

3. This type of road satisfies the light, farm-to-market traffic and pleases the taxpayers of the community.

4. The bonding cost to the individual township is small.

5. The added mileage to the county highway system of improved roads at a small cost nets a gain in gasoline tax from state tax fund.

6. This method relieves the trustee of the township of further maintenance cost of the earth roads thus improved.

7. The combination stone and gravel roads serve to link the outlying communities closer together through a system of cheap, all-weather roads, and taxpayers are well satisfied.

I believe some 10 to 12 miles of this type of road have been completed during 1930. Very little data are yet available as to maintenance costs.

ROAD CONSTRUCTION WITH COUNTY EQUIPMENT

By Ralph Lebo, Fulton County Highway Superintendent

In dealing with gravel road construction there are three vital elements to be considered, namely: public necessity for the road, the kind of grade and material specified, and finally the quality of inspection which determines whether or not the taxpayers receive full value for the money expended.

Road construction is accomplished by various procedures. The method most used I suppose is by the contract procedure. At one time this method was by far the best, for it was about the only way in which to secure the grading and surfacing of our county roads in large mileage.

In our county about ten or fifteen years ago when the three-mile-road law went into effect, not only farmer A, but most of his neighbors carried a road petition affecting his property, and experienced little difficulty in securing signatures. These petitions were filed in the auditor's office and acted upon by the county commissioners; the roads were ordered built and bonds were sold; and there was not a dissenting voice.

The result—roads of varying quality, good, poor, and worse were soon constructed. Taxes went skyward; the people found they had mortgaged their governmental unit to the limit.

Just now our county is emerging from this burden of debt. The roads built thereby are now being repaired at considerable expense, and many of them should be rebuilt.

We are not growling at the apparent mistakes of the taxpayers of that time, but since these trunk lines are now controlled and maintained by the county we feel that the less important roads in the community can be properly built at a great deal less cost by other methods.

The township trustee and his advisory board are best informed as to which of these township roads should be improved first, and the county road officials should know the quality of road material and grade best suited to the county system.

In the summer of 1929 the trustees of our county asked the county auditor to call a meeting of the county commissioners, county surveyor, trustees, advisory board, road superintendent and his assistants, and others interested in the county's welfare. The auditor had been instructed to secure data from other counties and to submit a general plan whereby the county might build these township roads more cheaply. It was discovered that quite a few countries had been operating successfully under a similar plan.

We found that the gravel roads in Fulton County constructed in recent years by the contract system had cost \$5,000 per mile, while a short time before the cost was almost double that amount. Of the total cost it appeared that \$800 to \$1,200 was expended in preliminary surveys, advertising, attorneys' fees, bond cost, superintending, and the contractor's profit.

It was further found that each township could not afford to own equipment sufficient to do the necessary grading for the quantity of work required.

It was urged at this meeting that the county commissioners at their earliest convenience advertise and purchase a grading outfit of the caterpillar type with which to do the grading for the repair work in the county, and receive petitions from the township trustees and advisory boards to build the grades for certain roads in their townships. The trustees could then place gravel thereon according to specifications set by the county board. This grading was to be done at the expense of the county, and the road when finally completed and accepted was to be taken into the county system and be maintained by the county.

This plan was carried out and the county road superintendent was instructed to supervise and control the operation of the repair work in the county, and receive petitions from the township trustees. The results have been most gratifying to the county. The trustees have co-operated splendidly, and the use of the grading outfit has been distributed equitably to the townships.

The money in the township is raised by placing the levy as high as possible, the maximum allowed being 30c; and in this manner the roads are paid as built without bond issues. The expense of the county grading outfit is carried by the gasoline tax under control of the county road superintendent.

Trustees find that after the grade is built they can employ home labor and supervisors at very moderate wages, and materials and quantities can be bought more cheaply.



Fig. 1. Fulton County tractor and self-loading wheel scrapers grading a township road.

The value of the grading outfit is \$7,500. The cost of operation (including depreciation, labor, fuel, oil, and repairs) is approximately \$35 per day. The time required for grading is 2 to 10 days, with an average of five or six days per mile. The average cost of grading per mile is approximately \$190.

(A) *Example number one, 2.30 miles—*

Grading	\$875.00
Culverts and their placing	375.00
Gravel, labor, etc.	4,103.19
Total	\$5,353.19
Cost per mile	\$2,330.00

(B) *Example number two, 3.0 miles—*

Grading (including stripping gravel pit)	\$630.00
Culverts and their placing	200.00
Gravel, labor, etc.	1,700.00
Total	\$2,530.00
Cost per mile	\$843.00

This road already had a good crust of gravel which had been put on by the township trustees, which reduced the cost of additional gravel required. We graded so as to save the gravel as much as possible. The trustees then put on 500 yards of very good gravel to the mile, which makes this a good road.