Coordination of Railway and Highway Transportation

Discussion by H. S. Fairbank of paper by S. O. Dunn, Editor of Railway Age
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I concur in Mr. Dunn's desire for a proper coordination of existing agencies of transportation; but disagree with his definition of the term coordination.

He gives scant recognition to the quality of service and lays strong emphasis upon cost as the basis upon which traffic would be apportioned to the several agencies under the scheme of coordination which he visualizes.

It may be pointed out that the tremendous volume of transportation by private automobiles has developed in utter disregard of the fact that the same number of passenger-miles could be furnished far more cheaply by the railroads. Nor has the greater cost of its service ever prevented the railroad from moving goods that could have been more cheaply transported by water.

The fact is that quality of service is at least as important as price in determining the natural flow of traffic to one or the other of available transportation agencies; and I wish to emphasize that fact, because I think it is not adequately recognized in Mr. Dunn's conception of coordinated service.

Mr. Dunn also stated that, of the whole cost of highway construction and maintenance, something less than half is paid by the motor vehicle and something more than half is raised by taxation of property. The statement is correct; but does not adequately present the situation.

There are two classes of roads: Those which serve as main traffic collectors and through routes; and those which serve as feeders to other arteries and give access to rural homes and farms. The first class is quite generally coincident with the Federal-aid and State roads of which there are at present some 300,000 miles. The second class is generally identical with the county and local roads of which there are about 2,700,000 miles.

The annual expenditures on these two classes of roads are approximately equal - somewhat greater for the Federal-aid and State roads than for the county and local roads. But, of the total tax revenue raised for the former, about 82 per cent is contributed directly by the motor vehicle in license fees and gasoline taxes, and the balance is contributed in the form of property taxes and Federal aid which in their incidence fall in large part upon motor vehicle owners.

Of the Tax revenue raised for county and local roads about 76 per cent rests upon property; and the balance, about 24 per cent, is paid directly by motor vehicles.

Now, the point that I would like to emphasize is: That to the extent that there is highway competition with railroads it occurs almost exclusively on the main roads which are preponderantly paid for directly by the motor vehicles; and the local roads which are paid for in large part by property taxation, so far from facilitating competition with the railroads, are the absolutely indispensable feeders of the railroads. I feel that, in view of their intimate service to the land it is entirely reasonable that these roads should be financed in the main by land taxation. But if there is any element of "subsidy" in such a plan, then I submit that the railroads themselves share very heavily in that "subsidy." For it must be remembered that the railroads do not now perform and never have performed a complete transportation service over their rails. A very large proportion of their freight is delivered to them and taken from them over publicly-financed highways.

With respect to the main highways, the design and cost of which is determined largely by the requirements of heavy vehicular traffic, I agree with the principle that vehicles of various weights and capacities should pay for the service in proportion to the road cost which their operation entails. Recent studies we have made, using data available for the State of Pennsylvania, indicate that there is a very close approach to the desirable

condition in the present scale of license fees and gasoline taxes in that State.

We selected Pennsylvania for a test of the adequacy of present tax rates because it is, I believe, the only State which classifies vehicles on the basis of gross weight in such a way as to permit an exact determination of the number of each gross-weight class of vehicles in operation.

In our study we assumed that the whole cost of constructing the entire State highway system of 13,000 miles should be borne by the motor vehicles. We then computed the depth of concrete pavement that would be required to support each gross-weight class of vehicles, using as the design loads the impacts which such vehicles would probably deliver, and employing the most exact theory of design thus far developed by our researches.

We then assessed to each registered vehicle of all classes an equal part of the cost of paving the entire system with a pavement of the minimum thickness required by 7-passenger automobiles. The additional cost of each increment of thickness required for the several heavier gross-weight groups we prorated among all vehicles of the respective determining groups and those heavier. In this way we apportioned the cost of an improvement of the entire system which would accommodate a maximum wheel load of 9,000 pounds, corresponding approximately to a 5-ton truck.

Without going further into details we found that vehicles of the largest gross-weight group would be required under this plan to pay about $300 a year. The present license fee for this class of vehicles is $155 and there is little doubt that the gasoline tax would make up virtually the entire balance.

There is just one other matter to which I should like to refer briefly; that is the statement in the article by Mr. Marvin of the Bureau of Standards to the effect that certain classes of vehicles would require for their support roads from 3 to 5 times as strong as those required for the accommodation of passenger automobiles.

The article in which the statement occurred was published at the request of the Bureau of Standards in our monthly magazine, "Public Roads." We published it, notwithstanding that we did not agree with it, viewing it as simply a theoretical assumption employed as an illustration of the main thesis, which dealt with a method of fixing the relative proportions of gasoline taxes and license fees - a method which we found very interesting. The statement is based upon simple theoretical considerations of gross weight, unmodified by experimental data now available bearing upon the effects of tires, subgrade support, etc.

The knowledge we now have of these other factors convinces us that the increase in strength required for the support of the

heavier vehicles is by no means as great as Mr. Marvin assumed on consideration of gross weight only. A ratio of 1 to 2½ probably covers the outside range of pavement strength required for the support of the various classes of vehicles from passenger automobiles to the heaviest vehicles now in normal use, assuming the use of pneumatic tires on all. And, practical considerations still further narrow the range, because the thickness theoretically required for passenger cars - less than 5 inches - is too light for practical construction.