massDOT Massachusetts Department of Transportation Highway Division

Critical Project Characteristics

Critical Project Characteristics	Work Zone ITS Applications								
	Queue/speed reduction warning	Real-time traveler information	Incident management	Dynamic lane merge	Variable speed limit*	Automated enforcement**	Construction vehicle entrance/exit warning	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		○			●				
A reduced speed (and thus speed limit) is believed to be necessary because of work zone hazards that are not readily apparent to motorists and so will not likely result in lower speeds driven						●			
The project plans limit ability of enforcement to operate (no shoulders, barrier on both sides, long stretches between interchanges)						●			
Access to and from the work space occurs directly from the travel lanes							●		
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								●	
Project documents include traffic mobility performance requirements (i.e., maximum allowable delays) that must be monitored to ensure and quantify compliance. Incentive or Disincentive payments are used (performance specifications) based on mobility impacts [delays or queues]									●

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Source: Battelle / FHWA Work Zone ITS Guide

* Use of variable speed limits (regulatory) are not currently statutorily allowed. However, Work Zone Limits with the "when flashing" indication can be used.

** Massachusetts currently can not use Automated Speed Enforcement for work zones, only for toll facilities.

● Characteristic could be addressed with this portable Work Zone ITS application.

○ Characteristic could be addressed with a portable Work Zone ITS application if some modification(s) were made ***or*** real-time actions taken by the operator.