Automated Performance Measurement of Winter Road Maintenance Results

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ABSTRACT

Snow Belt state and local transportation agencies have been raising the winter maintenance service level for a number of years. Also, motorists have developed high expectations for unimpeded travel fairly soon after a winter storm. A 2002 survey by the Iowa DOT of licensed Iowa drivers found that more than 44% of respondents expected interstate highways to be completely clear within six hours after a winter storm. There are several methods to determine the length of time to achieve a clear roadway. Employee observations are routinely used for determining road conditions. This paper explores the feasibility of using existing automated systems to provide objective, quantifiable data to measure driver perceptions of winter road conditions in comparison to physical measurements of pavement surface conditions. Automatic traffic recorders (ATRs) provide vehicle speed data at 70 locations on the Iowa primary highway system. There are 52 Road Weather Information System (RWIS) locations on the same system.

Hourly changes in average speed at ATR sites before, during, and after a winter storm indicate motorist perceptions of winter driving conditions. RWIS data include changes in road surface status, temperature, chemical factors, and precipitation. In places where ATR and RWIS sites are in reasonable proximity on the highway, the two data sets can be compared to determine the ways in which motorist perceptions align with physical road surface measurements concerning the time that must elapse after a storm for the road to return to the motorists’ expectations of a completely clear highway.

Speed and road surface data for major winter storms at 15 rural interstate highway locations have been analyzed to demonstrate the data’s utility for measuring performance from the customer’s perspective.

Note: This research was still in progress at the time of publication; contact the author above for more information.

Key words: performance measurements—winter road maintenance