

but that 400,000 had been planned, and that as an engineer he considered the system as planned, as a whole, rather than the part that had been completed. The remainder did not matter; it had been planned, ergo it would be built, someday, even though it had been planned since 1826 and was not yet built. But there is not the faintest doubt that those other 29,000 miles will be built and exactly as planned. We can learn much from far-sighted and clear planning for the future such as practised by the French road engineers.

Knowing the tremendous traffic that any road directly used for army purposes will be required to carry, we must build our bridges and roads accordingly.

### Trucks Increasing, Better Foundations Needed

The main thing that our roads must be made to stand is the continuous pound and wear of the 3 to 5-ton trucks and of the heavy wagons on iron tires with 4 to 6-in. wheels, the weight of which will not exceed, probably, 3 tons. Each of us in our own locality must see that we use materials, if possible, that are capable of withstanding this traffic.

I think we should all pay a great deal more attention to the foundations of our roads than we have done in the past, when the traffic was lighter. In my own State there is a tremendous commercial traffic in motor trucks. They are constantly on the increase. Most of our main roads have to carry 100 to 150 a day, and some of them have a much larger number. This is going to require stronger roads, thicker macadam, and a foundation in a great many places where the old macadam or gravel road would have held under the traffic of a few years ago without such foundations.

To do this, we must have federal government co-operation and support. I have some roads in Massachusetts that are perfectly alright for the traffic which they would normally experience, but if the government trucks keep pounding over them for another three or four months, I won't have any roads left at all in certain localities unless the government provides the money to maintain them in the unusual manner necessary.

We are getting 1,000 vehicles a day and from one hundred to two hundred trucks on old macadam that is fast being ruined. I know of one road in Maryland and Virginia over which the government has been running 150 trucks a day and it simply went to pieces. Our roads were built too poorly, most of them, for this sort of traffic, but the government is now beginning to co-operate properly and no doubt the Canadian government will do the same sooner or later.

### Auto Trucks Will Carry Most Freight

If money be very limited, spend it first of all on drainage. Build the ditches, provide your drains, form your surface. Then put in a good foundation if you can take another step.

The motor traffic of France and England is nothing compared to the motor traffic in Ontario or in the United States. All the autos in France do not number as many as the taxicabs in New York City alone.

England does not expect to be invaded, and yet as a war measure the British parliament has voted something like \$5,000,000 a year for the up-keep of roads in Great Britain.

Our government is working at cross purposes in dealing with the question of supplementing our railroads with truck traffic.

In the past we failed to look far enough ahead in building roads. The time is coming when most of our freight

carrying will be done by auto trucks. We must build our roads heavy enough to carry trucks.

The United States government is using trucks to deliver army contract goods, for in such cases it is time, not money, that counts.

The cost of the road must not be looked upon too seriously as it will generally be more than offset by the savings it will effect. I could cite innumerable instances where improvements in highways have more than paid for themselves. In one case three-ton loads are being hauled where three-quarter-ton loads were previously the maximum. In another instance milk is being trucked over a new highway to an adjacent city for a half cent a gallon, where the railroad formerly charged one cent. In addition, the farmers are also saved the cost of hauling to the railroad station and the cost (one cent) of carting from the station in the city to the distributor's plant. The farmers along that highway are saving \$71,000 a year as a result. The road is 13 miles long and cost about \$260,000. The saving far more than pays the interest, sinking fund and maintenance. One farmer saves \$150 in the hauling to market of his cabbages alone.

### Roads Pay For Themselves

Suburban roads increase land values to such an extent that the extra taxes more than remunerate the municipality for the expense. One road near Boston is  $1\frac{1}{2}$  miles long. It goes partly through what was a market garden and partly along a hardly passable hillside. Within eighteen months of the start of construction on that road, twenty-six new houses have been built averaging about \$2,500 each. Four sideroads join the new road. These have been partly developed and four houses are going up along them. The farm land was worth \$500 an acre and the hillside land \$200 an acre. The building lots are selling at \$750 each, 8 lots to the acre. The road cost about \$45,000 and the municipality is already collecting over \$1,000 annually more taxes than previously owing to increased valuation. It will soon collect a sufficient increase to meet the interest, sinking fund and maintenance of the road, without any doubt. The bonds were issued at  $4\frac{1}{4}$  per cent, I believe, and the required annual sinking fund is about  $1\frac{3}{4}$  per cent., so that they are already collecting a substantial portion of the interest and sinking fund charges. The road is bituminous macadam, penetration method, with a concrete base where necessary. It is 18 ft. wide, with a 3-inch gravel shoulder along each side.

People have said to me, "Why don't you stop the road building during the war, and let the labor go onto the farms?" Well, we employed more men and reduced their working hours, and when they finished their eight-hour day, they were still willing to help the farmer.

W. A. McLean, deputy minister of highways for Ontario, in discussing the above address, said: "We surely will have to reconstruct roads between towns and cities strongly and heavily enough for the motor truck traffic. It means that we must put in foundations strong enough to take care of heavy concentrated wheel loads.

"I believe that all our highways are military highways. If the highway which saves the farmers' time is not a military highway, I don't know what is."

The Toronto Harbor Commission has moved from its leased offices, on Bay St., to its own new building on the waterfront at the foot of Bay St.