Operational Use of Weather Forecasts in Winter Maintenance: A Matrix Based Approach

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ABSTRACT

In winter maintenance operations, weather forecasts have the greatest value when they can drive the operational activities of an agency or a work unit within an agency. Thus if an agency does not begin to plow snow until two inches (five centimeters) of snow have accumulated on the pavement, the weather forecast is of much less value than if that agency anti-ices and thus applies chemicals prior to the storm.

A major effort is underway in the US through the MDSS (Maintenance Decision Support System) to enhance the value of weather forecasts to winter maintenance agencies. While part of MDSS is focused on improving the accuracy of forecasts, an important part is also focused on providing real time operational advice to agencies deployed fighting the storm. Thus, for example, one aspect of the MDSS is to recommend to agencies when to apply chemicals on a given plow route.

Such advice clearly has enormous potential benefits, but it is also stretching the limits of the technology at present and it suggests that an intermediate step may have significant value. The intermediate step considered in this paper provides a strategic plan of action (as opposed to what might be termed a tactical plan focused on individual plow routes) based on the forecast. The plan of action is derived using a matrix similar to that presented in Appendix C the FHWA Manual of Practice for Anti-Icing. However, the Appendix C matrix did not provide a particularly flexible description of a winter storm and was missing a number of critical operational considerations. These are considered in greater detail in the paper.

This new matrix will be undergoing field testing during the winter of 2003-04. Three agencies will be chosen and will receive the strategic plan of action along with their tailored weather forecasts. The paper will discuss the challenges and opportunities presented by this field test and suggest directions for future development.

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