Guidance for Successful Anti-Icing Operations Based on U.S. Experience

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Highway anti-icing is the snow and ice control practice of preventing the formation or development of bonded snow and ice by timely applications of a chemical freezing-point depressant. The application of a chemical freezing-point depressant onto a highway pavement when a winter storm starts or before precipitation begins inhibits the development of a bond between snow and ice and the pavement surface. Moderate, periodic reaplication of the chemical during the storm can continue this effect. Such preventative operations are the core of an anti-icing program. A successful anti-icing program provides the maintenance manager with two major capabilities: the capability of maintaining roads in the best conditions possible during a winter storm and the capability of doing so efficiently. As a consequence, anti-icing has the potential to provide the benefit of increased traffic safety at the lowest cost. However, to achieve this benefit the maintenance manager must adopt a systematic approach to snow and ice control and must ensure that the performance of the operations is consistent with the objective of preventing the formation or development of bonded snow and ice. Such an approach requires considerable judgment, methodical use of available information sources, and timely operations that anticipate or respond promptly to icy conditions.

Guidance for successful anti-icing operations has been developed. This guidance is based on an analysis of data obtained during the winters of 1993-1994 and 1994-1995 in the 15 states participating in FHWA Test and Evaluation Project 28 and also on relevant experiences and the review of anti-icing practices in Strategic Highway Research Project H-208. Specific and concise guidance for anti-icing operations for six winter weather events has been formulated. The weather events are light snow storms, light snow storms with periods of moderate or heavy snow, moderate or heavy snow storms, frost or black ice, freezing rain storms, and sleet storms. The maintenance action for each event is defined for several pavement temperature ranges and associated temperature trends, and for initial and follow-up operations. The actions considered depend on the pavement temperature and other conditions and include application of chemicals, either alone or in combination with plowing, application of abrasives, plowing only, or doing nothing. Solid, liquid, and prewetted solid chemical application rates are suggested as appropriate. These rates are not to be considered fixed values but rather the middle of a range to be selected by an agency according to local conditions and experiences.