



Highways and Public Works

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Shakwak & Permafrost

The Shakwak Project on the Alaska Highway has presented some unique challenges; particularly achieving a stable road over permafrost soil continues. Many of the soils are of glacial origin and are termed "ice rich", requiring disposal of millions of cubic meters of material because it is unsuitable for road embankments.

Anything that causes the permafrost to melt will cause the ice rich soil to liquefy. Liquid soil has little strength and will settle or subside. When it freezes, it will expand or heave. This process causes large amount of damage on road surfaces. Undulations and cracking decrease drivability.

Thawed Permafrost

Handling thawed permafrost soil is nearly impossible for equipment. Some especially problematic areas of the Shakwak Project have been reconstructed during winter to minimize such problems.

Thawing is always deeper under culverts because of air and water passing through. It can be caused by

- disturbing the soil during construction,
- soil contact with ground water, or
- simply a warmer climate.

Some work undertaken to meet this challenge

- designing and building a road embankment to minimize melting
 - excavating large volumes of affected soil to meet road alignment needs
 - quarrying large amounts of rock and gravel to provide suitable construction materials
 - constructing granular blankets on ice rich slopes for stabilization and allowance of melting and settling without major slope failure
 - installing culverts in thawed streambeds, or insulating these with styrofoam and granular bedding material
- American and Canadian scientists and engineers continue to research techniques with potential to slow down melting beneath the roadbed and achieve a more stable highway embankment.

Shakwak Project

- The Shakwak Highway Project [3435.33 KB
- Permafrost
- Funding
- Accomplishments
- To Be Completed

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Who currently funds the Alaska Highway?

(see map to the left)

Spending on the Shakwak portion of the Alaska Highway has been an important part of overall expenditures by governments on this international highway. Since the Shakwak Agreement was signed in 1977, over US \$1.5 billion have been spent by both countries on upgrading and maintaining the Alaska Highway System in Canada (see pie chart on reverse).

The Government of Canada is responsible for capital improvements, operation and maintenance of the southerly section of the Alaska Highway, which runs from km 133, just north of Fort St. John, B.C., to the Yukon border.

The Government of Yukon is responsible for operation and maintenance on the entire Yukon segment of the Alaska Highway and the Haines Road, and for capital improvements on the Alaska Highway between the B.C./Yukon border and Haines Junction, Yukon.

The United States government is responsible for capital improvements to the north section of the Alaska Highway from Haines Junction, Yukon, to the Alaska border as well as all of the Haines Road.

Since 1977, the Yukon and Canadian governments have accounted for 74% of the capital and maintenance costs US \$1,143,747,254 on the Alaska Highway, including the Shakwak Highway and Haines Road. The U.S. and Alaskan governments have accounted for 26% of shared expenditures, US \$399,554,041, on the Canadian portion of the Alaska Highway and Haines Road.

The most recent funding for the Shakwak Project was provided under the *Safe, Accountable, Flexible, and Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU)*. SAFETEA-LU was enacted in 2005 — with an authorized amount of \$30 million US per year — for the Shakwak Project. This funding will cease in 2009. Future funding is required from the United States government to fulfill obligations stated in the Shakwak Agreement.

What has been accomplished and what remains to be done?

Since the Shakwak Agreement came into effect in 1977, the North Alaska Highway and Haines Road have undergone major improvements, with over 90% of the reconstruction work completed. During the same timeframe, the more southerly sections of the Alaska Highway have been almost completely reconstructed with only a relatively short section in northern British Columbia remaining to be upgraded.

Despite what has been accomplished to date, important work remains to be done. Immediate funding is required to undertake the following:

1. Rehabilitation and stabilization of areas affected by melting permafrost between Destruction Bay and the border near Beaver Creek: This will cost an estimated US \$70 million.
2. Pave the remaining 68 miles of the Haines Road: This is expected to cost an estimated US \$35 million upon completion.
3. Pave 67 miles of the Alaska Highway south of Destruction Bay: This will cost an estimated US \$39 million.

Future funding requirements:

4. Pave 145 miles from Destruction Bay to the Alaska Border: Until the permafrost is stabilized, paving cannot take place. Once stabilization is achieved, paving is estimated to cost \$93 million (2009 dollars). A future highway re-authorization will be required to fund this section and complete the Shakwak Agreement.

For more information

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The Shakwak Highway Project Upgrade

Renewed Funding for an American Highway in Canada

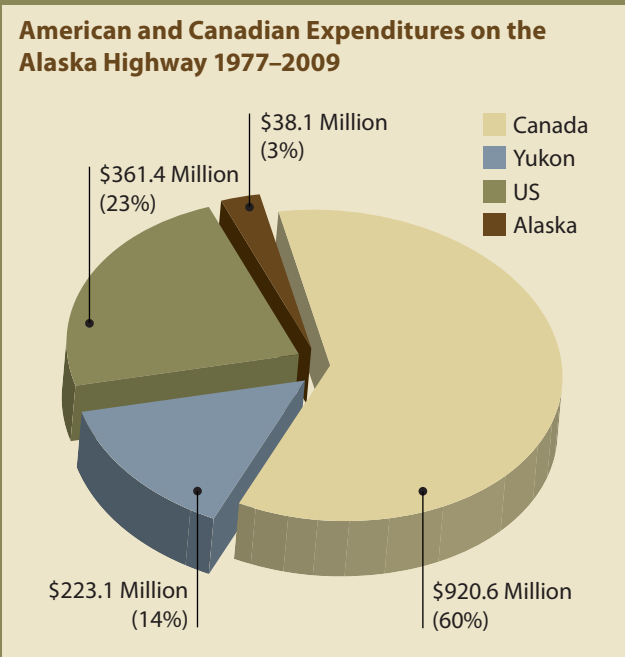
The Shakwak Highway links the Alaska panhandle to the Alaska interior and is also part of the Alaska Highway System which is the only land link to Alaska from the lower 48 states. The Shakwak Highway is located predominantly in Canada.

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Photos: Diame Villésche/www.ravenlink.ca

Why should the United States continue to contribute funding to the Shakwak portion of the Alaska Highway?

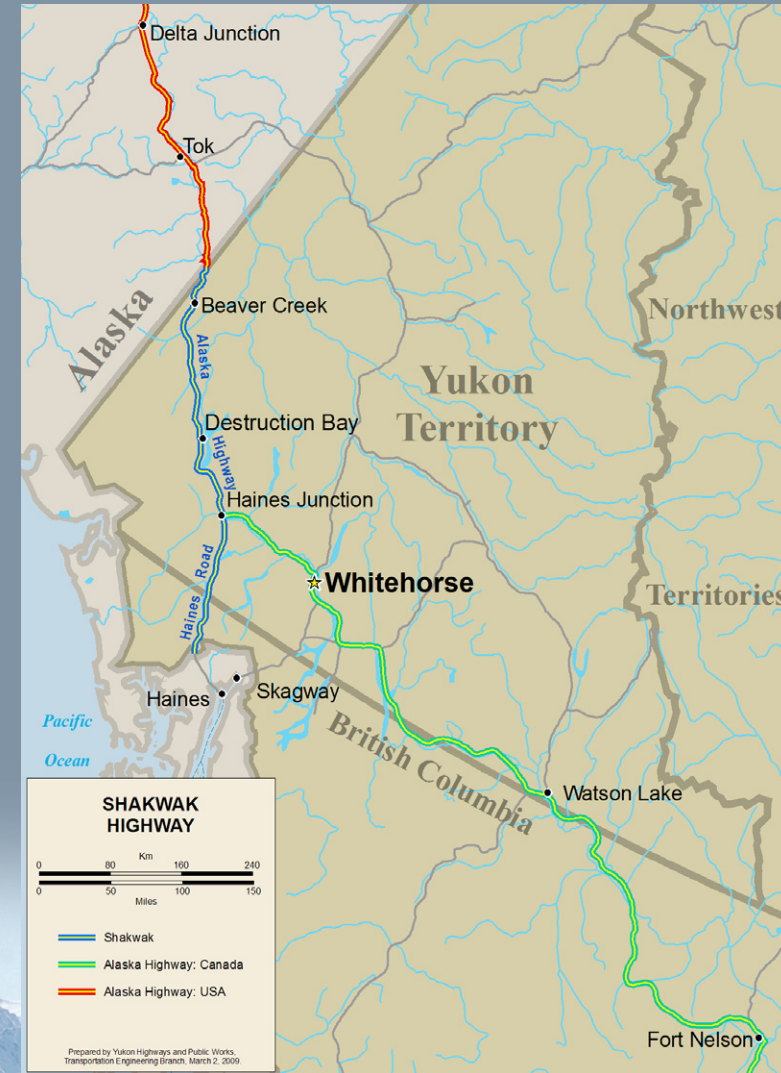
- 1. It is a strategic asset to the U.S.** — The Alaska Highway System continues to be strategically important. It is the only access by land between the Lower 48 States and the Pacific Command bases located in Alaska.
- 2. It is an important energy corridor** — The Alaska Highway System is becoming increasingly important to U.S. Energy Security as a supply route for oil and gas development in Alaska. It will provide critical logistical support for construction and operation of the proposed Alaska Highway Natural Gas Transmission System to transport Alaska North Slope gas to the mainland United States.
- 3. It links the separated land areas of Alaska** — The Shakwak Highway Project is the only road link from Alaska's interior to the Alaska panhandle, where the capital is located.
- 4. It supports mostly U.S. traffic** — Americans constitute around 85% of the traffic along the Shakwak Highway.
- 5. It provides jointly beneficial key infrastructure** — Over the past 30 years investments by the Canadian, American, Yukon and Alaskan governments have resulted in substantial improvements to the Alaska Highway system (see pie chart).
- 6. It provides for safer travel for American citizens** — An improved Alaska Highway System benefits the safety of U.S. citizens travelling between Alaska and the Lower 48 States. Currently, approximately 1,000 vehicles use the Shakwak section of the Alaska Highway every day during the summer months.
- 7. It decreases cost of commercial transportation** — Alaska-bound commercial traffic benefits from highway improvements due to savings in travel time, and reduced wear and tear on equipment.
- 8. It is value for money** — The reconstructed highway meets today's standard for alignment and width; once paving is completed, the surface condition will meet national highway standards.
- 9. It continues successful Canada-U.S. partnership to improve the Alaska Highway.**



Why is there an American Highway in Canada?

Shakwak is part of the Alaska Highway built by the United States government after the Japanese bombed Pearl Harbor in December 1941. The government of the day worried about the vulnerability of shipping lanes on the west coast and sought a land route to guarantee a continuity of supplies to and from Alaska. The Canada-U.S. Permanent Joint Board of Defense met and decided upon a route for a road between Dawson Creek, British Columbia (B.C.), and Fairbanks, Alaska. Canada granted the right of way and the United States financed the construction which was undertaken by the U.S. Army and the U.S. Public Roads Administration during 1942 and 1943.

At the end of the war, Canada assumed responsibility for maintenance and improvements of the Alaska Highway and Haines Road (also constructed by the U.S. Army). Post-war improvement efforts focussed on the area between Dawson Creek, B.C., and Whitehorse, Yukon. Beyond Whitehorse, sparsely populated northern sections of the road received little attention and began to deteriorate over time.



Where is the Shakwak Project?

In 1970, the U.S. Congress requested that a feasibility study be made for paving the Haines Road and the northern portion of the Alaska Highway to provide an all-weather roadway between Southeast and Interior Alaska.

This section of the highway came known as the Shakwak — from the Tlingit word meaning “between the mountains — and now covers approximately 325 miles. It includes the Canadian segment of the Haines Road, which runs from Haines, Alaska, to Haines Junction, Yukon, and the northern portion of the Alaska Highway from Haines Junction to the Alaska border near Beaver Creek, Yukon.

What is the Shakwak Agreement?

In 1977, the Canadian and United States governments negotiated the Shakwak Agreement for the purpose of improving these highway sections in Canada in order to facilitate transportation between and within their respective countries. Pursuant to the agreement, the United States agreed to pay the cost of reconstruction to a jointly agreed asphalt concrete pavement standard from funds appropriated for that purpose by Congress. Canada agreed to manage the reconstruction, provide land and granular resources, and maintain the highway after reconstruction.