

AVALANCHE SAFETY MEASURES FOR HIGHWAYS

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Abstract¹

Highway safety measures fall into four categories:

1. Training of highway maintenance crews.
2. Avalanche safety equipment.
3. Operational measures, and
4. Warning broadcasts.

In British Columbia, training and refresher programmes for highway personnel are conducted each winter. Course material includes:

- a) Instruction on snow, weather, and avalanche observations.
- b) Recognition of avalanche terrain.
- c) Procedures during hazardous periods.
- d) Procedures if caught in an avalanche, and
- e) Rescue procedures.

Training provides the foundation for the remaining categories, and cannot be overstressed.

Avalanche rescue caches for highway operations should contain such items as probes, shovels, markers, lanterns, and other items that would typically be found in ski area rescue caches, and, in addition, some heavier rescue items such as lighting towers, picks, heavy shovels, and metal detectors. Vehicles and equipment operating in avalanche areas should have two-way radios in order to monitor personnel positions. The vehicles should be equipped with probes and shovels, and personnel should carry rescue transceivers. Vehicles may be further protected with roll-bars, metal-mesh windows, and automatic engine shut-off valves to prevent carbon monoxide poisoning.

¹Full-length paper available from author.

The primary operational measures for the safety of maintenance crews and the public is the placement of large reflectorized signs (e.g., "Avalanche Area, Do Not Stop"). Signs should be erected prior to the avalanche season and taken down immediately after. During periods of high hazard, sections of highways may be closed with sturdy barriers set in locations that allow traffic line-ups on level terrain. Artificial release of avalanches is used on a few especially hazardous sections of B.C. highways. Multi-message illuminated signs can be programmed to provide information on hazards, closures, and alternative routes.

Warning broadcasts are sent over the two-way radio system to advise maintenance crews of changing weather conditions and recent avalanche activity. Warnings may also be released to the public via the news media in accordance with methods described by Judson (1975).

A further discussion of avalanche problems along B.C. highways is given by Godfrey et al. (1974).

References

- Godfrey, D.D., Schaerer, P.A., Tremblay, R.J., Freer, G.L., and Evans, S.G. 1974. British Columbia Dept. Highways Avalanche Task Force. Rept. to Hon. G.R. Lea, Minister of Highways, Sept. 30, 1974. B.C. Dept. Highways, Victoria. 33 p.
- Judson, A. 1975. Avalanche Warnings: Content and dissemination. USDA For. Serv. Res. Note RM-291, Rocky Mt. For. and Range Exp. Stn. Fort Collins, Colo. 8 p.

Discussion

- THYER: Would it be helpful to add more information to your avalanche signs to better explain the problem to the public?
- FREER: Perhaps, but there are too many signs already on the highway, and, in many cases, it is more effective to keep the message short and to the point.
- TURNBULL: How much information can you place on your electric blinking signs?
- FREER: Some of our more expensive signs that cost about \$45,000 can be programmed for up to 65 messages. The sign blinks at about 4-second intervals. At 80 km/hr a driver can read five messages.

NOREM: How long can a highway closure last?

FREER: It varies considerably. The worst examples are: Bear's Pass was closed for one month and the Trans-Canada Highway was closed for eight days.

EIGENMANN: Do you broadcast radio bulletins? It seems that most cars in North America are equipped with radios which are always left on.

FREER: Reception is generally poor in mountain areas. We issue road reports to the media, and tape messages, which can be relayed by telephone. We do not have a formal avalanche warning system, as yet.

NOREM: I feel it is commendable that your programme emphasizes the safety of road maintenance crews. Last year in Norway we had three avalanche accidents on our roads, all of which involved road workers.