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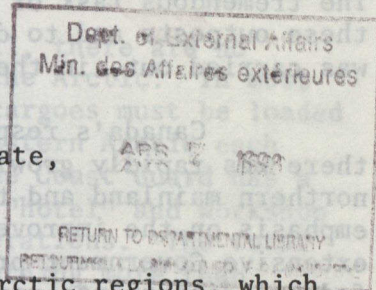
REFERENCE PAPERS

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TRANSPORTATION IN NORTHERN CANADA

(Prepared by the Public Affairs Directorate,
Ministry of Transport, Ottawa.)



The opening of Canada's vast and inhospitable Arctic regions, which may be termed, roughly, the mainland north of the 60th Parallel and the islands of the Arctic archipelago, hinges principally upon the availability of transportation.

The federal Ministry of Transport has the continuing task of deciding upon or recommending to the Government how far it should go in providing transportation and communications facilities in the North, which must exist if private enterprise is to take any part in developing the available natural resources. The Department each year carries out the supply by sea of the northern settlements, and it is also largely responsible for the provision and maintenance of air-fields and other aviation services throughout the North.

It was in 1880 that the British Government granted the Arctic islands to Canada, and there was a relatively short-lived outbreak of interest in the Western Arctic when the Yukon gold-rush occurred in the 1890s. The matter of providing transportation facilities for the opening of the North did not become of particular urgency, however, until the advent of the Second World War focused attention upon the need for defence installations in the North and the urgency of making the known oil and mineral resources of the Mackenzie River basin available to Canada and its allies.

As the demand for transportation in the Northwest developed, there was a marked growth in both air and water transport. Today there is a network of air services throughout the North, supported by navigational aids and meteorological and communications facilities.

Barge traffic is still the principal means of moving heavy cargo down the Mackenzie River system to the Northwestern Arctic shoreline. The river and its navigable tributaries are marked with buoys and other aids to marine navigation and buoy vessels of the Canadian Coast Guard operate along it from headquarters at a Ministry of Transport district marine agency at Hay River, Northwest Territories.

Marine Developments

The Canadian Government has been operating a regular annual patrol of the Eastern Arctic since 1922, but marine transport to that part of the North consisted until 1947 of little more than the single Government patrol vessel, plus a few small private freighters operated by firms largely concerned with the fur-trade. In that year a Canadian-United States program was begun to establish jointly-operated weather stations in the islands of the High Arctic. The tremendous task of transporting building materials and other supplies to these outposts and to defence establishments that had been built in the North was carried out, in the beginning, almost entirely by United States agencies.

Canada's responsibilities were rapidly increasing, however, and there was rapidly growing interest in exploring the natural resources of the northern mainland and the islands. At the same time, there was increased emphasis on the improvement of living standards of the native population and extensive Government programs toward that end were being developed by the federal departments concerned. As a result, in 1950, the Ministry of Transport put into service the new ship *C.D. Howe*, designed for Arctic work. Three years later, the heavy icebreaker *d'Iberville* was commissioned to support the Arctic sea-lift operations. Canada began to increase annually the degree of its participation in the supply undertakings to the northern ports-of-call, until it became an all-Canadian project.

Today, the annual Ministry of Transport supply convoys comprise some 15 Canadian Coast Guard vessels and some 18 chartered freighters and tankers. The Coast Guard ships include both heavy icebreakers and shallow-draft supply ships, the latter being able to reach many ports-of-call, particularly in the Hudson Bay area, where shallow water prevents ordinary freighters from operating.

From mid-July until late September and early October, the fleet of supply ships delivers supplies to some 40 Eastern Arctic settlements, including native villages, trading-posts, defence outposts and weather-stations. Because of the short season, the delivery is made by several convoys, each consisting of an icebreaker or two, depending upon the severity of ice conditions, and several cargo ships.

One convoy goes to the High Arctic, with Resolute Bay, Cornwallis Island, as a main calling-point. Another may work along the Baffin Island coast, while yet another makes its way to the defence establishments in Foxe Basin, on the west side of Baffin Island.

Other vessels are busy in Hudson Bay and Hudson Strait. At the same time, icebreaker assistance is afforded as needed to commercial shipping plying the route from Churchill, Manitoba, through the strait to Europe.

The Ministry of Transport operates and maintains the marine aids to navigation along the Hudson Bay route and in other Arctic waters, including those in the Western Arctic from Tuktoyaktuk, at the mouth of the Mackenzie River, eastward to Cambridge Bay, on Victoria Island, and to Spence Bay and

Shepherd Bay on Boothia Peninsula. An icebreaker based at Victoria, British Columbia, travels to the Western Arctic each summer to support the supply vessels operating along the coast from "Tuk".

The principal marine carrier in the Northwest is the Northern Transportation Company Limited, a Crown corporation that operates the freight barges and tugs down the Mackenzie River system. In 1969 they carried 256,000 tons of goods north in a fleet consisting of 142 barges and 27 tugs, as well as two Arctic cargo vessels.⁽¹⁾

Apart from the excellent facilities at Churchill, there are no harbour installations in the ordinary sense anywhere in the Arctic. In most instances, ships must lie offshore at ports-of-call and cargoes must be loaded in barges. Crews of stevedores are taken north to the Eastern Arctic each season by the Department to help in this operation and the Coast Guard has a special depot ship, CCGS *Narwhal*, equipped as a floating "hotel" and workshop to house the stevedores and otherwise support landing operations. The total cargo handled by ships in the sea-lift today runs to something more than 100,000 tons each season. In 1969 and 1970, the Ministry experimented in the use of a heavy helicopter for off-loading ships at Northern posts.

The marine operations are aided by the Ministry's ice-reconnaissance system, carried out throughout the northern navigation season by specially-equipped fixed-wing aircraft with trained ice-observers on board. The reports provided by these specialists are augmented by short-range ice-reconnaissance from helicopters carried aboard the larger Coast Guard icebreakers.

Ice-forecasting is carried on during the shipping season from bases at Frobisher, Edmonton and Resolute, with the longer-range outlooks provided from the Ice Forecast Central at Halifax, Nova Scotia.

During the past several summers, extensive research has been carried out in the previously little-known channels of the Arctic archipelago by scientific parties aboard Canadian Coast Guard vessels and hydrographic ships of the Department of Energy, Mines and Resources. While private firms have been investigating various mineral deposits in the North, the Coast Guard has carried out, and is continuing, a program of ice studies to determine the length of the season during which cargo vessels could reach these possible sources of mineral output, thus making their products available to the nations' industry.

Aviation Developments

The aviation scene in the Canadian North is very different from the scene in the days when bush pilots, flying with little or nothing in the way of

(1) For further information on the NTCL, see Reprint No. R17 -- *The History of the Northern Transportation Company Limited* -- distributed by the Information Division, Department of External Affairs, Ottawa.

navigational aids, ferried prospectors and traders northward. Today, at least four airlines are operating scheduled services to various parts of the Arctic, ranging as far north as Resolute Bay, and many more flying firms are licensed to operate charter flights to northern points.

It will not be economically feasible to provide many major air-fields in the North until the volume of flying is much greater than it is at present, and for this reason heavy use is made of float-equipped and, in winter, ski-equipped aircraft.

Cheaper transportation can be offered, provided the volume is great enough to warrant the use of large-capacity, wheel-equipped aircraft. Accordingly, the Ministry has tried to provide a series of airports for large aircraft at focal points for various northern areas. It has also helped in the development of smaller landing-strips, which can be used by light aircraft.

For a time after the Second World War, the Royal Canadian Air Force operated most major northern air-fields. Around 1950, the Transport Department began a gradual takeover of these fields, which include Whitehorse, Watson Lake, Coral Harbour, Snag, Aishihik, Frobisher Bay, Cambridge Bay and Resolute Bay. A major airport built by the Department at Inuvik is now a main terminal for air-service along the Mackenzie River and an important distribution point for the Western Arctic.

At Yellowknife and Fort Smith, paved runways have been built to handle large modern aircraft. The strip at Baker Lake can handle medium-size twin-engine planes and the runway at Coral Harbour on Southampton Island is maintained as a staging-point on the northern air-routes that run through Hudson Bay to the High Arctic. Frobisher Bay boasts an airport with a paved runway 9,000 feet long, capable of handling the largest jet-transport.

Communications

Federal telecommunications have been operative in the North since the 1920s, when the first radio direction-finding ship-to-shore communications were set up in the Eastern Arctic to assist shipping on the Hudson Bay route, *via* Churchill, Chesterfield Inlet, Nottingham Island, Cape Hope's Advance and Resolution Island.

Later, in the 1930s, another dozen or so stations were opened to assist aviation in the North. During and since the Second World War, the Ministry has installed and operated a large number of radio aids to air navigation, including radio ranges, non-directional radio beacons and, more recently, modern instrument-landing systems at Whitehorse and Frobisher. Associated facilities provide voice communication with aircraft over a wide range of frequencies.

In addition, international air-ground communications are provided at Resolute and Frobisher to serve international flights. Air-operational communications with southern points are provided *via* a combination of Ministry-owned radio and radio-teletype facilities and services leased from

communications companies. The Ministry has encouraged the development of public telecommunications services in the North by the commercial communications companies. This has resulted in standard public telephone and telegraph services being provided along the Mackenzie Valley, including modern telephone exchanges, and mobile radio-telephone service, as well as leased-line service, at many isolated locations throughout the Northwest. These services are of particular assistance in the development of air-transportation.

Meteorological Services⁽²⁾

Meteorology is an indispensable part of air-transportation, while communications stations in the North have carried out some weather-observing work for many years. A major advance in this field was the opening, mentioned earlier, of the joint Canadian-U.S. weather stations at Alert, Resolute Bay, Eureka, Mould Bay and Isachsen in the Arctic islands. These top-of-the-world stations make a vital contribution in the realm of climatology.

Today there are some 110 Meteorological Branch staff members employed by the Department at 22 northern airports and observation stations. The observations from these points, as well as from stations operated by other Government agencies under contract with private firms, are channelled into the communications system, which relays the information throughout most of North America and, in certain cases, to much of the northern hemisphere.

The Arctic Weather Central at Edmonton analyses these observations and provides weather forecasts for aviation, marine and other northern interests.

Other means of transportation in the interests of Arctic development are being given careful study both by Federal Government agencies and private enterprise. The use of air-cushion vehicles, which appear to hold promise as a means of transport in some parts of the North, have already been tested in the Northwest. Assessment of this relatively new means of transport, under the rugged conditions of both terrain and climate that prevail in the Arctic, is continuing.

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(2) See also Reprint No. R28 -- *Joint Arctic Weather Stations: Twenty-five Years.*

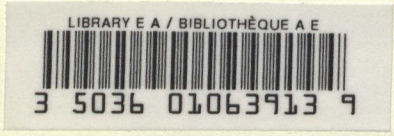
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(2) See also Reprint No