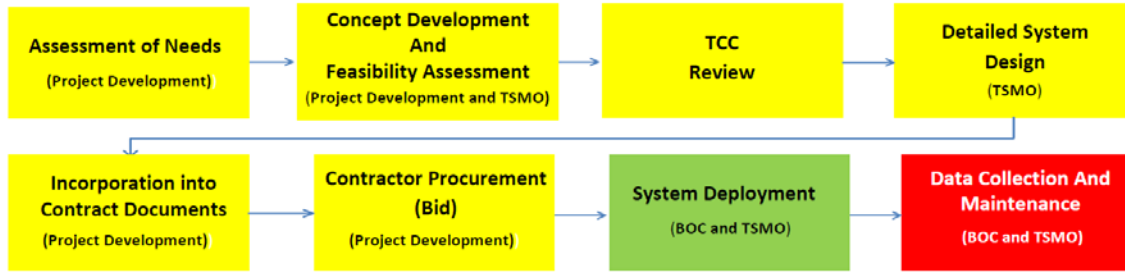




TSMO CONSTRUCTION WORKZONE PROGRAM PROCESS (8/24/16)



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

Temporary Work Zone ITS

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

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

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

SCORE CRITERIA	SCORE
<p>Factor 1 – Duration of work zone: Long-term stationary work will have a duration of:</p> <ul style="list-style-type: none"> ○ >1 construction season (10 points) ○ 4-10 months (6 points) ○ < 4 months; procurement and installation timeline is available prior to work starting (3 points) 	#
<p>Factor 2 – Impact to traffic, business, other destinations or other users (e.g. extremely long delays, high risk of speed variability, access issues) for the duration of work is expected to be:</p> <ul style="list-style-type: none"> ○ Significant (10 points) ○ Moderate (6 points) ○ Minimal (3 points) ○ No Impacts (0 points) 	#
<p>Factor 3 – Queuing and Delay: Queue lengths are estimated to be:</p> <ul style="list-style-type: none"> ○ ≥2 miles for periods > 2 hours per day (8 to 10 points) ○ 1-2 miles for periods > 1-2 hours per day (6 to 8 points) ○ ≤ 1 mile or queue length estimates are not available but pre-construction, recurring congestion exists for periods < 1 hour per day (4 points) ○ No anticipated queue (0 points) 	#
<p>Factor 4 – Temporal Aspects of Traffic Impacts: Expected traffic impacts are:</p> <ul style="list-style-type: none"> ○ Unreasonable for a time period that covers more than just peak hours (10 points) ○ Unreasonable during most of both morning and afternoon peak hours in either direction (6 points) ○ Unreasonable during most of peak hour in either direction (3 points) ○ Unpredictable; highly variable traffic volumes (1 point) ○ No impacts (0 points) 	#
<p>Factor 5 – Specific Issues Expected (0 to 3 points each based on judgement)</p> <ul style="list-style-type: none"> ○ Traffic Speed Variability ○ Back of Queue and Other Sight Distance Issues ○ High Speeds/Chronic Speeding ○ Work Zone Congestion ○ Availability of Alternate Routes ○ Merging Conflicts and Hazards at Work Zone Tapers ○ Work Zone Hazards/Complex Traffic Control Layout ○ Frequently Changing Operating Conditions for Traffic ○ Variable Work Activities (That may benefit from using variable speed limits) ○ Percent Heavy Vehicles (<8% = 0 points, 8% to 10% = 1 point, 10% to 12% = 2 points, >12% = 3 points) ○ Construction Vehicles Entry/Exit Speed Differential Relative to Traffic ○ Data Collection for Work Zone Performance Measures ○ Unusual or Unpredictable Weather Patterns such as Snow, Ice and Fog 	#
Total Score	
<p>If the Total Score is:</p> <ul style="list-style-type: none"> ○ ≥30 – ITS is likely to provide significant benefits relative to costs for procurement ○ ≥10 and <30 – ITS may provide some benefits and should be considered as a treatment to mitigate impacts ○ <10 – ITS may not provide enough benefit as a treatment to justify the associated costs 	#

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

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

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

•Characteristic could be addressed with this work zone ITS application

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