WORK ZONE BULLETIN #11/2017

Smart Work Zones

****The Smart Work Zone applications described in this bulletin are trial strategies. Project Sponsors may choose to use these applications on projects that meet the criteria below. Details outlined in this bulletin may be modified in the future based on the results of the trials.****

Summary

Smart Work Zones apply Intelligent Transportation Systems (ITS) to provide real-time information and warnings to motorists prior to or within the work zone. Through the integrated use of sensors, computers and communication channels, Smart Work Zones can reduce delays and improve safety on provincial highways.

Alberta Transportation already regularly uses several forms of ITS technology for work zones. Driver (Speed) Feedback signs, as addressed in Work Zone Bulletin #4, encourage drivers to self-correct by informing them of their speed in relation to the posted speed limit. On the communication side, 511Alberta is a web-based application that assists drivers with their route planning by identifying work zone locations and characteristics.

The purpose of this bulletin is to recommend additional technologies and identify the scenarios where they are best applied. The Key Changes below apply only to these new technologies that are being introduced in this bulletin. The integration of these Smart Work Zone technologies is expected to have several benefits for work zones including:

- Improved traffic flow through the work zone
- Enhanced safety for motorists and workers
- Better motorist response to hazards
- Reduced driver frustration

Key Changes

Type of Project

The use of Smart Work Zone technologies shall be limited to high volume provincial highways that are located in urban and urban fringe areas. At these locations, Smart Work Zones will have the most benefit due to the higher likelihood of congestion and the availability of alternate routes. Generally, high volume can be defined as equal to or greater than 20,000 vehicles per day. The benefits of Smart Work Zones will start to be substantial when the traffic volume reaches or exceeds 50,000 vehicles per day.

The Project Sponsor shall be ultimately responsible for determining whether a work zone should utilize Smart Work Zone applications. The Project Sponsor shall consider which type(s) of ITS technologies are most beneficial based on the recommendations below. Where the work zone falls near or within a municipality, the municipality must be consulted in case of impacts on local roads. If Smart Work Zone technologies will be included on a project, they must be incorporated within the Special Provisions.

Smart Work Zone Applications

Table 1 provides Smart Work Zone applications that are recommended for use on provincial highways. The Project Sponsor may choose to apply one or multiple technologies. By providing information that reflects current conditions, motorists can make decisions that can enhance the safety, travel time or capacity of the highway. The primary method for communicating the information is through Variable Message Signs (VMS) that are posted at the highway work zone location. However, the Project Sponsor may also want to consider having a communication strategy that relays the real-time information through Traveler Advisory (TA) methods. TA methods include any existing communication channels that are not at the worksite such as 511Alberta, commercial radio stations and other online media.

Table 1: Recommended Smart Work Zone Applications

Application	*Display*	*Definition*	*Conditions for Use*
Travel Time and delay estimation	*VMS TA*	Provides motorists with an estimate of the travel time and delays along the highway.	• Congestion is an issue • Delays/travel times are variable
Alternate route advisory	*VMS TA*	Suggests an alternate route for motorists. May provide motorists with an estimate of the travel time through the work zone compared to the travel time through the alternate route	• Congestion is an issue • An alternate route is available
Dynamic Merging Strategies	*VMS*	Displays messages indicating whether a zipper or early merge should be used depending on current traffic volumes.	• The highway traffic volume fluctuates significantly throughout the day, such that the zipper merge is only beneficial in a few hours of the work period. • Refer to Work Zone Bulletin #2 for the use of the zipper merge strategy.
Queue Warning	*VMS*	Warns motorists of the need to slow down due to an approaching queue	• Congestion is an issue. • There is a high speed on the approach.

Adapted from MassDOT Smart Work Zone Design Standards

Other considerations

Smart Work Zone applications are not limited to the ones outlined in Table 1. There are many emerging technologies that may be applicable to work zones. The use of such technologies may be considered if it is likely to provide significant benefit to the project.

One example of an ITS solution that may be considered for work zones in the future is Variable Speed Limit (VSL) signs. These signs can be used to deal with congestion by displaying regulatory or advisory speeds that can be changed depending on current traffic conditions.

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References
Work Zone Bulletin #4
511Alberta

Approved

Original signed
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