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Adjusting the Highway Viewpoint
to 1932 Conditions

by

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The theme of the exhibit of the Bureau of Public Roads for the 29th Annual Convention and Road Show of the American Road Builders' Association, is the physical relationships of the highway and the motor vehicle. That it is now possible to portray these relationships is an accomplishment of research which has taken years to develop to the point that we can talk about them in definitely measured terms with a high degree of confidence. But it would be a narrow viewpoint that would attempt to limit the achievements of highway transport over the past decade to narrow mathematical terms of technical research.

Again, under the emergency appropriation provided to advance the Federal aid road program for the past year, there were undertaken 2,216 projects, totaling over 13,000 miles of road, in 1227 counties, or only a little less ratio than a project to every other county. This was a part of the whole Federal aid road program undertaken and does not include the work done without Federal funds by the States, cities, counties or local communities.

In a year when there was so much unemployment, under the State and State-Federal road programs, during the summer months when it is possible to employ the maximum number of men in highway construction, upwards of 400,000 men were given work, and an equivalent distribution of wages to at least double this number to those employed in the production and transportation of materials and in other lines activated by the road funds.

There is general agreement among the highway officials of the country that 80 to 90 per cent of the road dollar is eventually distributed back to labor and personnel employment.

The emergency appropriation called for \$80,000,000 with a time limit of September 1. So vigorously was the program pursued by all connected with it, that less than \$200,000 composed of small balances remained unexpended when the appropriation expired. The emergency projects alone put under way for the first six months of 1931, called for an estimated total expenditure of \$256,000,000. This was a great demonstration of the ability of the road building agencies of the nation, road officials, engineers and contractors, to put under way quickly and carry forward rapidly a largely expanded road program.

Such an accomplishment as this, however, does not measure the real significance of what has taken place in the highway

field. A recital of facts and figures is of doubtful use in portraying a broad and definite idea of the real accomplishments in the highway transport field over approximately the past decade.

For nearly two years there has been such a tremendous amount of false information circulated with reference to the utilization of the highways and the dislocation of the prior flow lines of traffic, that it seems an opportune time to present, without complicating the discussion with these argumentative issues, some aspects which are of far greater importance to the public as a whole than the questions which have been so prominent in the public press and elsewhere.

For many years road contractors, manufacturers and producers of all kinds of equipment, supplies and materials for road construction, have been highly important factors in our economic structure for the employment of labor, and during the past two years this importance has been relatively greater than at any time previously.

We come to the present time, however, with much greater uncertainty than has heretofore existed as to the future. Much of this uncertainty has been brought about by the emphasis which has been placed upon a relatively small part of the use of the highways, that is, that part of highway usage which is competitive

with other transportation agencies, which serve to cloud the future of new highway building.

These controversial aspects, projected into a situation already becoming embarrassing by the depletion of the public road revenues and the necessity of limitations upon property taxes, have produced an uncertainty and lack of confidence on the part of the road building industry as to the future.

It is not my intention to enter into a detailed discussion, or to bring into this paper any attempted reply to the controversial questions of the utilization of the various types of transportation available. There are four aspects, however, which I wish to place briefly before the road building industry. In these aspects I believe are found those which will have an important, and perhaps the major bearing, upon the future growth of highway building and utilization.

The first of these is the characteristics of highway traffic. Since 1922 the Bureau of Public Roads, in cooperation with a large number of the State highway departments, has been making studies of highway traffic and the detailed aspects of highway transport. These studies have included States from Maine to California. There are areas of intense industrial development, and areas of almost no development. Here are some of the facts which have been found in these studies.

First. The predominating use of the highways is by privately owned passenger automobiles. In the eleven western States, on the Federal aid system alone there were more than 20,000,000 daily passenger-car-miles of road usage. In the States of Pennsylvania and Ohio this usage ran to about 6,000,000 miles daily. This immense use by privately owned automobiles approximates 85 to 90 per cent of the total volume of highway utilization.

Second. The use of the highways by either automobiles or motor trucks is predominantly local, taking the States as a whole. In such States as Pennsylvania and Ohio, typical of the more thickly populated, this local use is from 85 to 90 per cent.

Third. The predominating volume use of the roads by both automobiles and trucks is for short distances, that is, above half of the use will be under 30 miles.

Fourth. The ownership of both automobiles and trucks in use on the highways is predominantly private.

Since there has been a notable drop in the amount of transportation required, particularly for local service, there has been a growth in the longer distance travel of busses and trucks. They, like many others, are seeking employment. There

has been a certain amount of business taken over from the railroads by trucks and busses operated in the public or common carrier service, but this is an inconsequential part of the total volume use of the roads.

A great change has taken place in methods of merchandizing. There has been a change from relatively large to much smaller inventories, resulting from highway transportation quickly and easily available. This change is having a profound effect upon transportation methods. For example, in Ohio, out of a grand total of 84,000 retail establishments, 36,000, or 43 per cent, handle goods that require daily replenishment. In Maryland, of a grand total of retail establishments of 21,000, about 9,000, or 42 per cent, handle supplies that are replenished day by day. These are only two instances that indicate in a concrete way a service which has become established as a daily highway use.

It would be possible to carry this discussion into unnecessary lengths to demonstrate the intimate relationships which have been established between our whole population and highway transport. It is not necessary to go into these to point to the conclusion that no material part of the development of our highway system is contingent upon any of the services which are now in controversy. The need for highways will go on and on because of their highly localized services which belong to them exclusively.

The long-distance traffic may be termed a by-product, important in itself, but having practically no effect upon the necessity for the improvement, or the volume of use, of improved highways. Thus, from the standpoint of the future of highway building no matters now in controversy as to the carriage of persons or commodities by the various public transportation agencies, regardless of how they are finally composed, will affect more than a minor percentage of the use of the highways.

The second point that has had a profound bearing upon the tremendous development of highway transport is the coordination of effort by agencies behind the building and use of the highways. These agencies are primarily the highway officials and engineers, the highway contractors, including their organizations, and the manufacturers of all types of road and automotive equipment. This latter group includes not only the motor vehicle manufacturers, but many of the accessory manufacturers, including as an important group the rubber tire industry.

The major advances in this field are:

First, the improvement in engineering designs, in contractors' methods, in efficiency and adaptability of equipment, which resulted over the period of five years from 1924 to 1929, in a constantly decreasing index of road costs before there was

any effect from the present depression. The decrease in road costs for the five-year period from 1924 to 1929, taken from unit prices of Federal-aid projects, was about 27 per cent. During this same period there was a constant increase in the quality of the roads produced generally. The road contractors and equipment manufacturers are to be credited with a large part of this decreased cost, through improved organization and better methods, which permitted higher production with the same organization cost. Better engineering designs, better inspection, and a pride in their output on the part of both contractors and engineers, produced at a constantly decreasing cost a constantly better quality and more durable roads.

The composite prices for 1931 have been about 26 per cent below the average cost for the five-year period, 1924-1929. This latter reduction has to a large extent been due to lower prices for materials and to some extent lower prices for labor; but the general road costs which are now around 45 per cent lower than the peak costs of 1924 would not have been possible without the improved production methods and equipment and better engineering practices which have been developed.

Second, the important adjustment between the highway and the motor vehicle that has taken place has been accomplished

through the cooperation of the motor vehicle manufacturers, and the tire manufacturers and the highway engineers. Only a few years ago the heavier loads were all carried on solid rubber tires. Pneumatic tires had not been developed capable of carrying the heavier wheel loads. When, through the process of experimentation and research, it was found that the use of solid rubber tires under the heavier loads resulted in high impacts on road surfaces, causing depreciation in both the vehicle and the road, the tire manufacturers devoted earnest and successful efforts to the production of heavy duty pneumatic tires.

Also, when, through research, it was found that the wheel load or axle load rather than the gross load is of major importance in the effect upon the highway structure, the motor vehicle manufacturers re-designed their larger vehicles to increase the number of axles and to place them upon either the high pressure or balloon type of heavy duty tires. These two developments are of outstanding importance to the future of highway transport in their effect not only upon the service to the public, but also upon the public's pocketbook which, during these times, is highly important.

Today the highway transport industry is a highly convincing demonstration that highway officials, road contractors, equipment manufacturers, material producers, motor vehicle and rubber tire manufacturers, have cooperated to bring to the public, highway transport at a constantly decreased cost, both for the roads themselves and for the transport service; and these decreased costs are not small but are of large magnitude.

The third important aspect is that of the future highway program. In some particulars this, at the moment, is not quite favorable.

For two years the States and the localities have put into road construction every possible dollar of road income because of the demand to furnish employment. The Federal-aid highway program for 1931 was as follows:

Federal Aid Highway Program, 1931

	<u>Federal Aid</u>	<u>Total Cost</u>
Work yet to be done on going program Jan. 1, 1931	\$ 58,000,000	\$131,000,000
New work initiated during year	(136,721,689 (79,210,719*	283,637,422
Total	\$273,932,408	414,637,422
* Emergency Advance		

The emergency Federal appropriation of \$80,000,000 made in December, 1929, was a very large factor in putting this work under way rapidly during the first six months of 1931.

With the Federal funds now available the possible Federal-aid program for 1932 is as follows:

Possible Federal Aid Highway Program, 1932

	<u>Federal Aid</u>	<u>Total Cost</u>
Work yet to be done on going program Jan. 1, 1932	\$ 35,000,000	\$ 79,000,000
Possible program of new work using all available Federal- aid funds	<u>113,879,088</u>	<u>261,190,568</u>
Total	\$148,879,088	\$340,190,568

It will be noted that this is the possible program. I do not believe it is probable that under existing conditions the program will reach the possible figure of \$340,000,000 which is \$74,000,000 under that for the preceding year.

In addition to the Federal-aid program, there has always been a large State program. For 1930 the State funds available for expenditure came from the following sources:

State Highway Funds, 1930

		Percentage of total funds available for expenditure
1. State tax and appropriation from State treasury	\$ 43,317,991	3.8
2. Special motor taxes	700,911,184	61.7
3. Miscellaneous income	17,083,821	1.5
4. Transfers from local units	60,609,297	5.3
Total current tax income	821,922,293	72.3
5. Federal aid	92,462,836	8.1
6. Bonds	222,288,308	19.6
Total funds available for expenditure	\$1,136,673,437	100.0

Of this total income, 19.6 per cent came through the issuance of bonds. While these bonds were predicated upon the income from the gas tax and motor vehicle license fees and did not impose a tax upon property, the market for such bonds at the present time is practically non-existent. It is not probable that the States will have available any considerable bond money for this year's construction program.

I do not anticipate the same percentage of transfers from local units.

These two items together, for 1930, constitute 25 per cent of the total funds available to the States. In the meantime, there have been in a number of States diversions from the State highway funds of the receipts from the gas taxes and motor vehicle license fees.

A study for 1929 shows the following diversions:

Diversion of the Revenues from Highway User
Taxes and Imposts for other than State High-
way Purposes, 1929

1. To secondary roads.....	\$122,379,000	in 34 States
2. To city and town streets.....	16,743,000	in 8 States
3. State general fund.....	95,000	in 3 States
4. To harbors and docks (Mississippi)	189,000	in 1 State
5. To schools.....	9,271,000	in 3 States
6. River channels (New Jersey)....	80,000	in 1 State
7. Administrative and miscellaneous	<u>1,618,000</u>	in 6 States
Total	- \$150,375,000	

There has been a considerable increase in these diversions since. Because the special taxes have been accepted by the public with better grace than any other taxes, have been easy to collect, and have grown in amount from year to year at an unexpected rate because of the one fact that the public desires an increased mileage of new roads and a meticulous maintenance of the existing

ones, the tendency to reach into these special taxes for other purposes is the most alarming one with which we have to contend so far as the future of a stable and adequate road program is concerned.)

What has been said about the probability of a decreased State income for the ensuing year is even more true of the income for county and local roads. The larger part of the total funds available for these roads comes from property taxes and from the proceeds of bonds. Local property taxes will be reduced, and in general the market for the bonds of counties or other local units is not available at reasonable rates of interest and discounts.

As matters now stand, there can not fail to be a materially reduced amount of money available for this year.

As a fourth and final point, there is the matter of possible adjustments to meet present conditions, some of which are now under way, and some of which entail material modification of our present methods and existing organizations.

There are at present on the Federal-aid system 197,000 miles of main roads. Federal funds have been expended on 109,000 miles, leaving about 88,000 miles on which no Federal funds have as yet been used. Some of this mileage has been improved by the States, but a very large part of the 109,000 miles

has not been improved as yet with an adequate type of surface. Our whole road building policy has been typically a United States policy of mass production, of extending service rapidly over a large mileage through first-stage improvement, and of bringing these roads up to the necessary higher type of improvement while using them under a constantly growing traffic. The result of this policy has been to make possible large earnings by way of the gas tax and motor vehicle licenses paid for the use of this enlarged mileage thus secured. This income for 1930 paid all but about three per cent of the States' contribution to the cost of the State programs. In addition in 1929 there was allocated to other purposes \$150,000,000 and a larger amount in 1930.

In 1930 the Federal road aid amounted to only 8 per cent of the States' income for this purpose. State property taxes amounted to only 3 per cent. The remainder came from the road user taxes, bonds predicated upon these taxes, or from miscellaneous sources.

The very small contribution made from State property taxes could be withheld without the effect being particularly noticeable. The States which retain intact the income from the road user taxes have no difficulty in meeting the Federal aid

many times over. It is only the States which as a legislative policy divide these taxes back to the counties or other subdivisions, that have difficulty in financing a reasonable State program, or in meeting Federal aid without property taxes of any kind.

Federal road aid, by holding the expenditure of road user taxes imposed by the States, to a coordinated system of highways, not only between the States but for the nation as a whole, has had a profound effect in providing quickly a continuous system of roads which is earning a very large annual income for the public; and in holding construction to the standards that are necessary for economical maintenance. Federal road aid has been a large factor in bringing constructive economy into our expenditures for improved highways.

In addition to the system of main roads, there is no greater desire existing on the part of the public than to secure an adequate system of secondary or farm roads.

Federal aid, while it is directly applied to the Federal-aid road system, has helped to make possible the taking over of local roads as a State responsibility and the adding of these to the State systems.

In 1921 the State highway system consisted of 203,000 miles. In 1930 it contained 324,000 miles. In that 9-year period there was an increase of 121,000 miles of roads, lifted from the county systems and added to the State systems, to be constructed and maintained at the expense of the States which means at the expense of the road users. During the same period about 109,000 miles of roads received Federal funds.

Since the roads taken over by the States include those most heavily traveled, Federal aid has been one of the major factors in making it possible to relieve the burden of road taxation upon the counties and local units which are in the main supported from property taxes. The relief by Federal aid of local property taxation is strikingly illustrated in Wisconsin. In 1930 the cost of Federal-aid roads was paid 17.8 per cent from Federal aid, 59.2 per cent by the State from road user taxes, and 23 per cent by the counties. The State trunk-line roads not on the Federal-aid system were paid, 59.8 per cent by the State and 40.2 per cent by the counties. That is, the entire Federal contribution was applied to decrease the cost to the counties of the Federal-aid roads.

It has been stated that Federal aid takes from the rich States and gives to the poor States. Most of the States as such

pay no road taxes, but in a few, small property taxes combined with miscellaneous revenues and appropriations, total for the total State road programs about 3 per cent. But the revenues from which Federal aid is paid are not State taxes in any sense. They are individual taxes and there is no justification for claiming that Federal income taxes are any part of the State revenues. The income of the wealthier individuals and large corporations of the United States, from which the major portion of the Federal taxes come, are the results of production and sales in all of the States. The profits on the mines of Arizona accrue to individuals in the eastern States, and the income tax is credited to the district in which they have their residence. If Federal income tax were credited to its source rather than purely arbitrarily to the place where it is paid, we would have a very different distribution of the Federal income tax payments, and there is absolutely no basis for any State to claim that the Federal income taxes paid in that State belong to the State or are taken from the State. The return throughout the United States of a certain part of these revenues for road improvement is probably one of the fairest distributions of this form of taxation that could possibly be devised, and one of the most healthy for the good

of the nation. Thus, we find the Federal road aid and the income from the road user on the main roads and streets of the nation assisting in lifting the burden of taxation from the rural areas which have gone through an unprecedented period of capital depreciation and loss of income.

It does not seem possible to go much further in this direction at the present time, since there must be some assistance given to the cities and towns on their streets which are parts of the main State highway system, and it is fair that this shall come about. But there is an adjustment which can and must be made in the management of finances for rural roads. Improved methods of travel and the development of equipment capable of much greater production both in construction and maintenance indicate the desirability of consolidating the smaller road units into larger single units. In some sections it would possibly be sufficient to consolidate all units under the county. In others, a number of counties can be consolidated into one district. There has already been progress in this direction, and a considerable number of States have extended their facilities for direct or general engineering supervision and administration as well as financial help. There are many counties where the road problem is sufficiently large that the

road organizations should be maintained. To attempt to place all of these counties under a single State administration would make an unwieldy and inefficient machine. But there is no doubt that through cooperation between the State highway departments and the county engineering units, a correlation and unification of results could be secured at a lessened cost. We have more than 3,000 counties in the United States. A large number of these could be consolidated for road purposes at least with a resultant lowering of overhead costs, and the doing away with inefficient administrative boards. Only such a reorganization can effectively increase the field for efficient and economical engineering and contracting in the building of local or secondary roads.

There is a tremendous reaction against taxation, particularly the taxation of real estate and agricultural property. So long as taxation authority is vested in the very large number of boards existing and so long as the incessant demands for expenditures for public improvements and for other purposes have their impacts upon these same boards, there is little possibility of any rapid relief from taxation.

It is possible to put our house in order in the highway field, taken as a whole, by the elimination of small taxing

and expending districts, by the application of modern methods of engineering, construction and maintenance to the problems of consolidated districts. These are necessary to secure the continuation of an adequate road program if road revenues are materially reduced.

I believe that we are on a permanently lower level of prices for road work, but it is impossible to expect and unfair to ask that today's prices be continued when the nation's affairs have readjusted themselves to a more normal basis. Yet, I do not see in the present situation any real economic trends that are antagonistic to a continuation of a large annual program of road work or the lessened importance of highways and their utilization to the public; rather the opposite.

There should not be, and I do not believe there does exist, any hostility on the part of responsible individuals engaged in the highway field in whatever activity, toward other agencies of transportation, but rather a desire to cooperate and to coordinate highway transport with other agencies, retaining only the fair field which it can economically fill.

It is my hope that under the existing difficult conditions the utmost spirit of friendliness and good will shall prevail within the highway industry through the coming year in the effort to improve our whole economic condition.