

GOOD ROADS AND LAND DEVELOPMENT.*

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ECONOMIC and other practical questions in connection with good roads are not confined to matters relating to construction. While a great deal of money can be lost by extravagance in paving, by using the wrong materials and by want of employing engineering advice in making roads, yet although the fact is not quite appreciated, the direct and indirect loss due to bad planning of roads can be, and probably is, much greater than that which may be due to unscientific construction. Bad planning of a highway system has the effect of increasing costs due to haulage up steep grades and over greater length than is necessary; it causes roads to be laid over hills and across muskegs, creating difficulties in connection with land development and drainage of the worst kind; it has the effect of scattering the population, so that the amount of road surface to be made is entirely out of proportion to that which can be paid for out of any reasonable tax on the people or on the land served by the roads. For the latter reason it causes local authorities to leave roads unmade or to accept the most primitive forms of construction.

Roads should be designed by engineers to save waste in road space as well as in road construction. Above all else our highway policy should be designed to secure the principle of the maximum of convenience at the minimum of expenditure.

When road questions are discussed it is too frequently assumed that it only requires courage and willingness on the part of public administrators to secure a good roads system. As a matter of fact, there is scarcely anything in regard to which more courage and willingness are shown, and the real trouble is not the want of public spirit but simply the want of the available cash to construct roads according to our expensive and wasteful system of planning them. As a matter of fact we do not plan them; we fit them in somehow into a system of rectangular subdivision—either along the concession lines or on a five per cent. basis, which is little better. We should learn to plan our roads for a purpose. There are a few people in favor of good roads because they want to enjoy motoring in the country and a few others who do so because they want to sell road materials or machinery; but the public opinion in favor of good roads which really counts, is that which looks to that means to help in developing the resources of the country. These people want to know how much value the good roads are to the farm, to the factory, to the home; and they are not going to pay more than they are worth no matter how much those who want them from other motives may argue in their favor. Roads are primarily for the purposes of providing access to property, means of developing land, and means of communication for carrying on our industries.

Our roads in Canada are of too great a length, too great a width, and there are too many of them in proportion to the tax-paying capacity of the people, outside of the most thickly populated parts of the country.

Even in the United States, with their greater density of population and with their progressive road policy, they are only able to get satisfactory roads in rural districts by transferring too great a burden of construction to posterity, and then they only get one mile in ten constructed in a satisfactory manner.

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According to Mr. Nelson P. Lewis, engineer of the Board of Estimate and Apportionment of New York City, "The State of New York, by the vote of its people, has authorized the expenditure of \$100,000,000 for the improvement of the state highways, and this enormous sum is raised by the issue of 50-year bonds. While a portion of the work to be done is undoubtedly of a permanent character, such as the widening and straightening of the roads, the improvement of grades and provision for drainage by substantial structure of masonry or steel, a very large proportion of the expenditure is for road surfaces, many of which can scarcely be expected to last for more than ten years. Borrowing money for fifty years to pay for ten-year roads is obviously unwise."

The only sound principle in financing road improvements is to pay for all construction over the period during which it lasts, and only to borrow money for any longer period, say, up to fifty years, in respect of such portion of the work as is permanent. This permanent portion consists of the matters which may be described as incidental to the planning of the roads, such as, improving the grades by excavation and filling, acquiring a comprehensive survey of every part of a road system before large expenditure is incurred.

Comparisons are sometimes made between the good roads of the British Isles and the poor country roads of this continent. It is only during the last one hundred years that the roads in Britain have become satisfactory, and the greater part of the cost of improvement has been borne during the last twenty-five years. In the eighteenth century the roads in England were hardly passable. We are told that the old Romans used to travel over their highways in Southern Europe at the rate of 100 miles a day, but that in 1703 it took Prince George of Denmark fourteen hours to travel forty miles from Windsor to Petworth. So conservative were the masses of people in Britain against having good roads that in the eighteenth century they resisted their construction with riot and bloodshed, and even when the roads were made and improved, country people in many districts refused to use them. To-day, it is recognized in Britain that the best means of promoting agriculture and the proper development of the land is to have good roads. But the system has to be built up on an economic basis. Those who advise the large land-owners in England consider that there is no better investment than the making of good substantial roads, and that intensive farming cannot be carried on without them; but they only make the roads that are absolutely necessary and do not make reservations round the farms, as if by merely making the reservations they *ipso facto* created roads. Unfortunately, in Canada we have had no proper plan of our road system prepared; the rectangular lay-out of land is entirely meaningless from any other purpose than that of securing accurate measurement of the land for which purpose it is well adapted.

Human necessity, the traffic requirements of the whole population and the relative cost of development to the value of the land and other property developed, should be the guiding principles in laying out a system of roads and streets. Considering the enormous expenditures required to be incurred to improve roads, their economic and social value, the importance of directness of route, the danger and inconvenience of sharp curves and the advantage of easy grades, it is extraordinary that our stereotyped rectangular system pays no respect to either of these questions, except insofar as it does so by accident. The money that is spent by highway departments has to be allocated without the engineer having any voice in the