

Highway and Building Congress,  
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WHAT HIGHWAYS MEAN IN THE ECONOMIC, EDUCATIONAL  
AND SOCIAL LIFE OF THE UNITED STATES.

By

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The dominant motive behind the conception of this Highway and Building Congress is group cooperation. The circumstances resulting from grave causes, national and international, which are resisting and devitalizing our efforts to better economic conditions, have crystallized this undertaking for mutual helpfulness and for the supporting strength that lies in organized effort.

This Congress in itself presents two aspects that mark tremendous strides forward in human relationships which have taken place in a relatively short period of world history, a cohesion that is the outgrowth of adversity and a generous sharing for the common good.

The wholly voluntary character of the desire and the decision to participate in the Congress by so many organizations is both a credit to those responsible for the policies and an assurance that

the construction industry as a whole is thus best served. It is a forerunner of better times that the spirit of common effort to advance the common good so greatly distinguishes this first inclusive construction congress.

For three years now we have been attempting to achieve economic recovery largely on the basis of destructive criticism of every effort involving expenditures. Particularly has widespread criticism revolved about government and taxation from which government expenditures are financed. This is no objection to constructive criticism. Let every item of expenditure that cannot stand on its own merits be eliminated. This is not an inference that taxation is not unequally and unwisely distributed among sources. It is a protest against the "half truths that are worse than falsehoods" and the magnification of minor and incidental matters which have a wholly inconsequential effect upon either the level of governmental efficiency or the amount of governmental expenditures.

It is because of the spirit behind this meeting, a common effort for the common good, that I have felt it an opportune time to stress the principle that sound government, functioning through laws and their administration, is the most important single element to the many sections of the construction industry dependent upon

the highway improvement program of the future. This same principle holds true, directly and indirectly, for perhaps all of the construction field; but it has a wholly controlling effect upon future highway expenditures.

It is taking no great liberty with the subject assigned to compress it simply to highway values, and in place of attempting a complete inventory of these many and varied values, to develop some of the more important phases of a situation which now confronts not only the highway construction industry in all its various ramifications, but also the users of the highways, the general public.

Highways and Highway  
Transport a Going Concern

The most significant fact is that highways and highway transport are a going concern. What other major activity has held so closely to prosperity levels judged by the statistical record?

Motor vehicle registration reached the high figure in 1930, with 26,545,281 vehicles licensed. During that year these cars consumed an average of 554 gallons of tax-paid motor fuel, with an average tax rate of 3.35 cents per gallon.

In 1931, motor registration decreased by 731,178 vehicles or 2.8 per cent less than for 1930, while there was an actual increase

in fuel consumption of over 656,000,000 gallons or 4.4 per cent. Consumption per car reached 596 gallons with the average tax increased to 3.48 cents.

These figures deal with the United States as a unit and show on the whole a more intensive use of highway facilities. Even though the number of users has decreased, further investigation shows that highway transport has become so important a part of our business life that the effects of the depression have not been able generally to restrict motor vehicle use, and that only in those States and localities where the depression has most seriously affected the value of the staple commodities has an actual decrease of gasoline consumption been recorded.

The income from special taxes for the use of streets and highways paid through registration fees, license fees and gas taxes, has grown from \$121,469,000 in 1921 to \$829,381,000 in 1931. The utilization of the more than 25,000,000 motor vehicles provided transportation totals running into inconceivable and fantastic amounts, but nevertheless reasonably correct. These may be approximately expressed as follows:

- 150,000,000,000 vehicle-miles of private passenger car transportation.
- 24,000,000,000 ton-miles of local haulage, transportation and delivery of produce.
- 11,000,000,000 passenger-miles of bus transportation.

These 25,000,000 vehicles consume annually about -

- 15,400,000,000 gallons of gasoline.
- 450,000,000 gallons of lubricating oil.
- 50,000,000 tire casings and tubes.
- \$400,000,000 worth of parts and accessories.

They furnish direct employment to -

- 200,000 persons in their manufacture.
- 150,000 persons in the manufacture of tires, parts and accessories.
- 750,000 persons in garages, filling and service stations, etc.
- 2,500,000 persons as truck, taxi and bus drivers and private chauffeurs.

They furnish sources of direct revenue to railroads amounting to great sums annually from -

- Highway and street materials
- Materials and supplies shipped to motor vehicle factories.
- Finished cars shipped to dealers.
- Freight on gasoline, oil, tires, parts and accessories.

Public roads form the only avenue for the movement of the produce from 6,000,000 farms, with a total normal annual production value of about \$12,000,000,000. Much of the movement of

these products is now by motor. Thus, in 1931, over 21,000,000 head of livestock were brought to market by truck. Practically all of the rural mail is carried by motor vehicles.

#### Highways and Rural Education

Included in the vast movement of vehicles over our public roads and streets are about 55,000 school busses.

In the school year 1919-1920, 350,000 pupils were transported to rural schools. For the year 1929-1930 the number had increased to 1,903,000.

Even with the great advance that has been made in road improvement during the same period, a survey made recently by the U. S. Office of Education of rural school problems found that the query "What is your greatest transportation difficulty?" was answered by 33 per cent of the superintendents of rural schools as "Poor roads".

A survey made by the American Farm Bureau Federation reports that of 5,820 rural schools in 71 counties, 1756 were located on surfaced highways and 4,062 on unsurfaced highways.

#### Highways and New Farm Business

Although the trucking of farm produce to city markets is not

as yet so organized as to be free from many disadvantages, two facts stand out as important: (1) That the consuming markets are drawing larger amounts of the fresh and highly perishable fruits and vegetables from nearby producing areas, thus obtaining a better quality, and (2)\*"To some extent, the motor truck movement in several localities represents an actual gain in consumption - something that the farming population sorely needs to see if its production per man is to continue to increase as it has during the recent past".

There is no way to calculate the increased consumption of the citrus fruits or other perishable foods which transportation in bulk by motor truck has promoted. Large quantities of the lower grade fruits that in past years have rotted under the trees have been disposed of at prices that have provided the grower with some income.

#### Highways and Tourist Traffic

While our economic thought turns upon the tangible products and the returns from commerce in goods, improved highways and the motor vehicle have generated new sources of income such as the tourist business.

The tourist traffic in Michigan from other States, based upon the results of the Michigan transport survey, 1930-1931, was

\*Farm to City by Motor Truck

By C. B. Sherman, U. S. Department of Agriculture  
American Bankers Association Journal.

as follows: 2,500,000 cars entered the State, the average number of persons per car was 2.8, and the average stay in the State 11 days. An expenditure at the rate of \$3.50 per day per person would be approximately \$270,000,000, which is 2-1/2 times the total expenditure for rural roads and city streets in the State for that year.

In our West it is an accepted fact that catering to the tourists is one of the big businesses of the whole area. Something of its extent is indicated by the transport survey on the Federal aid highway systems of the eleven western States in 1930, for which the out-of-State traffic ranged from 4.9 per cent of the total traffic in California to 38.5 per cent in Arizona. In those which have large areas of publicly owned lands, sparse population, the difficulties of arid climate and rugged mountains, the ratio of tourist traffic to the total traffic reaches an average of approximately 16 per cent, or an average of more than 3,000,000 vehicle-miles daily.

The number of visitors to the National Parks has shown a remarkable growth. For the fiscal year 1932, 2,948,507 persons entered the Parks in 811,000 motor vehicles.

#### Highways and Decentralization of Industry

The tentative report of the Committee on Industrial



Decentralization and Housing of the President's Conference on Home Building and Home Ownership states: "The natural trend toward a better standard of living and the forward movement of human wants works with a freer hand and under a greater stimulus in the development of the home and the pride of home ownership than through any other channel. Industry, therefore, must be very definitely interested in better homes, in home ownership, in the economic self-reliance of the individual, etc.\*\*\*\*\*

"Owing to the fact that the existence of industry is dependent upon human needs and that the further growth of industry depends upon the further development of human wants, the consequent natural premise must be that industry, for its own good, should undertake a serious study of living conditions and endeavor to devise all possible means, through its location or relocation, to permit those who depend upon it for employment to avail themselves of the things that make for better health and for such better living conditions; that will make possible the continued growth and development of human wants and lend assistance to the satisfaction of those wants which, in turn, depend upon the preservation and further stimulation of the morale and the economic self-reliance of the individual."

In its tentative conclusions "The Committee wishes to emphasize the influence the transportation system has exercised toward concentration and, particularly, to call attention to the effect the railroad rate-structure has had.\*\*\*\*

"The historical development of the railroad rate-structure has been one which has strongly tended to force industry to locate in large centers."

The studies of the impact of taxation which have been carried on for several years by the University of Wisconsin and the Bureau of Public Roads, have pointed in a startling way to the rates of taxation which have become characteristic of the largest cities. The per capita taxation in two States, inclusive of all except Federal taxes, is:

PER CAPITA TAXES

Wisconsin - 1930

Unit	Highways: and Streets:	Education Public Services: Government	Total
Rural	\$21.13:	\$35.86	\$56.99
Municipalities			
Places to 2,500	16.30:	43.87	60.17
2,501 to 15,000	15.53:	52.79	68.32
15,001 to 75,000	17.43:	65.22	82.65
Milwaukee	15.62:	81.90	97.52
Total (State)	18.10:	53.92	72.02

Illinois - 1931

Rural	12.65:	40.57	53.22
Municipalities			
Places to 2,500	23.12:	35.25	58.37
2,501 to 15,000	22.62:	46.43	69.05
15,001 to 75,000	19.77:	46.15	65.92
75,001 to 400,000	19.40:	43.84	63.24
Chicago	21.00:	74.21	95.21
Total (State)	19.69:	56.63	76.32

There is not a common base for comparison between the States but the figures are comparable between the communities within each State. The large difference between the per capita tax in the large cities and that of the rural districts and smaller municipalities is one of the items, amongst many others, which make higher living costs in our largest population centers. It is questionable if these largest cities offer advantages consistent with the much higher living costs, and the evidence points to the economic desirability of decentralization of population at least insofar as the largest centers are concerned.

Unquestionably highway transport will be one of the chief factors in providing industry with a greater freedom as to location. It has also added to the possibilities of the development of a desirable social life in the smaller communities and this has removed a decided objection to living in such communities on the part of those accustomed to the larger cities.

Perhaps the most notable changes that have been the outgrowth of dependable highways and the motor vehicle, are the increased social and educational advantages that have been made easily available to those of the rural communities and smaller municipalities. The spread between the cities and the smaller communities, as measured by such advantages, has been greatly lessened, and the natural advantages of easily accessible rural areas and the attractive natural surroundings of these smaller communities have been likewise increased. Of all the great advantages that have come through improved highways and the motor vehicle, the greatest

undoubtedly consists in the opportunity that is now possible for the average family to establish homes in pleasanter and more natural surroundings than the big cities can offer. If in this country we are to maintain our boasted standards of living for the average citizen, every encouragement and assistance to attain such a worth while objective ought to be offered.

Highways and  
Unemployment.

One of the statements that has received widespread circulation is that our productive capacity is now such that even though business were resumed on a normal scale it would be impossible to draw back into industry more than a reasonable percentage of those now unemployed. There is no great reason to doubt this statement, but it is doubtful if the real reasons are generally understood.

During the ten-year period that followed the war, from 1919 to 1929, generally regarded as the peak of our industrial production, a tremendous volume of labor was engaged in general construction activities. These activities covered a wide range of expansion in private fields, such as the erection of manufacturing plants, the rehabilitation of the railroads, the building construction of business and service plants connected with the motor vehicle, the growth in the output and the opening of new oil fields,

requiring the building of pipe lines, the development of electrical power plants and their distribution facilities. All of these demanded labor, and it is probable that the entire construction program, including new equipment and public construction, reached a peak in 1929 of fifteen billion dollars or more. It is probable that this tremendous construction program absorbed upwards of one-fourth of the entire working population. A very large amount of this labor was used for permanent improvements and for increasing our productive facilities and was not used for actual production within these plants. Such a diversion of labor to the construction field would not under other circumstances have been possible, but running in parallel with the diversion of workers to the construction field were the increased mechanical efficiency and use of power which permitted labor to be diverted from production to construction.

This immense construction program caught up with the lag and for a time ran on its own momentum beyond the demand, which explains in a large degree the tremendous drop in speculative values, in the loss of paper profits and a tremendous shrinkage in the capital investment.

If we should consider around nine billion dollars a normal construction program, it is apparent that the 1929 construction program was increased by at least 66 per cent, and if our total

construction program is, at this time, around five billion dollars, there is today not more than one-third of the expenditure in this field that existed in 1929. A very large part of the present unemployment and lack of purchasing power has been caused by the tremendous decrease in construction.

Highway construction is the one activity that so far has held up to about the previous level, and through the efforts to extend employment the number of men engaged in this work, directly and indirectly, has been increased in proportion to outlay. While highway work is to a considerable extent seasonal, through 1930 the State and Federal aid work provided a continuous average direct employment of 288,000 men, which together with those engaged in the production of materials and equipment and transportation totaled close to 1,000,000 persons.

In the first part of 1932 employment dropped off due to depletion of funds until the Federal emergency appropriation of July, 1932, and for the fall months of 1932 the total employment on State and Federal work has been brought back to nearly 400,000 workmen. Due to the limitations on hours now generally enforced, the ratio of those indirectly employed is possibly less than for the previous years, but at least upwards of 800,000 men are directly and indirectly dependent upon the income from the Federal and State

highway construction and maintenance activities.

Due to the decreased demand for materials by other branches of the construction industry, the most careful estimates possible indicate that highway construction is taking now about half of all the cement that is being produced. The last figures available for production of aggregates are for 1931. For that year highway work took about 69 per cent of the crushed stone, 43 per cent of the sand, and 64 per cent of the gravel produced. The figures for the past year's current business are not available, but due to the further decrease in general construction it is estimated that 70 to 75 per cent of the crushed stone, gravel and sand production is going to road and street construction and maintenance activities.

Of the 1929 volume of asphalt and asphaltic oils consumed, around half was used for streets and highways, and this half represented at least 60 per cent of the value. The percentage of value used for current business is undoubtedly higher. Likewise considerable quantities of steel, lumber and fuel for the production of power are being consumed in the highway field.

In the equipment field in August 1931 reports on more than 5,000 active projects on the State highway system indicate that there were in use at that time: 2,150 power shovels, 1,175 cranes, 700 pavers, 1,750 mixers, 1,775 rollers, 24,500 trucks and 5,450 tractors. The repairs,



replacements and additions to this equipment produce a very large percentage of the present equipment business.

The use of rail transportation in connection with highway construction and maintenance involves the handling of gravel and sand, stone, asphalt, fuel, road oils, machinery, cement, automotive equipment, explosives, steel and other materials.

The rail transportation is used not only in moving a large part of this tonnage to the road work, but it is used in assembling the materials at points of production. For example, the manufacture of steel involves the transportation of ore, coal, and flux from their points of origin to the steel plants.

From a study of the records of the Interstate Commerce Commission showing total tonnage of the various materials handled by the railroads in 1931, it is probable that upwards of 15 per cent of the total tonnage moved by rail during 1931 originated in the activities required to meet street and highway improvement demands.

In reports compiled from over 5,000 active highway projects, there were engaged in August, 1931, 14,500 teams, 24,500 trucks and 5,450 tractors. Road and street construction required plants depending on the type varying from the simplest equipment for small grading jobs of possibly \$2,000 up to around \$50,000 for paving equipment.

The estimated value of the equipment employed on the 5,000 projects to which reference is here made indicates that tools and equipment aggregating a value of about \$100,000,000 were in use. Replacement and repairs of such equipment on a basis of three to five years would indicate an annual equipment expenditure of around \$40,000,000 to \$50,000,000.

No pretension is made that this analysis covers or indicates either the tremendous dimensions or the nation-wide spread of the highway improvement business as it relates to providing for employment or as it generates demand for manufactured products and rail transportation. The highway construction and maintenance industry is so large and so distributed that it is possible only to indicate in this review something of its significance to the economic life of the nation at the time when we are at the low ebb.

One thing is certain. With all materials, as well as the prices bid for work, reduced beyond all reasonable chance for profits, 80 to 90 per cent of the dollar spent for road work is paid out for labor and personnel employment. With the reduced hours and the policy of employing through local committees those most in need, the distribution of the road expenditures is generally reaching those for whom provision is most necessary.

As a very pertinent observation, the spirit that has actuated the whole construction industry to give us much employment as possible and to carry on regardless of profits, cannot be too highly praised. All who are connected with this industry have shown a public spirit that is unsurpassed. In times of such intense stress the small number of complaints reaching the Bureau of unfair attitude or practices is remarkable.

#### Improved Highways an Accomplishment of Government

The improved highways of the nation which have made possible the far-reaching and widely diversified utilization of the motor vehicle have been accomplished through government. They are the result of public policies and public administration.

The evidence here presented, which is far from inclusive, can be interpreted in only one way, - that highway transport is performing services so intimately and so necessarily a part of every phase of individual and community life that the use of existing and the extension of new highway facilities have been adversely affected by a relatively small percentage up to this time.

The future is more uncertain. There are many forces working not only to stop new work but to undermine and destroy much of the value

existing in that which has been accomplished.

While the major construction program has been carried out over the past ten years, these tangible results had their beginnings at least forty years ago when the first States began to plan their highway systems on the basis of business management and engineering principles. Such results as have been obtained through public administration of the improvement of highways in the past ten years have not become reality through magic or sudden inspiration. It required upwards of thirty years to develop the principles and policies which are responsible for today's improved highways. But it will be possible to tear down and to destroy much of this achievement in good government almost over night unless calm judgment rules.

State Highway Commission the  
Key to Good Administration

The beginning of highway administration consistent with modern needs was the establishment of the first State highway department. The next step was the establishment of a State highway system, segregating those roads of most importance for State jurisdiction. Little by little these principles were extended until the Federal Highway Act of 1916 required that all States, to participate in the Federal funds, must establish a State highway department, and this

was followed by the requirement in 1921 that there must be selected a Federal aid system not exceeding seven per cent of the road mileage on which funds were to be concentrated until the system was adequately improved. The State highway systems have been extended now to 330,000 miles, but they have in general been determined by traffic requirements.

These departments have generally been developed to a high degree of technical skill. Through cooperation within the American Association of State Highway Officials and with the Bureau of Public Roads the results of research and experience have been written into standard specifications and methods of business procedure designed to secure the best and most economical results.

Generally the construction work has been carried out through the letting of contracts on a strictly merit basis and this has helped to build a strong, efficient body of contractors. Through the use of constantly improved methods and equipment the rate of production has been increased and the standards of workmanship and finished product have been constantly improved.

Lying back of much of the value which we are obtaining from large mileages of highways improved with low cost surfaces, are the

highly organized maintenance operations of the State highway departments which are holding our roads against depreciation even though traffic has tremendously increased.

#### What Must be Preserved

In the months that lie ahead whatever is done to promote economy or to secure relief from property taxation insofar as it affects highway funds must commence with the State highway departments as the key to any sound accomplishment. It is possible to extend the authority and responsibility of these departments over large mileages and still obtain economical results. It is not possible to decrease or hamper them without disaster. A very large percentage of our highway mileage that is carrying heavy traffic is of relatively light construction. To decrease the ability of the highway departments to function or to lessen the funds required for adequate maintenance will result not only in a loss of adequate service but a rapid depreciation of the capital investment.

It has been the uniform practice for the past decade to predicate the bonds which have been issued for State road improvement upon the income from the special road user taxes. The interest and debt retirement commitments against these funds are sufficiently large in

a number of the States, together with necessary maintenance, to make it impossible to divert any of the income from the control of the departments and still preserve the credit of the State and the capital investment in highways.

While conditions vary between the States as to the fixed commitments against the special road taxes, economy cannot be obtained by diverting these funds to other than road purposes. In States which have an income that is more than adequate to meet fixed and necessary charges, it is possible to secure some relief from property taxation by the extension of the control of the State highway department over additional mileages of roads which are now wholly dependent upon property taxes.

As a concluding remark, highway construction and maintenance offer a field in which production does not pile up surpluses, provides for consumption of materials, for the profitable employment of labor, and leaves behind a utility which yet fails to meet the public demand in every section of the country. As an example of the efficient organizations of the State highway departments and the highway contracting industry of this country, since the Federal emergency construction highway fund was made available at the end of July, there has been placed under construction 7,020 miles of new highways or more than sufficient to reach two times across the continent from the Atlantic

to the Pacific. In addition 3,000 miles are ready to go under construction when weather permits, or a total of 10,000 miles, which will involve a total cost of around \$156,000,000. The number of people in this time of depression who will receive a livelihood from this source alone will reach into several millions, and the amount involved is less than 20 per cent of one year's income which we are collecting through the special taxes upon the road user.

Economic recovery can not be helped by a breakdown in our sound highway administration policies.