

VERMONT HIGHWAYS

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The Constitution of the United States gave to the world an ideal conception of the rights and privileges of the individual as a free and equal citizen. No aspiration, however high, is denied the lowest born of the land. No aspiration, save that of the President alone, is denied the adopted citizen, foreign born. Energy, intelligence and achievement, when accompanied by decency and trustworthiness, are richly rewarded in some form.

The Civil War definitely established the relationship of the several States and the Nation. In a major sense no aspiration was denied the individual State, save only those acts or institutions inimical to the Nation itself or to its Constitution.

So in this country, so far as possible, through established Government the aspirations of the individual and the aspirations of the State are unlimited, but their fulfillment is not guaranteed. From the time of the copy-book page we have been constantly impressed that the

success of the individual and the attainment of his aspirations depend upon his own efforts. So little, however, said about the progress of the States and the fulfillment of their aspirations being dependent upon their own efforts. One who has had the opportunity to know the States which constitute these United States more or less intimately, they each possess a character and individuality of their own. Their progress or failure for the time to progress can be summed up almost in one word - leadership. Upon the character and quality of the leadership which a State has, its ability to meet its problems and to withstand the competition or to equal the progress of its sister States. This leadership is not official alone, but is exerted through such associations as this. There must be a joining together of the commercial, industrial and agricultural ideals to accomplish in an adequate measure those things which make the upbuilding of the state. Of all of the forces which are necessary for state development, none is more important than adequate transportation in all its forms, each functional in the field for which it is best fitted. There is this difference, - that while all other forms of transport are being developed by private initiative, highway transport is dependent upon the public to supply the roadbed, while

individual supplies the rolling stock. This difference is both a strength and a weakness, so much depends upon the public attitude of mind. We have come now to a time when for this state there is no activity of the state as a business institution worthy of greater consideration than its conduct of highway affairs.

Demands for highway service have been increasing rapidly during the past two decades. Vermont registered motor vehicles have increased from less than 6,000 in 1913 to 74,063 in 1926. In 1926 there was one motor vehicle for each 4.76 persons, so the public business of providing highway service through the development of highway systems has become an industry of the first rank and to meet traffic demands under the normal limitations of funds, materials and labor supply, requires careful planning over a period of years. Plans must be matured in advance for future traffic demands, and improvements must be made so as to provide continuity of adequate service.

The necessary highway service, present and prospective can be reasonably determined only by an accurate and comprehensive study of existing traffic, its volume and type, and by the application of methods developed for this purpose.

The Vermont traffic survey was undertaken to provide accurate knowledge of present highway traffic and to establish, on the basis of this knowledge, a plan of highway improvement which would satisfactorily and economically meet the requirements of the state.

To meet this purpose the following specific information has been provided:

1. The relative traffic importance of the highway systems of the state as a basis for determination of their need for improvement and the basis of the distribution of highway funds among the systems.
2. Classification of highway routes and sections of routes on the basis of the volume and characteristics of present and expected future traffic, involving -
 - (a) average, maximum, and future total traffic and truck traffic,
 - (b) present and future number of small, medium, and large capacity trucks,
 - (c) present and expected future maximum loading and frequency of heavy gross and wheel loads, and
 - (d) present and expected future special traffic movement.
3. Establishment of a plan of highway improvement for a period of several years.

In 1898, Vermont, recognizing the desirability of coordinating and centralizing the highway work of the towns in the development of a State system of highways, established the State Highway Department, to act in an advisory capacity to the towns. In 1906, the State established the principle of state aid to the towns for road improvement on the main thoroughfares, and authorized the State Highway Department to supervise the construction and maintenance of these roads.

During the period from 1898 to 1926 the responsibility of the State Highway Department for the construction and maintenance of the selected road system has been steadily increased, the Department taking over the authority formerly exercised by the towns. The state, operating on the state aid principle, is responsible for the construction and maintenance of the selected road system, and controls the expenditure of state aid funds on town roads not included in the selected road system.

From 1906 to 1923 gravel surface, with the exception of 45 miles, were constructed on what now constitutes the selected road system. From 1923 to 1926 the improvement of this system has consisted principally of the construction

of additional mileage of new gravel surfaces, surface treatment of the gravel surface on the principal traffic routes.

The rapid increase in traffic on the principal highways during the past few years has materially increased the cost of maintaining gravel surfaces on the main routes of travel and in 1925 maintenance costs were approximately 85 per cent of total highway expenditures including bridges on the selected road system.

Recognizing the need for a definite program of highway improvement to meet the expected future traffic importance of the various sections of state highways, the Vermont Highway Board entered into an agreement with the United States Bureau of Public Roads to conduct a cooperative survey of transportation over the highways during the period July 16 to October 15, 1926.

The major highway problems confronting the State are the construction of surfaces superior to gravel on the principal traffic routes, replacing with more durable improvements the present gravel sections expensive to maintain, the construction of adequate bridges on these routes to replace old, inferior structures, the establishment of a primary highway system including the principal traffic routes,

financing the construction and maintenance of surfaces and structures on the state system, and the establishment of a secondary system of highways composed of those routes supplementary to the primary system, the state being responsible for controlling its development on the state aid principle.

The survey clearly shows that the routes comprising the Federal aid system are, with few exceptions, the most important traffic routes of the state. The improvement of this system, during past years, primarily with gravel surfaces, has not been consistent with their traffic importance because of a failure to provide sufficient funds for their proper improvement.

The selected road system, 30.6 per cent of the total rural mileage, carried 87.2 per cent of the traffic in 1926, and the town roads, 69.4 per cent of rural mileage, carried only 12.6 per cent of the traffic.

The Federal aid system, approximately 7 per cent of the rural highway mileage, carried approximately one-half of the total traffic. Average daily traffic on the Federal aid system was 702 vehicles per day and on the town road system 19 vehicles. Approximately 30 per cent of the Federal aid system of 1043 miles carried in excess of 800 vehicles

in 1926, almost one-half the system between 400 and 800, and less than one-fourth carried less than 400 vehicles per day. Of the 925 miles of selected numbered routes not included in the Federal aid system only ten miles carried more than 800 vehicles and three-fourths of this mileage carried less than 400. The largest volume of passenger cars and motor trucks was found on the main "through" routes, the most important of which are U. S. routes 2, 4, 5 and 7. The routes or sections of routes carrying the largest daily volume of traffic are in the vicinity of the largest cities and villages and on routes connecting these population centers.

The northwest-central section is the most important traffic area in the state and has the greatest density of population. Its population is slowly increasing, and over one-half of its population resides in 8.7 per cent of its area. A large volume of traffic may be expected on the principal routes connecting the centers of population. The need for highway service on the minor traffic roads, the selected un-numbered and town roads will remain small.

The southwestern section ranks first in traffic on the Federal aid system, second in traffic on the selected system and third in population. Population decreased slightly

from 1910 to 1920, but has increased in the more important cities and villages. The principal traffic routes of this section will require additional improvement to meet future requirements. Traffic on the minor routes will remain small. The southeastern section ranks second in population density and is increasing in population more rapidly than any other section of the state. Highway requirements are similar to those of the northwest-central section.

The north-central section is primarily an agricultural region, with a comparatively uniform distribution of population and traffic compared with other sections of the state. Foreign traffic is not of any great importance in this area and highway requirements are primarily the need for improved medium and minor traffic routes.

The south-central section comprising the Green Mountain area has a small volume of highway traffic and a small and decreasing population. The principal connecting routes with the other sections of the state will carry a medium traffic volume, while the traffic on other routes in this area will remain very small.

The northeastern section is a relatively undeveloped area of small and decreasing population and small expectancy of future traffic importance.

Foreign traffic, i.e., traffic of vehicles registered in other states, forms an important part of traffic on Vermont highways. The state is traversed by the main routes of tourist traffic between southern New England and Canada and between New York and the White Mountains and Maine Coast resorts, and is in itself an important summer tourist and recreational area.

During the period of the survey motor vehicles of foreign registration made up 35.6 per cent of the total traffic on the Federal aid and Selected Numbered highways. Of the total passenger car traffic 36.6 per cent was of foreign registration, and the corresponding percentage for truck traffic was 9.6 per cent.

Of the 1,043 miles of the Federal aid system 114 miles carried foreign passenger car traffic in excess of 500 daily vehicles, 513 miles between 200 and 500, and 416 miles less than 200.

With the exception of a comparatively small part of the highway mileage, motor truck traffic is a minor part of total traffic, and the construction of surfaces to serve passenger car traffic will in most cases be adequate for motor truck traffic. On the Federal aid system during 1926

only 22 miles carried 100 or more trucks per day and 241 miles 50 or more.

Motor trucks of 2 to 2-1/2 tons capacity were approximately one-fifth of the observed trucks, trucks of less than 2 tons capacity 77.4 per cent, trucks of 3 to 4 ton capacity comprised only 3.3 per cent while those of 5 ton or greater capacity, being only 0.4 per cent of total trucks observed, were a negligible part of total truck traffic.

That motor truck traffic in Vermont is predominantly a movement of small trucks carrying light loads is further indicated by the fact that 72.8 per cent of the loaded trucks weigh less than 8,000 pounds gross and 87.4 per cent less than 12,000 pounds gross. Only 3.9 per cent weigh 16,000 or more pounds. On Federal aid highways, the principally traveled routes, less than ten 2-ton or larger capacity trucks are found on approximately 70 per cent of the mileage.

The survey clearly shows that approximately 90.0 per cent of the traffic using the Federal aid and selected numbered roads was city traffic and 10.0 per cent farm traffic. The improvement and maintenance of the principal traffic routes of the State is, therefore, primarily the result of the use of rural highways by city motor vehicle owners.

Considering the number of loaded trucks and the net tonnage gravel, gasoline, milk, lumber, groceries, bakery goods and fresh fruits are the most important commodities transported on Vermont highways.

Highway traffic is primarily a means of local transportation. The daily volume of highway traffic in an area is largely dependent upon the population of the area, since population reflects motor vehicle registration and highway use.

In Vermont an important part of passenger car traffic is made up of tourist and recreational traffic originating in other states, such traffic is largely a comparatively long distance movement which has little relationship to the population of the area. Excluding foreign passenger car traffic, only 27.4 per cent of passenger car traffic and 20.7 per cent of total truck traffic is made up of vehicles traveling 30 miles or more per trip. Approximately three-fourths of the traffic vehicles registered in the state is produced in any given area in Vermont within a radius of 30 miles.

The density of traffic on the various sections of the selected road system has been used as the basis for an estimate of traffic on the same sections in 1931 and 1936,

applying for this purpose, the relation between the increase in traffic on the highways and the ratio of population to motor vehicle registration observed in other States. In 1926 there was one motor vehicle for each 4.7 persons in Vermont. Extending the past trend of this ratio to 1936 it is estimated that there will be one vehicle for each 2.7 persons. As the yearly increase in motor vehicle traffic on the highways has been found to be practically in direct proportion to the growth of motor vehicle registration, it may therefore be expected that traffic on the State highways will increase 39.8 per cent between 1926 and 1931 and 24.5 per cent between 1931 and 1936, or an increase of 74.0 per cent during the ten year period.

As a basis of the Vermont plan of highway improvement, the State highways are classified in three groups designated as major, medium and minor traffic highways according to their average daily present and expected future traffic. Routes or sections of routes carrying 1500 or more motor vehicles are classed as major routes; those carrying 800 to 1500 vehicles medium routes; and those carrying less than 800 minor routes. The routes or sections of routes are classified on the basis of 1926 traffic, and the estimated

traffic for 1931 and 1936 is employed to indicate the probable classification in those years. The above traffic limits are based primarily on experience and present practices in Vermont. The upper limit of the minor classification is higher than is commonly accepted in many states but is in accordance with Vermont traffic conditions, particularly the very limited use of trucks of over 2-1/2 ton capacity and the resulting absence of heavy wheel loads, the fact that observed traffic represents traffic during the period of seasonal maximum, and the serviceable type of gravel available for construction of gravel roads in Vermont.

If, on the basis of this experience, those sections of the Federal aid system which carry a traffic of 800 or more vehicles per day be considered as requiring a type of surface superior to gravel, it is found that approximately one-third of the 1,043 miles of this system, 335 miles, requires such surfaces between 1926 and 1931 and that 60 per cent, 614 miles, of this system should be improved with surfaces superior to gravel between 1931 and 1936.

Federal Aid Status of Vermont
April 30, 1927

Approved mileage of Federal aid system 1,043 miles

Total apportionment to date \$3,634,132

Balance available for new projects, April 30, \$314,662

Projects completed to April 30:

Total cost \$4,996,486

Federal aid portion 2,333,271

Mileage - 151.7 miles

Projects under construction on April 30:

Total cost \$1,501,129

Federal aid portion 564,170

Mileage - 25.9 miles

Projects approved for construction:

Total cost \$1,156,363

Federal aid portion 422,028

Mileage - 26.9 miles

Types of Federal Aid Projects

Completed to April 30:

<u>Type</u>	<u>Miles</u>
Gravel	95.0
Waterbound macadam	3.5
Bituminous macadam	29.1
Concrete	19.0
Bridges	<u>6.1</u>
Total	151.7

Under Construction:

<u>Type</u>	<u>Miles</u>
Gravel	5.9
Bituminous macadam	5.4
Concrete	13.5
Bridges	<u>1.1</u>
Total	25.9

Approved for Construction

<u>Type</u>	<u>Miles</u>
Bituminous macadam	10.8
Concrete	16.0
Bridges	<u>0.1</u>
Total	26.9