

Omitting the guarantees last referred to (they already form part of the funded debt due the public as previously dealt with) it will be seen that the total investment in cash or credit of the Dominion, provincial and municipal governments of Canada amounts to \$2,701,413,631. Setting a value of one dollar an acre on lands granted, this figure becomes \$2,748,704,197. As there are 42,075 miles of first main track steam railroads in Canada to-day, it will be seen that the federal, provincial and municipal contribution to the provision and operation of Canadian railway facilities since Confederation has amounted, roughly, to \$65,300 a mile.

TRANSPORTATION DEVELOPMENTS SINCE THE WAR

All the machinery of transportation within Canada showed a marked development in the years following the war. This expansion of facilities, so far as they had to do with the two principal railway systems, have been most fully dealt with in the report proper, with which this historical reference is designed to appear as an appendix. It remains, therefore, only to deal briefly in conclusion with the developments during the past decade in related fields of transport, such as waterways, airways and roadways.

(a) WATERWAYS

As this is written, two announcements of great moment have been made as affecting the Great Lakes-St. Lawrence navigation system, one, the final completion and official opening of the Welland Ship canal, which has been under construction since 1913, with a period of shut-down during the war; and the other the negotiation of a treaty between Canada and the United States for a proposed deep-water development for navigation and power of the international rapids section of the St. Lawrence river which, between lake Ontario and lake St. Francis, forms the boundary between the two countries. Coincident with this latter work would be the development by the Dominion for navigation of the purely national section of the St. Lawrence river, between Montreal and the head of lake St. Francis, a work already in part provided for by an arrangement with the corporation having in hand the power development at Beauharnois, which project is being adapted to fit in with the general scheme for the improvement of through navigation.

The plans for the proposed deep-water development of the St. Lawrence between lake Ontario and Montreal provide the same standard of navigation facilities as the Welland, and for the development of almost two million horse power of hydro-electric energy in the international section, while there is available a further two and a half million horse power in the purely national section of the river, the development of which for power, as and when required, is under the jurisdiction of the province of Quebec and subject to provincial policy and direction.

Welland Ship Canal

The Welland Ship canal is the fourth canal to be constructed between lakes Erie and Ontario, during the hundred years that have elapsed since the work of circumventing the falls of Niagara was first undertaken. The project, which is twenty-five miles in length, provides for a depth of twenty-seven feet in the canal reaches, while future enlargement is provided for by a depth of thirty feet in all locks and permanent structures. The useable length of the locks is 820 feet; the useable width 80 feet; the lift of each lock is 46½ feet, and the total elevation 326½ feet. A unique feature is the provision of three twin locks (Nos. 4, 5, and 6) in flight at the Niagara escarpment, by means of which

vessels may be passed simultaneously in both directions. The locks themselves are similar to the Gatun locks of the Panama Canal which, though of somewhat larger dimensions, have an aggregate lift of but 85 feet. The perpendicular distance from the coping of Lock No. 5 to the bottom of Lock No. 4 is 130.8 feet. The Horseshoe Falls at Niagara are only 28 feet higher.

The new canal consists of eight locks, including the necessary guardlock. The superseded canal included 27 locks, the original canal, 40. The locks are electrically operated, and the time required to fill one is eight minutes. The entire canal may be traversed in less than 8 hours, compared with 15 to 18 hours on the recent canal. The total anticipated cost of the work will be about \$130,000,000.

Canal Expenditures Generally

Upon the canals of the Dominion as a whole \$314,404,229 had been expended at March 31, 1931. Of this sum \$236,216,461 had been expended on capital account, and \$78,187,768 on operation and maintenance. As against this outlay, \$28,166,203 has been received in revenues, including tolls until 1904, when tolls were abolished. The principal revenue is now derived from hydraulic leases, rentals, elevator fees and wharfage charges. These now amount to a little over a million a year; operation and maintenance cost \$3,329,616 during the federal fiscal year ended March 31, 1931.

(b) AIRWAYS

Under the pressure of war the newest method of transportation—that by air—developed rapidly; and immediately after the Armistice consideration was given as to the possible uses of airways in Canada. It soon became apparent that the aeroplane was of especial value in reaching districts which were not readily accessible by other means, such as the far north, or sections of Northern Ontario. Services were established under various auspices to mining districts: the first regular service being inaugurated in 1924 to the Rouyn area. Similar further routes were subsequently established, and aeroplanes were used also for investigating the mineral resources of northern areas.

Early carriage of mail by air into remote districts led the postal authorities to establish regular and official delivery in such areas. Of a somewhat different nature were the air mail services meeting incoming and outgoing steamers. These were intended merely to give greater speed over routes already covered by rail. For all relative air mail routes co-operation was secured with the American services.

In relation to other modes of transportation, airways are not seriously competitive at present. The main use of the aeroplane for transportation in Canada is either to reach districts with which there are no other regular communications, or to gain speed between well settled districts. The aircraft, alone of transport agencies, is not dependent on rail, road or waterways. Within wide limits, it can follow any course.

For administrative purposes, civil aviation in Canada is divided into two classes: (1) civil operations carried out for other Dominion Government departments under the Director of Civil Government Air Operations; (2) commercial aviation, under the regulation of the Controller of Civil Aviation. Both are under the Department of National Defence, which also controls military air operations through the Royal Canadian Air Force. The total expenditure on civil air-services for 1930-1931 amounted to just short of one and a half million dollars.