

The stop sign, in my opinion, is perhaps the most abused sign that we have in the county; therefore, it should not be set back from the point of danger in an effort to save a sign. Place it at a point where the cause of danger is visible; then the driver can see and understand the reason he has been brought to a stop.

Too much protection and caution cannot be used at railroad grade crossings. Railroad signs should be erected 350 feet from the crossing under ordinary conditions or 450 feet where the speed of traffic is not slowed down by some road condition. The highway superintendent can determine the proper distance fairly well by a careful inspection of the conditions of the road and crossing involved. Frequently railroad crossings are so situated as to involve sharp curvature and a combination of signs may be used, such as a slow sign, or if you think best, a stop sign.

Slow signs should be used only where, for safety, careful driving at a reduced speed is necessary. The use of slow signs with other signs will not give satisfactory results except in unusual cases. As I stated before, it may be used as a pre-warning for a stop sign or to call special attention to railroad signs in especially hazardous conditions. In special cases, it may be used in addition to cross road or side road signs as it serves as a warning only.

No doubt all highway superintendents have received a copy of the manual on signs from the Indiana State Prison concerning the purchase of their markers. This manual gives the specifications of standard federal signs and markers and can be secured by writing Warden Daly.

While highways are under construction, it is advisable to mark and arrow all detours whenever and wherever possible, for such marking has a far-reaching effect on our motorists. When only standard signs and markers are used, the motorist is less confused and the signs are obeyed more readily.

The marking of dangerous curves, turns, and narrow bridges and the careful placing of stop signs at busy corners and the marking of detours certainly makes traveling much easier and safer and pleasanter for strangers, of whom we have a great many more on our county highways than we realize. A road that is well marked leaves a far more favorable impression on the motorist than the road that is poorly marked.

### BITUMINOUS MULCH SURFACES

By Robie Hiron, Delaware County Highway Superintendent

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Of the 92 counties in the State of Indiana, most depend on agricultural pursuits and small trading town areas, where it is necessary for the farming interests to come to town daily or weekly for their supplies. There has been a constant de-

mand from the farmers for roads that will get them out of the mud and enable them to get to town easily. This demand for roads has made it necessary for the commissioners of the various counties to build low cost roads, mostly of local gravel; this type of road has been used in certain counties for a number of years. The budgets of nearly all county road superintendents usually carried an appropriation for certain quantities of gravel, which were hauled and applied to the roads, and constant maintenance was necessary on these roads year after year to keep them in shape.

This condition has caused a number of road officials to realize that the constant maintenance of gravel roads is becoming an increasing drain on the available county road funds. Increase of motor vehicle travel has created a dust nuisance, and the necessity of constantly dragging these roads with some type of maintenance equipment is an additional source of annoyance.

To overcome these conditions, certain counties in Indiana have adopted the policy of tar-treating these gravel roads, thus creating a new era in county highway construction. In most instances, the cost of these tar treatments, plus repairs spread over four or five years, has been less than the annual cost of dragging plus the addition of new gravel on the untreated road.

Beginning in 1925 with about five miles of new tar-surface treatments, Delaware County has up to date accumulated a system of 106 miles of this type. Practically every main county highway and a number of lesser important roads are tar-treated. All the trading centers of the county have been connected, so that it is possible to go from any township in the county to the county seat at Muncie on treated roads. It is possible to ride on these tarred roads without dust or mud in perfect comfort any day in the year to practically any part of the county.

When gravel roads are tar-treated, daily, semi-weekly, or weekly dragging is unnecessary. Under such conditions, the county road superintendent is relieved of this maintenance, and his equipment is free to be used on other roads.

The success of such a program of highway maintenance is very clearly demonstrated in the financial condition of Delaware County. We have a fine system of county highways, and the cost of maintaining these tarred roads after the initial expenditure is less than we would ordinarily spend to maintain the same number of miles of untreated roads. As a consequence, we are paying for our roads as we go along and do not owe a dollar of bonded indebtedness for the roads that have been treated. On the basis of progress during the past five years, we expect to have our county highway system developed to a point where every one of our secondary roads will

be tar-treated within the next five years, without a dollar of bonded indebtedness involved.

We do not consider that this type of tar treatment is permanent or that it does not require a certain amount of maintenance. We have our maintenance crew well organized and properly equipped for taking care of any breaks that may appear on the surfaces, but we have less work to do on the whole system than we formerly had on a few of the untreated roads.

As an illustration, the Wilson Road, 4.4 miles in length, treated in the spring of 1930, has had but one light retreatment, in the fall of 1931; and the total maintenance cost, aside from this retreatment, was less than \$10.00. Our truck went out one morning with two men and in three hours had repaired all breaks in this entire road.

With this type of tar treatments we have demonstrated to our entire satisfaction the following facts:

Property values have been increased on farms adjacent to these tar-treated highways.

Taxpayers feel that their tax money is being economically and wisely used.

We have created a dustless, smooth-riding, non-skid, all-the-year-round highway system, without creating any bonded indebtedness.

## BITUMINOUS MULCH SURFACE

By C. W. Siniff, Allen County Highway Superintendent

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Bituminous mulch surface can be built with various kinds of materials. In most all cases local materials can be used, the resulting reduction in cost being to the interest of the taxpayers. Although in our county at present the people are asking relief in taxation, as they are in almost every other county, it is my opinion that a large share of our tax burden is due to the demands of the taxpayers themselves.

We have several miles of high-grade pavement laid on roads in our county that could not be termed secondary roads before construction. Such roads are petitioned for by a group of local taxpayers; viewers are appointed and sent out to view these roads and are supposed to take into consideration their location and importance. They decide as to the kind of material best fitted for any particular road; but regardless of the importance and location and amount of traffic carried, viewers usually recommend in their report a very high-grade, costly pavement. Bonds are issued on which the taxpayers have to pay over a considerable period of years.

Taking into consideration the conditions mentioned above, we found it necessary to give some thought to cheaper meth-