

Juneau Access Improvements Project
Draft Supplemental Environmental Impact Statement
AVALANCHES

Alternative 2B, East Lynn Canal Highway alignment, is affected by 43 avalanche paths, and Alternative 3, West Lynn Canal Highway alignment, is affected by 19 avalanche paths.

Avalanche paths vary quite a bit in size, in frequency of avalanches, and in the consequences of the slides they produce, so simply counting the number of avalanche paths in a given area doesn't provide an accurate indication of the risk level. Instead, geotechnical and environmental studies are used to calculate an Avalanche Hazard Index (AHI). The AHI is a statistical method of quantifying avalanche risk to vehicles traveling the highway. The classifications of avalanche risk based on AHI values are presented in Table 1 below.

Table 1: AHI Classifications

AHI	Classification
<1	Very low
1 - 10	Low
10 - 40	Moderate
40 - 100	High
> 100	Very high

Unmitigated AHI represents the risk level if no measures are taken to reduce it. The unmitigated AHI for Alternative 2B is 288 and for Alternative 3 is 101; these are classified as “very high” risk levels. The unmitigated AHI can be reduced through an avalanche mitigation program, which combines two basic methods:

Hazard Reduction: This includes actions that reduce the hazard from avalanches, such as adjusting the highway alignment to avoid avalanche paths or bridges spanning avalanche paths, or constructing physical barriers or snowsheds. Snowsheds are structures made of steel, concrete, or timber that cover the highway, allowing avalanches to pass over without affecting the roadway or vehicles traveling on it.

Risk Management: This includes practices that reduce avalanche risk to travelers through operations such as avalanche forecasting, highway closures, and explosives that release unstable snow when the highway is closed.

Mitigated risk is the risk that remains after both hazard reduction and risk management methods are incorporated; the resulting AHI is called the **residual** or **mitigated** AHI. In North America, the acceptable level of mitigated AHI is 40 or less.

DOT&PF incorporated hazard reduction and risk management methods into the design of Alternatives 2B and 3 to lower the avalanche risk. Specifically, the design for both routes

includes elevated fills and bridges, and a standard risk management program that requires avalanche forecasting and delivery of explosives. Alternative 2B has been designed with snowsheds in high-risk areas. With these factors, the mitigated AHI for both alternatives is less than 40.

Table 2 compares the AHI of Alternatives 2B and 3 with a sampling of roadways in North America.

Table 2: AHI Roadway Comparisons

Highway	Unmitigated AHI	Residual AHI
Little Cottonwood, UT	1045	40
Roger Pass, BC	1004	40
Red Mountain Pass, CO	335	70
Seward Highway, AK (Anchorage-Girdwood, old alignment)	188	39
Berthoud Pass, CO	93	20
Loveland Pass, CO	80	17
Teton Pass, WY	47	10
Lizard Head Pass, CO	39	8
Thane Road, AK	21	4
Alternative 2B: East Lynn Canal Highway, AK	288	28
Alternative 3: West Lynn Canal Highway, AK	101	18

DOT&PF estimated the number of days the highway would be closed due to avalanche hazard based on reviewing weather and avalanche records and protocols for implementing closure decisions using avalanche forecasting. Table 3 provides the estimated highway closures for Alternatives 2B and 3.

Table 3: Estimated Highway Closures

	Average Closure Time per Year (total days)	Average Number of Closures per Year	Closure Length (days)
Alternative 2B	12.1	9.9	0.8 to 2.2
Alternative 3	8.4	5.5	0.4 to 1.0

If winter avalanche control measures were to require an extended period of highway closures, one or more ferries would be available to transport vehicles and passengers between Auke Bay and Haines during that time.