been paved but the shoulder has not.

Statewide Guardrail 42266

Contractor: R.S. Audley, Inc.
Construction Total: $696,435.50
Contract Administrator: Kyle Rodrick

Project Description:
Removal of deficient median guardrail and replace with single slope concrete median barrier and thrie beam along I-93 in Hooksett between Toll Plaza and I-293/I-93 split, from approximately MM 27.4 to 26.9. This project will also remove obsolete guardrail under I-293 ramp overpass as a result of high mast light removal completed by 2014 Hooksett ORT conversion 15803.

Traffic Plan:
Traffic implications will be minimal due to majority of work behind temporary barrier in high speed shoulders during construction. Lane closures for material delivery will only be permitted during the following timeframes: NB High Speed Lane: Mon-Thu 9am-3pm; SB High Speed Lane: Mon-Fri 9am-3pm; NB/SB High Speed Lane: Mon-Thu 9pm-5am.

Comments:

- I-93 NB and SB are down posted to 55 mph using speed trailers because of the high-speed shoulder closure on NB and the high-speed shoulder closure and daily high-speed lane closures on SB. The issue came up that the speed trailers are not flanked (both sides of highway) as required per specifications. Most of the work is on the SB side, and the high-speed side has concrete barrier with an 8-10' shoulder. The consensus with the members in the van is that placing a speed trailer on the SB high speed shoulder next to the barrier would be presenting a hazard to the traveling public and should not be done. We think the speed trailers should be left as-is.

☑ SB and NB signs look good!

☑ Barrier looks good.

☑ Barrier delineators look great!

☑ Signs mounted on median concrete barrier look great!

☒ NB Portable Changeable Message Sign (PCMS) has message that says "Road Work Ahead". PCMS's should not repeat same message already on construction signs.

☒ Speed trailers are not delineated with drums per specification section 619.3.2.6.4.

Manchester-Hooksett 41475

Contractor: R.S. Audley, Inc.
Construction Total: $8,388,454.75
Contract Administrator: Conrad Skov

Project Description:
Project performs maintenance and preservation work on 5 bridges in: Manchester (127/122, I-93 SB over Stevens Pond; 124/119 Viaduct, I-93 SB over Stevens Pond; 119/115, I-93 over Wellington Rd; 102/108, NH 28A over I-93) and Hooksett (095/048, I-93 SB over US 3/NH 28). Work begins approximately at I-93 MM 21.3 and extends north approximately 3 miles. Major bridge work consists of removal and replacement of the deck asphalt and membrane, partial and full depth concrete deck repairs, abutment concrete repairs, expansion joint replacement and select bridge rail repairs. Permanent ITS is also being installed at approximately MM 25.8.

Traffic Plan:
I-93 Corridor: Work done over two construction seasons. Work on each bridge done in 2 phases maintaining two I-93 SB lanes with lane shifts and an additional lane for on/off weaves as

required. Min. lane width of 11`-0". I-93 SB on ramp at Exit 8 closed during one construction season. NH 28A: Work done in one construction season and 2 phases. Phase #1 utilizes lane shifts (1 lane each direction) and Phase #2 utilizes 1-lane, alternating 2-way traffic with temporary signals.

Comments:

- The traffic pattern for phase 2 on I-93 SB at the Exit 9 Bridge is a poor design. There are three lanes, the right two lanes are merging together at the same time that all lanes are being shifted to the right. There is also a vertical curve as you approach the area making it difficult to see. The C.A. has added a PCMS at the area where the two right lanes merge to alert traffic that this is occurring.

- Temporary signals in place with alternating one-way traffic at 28A over I-93 Bridge.

☑ Good ADA sidewalk across the 28A over I-93 Bridge.

☑ Stevens Pond I-93 SB bridge concrete barrier and delineators look good.

☑ Route 28A over I-93 bridge concrete barrier and delineators look good.

☒ The large orange construction sign on the median side on I-93 SB approaching the Stevens Pond Bridge is partially blocked by tree branches. The Contractor needs to trim tree branches so the sign is fully visible to approaching traffic.

☒ The shift symbol signs used at the I-93 SB Steven's Pond Bridge should be before the shift begins per MUTCD Typical application TA-7.

☒ The shift symbol signs used at the I-93 SB Exit 9 Bridge should be before the shift begins per MUTCD Typical application TA-7.

☒ The PCMS at the 28A over I-93 Bridge has a "Caution" message. Avoid using "Caution" ,"Use Caution", or repeating same message that is on our operational or permanent signing. Message could have read, "Temp. Signals Ahead" and "Be Prepared to Stop" for example.

Manchester 42635

Contractor: Pike Industries, Inc.
Construction Total: $8,429,696.87
Contract Administrator: Greg Tedeschi

Project Description:
This project includes two segments on I-293 (Manchester) and NH 28 Bypass (Derry-Auburn-Manchester), in three towns, totaling approximately 14.3 miles. Incidental work includes

guardrail upgrades and ADA curb ramp reconstruction on both sections with sign installation along NH 28 Bypass and ITS components along I-293.

Traffic Plan:
All work requiring a lane closure on I-293 will be night work. A 16-foot minimum lane width will be maintained at all times when travel is limited to one lane on I-293. All Exit ramps on I-293 will be closed one at a time at night for paving operations. On NH 28 Bypass, one lane will be closed at a time during paving operations and will use one lane, alternating 2-way traffic, lane shifts, and shoulder closures where necessary to complete the work, supplemented with uniformed officers and flaggers. All work within one mile of the Massabesic Traffic Circle will be at night.

Comments:

- ☑ Good pavement fillets on Brown Avenue milled joints.
- ☑ Good "Bump" signs at each milled joint.
- ☒ PCMS is too low on SB, should be minimum 5' above the shoulder pavement grade.
- ☒ "Bump" sign behind guardrail is too low. If signs are place behind guardrail they should be on Windmaster type bases with 3' extension.
- ☒ On 293 EB, there are two "Grooved Pavement Ahead" signs behind guardrail that are too low. If signs are place behind guardrail they should be on Windmaster type bases with 3' extension so they can be seen above the rail.

Exeter-Hampton 42848

Contractor:	Continental Paving, Inc.
Construction Total:	$6,977,096.70
Contract Administrator:	Steven Quirion

Project Description:
The project on NH 101 begins at pavement joint just E of Exit 9 (MP 124.6) and heads easterly to a pavement joint approximately 1/4 mile East of Towle Farm Rd overpass. Ramps at Exits 10, 11, 12, 13, and the I-95 interchange accel/decel lanes on NH 101 are included in the project. The mainline work includes spot inlays, longitudinal joint micro-mill, crack fill, polymer modified BWC overlay of the travel way, and fog seal of the shoulders. Ramp work includes 1/2" leveling course with 1 1/2" FW overlay or a 2" FW inlay. The Guinea Rd and Towle Farm Rd overpasses are included in the project to be resurfaced with a 1" FW inlay. Incidental work includes guardrail upgrades, curb ramp reconstruction, drainage work, bridge work (plug joint replacements and repair) and the installation of a 60' tall ITS CCTV pole at Exit 10.

Traffic Plan:
All work requiring lane closure on NH 101 will be night work. A 16` minimum lane width will be maintained at all times when travel is limited to one lane on NH 101. All exit ramps on NH 101 will be closed one at a time at night for paving operations with detours in place to alternate exits. Acceleration deceleration lanes at I-95 will be paved in a way that ramp traffic can be maintained at all times. The WZ was determined to be non-significant at the 12/17/20 TCC Meeting.

Comments:

- Contractor was granted permission to do some guardrail work during the day – milling, paving, and BWC will all be done at night. During today's ride through there is a lane closure on route 101 EB. The right lane is closed for a guardrail operation.

- At 10:10 AM heading EB with the right lane closed, it took the TC Van approximately 4 minutes to drive through the work zone (between Exit 12 and 13). Acceptable delay is 0 to 5 minutes.

☑ "Road Work Ahead" on Windmaster style bases look good!

☑ Lane Shift Taper rates looked good.

☒ The Truck Mounted Attenuator (TMA) is too far from the operation. The TMA should be moved with the operation to keep the workers protected.

☒ There is a Uniformed Officer on site parked within the lane closure after traffic has already been slowed. EB traffic is backed up beyond the 2nd and 3rd operational warning signs just ahead of 1st Road Work Ahead flanking signs. . This officer should be moving back with the end of the queue and positioning the cruiser in the shoulder about a quarter mile before the traffic queue to alert high-speed traffic that there is slowed/stopped traffic ahead.

Hillsborough-Henniker-Hopkinton Resurfacing 42864

Contractor: GMI Asphalt LLC
Construction Total: $3,385,672.06
Contract Administrator: Christopher Spingola

Project Description:
This project resurfaces two sections of Tier 2 roadway in three towns located in Districts 4 and 5. Work includes mainline US Route 202 and all NH Route 114 and Hatfield road ramps. The sections total approximately 6.7 miles.

Traffic Plan:
All work will be night work and traffic will be restored to normal patterns at the end of each workday. One-lane alternating two-way traffic will be required. Temporary lane shifts may be

utilized for work contained on the shoulder. Lane closure lengths will be limited to one mile w a two-mile separation between work zones. Work on ramps at NH 114 will be continuous day and night over multiple weekends. The ramps will be closed one at a time w detours set in place to alternate exits along US 202.

Comments:

- ☒ The flagger signs in use today are in very poor condition and should be replaced.
- ☒ There are construction signs on route 114 that are partially blocked and need tree branches trimmed.

Lebanon 41191

Contractor: E.D. Swett Inc.
Construction Total: $9,764,986.00
Contract Administrator: Andrew Silovich

Project Description:
Project consists of the rehabilitation of the I-89 NB & SB over US 4 & NH 10 Bridges and preservation efforts for the Mascoma River.

Traffic Plan:
The bridge superstructure replacement and widening work at exit 19 will be constructed in phases while maintaining two lanes of traffic in each barrel of I-89 mainline. Temporary short-term single lane and/or shoulder closures of I-89 mainline will be permitted during off peak hours as necessary to complete the work.

Comments:

- At 1:30 PM heading NB with the right lane closed, it took the TC Van 5 minutes to drive through the work zone. Acceptable delay is 0 to 5 minutes.
- ☑ NB traffic drums in good condition.
- ☒ NB – "Road Work Ahead" left sign stand is tipped over. The Contractor needs to maintain signs throughout the day. Other signs looked ok.
- ☒ NB lane merge symbol on left shoulder is turned at an angle because the shoulder is too narrow. This sign should be placed behind guardrail on a Windmaster type base with a 3' extension so it is visible above the rail.
- ☒ NB - There is a section that is 1000'+ that is missing striping, should be striped ASAP.

☒ SB – The "Road Work Ahead" sign in the median is missing. The C.A. said that this sign will be installed within the next few days as part of upcoming traffic shift. It will be moved back where the median widens out and will be easier to install.

District 2 Resurfacing 16162J

Contractor: GMI Asphalt LLC
Construction Total: $2,362,921.36
Contract Administrator: David Flynn

Project Description:
This project resurfaces seven sections of Tier 2, 3, and 4 roads within nine towns of D2. The sections total approximately 29.8 miles. The sections will be resurfaced via paver shim overlay and spot inlays. Eleven existing sidewalk curb ramps within one section will be improved. All impacted towns and utilities will be notified of the work.

Traffic Plan:
This project is expected to have minimal impacts to traffic with short-term work zones at individual locations. Traffic impacts are anticipated to be limited to temporary lane closures and short term one lane, alternating 2-way traffic during work hrs. WZ significance was determined to be non-significant at the 12/17/20 TCC Meeting.

Comments:

- At ±3:00 PM heading EB, it took the TC Van 20 minutes to drive through the work zone. The contractor was actively paving with alternating one-way traffic, including a couple of side roads to guide traffic through as well. Acceptable delay 0 to 5 minutes, marginal delay 5 to 10 minutes, Delay > 10 minutes consider improvements. It was recommended contractor tighten up roller and lane closure package to move traffic through more quickly.

☑ Operational signs look brand new, very good!

☑ Good use of cones on roadway centerline to alert motorist of work ahead.

☑ Good use of "Raised Manholes" signs!

☒ Enfield route 4 SB – The PCMS should not say "Use Caution". Do not use "Caution", "Use Caution" or repeating same messages that is on our operational or permanent construction signing. Acceptable messaging for this activity could have been: "Road Paving Ahead" and "Expect Delays".

☒ The Contractor is paving half the roadway today and placing single yellow, RPM's on centerline. It appears Contractor was attempting to use single yellow rpms where one-half of the double yellow centerlineline was somewhat visible (although not always visible)

and 2 rpms where no line was visible. However, this resulted in inconsistent use of the rpms and could create confusion to drivers. Temporary yellow RPM's should always be placed in pairs spaced at 40' intervals.

☒ The Contractor has the "Grooved Pavement Ahead" signs but are missing the "Motorcycles Use Caution" signs that are part of the sign package for milled surfaces. (NH Traffic Control Standards TC-8).

District 3 Resurfacing 16163J

Contractor: Pike Industries Inc.
Construction Total: $3,827,336.32
Contract Administrator: Michael Smith

Project Description:
This project resurfaces 11 sections of Tier 2, 3, and 4 roads within 13 towns of D3. The sections total approximately 59.5 miles. There are 6 drag shim sections included in this project. The sections will be resurfaced via paver shim overlay, high strength inlay, HBP overlay, and paver spot drag shim. 19 existing sidewalk curb ramps within 5 sections will be improved. 17 X-Lites Guardrail End units will be replaced. All impacted towns and utilities will be notified of the work.

Traffic Plan:
This project is expected to have minimal impacts to traffic with short-term work zones at individual locations. Traffic impacts are anticipated to be limited to temporary lane closures and short term one lane, alternating 2-way traffic during work hrs. Section 21304 (Tilton-Sanbornton, US 3) will be night work. Work zone significance was determined to be non-significant at the 12/17/20 TCC Meeting.

Comments:

☑ "Low Shoulder" signs look good!

☑ RPM's look good.

☒ Missing temporary stop bars. (Should be tape and at least 12" wide).

☒ "Low Shoulder" signs should be repeated at least every 2 miles through out each section. It seemed like there were not enough "Low Shoulder" signs used. Spacing of "Low Shoulder" signs may need to be reducing to less than 2 miles if road geometry or conditions warrant added warning (e.g. excessive drop-off on interior curve).

Loudon-Canterbury 29613A

Contractor: R.S. Audley Inc.
Construction Total: $7,413,784.00
Contract Administrator: Ashok Kakadia

Project Description:
Widening and pavement reclamation of NH 106 from south of Soucook Lane to north of Asby Rd (overlay of middle portion, deferred from the 29613 contract), and an RWIS in Gilford approximately 1550 feet south of the Allen Mills Rd intersection.

Traffic Plan:
Two-way traffic will be maintained during most work operations and during non-work hours. Daily shoulder closures and short-term lane shifts required on NH 106. Lane closures not allowed during the AM & PM peak hours. Culvert replacements that require one-lane alternating two-way traffic performed at night. One-lane alternating two-way traffic required on side roads for drainage construction and paving operations. Step widening in existing guardrail areas require shoulder closures with concrete barrier. Reclaim operations performed full width in relatively short segments to minimize duration of unpaved surface. Speed reduction from 55 to 45 proposed during work hours only.

Comments:

- ☒ The PCMS should not say "Use Caution". Do not use "Caution" or "Use Caution" or repeating same message that is on our operational or permanent construction signing.

- ☒ Speed trailers are not delineated with a retroreflective traffic control device as required by specifications. (Section 619.3.2.6.4)

- ☒ There are a few barrels (drums) that are out of spec. for reflectivity because they are faded or have stripes that are different than the alternating two orange and two white stripes required by section 6F.67 in the MUTCD. The faded drum sheeting is should be replaced per NH spec. 619.3.2.1.1.

TCC General Comments:

- TSMO needs to be given the comment about the message boards so their boards are not using the Caution messages that we were seeing on their boards.

- It needs to be mentioned during the Traffic Control Committee meeting that Turnpike and Maintenance projects with long work zone duration should be coordinating with the Bureau of Traffic for their work zone sign packages to make sure proper signs are included.

- It was discussed to remove the note in the plans to allow easel signs for work zone lasting more than 3 days. It was also mentioned that if a contractor wanted to use easels they could ask for permission. (This topic should be discussed at a Traffic Control Committee meeting.)

The following projects were visited but there were no comments made by the TCC:

- **Concord-Hopkinton 41703**
  No activity today.

- **Lebanon, NH- Hartford, VT 16148**
  No activity today.

Submitted by: Lee Simpson
Bureau of Construction

Noted by other Traffic Control Members:

Paul E. Metcalf, P.E.
Bureau of Construction

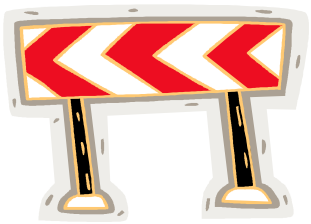
Theodore Kitsis, P.E.
Bureau of Construction

cc: W. Oldenburg , Traffic Control Committee Chair (via E-mail)
D. Rodrigue, Director of Operations (via E-mail)
T. Reynolds, Chief Project Manager (via E-mail)
J. Marshall, Administrator Highway Design (via E-mail)

Traffic Control Committee Members (via E-mail)
District Construction Engineers (via E-mail)
Prime Contractors involved with the projects reviewed (via E-mail)
All Construction Personnel
Attendees (via E-mail)

New Hampshire DOT
Department of Transportation

TRAFFIC CONTROL CHECKLIST



Prepared by:
Bureau of Construction and
Bureau of Traffic

TCC – October 9, 2019
(revised)

Prior to Construction

- ❑ Determine who is the Contractor's traffic control coordinator or specific traffic control maintainer.
- ❑ Make sure that the proper traffic control documents as stated throughout are being used.
- ❑ Review NCHRP 350 requirements for traffic control devices with the Contractor per Specification section 619.2.1, 2.1.7, & 2.1.8. Have suppliers of traffic control devices supply FHWA's letter certifying that devices meet NCHRP 350 requirements.
- ❑ Discuss possible locations for Portable Changeable Message Signs Arrow Panels, & Trailer Mounted Speed Limit Signs when required, reminding the Contractor that they must be outside the clear zone when not in use per Specification Section 619.3.2.6.3.
- ❑ Review the Contractor's permanent construction sign layout, prior to their erection. Approve only the final product, not the layout. Ensure that Dig Safe has been contacted for the post locations.
- ❑ Ensure the Contractor has the proper operational signs on site to adequately address the construction conditions (i.e. bump, dip, grooved pavement).
- ❑ Inspect the following before implementation:
  - ➢ Sign sheeting intensity, wording, text, size, etc.
  - ➢ Proper posts
  - ➢ Compare the condition of the channelizing devices to the required "Quality Standards for Work Zone Traffic Control Devices" per Specification Section 619.3.2.1.
  - ➢ Check the working conditions of arrow boards and portable changeable message signs. Note: If the arrow boards and/or portable changeable message signs are used at night, they must be dimmable. Check the function of the photo sensor or arrange to have manual operation to switch on and off both evening and daybreak.

Permanent Construction Signs

- Generally listed on the Construction Signs and Warning Devices (CSWD) summary sheet, which is included in the project Contract or Plans.
- Refer to Work Zone Traffic Control Standard Plans TC-3 for typical sign layout. Signs shall not block other roadway signs (see note #2 on TC-1). Refer to MUTCD for conditions not addressed by the TC sheets.
- Sign text shall follow the NHDOT Construction Sign Standards and Standard Highway Signs or contract per Specification Section 619.2.1.3.3.
- ROAD WORK (W20-1) and LENGTH OF WORK (G20-1) signs shall be fluorescent orange sheeting and 48"x48" signs unless in urban areas or so noted on the CSWD summary sheet. (See Standard Specifications Section 619.2.1.3.2)
- Generally are mounted on two U-channel posts unless noted differently on the CSWD summary sheet or Prosecution of Work.
- Post shall be flush with the top of the sign or maximum 6 inches below the sign. Post extended over the sign is unaccepted.
- Splicing of U-channel is allowed per NCHRP 350 requirements and shall be installed per manufacturer's instruction. Contractor shall provide certificate of compliance.
- Post shall be embedded at a depth of 2.5 ft.
- For post-mounted signs, signs shall be mounted at a height of 7 ft above EP in urban areas and divided highways. In rural areas signs shall be mounted at a minimum height of 5 ft above the EP.
- Signs when not in use shall be removed or covered completely with an approved material i.e. plywood per Specification Section 619.3.1.3.
- The sign installation shall have posts plumb and the text horizontal per Specification Section 619.3.2.2.

Operational Construction Signs

- Signs shall be mounted on an approved NCHRP 350 portable sign stand and the bottom of the sign shall be mounted a minimum 1 ft above the travelway.
- Cold planed areas should always have the following signs: Motorcycles Use Caution, Grooved Pavement Ahead, Bump or Dip.
- "Be Prepared to Stop" sign should be used along with a "Flagger" sign when the flagger is stopping traffic.

Portable Changeable Message Sign (PCMS)

(Refer to MUTCD Section 6F.60)

- **All messages shall be center justified**.
- Shall only contain two phases (messages) and the message shall not duplicate a construction sign in the same vicinity.
- If more than two messages are needed, use additional PCMS.
- Message shall consist of up to three lines eight characters per line per Specification Section 619.2.1.5.
- Message can use abbreviations as noted in MUTCD Section 1A.14.
- PCMS shall have adjustable display rates so the entire message can be read at least twice when driving at the posted speed limit.
- Message shall not scroll or travel horizontally or vertically across the face of the sign.
- Shall be mounted at least 7 ft above the EP in urban areas and divided highways and a minimum height of 5 ft in rural areas.
- Shall be delineated with TC devices (barrels).
- The PCMS trailer should be delineated on a permanent basis by affixing retroreflective material (white/red vehicle sheeting).
- Per 619.3.2.6.3 when a PCMS is not in use, it shall be removed from the clear zone unless adequately protected by portable barrier or equivalent and specifically approved.
- When PCMS are not in use and left within the work zone outside of the clear zone, the sign panel should be turned parallel to traffic.
- PCMS shall be placed so it will not block other signs or be blocked by other signs, vegetation, etc.
- All letters shall be at least 18 in per Specification Section 619.2.1.5.

Channelizing Devices

(Refer to MUTCD Section 6F.63)

- Spacing for use in tangents shall not exceed twice the speed limit in distance.
- Spacing on tapers shall not exceed the speed limit in distance.

A. Cones (Refer to MUTCD Section 6F.64)

- Must have prior approval to use cones on divided highways.
- Cones used on divided highways must be at least 28" high.
- If allowed, use 28" cones at night only during work hours. For non-work hours cones can be used at night only to supplement other channelizing devices i.e. drums or barricades with the drums & barricades still spaced per the required spacing on Work Zone Traffic Standard Plans TC-1.
- Cones used at night shall have two retroreflective bands around the cone. One (1) – 6" band located 3" to 4" from the top of the cone and another 4" band located 2" below the 6" band. See Work Zone Traffic Control Standard Plans TC-1.

B. Drums (Refer to MUTCD Section 6F.67)

- Drums shall be used for all tapers and tangents on divided highways.
- Drums shall be predominately orange.
- 36" minimum height and 18" minimum diameter.
- Shall have alternating orange and white retroreflective stripes 4" to 6" wide.
- Shall have two orange and white stripes with the top stripe being orange.
- Spaces between the stripes shall not exceed 3 inches.
- Ballast shall not be placed on top of the drum.

C. Barricades (Refer to MUTCD Section 6F.68)

- Stripes on barricades shall be alternating orange and white retroreflective sloping downward at an angle of 45º in the direction road users are to pass.
- Stripes shall be 6 inches wide except when rail lengths are less than 3 ft, where 4-inch stripes may be used.
- Use Type I and II in situations to direct the road users through a work zone.
- Use Type I on conventional roads or urban streets.
- Use Type II barricades on Divided Highways or other high-speed roadways (greater than 45 mph).
- Use Type III for road closures or partial closures.
- Rails are 8" – 12" wide.
- Type I & II rails are 24" minimum in length and the height to the top of rail from the ground is minimum 36".
- Type III rail length is a minimum 4 ft with a minimum height of 5 ft from top of rail to the ground.
- Ballast shall not be placed on the top rail.

D. Tubular Markers (Refer to MUTCD Section 6F.65)

- Use of tubular markers shall be approved in advance of the work.
- Tubular markers shall have a height of 42" or more.
- Reflectorization of 42" tubular markers shall be provided by four 4- to 6-inch wide alternating orange and white stripes with the top stripe being orange.

Portable Concrete Barrier

(Refer to MUTCD Section 6F.85)

- Any concrete barrier with structural damage, exposed rebar or broken corners shall not be used.
- All connection loops shall be intact and the linking pin shall pass through all loops.
- Delineators spaced every 25' per N.H. Standard Plans for Road Construction, GR-23.
- Barrier tapers should be at least minimum length shown in N.H. Standard Plans for Road Construction, GR-23.

Truck Mounted Attenuators (TMA's)

(Refer to MUTCD Section 6F.86)

- TMA's should be used for all work that requires a lane or shoulder closure. (Parking on the shoulder is considered a shoulder closure).

Flaggers

(Refer to MUTCD Chapter 6E)

- Check for Flagger Certification.
- Flagger vest apparel shall meet the MUTCD per Section 6F.02 requirements, ANSI 107-1999 Class 2 risk exposure. ANSI 107-1999, Class 3 risk exposure should be used for night work.
- Flagger stop/slow paddle shall be 18 in wide with 6" letters, be retroreflective and octagonal shape.
- "Flagger Ahead" and "Be Prepared to Stop" signs in place and removed if no longer needed.
- Proper Flagger clothing: hard hat or orange baseball cap, shirt, & safety vest.
- Flagger stations shall be clean and without distractions i.e. books, chairs, radios, personnel congregating. Flaggers are allowed to use 2-way radios to control traffic.
- Flagger station shall be on the shoulder of the approaching traffic outside of the lane closure per MUTCD and NHDOT Flagger Handbook. Flagger **shall not** be stationed in the travel lane.
- Flagger stationing shall be reviewed throughout the day for adequate lighting and shadows that may damper their visibility.
- Flaggers shall not leave their station for any reason such as picking up signs, barrels, cones, etc.
- Flaggers should use proper flagging etiquette and conduct themselves appropriately to send a clear, respectful message to passing drivers?
- Signaling with hand signals and stop/slow paddles shall follow the NHDOT Flagger handbook and the MUTCD.
- Flagger shall **never** flag from inside a vehicle.
- Flagger shall be informed on what to do if approached by emergency vehicles, in the event of accidents or a vehicle running the flagger station.
- The Contractor shall allow for proper rest breaks, explain the traffic control operation to the flagger and check the visibility of the signs and flaggers on the work area.

Temporary Pavement Markings

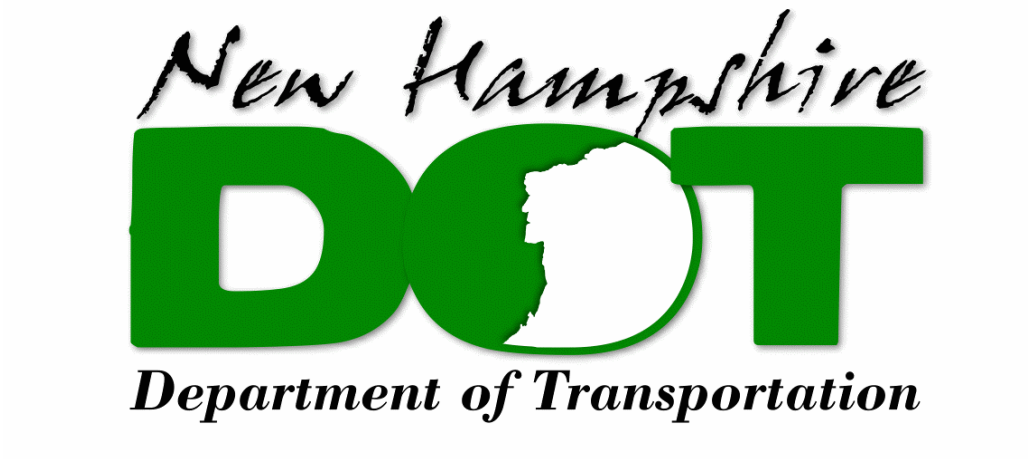
(Reference Spec 632, 619, & NHDOT WZTC Standard Plans)

Note: The Department's intent is for permanent pavement markings to be installed as soon as possible, which includes detours & winter binder/base pavement.

- Temporary pavement markings can be paint, tape or removable raised pavement markers placed prior to final markings on wearing course and are subsidiary to Item 619 Maintenance of Traffic.
- Pavement markings installed on detours or winter binder pavements are not considered temporary pavement markings. These markings are paid for under Item 632 and shall follow those specifications.
- Temporary pavement markings shall not be in place for more than 2 weeks.
- All temporary pavement markings shall be maintained. Markings rendered ineffective or dislodged shall be replaced.
- Temporary raised pavement markers shall not be used to supplement or substitute edge lines and non-longitudinal lines e.g. stop lines, railroad crossings, crosswalks, words, symbols, etc.
- Edgelines, channelizing lines, lane reduction transitions, gore markings, and non-longitudinal lines are usually not required for temporary pavement unless directed by the Engineer. Refer to NHDOT WZTC Standard Plans TC-1 note #7.
- Raised Pavement Markers spacing for double yellow centerline on two-way roadways is 40 feet. The curve radius or profile of the road may require additional markers at the discretion of the Engineer. These markers shall be yellow double face retroreflectorized markers placed in pairs. At the Engineer's discretion, "Do Not Pass" (R4-1) signs may be installed for added emphasis.
- Refer to the NHDOT Qualified Products List for approved raised pavement markers noted under 619 items.

- Pavement markings that are no longer applicable to current condition in the work zone shall be completely removed so that they are not visible either during day or night.
- Perform an occasional drive through on the project during the day and night to determine if the markings are no longer visible or if the white markings appear to be white and yellow markings appear yellow, and if they are in “acceptable” condition, if not the Contractor shall repaint the lines. Payment for restriping due to wear & tear or fresh pavement absorption shall be paid under 632 items.
- Prior to implementing a TC package and throughout construction, work zone drive through is important to verify that the markings are per the TCP.

Work Zone Traffic Control Inspection



Project Name

Prepared by

Completed on

Work Zone Traffic Control Inspection

Project Details	
Project Name	
State Number	
Location	
Contractor	
Contract Administrator	
Project Duration	
Notes:	

Work Zone Traffic Control		
Closure Type		
Shoulder Closure		☐
Lane Closure		☐
Lane Shift		☐
Flagging Operation		☐
Road Closure		☐
Temporary Traffic Signal		
Permit for temporary traffic signal has been issued.		

Work Zone Traffic Control Inspection

Work Zone Activity	
Status	
Notes:	

Advanced Warning Area	
Portable Changeable Message Sign (PCMS)	
Message has no more than two phases and three lines per phase.	
Each message is shown for a minimum of 2 seconds (longer is better for longer messages)	
Message is center justified on board	
18" font is used, and no more than 8 characters per line (no narrow fonts)	
Message is as brief as possible conveying: problem or situation, locations or distance to situation, recommended driver action (no generic or vague messages).	
Message makes sense regardless of which phase is read first.	
All pixels on sign are working and have similar brightness in all viewing angles.	
Message display does not flash, scroll nor is it otherwise animated.	
PCMS is situated and angled for maximum visibility and message can be read twice through at prevailing speeds.	
Does PCMS meet MUTCD requirements?	
Notes:	

Work Zone Traffic Control Inspection

Signs	
Are number of signs correct?	
Is sign sheeting acceptable?	
Are sign locations OK?	
Is there any Real Time signing?	
Notes:	

Shoulder Taper	
Shoulder is properly tapered?	

Arrow Panel	
Visible at 1 mile	
Legible at 1/2 mile	

Transition Area		
Channelization Devices in the Transition Area		
Cones		☐
Drums		☐
Vertical Panels		☐
Tubular Markers		☐
Barricades		☐
Concrete Barrier		☐
What is the condition of the channelizing devices in the transition area?		
Notes:		

Work Zone Traffic Control Inspection

Activity Area	
Is there a buffer space?	
Is a Truck Mounted Attenuator (TMA) being used?	

Channelization Devices in the Activity Area		
Cones		☐
Drums		☐
Vertical Panels		☐
Tubular Markers		☐
Barricades		☐
Concrete Barrier		☐

Does concrete barrier have adequate delineation?	
Does the concrete barrier have an end treatment (Impact attenuator)?	
Are channelizing devices in good condition in the activity area?	
Notes:	

Pavement Markings	
Are pavement markings in good condition?	
Are pavement markings correct for current traffic configuration?	
Notes:	

Hazards	
Any hazard advanced warning signs?	
Are there motorcycle hazards to be aware of?	
Are hazards marked with a TC device (drum or cone)?	
Are workers wearing proper P.P.E.?	
Any "Clear Zone" issues?	
Is pavement in acceptable condition?	
Is there a drop-off hazard?	
Notes:	

Work Zone Traffic Control Inspection

Flagging	
Are flagging operational signs correct?	
Is flagger location OK?	
Are flaggers using radios to communicate with each other?	
Are flaggers wearing the proper P.P.E. and do they look different than the workers?	
Are flaggers using stop/slow paddles?	
Are flaggers using good flagging procedures?	
Notes:	

Uniformed Officers	
Uniformed officer is compliant to standards?	

Road Closure	
Are there signs and barricades at closure points?	
Is there adequate detour signing?	
Notes:	

Night Operations	
Do workers have the proper P.P.E.?	
Is work area illuminated?	
Is flagger station illuminated?	
Lights are positioned to prevent glare (light towers, police strobes)?	
Do construction vehicles have adequate lighting and delineation?	
Notes:	

Work Zone Traffic Control Inspection

Pedestrian Safety in the Work Zone	
Is there adequate signing?	
Is there a continuous path for pedestrians?	
Is there protection from hazards?	
Is there a pedestrian detour?	
Is it ADA compliant?	
Notes:	

Bicycle Safety in the Work Zone	
Is there adequate signing?	
Is there a continuous path for bicyclists?	
Is there protection from hazards?	
Is there an appropriate detour in place?	
Notes:	

Speed Control Efforts		
Advisory Speed Signs		☐
Regulatory Reductions		☐
Signing		☐
Speed Display Trailers		☐
Police Enforcement		☐
Are there any speed control issues?		
Notes:		

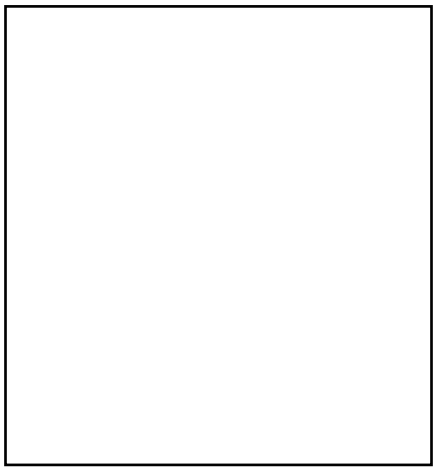
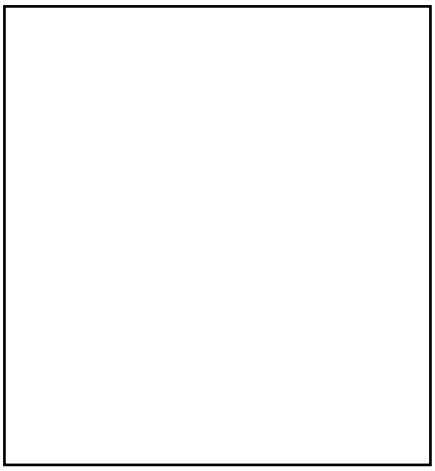
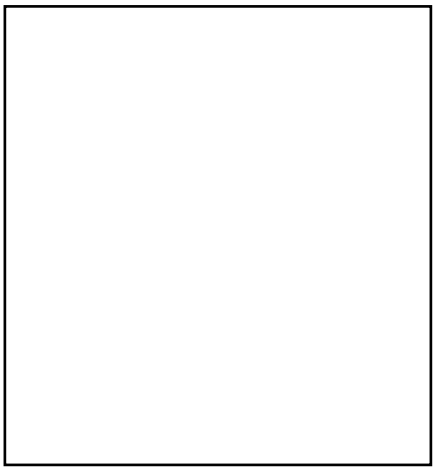
Work Zone Traffic Control Inspection

Summary Comments

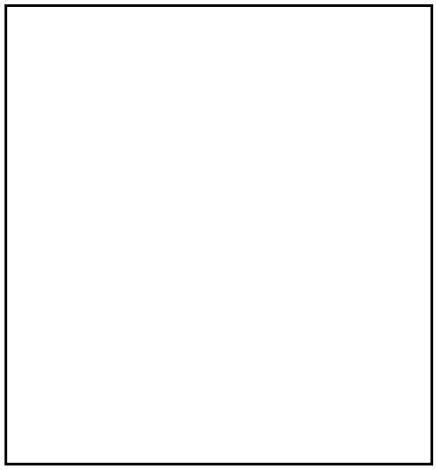
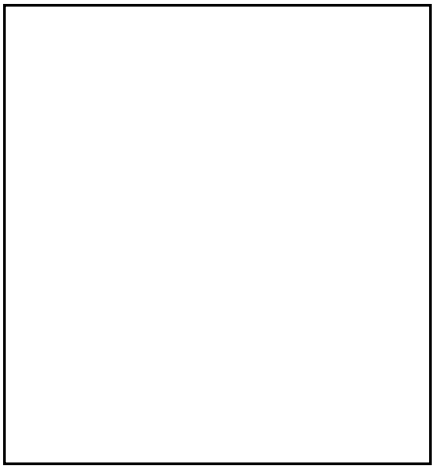
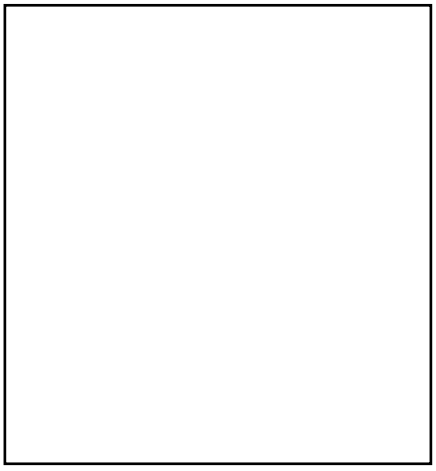
Corrective Actions

Media

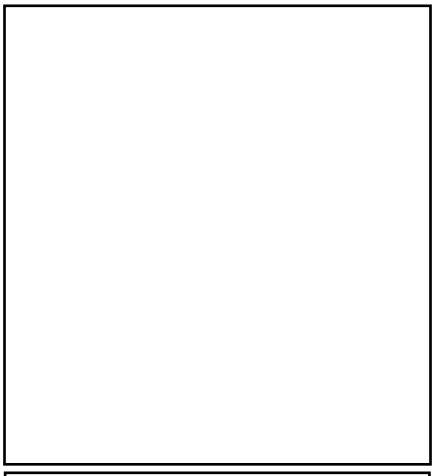
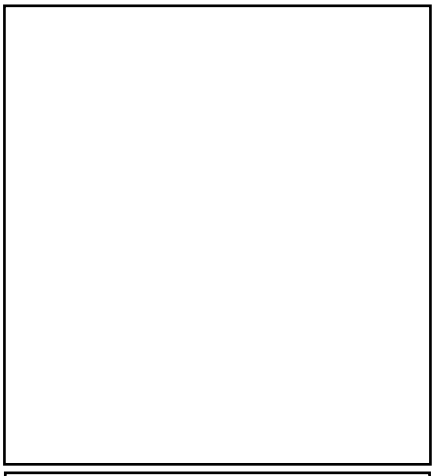
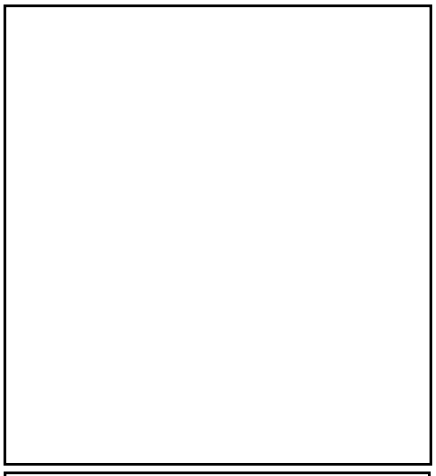
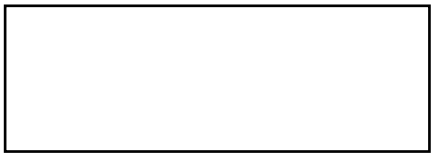
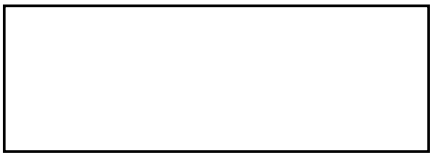
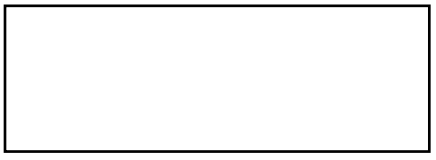
Media





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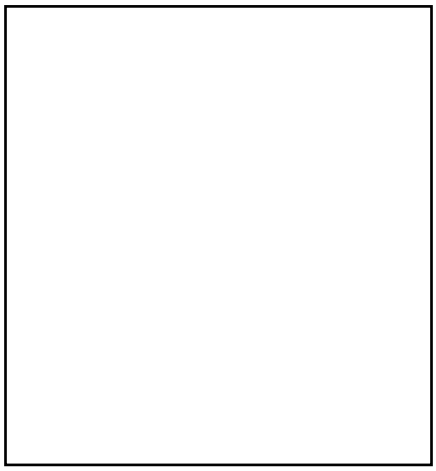
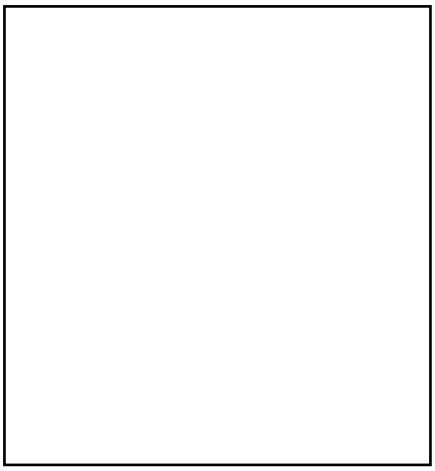
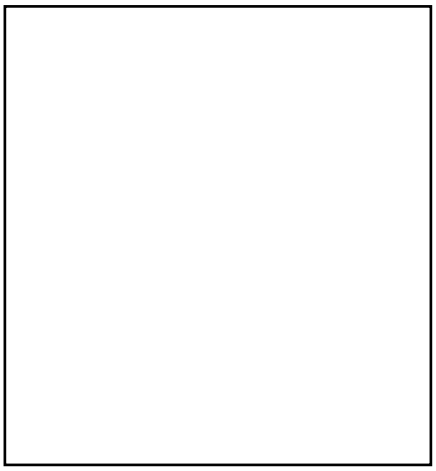
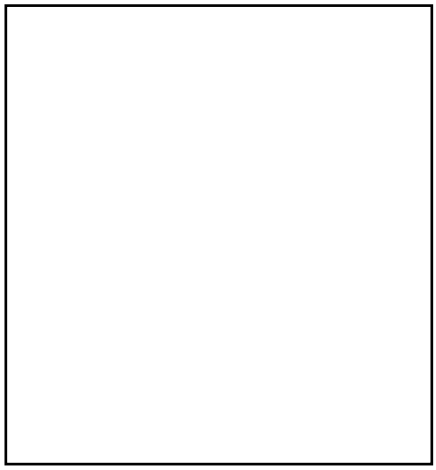
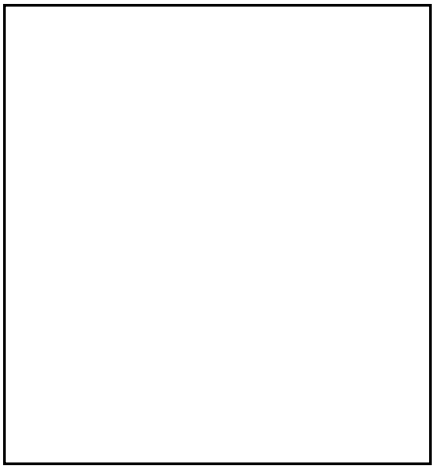
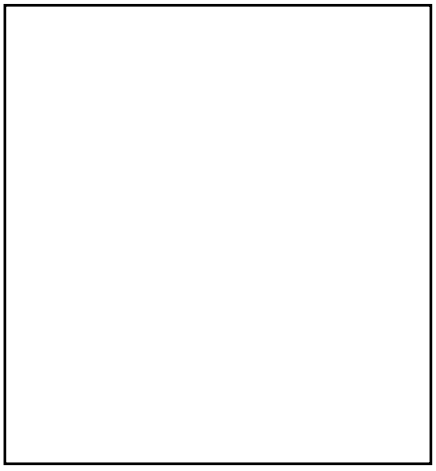
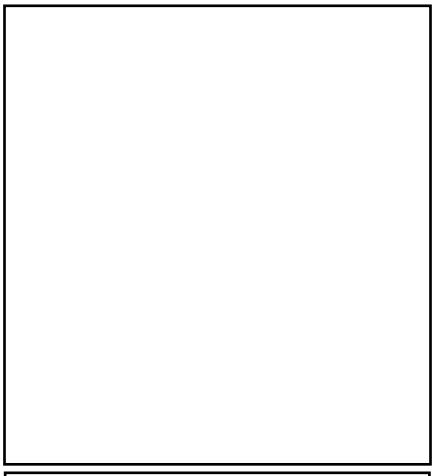
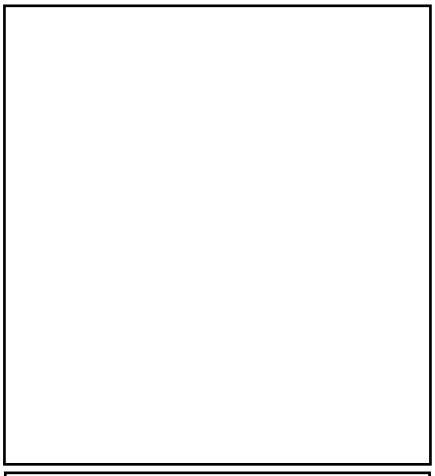
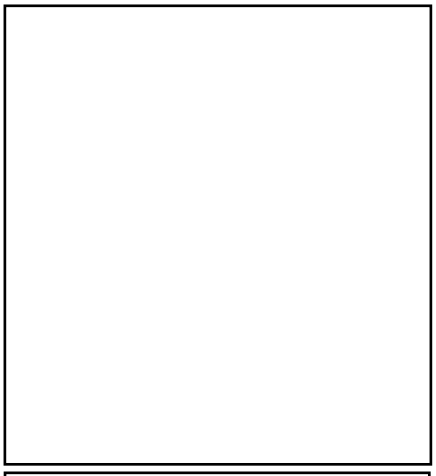
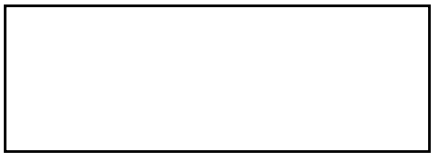
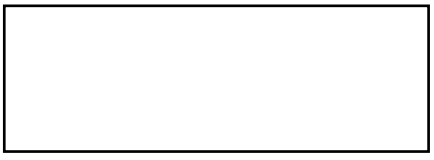
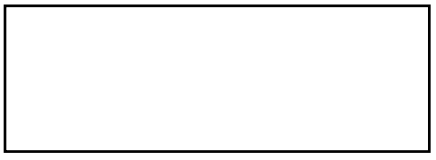








NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION

WORK ZONE TRAFFIC CRASH REPORT

(Reports are to be submitted to supervisor within 48 hours of crash)

1. Town or City:

2. Project Name:

3. Project Number:

4. Bureau: ☐ Bridge Maintenance ☐ Bridge Design ☐ Survey/Design ☐ Materials & Research ☐ Construction ☐ Traffic ☐ Highway Maintenance ☐ Turnpikes ☐ LPA

5. District/Shed/Contractor:

6. Crash Date:

7. Crash Time: _____ ☐ AM ☐ PM ☐ unknown

8. Number of Vehicles Involved:

9. Number of Persons Injured and Fatalities:

	GENERAL PUBLIC			PROJECT PERSONNEL	
	In Motor Vehicles	Motorcycles Bicyclists	Pedestrians	Operating Equipment	Pedestrians
Injured					
Fatalities					

10. Location of Crash:

OCCURRED ON	DISTANCE AND DIRECTION FROM	INTERSECTING ROAD OR FEATURE
_____ Route No./Street	_____ Distance from (ft.) ☐ north ☐ south ☐ east ☐ west ☐ at intersection	_____ Route No./Street/Feature

11. Type of Crash or Collision with (first harmful event):

☐ frontal/side ☐ rollover ☐ flagger/officer
☐ sideswipe ☐ bicyclist ☐ construction vehicle/equipment
☐ rear end ☐ worker ☐ went over a drop off
☐ head on ☐ pedestrian ☐ fixed object (check box below)
☐ OTHER: _____

Fixed Object:

☐ sign post ☐ channelizing devices ☐ retaining wall
☐ guardrail ☐ changeable message sign ☐ abutment/pier
☐ water ☐ temporary concrete barrier ☐ arrowboard
☐ tree ☐ construction equipment ☐ ledge outcrop
☐ boulder ☐ telephone pole ☐ impact attenuator
☐ light post ☐ construction material stockpile
☐ OTHER: _____

12. Roadway Design: ☐ two way traffic ☐ interstate/divided ☐ one way/ramp ☐ OTHER: _____

13. Road Alignment: ☐ straight and level ☐ intersection ☐ curve and level ☐ straight and on a grade ☐ curve at a hillcrest ☐ straight at a hillcrest

14. Roadway Surface Type:

Travel In.: ☐ asphalt ☐ concrete ☐ grooved pavement ☐ unpaved

Shoulders: ☐ asphalt ☐ concrete ☐ grooved pavement ☐ unpaved

15. Roadway Condition: ☐ normal ☐ rough ☐ wheel ruts ☐ potholes ☐ pavement edge drop offs

16. Surface Conditions: ☐ dry ☐ wet ☐ ice/snow ☐ unknown

17. Light Conditions: ☐ daytime ☐ nighttime ☐ nighttime illuminated ☐ dawn/dusk ☐ unknown

18. Weather Conditions: ☐ clear ☐ cloudy ☐ fog ☐ rain ☐ snow ☐ hail ☐ sleet ☐ freezing rain ☐ high winds ☐ unknown

19. Traffic Vol. : ☐ low ☐ moderate ☐ heavy

20. Posted Speed Limit: _____ mph

21. Traffic Control Package: ☐ in use ☐ not in use

Package Designation:

MUTCD TA- _____ **NHWZTC** TC- _____ **OTHER** _____

Condition of devices: ☐ good ☐ fair ☐ poor

Modifications or comments about the package: _____

22. Pavement Markings:

Left TW	Centerline	Right TW
☐ none	☐ none	☐ none
☐ RPM	☐ RPM	☐ RPM
☐ paint	☐ paint	☐ paint
☐ tape	☐ tape	☐ tape

23. Lane Width (feet):

Lanes: ☐ 9 ☐ 10 ☐ 11 ☐ 12 ☐ 12+ ☐ tapered ☐ unknown

Shdrs.: ☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ tapered ☐ unknown

24. Changeable Message Signs:

☐ none ☐ in place and operating ☐ in place and not operating

MESSAGE

phase 1: _____

phase 2: _____

*phase 3: _____

** FYI - per the MUTCD, message shall consist of only one or two phases*

25. Flaggers: ☐ in use ☐ not in use

26. Uniformed Officers :

☐ with vehicle ☐ without vehicle ☐ not used

27. At the time of the crash was there Work Zone related activity? ☐ yes ☐ no

28. Police Report:

Was a report generated? ☐ yes ☐ no ☐ unknown

Town/City/State Troop No. : _____

Officer Name: _____

Report Number: _____

continued on the back

29. Sketch Required

30. Additional Documentation

☐ daily report ☐ police report ☐ photos ☐ videos ☐ digital photos

**if possible date stamp photos or videos*

31. Crash Description and any Additional Comments:

32. Report generated by:

Signature	*Name (print)*	*Date:*
Signature of Supervisor	*Name (print)*	*Date:*

** Submit this report to supervisor within 48 hours of the crash.*

Distribution: Planning & Community Assistance Traffic TMC FHWA Bill Oldenburg Original to Construction

APPENDIX I

Terminology and Concepts

Appendix H - Terminology and Concepts

Detailed Design Alternative – Detailed design alternatives include all alternates retained for detailed study during the project planning process (e.g., bridge replacement in-line with the existing structure or parallel to it, widening 4-lane highway to 6-lane highway, grade separating an at-grade intersection, etc.).

Incident Management Plan (IMP) – An IMP is intended to address unplanned events or incidents for large, complex projects to ensure incident response operations within the work site are managed effectively. It identifies priorities and procedures for detection of and response to incidents with the goal of safeguarding the public and restoring traffic flow as quickly as possible. The plan should define a process of regular review and analysis to identify actions that will reduce incident frequency and severity.

Maintenance of Traffic Alternative Analysis (MOTAA) – The intent of a MOTAA is to identify and compare benefits and functional faults of work zone alternatives. It serves as the basis for scoping the project's work zone design and Transportation Management Plan (TMP). The analysis is performed for each detailed design alternative. It should address the benefits and problems of work zone options and include the design team's recommendation on the preferred type of MOT for each detailed design alternative.

Public Outreach (PO) Strategies – The PO component of a TMP consists of strategies that address communication with the public and concerned stakeholders, before and during the project. This component may include public awareness strategies and motorist information strategies, such as brochures, websites, radio, VMS messages, pre-trip and in-route information, etc. This effort is sometimes referred to as Public Information (PI).

Smart Work Zones (SWZ) – Using intelligent transportation systems (ITS) in work zones has the potential to make traffic flow through and around the work zone safer and more efficient. SWZ involves the use of electronics, computers, and communications equipment to collect information, process it, and take appropriate actions in a work zone. ITS technology can be applied in work zones to accomplish such tasks as monitoring and managing traffic or providing traveler information.

Responsible Charge – a person who determines technical questions of design and policy; supervises and is in responsible charge of the work of subordinates; is the person whose professional skill and judgment are embodied in the plans, designs, plats, surveys, and advice involved in the services; and who supervises the review of material and completed phases of construction.

The Rule – The Federal Highway Administration (FHWA) published the Work Zone Safety and Mobility Rule (*the Rule*) on September 9, 2004 in the Federal Register (69 FR 54562). This Rule updates and renames the former regulation on "Traffic Safety in

Highway and Street Work Zones" in 23 CFR 630 Subpart J.

Significant Project – Generally speaking, a significant project is one that, alone or in combination with other concurrent activities nearby, is anticipated to cause sustained work zone impacts that are greater than what is considered tolerable. Refer to "Guidance on Identifying Significant Projects" for a more detailed definition.

Traffic Control Committee (TCC) – The multi-disciplinary team that is comprised of representatives from various Bureaus of NHDOT and FHWA that is responsible for guiding the implementation of *the Rule*.

Traffic Control Plan (TCP) – A TCP is a plan that addresses traffic safety and control through the work zone. The TCP will follow NHDOT and MUTCD Guidance for the layout and placement of traffic control devices, signs, and related equipment for the project. The scope may range from a very detailed TCP designed solely for a specific project, to a reference to Typical Temporary Traffic Application from the Work Zone Traffic Control Standard Plans (included as TC sheets in the Book of Standards). It may be a combination of text and drawings that define specifically what traffic control measures will be provided for the project, how they will be implemented, and on what schedule. The degree of detail in the TCP will depend on the project complexity and traffic interface with the construction activity.

Transportation Management Area (TMA) - A TMA is an urbanized area with a population of more than 200,000 residents as defined by FHWA and the U.S. Census.

Transportation Management Plan (TMP) – A TMP details work zone impact management strategies and how they will be implemented. As a minimum, it is comprised of the Traffic Control Plan (TCP), Transportation Operations (TO) strategies and Public Outreach (PO) strategies. These elements are integrated into a single document that addresses site specific issues and project requirements. A TMP will be updated and refined as necessary throughout the project lifecycle to address changing needs.

Transportation Operations (TO) Strategies – The TO component of a TMP consists of strategies that address sustained operations and management of the work zone impact area. This component may include travel demand management strategies, traffic signal timing changes, ITS strategies, Smart Work Zone strategies, safety strategies, enforcement strategies, etc. These strategies are often included in the TCP and in other contract documents.

Windshield Survey – A qualitative analysis of an existing work zone that is conducted with the aid of the Traffic Control Checklist. Results of these inspections should be tabulated and reported on an annual basis to identify areas of potential improvement.

Work Zone Constraint – A work zone constraint is a potential negative impact caused by the work zone design (e.g., increased right-of-way costs, increased environmental impacts, reduced access to businesses, high utility relocation costs, etc.).

Work Zone Impacts - Work zone impacts refer to work zone-induced deviations from the normal range of safety and mobility. The extent of these impacts vary based on many factors such as, road classification, type of area (urban, suburban, or rural), traffic volume and travel characteristics, type of work being performed (construction, maintenance, utility work), time of construction (day/night), and complexity of the project.

Work Zone Incident Management - A mechanism by which the non-contract related traffic disruptions are minimized through foresight. An example is the use of standby tow trucks or vehicles equipped with push bumpers on site or close by to minimize response time and reduce the effect of accidents or breakdowns could have on traffic flow. Such measures shall be approved by the appropriate individual before they are added to the project.

Work Zone Mobility –Work Zone Mobility is the ability of road users to travel efficiently through and around a work zone with minimum delay compared to a baseline travel when no work zone is present.

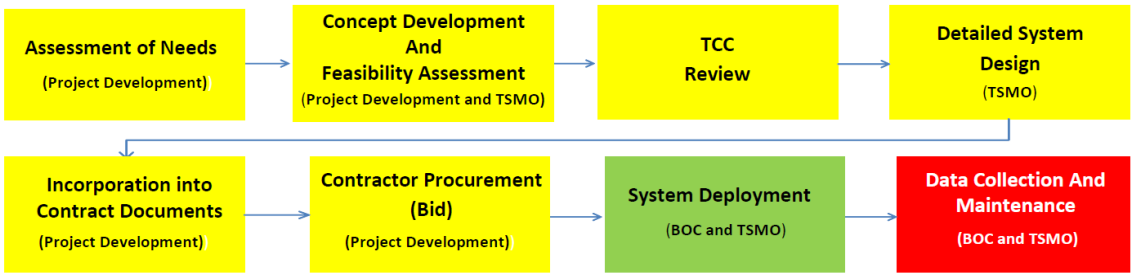
Work Zone Option – Work zone options are maintenance of traffic concepts that address construction staging, phasing and traffic control (e.g., lane closures, full closure of the facility using detour route(s) diversions, reversible lanes, use of temporary structures, etc.). Work zone options should be developed for each detailed design alternative.

Work Zone Safety – The intent of Work Zone Safety is to minimize exposure to potential hazards for users of transportation facilities in the vicinity of a work zone and also for highway workers at the work zone interface with traffic.

APPENDIX J

ITS Smart Work Zone Worksheet

TSMO CONSTRUCTION WORKZONE PROGRAM PROCESS (8/24/16)



Planning – Needs Assessment (Highway Design)	
	Overall assessment of the expected impacts of the work zone
	Users that could benefit from outputs (public, contractors?)
	Reviewing strategies to reduce mobility issues
	Dry Runs for Queue Management
Concept and Feasibility (Highway Design/TSMO)	
	Identify what to get out of ITS system
	Score work zone using scoring criteria and identify feasible ITS tools
	Review SWZ Toolbox
	Develop rough estimate
Traffic Control Committee Review	
	Discuss concept with TCC based on previous steps
Detail Design (TSMO)	
	Projects designed in house when feasible
	Use of Consultants to support design process in needed
	Project Submittal Documents provided through TSMO
Procurement (Bid)	
System Deployment (BOC/TSMO)	
	Submittal – sent to TSMO by BOC-TSMO to do review
	Construction Review/Set up with TSMO support
	Messaging Review – collaborative with BOC
	Web services confirmed prior to release od WZ system
	Post project – survey follow up
	Work with CA's on generated reports
Operations and Maintenance (BOC – TSMO)	
	TMC Daily Operations
	Track outage reports for projects
	Web service and Device filed maintenance through TSMO
Data Collection and reporting TSMO	
	Monthly Construction Communication State – Dashboard
	Construction Notifications – Mobility Impacts
	Mid and End of Season Work Zone Construction Reporting
Volume	ASTI Real Time or Wavetronix Reporting
Speed	ASTI Real Time or Wavetronix Reporting
Travel Time	http://www.nhtms.com/Work Zones/travel time.html
Queue Length	Dry Run Scenarios to simulate mobility concerns
	Internal TSNO Website Document Updates
	SWZ Map locations updated on internal website

Temporary Work Zone ITS

Scoring criteria based on USDOT FHWA Work Zone Intelligent Transportation Systems Implementation Guide January 2014.

Please E-mail this completed form to mailto:Charles.Blackman@dot.nh.gov prior to attending the TCC meeting.

Project Name/ # : Project Name here Submitted By: Enter Name here Date: Select Date

SCORE CRITERIA	SCORE
Factor 1 – Duration of work zone: Long-term stationary work will have a duration of: ○ >1 construction season (10 points) ○ 4-10 months (6 points) ○ < 4 months; procurement and installation timeline is available prior to work starting (3 points)	#
Factor 2 – Impact to traffic, business, other destinations or other users (e.g. extremely long delays, high risk of speed variability, access issues) for the duration of work is expected to be: ○ Significant (10 points) ○ Moderate (6 points) ○ Minimal (3 points) ○ No Impacts (0 points)	#
Factor 3 – Queuing and Delay: Queue lengths are estimated to be: ○ ≥2 miles for periods > 2 hours per day (8 to 10 points) ○ 1-2 miles for periods > 1-2 hours per day (6 to 8 points) ○ ≤ 1 mile or queue length estimates are not available but pre-construction, recurring congestion exists for periods < 1 hour per day (4 points) ○ No anticipated queue (0 points)	#
Factor 4 – Temporal Aspects of Traffic Impacts: Expected traffic impacts are: ○ Unreasonable for a time period that covers more than just peak hours (10 points) ○ Unreasonable during most of both morning and afternoon peak hours in either direction (6 points) ○ Unreasonable during most of peak hour in either direction (3 points) ○ Unpredictable; highly variable traffic volumes (1 point) ○ No impacts (0 points)	#
Factor 5 – Specific Issues Expected (0 to 3 points each based on judgement) ○ Traffic Speed Variability ○ Back of Queue and Other Sight Distance Issues ○ High Speeds/Chronic Speeding ○ Work Zone Congestion ○ Availability of Alternate Routes ○ Merging Conflicts and Hazards at Work Zone Tapers ○ Work Zone Hazards/Complex Traffic Control Layout ○ Frequently Changing Operating Conditions for Traffic ○ Variable Work Activities (That may benefit from using variable speed limits) ○ Percent Heavy Vehicles (<8% = o points, 8% to 10% = 1 point, 10% to 12% = 2 points, >12% = 3 points ○ Construction Vehicles Entry/Exit Speed Differential Relative to Traffic ○ Data Collection for Work Zone Performance Measures ○ Unusual or Unpredictable Weather Patterns such as Snow, Ice and Fog	#
Total Score	
If the Total Score is: ○ ≥30 – ITS is likely to provide significant benefits relative to costs for procurement ○ ≥10 and <30 – ITS may provide some benefits and should be considered as a treatment to mitigate impacts ○ <10 – ITS may not provide enough benefit as a treatment to justify the associated costs	#

Possible work zone ITS applications to consider for various critical project characteristics.

Critical Project Characteristics	Work Zone ITS Applications							
	Queue warning	Real-time traveler information	Incident management	Dynamic lane merge	Variable speed limit	Construction vehicle entrance and exit	Temporary ramp metering	Performance measurement
Frequent planned lane closures are expected, which will create queues that cause high speed differentials between queued and approaching traffic	●	●		○	●			
Emergency shoulders will be closed through the work zone and frequent stalls and fender-benders are expected to occur that will cause queues because they cannot be quickly moved to the shoulder	●	●	●					
Travel times and delays through the work zone will be highly variable and real-time information can improve pre-trip and real-time route choice, departure time, and possibly mode choice decisions		●	○					
Roadway access for emergency response vehicles will be significantly constrained by the project, increasing response and clearance times			●					
Frequent incidents are expected to occur within the project	○	●	●					
Having an operator able to view an incident within the project and assist responders in bringing appropriate equipment to the site will significantly reduce incident duration			●					
A long-term lane closure will create a v/c condition that is very close to 1.0 and improved flow rates through the lane closure could reduce the likelihood that a queue would form, or reduce its duration significantly when a queue did form				●			●	
The potential exists for queue spillback from the work zone into upstream interchanges or intersections (and resulting increase in cross-street congestion and rear-end crashes) due to an unequal utilization of all lanes, such that the encouragement of the use of all lanes for queue storage would reduce that probability of spillback conditions		○	○	●				
Work activities will frequently occur for which lower speed limits would be beneficial to have on a temporary basis (i.e. during temporary lane closures on freeway mainlanes, for temporary full road closures, during periods construction vehicle/equipment access into and out of the work space form the travel lanes, etc.)			○		●	○		
Traffic speeds through the project vary widely due to oversaturated conditions during the peak period, and the timing and extent of congested travel will vary significantly day to day.		○			●			
Access to and from the work space occurs directly from the travel lanes						●		

Critical Project Characteristics	Work Zone ITS Applications							
	Queue warning	Real-time traveler information	Incident management	Dynamic lane merge	Variable speed limit	Construction vehicle entrance and exit warning	Temporary ramp metering	Performance measurement
A high number of construction vehicle deliveries into the work space will be required during the project						●		
The location and design of the access points could create confusion for motorists (i.e., access to the work space looks like an exit ramp and is near an existing actual exit ramp)		○				●		
Little or no acceleration lane is available for construction vehicles entering the travel lanes from the work space		○				●		
Capacity reductions in the work zone now create an oversaturated condition due to merging ramp vehicles							●	
Temporary ramp geometrics have constrained acceleration lane lengths							●	
Work activities have temporarily disabled one or more permanent ramp meters within the limits of an operational ramp metering system							●	
Work zone ITS is already being deployed for other purposes								●
Project documents include traffic mobility performance requirements (i.e., maximum allowable delays) that must be monitored to ensure and quantify compliance and subsequent incentives or penalties to be issued (performance specification of mobility impacts [delay or queues]								●
The agency chooses the project for assessment purposes as part of its federally-mandated bi-annual process review								●

•Characteristic could be addressed with this work zone ITS application
◦Characteristic could be addressed with this work zone ITS application if some modification(s) were made or real-time actions taken by an operator