North Carolina
Department of Transportation

Guidelines

FOR

Transportation Management Plan Development

Work Zone Traffic Control

Transportation Management Plan
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Transportation Management Plan
Introduction

I. These guidelines were established to aid the plan developer in understanding the expectations of North Carolina Department of Transportation Work Zone Traffic Control throughout the developmental stages of a Traffic Management Plan (TMP).

II. The term plan developer used throughout this document shall represent any and all persons involved in the process of developing a TMP. A listing of the groups or parties intended to be encompassed by this definition includes but is not limited to the following:

NCDOT Work Zone Traffic Control (WZTC) Design Staff

Private Engineering Firms (PEF)

Transportation Management Plan

A Transportation Management Plan (TMP) lays out a set of coordinated transportation management strategies and describes how they will be used to manage the work zone impacts of a road project.

A Transportation Management Plan (TMP) is required for all projects/activities. The scope, content, and level of detail of a TMP may vary based on NCDOT Work Zone Safety and Mobility Policy and the anticipated work zone impacts of the project. The type of TMP needed for a project is based on whether the project is determined to be a "significant project" as described in detail within the North Carolina Department of Transportation Work Zone Safety and Mobility Policy .

Below is a list of the possible TMP components:

- Traffic Control (TC) Plan: Required for all projects/activities.
- Transportation Operations (TO) Plan: Required for Significant Projects/Activities and other Projects/Activities as needed.
- Public Information (PI) Plan: Required for Significant Projects/Activities and other Projects/Activities as needed.

The basic objective of each TMP is to permit the contractor to work within the public right of way efficiently and effectively while maintaining a safe, uniform flow of traffic. The construction work and the public traveling through the work zone in vehicles, bicycles, or as pedestrians must be given equal consideration when developing a TMP.

Transportation Management Plan
Coordination

Plan Developers shall be responsible for the following:

a. Coordinate and document all investigative measures with WZTC and other NCDOT Personnel (including Municipal Personnel, when applicable) concerning possible utility conflicts, the need for temporary shoring, any potential drainage problems, etc. Please note this coordination may require additional meetings.

b. Coordinate with Division personnel to identify feasible detour routes during construction. In addition, coordinate with the NCDOT Permit Section when overweight, overheight, and/or wideload detours are necessary.

c. Coordinate and/or address any constructability concerns with WZTC, Division, and other NCDOT Units as needed.

Project Contact (PEF)

All inquiries concerning the project shall be directed to the Work Zone Traffic Control (WZTC) Project Engineer or Project Design Engineer. The PEF should not contact internal units of the NCDOT unless directed to do so by the WZTC Section. This policy is effective throughout the life of the project.

Transportation Management Plan
TC Plan Format

CADD

Workspace

- Utilize the most up to date Work Zone Traffic Control CADD Workspace (see NCDOT CADD Services web-site)
    - This workspace will provide standard drawing levels to utilize along with other valuable tools and guidance when developing Traffic Control Plans and must be adhered to.

Scales

- All scales listed pertain to full size plan sheets. Full Size plan sheets shall be 22” x 34” with a 3” border on the left side and be derived from sheet cells found in cell libraries contained in the WZTC CADD workspace. Half size reproducible copies shall be on 11” x 17” sheets.
    - **Overview Drawings:**
        - 1”=100’ English; 1:1000 Metric
    - **Detail Drawings:**
        - 1”=50’ English; 1:500 Metric

Note: Any deviation from the above must be approved by the WZTC Project Design Engineer.

Electronic File Naming and Sheet Numbering Convention

- Examples for individual plan detail drawings:
    - B4289_TC_TCP_1.DGN or B4289_TC_TCP_01.DGN

- Examples for individual plan base maps:
    - B4289_TC_TCP_BTCP_1.DGN or B4289_TC_TCP_BTCP_01.DGN

- All electronic design files are to contain one sheet ONLY. However, this is not critical for Title, Phasing and General Note sheets.

TCP Base Maps

- All electronic base maps created for use as a reference file to Traffic Control Overview and/or Detail plan sheets shall be coordinately correct.

TCP Overview and Plan Details

- All drawings should be consistent.
- All electronic data files (roadway, drainage, topography, etc.) and (TC base maps) for which overview and or detail plan view drawings are based shall be attached as reference files with a direct 1:1 scale relationship. (Exceptions for the scaling of a reference file are to occur only for supplemental blow up details shown on plan sheets to assist in plan interpretation).
- All Text Fonts shall be 71 utilizing the NCDOT font resource library (ncdotFont.rsc).

  Text sizes for the various drawing elements can be derived from the WZTC Menu within the WZTC CADD workspace.

  - Please make note of and adhere to the following rule of thumb:

  DRAWING TEXT SIZE RULE: If using a scale other than those built into the WZTC Menu application it is up to the plan developer to determine the proper factor to apply to each of the text categories thus assuring that ALL TEXT stays the same size relevant to the drawing border regardless of the scale of the elements drawn.

  Example: General Text @ 1”=200’ = 28; General Text @ 1”=50’ = 7;

  Therefore General Text @ 1”=100’ = 14

- All drawing elements are to be placed on proper levels as provided and defined within the WZTC Menu within the WZTC CADD workspace.

TCP Layout Style

As more of the project information is determined and brainstorming begins, the layout style needs to be addressed. WZTC Project Design Engineer/Project Engineer and the Plan Developer will agree on the TCP layout style in the TMP-Scoping meeting. All subsequent submittals shall comply with the layout style that is agreed to in this meeting. Keep in mind the layout style is just as important as the information contained on the sheets. Some common layout styles are listed below; however, new and innovative ideas are always welcome.

1) Title Sheet
   General Notes and Phasing Sheet
   Detail Drawing Sheets
   Advanced Work Zone Warning Sign Detail Sheets

2) Title Sheet
   General Notes Sheet
   Phasing Sheets
   Detail Drawing Sheets
   Advanced Work Zone Warning Sign Detail Sheets

3) Title Sheet
   General Notes Sheet
   Project Overview Sheet
   Phasing Sheet
   Detail Drawing Sheets
   Work Zone Warning Sign Detail Sheets

4) Title Sheet
   General Notes Sheet
   Project Overview Sheet (Per Phase)
   Phasing Sheet (Per Phase)
   Detail Drawing Sheets
   Advanced Work Zone Warning Sign Detail Sheets

5) Title Sheet
   General Notes Sheet
   Project Overview Sheet with Areas (Per Phase)
   Phasing Sheet for Areas (Per Phase)
   Detail Drawing Sheets for Areas (Per Phase)
   Work Zone Warning Sign Detail Sheets

Transportation Management Plan
Plan Development Considerations

Before and during development of the plan

Constructability

- ☐ Earthwork balance through project (Are we constructing areas of fill before the areas of borrow where we will be getting the earth?)
- ☐ Tie in/ grade differences
- ☐ Grade changes at –Y- lines
- ☐ Utility issues
- ☐ Temporary Shoring- needs, locations, quantities, etc.
- ☐ Temporary pavement
- ☐ Drainage/ pipes, culverts- depth, installation, sags in Roadway, super-elevations, Where will water go during construction?, etc.
- ☐ Phasing of drainage: For instance, build ½ of road then other ½ of road, how will this affect the pipes installation/ drainage
- ☐ Drainage slope, pipes, CB installation and conflicts with temp alignments
- ☐ Stream relocations
- ☐ Phasing clarity, safety, constructability
- ☐ Stabilization as it relates to construction phasing and intersections
- ☐ Undercut
- ☐ Cross over wedging and drop offs
- ☐ Width of temporary bridge to be used - coordinate with Division; Reason: Temporary bridge may require a larger footprint (including sub-structure) than what has been provided. This can effect shoring requirements and locations.
- ☐ Can you begin construction of bridge before closing the road?
- ☐ Make sure everything that is supposed to be constructed is constructed.

Safety

- ☐ For new location, which –Y- lines are being crossed?
- ☐ Changes in traffic patterns/ intersection changes
- ☐ Crash data on project. Are there any roadway improvements needed?
- ☐ Site distances for lane closures both vertical and horizontal
- ☐ Advisory Speed Panels

Mobility

- ☐ What projects are surrounding the one you are working on?
- ☐ Pedestrian / Bike issues? Detours required?

Other Considerations

- ☐ User cost (especially pertaining to contract times)
- ☐ Time Restrictions, ICTs, etc.
- ☐ Moratoriums (and how they affect TMP)
- ☐ Environmental commitments
- ☐ Environmental Documents
- ☐ Overhead signs and are they included in TMP (even off project limits)
- ☐ Signal installation (on and off project limits- loop installation on existing road even though project is new location, etc.)
- ☐ Pavement design typical sections for final layer (1 ½" or 2" for asphalt)? Is diamond grinding specified for concrete pavement?

Coordination

- ☐ ADA and pedestrian issues
- ☐ Cooperation between contractors clause needed in contract?
- ☐ Changes in cross sections or typical sections after 25% roadway plans?
- ☐ Is coordination with Railroad necessary?
- ☐ Is coordination with EMS or schools necessary?

Temporary Pavement Marking

- ☐ Conflicts at intersections in pavement marking plans
- ☐ Design pavement marking for best traffic operations
- ☐ Crosswalks
- ☐ Tie pavement markings to existing

Transportation Management Plan
Site Visits

The plan developer should visit the project site at least once before the project is Let. (WZTC plan developers should seek supervisor's approval). It is recommended that the site visit be made prior to completing the 1st Submittal - Staging Concept, because there are many useful things that can be learned by visiting the project site that can not be determined from a set of plans or aerial photography.

These include:

- Who the local stake holders are: such as hospitals, types of businesses, schools, types of residences, etc.
- Existing sidewalks and/or pedestrian walkways or paths
- Emergency service providers
- Interconnectivity and the surrounding road network
- Nature of the traffic: local, commuter, traffic speeds
- Congestion of area
- Condition of existing road
- Existing pavement markings and markers (condition, type and layout)
- Existing traffic signals
- Existing stop signs

Transportation Management Plan
Requirements (All Meetings)

The Plan Developer shall be responsible for the following:

- ☐ Attend and present the proposed TMP at the Final Design Field Inspection (FDFI), Combined Field Inspection (CFI), Pre-Let Field Inspection (PLFI), Internal Constructability Review (ICR), External Constructability Review (ECR) meetings and/or any other meeting as needed.

- ☐ Take Meeting Minutes focusing on project information pertinent to Traffic Control (TC), at all project meetings and submit a draft of these minutes for approval within 3 business days following the meeting. After approval, the Plan Developer shall distribute the minutes to all attendees and any other party involved with the project as required.
    - NOTE: Obtain a copy of the meeting attendance list at the meeting.

- ☐ Maintain written documentation of all coordination between all parties concerning the project. Provide Documentation of all written, oral, and electronic coordination at Each Submittal.

- ☐ Additional meetings may be required after project is Let for construction. Such meetings may include pre-construction conference, periodic construction meeting, and/or any other meetings as required.

Transportation Management Plan
Scoping Meeting

General

Before any TMP design begins, a Transportation Management Plan Scoping Meeting must be held between the Plan Developer and the WZTC Project Design Engineer and/or Project Engineer. The decisions made in this meeting will set the course for the TMP. During meeting preparation, the plan developer should refer to the "Transportation Management Plan - Scoping Meeting Checklist", which provides potential traffic control issues for consideration. The plan developer shall come prepared and able to present, discuss and establish the following items at the Transportation Management Plan Scoping meeting.

Items to discuss and agree upon during the meeting:

- General traffic control strategy (discuss potential issues listed in the TMP -Scoping Meeting Checklist)
- Design parameter considerations: (for example: Do we need a temporary speed limit reduction; Are we keeping all temporary pavement within the R/W footprint, What is the minimum lane width we are going to use during construction; What is our minimum pcb offset during construction; ….Other).

Decisions to be made during the meeting:

- The need for Traffic Counts and who will perform same.
- TCP layout and style
- TCP scales (if different from those listed within chapter "TC Plan Format")
- Estimated number of plan sheets needed to complete the TCP.
- Manday estimate.
- Cost estimate (applicable to PEF only)
- Project Schedule - Number and dates of Submittals

NOTE: PEF negotiations may require multiple iterations or possible meetings.

Transportation Management Plan
Scoping Checklist

The purpose of this checklist is to provide the plan developer a general list of potential traffic control related issues that should be considered when preparing for the TMP Scoping Meeting. This checklist will help the plan developer and the WZTC Project Design Engineer or Project Engineer determine the traffic control scope of work for the project.

Gather the following for analysis:

- ☐ Project folder
- ☐ Planning Document. If this is not in the project folder, contact PDEA and ask if it has been completed or if a draft is available.
- ☐ Roadway Plans and Cross Sections
- ☐ ADT (including major –Y- lines)
- ☐ Identify all other ongoing or upcoming projects in the area
- ☐ County and State Map to examine the network
- ☐ Structural data if available
- ☐ Project Commitments

Study the gathered materials to determine the trouble areas in order to set a general direction for the Traffic Management Plan. Be prepared to discuss your findings with the WZTC Design Engineer or Project Engineer at the Traffic Management Plan - Scoping Meeting.

The following is a list of typical potential issues that should be investigated in regards to maintaining traffic in preparation for the meeting:

- ☐ Check proposed pavement designs. Do these pose any problems?
- ☐ Check the typical sections. Do these pose any problems?
- ☐ Check for grade change problems. Develop preliminary alternatives to resolve the problem.
- ☐ Check all tie-in locations. Develop preliminary alternatives to resolve any tie-in problems.
- ☐ Check for proposed bridges or culverts. Determine how these will be constructed (away from traffic, road closure, stage construction, etc.).
- ☐ Check for existing signals. How will these be affected by construction?
- ☐ Are any temporary signals anticipated? (where, why, when).
- ☐ Determine the work zone capacity. Are traffic counts necessary?

- ☐ Check for any traffic operation issues.
- ☐ Check the need for temporary shoring (where, why, when). [see Temporary Shoring Policy on WZTC webpage]
- ☐ Check the need for temporary pavement (where, why, when).
- ☐ Check the need for temporary drainage and drainage conflict concerns.
- ☐ Check the need for temporary guardrail/barrier (where, why, when).
- ☐ Are there any seasonal concerns that could affect the project?
- ☐ Will "wide-loads" be a concern? (where, why, when).
- ☐ Is the need for any blasting anticipated?
- ☐ Will there be any issues with Contractor access?
- ☐ Will the earthwork need to be phased in?
- ☐ Should we pursue accelerated construction or some other innovative techniques?
- ☐ Check for pedestrian issues. Are there existing sidewalks, worn footpaths, schools, or other areas that are likely to attract pedestrians?
- ☐ Are there any other observations that could impact the project?

After analyzing these potential issues, the plan developer should establish a general traffic management strategy for constructing the project to be presented at the Transportation Management Plan - Scoping Meeting. See TMP-Scoping Meeting for other elements for which the plan developer is also responsible.

Transportation Management Plan
Field Inspection Meetings

Field Inspection meetings are scheduled by the Roadway Design Unit and generally run by the Division Construction Engineer. The Roadway Design Unit will send plans to all appropriate personnel, for one of the three possible types of Field Inspections:

Final Design Field Inspection (FDFI) (See requirements all meetings)
This meeting is normally held 3 months prior to R/W, and is formerly known as the Preliminary Field Inspection. At the FDFI, the roadway design should be reviewed very closely. The types of information that should be finalized during this meeting are drainage, turn lanes, right of way, and utilities. This includes any design features that affect the slope stake limits. The plan developer will:

- ❒ Present the staging concept (unless a separate meeting is held with the Division to discuss the TMP)
- ❒ Identify and discuss temporary pavement locations
- ❒ Identify and discuss temporary shoring for maintenance of traffic
- ❒ Identify and discuss offsite detour improvement concerns
- ❒ Identify and discuss constructability issues

Combined Field Inspection (CFI) (See requirements all meetings)
This meeting is intended for smaller projects and is held in lieu of a FDFI and PLFI. The meeting is normally scheduled 3 months prior to R/W. The plan developer will:

- ❒ Present the staging concept (unless a separate meeting is held with the Division to discuss the TMP)
- ❒ Identify and discuss temporary pavement locations
- ❒ Identify and discuss temporary shoring for maintenance of traffic
- ❒ Identify and discuss offsite detour improvement/concerns
- ❒ Identify and discuss constructability issues

Pre-Let Field Inspection (PLFI) (See requirements all meetings)
This meeting is normally held 5 months before LET date, and is formerly known as the Final Field Inspection. The purpose of the PLFI is to discuss implementation of the design shown in the construction plans, the erosion control plans, the permit application drawings, and the project “green sheet” or environmental commitments. The plan developer will confirm the final TMP with the Division at this meeting.

Field Inspection Notification Letter

A Field Inspection notification letter will be sent to WZTC from the Roadway Design Unit. This is the notice to the plan developer to proceed with the checklists below before, during, and after a Field Inspection meeting:

- ❒ Send Division Traffic Engineer Force Account letter, form and a ½ size copy of Roadway Title Sheet within *2 business days* of receiving the notification. (WZTC plan developers ONLY)
- ❒ Bring the following items to each meeting
  - ✓ Staging Concept Plans
  - ✓ Current Roadway plans with cross sections
  - ✓ Project File

During the meeting:

- ❒ Prepare for meeting by making a list of appropriate questions to ask at the field inspection meeting:
  - ***Time restrictions*:**
    - Lane Closures: YES / NO (requires hourly counts)
    - Holidays: YES / NO (hourly counts not required)
    - Special Events: YES / NO (city, county, state, sporting events, fairs, etc)
    - Hauling: YES / NO (peak hours)
    - Road Closures: (elevation problems, tie-in, drainage installation, etc)
    - Emergency / Public Services (hospitals, fire departments, police, schools)
  - ***Signing*:**
    - Permanent signing (responsibility - Contractor or the State Forces)
    - Off-site detour (responsibility - Contractor or the State Forces)
    - On-site detour (responsibility - Contractor or the State Forces)
  - ***Temporary Pavement Markings, Markers & Delineators*:**
    - Temporary Pavement Markings: (Type)?
    - Temporary Pavement Markers: YES / NO
  - ***Signals*:** YES / NO (hauling, temporary, revised, new)
  - ***Department Furnished Equipment*:** (CMS, TMIA, TCC, Arrow Panels, PCB, MCB with transfer/transport vehicle, signal equipment, etc)
  - ***Problem Areas*:**
    - temporary shoring for traffic maintenance
    - temporary drainage
    - temporary slope construction
    - hauling across R/R, roadways
    - pavement removal/milling
    - drainage (deep cuts, boring & jacking, removal/plugging, curb & gutter)
    - drainage installation (precast structures, stage construction culvert)
    - off-site detours (bridges limits, widths, roadway's condition & widths, flooding problems, upgrades required [resurfacing, pavement markings, markers])

  - tie-ins (incidental stone, ICTs)
  - work zone protection (PCB with special detail for connection to existing/detour structures or guardrail or sheet piling
  - temporary pavement
  - railroads
  - utilities
  - wide load (detours)
  - earthwork
- ❒ Present TMP-Staging Concept Plan.
- ❒ Take notes at Field Inspection meetings, focusing on project information pertinent to Traffic Control.

Transportation Management Plan
Requirements for All Submittals

- ☐ Stamp or label the title sheet in each TCP Submittal with the corresponding submittal. (i.e. Staging Concept, etc..)

- ☐ Submit half-size copies of the previous marked up submittal.

- ☐ Submit half-size copies of each required submittal for review and approval. *The # of copies required for each submittal will be agreed on at the TMP - Scoping Meeting.*

- ☐ Submit an electronic copy in PDF file format of the TCP at each required submittal. (PEF ONLY)

- ☐ Provide half-size copies of the TCP for distribution at the FDFI, CFI, PLFI, ICR, and ECR meetings. *The # of copies required for each submittal will be agreed on at the TMP - Scoping Meeting.*

  NOTE: Each Submittal must be reviewed and approved prior to distribution or presentation at any meeting.

- ☐ Make timely Submittals of the Traffic Control Plan according to the schedule agreed upon.

- ☐ Advise WZTC Lead Project Personnel a minimum of one (1) week in advance of each planned submittal if adjustments of the dates are necessary.

Transportation Management Plan
1st Submittal-Traffic Management Concept

This submittal is required for all projects with the exception of the very basic and least complex of projects. The decision whether this submittal is required or not will be made at the Scoping Meeting.

I. PURPOSE

The purpose of the Traffic Management Concept is to organize and sequence the construction requirements in a safe and efficient manner. It is utilized to determine and convey the design decisions that are necessary to provide constructability of the project, while providing a method to maintain a safe flow of traffic through the construction zone. The Traffic Management Concept shall be developed in a manner that will provide the Contractor with the flexibility to work simultaneously in as many areas of the project as possible, and to expedite the project's completion. In doing so, the major items of work are to be identified and how they impact traffic. In addition, other "features" such temporary pavement, shoring, alignments, drainage, signals etc. are to also be identified and shared with the appropriate Division personnel, and also other NCDOT design sections and consultants that may be involved.

The Traffic Management Concept plan will be presented at the Final Design Field Inspection (FDFI) or Combined Field Inspection (CFI) for concurrence or. A separate constructability meeting is strongly recommended for complex projects. The need for a separate constructability meeting should be determined at the project scoping meeting. It's extremely important that all affected parties understand this Traffic Management Concept as it may affect the accuracy and completion of their plans, and therefore their attendance at the presentation of the Traffic Management Concept is very important, so that their requirements and suggestions can be incorporated into the Traffic Management Plan. *See Requirements for all Meetings*

II. SUBMITTAL REQUIREMENT: *Also, see Requirements for All Submittals*

The Traffic Management Concept plan should consist of the following elements:

- ☐ Written Traffic Management Concept Staging
- ☐ Traffic Management Concept drawings (Overview Drawings)
- ☐ Cross Section Views (Identifying Work areas and Traffic patterns)

Written Traffic Management Concept Staging:

- The Plan Developer shall provide a simple written description that "outlines" the sequence of work operations that are to take place in each "Phase" of construction and answers the following questions: What/Where is construction is taking place?

- What traffic control method is being used (lane closures, road closure, away from traffic, flaggers, etc.)?
- Where is traffic at the end of the workday?

Example:

Away from traffic, construct the following: -L-, -Y1-, -Y2- and -Y3- (include common road names). Traffic remains on existing alignment during this construction (See TCP-X).

OR

Using flaggers and lane closures, construct the tie-in of proposed -Y2- with existing -Y2-. Traffic will be on proposed -Y2- alignment at the end of the workday (See TCP-X).

The written Traffic Management Concept should be placed on the Traffic Management Concept drawings (Overview Sheets).

Traffic Management Concept Drawings (Overview Drawings):

Provide easy to understand overview drawings that show where construction is occurring and where traffic is being maintained during each specific phase of construction. **These drawings are intended to communicate a concept, not a final detailed plan; therefore, keep the drawings as simple as possible.** Each phase of work shall be shown on separate drawings. The use of separate, supplemental detail sheets may be necessary for more complicated areas. ,

Format / Layout (roll-out plots and/or border sheets) shall be determined at the TMP – Scoping Meeting. All drawings shall utilize appropriate scales that convey a clear and understandable view of the construction and location of traffic for each phase. "For complicated plans (with a large number of sheets, interchanges, flyovers, ramps and loops, etc.), it is helpful if the TMP sheets appear much the same as the roadway plan sheet for the area being described (scale, orientation, match lines, etc.). Details may be used for clarification, on the same sheet or on another, when the scale is too small to clearly show the intended construction.

All drawings, at a minimum shall show the following:

- ☐ Existing roads
- ☐ North Arrow
- ☐ Traffic flow arrows
- ☐ Existing and proposed road alignment designations **along with their common names**
- ☐ Horizontal alignment station tick labels and station ticks
- ☐ Driveways
- ☐ Cross Section views and locations (See category below)
- ☐ Match lines / Break lines
- ☐ Proposed and completed construction for the specific phase of work
- ☐ Provide any additional information that helps to explain the project

Show only areas under construction shaded in gray utilizing MicroStation WZTC Level: Gray Area Fill Shapes. Minimal color may be used on the Staging Concept Drawings if determined at the TMP- Scoping Meeting.

All areas that have been completed shall show the proposed features, and shall not be shaded.

Cross Sections:

Provide cross sections that illustrate the spatial relationship (both horizontal and vertical) with dimensions between traffic lanes and the proposed construction during each specific phase of construction. Show the traffic control devices to be used to separate opposing travel lanes and/or to separate traffic from construction. Identify each station location or station range, along with traffic flow arrows, road names/designations, and other features necessary to clearly define the elements drawn within each cross section view. For Bridge and/or Culvert sites, clearly identify the width of the proposed bridge or culvert that is to be constructed, the working room, traffic control device and offset, and width of travel lanes. Place the cross sections either on the overview or detail sheets.

Additionally the Traffic Management Concept plan shall contain the following if applicable:

- ☐ The location of any temporary pavement, temporary shoring and/or temporary signals needed during construction.
- ☐ Any potential needs and methods that are required for maintenance of pedestrian/bicycle traffic during construction.
- ☐ Any potential off-site detour route(s) and/or Oversize/Overweight detours required during construction. Ensure that the detour route's pavement conditions are able can handle the additional traffic. (i.e. bridge weight limits, widths, roadway condition and widths, flooding problems, upgrades required, etc.)
- ☐ Identify any Lane and Road Closures (both intermittent and/or long term)that may be necessary, make initial recommendations for lane closure, road closures, continuous operations, and other lane closure/road closures restrictions. If a long term closure is needed, then begin discussions on the amount of time required for this activity. Coordinate these with the Contract Time Officer
- ☐ Temporary drainage issues (deep cut, boring & jacking, removal/plugging, curb and gutter, etc.)
- ☐ Drainage installation (steel plates, precast structures, stage construction)
- ☐ Any potential temporary crossovers or on-site detour route(s) used during construction of the project
- ☐ Work zone protection (PCB, Water Filled Barrier, Guardrail, Drums, etc.)
- ☐ Utility issues (water & sewer – if available)
- ☐ Night work (may affect phasing)/Lighting
- ☐ Retaining walls

- ☐ Wedging, Pavement Removal & Replacement, Undercut, Tie-in areas (incidental stone, etc.)
- ☐ Roadway Typical Section (i. e. pavement design, drop-off's, soil stabilization, curing times, asphalt vs. concrete, milling, condition of existing shoulders, curb & gutter)
- ☐ Balancing Earthwork (cut/fill), Temporary slopes (confirm maximum allowable slope)
- ☐ Work Zone access (hauling, material delivery, staging area, etc.)
- ☐ Bridge Construction (girder installation, temporary bents, staged construction, bent construction, etc.)
- ☐ Overhead Signs (spanning entire travel way, cantilevered)

Submittal Package:

Items to be included with the submittal package should be discussed and agreed upon at the project scoping meeting. Submittal may include some or all of the items listed below. Submit items to the WZTC Project Design Engineer for review no later than the date agreed upon at the TMP - Scoping Meeting. If the project schedule has changed since the TMP - Scoping Meeting, contact the WZTC Project Design Engineer to discuss if the submittal date may be adjusted. Typically, the 1st Submittal – Traffic Management Concept is due no later than one month prior to the Final Design or Combined Field Inspection meeting. (For PEF's, this submittal date is typically two months prior to the Final Design or Combined Field Inspection meeting).

- ☐ Hard copy of the roadway plans and cross-sections.*
- ☐ Project File*
- ☐ Half-size copy(s) of the Traffic Management Concept.
- ☐ Traffic Counts, if applicable and any recommendations for time restrictions.
- ☐ Notes from TMP - Scoping Meeting.
- ☐ Notes from Site Visit (if applicable).
- ☐ Written Justification of Engineering Judgment
- ☐ Temporary Shoring Investigation (if applicable).
- ☐ List of items/questions to be discussed at the FDFI/CFI.

* This item(s) may not be required from PEFs.

Approval of this submittal will complete the Traffic Management Concept of the Transportation Management Plan.

(PEF ONLY) Payment for the Traffic Management Concept will not be approved until after the FDFI or CFI meeting.

Transportation Management Plan
2nd Submittal-Midpoint

The 2nd Submittal-Midpoint is optional on some less complex projects. The decision on whether or not the Midpoint submittal is required will be made at the Scoping Meeting.

I. PURPOSE:

This submittal should consist of the TCP developed from either the TMP Scoping Meeting, the 1st Submittal – Staging Concept or both, as applicable, and include all revisions requested during those reviews.

II. SUBMITTAL REQUIREMENT: *Also, see Requirements for All Submittals*

The 2nd Submittal-Midpoint should contain, but not be limited to the following:

General:

- ☐ The Layout of the TCP agreed upon in the Transportation Management Plan - Scoping Meeting.
- ☐ All revisions to the Traffic Control Plan requested from the Staging Concept Submittal Review, field inspections and/or constructability meetings if applicable.
- ☐ Details developed from the Staging Concept. NOTE: Overviews may be included as well depending on the layout and complexity.

Title Sheet:

- ☐ Finalized listing of applicable Roadway Standard Drawings .
- ☐ Index of Sheets.
- ☐ Indicate the Midpoint Submittal stamp (cell) on this sheet.

Project Notes Sheet:

- ☐ General Notes
  Include a finalized list of Project Notes specific to the project on the Project Notes Sheet. Include all final lane and road closure time restrictions with this submittal.
- ☐ Local Notes
  Include a finalized list of Local Notes specific to the project on the Project Notes Sheet.

  Note: If Local Notes are used, they shall be referenced in the Phasing.

Traffic Control Phasing:

The phasing at this submittal shall be expanded from the brief summary described in the Staging Concept including any requested changes made at that time.

☐ Address the following three main points when developing the Phasing:

- What construction is taking place?
- What Traffic Control method is used to maintain traffic during this construction; (i.e. is construction away from traffic or are lane closures and flaggers used during construction).
- Where is traffic at the end of the workday?

☐ Include a written description of how traffic will be maintained during each phase and step of construction. Refer to the proper Roadway Standard Drawing as applicable to describe how traffic will be maintained during construction at that time.

☐ Refer to the traffic control details and cross section view sheet numbers.

☐ Step out traffic shifts.

☐ Describe installation of temporary and final traffic signal(s).

☐ Refer to the Roadway, Signal, Signing, Structure and Pavement Marking Plans when relevant.

☐ Identify any Intermediate Contract Times (ICT's) needed throughout the project's duration. In addition, coordinate with field personnel and the Contract Time Engineer in Project Services concerning any issues pertaining to the duration and the scope of work included in these Intermediate Contract Times. Place a box around ICT's (see example below).

NOTE: As mentioned, Phasing is more detailed and specific than the summary described in the Staging Concept review submittal. For example the following could be written:

Working in a continuous manner, complete the work required in Step 1 in X days:

Step 1: -Using Roadway Standard Drawing 1101.02, sheet 1 of 9, complete the following:

- Construct the tie-in of proposed -Y2- and existing -Y3- from -Y2- Sta. X+XX to -Y2- Sta X+XX up to but not including the final surface layer. (See TCP-X).
- Place the final surface layer, Pavement Markings and Pavement Markers on -Y2-, Sta X+XX to Sta X+XX, and -Y3-, Sta X+XX to Sta X+XX.
- Activate the final traffic signal (Signal # XXXXX - See Signal Plans) at the -Y2- / -Y3- intersection. (See Final Pavement Marking Plans)
- Open traffic to the final pattern.

Traffic Control Overviews:

At this submittal, Overviews, if used, should show any proposed work that is started, under construction or completed during each particular phase of construction. Overviews may also show the location of Traffic Control Devices such as: drums, barricades, temporary signals, portable concrete barrier (PCB), etc.

Traffic Control Details:

- Include detailed plan views and cross section views that illustrate where construction is occurring and how traffic is maintained in relation to the construction.

- Shade **only** proposed work that is started, under construction or completed during each particular step or phase of construction. Previously completed work is shown with solid lines and is not shaded.

- Each construction phase shall be shown on separate drawings. Show directional flow arrows indicating traffic patterns and include a north arrow. Show all necessary traffic control devices, required signing, and any temporary pavement markings on detail sheets and in cross section views. Label all roads (include all known designations, names, and alignment data) and other relevant features described below:

    - Maintained Lane Widths
    - Temporary Pavement Marking and Marker Designation Labels
    - Match Lines
    - Additional Legends if applicable
    - TIP (if applicable) and Sheet Numbers, etc.

- Label all information on the detail drawings that has been referred to in the Phasing (i.e. station numbers, etc.)

Off-site Detour Signing and Temporary Guide Signs:

- Whenever an off-site detour is required and the Contractor is responsible for installing, furnishing, and removing the off-site detour signing, the Plan Developer shall obtain the required off-site detour sign designs or temporary guide signs from the Signing and Delineation Section when applicable.

- Include all off-site detour signing detail sheets with this submittal. These detail sheets will show the locations and type of signs used.

Advance Work Zone Warning Signs:

- Include all Advance Work Zone Warning Sign detail sheets applicable to the project. NOTE: Include all notes found on the Advance Work Zone Warning Sign detail sheets

within the Project Notes section of your plans if the Advance Work Zone Warning Signs are depicted on your plan details instead.

Additionally, the information identified in the 2nd Submittal shall include, but is not limited to, the following:

- ☐ All time restrictions used in the Construction Phasing and Project Notes. (Based on discussions)
- ☐ Any speed reduction and/or $250.00 penalty ordinance as coordinated with field personnel and the Regional Traffic Engineer.
- ☐ Areas which require temporary shoring, (if not identified in the Staging Concept Submittal).
- ☐ Areas which require temporary drainage, (if not identified in the Staging Concept Submittal).
- ☐ Coordination with the Utility Section and identification of any utility conflicts, if applicable.
- ☐ Any temporary alignment for on-site detours or temporary pavement. These temporary alignments should be coordinated with Roadway Design Personnel, (if not identified in the Staging Concept Submittal).

Submittal Package:

Submit the 2nd Submittal Mid-point Traffic Management Plan for review and approval prior to the Internal Constructability Meeting or as agreed upon in the TMP-Scoping Meeting.

Approval of this submittal will complete the 2nd Submittal of the Traffic Management Plan.

(PEF ONLY) Payment beyond the 2nd Submittal Mid-point will not be approved until after the ICR meeting.

NOTE: Most projects require an Internal Constructability Review Meeting unless otherwise indicated by WZTC lead personnel at the TMP - Scoping meeting.

Transportation Management Plan
3rd Submittal - Pre-Final

The 3rd Submittal - Pre Final TMP should basically be complete and taken to the Pre-Let Field Inspection (if applicable) to discuss with construction personnel.

I. PURPOSE:

This submittal shall consist of the final TMP as developed from requested revisions or comments from previous meetings and reviews.

II. SUBMITTAL REQUIREMENT: *Also, see Requirements for All Submittals*

This Submittal will be required for all TIP projects, and shall include the following:

- ☐ All final Traffic Control Plan Detail Sheets.
- ☐ All revisions to the Traffic Control Plan as requested from previous review.
- ☐ All requirements from previous submittals even if bypassed for your particular project.
- ☐ An Engineer's Estimate that includes calculations of estimated quantities for Traffic Control items. (Submit all calculations and or worksheets providing the basis of the estimate quantities submitted).
- ☐ A list of any Project Special Provisions (Standard and Non-Standard) and Specifications that will be needed for the project.
- ☐ Any speed reduction and/or $250.00 penalty ordinance as coordinated with field personnel and the Regional Traffic Engineer.

Submittal Package:

Submit the Pre-Final TMP to the WZTC Project Design Engineer for review and approval no later than the date agreed upon at the TMP - Scoping Meeting. If the project schedule has changed since the TMP - Scoping Meeting, contact the WZTC Project Design Engineer to discuss if the submittal date may be adjusted. Typically this submittal shall be made prior to the Pre-Let Field Inspection.

Approval of this submittal will complete the 3rd submittal of the Transportation Management Plan.

(PEF ONLY) Payment beyond the Pre-Final TMP will not be approved until after the Pre-Let Field Inspection.

Transportation Management Plan
4th Submittal - Final

I. PURPOSE:

The 4th Submittal shall consist of the final TMP developed from the previous submittal.

II. SUBMITTAL REQUIREMENT:

The TMP submitted at this time should be complete, ready to seal and include the following:

- Completed Transportation Management Plan with all revisions incorporated as requested from the pre-final submittal as well as any changes from Field Inspection meetings.
- Final Traffic Control quantity estimate. (Submit all final calculations and / or worksheets providing the basis for the estimate quantities submitted).
- A Full Sized sealed hard copy and all electronic drawings and documents of the Final Traffic Control Plan, including any Project Special Provisions and ICT's. (Include all electronic files that plan sheets are referenced to and dependant on for accurate representation). (Applies to PEF)
- NOTE: Electronic data may be delivered on a CD/DVD or through the FTS (File Transfer System) established by the NCDOT. (Applies to PEF)
- Electronic PDF of the complete set of electronic plans as submitted for distribution. (Seal / Signature not required on this copy). NOTE: (Place the words "Preliminary Not For Construction" on the title sheet prior to creation of this file). (Applies to all Plan Developers)
- All correspondence with other units or agencies relating to the Transportation Management Plan.
- Return any borrowed materials previously provided by NCDOT, if applicable. (applies to PEF)
- User Cost Package (WZTC plan developers ONLY).

Submittal Package:

Submit the final TMP to the WZTC Project Design Engineer for review no later than the date agreed upon at the TMP - Scoping Meeting. If the project schedule has changed since the TMP - Scoping Meeting, contact the WZTC Project Design Engineer to discuss if the submittal date may be adjusted.

Approval of this submittal will complete 100% of the Transportation Management Plan.

Transportation Management Plan
Project Turn-In

WZTC Plan Developers ONLY

Turn the following into the Roadway Project Engineer / Squad Leader in Roadway Design or Project Services:

Submittal Package:

- ☐ Sealed original full size Transportation Management Plan.
- ☐ Completed and signed Final Transportation Management Plans submittal letter which contains a listing of any attachments and Roadway Pay Item quantities required for Temporary Pavement, Temporary Shoring or Temporary Guardrail.
- ☐ Copy of Transport Quantity Estimate.
- ☐ Copy of Force Account Estimate, if applicable. (Include in Transport)
- ☐ Copy of any Intermediate Contract Times (ICT).
- ☐ Copy of any Project Special Provisions. *(Sealed)*

Final Procedures:

- Distribute copies of appropriate plans (pdf), and data per the Final TMP Submittal letter.
- Purge project folder(s) and file, along with a hard copy of the Transportation Management Plan in the file room.
- Finalize the Project User Cost Package, if necessary and turn-in to appropriate WZTC personnel.

Transportation Management Plan
References / Design Standards

All plans, designs, specifications and estimates shall conform to the NCDOT standard practices for highway construction, which are based on the latest edition of the following publications and or materials:

1. AASHTO – A policy on Geometric Design of Highways and Streets
2. AASHTO - Roadside Design Guide
3. Manual on Uniform Traffic Control Devices (MUTCD)
4. NC Supplement to Manual on Uniform Traffic Control Devices (MUTCD)
5. NCDOT – Standard Specifications for Roads and Structures (mainly Divisions 10, 11 and 12)
6. NCDOT- Roadway Standard Drawings (mainly Divisions 11 and 12)
7. FHA- MUTCD Standard Highway Signs
8. Highway Capacity Manual (All associated software shall be used as applicable, including any modifications as may be directed by NCDOT during the life of the project. See Congestion Management Guidelines for more details)

1. NCDOT WZTC Design Manual (when available)
2. MicroStation and GEOPAK software (see NCDOT web-site)
3. NCDOT WZTC web-site

Transportation Management Plan
Acronyms

AADT	Annual Average Daily Traffic
AASHTO	American Association of State Highway Transportation Officials
ABC	Aggregate Base Course
ACBC	Asphalt Concrete Base Course
ACIC	Asphalt Concrete Intermediate Course
ADA	Americans with Disabilities Act of 1990
ADT	Average Daily Traffic
B	Bridge Projects (B-1234)
BOT	Board of Transportation
C	Congestion Mitigation Projects (C-1234)
CADD	Computer Aided Design and Drafting
CE	Categorical Exclusion
CMS	Changeable Message Sign
D	Directional Factor
DHV	Design Hourly Volume
DOH	Division of Highways
DOT	Department of Transportation
EA	Environmental Assessment
EIS	Environmental Impact Statement
F	Ferry Projects (F-1234)
FDPS	Full Depth Paved Shoulder
FEIS	Final Environmental Impact Statement
FEMA	Federal Emergency Management Agency
FHWA	US Department of Transportation, Federal Highway Administration
FONSI	Finding of No Significant Impact
FY	Fiscal Year (begins July 1)
GIS	Geographic Information System
HCM	Highway Capacity Manual
HCS	Highway Capacity Software
HOV	High Occupancy Vehicle
I	Interstate Projects (I-1234)
ICT	Intermediate Contract Time
ITRE	Institute for Transportation Research and Education
ITS	Intelligent Transportation System
L	Main roadway alignment designation on a set of design plans.
LOS	Level of Service
LSA	Limited Service Agreement
MCB	Movable Concrete Barrier

MPO	Metropolitan Planning Organization
MUTCD	Manual on Uniform Traffic Control Devices
NCMIN	North Carolina Multimodal Investment Network
NEPA	National Environmental Policy Act
NHS	National Highway System
NOI	Notice of Intent
NCDOT	North Carolina Department of Transportation
PCB	Portable Concrete Barrier
PDE	Project Development Engineer
PDEA	Project Development and Environmental Analysis Unit (NCDOT)
PDF	Portable Document Format files viewed and printed with Adobe Acrobat Reader
PEF	Project Engineering Firm used to outsource work
PI	Public Information
PIP	Public Involvement Plan
PM	Pavement Marking
PMP	Pavement Marking Plan
PMII	Project Management Improvement Initiative
R	Rural Projects (R-1234)
ROW	Right-of-Way
RPO	Rural Planning Organization
RSD	Roadway Standard Drawings
RULE	The Work Zone Safety and Mobility Rule
SASHTO	State Association of State and Highway Transportation Officials
SEPA	State Environmental Policy Act
SHC	Strategic Highway Corridiors
STP	Surface Transportation Program
T	Truck Percentage
TCC	Temporary Crash Cushion
TCM	Traffic Calming Measure
TCP	Traffic Control Plan
TEAAS	Traffic Engineering Accident Analysis System software
TIP	Transportation Improvement Program
TMIA	Truck Mounted Impact Attenuator
TMP	Transportation Management Plan
TO	Transportation Operation
TTC	Temporary Traffic Control plan
TTST	Tractor Trailer Semi Truck
URL	Uniform Resource Locator, an address that specifies the location on the Internet
V	(Velocity) Design Speed
WCR	Wheelchair Ramp

Y	Secondary intersecting roadway alignment designation on a set of design plans.

Transportation Management Plan
Glossary

A | B |C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y |Z

A

AASHTO – American Association of State Highway and Transportation Officials is a standards setting body which publishes specifications, test protocols and guidelines which are used in highway design and construction throughout the United States. Despite its name, the association represents not only highways but air, rail, water, and public transportation as well.
The American Association of State Highway Officials (AASHO) was founded on December 12, 1914. Its name was changed to American Association of State Highway and Transportation Officials on November 13, 1973.

ACCELERATION LANE – a connecting lane leading from a ramp to a freeway and designed to enable the motorist to merge into freeway traffic at highway speed.

ACCESS – The ability to reach or connect to another mode of transportation from an existing mode of transportation or an individual property.

AGGREGATE BASE COURSE (ABC) – crushed stone used as a part of the roadway base to support pavement.

ANNUAL AVERAGE DAILY TRAFFIC (AADT) – the total volume of traffic on a highway segment for one year divided by the number of days in the year.

AREA OF CONCERN – an object or roadside condition that may warrant safety treatment.

B

BARRICADE – a device which provides a visual indicator of hazardous location or desired path a motorist should take. It is not intended to contain or redirect an errant vehicle.

BARRIER – a device which provides a physical limitation through which a vehicle would not normally pass. It is intended to contain or redirect an errant vehicle.

C

CADD – Computer-Aided Drafting & Design software that is comprised of computer technology for the design of objects, real or virtual.

CAPACITY – a transportation facility's ability to accommodate a moving stream of people or vehicles in a given time period.

CATEGORICAL EXCLUSION (CE) – a classification given to federal aid projects or actions, which do not individually or cumulatively have a significant impact on the environment. CE do not require extensive levels of environmental documentation.

CLEARANCE – lateral distance from edge of a traveled way to a roadside object or feature. Vertical distance from the roadway surface to the bottom of an overhead structure.

CLEAR ZONE – the total roadside border area, starting at the edge of the traveled way, available for safe use by errant vehicles. This area may consist of a shoulder, a recoverable slope, a non-recoverable slope, and/or a clear run-out area. The desired width is dependent upon the traffic volumes and speeds and on the roadside geometry.

CRASH CUSHION – a device that prevents an errant vehicle from impacting fixed objects by gradually decelerating the vehicle to a safe stop or redirecting the vehicle away from the obstacle.

CROSS SECTION – a vertical section of the road showing the different elevations and layers. Generated to calculate earthwork (cut and fill) for a proposed section of roadway. Also, used to show the spatial relationship between the maintained traffic pattern and construction operations.

D

DESIGN FILES – a Microstation CADD file. Electronic file that shows a plan view of the existing features, proposed construction, and location of traffic.

DESIGN HOUR VOLUME (DHV) – the 30^{th} highest hourly volume of the future year chosen for design. The design volume represents the "load" that highway must accommodate. It is one factor in determining the required number of lanes and other geometric features. The DHV is normally determined by multiplying it times a design hour volume factor, generally a percentage from 8% - 12%.

DESIGN SPEED – a selected speed used to determine the various geometric design features of the roadway. The assumed design speed should be a logical one with respect

to the topography, anticipated operating speed, the adjacent land use, and the functional classification of highway.

DETOUR – an alternate route utilizing onsite and/or offsite facilities when provided by the plans, contract, or as directed by the Engineer to facilitate highway construction.

DIRECTIONAL FACTOR (D) – a factor used to determine the one-way traffic volume. It is multiplied by the ADT.

E

EGRESS – the act of leaving.

ENVIRONMENTAL ASSESSMENT – a NEPA (National Environmental Policy Act) document that evaluates the environmental effects of a project. Often followed by a FONSI. If there are no significant impacts, the assessment is followed by an EIS.

ENVIRONMENT DOCUMENT – general term used throughout DOT to refer to any of the NEPA required documents.

ENVIRONMENTAL IMPACT ASSESSMENT – analytical process that systematically examines the possible environmental consequences of the implementation of projects, programs, and policies.

ENVIRONMENTAL FEATURES MAP – map of a project area showing known Human and Natural Environmental features often using information from various sources including GIS, aerial photography, etc.

EROSION – wearing away of the land by running water, rainfall, wind, ice or other geological agents, including such process as detachment, entrainment, suspension, transportation and mass movement. Geologically, erosion is defined as a process that slowly shapes hillsides, allowing the formation of soil cover from weathering of rocks and from alluvial and colluvial deposits. Erosion is often intensified by land-clearing human activities related to farming, resident and industrial development and it has as effect increasing run-offs, decline of arable layers, siltation in lakes, lagoons and oceans.

F

FONSI (Finding of No Significant Impact) – environmental document for proposed projects where it has been determined through the circulation of an Environmental Assessment that a project will not have a significant impact on the environment. A Finding of No Significant Impact is the decision document for an Environmental Assessment.

FHWA – Federal Highway Administration is a major agency of the U.S. Department of Transportation (DOT). As a cabinet-level organization of the Executive Branch of the U.S. Government, the DOT is led by a presidential appointee-the Secretary of Transportation. The top-level official at FHWA is the Administrator, who reports directly to the Secretary of Transportation. FHWA is headquartered in Washington, DC, with field offices in every State, the District of Columbia, and Puerto Rico.

FLAGGER PROGRAM – program to assess the resultant user cost derived from a flagging operation along a two-lane, two-way facility.

FLAGGING OPERATION – providing the use of competent and properly equipped personnel at locations and times for such periods as necessary for the control and protection of vehicular and pedestrian traffic during construction.

G

GREEN SHEET - A summary of project commitments with responsible units identified. Green Sheets provide a quick reference for special project commitments on stand-alone green page(s).

H

HABITAT – Place where an organism or population (human, animal, plant, micro-organism) lives.

HEARING MAP – A map, usually of the selected alternative, presented to the Public at a Public Hearing on a project.

I

INGRESS – the act of entering.

IN-HOUSE – Describes work performed by NCDOT staff.

INTERAGENCY TEAM – An interdisciplinary work group composed of individuals representing a number of government agencies who participate in the development of transportation projects.

INTERMEDIATE CONTRACT TIME – the number of hours, minutes or calendar days inclusive between the date of availability and the completion date, as set forth in the special provisions, including authorized extensions to the intermediate completion time or date.

INTELLIGENT TRANSPORTATION SYSTEMS (ITS) – Advanced traffic operations and communications technologies that increase traffic flow on existing facilities, improve safety, and provide better and more accurate traveler information.

L

LEVEL OF SERVICE (LOS) – A system to evaluate congestion on a roadway – similar to a report card. LOS A would indicate no congestion while LOS D indicates severe congestion that could easily lead to breakdown conditions.

LIMITED SERVICE AGREEMENT (LSA) – An "as-needed basis" contract established for a maximum dollar amount for professional or specialized services to be performed during a specified contract period, generally not to exceed three years. When a task is identified, a scope of services, schedule, and total compensation are negotiated with the firm for the performance of an individual assignment of professional or specialized service, as defined by the Agreement. The scope of services, schedule and compensation for each individual assignment are documented in a Notice to Proceed. The Department may elect to utilize the maximum amount of the agreement during the contract period, or may elect not to negotiate with the firm for any services during the contract period.

LINK – the method of referring one document to another.

LIQUIDATED DAMAGES - the sum of money stipulated in the special provisions that is charged against the contractor for each calendar day, each hour, or portion thereof that work described in the special provisions remains uncompleted after the expiration date, intermediate completion date, or the intermediate completion time shown in the special provisions, not as a penalty, but as liquidated damages.

LOCAL AGENCY – Includes municipal, county, other state government.

LONG RANGE TRANSPORTATION PLAN (LRTP) – A plan with a 20 year minimum planning horizon that must be updated every three to five years and is only required for Metropolitan Planning Organization (MPO). It incorporates all modes of transportation, including transit, bicycle, pedestrian, rail, aviation, ports, and ferries. The plan may be viewed as a layering of fiscally constrained plans with each layer equating to a separate, but integrated, mode of transportation. Therefore, only projects that can reasonably be expected to be funded within the planning period are included in the LRTP.

-L- LINE – Main line alignment chain designation within a set of roadway design plans.

M

MUTCD (Manual on Uniform Traffic Control Devices) - defines the standards used by road managers nationwide to install and maintain traffic control devices on all streets and highways. The MUTCD is published by the Federal Highway Administration (FHWA) under 23 Code of Federal Regulations (CFR), Part 655, Subpart F.

MEDIAN – the portion of divided highway separating the traveled ways for traffic in opposite directions.

MICROSTATION – is a full-featured 2D and 3D CAD program for DOS, Windows, Mac and Unix workstations from Bentley Systems, Inc. Created in 1984, MicroStation is a high-end package used worldwide in environments where many architectural and engineering designers work on large, complex projects.

MILESTONE – Used to document significant events or completion of phases of work in a project.

MITIGATION – To moderate the impact a project has on the environment.

MOBILITY – The ability to travel safely and unimpeded along single or linked transportation facilities.

MODE OF TRANSPORTATION – Modes are methods of moving people or goods; such as private vehicles, transit (bus, express bus, rail), biking, and walking.

MORATORIUM – A temporary ban or halt to a specific activity. For NCDOT projects, a moratorium usually refers to a defined period of time (i.e., "season" or "window") during which specific construction activities are not allowed in order to protect sensitive animal species from disturbance.

N

NATIONAL HIGHWAY SYSTEM (NHS) – The Interstate Highway System as well as other roads important to the nation's economy, defense, and mobility; developed by the US Department of Transportation in cooperation with the states, local officials, and metropolitan planning organizations. Includes the Interstate system and other routes identified as being of particular importance to local governments.

NATURAL RESOURCES – Natural assets (raw materials) occurring in nature that can be used for economic production or consumption.

P

PHASE – a part of a traffic signal time cycle where one or more traffic movements receive the right of way. A particular stage of written construction sequencing.

PHASING – phasing is a clear and concise step-by-step write-up that directs the contractor where to begin and how to proceed toward completion of the project. The main objective is to communicate to the contractor how to safely maintain traffic during the various stages of construction.

PEDESTRIAN – One who walks or journeys on foot; a walker.

PERMIT – Written permission given by a governmental agency with "permitting" authority to take certain action during specific steps of a project development process.

PLAN DEVELOPER – design engineer or Private Engineering Firm (PEF) that is involved in the process of developing a Traffic Management Plan (TMP).

PLANIMETRICS (pln) – mapping features for which only horizontal data, or plan view features is presented. These features generally include property lines, street centerlines, structures footprints, utility lines, location of vegetation and other natural or cultural features that may be pertinent to the purpose of the map.

PREFERRED ALTERNATIVE – Is the recommended alternative put forth no later than the FEIS (Final Environmental Impact Statement). A recommended Preferred Alternative can be identified in the DEIS (Draft Environmental Impact Statement).

PROJECT SCHEDULE – Grouping of interconnected activities that together, form the basis of a project schedule. During the life of a project, networks are used for planning, analyzing and controlling as well as monitoring schedules, dates and resources. The five types of standard networks include Document Preparation, Preliminary Plans, Final Plans, Right-Of -Way Acquisition, and Bid and Award.

PROJECT SCOPE – States what will and will not be included as part of the project.

PROJECT STaRS – Project Scheduling Tracking and Reporting System, which replaces the PMII name. This provides NCDOT management, planners and design engineers with access to project status information and reporting during the planning and design of TIP projects.

PUBLIC INFORMATION PROGRAM – process through which government utilizes various methods to notify the public about upcoming lane closures, including media advisories sent statewide and to local media, local businesses, etc.

NCDOT – North Carolina Department of Transportation is responsible for building, repairing, and operating highway, bridges, and other modes of transportation, including ferries in the U.S. state of North Carolina.

NCMIN – the North Carolina Multimodal Investment Network (NCMIN) is a tool used to clarify all the components, facilities, and modes of North Carolina's transportation system. Components of the network are typically classified on the basis of how each contributes to serving a particular type of transportation movement. Some facilities serve *Statewide* movements, while others are *Regional* in terms of the service they provide, while still others are *Subregional* (localized). This classification also associates the increasing level of state (NCDOT) or local interest in various facilities. All transportation facilities, regardless of ownership and mode, are included in the Multimodal Investment Network. Each facility is classified into one of three tiers (groups): Statewide, Regional, or Subregional. Each tier has distinct features that define how facilities function, the type of travel they serve, and other measures like connectivity and usage. *Statewide Tier* facilities serve long-distance trips, connect regional centers, have the highest usage, and mostly provide a mobility function (as opposed to a land access function). *Regional Tier* facilities connect major population centers and have a mix functions. Some of the Regional Tier facilities can be viewed as serving statewide transportation criteria, but they usually provide an unmistakable localized function. They are equally important to a particular region of the state and also provide some land access. *Subregional Tier* facilities serve localized movements. They provide more of an access function than mobility, and are of a higher interest to cities and counties than the state.

NETWORK – Links in which you want to use the travel demand model to predict volumes and solve transportation problems.

NOTICE OF INTENT (NOI) – The Notice of Intent (NOI) is an announcement to the public and to interested agencies that a project is being developed and that an EIS (Environmental Impact Statement) will be prepared. It briefly describes the Study Area, the proposed action, its proposed purpose and need, the agency's proposed public scoping process, and identifies the name and address of the agency contract person.

O

OFFSET – a lateral distance from edge of traveled way to a roadside object or feature.

OPERATING SPEED – the highest speed at which reasonably prudent drivers can be expected to operate vehicles on a section of highway under low traffic densities and good weather. This speed may be higher or lower than posted or legislated speed limits or nominal design speeds where alignment, roadside development, or other features affect vehicle operations.

PUBLIC INVOLVEMENT – Process through which government communicates with its stakeholders using a series of products, tools, documents, and outreach opportunities.

PUBLIC HEARING – The meeting designed to afford the public the fullest opportunity to express opinions regarding a transportation project. A verbatim record (transcript) of the proceedings is made part of the project record.

PUBLIC MEETING – an announced meeting conducted by the convening agency designed to facilitate participation in the decision making process and to assist the public in gaining an informed view of a proposed project at any level. Can be referred to as a public information meeting.

PUBLIC TRANSPORTATION – Transportation by bus, rail (commuter or light), ferry or other transport, either publicly or privately owned, which is provided to the public or specialty service on a regular and continuing basis.

Q

QUEWZ – 98 – is a microcomputer analysis tool for planning and scheduling use in freeway work zone lane closures. It analyzes traffic conditions on a freeway segment with and without a lane closure in place and provides estimates of the additional road user costs and of the queuing resulting from a work zone lane closure. The road user cost calculated includes travel time, vehicle operating costs, and excess emissions.

R

RIGHT OF WAY (ROW) / (R/W) – A public or private area that allows the passage of people or goods, including, but not limited to, freeways, streets, bicycle paths, alleys, trails and walkways. A public right-of-way is dedicated or deeded to the public entity for use under the control of a public agency.

REGIONAL TIER - facilities connecting major population centers and have a mix of functions. Some of the Regional Tier facilities can be viewed as serving statewide transportation criteria, but they usually provide an unmistakable localized function. They are equally important to a particular region of the state and also provide some land access.

S

SAP R/3 – Enterprise department-wide software used for business integration. SAP stands for Systems Applications and Products (in data processing). Worldwide corporation headquartered in Germany.

SCALE – the measurement (length) used on a set of plans to represent a larger measurement. For instance, 1 inch may represent 100 feet in a set of plans.

SCOPING – The process of establishing the principal issues to be addressed in an environmental impact assessment.

SCOPING DATA – Principal issues addressed in an environmental impact assessment.

SHOULDER – the portion of roadway adjacent to the traveled surface for accommodation of stopped vehicles for emergency use, and for lateral (side) support of base and surface courses.

SHY DISTANCE – the distance from the edge of the traveled way beyond which a roadside object will not be perceived as an obstacle by the typical driver to the extent that the driver will change the vehicle's placement or speed.

SIGNIFICANT IMPACTS – Any number of social, environmental, or economic effects or influences which may be brought about as a result of the implementation of a transportation improvement. "Significant impacts" may include effects which are direct, secondary, or cumulative. The term "significant" is used and interpreted to determine which type of NEPA (National Environmental Policy Act) document is appropriate. Categorical Exclusions (CE) are those actions which do not involve significant effects. Environmental Impact Statement projects in most cases can and do involve significant impacts.

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

SIGHT DISTANCE – the length of roadway visible to the driver of a vehicle at any given point on the roadway when the view is unobstructed; that area or property designated on the plans to be acquired for sight distance purposes in order to ensure the driver an unobstructed view.

STAKEHOLDERS – Individuals, communities, government agencies, private organizations, non-governmental organizations, and other's having an interest or "stake" in both the process and outcomes of a project.

STATE FORCES – employees of the State who are responsible for performing highway maintenance work and contract work which is not included as part of the contractor's duties and obligations.

STATEWIDE TIER - facilities that serve long-distance trips, connect regional centers, have the highest usage, and mostly provide a mobility function (as opposed to a land access function).

SUBREGIONAL TIER - facilities that serve localized movements. They provide more of an access function than mobility, and are of a higher interest to cities and counties than the state.

SURFACE COURSE – the top layer of the pavement structure.

T

THE WORK ZONE SAFETY AND MOBILITY RULE (RULE) - was published on September 9, 2004, in the Federal Register. All state and local governments that receive federal-aid funding were required to comply with the provisions of the rule no later than October 12, 2007. The Rule updates and broadens the former regulation at 23 CFR 630 Subpart J to address more of the current issues affecting work zone safety and mobility. The changes to the regulation encourage broader consideration of the safety and mobility impacts of work zones across project development, and the implementation of strategies that help manage these impacts during project delivery.

TITLE SHEET – the front sheet on a set of plans which describes the project, shows the location of the project, gives the general layout of the project, and other information (always sheet No.1 in a set of plans).

TRAFFIC CALMING MEASURE – includes speed bumps, traffic islands, roundabouts, etc. Their purpose is to slow motorized traffic, primarily on residential streets.

TRAFFIC CONTROL DEVICES –all signs, signals, markings and devices placed on, over, or adjacent to a street or highway by authority of a public body or official jurisdiction to regulate, warn, or guide traffic.

TRANSPORTATION IMPROVEMENT PROGRAM (TIP) – The State Transportation Improvement Program (STIP) is the document showing the transportation projects expected to occur over the next seven years.

TRANSPORTATION MANAGEMENT PLAN (TMP) - a TMP lays out a set of strategies for managing the work zone impacts of a project. Because work zone objectives, needs, and issues vary from project to project, the scope, content, and degree of detail in a TMP will also vary from project to project. It is ultimately up to the agency to establish and implement TMPs that best serve the mobility and safety needs of the motoring public, construction workers, businesses, and community.

The Work Zone Safety and Mobility Rule states that for significant projects the State shall develop a TMP that consists of a Temporary Traffic Control (TTC) plan and addresses both Transportation Operations (TO) and Public Information (PI) components. For individual projects or classes of projects that the State determines to have less than significant work zone impacts, the TMP may consist only of a TTC plan. However, states are encouraged to also consider TO and PI issues for these projects.

TYPICAL SECTIONS – A Section of a road that shows exactly what the road should look like after it is constructed. It includes the type and thickness of the base and surface materials, the crown, super elevation, ditch, slope, cut slope, fill slope, and all horizontal widths of components, such as surface, shoulders, and ditches.

TEMPORARY SHORING – for maintenance of traffic is defined as "that shoring necessary to provide lateral support to the side of an excavation or embankment parallel to an open travelway when a theoretical 2:1 or steeper slope from the bottom of the excavation or embankment intersects the existing ground line closer than five feet from the edge of pavement of an open travelway."

U

USER COST – are "indirect" expenses incurred by the motoring public due to highway project work. These costs generally occur due to the following:

- Delays caused by lane and road closures.
- Additional miles traveled due to off-site detours.

V

V – (velocity) design speed

W

WORK ZONE – any continuous tract or area of a roadway in which construction or maintenance is being performed.

Y

-Y- LINE – secondary or side street alignment chain designation intersecting the main line –L- within a set of roadway design plans.