



www.tfhr.gov/its/quickzon.htm

CASE STUDY SNAPSHOT #7

Cumulative Delay Analysis for Successive Work Zones on Beartooth Highway



The Central Federal Lands Highway Division (CFLHD) has been working with the United States Department of Agriculture (USDA) Forest Service and the

National Park Service to reconstruct a 30-kilometer (18.6-mile) section of the scenic **Beartooth Highway in Montana**. This section has not been rebuilt since the original construction in 1936. The highway can no longer support the types of vehicles driving on it today nor the increased volumes anticipated in future years. The reconstruction project will consist of upgrading the current roadway with improvements to the alignment, grade, and width of the road to meet current Federal Highway Administration (FHWA) guidelines.

QuickZone was used to evaluate a series of four different flagging operations near the Beartooth Ravine, part of the proposed 30-kilometer (18.6-mile) section. QuickZone enabled CFLHD to account for prospective delays at each work zone and predict delays for motorists incurred by a series of work zones. QuickZone was also configured to account for detailed seasonality demand data CFLHD had collected on the highway.

A key capability CFLHD required from QuickZone was the estimate of cumulative delay a motorist would likely encounter from a series of work zones, including localized bottlenecks, flagging operations, and periodic full closures. The initial results from QuickZone showed that four flagging operations at Beartooth Ravine produced substantial backups caused by the switchover times of the flagging operations. No single flagging operation, however, was shown to cause major traffic delays.



KEY OBSERVATIONS

CFLHD used QuickZone's capabilities to help **inform the local community of possible future delays** through a series of concurrent flagging operations.

CFLHD was able to see that **no single flagging operation would cause major delay problems but the combination of all four did produce potentially unacceptable delays.**

QuickZone enabled CFLHD to **quickly evaluate a series of work zones and their interactions with each other without having to use more complex simulation models.**

QUICKZONE

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