Transportation
Synthesis Report

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Pavement Surface Materials to Minimize Snowmobile Damage

Prepared for
Wisconsin Highway Research Program
Geotechnics Technical Oversight Committee

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Transportation Synthesis Reports are brief summaries of currently available information on topics of interest to WisDOT technical staff. Online and print sources for TSRs include NCHRP and other TRB programs, AASHTO, the research and practices of other transportation agencies, and related academic and industry research. Internet hyperlinks in TSRs are active at the time of publication, but changes on the host server can make them obsolete.

Request for Report

The Wisconsin Highway Research Program's Technical Oversight Committee on Geotechnics requested a synthesis report on potential surface materials to minimize or eliminate damage, specifically rutting, to pavement from snowmobile use. The TOC seeks current research and state transportation agency practices.

Summary

A check of national transportation Web sites and state transportation sites in the Upper Midwest, Northeast, and West, as well as a general search of Web resources found little research or commentary on snowmobile damage of pavement surfaces. Typically, snowmobile trails are unpaved, with agencies favoring crushed rock. Common damage-causing interaction of snowmobiles with pavements occurs at trail crossings of roads. Surface wear typically is associated with performance traction features – like carbide-tipped studs – on snowmobiles upgraded with such features. Rutting does not appear as a cause of concern with regard to snowmobile use. Following are documents that focus on the use of polymer resins in surface treatment of snowmobile crossings. Such materials, when used properly, promise years of protection to affected pavements.

Recent Research and Documentation

Following are links to state efforts to improve or regulate snowmobile trail or surface treatment.

Michigan. Bituminous Pavement Resurfacing at Snowmobile Crossings: MDOT Studies Asphalt Pavement Coatings, *Research Record* (MDOT) 87, June 1999. http://www.michigan.gov/documents/mdot_c&t_rr-87_67055_7.pdf. This 1999 article details work by Michigan in studying polymer coatings of asphalt surfaces at snowmobile crossings. Focused on surface wear, believed to result from increased use of high-performance traction control upgrades to snowmobiles, the four tested coatings proved effective as double coatings, with five- to eight-year lives as surface treatments. Recommendations on field application were included.

Iowa. Iowa Trails 2000 – Design Guidelines. http://www.iowabikes.com/trails/CHPT04-3.html
Iowa discourages use of asphalt on snowmobile trails due to damage from studs. The guidelines recommend using a natural surface corridor on trails alongside asphalt trails and, presumably, along highways.

Research in Progress

The following study builds research and design applications upon the Michigan work referenced above.

New Hampshire. Alternative Pavement for Snowmobile Crossings. Dec. 2004-June 2007.
http://rip.trb.org/browse/dproject.asp?n=10282. Research focuses on use of a British-developed resign-based compound of aggregate and sand reinforced with two types of fiber; it is applied hot to surfaces and designed to reduce wear. Mix guidelines and application based on Marshall designs will be developed and installed.