TR-400 The Potential of Friction as a Tool for Winter Maintenance

Key Words: Friction, Winter Maintenance, Ice, Snow, Traffic, Accidents

Abstract:

It is intuitively obvious that snow or ice on a road surface will make that surface more slippery and thus more hazardous. However, quantifying this slipperiness by measuring the friction between the road surface and a vehicle is rather difficult. If such friction readings could be easily made, they might provide a means to control winter maintenance activities more efficiently than at present.

This study is a preliminary examination of the possibility of using friction as an operational tool in winter maintenance. In particular, the relationship of friction to traffic volume and speed, and accident rates is examined, and the current lack of knowledge in this area is outlined. The state of the art of friction measuring techniques is reviewed. A series of experiments whereby greater knowledge of how friction deteriorates during a storm and is restored by treatment is proposed. The relationship between plowing forces and the ice-pavement bond strength is discussed. The challenge of integrating all these potential sources of information into a useful final product is presented together with a potential approach. A preliminary cost-benefit analysis of friction measuring devices is performed and suggests that considerable savings might be realized if certain assumptions should hold true. The steps required to bring friction from its current state as a research tool to full deployment as an operational tool are presented and discussed. While much remains to be done in this regard, it is apparent that friction could be an extremely effective operational tool in winter maintenance activities of the future.