

Best Practices for Road Weather Management

Montana DOT High Wind Warning System

When high winds blow across Interstate 90 in the Bozeman/Livingston area the Montana Department of Transportation warns motorists and manages vehicle access. Severe wind tunnel conditions occur frequently on a 27-mile (43-kilometer) section of the freeway, posing a safety risk to high-profile vehicles.

System Components: Traffic managers utilize an Environmental Sensor Station (ESS) to monitor wind direction and wind speed. The ESS is part of a statewide Road Weather Information System (RWIS), which collects and transmits environmental data to district offices via a Wide Area Network. Four Dynamic Message Signs (DMS) are installed on the roadway to display messages to eastbound and westbound motorists.



Wind Warning System Location

System Operations: Traffic managers employ an advisory strategy to alert motorists of high wind conditions and a control strategy to restrict high-profile vehicle access during severe crosswinds. Traffic and maintenance managers are alerted by the RWIS when wind speeds in the area exceed 20 mph (32 kph). A warning message—“CAUTION: WATCH FOR SEVERE CROSSWINDS”—is displayed on DMS when wind speeds are between 20 and 39 mph. When severe crosswinds (i.e., over 39 mph (63 kph)) are detected, a restriction message is posted on DMS to direct specified vehicles to exit the freeway and take an alternate route through Livingston. A typical restriction message reads “SEVERE CROSSWINDS: HIGH PROFILE UNITS EXIT”. DMS may also be used to warn drivers of poor pavement conditions (i.e., snow or ice) during winter months.

Transportation Outcome: Before DMS were installed, maintenance personnel had to erect barricades on the freeway to prevent high-profile vehicles from entering the affected highway section and being blown over or blown off of the road. Advising drivers and restricting access under high wind conditions has improved roadway safety, as well as the productivity and safety of maintenance staff.

Implementation Issues: Two DMS were strategically located on each end of the affected road segment to warn motorists traveling in both directions. The third and fourth DMS were installed in the middle of the 27-mile segment. Wind tunnel conditions are most severe between mileposts 330 and 338. One DMS was placed at milepost 311 for eastbound traffic approaching the area. Two DMS were mounted back-to-back at milepost 330 for both directions. The last DMS was positioned at milepost 338 to inform westbound drivers as they enter the threatened section.

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Contact(s):

- Ross Gammon, Bozeman Area Maintenance Chief, 406-586-9562, rgammon@state.mt.us.

Reference(s):

- "Message Signs Provide Real-time Road Information in Montana," ITS America Weather Applications web site, January 2002, <http://www.itsa.org/ITSNEWS.NSF/4e0650bef6193b3e852562350056a3a7/8d042124f5e4d92b85256b4a0070835c?OpenDocument>.
- "Road Weather Informational System," Montana DOT Traveler Information web site, http://www.mdt.state.mt.us/travinfo/weather/rwis_frame.html.

Keywords: wind, snow, ice, high wind warning system, freeway management, traffic management, traveler information, advisory strategy, motorist warning system, control strategy, access restriction, environmental sensor station (ESS), road weather information system (RWIS), dynamic message signs (DMS), high-profile vehicles, safety, productivity