

AUDIT AT A GLANCE

AVALANCHE SAFETY ON PROVINCIAL HIGHWAYS

Why we did this audit

- Roughly 1,600 avalanche paths pose risks to the provincial highway system.
- Avalanches can cause serious injury or death.
- The reliability of highways is critical to the province's economy.

Objective

To determine whether the Ministry of Transportation and Infrastructure is effectively managing its **avalanche safety program** to:

- ensure the safety of highway users
- minimize the frequency and duration of avalanche-related road closures

Audit period:

- We examined the avalanche safety program from 2018 to 2020.
- We used historical data to assess trends in indicators of highway safety and reliability (2000 to 2020).

Conclusion

The ministry is effectively managing its avalanche safety program, ensuring the safety of highway users and minimizing the frequency and duration of avalanche-related road closures, with some exceptions.

The ministry has accepted all 8 recommendations we made to improve highway user safety and reliability.

What we found

Avalanche risk assessment and notification

Ministry has mapped avalanche paths, but some path information is outdated

- 1,600 avalanche paths mapped
- Unknown when 2/3 of avalanche paths were last updated
- Descriptive information missing from 14% of the 1,377 active avalanche paths

Recommendation 1

Ministry collects appropriate weather and snowpack data

- Weather network includes 68 remote avalanche stations and 99 road weather stations
- Snow profiles meet industry guidelines on snowpack

Ministry gives timely avalanche forecasts

- Highway users and stakeholders (including maintenance contractors, BC Emergency Health Services, District of Stewart) getting the information needed on avalanches

Resources, tools and training

Program almost fully staffed

- Field offices—8 fully staffed with 16 people
- Head office—1 of 3 positions vacant for 6 years

Recommendation 2

Staff trained as required

- Staff—industry certified



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What we found (continued)

Resources, tools and training (continued)

Staff have tools to do job

- Day-to-day tools available
- Field equipment, signs, gates in place

Capital investments made but planning process lacking

- Ministry invests \$600,000 annually in maintaining its capital equipment
- Ministry invests in large infrastructure projects
- Capital planning process lacks formalized needs assessment

Recommendation 3, Recommendation 4

Highway user safety

No avalanche-related deaths on highways in last 20 years

- No avalanche-related deaths on provincial highways in the last 20 years
- In 1999, 2 ministry staff died in avalanche

Fewer incidents but follow-up process lacking

- From 2010 to 2020, avalanche incidents averaged 3 per year, down from a high of 42 in 1982
- Ministry prepares incident reports but does not have a process to track and follow up
- Ministry closes roads when avalanche forecast is high, but large avalanches still hit open highways

Recommendation 5, Recommendation 6

Frequency and duration of road closures

Fewer highway closures and lower total closure time

- Number of closures and total closure time show decreasing trends
- Ministry system outdated—roughly 10% of closure data missing due to data entry issues

Recommendation 7, Recommendation 8

Staff have taken action to improve highway reliability

- Initiatives to improve highway reliability include:
 - new avalanche control systems
 - expanded ditches and catchment areas
 - updated maintenance requirements

Looking ahead

After reading the report, you may want to ask the following questions of government:

1. How will the ministry ensure that its future investments in avalanche control infrastructure are made where the need is greatest?
2. How will the ministry measure its performance in meeting program objectives?
3. As highway use continues to increase, how can the ministry best ensure highway safety and reliability?