

**NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION**



**GUIDELINES**  
FOR  
IMPLEMENTATION OF THE  
WORK ZONE SAFETY AND MOBILITY POLICY  
PLANNING, DESIGN, CONSTRUCTION & MAINTENANCE

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## **GOALS, OBJECTIVES, AND STRATEGIES TO BE CONSIDERED FOR ALL PROJECTS**

**Goal A:        Implement requirements of the Work Zone Safety and Mobility Policy (23 CFR 630 Subpart J)**

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**Objective 1:    Consider work zone impact during TIP development**

- Revise existing “Feasibility Study” Process to account for work zone impacts, such as network impacts
- Consider appropriate project selection, project scope, and project limits

**Objective 2:    Consider work zone impact during project/activity planning**

- Identify “Significant” projects per develop process and criteria
- Revise existing project planning/activities process to account for work zone impacts, such as network impacts, identification of “Significant” projects/activities by considering other adjacent projects
- Establish default traffic management strategies
- Consider funding for traffic management strategies early in the process
- Coordinate work zone activities with IM (Incident Management) during planning

**Objective 3:    Consider work zone impact during design**

- Develop TMP for all projects/activity
- Establish a process during design to follow up on traffic management strategies that were determined in planning
- Formalize design guidelines for temporary traffic patterns
- Consider impacts of geometric design on traffic management operations during and after construction
- Incorporate value engineering earlier in design
- Anticipate construction and maintenance needs during design, such as, full depth shoulders and adjacent or future projects
- Provide the most accurate contract duration estimate
- Consider internal and external constructability reviews on all significant projects
- Allow more flexibility to the contractor to increase productivity
- Coordinate work zone activities with IM (Incident Management) during design

**Objective 4:    Consider work zone impact during construction**

- Implement, monitor, and revise (if necessary) TMP strategies (including Division Activities)
- Coordinate work zone activities with Incident Management during construction

**Goal B:        To promote an agency culture committed to the Work Zone Safety and Mobility Policy**

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**Objective 1:    Promote organizational awareness by educating staff on how decisions made in their respective work unit’s affect the success of the WZ Safety and Mobility Policy**

- Develop a program or method to educate staff at all levels on the policy
- Participate in national committees
- Host national or regional work zone safety conferences
- Document and share initiatives and successes nationally
- Develop a program or method to educate staff on how their timely decisions affect work zone safety and mobility, construction duration, and cost

**Goal C: To provide safe work zones for workers and road users**

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**Objective 1: Utilize ITS and enforcement strategies to enhance safety**

- Use Smart Work Zone Technology to monitor traffic flow and adjust traffic strategies
- Establish criteria for effective law enforcement in the work zone
- Use permanent ITS devices/programs more efficiently and cost effectively

**Objective 2: Provide a safe design with the work zone in mind**

- Establish criteria for the use of positive separation in work zone
- Establish guidelines for drop off protection
- Establish bike and pedestrian mobility policy in work zones
- Analyze crash history in the network and provide corrective measures

**Objective 3: Provide a continuously safe work zone environment**

- Monitor and maintain work zone devices
- Establish procedures for setting speed limits in work zones
- Continue to conduct safety meetings (tailgate meetings)
- Include Incident Management Plan (IM) as part of TMP for significant projects
- Conduct investigations where repetitive incidents occur, implement improvements where appropriate

**Objective 4: Reduce Crashes in Work Zones**

- Evaluate work zone crash data to establish work zone strategies and procedures that reduce crashes in work zones
- Analyze and consider pre-work zone crash data in TMP design

**Goal D: To consider mobility and access in work zones to minimize impact to users**

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**Objective 1: Utilize innovative technology in work zones to enhance mobility**

- Establish guidelines to match technology with work zone strategy
- Provide proactive “Real-time” Regional and Statewide notifications for significant projects, such as real time information to DMS, Welcome Centers, Trucking Association, etc.
- Utilize project website to enhance mobility

**Objective 2: Minimize delays and reduce congestion in work zones**

- Consider IMAP for “Significant” Projects
- Provide the road users with adequate access to business and residences while balancing the efficiency of the work zone
- Monitor work zones
- Establish state wide criteria for delays or queue lengths(thresholds)

**Goal E: To advocate innovative thinking in work zone planning, design, and management**

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**Objective 1: Consider alternative/innovative design, construction, contracting, and transportation management strategies to emphasize “Get In, Get Out, Stay Out” mentality**

- Consider the use of innovative design strategies, contracting techniques, materials, and construction methods
- Provide the contractor adequate access to the project to expeditiously complete the work
- Select the innovative traffic management strategy for the construction duration and work zone impacts to meet stakeholder needs
- Improve accessibility to electronic project files/data for all affected parties

**Objective 2: Minimize third party delay on letting and construction of projects**

- Update current Utility, Rail, and Utility Right of Way policies, procedures, specifications, and design manuals
- Include Utility, Rail, Municipality, and Right of Way coordination early in the planning process
- Investigate innovative ideas to minimize and eliminate 3<sup>rd</sup> party conflicts

**Goal F: To improve credibility/compliance of work zones**

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**Objective 1: Provide and disseminate useful and essential information**

- Utilize ITS (Smart Work Zone Technology, permanent DMS) to provide proactive and accurate “Real-time” information
- Establish a project identity when applicable for significant projects
- Include Public Information (PI) component as part of Transportation Management Plan (TMP)
- Coordinate work zone activities within the network to avoid conflicts
- Develop strategies to enforce compliance by activity owner’s (agencies, contractor, utilities, etc) with signing requirements
- Ensure useful information is generated and entered into existing databases that capture construction activities

**Objective 2: Provide consistency among all work zones**

- Require Work Zone Qualification and Training
- Establish a standardized method for determining lane closure and holiday restrictions
- Require the Contractor to provide a certified Traffic Control Inspector
- Use work zone signing only when work zone could be affecting traffic
- Develop strategies to enforce compliance with signing requirements

**Objective 3: Provide responsive customer service during the entire project delivery process to both internal and external customers**

- Provide timely responses to customers regarding work zones and work zone impacts
- Establish and maintain a project website for Significant Projects to provide information to the public

**Goal G: To continuously assess and improve work zone strategies, practices, and procedures**

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**Objective 1: Assess, document, and implement successful strategies**

- Solicit feedback and suggestions from field engineers and contractors to improve design policies
- Solicit feedback from law enforcement, road users, and municipalities

**Objective 2: Conduct project performance assessment and process reviews**

- Regularly conduct “Windshield Review” of active construction project work zones
- Conduct safety inspections/audits as needed to address specific problems that occur
- Utilize the FHWA Work Zone Self Assessment Program to evaluate the Department policies and programs
- Conduct process review to assess wide scale performance of work zones with the goal of improving work zone processes and procedures and develop strategies to address non-compliance

**Objective 3: Provide and disseminate essential temporary traffic control design information to traffic control professionals**

- Develop communication strategy to inform traffic control professionals
- Develop and implement a plan for training for traffic control professionals
- Develop Traffic Control Design Manual an

## PROJECT LEVEL PROCESS/EXPECTATIONS & OWNERS

### Goal A: Implement requirements of the Work Zone Safety and Mobility Policy (23 CFR 630 Subpart J)

Objective 1: Consider work zone impact during TIP development	OWNERS	
	Lead Unit:	Units affected:
<p><b>Revise existing “Feasibility Study” process to account for work zone impacts, such as network impacts</b>                      The intent is for work zone impacts to be identified early on in the process so that funding can be obtained for any strategies that may be used for traffic. Some of the processes may include:</p> <ul style="list-style-type: none"> <li>• FSU will coordinate with WZTCU (to include municipalities) to identify the significant projects and network impacts</li> <li>• FSU and WZTCU will create a checklist of items that are asked at each feasibility scoping meeting</li> <li>• WZTCU and FSU could work together to determine percentage of cost per project type</li> </ul>	FSU	WZTCU
<p><b>Consider appropriate project selection, project scope, and project limits</b>                      The intent is to minimize the impact on the users by proper sequencing and coordinating projects within the transportation network. Some of the processes may include:</p> <ul style="list-style-type: none"> <li>• FSU will coordinate with others to validate the project scope and project limits</li> <li>• TIP Unit will coordinate with others to determine the proper sequencing of project in an transportation network</li> </ul>	FSU/TIP Unit	
Objective 2: Consider work zone impact during project/activity planning	OWNERS	
	Lead Unit:	Units affected:
<p><b>Identify “Significant” projects/activities per developed process and criteria</b>                      The intent is to establish a project identity for significant projects/activities at the planning stage that is consistent through the delivery of the project and transfers from planning to design to construction. Some of the processes may include:</p> <ul style="list-style-type: none"> <li>• Need a required field in PMii</li> <li>• Establish a project website for “Significant” projects to provide and exchange information to participants in the delivery system</li> <li>• A procedure for how this process will work (Significant Projects Subcommittee working on process for DIV projects)</li> </ul>	PDEA (TIP) DIV (Activities)	TPB
<p><b>Revise existing project planning/activities process to account for work zone impacts, such as network impacts, identification of “Significant” projects/activities by considering other adjacent projects</b>                      The intent is to update the project planning process to account for work zone impacts. For TIP projects, processes may include:</p> <ul style="list-style-type: none"> <li>• WZTCU needs to create an internal process to identify work zone impacts</li> <li>• Clarify how work zone impacts affect the environmental resources (construction noise?)</li> <li>• May affect PMii</li> <li>• Determine what role this would play during a public hearing meeting</li> <li>• Consider contract duration at the planning scoping stage</li> <li>• Identify all stakeholders that could impact coordination issues such as, utilities, enforcement, communities, etc</li> <li>• Update process to include municipalities and utility companies as stakeholders</li> <li>• WZTCU to coordinate with IM to determine strategies and add IM to the checklist that PDEA addresses in the planning process</li> <li>• Consider condition of adjacent roadways in planning stage</li> <li>• Include traffic control commitments in the planning document</li> <li>• Use construction year traffic count for significant projects</li> <li>• Select the appropriate traffic management strategy for the construction duration and work zone impacts to meet stakeholder needs</li> </ul> <p>For Division Activities, processes may include:</p> <ul style="list-style-type: none"> <li>• Minimize the impact on the users by proper sequencing and coordination of projects within the transportation network</li> <li>• Create an internal process to identify work zone impacts</li> <li>• Clarify how work zone impacts affect the environmental resources (construction noise?)</li> </ul>	PDEA(TIP) DIV (Activities)	WZTCU/RDU/DIV

<p><b>Establish default traffic management strategies</b>  The intent is to establish default traffic management strategies per project/activities type based on impacts that are then refined to be project/activity on a project-by-project/activity-by-activity basis. Some of the processes may include:</p> <ul style="list-style-type: none"> <li>• WZTCU to write the guidelines</li> <li>• FSU &amp; PDEA (DIV) to implement the strategies</li> <li>• WZTCU &amp; PDEA (DIV) needs to develop a decision matrix for how to determine the traffic management strategies and fund them</li> </ul>	PDEA (TIP) DIV (Activities)	WZTCU
<p><b>Consider funding for traffic management strategies early in the process</b>  The intent is to be sure that the funding adequately accounts for traffic management strategies. Some of the processes may include:</p> <ul style="list-style-type: none"> <li>• Coordinate project/activity with any statewide ITS strategic plan</li> <li>• Consider some of the strategies such as Transportation Management Centers, IMAP, ITS device deployments (ramp metering, weather stations, smart work zones, cameras, message signs, etc.)</li> </ul>	PDEA/TIP Unit(TIP) DIV (Activities)	WZTCU /PS/ITS
<p><b>Coordinate work zone activities with Incident Management (IM) during planning</b>  The intent is to assess how BOTH the work zone and the ultimate roadway improvement, during the planning process, would impact IM so that design features and their associated costs could be factored into the project/activity. Some of the processes may include:</p> <ul style="list-style-type: none"> <li>• ITS Ops/ DIV IM develop a checklist to help planners make this assessment. Sample IM features: enforcement and accident investigation areas, IMAP, incident detection or cameras, towing, alternative access points for emergency vehicles, etc</li> <li>• Determine the use of permanent devices in the work zone</li> </ul>	PDEA (TIP) DIV (Activities)	WZTCU/ITS Ops/RDU/Division ITS

**Objective 3: Consider work zone impact during design**

	OWNERS	
	Lead Unit:	Units affected:
<p><b>Develop TMP for all projects/activity</b>  The intent is to develop a TMP for all projects/activities. WZTCU &amp; IMPACT (DIV) will coordinate to develop the TMP.</p>	WZTCU(TIP) DIV (Activities)	IMPACT
<p><b>Establish a process during design to follow up on traffic management strategies that were determined in planning</b>  The intent of this strategy is to conduct a more detailed design level assessment of the work zone impacts of individual projects and develop appropriate TMPs. Some of the processes may include:</p> <ul style="list-style-type: none"> <li>• Assess work zone impacts of the project through the various design iterations.</li> <li>• Consider alternative design, construction, contracting, and transportation management strategies in the assessment of WZ impacts.</li> <li>• Select appropriate transportation management strategies that will help manage the work zone impacts of the project.</li> <li>• Develop TMPs based on the selected/determined strategies.</li> <li>• Include appropriate TMP items in plans, specifications, and estimates (PS&amp;Es) for the project. (FHWA Brochure)</li> <li>• Coordinate with stakeholders identified in planning or identify new stakeholders (IM meeting, community meetings, etc)</li> </ul>	WZTCU (TIP) DIV (Activities)	
<p><b>Formalize design guidelines for temporary traffic patterns</b>  The intent is to implement a traffic control design manual. Some of the topics that may be included, but not limited to:</p> <ul style="list-style-type: none"> <li>• Lane closure restrictions</li> <li>• Road closure restrictions</li> <li>• Minimum lane widths</li> <li>• Minimum shoulder widths</li> <li>• Minimum deceleration lane lengths (capacity)</li> <li>• Minimum acceleration lane lengths (merging)</li> <li>• Ramp closure restrictions</li> <li>• Set threshold for queue lengths during construction.</li> </ul>	WZTCU	RDU/TEB/CU/DIV (DDC)
<p><b>Consider impacts of geometric design on traffic operations during and after construction</b>  The intent is to develop guidelines to make the geometric design fit better with the construction staging and maintenance of traffic on a project. These guidelines might include:</p> <ul style="list-style-type: none"> <li>• Keep proposed grade as close to existing as possible</li> <li>• Symmetrical vs. asymmetrical design</li> <li>• Identify need for on or off-site detours, run-arounds, and cross-overs</li> </ul>	RDU (TIP) DIV (Activities)	WZTCU

<b>Objective 3: Consider work zone impact during design</b>	<b>OWNERS</b>	
	<b>Lead Unit:</b>	<b>Units affected:</b>
<ul style="list-style-type: none"> <li>Phasing of structures to accommodate temporary traffic patterns</li> <li>Should occur each time a design (preliminary, final) is performed</li> <li>Effects of positive protection</li> </ul>		
<b>Incorporate value engineering earlier in design</b> The intent is to alter the current procedure to incorporate value engineering (peer review) earlier in the design process to develop a more effective and efficient design.	ADU	All Preconstruction
<b>Anticipate construction and maintenance needs during design, such as, full depth shoulders and adjacent or future projects</b> The intent is to develop a procedure to solicit Division feedback to improve constructability, improve maintenance, and minimize work zone impacts on future projects and activities. <ul style="list-style-type: none"> <li>Identify what information is needed from the Division.</li> </ul>	RDU (TIP) DIV (Activities)	WZTCU/DIV
<b>Provide the most accurate contract duration estimate</b> The intent of this strategy is to match the contract duration to the traffic management strategy. <ul style="list-style-type: none"> <li>Determine the contract duration earlier in the design process to match the chosen traffic management strategy.</li> </ul>	PS (TIP) DIV (Activities)	RDU/ WZTCU/ CU/ADU
<b>Consider internal and external constructability reviews on all significant projects</b> The intent is to develop a process to incorporate internal and external (Contractors) constructability reviews on all significant projects.	ADU (TIP) DIV (Activities)	WZTCU/ CU
<b>Allow more flexibility to the contractor to increase productivity</b> The intent of this strategy is to allow the Contractor more flexibility by choosing adaptable designs as it relates to constructability. <ul style="list-style-type: none"> <li>Consider performance-based specifications and contracts.</li> </ul>	CU (TIP) DIV (Activities)	WZTCU/PS/ DIV
<b>Coordinate work zone activities with Incident Management during design</b> The intent is to evaluate incident management needs during construction and incorporate needs into the traffic control phasing. <ul style="list-style-type: none"> <li>There would be an evaluation of IM issues during design so that specific features of the work zone and completed project would improve or at least not degrade Incident Management in the area. (See Goal A, Objective 2 for list of possible IM elements.)</li> </ul>	WZTCU (TIP) DIV (Activities)	RDU/ ITS Ops/ DIV

<b>Objective 4: Consider work zone impact during construction</b>	<b>OWNERS</b>	
	<b>Lead Unit:</b>	<b>Units affected:</b>
<b>Implement, monitor and revise (if necessary) TMP strategies (including Division Activities)</b> The intent of this strategy is to implement procedures to ensure project commitments are being met and information going out to the public is accurate, timely, and consistent. These procedures may include: <ul style="list-style-type: none"> <li>Regular Safety and Operations Meeting with Contractor, Division, WZTC, NCSHP, IMPACT, and Traffic Safety</li> <li>Providing adequate DOT (or 3<sup>rd</sup> party contractor) staff and equipment to run a TMC or an IMAP program on significant projects.</li> <li>Documented expectations for traveler information and IM.</li> <li>Review and analyze traffic flow and accident data on regularly scheduled intervals during the life of the work zone , recommend, and implement improvements.</li> <li>Coordinate with stakeholders identified in planning and design or and new stakeholders identified at later stages, for example, Safety and Operations Meeting</li> </ul>	DIV	WZTCU/ CU/ DIV/ ITS Ops
<b>Coordinate work zone activities with Incident Management during construction</b> The intent of this strategy is to implement, monitor, assess, and revise incident management strategies developed during design. This could include: <ul style="list-style-type: none"> <li>Work through local Interagency Incident Management Teams (or creating them where they do not exist); continually share and evaluate the work zone for its ability to support good Incident Management. Ensure that after incident, reviews are held that includes the Contractor and DOT Construction staff.</li> <li>Regular Safety and Operations Meeting with Contractor, Division, WZTC, NCSHP, Impact, Traffic Safety</li> </ul>	DIV	CU/CU/ CU/ DIV/ ITS Ops

**Goal B: To promote an agency culture committed to the Work Zone Safety and Mobility Policy**

Objective 1: Promote organizational awareness by educating staff on how decisions made in their respective work unit's affect the success of the WZ Safety and Mobility Policy	OWNERS	
	Lead Unit:	Units affected:
<b>Develop a program or method to educate staff at all levels on the policy</b> The intent is to develop a program to educate staff at all levels on the policy. Make the policy available to all levels.	Committee	T&D/CU/All
<b>Participate in national committees</b> The intent is to participate in national committees and share and gain information.	WZTCU	
<b>Host national or regional work zone safety conferences</b> The intent is to host a national work zone safety conference to share and gain pertinent information.	WZTCU	
<b>Document and share initiatives and successes nationally</b> The intent is to document and share initiatives and successes nationally.	WZTCU	CU/IT/All
<b>Develop a program or method to educate staff on how their timely decisions affect work zone safety and mobility, construction duration, and cost</b> The intent is to develop a program to educate staff on how their timely decisions affect WZ S&M, construction duration, and cost.	WZTCU	CU/T&D/All

**Goal C: To provide safe work zones for workers and road users**

Objective 1: Utilize ITS and enforcement strategies to enhance safety	OWNERS	
	Lead Unit:	Units affected:
<b>Use Smart Work Zone Technology to monitor traffic flow and adjust traffic strategies</b> The intent is to monitor traffic operation within work zone and networks using smart zone technology. Some of the processes may be: <ul style="list-style-type: none"> <li>Encourage the integration of SWZ into existing ITS.</li> <li>Use permanent ITS in lieu of temporary devices where applicable, assuming that the long-range strategic goals and the short term ITS work zone strategies are compatible.</li> <li>Define goals and performance measures of SWZ. Monitor, evaluate, and modify operations during life of WZ.</li> </ul>	WZTCU	CU/ ITS Ops/ITS
<b>Establish criteria for effective law enforcement in the work zone</b> The intent is to establish guidelines for matching law enforcement strategy to type of work zone. Examples would include Operation Yellow Jacket and Drone Car. Strategies would include: <ul style="list-style-type: none"> <li>Coordinate with law enforcement by evaluating and prioritizing our project needs for enforcement needs and keep updated</li> <li>Coordinate with law enforcement agencies to develop a program to familiarize them with work zone safety (Target audience is local law enforcement agencies...sheriff, municipalities, DMV, etc)</li> <li>Work with local Interagency Incident Management Team</li> </ul>	CU	SHP/WZTCU/DIV
<b>Use permanent ITS devices/programs more efficiently and cost effectively</b> <b>TABLED until we Talk with Kelly about this strategy and see how/if it fits into the first strategy under this objective or how it relates to work zones.</b> - Use all available permanent ITS devices and statewide Traveler Information tools (TIMS/511) approaching work zones or logical diversion points. Have more real time information on ITS Devices and TIMS/511. (Possible strategy: Tie TIMS to HiCams, create Chief Engineer's Performance Measure, etc.) Do we/how do we make sure traffic signal systems are proactively optimized on detour or likely alternative routes during work zone. (Damron)	ITS Ops	ITS/WZTCU/DIV

**Objective 2: Provide a safe design with the work zone in mind**

	OWNERS	
	Lead Unit:	Units affected:
<p><b>Establish criteria for the use of positive protection in work zone</b>                      The intent is to be consistent in the use of the appropriate positive protection. The WZTCU is already working on the criteria for this strategy. This criteria goes hand in hand with the drop off policy. This strategy applies to all projects, applies to maintenance, and is measured by a establishing criteria and using it.</p>	WZTCU	DIV
<p><b>Establish guidelines for drop off protection</b>                      The intent is to be consistent in the use of drop off protection measures. This strategy applies to all projects, applies to maintenance, and is measured by establishing criteria and using it.</p>	WZTCU	DIV
<p><b>Establish bike and pedestrian mobility policy in work zones</b>                      The intent is to comply with the MUTCD requirements for maintenance of pedestrians and bike traffic in the work zone. This strategy applies to all projects, applies to maintenance, and is measured by a establishing criteria and using it.</p>	WZTCU	DIV, TEB, RDU, STUCTURES, PDEA, PEDS&BIKES
<p><b>Analyze crash history in the network and provide corrective measures</b>                      The intent is to look into problem areas on the project and within the network and correct them when appropriate. As a process the fatal investigations completed by the RTEs are copied to Stuart.</p>	WZTCU	TEB, RDU

**Objective 3: Provide a continuously safe work zone environment**

	OWNERS	
	Lead Unit:	Units affected:
<p><b>Monitor and maintain work zone devices</b>                      The intent of this strategy is to create a checklist for inspectors to monitor work zone devices and minimum performance standards for devices. This applies to all projects and includes maintenance. It is measured by a checklist and developing the standards.</p>	WZTCU (procedure) DIV (maintain)	DIV
<p><b>Establish procedures for setting speed limit in work zones</b>                      The intent is to standardize the way we set speed limits in work zones. One procedure would include establish criteria for speed limit reduction in work zone.</p>	WZTCU	TEB/DIV
<p><b>Continue to conduct safety meetings (tailgate meetings)</b>                      The intent is to emphasis the importance of conducting safety meetings and promotes day to day safety discussions.</p>	S&L/DIV	CU/Field units(L&S, Traffic Survey, etc)
<p><b>Include Incident Management Plan (IM) as part of TMP for significant projects</b>                      The intent is to develop a plan from the IM elements that were identified in planning and design for significant projects.</p>	ITS Ops	WZTCU /DIV
<p><b>Conduct investigations where repetitive incidents occur, implement improvements where appropriate</b>                      The intent is to identify problematic locations and make recommendations to implement improvements. A process needs to be set up so that the right people are involved. Some of the processes could include:</p> <ul style="list-style-type: none"> <li>• Set threshold of crashes and investigate crashes that exceed threshold</li> <li>• Incidents that affect the travel way and impacts traffic within the work zone will be logged into TIMS and can be paged out to relevant subscribers for significant projects</li> <li>• Incidents needs to be defined and could include crashes, congestion, etc.</li> </ul>	DIV	S&L/WZTCU

**Objective 4: Reduce Crashes in Work Zones**

	OWNERS	
	Lead Unit:	Units affected:
<p><b>Evaluate work zone crash data to establish work zone strategies and procedures that reduce crashes in work zones</b>                      The processes would include:</p> <ul style="list-style-type: none"> <li>• <b>Improve method of collecting work zone crash data, This could include:</b> <ul style="list-style-type: none"> <li>- Determine where we need to focus our efforts by identifying the type of work zone (TIP/Maintenance/Utility/3<sup>rd</sup> party)</li> <li>- Accurately identify severity of crash for each work zone crash</li> <li>- Coordinate with Traffic Ops to find the best use for TIMS</li> <li>- Possibly modify form for collecting information</li> <li>- Coordinate with law enforcement to obtain and collect crash data</li> <li>- Flow chart of who uses the data collected</li> </ul> </li> <li>• <b>Develop a process to routinely analyze work zone crashes and operational data on projects</b> <ul style="list-style-type: none"> <li>- Modify plans as needed</li> <li>- Update any policies/procedures as needed</li> <li>- Coordinate with Traffic Ops to find the best use for TIMS</li> <li>- Develop a database with project level information for analysis</li> </ul> </li> </ul>	TEB/WZTCU	WZTCU/ITS Ops/Other units may be affected
<p><b>Analyze and consider pre-work zone crash data in TMP design</b>                      The intent is to analyze crash history on corridor, alleviate any deficiencies, and incorporate into successive stages and final design. One process could be to Develop checklist for road safety audit</p>	WZTCU (TIP) DIV (Activities)	TEB/DIV

**Goal D: To consider mobility and access in work zones to minimize impact to users**

**Objective 1: Utilize innovative technology in work zones to enhance mobility**

	OWNERS	
	Lead Unit:	Units affected:
<p><b>Establish guidelines to match technology with work zone strategy</b>                      Technology could include using ITS (dynamic lane merge, Smart Work Zone) and match technology with work zone strategies</p> <ul style="list-style-type: none"> <li>• Consider keeping technology in place after project is over – don't just lease</li> <li>• Implement and effectively use strategies identified in planning and design phases.</li> <li>• Establish performance measures to assess effectiveness</li> </ul>	WZTCU	CU/ ITS Ops/ITS/DIV
<p><b>Provide proactive "Real-time" Regional and Statewide notifications for significant projects, such as real time information to DMS, Welcome Centers, Trucking Association, etc.</b>                      The intent is to provide accurate real-time information to motorist so that they can make informed decisions. This could include: Improving quality, timeliness and credibility of TIMS entries will significantly improve this, since TIMS entries can help generate other ITS messages. With implementation of the 24x7x365 NCDOT Statewide TO Center in Jan 2007 we could treat work zones (both Construction &amp; Maintenance) just like we treat accidents and provide the same level of local, regional, statewide, or multi-state traveler information for "significant" work zones. (See "Special Alert Checklist for list of real time traveler information strategies.</p>	ITS Ops (TIP) DIV (Activities)	CU/WZTCU/DIV
<p><b>Utilize project website to enhance mobility</b></p> <ul style="list-style-type: none"> <li>• Establish a project website for "Significant" projects to provide and exchange information to participants in the delivery system</li> <li>• This website is for internal use</li> <li>• PDEA to begin but would affect all design units</li> <li>• TDSS Transportation Decision Support System may be already working on this</li> </ul>	OEQ/ IT (TIP) DIV (Activities)	Project Manager/PDEA/All Design Units/ DIV

**Objective 2: Minimize delays and reduce congestion in work zones**

	OWNERS	
	Lead Unit:	Units affected:
<p><b>Consider IMAP for “Significant” Projects</b>                      The intent is to establish criteria IMAP type services for significant projects to reduce incident duration and prevent secondary crashes. This could include:</p> <ul style="list-style-type: none"> <li>• Requiring the contractor to provide some type of IMAP services</li> <li>• This may or may not include maintenance projects, depending on funds and existing IMAP services</li> <li>• May be more global, consider network</li> </ul>	ITS Ops	DIV/WZTCU
<p><b>Provide the road users with adequate access to businesses and residences while balancing the efficiency of the work zone</b>                      The intent is to develop programs to balance the accessibility and efficiency of the work zone for all road users. This could include:</p> <ul style="list-style-type: none"> <li>• Implementing a work zone pedestrian and bike access policy</li> </ul>	PDEA (planning) WZTCU (design) DIV (construction)	CU
<p><b>Monitor work zones</b>                      The intent is to monitor work zones for speed, volume, queue lengths, etc and use this information to revise existing or implement new strategies on that project to reduce congestion and delays. Some of the process would include:</p> <ul style="list-style-type: none"> <li>• Establish a process for collecting</li> <li>• Establish a process for analyzing data</li> <li>• Coordinate existing DOT data collecting efforts</li> <li>• Implement the criteria for delay (thresholds)</li> <li>• Use “Speed Info” areas</li> <li>• More detection and self-serve web-based access to it for all DOT customers in real time.</li> <li>• All projects, including maintenance</li> </ul>	DIV	ITS Ops/WZTCU TEB/
<p><b>Establish state wide criteria for delays or queue lengths(thresholds)</b>                      The intent of this strategy is to establish a statewide maximum acceptable delays or queue lengths. Process that may be included:</p> <ul style="list-style-type: none"> <li>• Database for lane closure time restrictions.</li> <li>• Queue lengths may be easier to measure</li> </ul>	WZTCU	TEB

**Goal E: To advocate innovative thinking in work zone planning, design, and management**

Objective 1: Consider alternative/innovative design, construction, contracting, and transportation management strategies to emphasize “Get In, Get Out, Stay Out” mentality	OWNERS	
	Lead Unit:	Units affected:
<p><b>Consider the use of innovative design strategies, contracting techniques, materials, and construction methods</b>                      The intent is to encourage the use of innovative strategies to save time, improve quality, reduce cost, improve safety, and improve mobility. Examples could include: precast pavement slabs, automated speed enforcement, temporary lighting, better retroreflectivity, rumble stripes, delineation, and innovative traffic control devices.</p>	All design units, DIV, etc	Other design units
<p><b>Provide the contractor adequate access to the project to expeditiously complete the work</b>                      The intent is to design the project so the contractor can get to the work faster and to provide the contractor adequate ingress and egress to the project without impeding traffic operation.</p>	WZTCU	DIV
<p><b>Select the innovative traffic management strategy for the construction duration and work zone impacts to meet stakeholder needs</b>                      The intent to match the traffic management strategy to the construction duration and work zone impacts to meet stakeholder needs. Determine when to talk about this and who to involve. Work with the Division to determine the desired project duration and communicate the desired project duration to those determining project duration times. Must be an iterative process.</p>	WZTCU	PS/PDEA/CU/ADU
<p><b>Improve accessibility to electronic project files/data for all affected parties</b>                      The intent is to make plans and documents easily available electronically to facilitate the deliver of the project, possibly a website.</p>	OEQ	IT/File Owners

Objective 2: Minimize third party delay on letting and construction of projects	OWNERS	
	Lead Unit:	Units affected:
<b>Update current Utility, Rail, and Utility Right of Way policies, procedures, specifications, and design manuals</b> The intent is to minimize delays to project completion.	PS/Rail/ROW/Utilities	
<b>Include Utility, Rail, Municipality, and Right of Way coordination early in the planning process</b> The intent is to coordinate with 3 <sup>rd</sup> parties to address possible delays and improve the delivery process.	PDEA (TIP) DIV (Activities)	All other affected units
<b>Investigate innovative ideas to minimize and eliminate 3<sup>rd</sup> party conflicts</b> The intent is to find ways to work with 3 <sup>rd</sup> parties to minimize delays. 3 <sup>rd</sup> party may be environmental agencies, utilities, and railroad. Ideas could include <ul style="list-style-type: none"> <li>• Making utility relocation a pay item</li> <li>• Consider sharing electronic files</li> <li>• Include and use the highest level of Subsurface Utility Exploration (SUE) on all urban significant projects</li> </ul>	PS/Utilities (TIP) DIV (Activities)	

**Goal F: To improve credibility/compliance of work zone**

Objective 1: Provide and disseminate useful and essential information	OWNERS	
	Lead Unit:	Units affected:
<b>Utilize ITS (Smart Work Zone Technology, permanent DMS) to provide proactive and accurate “Real-time” information</b> The intent is to use dynamic ITS to improve compliance in the work zone.	ITS Ops (TIP) DIV (Activities)	WZTCU/CU/DIV/ITS
<b>Include Public Information (PI) component as part of the Transportation Management Plan (TMP)</b> <ul style="list-style-type: none"> <li>• The intent is to comply with the rule for safety and mobility and to provide useful and essential information to the public. This would include developing a process to include PI in the TMP and working with local media.</li> </ul>	WZTCU/CU (TIP) DIV (Activities)	DIV/CO
<b>Establish a project identity when applicable for significant projects</b> The intent is to establish a project identity for significant projects at the planning stage that is consistent through the delivery of the project and transfers from planning to design to construction. This would be part of the PI component of the TMP.	CU/PDEA/DIV (TIP) DIV (Division Activities)	WZTCU/ /DIV/M
<b>Coordinate work zone activities within the network to avoid conflicts</b> The intent is to coordinate work zone activities (construction, maintenance, 3 <sup>rd</sup> party) so that credible information is provided to the motorist. Examples of conflicting activities include detouring traffic into a lane closure, back-to-back lane closures, or providing PI that no lane closures will be in place and maintenance puts in a lane closure.	WZTCU/DIV (TIP) DIV (Activities)	
<b>Develop strategies to enforce compliance by activity owner’s (agencies, contractor, utilities, etc) with signing requirements</b> The intent is to enforce compliance. Issues to be addressed: <ul style="list-style-type: none"> <li>• Use work zone signing only when the activity could be affecting traffic</li> <li>• Remove/ cover signing that does not apply</li> <li>• Ensure that applicable signing is used</li> <li>• Ensure the correct messages are on the CMSs and DMSs</li> </ul>	WZTCU	TEB (Traffic Safety), ITS Ops, RM, DIV, CU, PS (contract time committee), M
<b>Ensure useful information is generated and entered into existing databases that capture construction activities</b> The intent of is to provide accurate real-time information to motorist that is essential and useful. The could be included: <ul style="list-style-type: none"> <li>• Coordinating existing databases that captures on going construction activities on Interstates and US Highways (TIMS, STOC, Construction Progress Database, RTMS, “Speed Info” Areas)</li> </ul>	ITS Ops	WZTCU/CU/DIV/M

Objective 2: Provide consistency among all work zones	OWNERS	
	Lead Unit:	Units affected:
<b>Require Work Zone Qualification and Training</b> The intent is to have proper work zone installation, maintenance, and oversight. This would be a requirement of the Department and the industry. This would include: <ul style="list-style-type: none"> <li>• Require the Contractor to provide a certified Traffic Control Inspector</li> </ul>	WZTCU	TEB, DIV, CU

<b>Objective 2: Provide consistency among all work zones</b>	<b>OWNERS</b>	
	<b>Lead Unit:</b>	<b>Units affected:</b>
<ul style="list-style-type: none"> <li>Education on state industry standards for approved traffic control devices.</li> <li>Educate DOT staff including residents, inspectors, etc about standards and specifications, traffic operations, intent, etc</li> </ul>		
<b>Establish a standardized method for determining lane closure and holiday restrictions</b> <ul style="list-style-type: none"> <li>The intent is to provide a consistent method to determine lane closure and holiday restrictions for all activities within a corridor or network. The system could include: A statewide database that includes predetermined time restrictions on Interstates and US Highways (similar to Maryland and Ohio)</li> <li>Establish a system for issuing lane closure permits for every lane closure</li> <li>Provide exclusion of emergency situations</li> <li>Provide waiver process for noncompliance</li> <li>Provide up to date traffic counts</li> <li>Use construction year traffic count for determining appropriate restrictions</li> </ul>	WZTCU	TEB (Traffic Safety), ITS Ops, CU, DIV, RM, IM, TSU, PS, IT

<b>Objective 3: Provide responsive customer service during the entire project delivery process to both internal and external customers</b>	<b>OWNERS</b>	
	<b>Lead Unit:</b>	<b>Units affected:</b>
<b>Provide timely responses to customers regarding work zones and work zone impacts</b> The intent is to provide an open line of communication between the Department and stakeholders. Consider all target audiences identified during planning and early development stages of TMP strategies.	CU	DIV, CO, WZTCU, ITS Ops
<b>Establish and maintain a project website for Significant Projects to provide information to the public</b> The intent is to provide an open line of communication between the Department and the public and provide credible, timely information to the public. The could possible be linked to TIMS	PDEA	IT, WZTCU, ITS Ops, CU, DIV, CO, PRECON, DDC, OEQ

**Goal G: To continuously assess and improve work zone strategies, practices, and procedures**

<b>Objective 1: Assess, document, and implement successful strategies</b>	<b>OWNERS</b>	
	<b>Lead Unit:</b>	<b>Units affected:</b>
<b>Solicit feedback and suggestions from field engineers and contractors to improve design policies</b> The intent is to evaluate a project after completion to determine lessons learned and implement changes to current policy.	CU/WZTCU	DIV, TEB (RTE), RDU, Other Design Units, ADU
<b>Solicit feedback from law enforcement, road users, and municipalities</b> The intent is to evaluate a project after completion to determine lessons learned and implement changes to current policy.	CU/WZTCU	DIV, ADU

<b>Objective 2: Conduct project performance assessment and process reviews</b>	<b>OWNERS</b>	
	<b>Lead Unit:</b>	<b>Units affected:</b>
<b>Regularly conduct “Windshield Review” of active construction project work zones</b> The intent is to assess the compliance of our policies. The target is on work zone policies.	WZTCU	DIV, CU, ADU, TEB
<b>Conduct safety inspections/audits as needed to address specific problems that occur</b> The intent is to address specific safety concerns on a project. Project for safety audits can be identified during “Windshield review”. Evaluate existing forms. The WZTCU and CU are now using the same forms and sharing audits with each other. May need to include the municipalities in the safety audit review. This should be required on a regular basis for Significant projects. Regular basis is at least once a year and/or when significant phase changes occur.	Committee (procedures) DIV (conduct)	WZTCU, TEB, CU, M, ADU
<b>Utilize the FHWA Work Zone Self Assessment Program to evaluate the Department policies and programs</b> The intent is to effectively participate in and benefit from the FHWA Work Zone Self-Assessment Program. The process would include: <ul style="list-style-type: none"> <li>Develop an action plan to address deficiencies</li> <li>Develop an attendee list of key participants that represent key functional areas in the Department</li> </ul>	WZTCU	

**Objective 2: Conduct project performance assessment and process reviews**

	OWNERS	
	Lead Unit:	Units affected:
<p><b>Conduct process review to assess wide scale performance of work zones with the goal of improving work zone processes and procedures and develop strategies to address non-compliance</b>                      The intent is to evaluate the data from the FHWA Work Zone Self-Assessment Program, Safety Audits, and Windshield Review to improve work zone processes and procedures. The process may include:</p> <ul style="list-style-type: none"> <li>• Develop an action plan to address deficiencies</li> <li>• Define the personnel and rank doing the reviews that include representatives from planning, design, and construction</li> <li>• Waiting on an example of what this requirement means from Joe Giegler</li> <li>• Consider the following for non-compliance:                             <ul style="list-style-type: none"> <li>- Explore making safety one of the bases for prequalification</li> <li>- Explore Leaving lane closure signs then assess liquidated damages</li> <li>- NOV for traffic control</li> <li>- Develop policy for making enforcement consistent (standard methods of enforcement)</li> </ul> </li> </ul>	WZTCU	Planning, Design, and Construction Units

**Objective 3: Provide and disseminate essential temporary traffic control design information to traffic control professionals**

	OWNERS	
	Lead Unit:	Units affected:
<p><b>Develop communication strategy to inform traffic control professionals</b>                      The intent is to evaluate and enhance existing disseminate information to traffic control professionals (ADU, DIV, and PEF). The process could be communication web for traffic control professionals.</p>	WZTCU	IT
<p><b>Develop and implement a plan for training traffic control professionals</b>                      The intent is to evaluate existing training tools and improve as necessary. The process needs to determine:</p> <ul style="list-style-type: none"> <li>• Who will do the training, provide updates?</li> <li>• Who attends the training? (Designers in WZTCU, division design, design-build, and private engineering firm )</li> </ul>	WZTCU	
<p><b>Develop Traffic Control Design Manual</b>                      The intent is to finalize and distribute the TC Manual.</p>	WZTCU	

**Committee Contact Key**

ADU – Jimmy Travis	ITS Ops – Kelly Damron	OEQ– DeWayne Sykes	TEB– Terry Hopkins
CU – Michelle Long	PDEA – Charles Cox	PS– Jimmy Travis	TIP Unit –Derrick Lewis
DIV – Joey Hopkins, Wendi Johnson	RDU – DeWayne Sykes	PS/Rail/ROW/Utilities – DeWayne Sykes	WZTCU – Stuart Bourne
FSU – Derrick Lewis			

**Acronym Key**

ADU - Alternate Delivery Unit	ITS Ops – ITS Operations (Kelly)	ROW – Right of Way
CM – Congestion Management	L&S – Location and Surveys	SHP – State Highway Patrol
CO – Communications Office	M – Municipalities	S&L – Safety and Loss
CU – Construction Unit	OEQ – Office of Environmental Quality	T&D – Training and Development
DIV – All 14 Divisions	PD – Program Development Branch	TEB – Traffic Engineering Branch
FSU – Feasibility Studies Unit	PDEA – Project Development Environmental Analysis	TIP Unit – Transportation Improvement Program Unit
IM – Incident Management	PRECON – Preconstruction (all Design Units)	TPB – Transportation
IMPACT – Public Information/Construction Unit	PS – Project Services	TSU – Traffic Survey Unit
IT – Information Technology	RDU – Roadway Design Unit	WZTCU – Work Zone Traffic Control Unit
ITS – Intelligent Transportation Systems (Greg)	RM – Roadway Maintenance	

## CRITERIA FOR DETERMINING SIGNIFICANT PROJECTS

### EVALUATION PROCEDURES DURING PLANNING AND DESIGN

This section provides decision-making procedures for determining the significance of construction projects, maintenance operations, or encroachments (from this point on will be referred to as “activities”). Consistent traffic control installations as well as coordinated traffic management strategies (lane and road closure restrictions, etc), and traveler information are essential so both safety and mobility are incorporated into all work zones. Although the types of activities, activity duration, amount of traffic control and planning can be very different between construction projects and maintenance activities, both have the ability to adversely affect safety and mobility. Therefore, it is necessary to have similarly planned traffic management strategies that are consistent regardless of what type of activity is underway.

During the planning stages, all activities must be evaluated by the responsible charge (see Table 1) at the appropriate times (see Table 2) to determine at what level the impacts will be “Significant” (see Significant Project Definition on page 4 of the Policy). For TIP projects and Raleigh Let Division Activities, use the Criteria chart shown in Table 3 (See page 19) for determining level of significance and impacts to the road users, local communities and commerce. For other division activities and encroachments, use the procedures for work zone traffic control decision making found on pages 20-21. The significance level of an activity affects the amount of safety and mobility planning involved and requires a Transportation Management Plan (TMP) (See Page 18).

The information found on pages 8-11 will also aid the responsible charge in establishing the transportation management strategies and/or alternate delivery methods appropriate for the activity (See Appendix). The idea is to use these processes to mitigate the impact of activity so there is consistency and uniformity in our approach to improving both safety and mobility on our roadway network.

**Table 1**

#### **Responsible Charge of Significance Evaluation**

TIP Activities	Division Activities
The WZTCU will be responsible for facilitating the determination of significance with Division, Planning, and Design Representatives	The Division will be responsible for facilitating the determination of significance or can choose to delegate to or request assistance from the Work Zone Traffic Control Unit.

The level of significance should be evaluated as early in the planning stages as possible, including at each of the following points of activity development as a minimum:

**Table 2**

#### **Time Table for Evaluating Activity Significance**

	TIP Projects	Raleigh Let Division Activities	Other Division Activities and Encroachments
Planning Scoping Meeting	√		
Prior to Concurrence Point 1 in the Merger Process	√		
Final Design Scoping Meeting	√		
Final Design Field Inspection	√		
Six (6) months before Let		√	
At appropriate time to develop proper TMP			√

CRITERIA FOR LEVELS OF IMPACTS ON SAFETY AND MOBILITY AND REQUIRED  
TMP COMPONENTS

All activities will be categorized into levels 1-4 as described below. Activities that are level 1 and level 2 will be considered “significant”. These activities will receive additional scrutiny and have additional measures implemented in an effort to reduce their overall impacts to safety and mobility. The reduction in overall impacts will be considered to the greatest extent practical to support the goals of this policy. For TIP projects and Raleigh Let Division Activities, actions such as planned/coordinated letting schedules, accelerated construction practices, innovative contracting techniques, monetary incentives, public involvement and public information strategies, etc. are methods to help achieve the desired result of reducing sustained work zone impacts on North Carolina’s transportation network. For other division activities, consideration on ways to reduce the duration and impacts to safety and mobility and public information are required.

A Transportation Management Plan (TMP) is required for all activities. A TMP lays out a set of coordinated strategies and describes how these strategies will be used to manage the work zone impacts of an activity. The scope, content, and level of detail of a TMP will vary based on the work zone policy and the anticipated work zone impacts of the activity. The type of TMP needed for a project is based on the activity’s level of significance.

Below are general descriptions that identify the 4 levels of activities and differentiate the impacts that activities have on the road users, local communities, and commerce in North Carolina. Specific criteria to determine if a project/activity is considered level 1 is listed on page 19. Also included are the required TMP components for each level.

**Level 1 Activities** - These represent “significant” activities and are anticipated, but not required, to have an adverse impact to the traveling public at the national, statewide, and regional levels to include the Interstate and Intrastate system, and have a high level of public interest. These projects would be considered the statewide tier.

Required Transportation Management Plan (TMP) components

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

**Level 2 Activities-** These represent “significant” activities and are anticipated, but not required, to have an adverse impact to the traveling public at the regional and local levels, and have a perceived high level of public interest. These projects would be considered the regional tier.

Required Transportation Management Plan (TMP) components

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

**Level 3 Activities-** These represent non-“significant” activities and are anticipated, but not required, to have low impacts to the traveling public at the regional, and local levels, and have a perceived moderate level of public interest. These projects would be considered the regional or sub-regional tier.

Required Transportation Management Plan (TMP) components

- Temporary Traffic Control Plan (TTC)
- Transportation Operations Plan (TO)- As Appropriate
- Public Information Plan (PI)- As Appropriate

**Level 4 Activities-** These represent non-“significant” activities and are anticipated, but not required, to have low impacts to the traveling public at the local level, and have a perceived low level of public interest. These projects would be considered the sub-regional tier.

Required Transportation Management Plan (TMP) components

- Temporary Traffic Control Plan (TTC)

**TABLE 3**  
**Criteria Chart for determining level of Significance**

		<b>USE FOR DIVISION ACTIVITIES AND TIP PROJECTS</b>				<b>USE FOR TIP ONLY</b>	
<b>Level</b>	<b>On an interstate within a TMA? Has intermittent or continuous lane closures for 3 days or longer?</b>	<b>Existing AADT (Also may use Anticipated AADT if available)</b>	<b>Total Truck Traffic</b>	<b>Anticipated Additional Travel Times</b>	<b>Anticipated Level Adverse Impacts to existing transportation infrastructure and/or high volume traffic generators</b>	<b>Duration of Traffic Impacts(change this to include corridors, etc.) (using conventional estimating/letting methods)</b>	<b>User Value and/or User Cost</b>
<b>SIGNIFICANT</b>	<b>1</b> <b>meets <u>ANY</u> of these criteria</b>	Yes to both questions, project/ activity is significant Yes to one, refer to remaining columns in chart	AADT per lane > 15,000 Examples as minimums: 30,000 AADT for a 2 lane road 60,000 AADT for a 4 lane road 90,000 AADT for a 6 lane road 120,000 AADT for a 8 lane road	≥ 20%	Exceeding 15 minutes	High	≥ 3 Years  ≥ \$50,000/day
	<b>2</b> <b>meets at <u>least 2</u> of these criteria</b>	Yes to both questions, project/ activity is significant Yes to one, refer to remaining columns in chart	AADT per lane ≥ 10,000 but < 15,000 Examples as minimums: 20,000 AADT for a 2 lane road 40,000 AADT for a 4 lane road 60,000 AADT for a 6 lane road 80,000 AADT for a 8 lane road	≥ 15% but < 20%	> 10 minutes but ≤ 15 minutes	Moderate	2 Years but < 3 Years  ≥ \$25,000/day but < \$50,000/day
	<b>3</b> <b>meets at <u>least 2</u> of these criteria</b>	No to one question refer to remaining columns in the chart	AADT per lane ≥ 7,500 but < 10,000 Examples as minimums: 15,000 AADT for a 2 lane road 30,000 AADT for a 4 lane road 45,000 AADT for a 6 lane road 60,000 AADT for a 8 lane road	≥ 10% but < 15%	> 5 minutes but ≤ 10 minutes	Low	≥ 1 Year but < 2 Years  ≥ \$12,500/day but < \$25,000/day
	<b>4</b> <b>meets <u>ANY</u> of these criteria</b>	No to one question refer to remaining columns in the chart	AADT per lane ≤ 7,500 Examples as maximums: 15,000 AADT for a 2 lane road 30,000 AADT for a 4 lane road 45,000 AADT for a 6 lane road 60,000 AADT for a 8 lane road	< 10%	< 5 minutes	N/A	< 1 Year  < \$12,500/day

## PROCEDURE FOR WORK ZONE TRAFFIC CONTROL DECISION MAKING FOR SIGNIFICANT DIVISION ACTIVITIES

1. Once the need for an activity has been identified, determine the extent of traffic control measures necessary for this activity considering:
  - Duration of activity including traffic control set-up (if greater than 8 hours, it may be considered “long term” which would require different decision making parameters)
  - Mobility impacts to motoring public using proper traffic control set-up
  - Manpower available to perform activity
  - Exposure and safety of workers installing traffic control devices vs duration of activity excluding traffic control set-up
  - Time of day the work will be done

Once you have determined what type of traffic is required for the activity, consider what time of day to work:

- ADT (evaluate volumes per hour...more than 150 per lane will cause backups)
- Peak hour volumes vs non-peak hour volumes
- Is the traffic heavier during the week or the weekend?
- Is the traffic heavier certain times of year?
- If traffic is lighter on the weekend, is the traffic heavier on Saturday than Sunday?

Considerations for night work:

- Do you anticipate any quality control issues for night work?
- Does working at night increase or decrease the safety of your work zone?

2. Once you have determined when and how you are going to perform the activity, contact the following to inform them of your plans:
  - NCDOT Communications Office
  - Local Emergency Services (EMS, Fire, Police, School Systems, etc.)
  - NCDOT TIMS (Traveler Information Management System)
3. Before deploying personnel and devices, visit the site to pre-plan the use of traffic control devices:
  - Are there vertical and/or horizontal curves at the site that require amendments to the traffic control set-up?
  - Are there driveways and/or ramps that need to be addressed?
  - Can traffic control device locations be pre-determined to minimize set-up time and exposure to traffic?
  - Are there permanent DMS (Dynamic Message Signs) on-site and/or in the vicinity that could be used to aid in the traveler information?
4. Once the traffic control has been installed and before work begins
  - Watch traffic to see if they are perceiving the traffic control measures as anticipated
  - Is a queue beginning to form or is traffic flowing smoothly through the work zone?
  - Are motorists taking last minute chances that can be related to misinformation?
  - Does there appear to be near misses or crashes that can be attributed to the work zone installation?
  - Will the workers feel safe working in the work zone?

If problems occur or are anticipated, make appropriate changes to the traffic control measures before work begins

5. Once work has been completed and traffic control measures have been removed:
  - Evaluate the plan that was put into place to determine if it worked as anticipated.
  - Were changes made during the work period? If so, did they alleviate the problems?
  - Were there any work zone related crashes that could have been avoided by using alternate/additional traffic control measures?
  - If a queue formed, how long was it, and was it acceptable? Were there crashes related to traffic being stopped at the back of the queue?
  - Were citizen complaints received about the work zone? If so, were they related to the quality of the work zone traffic control?

**DRAFT 7/23/07**

**DIVISION ACTIVITY  
TRANSPORTATION MANAGEMENT PLAN (TMP)**

<b>Temporary Traffic Control (TTC)</b>	What type of Work Zone Traffic Control Plan was used? RSD, Detail Drawings, Prepared Plan? _____ _____ If RSD was used, list _____ If RSD was used, were there any necessary changes? List _____ _____ _____	
<b>Transportation Operations (TO)</b>	What time of day did the work actually take place? _____ What time of day did you install the first traffic control device? _____ What time of day did you actually get the first piece of work equipment into the travel lane? _____ What time of week did the work actually take place? _____ What was the actual duration of the activity without traffic control set-up? _____ What was the actual duration of the activity with the traffic control set-up? _____ Did traffic flow smoothly through the work zone? If not, why? _____ Were there any accidents related to the work zone and/or resulting queue? If so, describe. _____ _____	
<b>Public Information (PI)</b>	Was the Communication Office notified? If not, why? _____ _____ If so, when? _____ Were local Emergency Services notified? If not, why? _____ _____ If so, when? _____ Was the activity entered into TIMS? If not, why? _____ _____ If so, when? _____ Were CMS/DMS used? If not, why? _____ _____ If so, when? _____ How far before the work zone are the CMS/DMS? _____	
<b>Evaluation/ Assessment</b>	If there were any changes to the planned TMP, what were they and why were they changed? _____ _____ If there was a lesson learned for the next similar activity, what was it? _____ _____	
<b>Contact Info.</b>	Date: _____ Name: _____ Title: _____ Office _____ Location: _____ Phone No: _____	Other Information: _____ _____ _____

## REQUESTS FOR EXCEPTIONS

Exceptions may be granted on specific activities and/or categories of activities. Activities that are issued exceptions will require TTC Plan. The other components of a TMP (PI & TO) may be included as appropriate.

The process for exception requests include the following:

- Assess the Work Zone impacts of the specific Activity or categories of Activities using appropriate methods.
- Compare the expected work zone impacts with the department's Work Zone Safety and Mobility Policy and verify the activity is not expected to have sustained work zone impacts.

Once an exception is determined to be necessary, the group in responsible charge should request the exception to the appropriate entity:

**TABLE 4**  
**Responsible Charge for Exception Requests**

<b>Federally Funded TIP Activities</b>	Exceptions will be requested by the WZTCU and directed to the FHWA NC Division Office
<b>State Funded TIP Activities</b>	Exceptions will be requested by the WZTCU and directed to the NCDOT Highway Administrator or designate for his review and approval
<b>Federally Funded Division Activities</b>	Exceptions will be requested by the Division Engineer and directed to the FHWA NC Division Office through the Work Zone Traffic Control Unit
<b>State Funded Division Activities</b>	Exceptions will be requested by the Project Manager to the Division Engineer for his review and approval
<b>Other Activities</b>	Contact the Work Zone Traffic Control Unit

**ASSESSMENT REQUIREMENTS DURING/AFTER CONSTRUCTION**  
**To Be Developed**

## APPENDIX

### DEFINITIONS AND ACRONYMS

#### **Alternate Delivery Techniques –**

- Design Build, A+B Bidding, Accelerated Construction, Alternate Let Schedule, Incentives/Disincentives for early completion, etc.

**AADT** - Average Annual Daily Traffic

**ADT** - Annual Daily Traffic

**ADU** – Alternate Delivery Unit

**BPOC** - Bridge Purchase Order Contract

**CFR** - Code of Federal Regulations

**CM** - Congestion Management

**CMS** - Changeable Message Sign

**CO** - Communications Office

**CU** - Construction Unit

**DDL** - Division Design Let

**DIV** - All 14 Divisions

**DMS** - Dynamic Message Sign

**FHWA** - Federal Highway Administration

**FSU** - Feasibility Studies Unit

**IM** - Incident Management

**IMAP** - Incident Management Assistance Patrol

**IMPACT** - Public Information/Construction Unit

#### **IMPACTS -**

##### **High**

- Will result in significantly decreased mobility (existing congestion increases 50-100%)
- Cannot accommodate existing mass transit and/or rail systems
- Cannot accommodate pedestrians safely

##### **Moderate**

- Will result in decreased mobility (existing congestion increases 25-50%)
- Cannot accommodate existing mass transit and/or rail systems at their existing levels, but does allow for continued service at a reduced level
- Cannot accommodate pedestrians safely at their existing levels, but does allow for continued service at a reduced level

##### **Low**

- Will result in minimally decreased mobility (existing congestion increases 0-25%)
- Allows continued service of existing mass transit and/or rail systems
- Accommodates pedestrians safely at their existing levels

**IT** - Information Technology

**ITS** - Intelligent Transportation Systems (Greg)

**ITS Ops** - ITS Operations (Kelly)

**L&S** - Location and Surveys

**Local Level** (includes municipalities)

**M** - Municipalities

**MMS** - Maintenance Management System

**NCDOT** - North Carolina Department of Transportation

**NHS** - National Highway System

**OEQ** - Office of Environmental Quality

**PD** - Program Development Branch

**PDEA** – Project Development Environmental Analysis

**PRECON** – Pre-construction (all design units)

**PE** - Professional Engineer

**PI** - Public Information

**DRAFT 7/23/07**

**PS** - Project Services

**RDU** - Roadway Design Unit

**RM** - Roadway Maintenance

**ROW** - Right of Way

**RTMS** - Remote Traffic Microwave Sensors

**ROAD USER** - Motorists, Pedestrians, and Bicyclists

**S&L** - Safety and Loss

**SHP** - State Highway Patrol

**STOC** - Statewide Transportation Operations Center

**SUE** - Subterranean Utility Easement

**T&D** - Training and Development

**TEB** – Traffic Engineering Branch

**TIERED LEVELS** -

- **Statewide:** Includes all interstate highways, Intrastate highways, and major US routes
- **Regional:** Includes remaining US routes, major NC routes, and some secondary routes providing regional connectivity
- **Sub-regional:** Includes State routes providing limited connectivity and all remaining secondary routes.

**TIMS** - Traveler Information Management System

**TIP UNIT** – Transportation Improvement Program Unit

**TMA** - Transportation Management Area:

- Asheville, Charlotte, Fayetteville, Greensboro/High Point, Raleigh-Durham, Wilmington, Winston-Salem
- (See [www.fhwa.dot.gov/ncdiv/about/tma.htm](http://www.fhwa.dot.gov/ncdiv/about/tma.htm))

**TMP** - Transportation Management Plan

**TO** - Transportation Operations

**TPB** – Transportation

**Traffic Generators (High Volume)** -

- Stadiums, Large shopping centers, tourist destinations, etc.

**Traffic Management Strategies** -

- Lane closure time restrictions, road closure, hauling restrictions, minimum lane widths, minimum number of maintained lanes, ITS devices, enhanced incident management, public information, etc.

**Transportation Infrastructure** -

- Mass transit, rail, pedestrian traffic, etc.

**TSU**- Traffic Survey Unit

**TTC** - Temporary Traffic Control

**VECP** - Value Engineering Concept Proposal

**WZTCU** - Work Zone Traffic Control Unit

**WORK ZONES** - This is the area where a project or activity is located and affecting traffic

## WORK ZONE SAFETY AND MOBILITY COMMITTEE MEMBERS

<i>Name</i>	<i>Representing</i>
Stuart Bourne, PE – <i>Committee Chair</i>	NCDOT Work Zone Traffic Control Unit
Mike Bruff, PE	NCDOT Transportation Planning Branch
Scott Capps, PE	NCDOT State Road Maintenance Unit
Charles Cox, PE	NCDOT Project Development & Environmental Analysis
Kelly Damron, PE	NCDOT ITS Operations Unit
Greg Fuller, PE	NCDOT ITS & Signals Unit
Joe Geigle	Federal Highway Administration (FHWA)
Lawrence Gettier, PE	NCDOT Work Zone Traffic Control Unit
Nicole Hackler	NCDOT Feasibility Studies Unit
Joey Hopkins, PE	NCDOT Division Maintenance
Terry Hopkins, PE	NCDOT Traffic Safety Unit
Deborah Hutchings, PE	NCDOT Systems Planning Group
Joseph Ishak, PE - <i>Policy Subcommittee Chair</i>	NCDOT Work Zone Traffic Control Unit
Wendi Johnson, PE	NCDOT Division Construction
Gus Jordi, PE	Charlotte Department of Transportation (CDOT)
Steve Kite, PE	NCDOT Work Zone Traffic Control Unit
Kevin Lacy, PE	NCDOT Traffic Engineering Branch
Derrick Lewis, PE	NCDOT Feasibility Studies Unit
Michelle Long, PE	NCDOT Public Information
Meredith McDiarmid, P.E - <i>Significant Projects Subcommittee Chair</i>	NCDOT Work Zone Traffic Control Unit
Jo Ann Oerter	NCDOT ITS Operations Unit
Rodger Rochelle, PE	NCDOT Alternate Delivery Unit
Tammy Stewart	NCDOT Public Information
DeWayne Sykes, PE	NCDOT Roadway Design Unit
Max Tate, PE	Federal Highway Administration (FHWA)
Jimmy Travis, PE	NCDOT Alternate Delivery Unit
David Wasserman, PE	NCDOT Systems Planning Group
<b>Committee Support:</b>	
Jessica Kuse, PE	NCDOT Work Zone Traffic Control Unit
Jennifer Portanova, PE	NCDOT Work Zone Traffic Control Unit