TRANSPORTATION BY LAND IN NORTHERN CANADA

Canada is often described as 'The Great White North.' Consisting of a vast geography, Canada's great landmass extends to the northern reaches of the Earth. The terrain and climate pose many challenges to transportation in the region, regardless of the season or method of travel. However, there have been many innovative adaptations to accommodate modern travel needs that work with the natural landscape and weather of the North.

Transportation in the North has always been strongly influenced by the environment. Before the development of railways and motorized vehicles, long distance travel in the North involved boats, snowshoes, and dog sleds. These methods of transportation are still used today, although a growing interest in Northern resources required the development of overland transportation methods capable of carrying heavy loads of people and equipment.

By the late 19th century, railways had been introduced into the northern landscape. The development of the White Pass and Yukon Route coincided with the Klondike gold rush of 1898. The railway linked the Skagway, Alaska port to Whitehorse with 110 miles of rail through and over mountainous terrain. The railway was essential to the development of the mining industry in the North, and continued operation into the late 20th century.

Railways require significant infrastructure development, but are capable of increasing the frequency of travel as well as decreasing travel times. Further, larger loads can be transported in shorter times than by other methods of transportation, such as boats. Similarly, highways offer faster turn-around time on shipments and the convenience of traveling at desired intervals. However, the majority of highways in the northern territories are relatively short, gravel, and not necessarily accessible year-round. Further, the infrastructure foundations for railways and highways are heavily influenced by land quality and the climate. Permafrost and the harsh winter weather pose unique challenges to the maintenance and repair of roads and railways. The Northwest Territories and the Yukon Territories together maintain 6000 km of highway. Nunavut has no long distance highways.

A major advancement in road travel for motorized vehicles that works with the northern climate is that of the ice road. Although frozen rivers and lakes have been used for centuries by Native peoples and the Inuit for traveling and hunting, a collection of ice roads have recently been transformed into a formalized road network. Public and private ice roads are constructed and maintained each season to transport private, recreational and commercial vehicles into the far northern regions otherwise accessible only by barge. To get maximum use of the short hauling season, commercial vehicles ply the ice roads 24 hours a day whenever possible.

Travel during the winter months is thus much more direct and accessible with the help of these ice corridors. They also offer a much more efficient way to transport large equipment northwards in preparation for summer work, such as mining excavations and constructing buildings. However, ice road travel is not without its drawbacks. In addition to the hazards of extreme cold, severe winter storms and visibility white-outs, dangers such as ice blow-outs, overflow, wash-outs, pressure ridges, cracks, and worn portages

must be considered. Rigorous maintenance and monitoring of the ice roads is essential for ensuring the safety of ice-road travelers.

But the benefits of a sophisticated ice roads network to Northern communities may be short lived. It is projected that the impacts of climate change, such as rising temperatures and melting permafrost, will strongly affect the preservation and construction of built structures in the north. For instance, the Mackenzie District has warmed by 1.5º over the past 100 years, and the Arctic tundra by 0.5º during the same time period. Some of the potential effects of climate change in the north include permafrost degradation, which will result in surface instability and challenge transportation infrastructures, and rising sea levels, which will threaten coastal infrastructure along the Beaufort Sea. Further, the projected impacts of climate change may have drastic effects on the length of time ice roads can remain open for business: if spring melt comes early or winter temperatures are too warm, the ice may only be stable enough to safely support transportation during short periods of time.

The unique challenges involved in northern land transportation, such as extreme climate, vast distances and permafrost, have inspired many innovative solutions for travel. Formalized networks of ice roads are a key example of how transportation can work with the northern climate to improve accessibility to remote Northern communities and industries.

For More Information:

Publications

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Websites

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