

CHAPTER 5
SUPPLEMENTARY DISCUSSIONS
THE LOW COST ROAD PROBLEM

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ONLY EIGHTEEN PER CENT OF OUR HIGHWAYS SURFACED

There are in the United States today three million miles of rural highways. Of these less than one-fifth or only eighteen per cent of the whole, are surfaced. This eighteen per cent represents practically all our road-building activities up to the present. The question facing us in this country today, is how are we going to improve the other eighty-two per cent, the remaining two and a half million miles, and still keep in good condition what has already been built.

HOW TO IMPROVE THE OTHER EIGHTY-TWO PER CENT

We have been at this job of road improvement more or less intensively for the last twenty years, and we are giving good service on only eighteen per cent of our mileage. To be sure that per cent is in general on the routes most heavily traveled, but what are we going to do about the other eighty-two per cent? We have spent perhaps ten billions of dollars on the eighteen per cent. What is it going to cost to handle the remaining eighty-two per cent? It does not take much discernment to see that we are going to have to stretch the dollars much farther than we have been stretching them.

THE ANSWER IS A LOW COST ROAD

Realizing the magnitude of this question the Highway Research Board started this investigation on the low cost road. There is no study of our road problem that will be looked upon with more interest, and which can be investigated with greater profit than this one. Therefore, I am here today making a special plea for the low cost road.

Our so-called permanent pavements do not want for advocates. The Portland Cement Association has very ably presented the case

for the concrete road. The National Paving Brick Manufacturers Association tells us that "brick roads outlast the bonds." But not one of them has a solution for the problem of improvements that must be made at a cost of only a few thousand dollars per mile. This is not to their discredit. They are in business for profit. The profit on low cost roads is necessarily very small and will not pay for any expensive promotion. But the problem is here, and public officials in charge of road building must solve it.

SEVENTY-FIVE PER CENT OF RURAL MILEAGE MUST BE
LOW COST ROADS

Mudbound communities must be released from their bondage. And it must be done on seventy-five per cent of our mileage for only a few thousand dollars per mile, or not done at all. The concrete road, and the brick road are not the answers to the problem before us. Funds are not available and will never be available to lay the so-called permanent pavements on the greater part of our rural mileage.

LIGHT TRAFFIC DOES NOT JUSTIFY LARGE EXPENDITURES

The investment of public funds should be governed by the same principles as private funds. Private interests before investing capital in new enterprises try to make certain that there will be the greatest return for the lowest possible capital outlay. Many concerns have failed because dividends could not be paid on a too large an original investment.

There is a point where the addition of cement to concrete does not bring returns in strength and quality proportionate to the cost. So too in the economical placement of road funds there is a point where added expenditure of money does not bring proportionate returns in traffic service, particularly where there may be a crying need of the extra funds elsewhere.

REDUCED TRAFFIC MEANS MODIFIED ROAD DESIGNS

Obviously the kind of surfacing and likewise the line, the grade and even the drainage structures on light traffic roads should be modified to keep the cost proportionate to the service requirements. And yet in this age, when standardization is so glorified, we often find the same sort of standards as to maximum grades, minimum radii on curves, minimum width of roadway and even design of pave-

ment sections applied to routes that proper investigation shows will carry widely varying amounts of traffic

A ROUTE NO BETTER THAN ITS WORST SECTION

There may perhaps be those who call themselves engineers who frown upon the low cost road because it is dusty, because it causes greater tire wear than pavements, because the grades are steeper or narrower or the curves a bit sharp in places. Such theorists should be marooned on a mile of good pavement sandwiched between ten mile stretches of ungraded mud road, left thus because all the funds available have been spent on the mile of ideal section, and compelled to fight their way out, day in and day out, jeered and cheered on their journey from mud hole to mud hole by the natives mudbound through the lack of common sense shown by these pseudo-economists

We all prefer good pavements to dusty traffic bound roads. We all might prefer plush seated limousines to Fords. But we do not prefer to travel ten miles on horseback through mud to be able to ride a mile on a pavement in the limousine, when we might make it ten times more comfortably all the way over the cheap road in a Ford

OUR ROAD PROBLEM PRIMARILY A FINANCIAL PROBLEM

I emphasize that this road problem is bigger than a problem of pavement design. It is primarily a problem of financing highways.

An engineer has been defined as a man who can do with one dollar what any fool can do with two dollars. We have a lot of technical men who cannot pass as engineers on that definition.

With plenty of funds it is easy for an engineer to design and build a pavement of excellent quality, but I submit to you, that to take the same funds and bring relief to a large area that would have to wait many years for scientifically designed and well-built pavements, in the meantime paying a mud tax greater than the cost of pavements, is a much greater accomplishment.

OHIO'S EXPERIENCE ON LOW COST ROADS

A few words concerning our experience in Ohio on low cost roads may prove interesting.

4000 miles in 17 years

The State Highway Department was established in 1906

On January 1, 1923, after a lapse of nearly seventeen years, the state had completed and was maintaining only 4050 miles of road built on the state-aid plan. These 4000 miles were scattered over a state system of nearly 11,000 miles. There were gaps of bad road on important routes. The poorer counties, unable to cooperate with the state on the state-aid plan in very many cases had less than 30 miles of road passable the year round on the state system. Such parts of the state were practically mudbound during the spring months.

Up to this time the state had confined its activities almost exclusively to the building of hard surface pavements. There was a popular demand for an immediate change in policy.

If roads were to continue to cost \$30,000 per mile and upwards it was only a problem in elementary arithmetic, knowing the amount of funds available for road purposes, to figure that it would be many years in the future before agriculture, industries, churches and centralized schools in these communities could expect relief.

Popular Demand For More Mileage

An analysis of the problem as it effected the state system showed the roads divided into four classes: (1) Those portions already paved, (2) those portions which demanded immediate paving and for which funds were available; (3) those portions which from an economic point of view should be paved, but for which only limited funds were available; and (4) those portions upon which expensive construction could not be justified because of light traffic. Evidently the first two classes were cared for, but a problem was presented in classes 3 and 4, and study was concentrated on them.

The Only Solution, A Low Cost Road

The only solution was a low cost road that would be passable and smooth the year round.

We began applying this remedy with some trepidation late in 1923.

1700 Miles at \$3000 Per Mile in One Year

Experience gained in 1924 and 1925 enabled us to gradually increase our output so that for 1926, along with the usual annual program of about 400 miles of hard surface paving, including many notable bridge structures, an additional 1700 miles of old roads impassable for much of the year were improved by the use of traffic bound surfacing at a cost not averaging over \$3000 per mile. Greater expenditures per mile had to be made where large bridges or culverts had to be replaced, where the topography necessitated heavy grading or where surfacing materials were not readily available and hence costly.

Some of the grading and structure work was done by contract and the surfacing added later. By far, however, the greater part of the grading and small structure operations were performed by the day labor method. This obviated the need for and the delay in making detailed plans and surveys. The best line and grade commensurate with the funds available was obtained.

A Trained Organization Very Important

As noted above 1700 miles were thus handled in 1926. This was made possible by an organization of men and equipment developed over two or three years previous which had been gradually able to increase the miles improved each season. The job required a large amount of equipment, particularly graders and tractors. Some of it was war surplus, but the larger part was purchased by the State Highway Department through competitive bids.

The biggest problem, however, was to train men to do the work well with the limited funds available.

Those Who Came to Scoff, Remained to Cheer

At first our work was ridiculed. It was a new departure for the state to be building cheap roads. But "those who came to scoff remained to cheer." After four years the thunderous criticism that greeted the inauguration of the new policy has quieted down to a mere whisper.

The low cost traffic bound road has filled a great need and has met with great popular approval in Ohio. It is the solution of the problem where roads must be had, and funds are not available for pavements. The work done along this line on state roads in Ohio, coop-

eratively by the state and counties, has proven a great object lesson to the authorities responsible for our back roads. It has shown those who have very limited funds what can be done with a little money intelligently expended. Tax payers in communities where these roads have been built almost over night have been agreeably surprised and have thus become more friendly to expenditures for road purposes. Since opening up some of these routes new life has been given to many communities and traffic has increased considerably. Hard surfacing with the same money would have given much less benefit because of the greater mileage left impassable.

Here let me repeat again what was said in the first part of my discussion.

With plenty of funds it is easy for an engineer to design and build a pavement of excellent quality, but to take the same funds and bring relief to a large area that would have to wait many years for scientifically designed and well-built pavements, in the meantime paying a mud tax much greater than the cost of pavements, is to my mind a much greater accomplishment.