

It is important that all of us have a complete picture not only of the road business in our own counties, but also of the state highway network and of the problems the State Highway Commission faces in meeting the demands made upon it.

All of us need to know that the state spends, altogether, from gas tax, federal aid, license fees, etc., about \$33,000,000 a year on both state and county highway systems and state routes through cities and towns. Under a law enacted in 1937, the state receives two-thirds of this amount, or about \$22,000,000 a year for all construction and maintenance; \$1,250,000 goes into the state general fund; \$2,000,000 goes to cities and towns for construction and maintenance of streets; \$966,666 goes to the state police department; and one-third of the remainder, about \$9,300,000, to the counties for road construction and maintenance.

Let us inform ourselves of the relative position of our own state and county in the road building picture, as to miles, cost, bonded indebtedness, etc.

When we get and know all these facts, let's give them to the general public at local city or county meetings—let's tell the story of transportation and how good roads enter into it.

And let us report new work or new projects when they are ready. When Professor Petty visits your county to inspect your roads, make it an event that calls attention to the highway system of the county, of which you and all the other folks are and should be proud.

There are countless opportunities to tell the story of roads, not with the idea of spreading propaganda, but with the notion of telling the people what you are doing for them. If the job is being well done, there will be no question; but if it is not, it is more important to you than anyone else to know about it, although it concerns every stockholder in this great network of highways.

Let us continue to tell the people of the merits of Indiana roads and help arouse and keep alive a new interest and pride in the accomplishments of you men who have given us the best road system of any state.

## METHODS INSURING SMOOTHER AND MORE DURABLE BITUMINOUS ROAD SURFACES

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In discussing this subject I shall not enter into the discussion of the different bituminous materials but will confine myself very closely to construction problems only. It seems strange that in counties that construct their own roads, we find such a variety of methods used. The same is true with

contractors where counties contract their work. Even the various state highway departments vary greatly in constructing their bituminous surfaces. In most other types of road construction we find a very uniform set of rules, that are usually closely followed. Hence, it is not to be wondered at that each of us county men may have his own pet ideas. This is not due to difference of opinion, so much as it is that we are forced to use the equipment we have available.

From experience I can well realize the position of a road supervisor asked to construct a black-top on a certain piece of road, with practically no equipment suitable for that purpose. This in itself accounts for a lot of the rough riding, uneven edges, various thicknesses, high crowns, and wavy surfaces, all of which go to make up a poor-riding road.

Many of our problems vary according to our geographical location, and the equipment we need varies accordingly. Some have a heavy snow problem, some have hill problems, some have sink-hole problems, all of which call for different types of maintenance equipment. But the fundamental principles of insuring smoother bituminous road surfaces and the equipment necessary in construction do not vary.

Too much emphasis cannot be placed on proper preparation of the base, scarifying, if necessary, the old stone and gravel surface, and reshaping it to the proper crown of about 2 inches for 12 feet of width. Then to insure a perfect riding surface this base should be maintained by a long-base maintainer, preferably the maintainer constructed on runners at least 20 to 25 feet long. By closely watching the spirit level on this machine, it is possible to construct a base with uniform crown and riding surface. The base being thus prepared, you have well started on a smooth-riding road.

However, if after your bituminous base is constructed your plans call for a road-mix surface, the same care must be used in laying it out and in the final treatment of the surface. Numerous ways have been tried for laying out road-mix with graders and other short-wheelbase tools, but none of these will get results comparable to those secured with the sled-type, cut-off drags using runners at least 20 to 25 feet long.

If you are preparing a base to which you later expect to apply plant-mix material, using the regular paver, it is essential that you take precaution in preparing the surface of your base, as most of the mechanical spreaders now in use are of a short wheelbase. While they will lay the material to a uniform depth, nevertheless they will follow very closely the surface contours left in the base, and will not insure a smooth-riding surface. If you plan on using a road-mix surface, it is still essential to use the same type of construction for your base. Then when you lay out the road-mix material with the same long-base maintainer, or better still the sled-type maintainer, it will insure an even thickness of the mat and a smooth

surface. If you are planning a retread on an old bituminous road of uneven surface, the same type of equipment will assure you a smooth, even-riding surface and will also enable you to run a wedge course along the edge, taking out much of the old high crown that we find on our older roads.

When resurfacing an oil-mat road that has been constructed without the above-described tools, the surface can be very much improved by using a smaller planer-type drag on the surface, being careful to cut only the high spots.

I feel that almost any county attempting to do its own work can well afford to purchase some of this very necessary equipment. Its cost is not prohibitive, as you can secure attachments for your graders, using a 24-foot leveling straight edge and a spirit level to insure an even crown, for \$500 to \$600.

#### SIZE OF MATERIALS

Another important item is the size of the aggregate used. Pit-run gravel, commonly used in oil mats, usually contains enough fines completely to fill all the voids, leaving a smooth, tight surface. However, on some of our retreads where rapid curing asphalts are used, it is impracticable to include the fines in the mix. In this case, it is advisable to use a thin coat of fine stone chips to fill the voids left in the larger stones. This should be done before the bituminous material has cured. After these have been applied at the rate of about 15 pounds to the square yard and have been well rolled in it, it is well to leave the road open to traffic for two or three weeks. Then after sweeping all the loose stones from the edges of the road, tread the road at about .15 gallon per square yard with a rapid-curing, heavy asphalt, and immediately apply a heavy coat of sand. The sand should be applied with a mechanical spreader ahead of the truck. This will insure a smooth, non-skid surface and eliminate all the roughness and roar one finds in so many of the seal coats where coarse aggregate is used and the voids left open. More important still, it gives you a seal against water and air, the last of which is the most destructive element to bituminous surfaces.

#### ROAD EQUIPMENT

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A series of pictures which I will show you on the screen in a few minutes will give you some idea of the equipment we use. We feel that our equipment is equal to our requirements in maintaining 1,062 miles of county roads.

In 1937 we purchased one 8-ton roller, which we used to good advantage on our "black-top" roads and also on some heavy fills that required rolling.