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THE ST. LAWRENCE SEAWAY AND MONTREAL

Address by the Hon. George C. Marler, Minister of Transport, to the Kiwanis Club of Montreal, October 18, 1956.

I thought that on this occasion I would talk to you about "The St. Lawrence Seaway and Montreal". The St. Lawrence Seaway Authority, presided over so ably by my predecessor, the Hon. Lionel Chevrier, formerly Minister of Transport, has organized a number of tours of inspection of the work now in progress but there are still a good many people who have not yet had the opportunity of seeing what is being done. With this in mind, I thought that I would try to give you a broad description of the project and a general appreciation of what it means to Montreal.

However, before I come to deal with the present I should like to turn back a few pages of Canadian history. Going back, we find that the first attempt to build a canal in Canada was made by the Sulpicians in the early part of the eighteenth century. They attempted to construct a canal to by-pass the Lachine Rapids but due to a lack of funds the project was never completed. The first successful project was the series of locks and canals built by the Royal Engineers between 1779 and 1783 to provide navigation between Lake St. Louis and Lake St. Francis. These provided a total rise of about fifteen feet, but the available draft barely exceeded two feet.

Only minor works were carried on from time to time until 1821 when the building of the Lachine Canal was undertaken. This canal, designed to overcome the drop of about forty-six feet between Lake St. Louis and the Harbour of Montreal, consisted of seven locks of five foot draft. Before it was finished in 1825 private interests had embarked on the building of the Welland Canal to provide eight foot navigation between Lake Ontario and Lake Erie. The magnitude of this undertaking may be judged by the fact that the Niagara escarpment is some 327 feet in height, but despite the difficulties of the task the first canal was completed from lake to lake in 1833.

Since then, Canada has been engaged, almost without interruption, in the extension and development of her system of canals, the main purpose being to provide navigation facilities from Montreal through to the Great Lakes. From 1834 to 1856 the canals of the St. Lawrence River system were deepened to provide nine foot navigation and the enlargement of the Welland Canal was undertaken in order to increase its capacity.

Then seventeen years later the next great period in our canal history began and the further deepening of the canals to provide fourteen foot navigation was undertaken, though the project was in fact completed only in 1904.

Then, after a brief respite of only nine years, we were off again on the greatest undertaking of that time, the building of the Welland Ship Canal which was started in 1913. This was a massive project. The new canal, in place of the twenty-seven locks which existed formerly, consisted of only eight locks, three of which were twinned, or doubled. It cost Canada $132,000,000 when it was completed in 1932, but what is particularly significant is that the locks have thirty feet of water over the sills and the twenty-seven mile canal has a depth of twenty-seven feet, except in a few places where it is only twenty-five.

And now, in this year of grace 1956, we find ourselves engaged in this great undertaking of our own time, the St. Lawrence Navigation and Power Project. It would be a waste of time to try to measure its magnitude against the yardsticks we have used in the past; it is obviously more important to place it in its setting as a vital part of the St. Lawrence-Great Lakes waterway which has been described - properly, I believe, and despite our aversion to superlatives - as the world's greatest inland navigation system. The fact that the waterway extends more than 2,000 miles from the Atlantic Ocean to the western end of Lake Superior fully justifies calling it the greatest, but if that is not adequate qualification, I suggest that the fact that it overcomes the difference of 600 feet between the level of the Atlantic and that of Lake Superior should clinch the title.

The Five Steps

It accomplishes this remarkable feat in five steps. The first, of course, is from the sea to the Port of Montreal and accounts for only 20 feet out of the 600; but it is one for which we have made substantial expenditures. Originally, though the Gulf of St. Lawrence as far as Quebec was navigable by the largest ships afloat, sections of the route between Quebec and Montreal were restricted by the natural depth of 10½ feet at low water. Canada commenced dredging operations as early as 1844 and has spent some $300,000,000 developing the St. Lawrence Ship Channel which at low level now has a minimum depth of thirty-five feet. May I add that we are continuing with further dredging at this time in order to widen

the channel and improve it at some points, in anticipation of the greater traffic which the Seaway promises.

The second step, accounting for another 225 feet, is the St. Lawrence River above Montreal which comprises the Lachine, Soulanges, Lake St. Francis, International Rapids and Thousand Islands sections. As you know, this part of the waterway is navigable by means of the fourteen foot canals to which I referred a moment ago.

The third step, the highest of all - 327 feet - is the Niagara Falls section between Lake Ontario and Lake Erie, which I mentioned earlier, and which can be surmounted by means of the Welland Ship Canal which, you will remember, has a minimum depth of twenty-five feet.

The fourth step is the Detroit-Lake St. Clair passage - some eighty-nine miles in length but only eight feet in height - joining Lake Erie and Lake Huron. Because of the gradual rise in level, there are no canals or locks in this part of the waterway but it has been necessary to dredge the channels. Traditionally this work is undertaken by the United States government which, at considerable expense, has progressively deepened the channels so that they now have a depth of twenty-five feet in the downbound and twenty-one feet in the upbound.

The final step is the St. Mary's Falls section where there is a rise in level of some twenty-one feet. Here, in order to permit ships to travel between Lake Huron and Lake Superior and to by-pass the St. Mary's Falls, locks have been built at Sault Ste. Marie, four on the U.S. side of the river and a fifth on the Canadian side. I am sure that you will be surprised by the fact that these locks handle a far greater volume of shipping than any other canal system in the world, and probably three times the volume handled in the Panama Canal. The volume of traffic carried in 1954 was approximately 85,500,000 tons and the principal items, ranked in order of volume, are iron ore, coal and wheat.

The movement of wheat and other grains is, of course, of prime importance to Canada because in a normal year about half of Canada's grain crop moves in ships from the Lakehead down the waterway. Some of the crop is discharged at ports in the Georgian Bay or elsewhere on Lake Huron, but a good deal goes on down the waterway. Some is discharged by the larger vessels at Port Colborne for trans-shipment into smaller vessels, and some goes on down through the Welland Canal, across Lake Ontario and down the river to Prescott, where similar operations of trans-shipment are carried out.

This movement of wheat and other grains is carried out either in lakers or canallers, with this difference that the lakers which are deep draft vessels can go no further than Prescott while the canallers, built specially for the purpose,

can comfortably navigate the fourteen foot canals between Prescott and Montreal. The mention of this difference makes it opportune at this point to compare the two types of vessels.

The lakers, of which there are a number operating in the Great Lakes, may be as long as 700 feet, carry some 20,000 to 25,000 tons of cargo, or 700,000 to 800,000 bushels of grain, and operate with a crew of thirty-two to thirty-five. Canallers, on the other hand, whose length and draft are severly limited by the locks in the St. Lawrence canals, can carry only 2,000 to 3,000 tons of cargo, or 70,000 to 80,000 bushels of grain, and need a crew of about twenty-five. I know that these figures are not all of the pertinent factors, but they are sufficient, I am sure, to convince you that economics favour the larger type vessel; but unfortunately at the present time it cannot operate through the barrier between Prescott and Montreal.

It is the provision of facilities for deep draft vessels between Prescott and Montreal that is the purpose of the navigation works now under way but, as you know, the seaway project also concerns the development of power. It is not practicable to consider the one without the other.

The principal works are to be carried out in the International Rapids section of the river. Those for the development of power are being undertaken by the Power Authority of the State of New York and by the Hydro-Electric Commission of Ontario at an estimated cost of $600,000,000. They are in the process of damming the river on both sides of Barnhart Island and the power-house will span that part of the river lying between that island and the mainland of Ontario. The development will produce 2,200,000 H.P., to be divided by New York and Ontario, both of which have need of additional hydro-electric energy.

When the dams are completed and closed they will raise the level of the river about eighty feet and will back up the water to a point near Iroquois Island, thereby creating an enormous pool or lake, submerging the existing fourteen foot locks and canals to the west of Cornwall.

Another dam across the river is to be built at Iroquois, not for power purposes but in order to regulate and control the flow of water from Lake Ontario.

To enable shipping to pass through these two dams, locks are in process of being built. Two are being built at Barnhart Island on the United States side of the river by the Saint Lawrence Seaway Development Corporation at an estimated cost of about $85,000,000, while at Iroquois Island the St. Lawrence Seaway Authority is building a lock on the Canadian side at a cost of about $15,000,000.

Though dredging is to be done in the vicinity of Cornwall Island and in Lake St. Francis, the next important

works, as we move downstream, are those being undertaken at Beauharnois. As you know, power has already been developed at Cedars Rapids on the north side of the river and by means of the Beauharnois Power Canal on the south side. In this part of the river about 2,000,000 H.P. can be developed. Quebec Hydro has already developed some 1,500,000 H.P. and has plans for the development of additional power. To provide communication between Lake St. Louis and the Beauharnois Power Canal the Seaway Authority is already well advanced in the construction at the eastern end of the canal of two locks which, with incidental work, are expected to cost some $50,000,000.

As we continue to move down the river, we come to the Lachine section, where it is possible to develop some 1,200,000 H.P. The development of this potential could have been started at the same time as the Seaway but as the Province of Quebec in 1954 seemed not to be ready to proceed with the power development, the present works being carried out in the Lachine section are solely for the purpose of navigation.

These works for navigation involve the building of a lock near the outlet of Lake St. Louis, a canal several miles in length, extending overland from Caughnawaga to the Laprairie Basin and then eastward in the Laprairie Basin to another lock at St. Lambert which is being built just above Victoria Bridge. The canal then extends eastward past St. Helen's Island and will afford easy passage for shipping either across the river to the Port of Montreal or downstream by means of the St. Lawrence Ship Canal.

Lachine Section

The works in the Lachine section will be by far the most costly of all of those for navigation and are probably the most complex because of the other transportation facilities lying across the path of the Seaway. I refer, of course, to the four bridges which you all know very well. May I tell you briefly something of the problems which have had to be faced and what the Seaway Authority or other agencies are planning to do.

The first bridges to be encountered were the railway bridge at Ville LaSalle and the Honore Mercier highway bridge. At this point in its course, the seaway canal lies inland and therefore to the south of these two bridges. In consequence, the railway bridge itself will not be affected but as the seaway canal cuts through the railway embankment a lift span for railway traffic is to be built over the Seaway at this point.

So far as the Honore Mercier bridge is concerned, the Seaway Authority, in co-operation with the provincial government, has worked cut plans for a bridge to be built at a height of 120 feet over the seaway canal. This new

bridge will connect with the Honore Mercier bridge by means of a ramp and with the highways on the south shore by means of approach roads designed to distribute the traffic properly and to carry it across the railway embankment, thus avoiding the present narrow arch under the railway embankment.

The Victoria Bridge presented much more complex problems. After a great many alternatives had been carefully considered, it was decided that the best solution would be obtained if the first lock of the Seaway were to be located at St. Lambert in immediate proximity to the bridge. This will make it possible in due course to incorporate in the present bridge a lift span over the downstream end of the lock and to build a diversionary bridge which will have a lift span over the upstream end of the lock and which will be connected to the present bridge. Just a word as to how these facilities will operate. When the downstream lock gate is closed rail and road traffic will use the present bridge, but when the downstream lock gate is opened because a vessel is either approaching or leaving the lock the upstream lock gate must be closed and traffic will therefore move over the diversionary bridge. The essential point is that one lift span or the other will always be in the down position and signals will tell motorists where to go and automatic switches will take care of train movements.

Consideration was given to the feasibility of building a tunnel or a high level bridge for rail and road traffic but, because of the need of a gradient suitable for railway operations, it was found that the length of a tunnel or bridge would be over seven miles and that the cost would be nearly as much as Canada's part of the cost of the Seaway itself.

A clearer understanding of the problem may be had if the railroad's needs are separated from those of highway traffic. The steeper grades which are suitable for highway purposes are wholly unsuited for railway purposes and in the solution of the Victoria Bridge problem a separation of the two needs has been important. The Canadian National, which believes that the Victoria Bridge has many years of useful life ahead of it, is satisfied that its needs will best be met by the present Victoria Bridge and the proposed diversionary bridge. So far as motorists are concerned, the proposed changes in the Victoria Bridge will not diminish its usefulness for motor vehicles, and I think that the Nuns Island bridge, which the federal government has promised to build, will be a substantial addition to present facilities; and nothing will prevent other authorities from building other bridges if that be considered necessary.

So far as the Jacques Cartier Bridge is concerned, the southern part must be raised to a height of 120 feet over the Seaway. I shall not go into details but shall merely tell you that it is expected that this work will be carried out without interrupting the flow of highway traffic

except for a few hours when the new high level span is rolled into place in substitution for the existing span over the Seaway.

I hope that this gives you a good general view of the works that are now being carried out. General as it has been, however, I hope that the description which I have given you has conveyed the impression of magnitude that an actual inspection of the work produces. It is indeed a tremendous undertaking. I have given you one or two figures as to costs in the course of my remarks but not the total. I am sure you will be interested to know that at present it is estimated that the costs of the navigation works are likely to be $300,000,000, or slightly more; whereas, as I told you earlier, the power works are to cost around $600,000,000.

When the Seaway is completed and opened for navigation in the spring of 1959, we shall indeed have a waterway in which we can take great pride because the new locks are to have thirty feet of water over the sills and all channels, including even the Welland Canal, are to be dredged to a depth of twenty-seven feet. This will leave only the channels in the upper sections of the waterway with a depth of less than 27 feet and the U.S. government has planned for the improvement of these channels.

The Seaway, when completed, is, of course, going to bring about a change in the pattern of ship movements on the waterway. The time at my disposal is too limited for me to discuss at any length this aspect of the question, but certain obvious things may be said in a few words.

New Pattern of Ship Movements

First, there will be an increase in the movement of iron ore up the Seaway and of wheat and other grain down the Seaway. There will be an increased volume of ocean traffic moving from the sea to the Great Lakes and vice versa. A number of small ships are already engaged in this trade but I think that we shall see larger vessels and an increase in the volume of traffic carried by these ships, particularly from U.S. ports on the Great Lakes.

Second, the opening of the Seaway will also see some changes in the Harbour of Montreal and I am sure that you will be glad to know that the National Harbours Board has already taken steps to make sure that the facilities of the harbour will meet the needs arising from the traffic that is in prospect. They are making arrangements to provide berthing accommodation for the lakers that will come down the waterway when the Seaway is opened and, in order to reduce to a minimum the turn-around time of these large vessels, the Board has commenced and is carrying out actively a programme of modernizing the grain unloading facilities of our port. Dredging of the harbour is to be undertaken so as to

facilitate the movement of the lakers, additional sheds are being provided and, generally speaking, a broad programme of works is in course of being carried out so that the port will be equal to the demands that will be made upon it when the Seaway becomes a reality.

One final word so far as Montreal and the Seaway are concerned. I know that there are some who fear that when the Seaway is open and the deep draft vessels move into the Great Lakes, Montreal may lose its place as the pre-eminent Canadian port. I do not count myself among these pessimists; I think that the future holds great things for Montreal. Montreal already has so many advantages - hydro-electric power, a good supply of labour, excellent communications and transport facilities - and, besides this, is located in the heart of what is perhaps the most populous if not the richest market in Canada. If, to all of these existing advantages, we add those that will accrue from the Seaway, I think that we shall have our full share. All that we need to do is to seize the great opportunities that are being offered to us and make the very most of them.

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