

GROWING TRANSPORTATION PROBLEMS OF THE HIGHWAY

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In the course of a single generation the entire pattern of land transportation in the United States has changed. In the place of the draft animal we have the motor vehicle, which, for practical purposes, is an equally flexible mode of transport, has greater capacity, much higher speed, and a larger radius of operation. Our people have grasped this form of transportation with avidity, both for pleasure and for business, for private and for commercial purposes. Our steadily increasing national wealth has permitted and justified a concomitant extension of our State and local highway improvements to meet the broader potentialities of motor transport. Today we have the accomplished fact of the motor truck and the motor passenger carrying vehicle as definite elements in our national transportation equipment.

With this change have come many problems. These range from local traffic and parking regulations to the broadest interstate questions involving reciprocity in the recognition of State laws, fees and licenses, and to matters of interstate commerce both by private and common carriers. The fact that the motor truck and passenger bus may operate for hire and profit on the public roads, and that they may occupy a competitive place with other forms of commercial transport introduces a series of problems spreading over the entire field of taxation. The development of all classes of motor

transportation has been so great and the use is now so extended that questions of public safety on the open highway are added to the diverse and perplexing problems raised.

The great flexibility of motor vehicle operation has so completely obliterated township and county lines, and is so capable of dimming State lines that it would seem that the States would by a natural impulse of enlightened self-protection take every reasonable step to conform to the obvious requirements of this new transportation and its proper control.

That they have not "obeyed that impulse" is shown by even a cursory examination of existing State regulations. Each State has attacked the problem from its own standpoint, and without much consideration of the effect its legislation may have upon vehicles entering it from other jurisdictions. It may be said, in fact, that the only regulation upon which there is effective uniformity in all States is that of the registering of vehicles, and the issuance of identifying license plates. Beyond that, the broad field of control is occupied by a great number of diversified statutes and rulings.

While all States register motor vehicles, only nineteen have created an office of commissioner or registrar of vehicles for this purpose, the others assigning these duties to various State officers or departments. To provide legal proof of ownership and to protect the vehicle against theft, twenty-two States and the District of Columbia have adopted laws requiring a certificate of title for all owners. The fundamentally important provision for an operator's license is found in the laws of only twenty-five States and the District of Columbia, and only nineteen of these require any kind of examination of applicants for license.

As a means of insuring compensation for injury or damage in cases of accident, nineteen States have adopted a law which exacts proof of financial responsibility, either by posting collateral, taking out bond or obtaining insurance, on the part of any person convicted of a major traffic offense before his license or permit to operate is restored. One State (Massachusetts) imposes compulsory insurance upon all drivers.

The regulating of traffic has received attention to greater or less degree in all States, but with considerable divergencies on certain points. For example, only thirty-one States and the District of Columbia have fixed definite speed limits, these varying in the case of passenger cars from 30 to 50 miles per hour. A "reasonable and proper speed" is stipulated in fourteen States, with some of them specifying a figure beyond which higher speed is deemed "Prima facie evidence of improper driving." Forty States require drivers to use hand signals to indicate their intention of turning or stopping, but the nature of these signals is not uniform.

Limitations on the size and weight of motor vehicles have been set by all States, but in many cases, it must be admitted, without having gone very far into a scientific investigation of highway and traffic conditions. This lack of accurate scientific data is revealed when the great diversity of existing regulations regarding the physical characteristics of vehicles is contrasted with the standardization of the vehicles themselves under mass production methods of manufacture and the uniform standard of excellence towards which our highway system is steadily progressing. To cite only a

few illustrations, the maximum permissible width of a vehicle in the several States ranges from 84 to 102 inches; height from 11 to 14-1/2 feet; length of a single vehicle from 26-1/2 to 40 feet; and length of a combination of vehicles from 30 to 85 feet. Even greater variance is found in the matter of weight, which may range from 15,000 to 36,000 pounds gross in the case of a pneumatic tired four-wheel vehicle, and from 16,000 to 48,000 pounds gross on a pneumatic tired six-wheel vehicle.

For several years committees of the American Association of State Highway Officials and the National Automobile Chamber of Commerce have worked jointly to formulate a code of regulation of weight, dimension and speed which might find uniform acceptance by all States. As the outcome of these deliberations the American Association of State Highway Officials at its recent meeting in Washington agreed upon the following recommendations:

(1) WIDTH

No vehicle shall exceed a total outside width, including any load thereon, of eight feet except vehicles now in operation which, by reason of the substitution of pneumatic tires for other types of tires, exceed the above limit.

(2) HEIGHT

No vehicle unladen or with load shall exceed a height of twelve feet, six inches.

(3) LENGTH

(a) No vehicle shall exceed a length of thirty-five feet extreme over-all dimension, inclusive of front and rear bumpers.

(b) Combinations of vehicles shall consist of not more than two units and, when so combined, shall not exceed a total length of forty-five feet.

(c) The truck tractor and semi-trailer shall be construed to be one vehicle for the purpose of determining lengths.

(d) For occasional movements of materials or objects of dimensions which exceed the limits herein provided, a special permit shall be required.

#### SPEED

(a) Minimum speed. No motor vehicle shall be unnecessarily driven at such a slow speed as to impede or block the normal and reasonable movement of traffic except when reduced speed is necessary for safe operation or when a vehicle or a combination of vehicles is necessarily or in compliance with law proceeding at reduced speed.

(b) Maximum speed. No bus or truck shall be operated at a speed greater than forty-five miles per hour. Passenger automobiles may be operated at such speeds as shall be consistent at all times with safety and the proper use of the roads.

(c) Vehicles equipped with solid rubber or cushion tires shall be operated at a speed not in excess of 10 miles per hour.

#### (5) AXLE LOAD

(a) The wheels of all vehicles, including trailers, except those operated at 10 miles per hour or less, shall be equipped with pneumatic tires.

(b) No wheel equipped with high pressure, pneumatic, solid rubber or cushion tires, shall carry a load in excess of 8,000 pounds, or any axle load in excess of 16,000 pounds.

Research indicates that low pressure pneumatic tires can carry 9,000 pounds per wheel without increasing pavement slab stresses.

An axle load shall be defined as the total load on all wheels whose centers may be included between two parallel transverse vertical planes forty inches apart.

(c) These limitations are recommended for all main rural and intercity roads, but should not be construed as inhibiting heavier axle loads in metropolitan areas if any State desires.

(d) These weight specifications for wheel and axle loads may be restricted by the State Highway Department for a reasonable period where road subgrades are materially weakened from thawing after deep frost or from a continued saturated condition of the soil.

(e) GROSS WEIGHTS

Subject to the limitation imposed by the recommended axle loads no vehicle shall be operated whose total gross weight, with load, exceeds that given by the formula

$W = c(L \text{ plus } 40)$  where

W = total gross weight, with load, in pounds

c = a coefficient to be determined by the individual States

L = the distance between the first and last axles of a vehicle or combination of vehicles, in feet

A value of 700 is recommended for "c" as the lowest which should be imposed but this should not be construed as inhibiting greater values.

but it is the control of vehicles according to their business characteristics that presents perhaps the most intricate phase of the motor transport problem. Part of our difficulty in understanding and rationalizing this question is possibly due to the fact that the present system of regulation rests on an assumption which, from a strictly engineering standpoint, is entirely arbitrary; that is, that all vehicles may be divided into two classes, those privately owned and operated and those operated for hire. The distinction between these two groups has come to be regarded as a proper one in most States of this country as well as in many foreign lands where the same problem has arisen, on the grounds that an operator using the public highways as a place of business for direct profit to himself should pay more for these facilities than the private vehicle owner who carries his own goods or merchandise, or his

own family or friends, in vehicles owned and operated by him only incidentally to his major business.

Under the for-hire group, a further necessary breakdown distinguishes between the common-carrier, who holds himself out indiscriminately to serve the general public, and the contract carrier who operates only under contract with separate clients. Detailed consideration of these matters would exceed the scope of the present paper, but it may be noted that forty-seven States and the District of Columbia now regulate the operation of buses, which are common carriers of persons; thirty-nine States and the District of Columbia have laws regulating the operation of common carriers of property; and thirty-four States have enacted laws dealing with contract carriers.

Taxation of motor vehicles reflects diversity in the taxing jurisdictions - Federal, State, and municipal; in the types of taxes - general, including ad valorem taxes levied on the motor vehicle as personal property, and special, including annual registration and license fees, motor fuel taxes and the like; and in the basis of impost - weight, horsepower, cost price or value, engine displacement tonnage capacity, sometimes an arbitrary flat rate or a combination of the above factors. As a result a 3-ton truck may pay from \$9.60 to \$134 annual registration fee, according to the State in which it is registered, and if operated as a common carrier, the total fee may mount as high as \$900 per year.

Reciprocal relations between the States are also non-uniform in character, although the private passenger car enjoys fairly liberal treatment in all jurisdictions. Commercial vehicles, however, generally can operate in States other than the State of registration only under very limited reciprocity, and must register and pay full fees in many States.

The matter of taxation is involved in the broad question of reciprocity. States are naturally jealous to receive some contribution from vehicles from other States that use their roads constructed at high cost, and sometimes their efforts to this end have disrupted commercial traffic and reacted upon their own vehicle owners. A recent instance of this kind occurred in October, 1932, when a new law went into effect in Pennsylvania requiring all out-of-State for-hire truck operators to take out Pennsylvania licenses as soon as they entered the State. Officers at once arrested drivers and impounded trucks in considerable numbers pending payment of the required license fees. New Jersey officials, whose laws offer full year-round reciprocity to all types of vehicles from other States, at once retaliated and ordered that all Pennsylvania trucks, privately operated and for-hire alike, must be licensed in New Jersey immediately upon their entering that State. Other commonwealths surrounding Pennsylvania indicated that they would take similar action.



Normal truck traffic across State lines in the affected area came to an almost complete standstill, while shippers and operators besieged their State officials with recriminations and complaints. The situation was cleared up only by a hastily summoned conference and a compromise agreement. Similar occurrences in the past have always demonstrated the natural pressure of commercial highway transport across State lines, and its resistance to overly severe restrictions.

But the total amount of interstate traffic after all is a small part of all motor vehicle mileage. In the case of passenger cars, it is probably in the neighborhood of 10 per cent. For trucks of all kinds, surveys in many parts of the United States would seem to indicate that the average is about 7 per cent. The real problem which is most pressing and serious at the moment is that of equitably adjusting motor vehicle taxes within the State.

This matter has three broad phases. If first we consider the public road system as a whole, a decision must be reached as to the portions of the total cost that may equitably and successfully be placed upon landed property and upon highway transportation itself. Next, when we separate our public highways into the classes indicated by use, by supervising authority, or by any other satisfactory basis of classification, we must determine what part of the cost of each should be paid by the users of the differ-

ent groups of roads, regardless this time of whether the land or the vehicle is the source of the revenue. Finally, when we classify the traffic itself rather than the highway, we find reason to differentiate between the type and use made of the vehicle. It will be a very nice problem to come to a definite conclusion on many points involved in these matters of taxation. We do not yet agree on the fundamentals.

As an approach to a solution of these matters, the Bureau of Public Roads has cooperated with five States in conducting tax or traffic surveys designed to furnish facts on which sound conclusions may be based. In 1930 a general tax study was conducted in Wisconsin in cooperation with the Department of Economics of the State University. The incidence of all taxes and their distribution was determined to show just what shifts in funds actually occurred in connection with the highway construction program of that State in 1930. In the following year an extensive traffic survey and a tax study were conducted in Michigan, with the cooperation of the State Highway Department and the University of Wisconsin to develop the relation between shifts of tax funds among the political units paying them and the amount of traffic by local elements of transportation. In the year 1932, a cooperative study of the taxes of Illinois was made similar to that conducted in Wisconsin two years before, and in 1932 a survey was started in New Jersey in conjunction with the State Highway Commission, in which special attention is being given to the several classifications of truck

traffic, interstate, intrastate, by private owner, contract hauler and common carrier. This study begun late in the year will continue through most of 1933. While we wait for results, it seems that highway transportation is beginning to take a place as a general tax carrier.

To the highway administrator, this tendency is unwelcome, but not so because of selfish or bureaucratic motives in the least. It is an off-hand, ill-considered attempt to adjust a most difficult and deeply serious matter. It may indicate that a period of many years will elapse before any really sound or conclusive steps are taken to secure adjustment of the tax situation as it affects highways. The importance of immediate relief in some directions must, however, be recognized, and it is a hopeful indication that some States have limited the period during which additional diversions of motor vehicle revenues shall continue, and some have met the demand for local relief by assuming obligation for local highway indebtedness. These are, at least, thoughtful ways of meeting an emergency.

Highway transportation as it affects public safety has been under consideration for many years. Some aspects of the general problem have been successfully met. I think engineers have done their part both in the construction and control of vehicles and in the designing and building of roads to make both of these elements much less responsible for accidents than the personal element represented by the operators of cars and trucks. Widths of traffic lanes, uniformity, regularity and texture of surface construction, clearances, gradients and alignment have been studied and adjusted so that in new roads and in reconstructed sections of old roads

little remains to be done to insure the traveler against accidents inherent in the road or pavement. The treatment of shoulders, the use of curbs of the lip type and the width and details of drainage structures have received attention and are adapted to the traffic in all new cases. The one remaining phase of general design that is less commonly applied is the treatment of intersections. Expense alone has prevented highway grade crossing elimination where existing or predictable traffic indicates that such treatment is desirable. But even here the engineer is ready with designs and construction details that will meet practically any possible case. In some States, conspicuously in New Jersey, such eliminated intersections are notable and extremely satisfactory.

The various organizations that have developed road marking and the standardized system of precautionary signing are now engaged in revising and combining the two manuals issued originally by the American Association of State Highway Officials and the National Conference on Street and Highway Safety and with the completion of this task the remaining efforts to increase the safety of highway transportation will rest largely with the operating officials. There will have to be devised undoubtedly an adequate, workable system of insurance to underwrite the property and personal losses incident to accidents, and greater effectiveness will have to be secured in licensing only the reasonably competent driver and in policing the public highways to enforce proper regulations. Many of the State officials are fully conscious of the problem presented and are giving the matter the thought and recommending the action appearing most satisfactory under their

local conditions. Most of the principles are agreed upon and the major effort is now directed to practical methods of application. Licensing of all drivers, some form of public liability insurance, an adequate highway police body, and a considerate, intelligent and firm enforcement of law are accepted in principle. A section of the Uniform Vehicle Code is devoted to the licensing of chauffeurs and drivers.

No doubt the important economic problem involved is the adjustment of highway transportation into its proper and deserving place in the national system of communications. History has repeated itself to date, and competition has been emphasized where cooperation and correlation should have been sought. The value and service of truck transportation are established beyond question. The place and need of rail transportation are equally unquestioned. So far as the accomplishment of transportation service is concerned the two forms of transport should be amalgamated, each to serve the other, each to supplement the other. The law should treat both forms of transport equitably, without restricting either beyond the extent necessary for safety and equal service to all comers. The great flexibility and freedom of movement possible with motor truck transport should not be curtailed and the railroads should be relieved equally of requirements that no doubt militate against their most efficient and economical operation when considered, not alone, but as a part of a larger, more extensive and penetrating system of communications.

The necessary and inevitable solution can not be approached exclusively from the point of view of either mode of transport; it must obviously

be an adjustment, but not necessarily a compromise. Representative interests are at work now to find if possible a common ground, and it is apparent and gratifying that this truly fundamental problem of highway transportation will be considered with greater enlightenment than has prevailed at times in the past.