



Vancouver, Canada

May 31 – June 3, 2017/ *Mai 31 – Juin 3, 2017*

ODE TO THE ROAD – ALASKA HIGHWAY TURNS 75 YEARS OLD

Mackenzie, Alistair¹, Johnson, Ken^{2,3}

¹ Retired Engineer, Burlington, Ontario

² Planner, Engineer, and Historian, Cryofront, Edmonton, Alberta

³ cryofront@shaw.ca

Abstract: The completion of the Alaska highway occurred 75 years ago, and the project remains an engineering milestone in the far north. When World War Two broke out in Europe in 1939, the United States chose not to provide any direct aid to the Allies, however, British covert operations were in full operation within America. Nazi Germany developed battle plans to invade, and conquer Russia for its resources, and then shift its focus on the conquest of the British Isles. With this knowledge Britain and the United States knew that support to Russia was an absolute military necessity in order to eventually defeat Nazi Germany. The supply of materials and equipment to defend Russia was organized through a number of routes. The shortest and fastest route for delivery of planes was a polar route from the United States, through Canada, Alaska, and Siberia. Upon the invasion of Russia by Nazi Germany, the work began to upgrade this local supply route into the Northwest Staging Route. The Route had two major functions during the second world war. Firstly, it was a significant factor in the route location for the Alaska Highway, and it was very useful in the highway construction. Secondly, the airfields were used to ferry planes to Fairbanks to be picked up by Russian crews. Six months before the invasion of Pearl Harbour by the Japanese Imperial Navy, Americans were in northern British Columbia readying for the eventual activity associated with the Alaska Highway. However, at the time the American people were still not in favour of entering the war, and it was not until the Pearl Harbour attack that the resources were applied to the 9 month construction of “the road”.

Keywords: - Alaska Highway, History, World War Two

1 The Russian Territory of Alaska

The northwest region of North America was settled by Asians approximately 24 thousand years ago, however, it remained outside of recorded history until the 18th century. During the 1700's the Russian people, travelling from Russia's far east across the Bering Sea, discovered a valuable resource in a fur bearing animal known as the sea otter. This fur trade activity brought Russian sovereignty to Alaska, and almost brought about the extinction of the sea otter.

The isolation of the territory of Alaska from the centre of Russian political activity allowed a family known as the Baronoffs to amass a significant fortune through the fur trade. However, this frustrated the Tsar of Russia in his efforts to collect any tax. This frustration steadily grew until the Tsar was presented a profitable alternative to sell the Alaska Territory to the United States of America for seven million dollars in 1867.

2 The American Territory of Alaska

Once acquiring the Alaska Territory, the American government considered the concept of building a road to this isolated area, however the President of the time, Ulysses S. Grant, did not support the idea. Some thought was also given to the concept of a Canada-Alaska railway linking with a Russian railway by bridging or tunnelling the Bering Strait.

The first significant effort to create an overland route came in 1897 when Major Moody of the Northwest Mounted Police was given the assignment of completing a route survey for an overland route from Dawson Creek to Fort Selkirk on the Yukon River. After 13 months, and 2600 kilometres (1600 miles), Moody eventually made it to Fort Selkirk, and presented a conclusion to his superiors that an overland route into the Yukon Territory from Northern British Columbia was not feasible.

The Klondike Gold Rush of 1898 changed the entire perspective on the northwest of North America, and presented Canada the dilemma of maintaining sovereignty over the Yukon. The construction of the White Pass and Yukon Railway presented an avenue which favoured Americans because of its origin in what the Americans claimed to be Alaskan territory. To counter this effort the North West Mounted Police started to blaze an overland trail to the Klondike gold fields in 1905. However, only 600 kilometres (375 miles) of a horse trail was completed from Ft. St. John before the project was abandoned.

The territory of Alaska did not begin to lobby hard for a road to the south until the First World War, at which time the Alaska representative Donald McDonald lobbied to build a road to link Alaska with Central America. The lobbying efforts were also complimented by commissions and publicity stunts in support of a road. However all of these efforts did not produce any significant results.

In 1939 a new phase of the argument of an overland route to Alaska was entered by the identification of a security issue related to overland access to Alaska.

3 The Concept of a Road

3.1 A Military Necessity

Various military units were stationed on the southeast coast of Alaska after the purchase of Alaska from Russia in 1867. However, the growing knowledge of the territorial and political objectives of Nazi Germany become the catalyst for pursuing road construction.

In 1933 Winston Churchill, then Minister of Defence in Great Britain, issued a warning about Germany, but this warning was largely ignored. In 1937 a Canadian businessman by the name of Stevenson provided files to Churchill clearly identifying Nazi Germany's plans for conquest; these files were again ignored by the British leaders. This information not only identified Nazi Germany's plans for world conquest, but also Nazi Germany's secret weapons under development, including the atom bomb.

War broke out in Europe in 1939, and the United States did not provide any direct aid to Britain, however, British covert operations were in full operation within America. These covert operations were able to ascertain that the Battle of Britain in 1940 was a bluff to confuse Russia into believing it was at no risk of invasion.

Nazi Germany had a peace treaty with Russia, but the Nazi leaders felt that a potential threat remained in spite of this treaty. Nazi Germany developed battle plans to invade and conquer Russia for its resources, and then shift its focus on the conquest of the British Isles. With this knowledge Britain and the United States knew that support to Russia was an absolute military necessity in order to eventually defeat Nazi Germany.

3.2 The Defense of Russia

On June 22, 1941, Nazi Germany initiated operation Barbarosa, and began the invasion of Russia. On June 23, 1941 the Allied forces initiated the action to support the defences of Russia. At this time the

United States was officially still a neutral country in the Second World War, therefore the United States efforts were very secretive.

The supply of materials and equipment to defend Russia was organized through a number of routes. Seas routes east to ports in northern Europe and southeast Asia were available, as well as a sea route west to the port of Vladivostoff on Russia's east coast. The sea routes east were long and very vulnerable to attack from the Nazi Germany forces in the Atlantic. The sea route west to Vladivostoff was much shorter, and less vulnerable to attack because of the Japanese preoccupation with the South Pacific, and Vladivostoff was linked to the Russian west through the Trans-Siberian Railway.

The defense of Russia was to include the supply of raw materials such as 5,000 metric tons of Canadian aluminum to provide the material for equipment manufacture. However, what Russia needed even more was equipment such as aircraft delivered ready for use. The shortest and fastest route for delivery of these planes was a "great circle" polar route from the United States, through Canada, Alaska, and Siberia.

In early 1941, airfields were constructed in Grande Prairie, Alberta, Ft. Nelson, British Columbia; and Watson Lake and Whitehorse, Yukon Territory. The purpose of these airfields was apparently to facilitate the movement of aircraft and supplies to western Canada and Alaska. The existing airfield in Fairbanks, Alaska was expanded as the northern terminus of the air route.

Upon the invasion of Russia by Nazi Germany, the work began to upgrade this local supply route into the Northwest Staging Route. The Northwest Staging Route had two major functions during the second world war. Firstly, it was a significant factor in the route location for the Alaska Highway, and it was very useful in the highway construction. Secondly, the airfields were used to ferry planes to Fairbanks to be picked up by Russian crews for lend-lease to Russia. In Russia, construction of airfields across Siberia began to match those in Canada and Alaska.

Six months before the invasion of Pearl Harbour by the Japanese Imperial Navy, Americans were in northern British Columbia readying for the eventual activity associated with the Alaska Highway. However, at the time the American people were still not in favour of entering the war.

The invasion of Pearl Harbour, which was known to military officials 5 days before it occurred, was to be the catalyst for official American involvement in the Second World War. Very shortly after Pearl Harbour, support of a road to Alaska was accepted by the American people as a necessity for the defense of Alaska against the Imperial Japanese invading forces. The decision for the Americans to finance and build a road was made, with transfer to Canadian ownership after the war.

3.3 A Highway Route

Several routes had been proposed for the road before construction was ever initiated. The American bureaucracy preferred a route which started in Prince George, British Columbia, and struck northwest to Altin, British Columbia, and then on to Whitehorse, Yukon, and finally Fairbanks, Alaska. This route would eventually connect Alaska and Seattle, however it was close enough to the west coast to be vulnerable to enemy attack, and there were no existing air bases along the way. This route also would also have steep road grades and be subject to heavy snowfall during the winter months.



Figure 1: The Alaska Highway route from Dawson Creek to Fairbanks

The Canadian bureaucracy preferred a route which also started in Prince George, but which followed the Rocky Mountain Trench north to the Pelly River, Yukon. From Pelly River the road would traverse to Dawson City, Yukon and down the Yukon Valley to connect the Richardson Highway of Alaska to Fairbanks, Alaska. The advantage of this route was that it was farther inland, and away from the threat of enemy aircraft attack, however there also were no connecting air bases.

A "Prairie Route" was advocated by the United States Army Corps of Engineers. This route was far enough inland to avoid attack by enemy planes, and it connected the air bases of the Northwest Staging Route from Edmonton to Fairbanks. It traversed through more level terrain, not ascending a pass over 1,300 metres (4,250 feet). There was also a railhead at Dawson Creek, British Columbia and a winter trail from there to Fort Nelson, 480 kilometres (300 miles) to the northwest.

The practicality of the "Prairie Route" won out over the two other possibilities, and a decision was made on February 2, 1942 to follow this Route.

4 Building of the Road

4.1 Construction

The simple objective of the Alaska Highway was to construct a pioneer road for military traffic as quickly as possible from Dawson Creek, British Columbia to Fairbanks, Alaska.

On March 2, 1942 the first train carrying troops arrived in Dawson Creek to begin construction. There were no reliable maps of the proposed route, and only a winter trail from Dawson Creek to Ft. Nelson, and a wagon road from Whitehorse northwest to Kluane Lake.

Three major groups of US military personnel were mobilized in Canada and Alaska for the project. One group proceeded to Dawson Creek by rail to begin work northward toward Alaska, The second group went to Whitehorse by rail on the White Pass and Yukon Railway to begin work northward, and southward. The third group mobilized through the existing Richardson Highway from Valdez on the Alaska coast to construct southward towards the Yukon from Alaska.

The help of local trappers, prospectors, and First Nation members was enlisted to help locate the road. Local packers with their mule teams were used to help supply the advance survey parties.

Five hundred and forty kilometres (335 miles) of untravelled wilderness separated Ft. Nelson and Watson Lake, the first settlement in the Yukon Territory. The highest point of the road crossed Summit Lake in this section of the road at 1200 metres (4,000 feet).

Northward from Whitehorse, the road alignment went around the south shore of Kluane Lake, and crossed the large glacial rivers of the western Yukon. At the Alaska border, the route traversed through Tanana River Valley reaching Delta Junction and the Richardson Highway of Alaska.

In April 1942 route location personnel were at work along the entire road alignment, with heavy equipment following close behind. Five to six kilometres of road could be built in a day because construction could proceed 24 hours a day with the long summer daylight hours.



Figure 2: Operating a scraper during the original construction of the Alaska Highway

The most difficult problem for the construction was the inexperience of the military engineers in building a highway on permafrost. In many areas along the route where the top layer of ground was removed, the underlying ground thawed and produced a "quagmire" which was difficult to build on. The best strategy in these areas was to leave the permafrost intact and build the road on top of it by laying a layer of insulating gravel.

The route between Whitehorse to the Alaska border was particularly difficult to complete. There were large areas of muskeg, several large glacial rivers to bridge and many sections of roadway which required blasting to remove bedrock. Ice jams in the rivers during the 1942 spring breakup also added to the difficulty.

The temperatures during the winter months dropped to minus 45 degrees centigrade, with a record minimum of minus 63 degrees centigrade occurring at the runway in Snag, Yukon in 1942. At these temperatures, machinery would not function well and breakdowns were frequent.

On September 24, 1942, bulldozer operators met at Contact Creek (Mile Post 588.1, Km 946.3) to close the southern section of the road. On October 20, 1942 the bulldozers met near Beaver Creek, Yukon

(Mile Post 1,202, Km 1,934) to close the section of the road from Alaska to Whitehorse. The pioneer road had been completed in eight months and twelve days. An opening ceremony was held at Soldiers Summit on Kluane Lake on November 20, 1942 to officially celebrate the completion of an overland link to northern Canada and Alaska.

4.2 Structures

The most significant problem for the construction next to the permafrost difficulties was bridging the many small streams and major rivers along the route. Over the entire length of the highway a total of 133 bridges and 8,000 culverts were constructed. Some of the rivers could be crossed with small log structures, but others were meandering glacier-fed rivers, hundreds of metres wide. These large river crossings required major bridge structures for an all-season road.

Temporary log or pontoon bridges were used extensively at the beginning of the construction over the smaller streams, and ferries were used on the larger rivers to accommodate the rapid pace of construction.



Figure 3: Kiskatinaw Bridge near Dawson Creek was built in 1942 to replace timber trestle (in foreground)

The longest structure along the highway was the Nisutlin Bay bridge at Teslin Lake, Yukon with a length of 700 metres (2300 feet). The initial pilings for this bridge were set within a thin layer of sand in the lake bottom, below which was mostly permafrost.

The Peace River bridge near Ft. St. John was the most difficult bridge to build. A ferry was initially used to carry the supplies across the river but it was inadequate to move the necessary quantity of material. A timber trestle bridge was built in October 1942, but the river destroyed this in November. A suspension bridge was started in December 1942 and completed in August 1943, reaching a length of 650 metres (2,130 feet).

4.3 Construction Supply

Another significant problem of building the road was maintaining the flow of supplies to the construction activity. The problem was compounded by adverse weather conditions, remoteness of the area, and the lack of enough ships to mobilize supplies to the coastal supply points.

There were many supply routes used during the course of construction. To supply the construction proceeding north and south from Whitehorse, material was shipped to the Port of Skagway, and on to Whitehorse via the White Pass and Yukon Railway. Skagway was in term supplied from the Port of Prince Rupert in British Columbia. In 1943 alone the railway hauled over 250,000 metric tons of material from Skagway into Whitehorse. Dawson Creek, at the end of the railway in northern British Columbia, was the major supply point for the southern section of the road. The supply of materials progressed up the road with the construction.

The interior highways of Alaska and the Alaska Railroad connecting Anchorage and Fairbanks kept the supply of materials moving to the construction at the north end of the road. Several of the Yukon lakes and rivers were also used to supply construction areas along the construction route by riverboat.

4.4 Construction Workers

Living conditions were particularly uncomfortable during the early part of the road construction. Workers had to live in tents with inadequate heat in the winter and little insect protection in the summer. The food supply for such a large contingent of troops was also a major supply problem. As the highway construction progressed, more suitable accommodation was built and better food was obtained.

Insects were a problem along the highway due to the large expanses of water available for insect breeding grounds. The use of head nets were very common, especially during the summer months, and many workers were unable to work because of swelling from insect bites.

The cold weather was possibly the hardest adjustment for the personnel to become accustomed to. Most of the workers had never experienced such extreme temperature ranges. In total approximately 10,000 men and women were mobilized for the construction of the Alaska Highway.

5 The Alaska Highway Legacy

5.1 A Northern Gateway

In 1940 there were approximately 72,000 people in Alaska, and it was envisioned that Alaska was a gateway to Canada and the west coast of the United States. This vision and much more was proven to be a fact with the implementation and operation of the Northwest Staging Route, which began ferrying aircraft in August 1942. A total of 8,000 aircraft were ferried from Great Falls, Montana to Moscow, Russia, with only 140 aircraft lost on route.

This effort provided a significant component to defeating the forces of Nazi Germany in Russia, and ultimately in Europe.

5.2 Reconstruction of the Alaska Highway

The pioneer road constructed in 1942 was a single lane, rough road that would have to be upgraded in order to be usable by the increasing military and civilian traffic. In early 1943 the job of upgrading the road to an all-weather structure became a civilian exercise. The upgrading included reducing road grades, straightening road alignments, and constructing permanent bridges.



Figure 4: Surveying of Alaska Highway during reconstruction work

Five major contractors were hired to oversee the construction, with specialty contractors hired for the large bridge projects. By October 1943, with the highway upgraded as an all-weather road, the United States government ordered the project completed. The military then took over and did what maintenance it could to keep the road open.

The road, when completed, traversed over 2500 kilometres (1500 miles) from Dawson Creek to its junction with the Richardson Highway at Delta Junction, Alaska. The total cost of the road was over \$138 million 1941 dollars, and required the placement of 133 bridges and 8,000 culverts.

Upon turnover of the road to the Canadian government in 1946, Canadians paid the United States \$70 million. Reconstruction of the road continues today using many of the lessons learned during the initial construction.

The Alaska Highway is a connection to the Russian far east, born of war. It now remains a major trade route for the northwest, and a potential international trade route for Canadians and Americans for the future.