

The big question is to think out carefully what class of construction should be adopted to meet the requirements of each. It is just as reckless and foolish to build a cement-concrete road on a back concession as it would be to put an ordinary gravel, such as is suitable for a back concession, on one of the main roads which is subjected to several thousand vehicles a day. The construction must be designed in keeping with the requirements. That is one thing that I would like to impress upon you. That construction should not be any more expensive than necessary, but you should not fail to make suitable expenditure wherever requirements of traffic demand it. Build the maintenance into the construction if possible; provide a road that is going to easily meet the requirements of the traffic, and wherever any section of road is so densely travelled as to require a more expensive construction, then I say it is good business economy to undertake a more expensive class of road.

#### Build to Meet Requirements

Let us not get away from the fact that the different classes of construction each have their own place in a proper scheme for roads. They are not interchangeable, but one at times is just as advisable as another under other circumstances. I do not believe in building cheap roads any more than in using cheap construction in connection with anything else; I mean, I do not believe in building low-cost roads merely for the purpose of making a crust which will apparently be an improvement to that road. The gravel road has its place, but it is necessary that it be as carefully constructed as is the most modern design of road.

We have been building a great mileage of water-bound macadam roads—crushed stone roads—and in various parts of Ontario this is the cheapest material one can get in some places; gravel is scarce, while stone is to be found in abundance. Where this is true, then it is up to the management to provide the most capable machinery that can be purchased for the purpose of preparing that material as it should be prepared and at the least possible outlay. In other sections of the country, good gravel is to be found where stone is scarce. It would make a road very expensive if stone had to be shipped a long distance. This is a point that must be considered: How does the cost of the local gravel compare with that of bringing in broken stone, in view of the service which the road is to be called upon to perform?

#### Gravel is Suitable Material

Design carefully in the first place; see that the material is of the proper quality; in a great many instances we find this has been one of the great weaknesses in connection with the work carried on in the United States. Anything in the nature of stone was, in the first instance, considered quite good enough to make a first-class road. Stone was very much better than gravel; it did not matter what the quality of the gravel was as long as bed-rock could be found; they believed in crushing the stone and putting it down in place of the gravel; but if gravel is carefully selected and cleaned, and properly applied, and oiled or treated with some bituminous material, then it has its proper place in the road program of this or any other province.

The construction of culverts should be undertaken in the most durable and substantial way. No weak material has its place any longer in the program of the principal roads. While our bill does not provide for payment of any portion of the cost of bridges, yet it does include all culverts up to a span of 20 ft. These we expect will be made of cement-concrete and built according to modern plans, and these will include, as a general rule, most of the openings through roads except the larger bridges, which the federal government did not at the time think we should join in building.

The width of the road and the width of the material to be placed on the road must, in the first place, be prepared by your own departments. The provincial departments have the designating of the roads, they have the designing of the class of roads to be built, and they have the supervision of the work. The federal department does not undertake to join in any of these things beyond simply seeing that the

plans are suitable plans and that the work has been carried out in accordance with these plans. When that is done, then 40% of the cost of the work on these roads will be paid.

The department which we are organizing is not of a very expensive character. We do not believe that the provinces are going to raise \$30,000,000 of their own money and spend that recklessly in order to get \$20,000,000 of our money, and we feel that the largest share of the responsibility should be placed upon the provincial departments.

It is very encouraging to know that within the last few years the provinces have all been working along the lines of establishing road departments, and these road departments now have special charge of most of the provincial or important roads. They have issued simple plans and specifications which are very useful in guiding the local authorities in carrying out their part of the work. I attach the very greatest importance to the fact that out of possibly 55,000 miles of road in Ontario, only 1,800 will be treated as provincial roads, which leaves a tremendous mileage of road still in the hands of the local municipalities.

The importance of a road is something which you have to judge from its locality, the amount of traffic that is on the road at the present time and the probable amount of increase which will be caused by the improvement of the road. The possible development of the section toward greater production may involve a more expensive road and one which would require a greater amount of care and attention. The different plans only tend to classify or single out the different kinds of road, and in this connection, it is necessary, not only to confine ourselves to the classification of the principal or provincial roads, but it is necessary that we should as carefully single out the provincial county roads, the county roads and the principal township roads. All these fall into classes of their own and should be treated accordingly.

#### Use Machinery Everywhere Possible

The matter of utilizing to the fullest extent modern machinery in connection with this work is very, very important. The high cost of man-power and horse-power in connection with work of this kind is making it almost prohibitive, and mechanical or motor-driven implements and machinery should be used as far as possible as a part of the economic construction of our roads.

It is not our intention, and it is outlined in our regulations, that we should in no way conflict or clash with the provinces in carrying out their work. Each province has its money singled out for it, and each one knows just how much it can earn and how fast it wishes to go. The money will be available at any time in connection with grading, or gravelling, or stoning, or putting down of bituminous or concrete pavement where such is demanded. The class of construction is not one that can be fixed by standards, and, consequently, we are not sending out standards. We are going to try and work with the different provinces and see if we can, by working together, adopt standards that will be suitable for the requirements before any fixed standards are undertaken.

#### No Interference from Ottawa

I believe the federal appropriation is one which was clearly justified. The provinces are all now working on their plans and seem to be very anxious to get this assistance to make improvement as speedily as they possibly can. It will be very interesting to watch the rivalry that will be created between the different provinces in this connection. I know that appears to be the spirit now, and it is surprising to find that one of the prairie provinces was the first to have its general plan filed under the Act.

This great movement is going to be one of the best investments which Ontario or any other province can make so long as they are careful in the design of their scheme and see that the work is wisely planned and that the money is cautiously expended. If this is done, you will receive the heartiest co-operation from our department and the least possible interference consistent with good management and good work.