REPORT

OF THE

LEGISLATIVE INTERIM COMMISSION ON HIGHWAYS

Submitted to

THE LEGISLATURE OF THE STATE OF MINNESOTA

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LEGISLATIVE
INTERIM COMMISSION ON HIGHWAYS

Appointed pursuant to Chapter 615 of the laws enacted at the 1947 session of the Legislature of the State of Minnesota.

From the Senate:

Senator Archie H. Miller, Hopkins, vice chairman
Senator C. A. Dahle, Duluth
Senator Norman J. Larson, Ada
Senator B. G. Novak, St. Paul
Senator Oscar A. Swenson, Nicollet

From the House:

Representative P. J. E. Peterson, Truman, Chairman
Representative Roy E. Dunn, Pelican Rapids, Secretary
Representative Aubrey W. Dirlam, Redwood Falls
Representative Lawrence M. Hall, St. Cloud
Representative Robert F. Lee, Annandale

Counsel—Appointed by the Commission

G. P. Smith, Mankato

Editor of Report

H. E. Samuelson, St. Paul

ACT CREATING COMMISSION

Chapter 615, Laws of Minnesota 1947

AN ACT creating an interim commission on highways to make a study and investigation of the trunk highway system and other highways in relation thereto; authorizing the issuance of subpoenas for witnesses and records; and appropriating money therefor.

WHEREAS, the Trunk Highway System of the State of Minnesota has been constructed and improved at public expense with the use of moneys derived from motor vehicle registration fees, Federal aid, gasoline taxes and other revenues for the purpose of providing arteries of travel and commerce; and

WHEREAS more than 25 years have elapsed since the creation of the trunk highway system and information is desired by the legislature to determine the relationship of the Trunk Highway System with other highways in the state, whether there is a need for extending the Trunk Highway System in order to aid in the economic development of the state by providing proper transportation to meet changing conditions, and whether funds are being levied equitably for the construction and maintenance of the Trunk Highway System in its relationship to the other highways of the state; and

WHEREAS the legislature is in need of an adequate report regarding the foregoing; Now Therefore

Be it enacted by the Legislature of the State of Minnesota:

Section 1. **Interim commission on highways; membership.** There is hereby created and established an interim commission on highways consisting of five members of the House of Representatives to be appointed by the Speaker, and five members of the Senate to be appointed by the Committee on Committees of the Senate. The appointments to such interim commission shall be made upon the passage of this act. Vacancies occurring or existing in the membership of the interim commission shall be filled by the appointing power.

Sec. 2. **Duties; scope of inquiry.** The interim commission hereby created and established is authorized and directed to ascertain, study and analyze all facts and matters relating or pertaining to the subjects in the foregoing recitals, including but not limited to the present status of the Trunk Highway System in relation to other highways; existing inadequacies in the Trunk Highway System which should be remedied; materials and equipment to be used in the construction and maintenance of highways; the financing of highway systems and their administration; the reasonable justification for the extension of the Trunk Highway System and the coordination of all highways of the state; highway needs arising from changing economic conditions; the interrelationship between the state and local units of government and the interrelationship between the state and Federal government with reference to highways; special problems relating to highways and matters incidental thereto; the need for revising and recodifying the laws pertaining to highways, and the control and regulation of traffic upon highways; and to report thereon to the legislature including in the report its recommendations for appropriate legislation.

Sec. 3. **Duration of commission.** The interim commission is authorized to act during this session of the legislature and after final adjournment until the commencement of the next regular session with authority to file its final report not later than the 15th day after the opening of the next regular legislative session.

Sec. 4. **Meetings; officers.** The interim commission shall have the authority and power to hold meetings at such times and places as it may designate for the purpose of taking evidence and testimony necessary or helpful in effectuating the purposes of the act. The commission shall select a chairman, a vice chairman, and such other officers from its membership as it may deem necessary.

Sec. 5. **Expenses; secure cooperation.** The members of the interim commission shall serve without pay but shall be allowed and paid for all expenses incidentally and necessarily incurred in the performance of their duties within the limit of the appropriation provided herein. The commission is vested with power and authority, to subpoena witnesses and records, to employ expert legal, engineering and clerical aid and assistance, to purchase stationery and other supplies, to rent or otherwise provide for the use of offices and equipment, to cooperate with and to secure the cooperation of any governmental subdivision or agency of the state in investigating any matter within the scope of this enactment, and the officers of any governmental subdivision or agency of the state shall assist the interim commission with such information and data as it may require. The interim commission shall do any and all things reasonably necessary or convenient to enable it fully and adequately to exercise its powers, perform its duties, and accomplish the objectives and purposes of this enactment.

Sec. 6. **Appropriation.** The sum of $20,000 is here appropriated out of the Trunk Highway Fund in the state treasury or so much thereof as may be necessary to pay all expenses incurred pursuant to this act. For the payment of such expenses the interim commission shall draw its warrants upon the state treasurer which warrants shall be signed by the chairman and at least one other member of such commission who has been so designated and the state auditor shall then approve, and the state treasurer shall pay such warrants as and when presented but not exceeding in the aggregate the amount herein appropriated.

Approved April 28, 1947.

REPORT OF THE COMMISSION

To the Honorable Members
of the 1949 Legislature
of the State of Minnesota

In compliance with the authority and directions set forth in Chapter 615 of the Laws of 1947, your Interim Commission on Highways during the past two years has been making an extended study of the condition, finances and needs of all road systems in the state.

The Commission organized by electing Representative P. J. E. Peterson chairman, Senator Archie H. Miller vice chairman and Representative Roy E. Dunn secretary. G. P. Smith of Mankato was chosen as counsel for the Commission.

The first meeting of the Commission was held at the Capitol, June 16, 1947. Further meetings and hearings were held July 18, August 4, 14 and 29, October 3, 14 and 17, November 6 and December 5, 1947; January 9 and 10, February 2, 3, 27 and 28, March 9 and 10, April 2, 3 and 30, May 1 and 8, July 9, 10 and 23, August 21, September 3 and 24, October 22 and 23, November 10, 11, 29 and 30, and December 21, 1948.

Subsequent to the drafting of the bill creating the Commission, and simultaneous with its passage on the last day of the session, a bill was passed proposing an amendment to Article IX, Section 5, of the Constitution, providing that one-half instead of one-third of the gas tax proceeds be placed in the state road and bridge fund for allotment to the counties.

Pendency of the amendment created a problem for the Commission. Adoption or rejection of the amendment would affect revenues of both the state trunk highway fund and the counties. Obviously no final conclusions or recommendations for legislation, particularly on matters relating to revenue, could be made until the outcome of the vote on the amendment was known.

The Commission could not postpone its investigation until after the 1948 election and began early in 1947 assembling data on road needs and finances. From time to time the Commission heard representatives of the U. S. Public Roads Administration, the State Department of Highways, the county highway engineers, the county commissioners, town boards and municipal authorities. The Commission also heard a number of delegations

advocating addition of new routes to the state trunk highway system or otherwise interested in highway improvement, finances and traffic regulation.

This Committee did not deem it within the scope of its legislative commission to advise the voters that the amendment be or not be adopted. It was agreed that this decision must be left to the voters. The proposed amendment failed of passage at the election November 2, 1948, thereby leaving unchanged the requirement of the constitution that two-thirds of the gasoline tax receipts go to the trunk highway fund and one-third to the state road and bridge fund, for allotment to the counties.

Minnesota highways are administered in four classes: trunk highways, county roads (state aid and gas tax), urban streets, and township roads. All roads and streets of the state constitute our highway system. Any comprehensive plan requires a study of the relative need of each group. It is not now economically feasible to meet all public demands for road improvements. It appears that to meet the more urgent demands, in the face of increased maintenance and construction costs, added revenues are required.

The original constitutional trunk highway system included 6,555 miles of highways. 4,666 miles have since been added by legislative enactment. At this time 1,891 miles of the trunk system have not been improved by construction and 2,842 miles of trunk highways are untreated gravel surface. In the spring of 1948 a total of 7,638 miles of trunk highway was restricted to axle loads less than normal legal limits. The paved trunk highways include some 500 miles of two lane, 18 foot pavement, all on heavy traffic routes and all deteriorated and definitely obsolete and inadequate.

Transferring a road to the trunk highway system will not insure its early improvement—it may have the opposite effect. If roads of a local character are added to the state system, their priority of improvement would be low in comparison with main trunk routes. Over half the mileage added sixteen years ago is not yet improved by permanent construction. Local roads may best be administered locally where they will qualify for improvements on a higher priority.

The Commission concludes that generally it is not now economically sound to add mileage to the trunk highway system without added revenue. Adding any substantial mileage will increase maintenance expenditures and slow up construction. The interest of the people in the trunk system is primarily in a system of routes of general use. It may appear advisable from time to time to add a limited mileage of routes that have devel-

oped heavy traffic, or routes that will serve as connecting links. Any proposal for added trunk highway mileage should be carefully scrutinized on the basis of general traffic use.

The county road system in our 87 counties comprises 16,216 miles of state aid roads and 26,390 miles of county aid or gas tax roads; a total of 42,606 miles. The state aid roads are generally the routes of primary county use and need and the county aid those of secondary county use.

For necessary construction and maintenance of this system the counties had available in 1947:

One-third of 4c gas tax divided, as State Aid	$ 1,200,000
and as gas tax allotment	7,227,000
Federal Aid	2,000,000
County tax levies	10,830,000
Total	$21,257,000

Here, too, the problem is not fully solvable. Traffic needs require a more substantial improvement of the main routes of the county system. Available sources of income are not sufficient to fully meet the needs, but much can be accomplished by planning and the programming of available funds.

The Commission is in agreement that the township unit of government should generally be preserved and that local access roads outside the state and county systems can be best administered and constructed under township authority. It is pointed out that the average township has not the means to procure and operate necessary blading and snow plowing equipment. This problem has been met in several counties by agreement between the county and town boards for use of county operated equipment on town roads. The Commission believes it is in the public interest that this practice be encouraged and will recommend a statute specifically authorizing township-county agreements for the use of county blading and snow plowing equipment on town roads.

It is recognized that urban needs must so far as possible be met. Population centers require relief of traffic congestion on arterial routes. An adequate highway system must have adequate terminals. Any long range plan must include provision for the improvement of urban trunk routes. Municipalities are entitled to such fair assistance in highway problems as may be accomplished under constitutional limitations. The first urban need is the improvement of urban trunk routes.

Urban dwellers contribute to county road funds the same as township residents. It appears fair to the Commission that the state aid roads extend through cities and villages, the same as

through the townships so as to form a connected system. The Commission will recommend legislation granting such authority. Local streets must be left to the responsibility of city and village authorities, the same as local rural roads are the responsibility of the townships.

Under the constitution (article 16) all motor vehicle taxes are dedicated to the trunk highway fund; and the excise tax on gasoline is divided one-third to the state road and bridge fund and two-thirds to the trunk highway fund (Article 9, Sec. 5). It is further provided (Article 9, Sec. 16) that the state road and bridge fund be allocated each year not more than 3 per cent nor less than one-half of 1 per cent thereof to any one county.

The voters at the 1948 general election did not approve an amendment proposed to change the gasoline excise tax division. If any amendment is to be submitted at the 1950 general election, the problem is deemed one for the legislature. The Commission does recommend, however, that when and if the legislature considers the submission of any amendment affecting gasoline tax division, it study the advisability of continuing the constitutional limitation to any county. When the limitations were adopted by the people it controlled only the distribution of a state wide millage levy. The purpose was clear: to tax all properties, rural and urban, for the construction of a rural system of state aid roads. At the present time the equity of continuing the application of the limitations to the larger and to the more populous counties should be the subject of legislative study.

The Commission recommends a review of the motor vehicle registration tax law. From time to time the law has been amended with the result that now passenger cars are taxed on a net weight basis, farm (T) and 35 mile zone (X) trucks on a list price basis, and general purpose (Y) trucks on a gross weight basis. There are two other truck classifications of which little use is made by the public; forest (F) and interstate (IY) trucks, taxed respectively on a list price and a ton mile basis.

List price of trucks has been subject to such fluctuation and increase from year to year that the Commission concludes it is no longer a proper basis for truck taxation. For example, under existing law, the annual fee for a new truck in the smaller sizes is higher under the T (farm) and X (zone) classification than under the Y (unrestricted) classification.

It appears that Minnesota alone provides a state-wide zone classification for trucks. The zone law is very difficult of enforcement, is frequently abused, and is inequitable in its application. The Commission recommends for consideration the abolishment of the X as well as the F and IY truck classifications, and the classification of all trucks as either farm or general pur-

pose trucks, with the tax on trucks restricted to farm use on a net weight basis, and the tax on general purpose trucks on a declared gross weight basis.

The Commission recommends the consideration of a progressively higher tax than now provided on the heavier truck units, and consideration of a mileage tax for over-the-road buses.

The Commission further concludes that present depreciation rates are too rapid and minima too low, particularly on passenger cars. The present depreciation rates and minima were adopted as a depression measure in 1933. They are materially more rapid and lower respectively than provided by the original act and do not now fairly reflect market values of the older vehicles. The Commission recommends that the Legislature consider a revision somewhat similar to the original registration act in this respect with the effect of decelerating depreciation and increasing minima.

The net result of the motor vehicle registration changes suggested by the Commission should be simplified administration, improved enforcement and a more equitable tax base.

It is obvious, with very materially increased construction and maintenance costs, that the trunk highways cannot be kept up and pressing demands met on a pre-war tax base. The economy of the state and the needs of the public require an adequate trunk highway system.

Road user taxes on the current basis will not provide sufficient revenue to carry out the ten-year construction programs considered necessary to make the state and county road systems reasonably adequate to traffic. If highway costs do not stabilize at lower than present levels, it is evident that succeeding Legislatures must reconsider the rates and basis of highway revenues.

The Commission further recommends:

1. The transfer of chauffeurs' licensing administration to the drivers license division of the Highway Department.

2. A study of drivers license fees with the view to making this division self-supporting.

3. A legislative study by a joint Senate-House committee of the civil service law and regulations in their application to administrative and engineering and other technical employees of the Highway Department.

The hearings held by the Commission have brought forth information on Minnesota road problems which the Commission believes should be made available to the public. This information

includes a general outline of Minnesota highway history, past and present road laws, information on mileage and condition of all classes of roads and streets, road revenues, road use, needed improvements, motor vehicle use and taxation and demands for road improvements confronting the various road administrative agencies. A summary of this information is included in this report.

The Commission is indebted to the State Department of Highways for its cooperation in furnishing necessary data. M. J. Hoffmann, Commissioner of Highways, and O. L. Kipp, Chief Engineer, have not only presented the needs of the trunk highway system but emphasized the need for simultaneous improvement of all classes of roads and their integration into one transportation system serving the needs of all the people of the state.

The Department of Highways has also made the services of its personnel available to the Commission. Particularly helpful has been the Highway Planning Survey Division, a research agency financed jointly by the state and the U. S. Public Roads Administration. This division, besides making available all the data collected and compiled during the past dozen years on the condition, use and finances of all road and street systems in the state, has also made a number of special studies to supply specific information desired by the Commission. K. B. Rykken, manager of the Planning Survey, has been untiring in his efforts to furnish needed information, and the Commission wishes to express its appreciation for his assistance.

The Commission acknowledges its indebtedness to the State Association of County Highway Engineers, the Minnesota Association of County Commissioners, the League of Minnesota Municipalities, the committee representing the three cities of the first class, the township officers organization, and many other representatives of civic groups and road user organizations who have furnished valuable information on various phases of Minnesota's road problems.

The Commission also heard a number of individuals and delegations urging the addition of various new routes to the state trunk highway system. Although the Commission has not felt that recommending individual routes was one of its func-

tions, the information has been valuable because it gave an insight into some of the problems confronting the counties in their efforts to maintain routes carrying heavy traffic.

The legislative members have served without compensation, as directed by the act creating the Commission.

Dated: December 21, 1948.

Respectfully submitted,

P. J. E. Peterson, Chairman
Archie H. Miller, Vice chairman
Roy E. Dunn, Secretary
C. A. Dahle
Norman J. Larson
B. G. Novak
Oscar A. Swenson
Aubrey W. Dirlam
Robert F. Lee

The undersigned, a member of the Interim Commission on Highways, is in agreement with the majority of the Commission except in the recommendation for the transfer of chauffeurs' licensing administration to the drivers license division of the Highway Department. The undersigned therefore dissents from the foregoing report in this one particular.

Respectfully submitted,

Lawrence M. Hall

FACTUAL REPORT

FOREWORD

The following report aims to present in a concise manner pertinent facts on the Minnesota road problem. It is not intended to be a survey complete in all details, but it is a summary of the information and recommendations presented to the Commission by representatives of the State Department of Highways, the county highway engineers and county commissioners, the town boards and city and village authorities.

Much of the factual data in this report has been furnished by the Highway Planning Survey Division of the Department of Highways. Compilation of this report has also been undertaken by this division, under the direction of Mr. G. P. Smith, counsel for the Commission. Recommendations of the principal groups appearing before the Commission are quoted in considerable detail. Interpretative comment also accompanies the factual data at various places. It should be understood that such comment does not necessarily reflect the views of the members of the Commission.

NOTE: The term "urban" where used in this report includes all incorporated cities and villages, while "rural" refers to unincorporated areas. An exception is made in sections pertaining to Federal Aid, where the definitions used in the 1944 Federal Aid Act are followed: namely, "rural" areas include incorporated places of less than 5,000 population, while "urban" includes only incorporated places of 5,000 population or more.

SUMMARY OF FACTUAL AND HISTORICAL DATA

Road development in Minnesota has never caught up with the demands created by the rapid growth of motor vehicle traffic. Increase in the number of vehicles has been accompanied by increases in average annual mileage, in average speed and in average weight of vehicles and loads. The multitude of vehicles has created serious congestion on main rural trunk highways and urban arteries. Rapid increase in truck transport and use of school busses has brought growing demands for improvements of all rural roads.

Basic changes in road laws and road building methods have been made from time to time in the past, to fit new methods of transportation and to meet new demands of agriculture, commerce and industry. Notable basic changes within the last half century include adoption of the state aid principle, establishment of the state trunk highway system, initiation of motor vehicle taxation and dedication to highway use, extension of the state aid principle to secondary roads, initiation of motor fuel taxation, and extension of motor fuel tax use to farm-to-market roads.

Just as road needs have been met as they arose in the past, it is certain that present problems will be solved. They may not all be solved at once, nor as quickly as some desire, but the state's road history gives assurance that the needs will be met.

Although road revenues have been increased from time to time, the increase has not been proportionate to traffic growth. Neither has there been any increase in road revenues to compare with the post-war increase in costs of construction and maintenance. Road deficiencies have been accentuated by the reduction in state and local revenues during the depression, by curtailment of construction during the war, and by reduced purchasing power of the road dollar since the war ended.

Public demands for improvements in all classes of roads far exceed the ability of the people to finance the desired improvements. It is not economically feasible to meet all public demands for road improvements. Progress can best be made by meeting the more urgent needs first.

While extensive improvements are needed on all classes of roads, four conditions are outstanding: (1) Total inadequacy of the earlier built trunk highways to carry today's traffic. (2) Inadequacy of trunk routes not yet improved since being added

to the state system. (3) Inadequacy of main county roads, accentuated by growing use of school busses and truck transport. (4) Congestion on main arteries in all urban areas.

It is clear that to meet the more urgent needs only, in the face of rising costs of construction and maintenance, additional revenue will be needed. With the demands for other governmental activities, county and local road and bridge levies cannot be materially increased. No increase in Federal Aid above the sums authorized by the 1944 post-war program can be anticipated. If demands for road improvements are to be met, additional revenue can come from only one source, the motor vehicle user.

Although Minnesota's roads and streets are administered by more than 2,700 separate agencies, all state, county and local roads and streets are part of one transportation system. The relative needs of all classes must be considered together. Transfer of mileage from one system to another or reallocation of present revenues will not alone meet the general needs.

The welfare and prosperity of every individual are affected by the condition of many roads which he does not personally travel. Good roads give him a better market for what he produces, and affect the supply and the price of everything he buys. Agriculture is Minnesota's basic industry. A major portion of the state's commerce and manufacturing are devoted to marketing and processing farm products and supplying the needs of agriculture. The state's growth and prosperity depend upon adequate transportation facilities between agricultural areas and industrial and commercial centers.

Traffic accidents take a heavy annual toll of life, limb and property. Accidents occur on all classes of roads but are most numerous on congested streets and highways. Road widths, alignment and sight distance inadequate to present day speed and traffic volume are contributing factors. Improvements designed to make streets and highways safer must go hand in hand with traffic law enforcement and driver education.

I. RELATION OF HIGHWAYS TO STATE'S ECONOMIC AND CULTURAL LIFE

One outstanding fact is apparent to everyone in any way concerned with road legislation or administration. The demand for improvements in all classes of roads and in all sections of the state far exceeds the ability of the people to finance or build the desired improvements.

Every community in the state wants better roads. Every vehicle owner and operator wants the roads he uses improved so he can travel where he wishes, every day of the year, safely and without being hampered by mud, dust, snow, ice, load restrictions or traffic congestion.

"Selling good roads" is not necessary in this day and age, and is not the function of this report. Nevertheless, a brief review of the relation of highways to the state's economic and cultural life is appropriate.

Good roads and motor vehicles have revolutionized the state's entire economic, social and cultural life. They influence the location of schools, churches and other cultural centers, as well as the attendance at these centers. They make educational centers accessible to greater numbers of boys and girls. They have vastly improved the facilities for treating the sick and injured. They have, in fact, had a tremendous influence on every phase of life.

Development of roads and motor vehicles have been closely related. Lack of all-weather roads limited use of the first automobiles largely to fair weather pleasure trips. When better roads permitted year-round travel, automobiles became everyday utility vehicles, taking people to and from work and on all types of business errands. As their usefulness expanded their numbers increased, in turn creating more and more demands for road improvements.

Growth of Truck Transport

Use of trucks for transportation started more slowly but developed rapidly as roads throughout the state were improved. At first trucks were used mainly for intra-city hauling. The next development was inter-city transport. Soon the use of trucks spread to all classes of roads. Within the last decade

there has been a marked increase in the number of trucks operating on secondary rural roads, as well as in the average weights of loads hauled on these roads.

In 1921 trucks made up only 7 per cent of the total registration. In 1947 this had increased to 17 per cent. *Trucks and trailers, with their greater average annual mileage and greater average weights, now generate a greater total ton-miles of traffic than is created by the much larger number of passenger cars.*

Without minimizing the importance of passenger car travel in the state's economic and cultural life, it must be emphasized that truck transportation has become an exceedingly important factor in agricultural, industrial and commercial development. It has also created road building and maintenance problems far greater and more complicated than those which faced the road builders when "pleasure cars" first came into general use.

Relation of Agriculture to Other Industries

Agriculture is Minnesota's basic industry. A major portion of the state's commerce and manufacturing is devoted to processing and marketing farm products, and supplying the needs of agriculture. Consequently, the state's growth and prosperity to a very large extent depend upon adequate transportation facilities between the agricultural areas and the industrial and commercial centers, large and small.

Road development has been closely related to changing agricultural conditions. The change from one-crop to diversified farming aroused a new interest in good roads late in the nineteenth century. Better roads made further changes in farming methods possible, and in turn brought more demands for more good roads.

The rate of development in the dairy and canning industries, in the production and processing of beef, pork and poultry, in the raising of sugar beets and soy beans, and in many other types of agriculture and related activity has been closely linked to the development of transportantion facilities. Even the processing of farm products for consumption on the farm is now to a large extent done at central plants.

Practically everything bought or used by the ultimate consumer is today carried either all or part of the way by truck.

All of the milk consumed in the larger cities in Minnesota is transported by trucks from the farms.

Three-fourths of the livestock received at South St. Paul comes by truck, a larger proportion at some of the smaller markets.

A large part of the pulpwood and other timber produced in Minnesota is hauled to the paper mills, saw mills or shipping centers by truck.

The number of communities dependent solely on highway transport for needed supplies and for marketing what they have to sell has been increased considerably in the last two decades by abandonment of unprofitable railroad branch lines. In 1927 Minnesota had 8,792 miles of railroads, not including switch tracks or industry tracks. In 1948 the total had been reduced to 8,206 miles. This represents a net reduction of 586 miles.

Motor Vehicle Ownership Widespread

Brief comment on the relation of highways to other forms of transportation may be appropriate. To a limited extent highways, railways, waterways and airways are competitive, but in the main they supplement each other. In one respect the highways have a special usefulness. The services offered by railways, waterways and airways are largely limited to fixed routes or fixed terminals. Motor vehicles provide direct access to farm and city homes, fields and forests, stores and factories, schools and churches, parks and playgrounds.

Motor vehicles are unique in their widespread private ownership and in their adaptability to the individual transportation requirements of the average citizen. Trains, planes and ships, because of their size and cost, are largely owned and operated by public service agencies. Furthermore, in a railroad system the roadbed and rolling stock are all under one ownership and management.

The almost universal ownership of motor vehicles makes public governmental units the logical agencies for road building and maintenance. Building roads for motor vehicle use is not an ordinary governmental function. It is, in a sense, a service to a special group but a group so large as to constitute almost the entire population. Road building may therefore be considered a great cooperative enterprise in which every adult citizen has a voting membership and in which each vehicle owner pays somewhat in proportion to the use he makes of the facilities provided.

II. HISTORICAL BACKGROUND

Road building is an endless and seemingly continuous task. The history of road development in Minnesota is a record of progress. The pace has been more rapid in some periods than others. Basic changes in road laws and in road building methods have been made from time to time to fit new vehicles of transportation and to meet new demands of agriculture, commerce and industry, and social and cultural development.

While periodic changes are required to meet changing conditions, it is never possible to exchange forthwith an old road system for a new one. Roads must be built one section at a time and each section improved step by step. Today's highways have been developing through many stages from pioneer trails.

The same is true of our road laws. They have been developed step by step from pre-territorial days to the present time. Long established practices cannot easily be changed. A brief review of Minnesota road history may therefore be helpful to anyone interested in future road development.

Periods of Road Development

Minnesota road history divides itself into three general periods:

1. The early days when ox-cart trails and wagon roads were the only avenues of inland transportation.
2. The half century when wagon roads served mainly as feeders to the railroads.
3. The recent decades since the motor vehicle came into general use.

At no time in the history of the state has it been possible to meet all public demands for better roads. Nevertheless, when inadequacies have become evident, steps have been taken to remedy matters. The Legislature, the administrative officials and the public have cooperated to meet changing conditions. Four forward steps stand out among the events of the last half century:

1. Adoption of the state aid principle in 1898 and expansion of county participation following revival of good roads interest.

2. Expansion of the state aid program, requirement of maintenance for all roads, and adoption of a new code of road laws under leadership of Robert C. Dunn, in 1911-1913, when influence of motor vehicles became noticeable.

3. Establishment of the trunk highway system under leadership of Charles M. Babcock, and adoption of a road user tax plan for highway purposes.

4. Allotment of part of road user revenues to counties when need for more rapid improvement of farm-to-market roads became evident.

It is now twenty years since this last basic change was made. The depression and the war in turn tended to defer the growing demand for road improvements, but this has made the demand all the more emphatic since the war ended.

Extensive improvements are needed on all classes of roads, but four conditions are outstanding: (1) Total inadequacy of the earlier built trunk highways for present traffic needs; (2) inadequacy of routes not improved since being taken into the trunk highway system; (3) inadequacy of main county roads, accentuated by greater use of school busses and truck transport; (4) congestion on main arteries in all urban areas.

Just as road needs have been met from time to time as they arose in the past, it is certain that present problems will be solved. They may not all be solved at once, nor as quickly as some desire, but the state's road history gives assurance that the needs will be met.

Before the Railroads Came

The pre-railroad era of road building includes both pre-territorial days and the territorial period from 1849 to 1858.

Forerunners of the first constructed roads were the Indian trails and later the network of ox-cart trails between the Red River Valley and the head of navigation on the Mississippi River. These were paths of least resistance, compacted by hoofs and wheels, crossing rivers by fords, but in no sense constructed roads. The first recorded road building in what is now Minnesota was a nine-mile stretch around a series of falls on the Pigeon River near Grand Portage, built by the British before 1816. Some short roads were built near Fort Snelling after that post was established in 1819. Extensive surveys were made for military roads connecting Fort Snelling with the outside world.

The first area in Minnesota open to settlement was in the triangle west of the St. Croix River and north of the Mississippi. This area came under the Wisconsin road laws soon after that

territory was organized in 1836. The county was the road building unit. Road supervisors were appointed by the county board. Laws provided for establishment of roads upon proper petition and for levying of poll taxes and property taxes for road purposes. There was a limited amount of construction during this period.

Territorial Road Building

With these three types of pre-territorial roads—a network of trails, a projected system of military roads, and the county roads in the St. Croix delta—the groundwork had been laid for the territorial road systems. Organization of the Minnesota territory in 1849 was followed by a period of active road building. Wisconsin road laws became the basis for Minnesota road laws. There were three classes of roads: Federal, territorial, and county. There were no town organizations and no town roads in the territorial period.

Federal roads were built by congressional appropriations voted for military and Indian reservation roads. They were planned by engineers and built by contract. Nearly 1,000 miles of such roads, touching strategic points in the territory, were built. Federal funds for road building in this period totaled $467,000.

Territorial roads were established by special acts of the Legislature. Costs of location and right-of-way were paid from territorial funds, but construction became the responsibility of the county.

County roads were established by the county boards and built by the counties. All roads were maintained by the counties. Each county was divided into road districts, each with a supervisor named by the board. Duties of supervisors included buying material, letting contracts, collecting taxes, and seeing to it that all able-bodied men from 21 to 50 worked three days each year on the roads.

In 1857 the Legislature provided for the election of two road commissioners in each county who, with the county surveyor, constituted a board of road commissioners having all the highway responsibility formerly held by the county board, except levying taxes.

Road building was necessarily primitive and consisted largely of clearing away trees and stumps, building crude bridges and corduroying low places. A width of 66 feet was established for both territorial and county roads and 33 feet for cartways. Roads were deep mud in wet weather and cloudy with dust when dry. Yet they played an important part in the development of the

new territory. They were the only avenues for carrying mail, goods and passengers between the river towns and inland settlements. Population according to Federal census increased from 6,077 in 1850 to 172,023 in 1860.

Period of Railroad Predominance

The state constitution, adopted in 1858, provided that the state shall never contract any debts for works of internal improvements, nor be a party to such works, except where grants to the state had been dedicated to a specific purpose.

The casual student might attribute to this prohibition the lag in road interest which continued for nearly a half century. Actually, interest in road building had given way to agitation for railroad construction in the later territorial years. With the coming of the railroads, wagon roads became largely a matter of local concern and a means of reaching the nearest railroad station.

The counties played a minor role in road activity from 1858, when Minnesota became a state, until the turn of the century. The first state Legislature provided for town organizations. Town supervisors were responsible for the general care of all roads and bridges. They were authorized to require all able bodied males to work on the roads two days a year.

The chairmen of the town boards constituted the county board with power to establish, alter or discontinue county roads.

A general road law passed in 1860 declared all roads, including territorial and state roads, to be town roads. Town boards were given power to alter, discontinue or reopen such roads.

County boards of elective county commissioners were created by an act of 1860. In 1862 these boards were given power to establish, alter or vacate county roads. State and other roads touching more than one county were declared to be county roads. County boards might appropriate $1,000 a year for road improvement; more by popular vote. Towns were required to keep county roads in repair.

State roads were established by special acts of the Legislature, but the state assumed no responsibility beyond designating the route. In 1872 a law was passed permitting establishment of roads involving more than one county through district court proceedings. In 1892 an amendment to the constitution specifically prohibited establishing roads by special laws.

For fifty years most of the road work was done by working out taxes. Mileage increased as settlement expanded, but road conditions changed little.

Revival of Road Interest

As long as grain and livestock were the principal farm products, roads mattered little. Hauling grain could wait until roads were dry or frozen, or when snow permitted hauling by sled. Cattle were usually driven to market on the hoof. In the nineties the growth of dairy farming created a demand for roads that would permit more frequent and regular trips to local creameries. Good roads interest was also generated by the rural mail delivery plan and the general use of bicycles. Merchants anxious to extend their trade territory were active good road boosters.

All these factors caused a revival of good roads interest before the coming of the motor vehicle. Authority of the county boards in road matters was extended from time to time. In 1895 the Legislature submitted a proposal to the voters to set aside the income from the internal improvement land fund to a state fund for road improvements. This proposal received 152,765 affirmative and only 28,991 negative votes, but failed to receive a majority of the votes cast at the election.

In 1897 the Legislature submitted a constitutional amendment creating a state road and bridge fund to include income from the internal improvement fund and such taxes as the Legislature might levy, not exceeding 1/20 mill. It authorized creation of a state highway commission of three members. It provided that no county should receive more than three per cent nor less than one-half of one per cent of the total fund in any one year.

The amendment was adopted in 1898 but legislation to put it in effect was not enacted until 1905. The law then passed created a State Highway Commission to take office in 1906, provided for an annual tax levy of 1/20 mill and authorized county boards to designate "state roads" and improve them under rules laid down by the Commission. Town boards were responsible for "repair" of these roads but there was no provision for regular maintenance.

Legislative Appropriations for Roads

The Legislature from time to time had appropriated the proceeds of Federal grants for road purposes. The road and bridge fund amendment, however, placed the income from the internal improvement land fund in the hands of the State Highway Commission, taking effect when the Commission was created. But appropriations for road projects were popular. The Legislature in 1907 appropriated $200,000 annually from the general revenue fund and in 1909 increased the annual appropriation to $300,000. This money was allotted for designated projects, to be

spent without supervision by the Highway Commission. In 1909 a taxpayer's suit brought a decision from the State Supreme Court that the State constitution prohibited any state participation in works of internal improvement except as permitted in the road and bridge fund amendment. This decision ended the so-called "pork barrel" appropriations and materially strengthened the position of the State Highway Commission.

The Elwell Road Law

A digression from the general trend of road legislation was the so-called Elwell Act, passed in 1911, providing for designation of "state rural highways" by district courts upon petition of six or more freeholders. Issuance of bonds for improvement of these roads was authorized. One-half of the cost of improving the roads was to be paid from the state road and bridge fund, one-fourth by the counties and one-fourth by benefited property owners. This act was repealed in 1915. Fifty highways, totaling 1,134 miles, were designated and improved under this act at a total cost of $3,254,000.

State Road Activities Expanded

Revisions of the road and bridge fund amendment were adopted in 1906, 1910 and 1912. Under these amendments the state aid tax levy was increased to ¼ mill in 1911 and 1 mill in 1913. The increased funds permitted a rapid expansion in state aid road work. The staff of the Highway Commission was enlarged and engineers assigned to various counties. Funds for salaries and expenses of this staff were paid from the general revenue fund. The annual appropriation for this purpose was $150,000 per year from 1911 to 1915 and $100,000 from 1915 to 1917. From 1917 to 1921 funds for the work of the Department were appropriated from the state road and bridge fund.

In 1913 a new general road law was adopted. It defined three classes of roads as follows:

1. State roads constructed and maintained by the counties with state aid and under the rules of the State Highway Commission.

2. County roads to be constructed by the county boards under rules of the Commission, and maintained by the town boards.

3. Town roads to be constructed and maintained by the town boards.

It may be noted that this act for the first time made provision for regular maintenance of all rural roads. The same

law provided for an annual levy of 1 mill on all property in the townships, proceeds of this levy to constitute a fund for buying drags and dragging county and town roads.

Motor Vehicle Starts New Era

Although motor vehicles appeared in Minnesota as early as 1895, they did not come in sufficient numbers to greatly influence the good roads movement until after 1910. Horse drawn traffic predominated and roads were mainly feeders to the railroad lines. Railroads actively encouraged the good roads movement.

The State Highway Commission from its inception had considered development of a network of main highways, but it concluded in 1911 that "the general interest of the state would be better served by applying state aid to a general improvement of the common earth road, trusting to future effort to provide ways and means for carrying out the original scheme."

In the second decade of the present century, motor vehicles began appearing in sufficient numbers to cause noticeable concentration of traffic on some intercity and other main roads, accentuating the demand for a network of connected routes. The trend was encouraged by passage of the first Federal Aid Highway Law in 1916. The State Highway Commission selected for Federal aid roads a network of 6,200 miles connecting all county seats and other centers of population. This network became the forerunner of the trunk highway system.

The work of the Highway Commission in the first years was largely educational, but as funds and personnel grew the administrative duties increased. It appeared that a single full-time commissioner could act more efficiently than a non-salaried commission meeting only at intervals. The Legislature in 1917 abolished the Commission and created the office of Commissioner of Highways. An allotment board composed of the Commissioner of Highways, the State Treasurer and the State Auditor was created to make the annual apportionment of the state road and bridge fund to the counties.

State Becomes a Road Builder

Under the state aid plan initiative in designating and improving "state" roads rested with the counties. This made it difficult to achieve the uniformity in construction and maintenance of connecting highways needed for the new type of traffic. The new commissioner of highways formulated a plan for a system of state trunk highways. The plan was ratified by the 1919 Legislature, submitted to the voters in the form of a constitutional amendment and adopted in 1920. It provided for creation of seventy routes totaling about 7,000 miles and con-

necting all county seats and other principal centers, these routes to be located, constructed and forever maintained by the state.

One argument used in behalf of the trunk highway plan was that it would relieve the counties of the upkeep of the more costly routes and leave state aid and local funds available for use on secondary routes. In keeping with this understanding, the general highway act passed in 1921 made the 1-mill state aid fund available for a system of state aid roads to include former "state" roads not taken into the trunk highway system and such other roads as the county boards might designate.

In addition to the trunk highways built and maintained by the state and the state aid roads built and maintained by the counties with state aid and supervision, the 1921 act provided for two classes of roads:

1. County roads, established by the county boards or by district courts, improved by the counties and maintained by the town boards.

2. Town roads, established, improved and maintained by the town boards.

The trunk highway amendment permitted addition of new routes when 75 per cent of the mileage in the original system had been permanently improved or when necessary to connect new county seats. Laws adding two routes to the system, aimed to connect new county seats, were passed in 1923. One was held unconstitutional and one did not become effective until the law was amended in 1929. In 1933, following a finding that 75 per cent of the system had been "permanently improved," the Legislature added 140 routes totaling about 4,500 miles. Minor additions were made in 1943 and 1945.

Development of Road User Taxation

Motor vehicles were registered locally until 1909 when a state registration act was passed. The fee was nominal, $1.50 per year and later $5.00 for a three year period. Fees at first went to the general revenue fund, but beginning in 1915 the net proceeds, after deducting expenses, were credited to the state road and bridge fund. Net receipts in the road and bridge fund from license fees from 1915 to 1921 totaled $1,481,582.

The 1920 trunk highway amendment authorized taxing motor vehicles on "a more onerous basis" than other personal property, the proceeds to be used for trunk highway purposes. Development of this tax is discussed in detail in a later section of this report.

In 1924 the constitution was amended to permit taxing motor fuels, the proceeds to be placed in the trunk highway fund. The purpose was partly to provide increased funds and partly to provide more equitable taxation than the fixed annual fee. In 1928 a second amendment was adopted placing two-thirds of the proceeds of the motor fuel tax in the trunk highway fund and one-third in the state road and bridge fund for allocation to the counties.

Following adoption of the latter amendment, a new class of roads, to be known as "county aid roads," was created. Proceeds of the 1-mill levy were allotted to the counties for use on state aid roads and proceeds of the counties' share of the gas tax to the county aid roads. This gave new impetus to the improvement of farm-to-market roads. Transfer of numerous town roads to the county aid class gave needed relief to the townships. The former "county" roads also were generally transferred to the county aid class, except in the three most populous counties where gas tax funds may be used on all county roads without formality of designation as "county aid" roads. Only a few other counties now have any "county" roads.

The motor fuel tax was fixed at 2 cents per gallon in 1925 and increased to 3 cents in 1929. In 1937 and again in 1939 the rate was made 4 cents for temporary fixed periods. In 1941 the 4-cent rate was made permanent. At the same time the 1-mill state aid tax levy, which had been in effect since 1913, was repealed. In lieu thereof, $1,200,000 was appropriated annually from the gas tax receipts in the state road and bridge fund and the balance appropriated for county aid roads.

Urban Interest in Rural Roads

Some comment on development of urban-rural road relations may be appropriate in this outline of Minnesota road history.

Density of population and traffic made it necessary and possible for urban communities to gravel surface, oil or pave streets earlier than such improvements were attempted on rural roads.

Urban interest in roads, however, has always extended beyond municipal limits. Desire of business men to enlarge their trade territory was the primary motive. Then when motor vehicles came into use urban residents wanted better roads so they could travel to other cities and into the rural areas.

Early day bridges to connect cities with adjoining areas were usually financed with city funds, except when built as toll bridges by private companies. In many cases, cities and villages built or helped to build roads considerable distances beyond

their corporate limits. In some cases the more populous counties built roads into adjoining counties. These practices were common from territorial days until some years after the trunk highway system was established. Some of the laws authorizing such expenditures are still on the statute books.

Urban residents have taken an active part in various good roads movements. They joined in support of the original state road and bridge fund amendment in 1898, the Dunn 1-mill amendment in 1912, the trunk highway amendment in 1920 and the gas tax amendment in 1924.

Urban voters approved these measures knowing that relatively little of these funds would be spent within municipal limits, at least for some years. The trunk highway system did not include any mileage within Minneapolis, St. Paul, Duluth and South St. Paul until 1933. State road and bridge fund allotments even now can be used only to a limited extent within municipalities—state aid funds only in villages and in cities of the fourth class, county aid funds only in unplatted portions of villages.

Street problems resulting from increased traffic have created a growing demand for increased expenditure of road user funds in urban areas. In the last quarter century there has been a gradual step by step development in this direction. Two facts, however, indicate that there will always be a strong urban interest in rural highways. In the first place, there is always a large volume of travel by urban residents on rural roads. Furthermore, urban and rural prosperity are closely related, and the welfare of each is very closely related to the condition of the roads connecting producing areas with the processing and distributing centers.

III. GENERAL SUMMARY OF ROAD MILEAGE, ROAD USE AND FINANCES

Administration

The agencies responsible for improvement and maintenance of Minnesota's roads and streets fall mainly into three groups:

1. State Highway Department, responsible for trunk highway system.
2. County boards, responsible for secondary roads: state aid, county aid and county roads.
3. Town boards and city and village councils, responsible for local roads and streets.

While the above agencies have primary responsibility for these various classes of roads, other agencies have supervisory authority. The U. S. Public Roads Administration exercises supervision over all state and county roads improved with Federal aid. The State Highway Department has supervision over state aid expenditures on the state aid system.

There are also various cases of joint responsibility. Location and grades of trunk highways within municipal limits must be approved by the municipal authorities. When a street over which a trunk highway is routed is wider than needed for normal trunk highway traffic, the state and the municipalities may maintain and improve their respective portions independently, or by agreement it may be done by either of the two with reimbursement by the other. A similar situation prevails in respect to county roads within municipal limits.

There is also a limited mileage of roads built to serve special needs, but open to public travel, such as state and federal park and forest roads.

Mileage of Roads and Streets

Minnesota has 120,921 miles of public roads. Only four states—Illinois, Kansas, Missouri and Texas—have a larger total mileage.

Minnesota's road mileage is equivalent to an average of one mile of road per 23 persons. The average for all states is one mile per 40 persons.

In the unincorporated areas of Minnesota there is an average of one mile of road for every nine people. Within the city and village corporate limits the average is one mile of road or street for each 158 people.

The road and street mileage in each system is shown in Table 1.

TABLE 1
MINNESOTA HIGHWAY MILEAGE
January 1, 1948

	Rural	Urban*	Total
State Trunk Highways	9,927.2	1,294.3	11,221.5
County Highways			
State Aid Roads	15,434.5	781.4	16,215.9
County Aid and County	25,933.5	456.3	26,389.8
Total County	41,368.0	1,237.7	42,605.7
Township	56,362.5		56,362.5
Municipal Streets (not in above systems)		8,718.1	8,718.1
Other Public Roads			
State Park, Forest and Other Roads	852.7	7.5	860.2
National Park, Forest and Other Roads	1,150.8	2.5	1,153.3
Grand Total	109,661.2	11,260.1	120,921.3

There are 7,401 miles in the original or primary Federal aid highway system. This system embraces the main or more heavily traveled routes in the trunk highway system, including nearly all of the constitutional routes and a limited mileage of the legislative routes.

The Federal aid secondary system, created in compliance with the Federal Aid Highway Act of 1944, includes 3,797 miles of state trunk highways and 10,071 miles of roads not in the state system. Since the Federal government demands assurance from the state that roads improved with Federal aid be properly maintained, it is required that non-trunk roads in the Federal aid secondary system be designated state aid roads, so that the state will have some control over maintenance.

Minnesota has 4,396 miles of "U.S. numbered highways." This is a numbering system worked out by the American Association of State Highway Officials for the convenience of the public. This numbering does not affect jurisdiction over these routes, nor indicate whether they are or are not Federal aid highways.

Highway Planning Survey data showed that as early as 1936 Minnesota had reached a point where 64 per cent of all farm units are located on some type of surfaced road and more than 90 per cent are within a mile of such a road.

*Includes all roads and streets within city and village corporate limits.

Comparison with Planning Survey reports made by various other states from 1936 to 1938 showed that Minnesota had 55.6 per cent of its rural road mileage (state, county and local) surfaced with gravel or higher types, while the average for the states of Iowa, Kansas, Michigan, Missouri, Nebraska, North and South Dakota and Wisconsin was 33.6 per cent. Of the states listed, only Michigan and Wisconsin had a higher percentage surfaced than Minnesota.

Interrelation of Road Systems

Trying to evaluate the relative importance of the various road systems is like deciding which is the most important leg on a three-legged stool. Each is of little value without the others. Trunk highways are of no value unless you can get to them, and local roads are just as valueless unless they connect with main arteries. Almost every motor vehicle trip involves travel on more than one class of roads. Many trips involve all classes — trunk highways, county roads, local roads and municipal streets.

State, county and local road officials alike will testify to the continuous and insistent demands for improvements in all classes of roads. Traffic surveys and engineering studies confirm the need for many of the improvements demanded by road users and civic groups. Simultaneous improvement of all classes of roads is needed. Shifting roads from one system to another, or reallocation of available funds, will not satisfy the general demand for more good roads.

The problem is to determine what improvements are necessary to provide a balanced transportation system which will best serve the needs of the people in all vocations and in all sections of the state. Roads carrying the heaviest traffic must necessarily cost more to build and maintain, but on a vehicle-mile unit basis light traffic roads are more expensive. Present and potential traffic volume is not the only factor to be considered in determining relative importance of road systems or individual routes, but it is the prime factor.

Road Use and Traffic Volumes

Four factors have combined to increase the traffic burden on Minnesota roads and streets; namely, increase in the number of vehicles in use, increase in the average annual travel per vehicle, and increase in the average weight and average speed per vehicle.

Motor vehicle registration has been a matter of record since 1909 and gasoline consumption since the gas tax was initiated in 1925. With these records, supplemented by traffic surveys

and road use studies, it is possible to estimate the average travel per vehicle and the total vehicle mileage traveled in the state. The number of vehicles registered and the estimated average and total vehicle miles for the years 1926, 1936 and 1946 are shown in Table 2.

TABLE 2
MOTOR VEHICLE REGISTRATION, AVERAGE ANNUAL MILEAGE AND TOTAL VEHICLE MILEAGE

Year	Cars, Trucks and Busses	Average Annual Travel	Total Vehicle Miles
1926	630,285	4,860	3,063,185,000
1936	783,226	6,802	5,285,996,000
1946	804,594	8,830	7,104,809,000

Comparative ton-mile data for the earlier years are not available, but the increase in average weights of both cars and trucks is well known. For many years cars under 2,000 pounds, registered in class "A," constituted a substantial part of the total passenger registration. High points were 1923 when 55 per cent of the passenger cars were in Class "A," and 1927 when the number of cars registered in this class reached a peak of 265,457. Following abandonment of the Model T Ford, the "A" class gradually declined. From and after 1942, less than one per cent of the cars have been in the "A" class.

Trucks have increased in number more rapidly than passenger cars. Truck registration in 1947 was six times as great as in 1921, while passenger car registration in the same years multiplied 2.4 times. Average weights of trucks and loads have increased steadily.

Average speeds of both cars and trucks have doubled in the last quarter century. Impacts of wheels at higher speeds to some extent cause greater wear on road surfaces, but the main effect of higher speeds is to accentuate the demand for wider roadways, better alignment, and dustless surfaces. Increased speed combined with increased traffic has hastened the obsolescence of many highways.

Traffic Distribution

While gasoline consumption furnishes a basis for estimating total traffic volume, more detailed studies are necessary for an estimate of traffic distribution on various road systems. The first general study of this kind in Minnesota was made by the U. S. Bureau of Public Roads (now the Public Roads Administration) and the State Highway Department for the Citizens' Interim Committee appointed under a resolution of the 1933 Legislature. More comprehensive studies were undertaken by the Highway Planning Survey in 1936 and subsequent years.

The estimated vehicle miles of travel and the percentage on each road system in 1946 are shown in Table 3.

TABLE 3
1946 TRAVEL BY SYSTEM

System	Vehicle Miles	Per Cent
Trunk Highways		
Rural	2,559,491,000	36.0
Urban	962,363,000	13.5
Total Trunk Highways	3,521,854,000	49.5
County Roads (State aid, County aid and County)	1,077,089,000	15.4
Township Roads	423,447,000	5.6
Municipal Streets (Not including T.H.)	2,082,419,000	29.5
Totals	7,104,809,000	100.0
RURAL-URBAN DISTRIBUTION		
Rural Roads (State, County and Local)	4,060,027,000	57.0
Municipal Streets (Including Trunk Highways)	3,044,782,000	43.0
Totals	7,104,809,000	100.0

Earlier studies of traffic distribution on the various road systems made by the Highway Planning Survey in 1936 and the study of 1932 traffic made for the 1933 Citizens' Interim Committee arrived at approximately the same percentage distribution as the 1946 estimate.

Origin of Traffic

Road use studies made by the Highway Planning Survey (pre-war) showed that 27.6 per cent of the total vehicle miles of traffic was generated by vehicles owned in unincorporated areas and 72.4 per cent by vehicles owned in cities and villages. Of the latter, approximately one-half was by vehicles owned in the three large cities and one-half by those owned in other cities and villages.

Further breakdown by origin and place of travel showed the following percentages of the total vehicle mile traffic:

Rural-owned vehicles on rural roads	23.4 per cent
Rural-owned vehicles on urban roads	4.2 per cent
Urban-owned vehicles on rural roads	35.1 per cent
Urban-owned vehicles on urban roads	37.3 per cent
	100.0 per cent

In the above figures, "urban roads" include all roads and streets within municipal limits; "urban-owned" include all vehicles owned by city and village residents. More detailed analysis will be found in "Minnesota Highway Facts."

Trip-Length Data

Another revelation of the Planning Survey studies was that the motor vehicle is used mainly for short every-day trips. Long distance travel constitutes a smaller part of the total than is commonly assumed.

More than one-half of the round trips were less than 10 miles, 24 per cent were 10 to 19 miles and 10.7 per cent were 20 to 29 miles. Round trips of 100 miles or more constituted only 6.2 per cent of the total number of trips and only 34 per cent of the total mileage.

Sources of Revenue

The main sources of revenue for the various road systems are as follows:

1. State trunk highways: Federal aid, motor vehicle license fees and two-thirds of net gas tax receipts.
2. State aid, county aid and county roads: Federal aid, one-third of net gas tax receipts, and county road and bridge tax levies.
3. Township roads: Local road tax levies with limited grants from county funds.
4. Local municipal streets: Local street tax levies and special assessments.

The revenues of all the road administrative agencies in the state from these various sources, with duplications and transfers omitted, were as follows in 1947:

Road and street tax levies	$26,296,696
Special assessments	2,547,250
Motor fuel tax	22,891,688
Motor vehicle registration tax	10,715,698
Federal aid	9,621,306
Total	$72,072,638

Income from interest on invested funds, highway patrol fines, parking meters and various other miscellaneous sources in 1947 amounted to $3,477,040, bringing the total to $75,549,678. This total represents actual receipts, which differ somewhat from figures based on tax levies, Federal aid allotments, etc.

Relationship between Travel and Revenue

Although road needs have made it necessary to increase road revenues from time to time, the increase has not been as rapid as the growth of traffic.

Receipts from property taxes, which had been going up steadily during the first two decades of the present century, reached a peak in the 1920 levies, collectible in 1921. Increases in recent years have not brought the total to the 1921 level.[1]

While initiation of motor vehicle and gas taxes and substantial increases in Federal aid doubled the total revenues in the quarter century from 1921 to 1946, the number of vehicles was more than doubled. As a result, average total road revenue per vehicle decreased from $81.78 in 1921 to $66.36 in 1946. The revenue figures include receipts from property taxes, road user taxes and Federal aid, but do not include proceeds of bond issues, which were substantial in 1921.

Increase in total travel has been considerably more rapid than increase in registration, due to greater average annual mileage. Road revenues from all sources averaged 3.02 cents per vehicle mile in 1921 and 0.75 cent per vehicle mile in 1946.

If property taxes and Federal aid are omitted and road user revenues alone considered, it is found that the motor vehicle tax in 1921 produced 0.63 cent per vehicle mile. Although a 2 cent gas tax was initiated in 1925 and later increased to 4 cents, the combined motor vehicle and gas tax in 1946 averaged only 0.44 cent per vehicle mile.

Data for estimating traffic on a ton-mile basis are not available for the earlier years, but the increase in the number of heavy vehicles and the average weight of all vehicles is well known. It is evident, therefore, that the decrease in road revenues per ton-mile between 1921 and 1946 is much greater than the drop in revenues per vehicle mile of travel.

The figures above consider only dollar revenues and not purchasing power of the dollar. Improved machinery and methods brought marked reductions in costs of dirt moving and many other operations in the two decades from 1921 to 1941. Recent increases in costs of labor, material and equipment have more than offset the pre-war cost reduction, so that the purchasing power of the road dollar today is considerably less than at any time since the modern road building era started.

Allocation of Road Tax Burden Among Principal Beneficiaries

Sources of road revenues in Minnesota have in the main followed the general national trend in the allocation of the road tax burden among the beneficiaries of road development.

[1]Figures on property taxes are based on State Auditor's Abstract of Tax Levies. They do not include special assessments, and municipal road and bridge tax levies are not complete in all cases. However, they furnish the best available figures for comparison of present and past road tax levies.

A report on "Suggested Approaches to the Problem of Highway Taxation," by G. P. St. Clair of the U. S. Public Roads Administration, summarizes the benefits in these words:

> "There is almost universal acceptance of the concept that the provision of highway facilities serves three major interests:
>
> "1. The interest of access to land and improvements, a service indispensable to personal, family and business activity.
>
> "2. The public interest or general welfare, as represented by the use of roads in transacting public business, in national defense and war activity, in providing police and fire protection and access to schools, in aiding in conservation of forests and other resources, in promoting commerce within and among the states, in providing employment during periods of depression and in other activities of general benefit to the citizenry.
>
> "3. The interest of the motor-vehicle user in the provision of facilities upon which the private automobile may be used in recreational, social and personal business activities and upon which the commercial vehicle may be operated in gainful pursuits."

In Minnesota these three major interests find a parallel in the three principal sources of highway revenue:

1. Taxes on land and other property. Municipal street improvements are to a considerable extent financed by assessments on benefited property. This method has not been applied to rural roads except for a brief time under the Elwell Act. Local tax levies for local roads and streets are, however, a recognition of the value of local roads in providing access to farms, homes and business places.

2. The public interest or general welfare is at present represented mainly by Federal aid allotments. County road tax levies are partly a recognition of the public benefit, partly of the direct benefit in furnishing access to farms and other places within the county.

Appropriations for roads from state general revenue funds are prohibited by the Minnesota constitution. The state road tax levies made from 1905 to 1941 under authority of the state road and bridge amendment may, however, be considered an example of state-wide public interest in roads.

3. Direct state imposts upon the motor vehicle user are by constitutional provisions dedicated to road use. Federal excise taxes on motor vehicles, parts, accessories, tires, motor fuel and lubricants are not so dedicated.

Property taxes for road purposes in Minnesota reached a high level about 1920 when the total of state, county and local road tax levies was in excess of $21,000,000. The levies declined somewhat in the twenties when the trunk highway plan relieved the counties of the expense of the main routes. They declined rapidly in the thirties, partly due to depression conditions and partly to relief given the counties through sharing in the gas tax. County and local levies have increased considerably since the war, and in 1947 exceeded the 1921 figure, but with the pressing demands on county and local units for funds for other governmental purposes, it is not likely that the totals can go much higher. It cannot be anticipated that Federal aid will exceed the grants in the 1944 act. It is reiterated that if road needs are to be met, additional funds will be required, and that such funds can come from only one source; namely, the motor vehicle user.

Expenditures on Various Systems

Expenditures upon the various road systems in 1935, 1940 and 1947, as compiled by the Highway Planning Survey, are shown in Table 4. The figures include all current expenditures for construction, maintenance and administration but do not include payments for debt retirement or interest. It should be noted that the figures indicate the system where the money is expended, which is not always the same as the spending unit; for instance, county expenditures on town roads are included in the township road totals and not in the county totals.

TABLE 4
EXPENDITURES ON VARIOUS ROAD SYSTEMS

	1935		1940		1947	
	Amount	Per Cent	Amount	Per Cent	Amount	Per Cent
State Trunk Highways	$18,365,290	48.2	$18,079,503	43.9	$32,845,516	43.1
State Aid, County Aid and County Roads	11,252,594	29.6	12,820,150	31.2	21,204,036	27.8
Township roads	3,539,222	9.3	4,251,915	10.3	9,273,893	12.2
Local Municipal Streets	4,914,789	12.9	6,021,491	14.6	12,924,161	16.9
Totals	$38,071,895	100.0	$41,173,059	100.0	$76,247,606	100.0

Note: Debt retirement and interest not included.

The total expenditure of $21,204,036 on the county road systems in 1947 included $11,078,475 spent on the state aid roads and $10,125,561 spent on county aid and other county roads. With the greater part of the counties' share of gas tax funds allotted to county aid roads, the state aid roads had to depend to a large extent on the county road and bridge property tax.

Comparison of the traffic distribution in Table 1 and the 1947 expenditure distribution in Table 4 shows that the state trunk highways had 49.5 per cent of the traffic and 43.1 per cent of the total expenditure. County roads had 15.4 per cent of the traffic and 27.8 per cent of the expenditures. Township roads

had 5.6 per cent of the traffic and 12.2 per cent of the expenditure. Local municipal streets had 29.5 per cent of the traffic and 16.9 per cent of the expenditure.

Dividing the expenditures by the estimated vehicle miles of travel, it is found that the expenditures on the various road systems per vehicle mile were as follows:

Road System	Cents per Vehicle Mile of Traffic
State trunk highways	0.89
County road systems	1.87
Township roads	2.08
Local municipal streets	0.59
Average, all systems	1.03

While the figures for a single year should not be considered too significant, they bear out the comment previously made, to the effect that while heavy traffic routes cost more per mile, lighter traffic roads require greater expenditure per vehicle mile of traffic.

The Planning Survey's compilations further show that expenditures on the various systems in 1947 were divided between construction and maintenance in the proportions shown in Table 5:

TABLE 5
PERCENTAGE SPENT FOR CONSTRUCTION AND MAINTENANCE ON EACH SYSTEM

Road System	Percentage Spent For Construction	Maintenance	Total
Trunk Highways	73.9	26.1	100.0
County Systems	36.7	63.3	100.0
Township Roads	61.7	38.3	100.0
Local Municipal Streets	39.8	60.2	100.0
All Systems	56.3	43.7	100.0

The fact that the greater portion of the county roads are gravel surfaced may account for the high percentage of maintenance expenditures on those systems. Custom in many municipalities of building up bituminous surfaces by annual light treatments charged to maintenance, is one factor in the high percentage of maintenance on local streets. The figures should not be considered too significant; some operations are difficult to classify because the same operation includes restoration to original condition plus more or less betterment. It might be noted, however, that in all systems maintenance comes first, and the balance of funds remaining to a large extent determines the construction program.

Status of Road Indebtedness

When the motor vehicle came into general use, revenues from property taxes, assessments, and road user taxes were insufficient to provide funds needed for the initial conversion of horse-and-buggy trails to roads usable by the new machines. Bond issue financing was used extensively. In more recent years, the state and counties quite generally have followed the pay-as-you-go method. Municipalities also are doing less financing by bond issues, except where assessments are collected on the installment plan. The townships alone seem to be issuing more bonds in recent years. At the present, borrowed funds are a minor part of the total road expenditures.

Reduction of bonded indebtedness was well under way before the war started, and it was accelerated during the war. Total indebtedness of all road building units in Minnesota in 1935 and 1947 is shown in Table 6.

TABLE 6

MINNESOTA BONDED HIGHWAY INDEBTEDNESS*

Unit of Government	Amount at End of Calendar Year 1935	1947	Increase or Decrease
State			
State Bonds	$31,500,000	$10,975,000	—$20,525,000
County Reimbursement Bonds	10,585,152	.....	— 10,585,152
Counties	14,938,539	2,745,606	— 12,192,933
Townships	1,561,965	3,302,972	+ 1,741,007
Incorporated Places			
Under 50,000	3,536,230	2,354,818	— 1,181,412
Over 50,000	19,919,071	6,273,557	— 13,645,514
Totals	$82,040,957	$25,651,953	—$56,389,004

In addition to reducing their indebtedness, the state and its subdivisions built up substantial cash reserves during the war. The state and a number of other units invested some of their surplus in U. S. government bonds. The total cash and invested funds in state, county and local road funds as of December 31, 1947 was $40,184,992.

There has also been a marked reduction in overdrafts in county and local road funds during the war, but since the war ended the practice has to some extent been resumed. On December 31, 1936, forty-one counties reported overdrafts in road and bridge funds totaling $1,627,763. On December 31, 1944, only eight counties had overdrafts, the total being $304,511. On December 31, 1947, however, there were twenty-three counties with overdrafts totaling $1,250,255.

*Short term notes, overdrafts and deficits not included.

Motor Vehicle Traffic Accidents

Motor vehicle traffic accidents in Minnesota brought death to 570 persons in 1947 and more or less serious injuries to 17,478 others. A total of 41,819 accidents, involving 73,577 vehicles and 2,571 pedestrians, were reported.

These figures do not include all motor vehicle accidents. They include only accidents on public streets and highways and not those occurring on private property. They do not include the very numerous minor accidents, since the law requires reporting only accidents involving death, personal injury or property damage in excess of $50. There probably were also a number of accidents involving injuries or property damage over $50 which drivers failed to report as required by law.

Traffic accidents in 1947 cost the people of Minnesota $25,650,000, according to National Safety Council estimates. These figures include both direct costs to accident victims and the larger indirect costs shared by all taxpayers. That the Safety Council's estimate is conservative is indicated by reports of the Commissioner of Insurance showing that in 1947 Minnesota motorists paid a total of $28,991,031 in premiums for automobile liability, property damage and collision insurance.

Traffic accidents occur on all classes of roads and streets, but a disproportionate number occur in cities and villages due to concentration of vehicles and pedestrians on a relatively small road mileage. The number and per cent of accidents occurring within municipal limits, on rural trunk highways, and on other rural roads are shown in Table 7, based on statistics compiled by the State Highway Department's traffic and safety division.

TABLE 7
LOCATION OF MOTOR VEHICLE TRAFFIC ACCIDENTS, 1947

Place of Accident	All Reported Accidents		Persons Injured		Persons Killed	
	Number	Per Cent	Number	Per Cent	Number	Per Cent
Cities over 50,000	22,688	54.3	6,843	39.2	102	17.9
Cities and Villages under 50,000	10,029	24.0	3,709	21.2	123	21.6
Total Urban	32,717	78.3	10,552	60.4	225	39.5
Rural Trunk Highways	6,300	15.0	4,915	28.1	233	40.9
All Other Rural Roads	2,802	6.7	2,011	11.5	112	19.6
Total Rural	9,102	21.7	6,926	39.6	345	60.5
Total	41,819	100.0	17,478	100.0	570	100.0

It will be noted that 78.3 per cent of all reported accidents occurred on roads and streets within municipal limits, whereas traffic within these areas is only 43 per cent of the total. The proportion of persons injured in those areas, 60.4 per cent, is also higher than the traffic percentage.

Distribution of deaths is closer to total traffic volume, 39.5 per cent of the deaths and 43 per cent of the traffic in urban areas, with 60.5 per cent of the deaths and 57 per cent of the total traffic on rural roads.

Accidents on rural roads are usually more serious. There was one death for each 26 reported accidents on rural roads, and one death for each 145 accidents in urban areas.

Pedestrians are conspicuous among urban victims. Of the 225 killed within municipal limits, 131 were pedestrians. Among the 345 killed on rural roads only 47 were pedestrians.

Relation of Road Conditions to Accidents

To what extent road conditions are responsible for traffic accidents is difficult to determine. Practically every accident involves the human factor—if some driver, pedestrian or other person had been more careful, the accident would not have occurred. Day by day records show that when roads are very bad —for instance, when they are covered with sleet—drivers are more cautious and there are few serious accidents. On the other hand, new and improved roads are sometimes a temptation to carelessness with serious consequences.

Nevertheless, road conditions are a factor in many accidents. Road defects, such as bad shoulders, holes, ruts, loose gravel, gravel windrows, floods and landslides, were indicated in 2,191 accidents reported in 1947, or about 5 per cent of the total.

Narrow roadways, heavy traffic intersections, sharp curves and restricted sight distances were undoubtedly a factor in a greater number of accidents than the "road defects" shown above. The high proportion of accidents in urban areas is definitely related to traffic congestion. There is a similar concentration of accidents on heavy traffic routes in rural areas, particularly on the old 18-foot pavements. On highways where four-lane divided roadways have replaced two-lane roadways, there has been a very marked drop in the number and severity of accidents.[1]

Progress in Accident Prevention

Wider roadways, better surfaces, improved alignment, grade separations and divided roadways where traffic warrants, will make it easier for the ordinarily prudent and cautious driver to

1On U.S. 10 north of St. Paul (Lexington Avenue) a three-lane highway, there were 4.6 accidents per million vehicle miles of traffic in 1947, while on T.H. 51 north of St. Paul (Snelling Avenue) a four-lane divided highway with nearly twice as much traffic, the rate was 3.2 accidents per million vehicle miles. On U.S. 61 between Duluth and Two Harbors, a two-lane road, the accident rate was 4.8, while on U.S. 53 from Duluth to Pike Lake, a four-lane divided highway with approximately the same traffic volume, the rate was 2.8 accidents per million vehicle miles.

avoid tragedy. But road improvement alone will not solve the accident problem. Traffic engineering must go hand in hand with driver education and traffic law enforcement.

Minnesota has made good progress in accident prevention. It has been among the leaders in enacting sound legislation for traffic regulation, driver licensing, accident reporting, and safety responsibility. The state highway patrol and local agencies generally have set high standards in traffic law enforcement. Substantial progress has been made in introducing driver training courses in the high schools. Newspaper and radio stations have conducted effective safety campaigns. State, county and local agencies concerned in any phase of safety engineering, traffic law enforcement and driver education have been cooperating toward a common goal. The public is keenly aware of the accident problem and active in support of the safety movement. The Minnesota Safety Council has been an important factor in stimulating and correlating safety activities on both state and local levels.

Safety activities to be effective must be continuous and not sporadic. That this has been the case in Minnesota is evident from the steady reduction in the accident rate. In the period from 1931 to 1939 there were an average of 12.6 deaths per 100,000,000 vehicle miles of travel. In the years from 1940 to 1947 the average was reduced to 7.6. The rate in Minnesota has been consistently lower than the average for all states. The United States average was 16.0 deaths per 100,000,000 vehicle miles for the 1931-1939 period and 10.9 from 1941 to 1947.

While substantial progress has been made, the summary of 1947 accident reports shows that much remains to be done. The augmented road improvement programs discussed in this report, if and when carried out, will go a long way toward providing the safer highways needed for Minnesota's growing traffic. The Commission has not considered any legislation pertaining to traffic regulation. In the fields of enforcement and education it is believed that progress can best be made by continued and intensified efforts along the lines of past activities. Consideration should be given to enlargement of the state highway patrol to keep pace with growth of traffic on state trunk highways.

IV. STATE TRUNK HIGHWAY SYSTEM

The state trunk highway system was created by Article XVI of the state constitution, adopted in 1920. The amendment provides that the system shall be located, constructed, reconstructed, improved and forever maintained by the state. Seventy routes were specifically designated by the amendment and 144 routes have since been added by legislative action.

The trunk highways are the main arteries in the Minnesota road system. They connect all county seats and other centers of population. They carry approximately the same total vehicle miles of traffic as all other systems, rural and urban, combined.

More than two million of the state's 2,792,300 people (1940 census) live either on farms within a mile of a trunk highway or in cities and villages located on trunk routes.

Thirty-seven per cent of all rural dwellings are within a mile of a trunk highway and 63 per cent are within three miles of the state routes.

There are 620 cities and villages located on trunk highways, and according to the 1940 census these places contained 98 per cent of the state's municipal population. There are 139 incorporated places not on trunk highways. In the appendix is shown a table listing all incorporated places not on trunk highways.

Status of Improvement

Analysis of state trunk highway improvements shows that 235.50 miles in the original or constitutional system and 2,984.56 miles in the routes added to the system by legislative action have not yet been improved by permanent construction. Some of this mileage, however, has had some improvement in the way of betterments made as part of the annual maintenance operations. The mileage in each system improved by construction, the mileage improved by maintenance betterments and the mileage which has had no substantial improvement are shown in Table 8.

The figures in Table 8 should not be considered an index to present condition or adequacy of improvements. A part of the mileage shown as having had no construction was in a relatively high state of improvement when taken into the trunk highway system and may be reasonably adequate for the time being. Some light traffic routes having only maintenance betterments may also be reasonably satisfactory. On the other hand, many of the routes shown as constructed are either deteriorated or obsolete.

TABLE 8
IMPROVEMENTS IN TRUNK HIGHWAY SYSTEM

Type of Improvement	Constitutional Routes Miles	Legislative Routes Miles	Entire System Miles
Improvements by Construction, including those made by local authorities under reimbursement agreements	6,319.70	1,681.70	8,001.40
Major Betterments by Maintenance Division or other authorities such as W.P.A., including grading, reshaping or surfacing to higher types	217.50	1,111.46	1,328.96
No Improvement except minor reshaping, resurfacing or retreatment to same type as existed when taken into trunk highway system	18.00	1,873.10	1,891.10
Total	6,555.20	4,666.26	11,221.46

(Figures in above table are as of August 8, 1947, including work then under contract.)

All of the unimproved mileage must sooner or later be improved by permanent construction, and in some cases the need is urgent. Likewise a considerable part of the mileage heretofore improved by construction needs widening, resurfacing or complete reconstruction.

The status of improvement of the trunk highway system, as to surface types, is shown in Table 9.

TABLE 9
SURFACE TYPES OF STATE TRUNK HIGHWAYS—JANUARY 1, 1948

Type of Surface	Constitutional Routes Miles	Legislative Routes Miles	Entire System Miles
Pavement[1]	2,931.49	316.32	3,247.81
Bituminous[2]	3,265.81	1,865.23	5,131.04
Gravel	357.90	2,484.71	2,842.61
Totals	6,555.20	4,666.26	11,221.46

The figures in Table 9, like those in Table 8, do not indicate adequacy of the existing improvements. All of the gravel routes need higher type surfaces, because under present conditions even the lightest traffic routes in a primary highway system should have dustless surfaces. Some of the bituminous mileage needs paving to carry heavy traffic through all seasons, and nearly all of it needs further improvement. Of the 5,131 miles of bituminous roads in the system, about 2,300 miles were developed under maintenance operations without designed bases. The remaining 2,800 miles, built with designed bases, are in many cases in various steps of stage construction, much of it requir-

1Concrete, brick, block, bituminous on concrete base.
2All classifications of designed bituminous roads.

ing strengthening of both base and wearing surface. Likewise a part of the paved mileage is definitely obsolete and needs widening or reconstruction.

Trunk Highway Deficiencies

There is no such thing as a completed highway system. If and when the time comes when all parts of the system have been improved by construction, there will be continuous and growing need for reconstruction.

Highways wear out, just like a suit of clothes. There is continuous deterioration, due to wear and tear of traffic and action of the elements. This deterioration is most noticeable in the road surfaces, but it is also taking place in the subgrade and structures.

Highways also become outgrown, just as clothes do when the wearer happens to be a growing boy. In a period when motor vehicle traffic has been developing as rapidly as in the last thirty years, obsolescence becomes a greater factor on some roads than deterioration.

Few people in the early twenties could foresee the rapid growth in traffic volume, the higher average speeds and the greater average weights which have developed since that time. Even if these changes could have been foreseen, it would not have been expedient to make improvements too far in advance of the needs then existing, nor would it have been wise to concentrate too much of the available funds on a small mileage of highways.

It might be further noted that improvements made a quarter century ago and now obsolete because of traffic growth, have long since paid for themselves. This statement will hold true whether the computation is based on motor vehicle and gas taxes earned by these roads, or on the benefits to road users.

The road inventory made by the Highway Planning Survey in 1936 revealed that 54 per cent of the trunk highway mileage was deficient either in roadway widths or surface types, or both, without considering deficiencies in grade or alignment. The same survey recorded 284 excessive grades, 6,257 excessive or substandard curves and 15,777 restricted sight distances on the trunk highway mileage.

Deficiencies of the type noted were found both on the routes which had not been improved since they were taken into the system, and on routes which had been graded, paved or otherwise improved in the earlier years of trunk highway construction. For instance, curves which were considered safe when speeds averaged 25 to 30 miles per hour have become dangerous and inadequate at present day average speeds.

The Highway Planning Survey recently started the work of bringing the trunk highway inventory up to date, and expects to have this work completed early in 1949. While construction has removed many of the deficiencies shown in the 1936 inventory, this has been offset by increased traffic demands and by the deterioration due to wear and tear of traffic and action of the elements. General opinion of engineers is that the sum total of deficiencies has increased rather than lessened since the original inventory.

Pavement Deficiencies

One of the most serious deficiencies in the trunk highway system is the mileage of narrow pavement constructed previous to 1928 when the 20-foot width was adopted as standard. As of December 31, 1947, there were 555 miles of 18-foot pavement in the system, not including sections under contract for widening. All of these pavements are on routes with very heavy traffic and are definitely obsolete and inadequate. Besides being too narrow for safe and expeditious movement of traffic, some of the pavements are badly deteriorated.

In some cases the existing pavements can be widened, with or without resurfacing, depending on condition of the slab. In some cases complete reconstruction is necessary, due either to poor alignment or to deterioration of the slab.

On some of the routes with the heaviest traffic, building of four-lane divided highways is necessary. Where the old pavement is in reasonably good condition it may be used for a time as a one-way roadway, necessitating the building of only one new two-lane roadway. Where the old roadway is badly deteriorated or obsolete due to poor alignment, building of a complete new four-lane divided pavement is necessary.

The 20-foot width remained the standard for two-lane pavements from 1928 until 1941, when construction of some new pavement with a 22-foot width was begun. The present mileage of 20-foot pavement is 1,999. On the average the 20-foot pavements carry somewhat less traffic than the older 18-foot pavements. While widening is not as urgent on the 20-foot as on the 18-foot mileage, it would be desirable. On some sections traffic has already reached a volume where widening cannot long be postponed.

There are also 88 miles of 27-foot three-lane pavement in the trunk highway system, most of it built in 1927 and 1928. Three-lane pavement is now considered a serious traffic hazard, particularly when lanes are only nine feet wide. Most of the mileage carries traffic which makes early construction of four-

lane divided highways necessary. Generally this will be done by retaining the old pavement as a two-lane one-way roadway and building one new two-lane roadway.

Due to concentration of commercial and residential improvements fronting on the main highways, the cost of additional right-of-way needed for widening or reconstruction usually becomes a large item of expense.

Is Construction Keeping Pace with Depreciation?

When the trunk highway system was new, some people looked forward to the time, thought to be not too far distant, when the system might be completed. As the realities of obsolescence and deterioration have become more evident, talk of "completion" of the system is seldom heard. It is clear that highway construction is a never ending task. "Permanent" construction is not everlasting.

Thirty years is sometimes spoken of as the economic life of a concrete pavement, but this is only a generalization. Many of the earlier pavements became obsolete in two decades or less. This was largely due to width and alignment which proved inadequate for heavier traffic and higher average speeds. In some cases heavy loads and frost action have caused serious damage to the slab itself. On the other hand, concrete pavements may be found that are forty or even fifty years old and still structurally sound.

Due to the advance in paving technique, together with experience in subgrade construction, pavements built in later years have considerably greater strength and durability, and longer life may be expected if traffic conditions do not change too much. What effect traffic growth and the trend toward larger loads will have on these newer pavements remains to be seen. At best there is constant depreciation, and a substantial part of the future construction program must be devoted to widening, resurfacing or replacing old pavements.

It is still more difficult to ascribe any "life expectancy" to gravel and bituminous surfaces or subgrades. Without maintenance their life could be very short, but with proper repairs and periodic retreatment and replacement of material, they may last indefinitely. What more often happens is that traffic growth demands widening, change to higher type surfaces and in many cases reconstruction with better grades and alignment.

Bridges have a relatively long life, but these too must have periodic overhauling and eventual replacement. A large number of the older trunk highway bridges, built long before they were

taken into the trunk highway system, have long been inadequate and in numerous cases it is necessary to restrict weight of loads carried.

It is doubtful if Minnesota highway construction has kept pace with growing traffic and depreciation, and very evident that the future requires an accelerated highway construction program if the problem is to be met. Depreciation is continuous, but the pace of construction was slowed down by the depression, by the war, and in the post-war years by the reduced purchasing power of the dollar.

Spring Load Restrictions

One indication of the inadequacy of present trunk highway improvements is the need for load restrictions during the spring break-up. These load restrictions are needed to protect road surfaces from destruction and to keep roads passable and in reasonable good condition for travel by all but the largest loads.

In the spring of 1948 a total of 7,637.9 miles of trunk highways were restricted to axle loads below normal legal limits. The number of miles posted for various axle loads was as follows:

Maximum Axle Load Tons	Miles Posted
1.5	9.5
3	1,821.8
4	3,312.8
5	1,900.1
6	245.1
7	348.6
	7,637.9

The restricted mileage represents 68 per cent of the total trunk highway mileage or 95 per cent of the unpaved mileage. The restrictions were in effect for varying periods from early March to June 10, averaging about six weeks. The restrictions not only inconvenience many road users, but they seriously handicap agriculture and all other industries dependent on highway transportation.

In this connection the statutory provisions of two nearby states may be of interest. In Michigan normal maximum axle loads are reduced 25 per cent on hard surfaced roads and 35 per cent on all other roads, during March, April and May. Wisconsin law provides for classification of all roads into "A" and "B" classes. Maximum axle load is 9½ tons on class "A" roads and 6 tons on class "B" roads, in all seasons. In addition to statutory load limitations, both states permit road authorities to make further restrictions when conditions make it advisable.

Effect of Enlargement of Trunk Highway System

Reference to Table 8 on a preceding page shows that 96 per cent of the original routes have had some improvement by construction (as distinguished from betterments), but only 36 per cent of the legislative routes have been so improved. Table 9 shows that more than 44 per cent of the constitutional but less than 7 per cent of the legislative routes have been paved. More than half of the legislative routes have only gravel surfaces.

The law provides that until such time as the routes are constructed, practicable roads along the general location shall be designated as temporary trunk highways and maintained for the benefit of the traveling public. Except for short sections where there was no available road, temporary routes were designated for the entire original system in 1921 and in 1933 for the routes added to the system that year.

The original system was in operation without major enlargement from 1921 to 1932, or 12 years. When the enlarged system had been in operation for a similar 12-year period, namely from 1933 to 1944, a summary of expenditures showed that maintenance costs for the first 12-year period totaled $52,897,000 and for the second 12-year period, $88,016,000. The increase in maintenance costs was nearly in proportion to the increase in mileage.

The same summary showed that construction expenditures for the first 12-year period totaled $164,935,000 and for the second 12-year period $128,013,000. While various factors such as bond issues, change in tax rates, etc., influenced the amount of money available for construction, it is significant that the $35,119,000 increase in maintenance costs in the second period almost equals the $36,922,000 decrease in construction.

A survey of the practice in other states shows that in eight states the designation of new routes is a legislative function. In seventeen states authority to add new routes has been given to the state highway department, in some cases with definite limitations. In twenty states the authority to add new routes is shared by the legislature and the highway department. In three states all roads are under jurisdiction of the state highway department.

PRESENT TRUNK HIGHWAY FINANCES

Revenues for trunk highway purposes come mainly from three sources: motor vehicle license fees, two-thirds of the gas tax and Federal aid. Some additional revenue is obtained from interest on investments, transfers from the highway patrol funds, drivers license fees and other miscellaneous sources.

The revenues from these various sources for the 1946-47 and 1947-48 fiscal years and estimated revenues for the 1948-49 fiscal year are found in Table 10.

TABLE 10
TRUNK HIGHWAY REVENUES, 1946 TO 1949

Year Ending June 30	Motor Vehicle	Two-Thirds Gas Tax	Federal Aid	Miscellaneous	Total
1947	$10,598,268	$15,227,059	$ 5,640,324	$ 963,010	$32,428,660
1948	12,845,816	16,273,010	8,261,033	1,177,630	38,557,489
1949	12,500,000	16,400,000	10,000,000	800,000	39,700,000

Federal aid is paid only after completion of construction, hence actual receipts for the 1946-47 and 1947-48 fiscal years are less than the allotments.

Estimates for the 1948-49 fiscal year are based on present tax rates. If any increase in motor vehicle taxes is voted by the 1949 legislature, it probably will not apply before the 1950 registrations beginning Oct. 1, 1949, and will therefore not affect income in the 1948-49 fiscal year.

Federal Aid Post-War Program of 1944

The present plan of Federal aid for highway improvement was initiated in 1916. From that date to 1941, allotments of Federal aid to Minnesota totaled $103,959,743.65 including allotments under the N.R.A. program. When the United States entered World War II, use of Federal aid was suspended, except for projects under contract or projects needed for national defense. The suspension of construction during the war created demands for an enlarged post-war program. Congress thereupon passed the Federal Aid Highway Act of 1944 authorizing allotment to the states of one-half billion dollars for each year of a three-year post-war program, plus smaller sums for forest highways and other special service roads. The new act, in addition to providing funds for the regular Federal aid system, earmarked certain funds for a system of secondary or feeder roads and other funds for the urban portions of the primary Federal aid system. The allotments to Minnesota under this act are shown in Table 11.

TABLE 11
ALLOTMENTS TO MINNESOTA
FEDERAL AID HIGHWAY ACT OF 1944

	For Fiscal Year Ending June 30, 1946	1947	1948	Totals
Federal Aid Highway System	$ 6,055,101	$ 6,043,897	$ 5,881,802	$17,980,800
Federal Aid Secondary System				
Trunk Highway	2,170,973	2,163,523	2,052,027	6,386,523
Off Trunk Highway	2,000,000	2,000,000	2,000,000	6,000,000
Federal Aid Urban System	2,206,152	2,206,152	2,149,584	6,561,888
Totals	$12,432,226	$12,413,572	$12,083,413	$36,929,211

Shortages of material, equipment and experienced manpower made it impossible to start any projects in the post-war program until several months after the war ended in 1945. Continued shortages and high prices throughout 1946 and 1947 further delayed the program, so that it is now about a year behind the schedule contemplated by the act of Congress. However, all allotments in the post-war program remain available for two years after the end of the fiscal year for which the allotment is made. To remain available, it is not necessary that Federal funds be earmarked for projects under contract, but only that they be covered by agreements for specific projects. All of the allotments in the post-war program have already been earmarked either for projects under contract or for programmed projects, and the Commission is assured that, barring unforeseen circumstances, no portions of the allotments to Minnesota will be forfeited.

The delay in starting the post-war program was most noticeable in the case of projects to be financed with Federal aid for highways in urban areas. One reason was that preparation of plans and acquisition of right-of-way for urban projects requires more time than for projects on rural roads. Many urban projects require removal or demolition of numerous buildings, and the housing shortage therefore tended to delay these projects. Nearly all urban projects involve considerable bridge construction, and bridge materials are almost impossible to obtain in the post-war years. Some urban projects, however, have been completed or placed under contract and preliminary work on several others is well under way.

Federal Aid Highway Act of 1948

Delays similar to those encountered in Minnesota in carrying out the 1944 Federal Aid program were prevalent in nearly all states. Consequently when Congress passed a new Federal Aid act in 1948 it did not provide any funds for the fiscal year ending June 30, 1949. Funds authorized for each of the fiscal years ending June 30, 1950 and 1951, were 10 per cent less than the funds authorized for each year by the 1944 act. Allotments made to Minnesota under the 1948 act, for the fiscal year ending June 30, 1950, are as follows:

Federal Aid Highway System	$ 5,356,784
Federal Aid Secondary System	3,690,493
Federal Aid Urban System	1,960,081
	$11,007,358

Approximately the same allotments are anticipated for the fiscal year ending June 30, 1951.

Of the amount allotted for roads in the Federal Aid Secondary System, $2,000,000 has been set aside for county roads in this system, the same amount as in each year covered by the 1944 act. Consequently the sum remaining for trunk highways in the F.A.S. system is materially reduced.

War Time Surplus Funds

When the United States entered World War II, the curtailment of highway construction was more rapid and immediate than the decrease in revenue from motor vehicle and gas taxes. As a result the cash on hand in the trunk highway fund began to increase. Surplus funds were set aside as a post-war construction fund. The legislature of 1943 authorized the investment of surplus funds in U. S. government bonds.

Later in the war, restrictions on gasoline, tires and motor vehicles reduced the motor vehicle and gas tax revenues so that the surplus increased less rapidly, but some increase in investments was possible. After the war ended, revenues from road user taxes began to increase before the post-war construction program could get under way. On June 30, 1947, the invested funds, plus cash balances and amounts receivable from the trunk highway sinking fund, from the highway patrol fund and from Federal aid on projects under contract, reached a total of $34,468,089.

Existence of this amount of invested funds, cash balances and funds receivable has led some people to assume that the Highway Department has large sums of unused funds, and that these funds might be used to speed up the construction program and provide some of the improvements which are being demanded by road users and community groups throughout the state.

Such assumptions fail to take account of the requirements of the encumbrance law enacted in 1939. Under this law no contracts can be let or other commitments made unless funds are on hand equal to the amount of the contract or commitment, and these amounts must be encumbered and retained until the obligation is paid.

This makes it necessary to keep substantial amounts of money on hand at all times, varying with the amount of work under contract. On June 30, 1943, when construction was limited to defense and emergency projects, the total amount encumbered was $4,336,007. After the war ended and construction was resumed, the amount of encumbrances increased steadily, reaching a total of $25,701,328 on June 30, 1948.

In addition to the amounts formally encumbered, there are always certain amounts budgeted for bond obligations, maintenance and various other current expenditures. The amounts remaining after deducting encumbrances and other budgeted funds

may be considered the amount avalaible for undertaking additional projects. The unencumbered and unbudgeted balance reached a high mark of $13,440,971 on June 30, 1945. On June 30, 1948, it had been reduced to $4,253,310 and it is estimated that by June 30, 1949, it will be reduced to $500,000.

The total of trunk highway funds invested, including the trunk highway sinking fund, the total of funds on hand or receivable and the total of funds not budgeted at the end of each of the last six fiscal years, together with the estimated amounts that will be available at the end of the current fiscal year, are shown in Table 12.

TABLE 12
STATUS OF TRUNK HIGHWAY FUNDS
1943 to 1948—Estimated for 1949

End of Year June 30	Invested T.H. Funds	Total on hand or receivable including investments	Encumbrances and other budget commitments	Balance of funds not encumbered or otherwise budgeted
1943	$14,000,000	$19,243,985	$ 8,943,984	$10,300,001
1944	18,800,000	21,931,466	9,269,304	12,662,162
1945	19,300,000	22,657,740	9,216,768	13,440,972
1946	22,000,000	30,722,206	19,910,390	10,811,816
1947	20,000,000	35,562,871	26,812,127	8,750,744
1948	23,050,670	36,488,190	32,234,879	4,253,310
1949	20,000,000*	29,000,000*	28,500,000*	500,000*

Under the encumbrance law, it is necessary to keep substantial amounts of trunk highway funds on hand, especially when a large program of construction is under way. Good business judgment dictates that as much of this fund as possible be invested in interest-bearing securities. From the time of the enactment of the law permitting investment of surplus trunk highway funds, up to December 31, 1947, the state collected $1,460,138 interest on funds so invested.

State Highway Indebtedness

The trunk highway amendment to the constitution permits issuance of not to exceed $10,000,000 in bonds for highway purposes in any calendar year, and limits the amount outstanding at any one time to $75,000,000. Such bonds have a first claim on revenues from motor vehicle taxation.

The amendment also permits reimbursement of any county for improvements made after February 1, 1919, on routes in the original system. A substantial amount of work done by the counties both before and after adoption of the amendment was accepted by the state for reimbursement. With minor exceptions reimbursement was made by taking over bonds issued by the counties. The total of county bonds assumed by the state, under laws passed in 1921, 1923, 1925 and 1927 was $34,782,436.24.

*Estimated.

Many of the county bonds were ten-year bonds. To avoid too great a drain on trunk highway construction funds, the 1929 legislature authorized issuance of $13,445,000 in refunding bonds. In 1931, an additional $1,200,000 in state bonds was authorized for cash reimbursement of certain counties.

Laws authorizing issuance of state bonds for trunk highway purposes were passed in 1931, 1935 and the special session in 1935-36. The total of bonds issued under these acts was $25,505,000.

The total of bonds assumed or issued by the state under various acts from 1921 to 1936 was $74,932,436.24. The total interest on these bonds was $36,064,303.39. Total of interest and principal was $110,996,739.63.

The last of the county bonds was paid in 1945. The last of the state bonds is due in 1952. The amounts of interest and principal due in each year on state highway bonds outstanding on January 1, 1949, are given in Table 13.

TABLE 13
OUTSTANDING STATE HIGHWAY INDEBTEDNESS

Year	Principal	Interest
1949	$2,500,000	$190,000
1950	2,500,000	130,000
1951	2,500,000	70,000
1952	650,000	8,125
Totals	$8,150,000	$398,125

When the above bonds and interest are paid, all state highway indebtedness will have been liquidated and correspondingly greater funds will be available for construction.

Effect of Decrease in Dollar Purchasing Power

Restrictions on highway construction put in effect late in 1941, due to need of materials and manpower for national defense, forced postponement of many projects programmed for 1942 or soon thereafter. When the war ended, demands for these projects were revived and changing traffic conditions created demands for many additional improvements. The State Highway Department had continued making surveys and preparing plans during the war, although with greatly reduced personnel.

With plans ready, with a surplus of state funds accumulated during the war, and with increased Federal aid authorized by the act of 1944, it was assumed that construction on an enlarged scale would get under way immediately after the war ended. Events proved otherwise. Shortages of manpower, materials and equipment, and uncertainties as to future economic conditions,

not only delayed the start of post-war construction but caused increases in prices which greatly reduced the amount of work that could be accomplished with the funds available.

An analysis of unit prices in the low bids on contracts awarded in 1947 compared with unit prices in 1940 shows the following increases in costs:

Type of Work	Percentage Increase
Grading	55
Graveling	54
Paving	53
Bases	54
Bituminous, Road Mix	48
Bituminous, Plant Mix	47
Bridges	87
Weighted Composite Average	55

These percentages consider only the actual increase in unit costs due to labor, management, materials and transportation costs.

The percentage increase for bridges is based on analysis of a limited number of bridges and culverts. Structures placed under contract after the war have been nearly all reinforced concrete bridges and culverts. Shortages of structural steel have forced postponement of practically all bridge projects involving substantial quantities of steel. Indications are that if such work had been undertaken, increase in price would have been considerably more than the 87 per cent shown in the above table.

The price increases quoted above show only the increased costs of purchasing equivalent quantities and qualities of construction. Increased costs have also resulted from time to time due to changing traffic demands. For instance, a pavement width which may have been safe and adequate on a highway carrying an average daily traffic of 1,000 vehicles when speeds averaged 30 miles per hour becomes inadequate and hazardous for the same traffic volume when average speeds go up to 50 miles per hour. Likewise the higher average speeds have necessitated streamlining the cross section of highway grades, building easier curves, providing additional traffic control devices and many other refinements. The combined effect of higher costs and greater demands by traffic is an approximate doubling in the per-mile cost of construction.

Increase in Maintenance Costs

Maintenance expenditures on the trunk highway system in the calendar year 1947 totaled $7,811,240, compared to $5,931,-

334 in the calendar year 1941. These figures do not include betterments performed as a part of maintenance operations.

One cause of the increase is higher costs. Anlysis of unit costs of some of the principal items entering into routine maintenance, repair and reconditioning of trunk highways shows the following average increases in 1947 as compared to 1941: Labor, 35 per cent; bituminous material, 38.6 per cent; equipment use, 20 per cent; application contracts, 21 per cent; mineral aggregate contracts, 20.6 per cent

Another cause is the growing demands of traffic. Increase in the number and weight of vehicles causes greater wear and tear on roadway surfaces and structures. Requirements for service to traffic, such as snow and ice control, signs and signals, center lines and "no passing" lines, also are growing steadily.

No Comparable Increase in Revenue

There has been no increase in highway revenues comparable to the increase in costs of construction and maintenance. What increase there has been in highway revenue has resulted mainly from increased registration and greater motor vehicle use than from any increase in rates.

Average motor vehicle registration fees have been consistently lower since 1933 than they were from 1921 to 1932. Total motor vehicle tax receipts in the calendar year 1947 for the first time exceeded the previous high peak of $11,007,914 established in 1931. The increased proportion of new cars was mainly responsible for the 1947 increase.

The gasoline tax rate is now 4 cents per gallon, the same as it has been ever since 1937, except for a brief period in 1940-41 when it dropped to 3 cents.

Trunk highway revenues from motor vehicle and gas taxes in 1947 were 20 per cent higher than the 1940 total and 50 per cent higher than the average annual income from these sources in the 1931-1940 decade. In the meantime traffic has increased very materially and demand for highway improvements has increased accordingly. But with the increase in construction costs and requirements, it is clear that present revenues will buy less highway mileage than pre-war revenues and will fall far short of meeting the growing demand for better highways.

V. TRUNK HIGHWAY CONSTRUCTION PROGRAM

Following compilation of the Highway Planning Survey data on trunk highway conditions and traffic, the State Highway Department in 1940 began developing a study of construction needs on the trunk highway system. Consideration was given to deficiencies in grade and alignment, inadequacy of surface types, inadequacy of pavement widths, and general condition of highways.

When construction was brought to a standstill by the war, revision of the former program and development of a post-war program became necessary. Following appointment of the Legislative Interim Commission on Highways in 1947, the program was further revised and brought up to date. Some of the improvements contemplated by the 1940 study have already been carried out, some others are under contract or tentatively programmed for letting during the 1948-49 fiscal year. In the meantime new needs have developed, due either to highway deterioration or traffic growth. All these changes were taken into account.

Estimate of Construction Needs

The program of construction needs presented to the Commission contemplates improvements which will make all sections of the present trunk highway system reasonably adequate to present traffic and to the traffic increase which may reasonably be expected to develop before 1959. It contemplates grading or regrading wherever necessary to provide subgrade adequate to present day traffic loads, and alignment suitable to present day speeds. It contemplates paving additional heavy traffic routes where necessary, rebuilding or widening present pavements where inadequate, and building four-lane divided highways on a limited mileage of the heaviest traffic routes.

The proposed program also contemplates strengthening or rebuilding a considerable mileage of present bituminous surfaces, as well as bituminous surfacing all of the present gravel surfaced routes, so that the entire system would have either paved or bituminous surfaces. It also contemplates replacement or reconstruction of inadequate bridges, building new highway-highway and railway-highway grade separations where demanded by traffic conditions, and also a substantial program of improvement of municipal arteries. The number of miles of each type of construction together with the estimated cost are shown in Table 14.

TABLE 14

ESTIMATE OF MINNESOTA TRUNK HIGHWAY CONSTRUCTION NEEDS

Period: 1950-1959 Inclusive

Type of Work	Miles	Cost
Grading	4,141.20	$ 89,027,222
Stabilized Base	5,338.02	38,003,434
Bituminous Surface	6,926.31	35,894,480
Concrete	939.40	41,632,424
Regrading and Widening Existing Pavements	654.62	26,924,971
Bridges (including urban)	(836) No.	72,292,400
Right of Way	4,325.88	18,879,750
Municipal Construction (except bridges)		132,337,187
New Office Building		3,755,000
Total		$458,746,868

The estimates of cost shown in the table are based upon 1946 unit prices, the last full year for which cost figures were available when the estimate was submitted. Contract cost prices in 1947 were about ten per cent higher than in 1946. The Commission will not attempt to prophesy future price trends.

Effect of Program on Load Carrying Capacity

The proposed construction program does not contemplate improving all routes in the trunk highway system to a point where they will carry 9-ton axle loads, the maximum allowed by law, in all seasons of the year. To do so would involve expenditures far in excess of the estimated cost of the proposed program outlined above. The contemplated program will reduce the need for spring load restrictions, but it will not eliminate them.

In addition to the paved mileage, it is expected that some of the heavy bituminous routes, where soil conditions are favorable, will carry 9-ton axle loads the entire year. The program contemplates a network of 4,775 miles on which 9-ton axle loads may be carried at all times, connecting the principal centers of population in all sections of the state. On an additional 3,550 miles the program proposes improvements sufficient to permit carrying loads up to 7-ton axle weight through the spring break-up and 9-ton loads at all other times. On the remaining 2,900 miles of trunk highways, all routes with relatively light traffic volume, it is proposed to construct roadways capable of carrying 5-ton axle loads during the spring break-up and 9-ton loads in all other seasons.

Concrete or Bituminous Surfacing

Widely varying views on the relative merits of concrete and bituminous surfacing have been expressed by many individuals

appearing before the Commission. To throw some light on this question, the State Highway Department was asked to furnish the Commission with data on its experience.

At the time improvement of the trunk highway system was started, general practice was to use concrete for heavy traffic routes and untreated gravel for surfacing other routes. The Department, however, began experimenting with bituminous gravel treatment as early as 1921. This work was done as a maintenance operation, partly as a dust layer and partly to cut the cost of gravel road upkeep. Treatments were generally of the lighter type, sometimes to aid in carrying traffic on temporary trunk highways until permanent highways could be built, sometimes as a temporary surfacing on permanent grades programmed for eventual paving. By the end of 1926 there were 229 miles of bituminous in the system.

After this experimental work, construction of permanent bituminous surfaces on designed stabilized bases was started and gradually accelerated. On Jan. 1, 1948, there were 5,131 miles of bituminous surfaces in the trunk highway system. Of this total 2,800 miles had been constructed on designed stabilized bases, 2,300 miles by the construction division and 500 miles by the maintenance division. This left 2,331 miles of bituminous trunk highway surfaces that had been developed under maintenance operations without designed bases.

During the 27 year period from 1921 to 1947, the maintenance division expended a total of $12,055,000 for new bituminous surfacing. The average cost of bituminous surfacing built by this division, including the 500 miles with designed bases and 2,331 miles without bases, has been $4,258 per mile. Actually the average cost per mile is somewhat less, because the total mileage used in determining the average does not include 1,421 miles of bituminous surfacing which was replaced by new construction.

During the same period the construction division expended $10,683,000 for bituminous surfacing and $9,209,000 for stabilized gravel base, or a total of $19,891,000 for flexible type base and surfacing. This represents an average cost per mile of $8,648. Bituminous surfaces built by construction are generally of a heavier and more permanent type than those done by maintenance.

Total expenditure for new bituminous surfacing by both construction and maintenance divisions from 1921 to 1947 was $31,946,000. Applied to mileage now in the system, this represents an average cost of $6,226 per mile. In the same period the Department spent $20,134,000 for bituminous maintenance, or an average of $281 per mile per year. This figure covers maintenance of roadway only.

It is generally found necessary to restrict loads on bituminous roads during the annual spring break-up. In the spring of 1948, restrictions were posted on 5,151 miles of bituminous trunk highways. In spite of these restrictions, some of these surfaces suffered some damage. However, on some routes where subsoil conditions are favorable it is possible to carry traffic through the spring break-up without restrictions. In the spring of 1948 there were 180 miles of bituminous highways on which no restrictions were posted. (This does not include bituminous surfaces on concrete base, which are classed as pavement.)

Paved routes generally carry heavier traffic than bituminous surfaced routes, but in areas of favorable soil conditions there are some heavy traffic routes where bituminous surfacing is giving satisfactory all-year service without load restrictions. One notable example is T.H. No. 7, between Minneapolis and Excelsior, one of the heaviest traffic routes in the entire system. Another is U. S. 10 between Anoka and Elk River. When this section was rebuilt as a divided highway, bituminous material was used on the new roadway, and used for widening and resurfacing the old 18-foot pavement for the other roadway.

One advantage of bituminous surfacing is the opportunity for stage construction, starting with lighter treatments and strengthening the base and wearing surface from time to time as traffic demands and funds permit. With the same amount of money a far greater mileage can be given initial bituminous treatment than could be paved with concrete. The gradual building up of heavier bituminous wearing surfaces on designed stabilized bases tends to lessen the damage during the spring break-up and make it possible to carry heavier loads without damage during this period.

The proposed program of trunk highway construction includes 939 miles of concrete at an average cost of $44,317 per mile, based on 1946 unit prices. It also includes 5,338 miles of stabilized bases at an average cost of $7,119 per mile and 6,926 miles of bituminous surfacing at an average cost of $5,182 per mile, making a cost of $12,302 per mile for base and wearing surface. The figures above do not include grading costs.

General rule of the Department is to use concrete on heavy traffic routes and bituminous surfacing for lighter traffic. Selection of surface type, however, is not based on traffic volume alone. In areas with soils of uncertain stability concrete may be used on some routes with only medium heavy traffic, while in other areas with favorable soil conditions bituminous surfacing may be used for routes of very heavy traffic volume.

Use of concrete on heavy traffic routes, especially where soil stability is questionable, is justified by experience. Bituminous

treatment on routes where light traffic does not justify the initial high cost of paving is likewise sound. Between these two classes of roads are routes with medium-heavy traffic where there may be honest differences of opinion as to the relative economy and serviceability of the two types. The Department has devoted a great deal of research to this problem, and this must be continued.

Financing Proposed Improvement Program

While the estimate of construction needs is based upon present traffic and the traffic increase which may be expected before 1959, it is not put forth as a ten-year construction program. If construction prices stabilize at the 1946 level, it would cost $45,875,000 per year to complete the program in a ten-year period. This would require an annual construction program approximately twice as large as carried out in 1946, 1947 and 1948. Financing such a program would require a very substantial increase in trunk highway revenues.

Experience in taking bids on highway projects since the end of the war indicates that shortages of experienced personnel, material and equipment would not make it practical or advisable to undertake an immediate doubling of the annual construction program. A gradual acceleration of the program, year by year, would appear to be more feasible and satisfactory.

Revenues for 1949-1951 Biennium

Estimated trunk highway revenues and expenditures for the biennium from July 1, 1949 to June 30, 1951 are shown in Table 15. Estimates of motor vehicle taxes are based on present rates and estimates of gas taxes are based on a 4 cent per gallon tax, with two-thirds credited to the trunk highway fund. Actual revenue might be higher or lower, depending on economic conditions, availability of new motor vehicles, shortages of motor fuel and changes in vehicle design which might affect economy in motor fuel consumption.

Federal Aid is not included in the table. Allotments available to the trunk highway funds under the Federal Aid Highway Act of 1948 total $11,007,358 for the year ending June 30, 1950. Of this amount $2,000,000 have been allocated to the counties, leaving $9,007,358 available to the trunk highway fund. Approximately the same amounts may be anticipated for the year ending June 30, 1951. Federal aid, however, is not paid until after construction projects are completed.

No estimate of funds on hand at the beginning of the fiscal years is included in Table 15. Construction programs in 1946, 1947 and 1948 have been partly financed by reserves accumulated

TABLE 15—STATE TRUNK HIGHWAY FUND

ESTIMATED REVENUE AND EXPENDITURES BASED ON BIENNIAL BUDGET 1949-1950, 1950-1951

Item		1949-1950			1950-1951		
	REVENUE						
1	Motor Vehicle Registration (1948 Base)		$12,800,000.00			$12,800,000.00	
2	⅔ Gas Tax—4 cents (1948 Base)		16,200,000.00			16,200,000.00	
3	Miscellaneous Revenue		700,000.00			700,000.00	
	Total Revenue			$29,700,000.00			$29,700,000.00
	EXPENDITURES						
	Debt Service and Activities Required by Statutes						
4	Interest and Principal on Bonds		$ 2,630,000.00			$ 2,570,000.00	
5	Administration of Motor Vehicle Division		725,000.00			725,000.00	
6	Other State Departments (State Auditor, State Treasurer, Civil Service and Department of Administration)		175,000.00			175,000.00	
7	Highway Patrol		750,000.00			747,000.00	
8	Traffic and Safety		213,000.00			190,000.00	
9	Drivers License		354,000.00			361,000.00	
	Total			4,847,000.00			4,768,000.00
	Balance Available to Department of Highways			$24,853,000.00			$24,932,000.00
	DEPARTMENT OF HIGHWAY EXPENDITURES						
	General Administrative Expense						
10	Administration		$ 181,000.00			$ 187,000.00	
11	Building Service and Stores		328,000.00			329,000.00	
12	Legal		100,000.00			100,000.00	
13	Finance		176,000.00			179,000.00	
	Total Administrative Expense			785,000.00			795,000.00
	Bal. Available for Maintenance, Construction, R/W, and Building and Equipment			$24,068,000.00			$24,137,000.00
	MAINTENANCE DEPARTMENT EXPENDITURES						
14	Routine Maintenance	$ 4,972,000.00			$ 4,993,000.00		
15	Bridge Maintenance	263,000.00			265,000.00		
16	Snow and Ice Control	2,000,000.00			2,008,000.00		
17	Extraordinary Maintenance	50,000.00			50,000.00		
	Total Regular Maintenance		$ 7,285,000.00			$ 7,316,000.00	
18	Special Roadway Maintenance (Replacement of Existing Surface Facilities)		2,250,000.00			2,259,000.00	
	Total Maintenance Expenditures			9,535,000.00			9,575,000.00
	Balance Available for Construction, Right of Way, Buildings and Equipment			$14,533,000.00			$14,562,000.00

TABLE 15—STATE TRUNK HIGHWAY FUND—Continued

ESTIMATED REVENUE AND EXPENDITURES BASED ON BIENNIAL BUDGET 1949-1950, 1950-1951—Continued

Item		1949-1950			1950-1951		
	BUILDINGS AND NEW EQUIPMENT						
19	Buildings		$ 800,000.00			$ 800,000.00	
20	New Maintenance Equipment, Cost in Excess of Reserves		250,000.00			250,000.00	
21	New Equipment for Shop, Laboratory and Office		115,000.00			115,000.00	
	Total			1,165,000.00			1,165,000.00
	Balance Available for Construction and Right of Way			$13,368,000.00			$13,397,000.00
	CONSTRUCTION, RIGHT OF WAY, ADMINISTRATION, SURVEY, PLANS AND SERVICES (Not Eligible for Federal Participation)						
22	Central Office Expense, Administration of Construction	$ 404,000.00**			$ 406,000.00		
23	Plans, Surveys and Engineering for Other Divisions	1,672,000.00**			1,688,000.00		
24	Laboratory and Research	299,000.00**			303,000.00		
	Sub-Total		$ 2,375,000.00			$ 2,397,000.00	
25	Construction—100% State Funds	$ 4,500,000.00*			$ 4,500,000.00		
26	Roadside Development—Seed, Sod, etc	158,000.00**			158,000.00		
27	Right of Way Acquisition, Including Gravel Purchases	1,235,000.00**			1,239,000.00		
	Sub-Total		5,893,000.00			5,897,000.00	
	Total Construction and R/W Expense Not Subject to Federal Participation			8,268,000.00			8,294,000.00
	Total Available to Match Federal Aid			$ 5,100,000.00			$ 5,103,000.00

*Includes improvements necessary to carry traffic but not up to standards making them eligible for Federal Aid. One example of such work is reshaping, graveling or bituminous treatment on roads where construction on permanent location cannot be currently undertaken. Another example is interim bituminous surfacing on roads graded to standard but not ready for paving.

**Estimates correspond to biennial budget submitted to Department of Administration, and are based on a Federal Aid construction program of $18,000,000 and a total construction program of approximately $26,000,000, including engineering, right of way and improvements not eligible to Federal Aid. If revenues are not sufficient to permit undertaking entire program, the items marked (*) and (**) must be cut and available funds used to match Federal Aid.

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during the war, but these reserves will be practically exhausted before the beginning of the next biennium. The status of the cash and invested reserve and encumbered and unencumbered funds is given in Table 12.

The construction program for any year is determined by the balance remaining after various necessary current expenditures are deducted from available revenue.

Payment of principal and interest on state highway bonds has first claim on trunk highway revenues. Bonds and interest due in the biennium total $5,200,000. The last of the outstanding bonds will be due in the year ending June 30, 1952.

Next in priority are funds required to support the motor vehicle division, and transfers to other state departments, as required by law. Following these in priority are certain activities within the Department also required by law, such as the state highway patrol, drivers license and traffic safety activities. Funds must also be set aside for general administrative expense.

Maintenance Requirements

The largest item of expense having precedence over construction is maintenance of the 11,000 mile state trunk highway system. Estimates of expenditures for maintenance in Table 15 include all operations necessary to keep or restore highways to their original condition, and to keep traffic moving safely. Besides the routine or ordinary day by day smoothing, repairs, snow and ice control and other work done by regular sectionmen, there are special and extraordinary maintenance. Special maintenance covers periodic reconditioning of larger sections of road surfaces, involving replacement of like materials approximately to original condition but not to an extent which might be classed as betterment. Extraordinary maintenance includes repairs and reconstruction necessary in cases of damage by fire, flood, storm or other catastrophe.

Expenditures for routine, special and extraordinary maintenance on the trunk highway system averaged $6,300,000 per year from 1939 to 1947, according to Highway Department records. These figures include the war years, when maintenance activities were curtailed wherever circumstances permitted. The estimates for the coming biennium are approximately 50 per cent in excess of the 1939-47 average. The increase is partly due to higher costs of labor, material and equipment, partly to activities necessary to serve increased traffic.

Analysis of routine maintenance requirements for the 1939-47 period show costs divided between the different types of work as follows:

Type of Operation	Per Cent of Total
Roadway Surface	40.0
Shoulders and Approaches	5.8
Roadside and Drainage	20.2
Traffic Service	5.0
Snow and Ice Control	26.4
Structures	2.6
Total	100.00

An accelerated construction program would in time permit some reduction in maintenance. Pavement costs less to maintain than bituminous surfaces, and the latter in turn cost less than gravel. Higher grade lines cut snow control costs and flat slopes cut roadside maintenance. However, such savings may be offset by the demands of increased traffic volume.

There are no such wide differences in maintenance costs as were experienced in the early days of the trunk highway system. Traffic then developed so rapidly on some routes that attempts to maintain gravel surfaces until paving could be built proved very costly. On heavy and medium-heavy traffic routes it was considered that the saving in maintenance would more than equal the annual interest and depreciation charge on pavement. Such conditions were used as an effective argument for bond issue proposals. Development of bituminous technique has materially reduced the cost of improving and maintaining intermediate or medium-heavy traffic routes and the opportunity for stage type construction has eliminated one of the arguments for bond-issue financing.

Estimated Construction Expenditures

The estimated balance available for construction, after deducting requirements for bonds, activities required by statutes, maintenance, general administrative expense, building and equipment, is $13,368,000. Construction expenses not eligible for Federal Aid have been estimated at $8,268,000 in the budget submitted by the Department of Highways to the State Department of Administration.

The estimates for construction are tentative and are based upon assumed revenue increases which will permit a Federal Aid construction program of $18,000,000 and a total construction program of $26,000,000. If revenues are not sufficient to permit undertaking this entire program, the items not eligible for Federal Aid will be reduced and available funds used for matching Federal Aid, so that no part of the state's Federal Aid allotments will be forfeited.

The estimate of $4,500,000 for construction with 100 per cent state funds covers a large variety of improvements necessary and desirable to serve traffic but not up to standards making them eligible for Federal Aid. One type of work in this classification is reshaping, graveling or bituminous treatment on routes where construction cannot be undertaken immediately. Sometimes short grade lifts on low spots are necessary to carry traffic until permanent grades can be built. Another example is interim bituminous surfacing on sections of highway which have been graded but where paving must be postponed for a year or more. In such cases the grading and paving will be eligible for participation in Federal Aid, but the interim surfacing is done with 100 per cent state funds. Other examples include minor corrections of alignment to remove traffic hazards, installation of traffic control signals, subgrade improvements to prevent frost boils and frost heaves.

Estimates for engineering, right-of-way and similar construction expenditures likewise must be curtailed if funds are not available to permit undertaking the contemplated program. If, however, it becomes necessary to curtail the program in order to leave a balance sufficient to match Federal Aid, it will be necessary to postpone a great many desirable improvements which are not eligible for Federal Aid.

Higher Costs Curtail Accomplishments

The construction estimates in the budget for the coming biennium contemplate a program no larger than undertaken in the years from 1946 to 1948, since the war ended. Due to the decreased purchasing power of the dollar, this program will accomplish considerably less construction than would have been possible with the same funds at prewar prices. The proposed program contemplates expenditures in each year of only about one-half of the amount that would be necessary if the improvements considered necessary to make the trunk highway system adequate to present traffic and anticipated increases in a ten-year period were to be carried out in ten years.

In connection with any consideration of sources of revenue to offset the increased cost of construction, and possible to permit an accelerated program, it might be pointed out that at the present rate of gasoline consumption, each one cent of gasoline tax brings approximately $6,000,000 of net revenue, after deducting refunds, of which the trunk highway fund receives two-thirds and the state road and bridge fund one-third, for allotment to the counties. The present 4-cent gas tax produces about $24,000,000, of which the trunk highway fund receives $16,000,000 and the counties $8,000,000.

Motor Vehicle Registration and Taxation

Motor vehicle tax laws have been amended at practically every session since the original 1921 law was enacted. Frequently amendments have changed the rate or method of taxing only one class of vehicle. This has resulted in various inconsistencies. Some classes of vehicles are taxed on net weight, some on gross weight, some on manufacturer's list price, some on a flat fee basis. Some classes get no age depreciation allowance and some do, some more rapid than others.

A detailed study of existing rates was made by a sub-committee composed of Representative P. J. E. Peterson, chairman of the Commission; Senator Archie H. Miller, vice chairman, and G. P. Smith, counsel. An analysis showing the number of vehicles registered and the fees paid in each class, each weight group and each age group, was made by the Highway Planning Survey from 1948 registration records furnished by Secretary of State Mike Holm.

The study of 1948 registrations to April 1 made for the Commission revealed some interesting data on ages and sizes of vehicles. It was found that:

> More than one-half, or 51.4 per cent, of the passenger cars registered are ten years old or older.
>
> Nearly two-thirds, or 64 per cent, of the "T" or farm trucks are ten years old or older.
>
> Nearly one-half, or 48.2 per cent, of the "X" or 35-mile zone trucks are ten years old or older.
>
> In contrast, 71 per cent of the "Y" or unlimited use trucks are less than three years old.
>
> Cars under 2,000 pounds weight, which constituted 55.0 per cent of the car registration in 1923, are now less than 0.4 per cent of the total.

The number of vehicles registered, the total fees paid, and the average fee paid, in each class, are shown in Table 16. Tables giving a detailed analysis of the number of passenger cars and "T," "X" and "Y" trucks registered and the fees paid in each age and weight group will be found in the appendix.

Passenger Car Registration Taxes

Passenger car fees at present are governed by a schedule based on weight, adopted in 1947 and designed to perpetuate tax rates then existing regardless of future fluctuations in car prices. Fees on new cars range from a minimum of $11 on a car weighing under 2,000 pounds to a maximum of $75 on a car weigh-

ing more than 4,800 pounds. A 10 per cent reduction is allowed the second year and 15 per cent each succeeding year until the minimum of $7.50 for cars weighing 2,000 pounds or more, and $5 for smaller cars, is reached.

TABLE 16

1948 MOTOR VEHICLE REGISTRATIONS, RECEIPTS AND AVERAGE FEES TO APRIL 1

Type of Vehicle	Number Registered	Total Taxes Paid	Average Tax
Passenger Cars[1]			
A, under 2000 pounds	2,703	$ 14,626.60	$ 5.41
Over 2000 pounds	713,649	7,237,854.41	10.14
Total Cars	716,352	7,252,481.01	$10.12
C, Busses[2]	321	158,767.71	494.60
Trucks			
T, Farm use	51,358	554,727.70	10.80
X, 35-mile zone	68,304	1,406,892.30	20.60
Y, Unlimited use	23,103	1,312,113.26	56.79
IY, Interstate ton-mile base	92	506.00	5.50[3]
F, Forest	107	5,125.10	47.89
Total Trucks	142,964	3,279,364.36	22.94
Total Cars, Trucks and Buses	859,637	$10,690,613.08	$12.44
Motorcycles	7,129	23,471.28	3.29
Snowmobiles	19	98.00	5.16
Trailers			
Z, House trailers	3,186	46,173.56	14.49
TZ, Farm use	21,951	53,274.44	2.43
XZ, 35-mile zone use	6,666	101,482.25	15.22
YZ, Unlimited use	2,894	395,138.41	136.54
IZ, Interstate ton-mile	986	7,050.22	7.15
FZ, Forest	8	2,113.30	264.16
Total Trailers	35,691	605,232.18	16.96
Tax-Exempt Vehicles	7,596	2,671.65	.35
Tax-Free Trailers	39,167	14,136.72	.36
Grand Total	949,239	$11,336,222.91	$11.94

[1]Includes taxicabs, hearses, ambulances, privately-owned school busses, and limited zone commercial passenger busses.
[2]Unlimited zone commercial passenger busses only.
[3]Registration fee is $5.00. Total ton-mile tax not known until end of year.

Average car registration fee in 1946 was $7.92 and in 1947 it was $9.40, both being on the old "factory list price" basis. Fees for 1948 licenses on cars registered up to March 31, 1948, averaged $10.12. Average for 1946 to 1948 models was $21.75, while practically all older models took the $7.50 or $5.00 minimum fee.

Passenger car license fees from 1921, when the trunk highway amendment took effect, up to 1947, when the weight base schedule was adopted, have fluctuated both with changing rates and changing vehicle prices. The basic rate was fixed at 2 per cent of factory list price in 1921, with a minimum of $12.00 for cars under 2,000 pounds and $15.00 for heavier cars. A reduction of 25 per cent was allowed in the fourth and fifth years and

50 per cent thereafter. In 1923 the basic rate was changed to 2.75 per cent, with a reduction of 10 per cent the second year and an additional 10 per cent each year thereafter. In 1925 the basic rate was cut to 2.4 per cent, and minimum fees reduced to $10.00 and $12.50.

In 1933, as a depression relief measure for two years, the tax was reduced 50 per cent on cars under 2,000 pounds and 40 per cent on heavier cars, and minimum fees cut to $5.00 and $7.50. In 1935 the basic rate was made 2.2 per cent with depreciation of 10 per cent the second year and 15 per cent each subsequent year but the $5.00 and $7.50 minimums were retained and have not since been increased.

Present low minimum fees and rapid depreciation allowance, adopted as depression relief measures, give older cars a tax advantage entirely out of proportion to their value or their use of the highways. Analysis of 1948 registrations shows that the average fee for 1946 to 1948 models is $21.75. Nearly all 1942 models and all older models pay the $7.50 or $5.00 minimum fee. There are no 1943, 1944 or 1945 models.

Under the 1921 schedule a car costing $1,200 F.O.B. factory would pay $24 each of the first three years, $18 the fourth year to a minimum of $15. Under the schedule adopted in 1935 a car listed at $1,200 F.O.B. would pay $26.40 the first year, $23.76 the second year, $19.80 the third year, and $15.84 the fourth year to a minimum of $7.50. Under the schedule in effect in 1948 a car weighing from 3,001 to 3,200 pounds (most of the models in the so-called popular makes come in this weight range) would pay $22.25 the first year, $20.03 the second year, $16.69 the third year, $13.35 the fourth year and $10.01 the fifth year, reaching the $7.50 minimum the sixth year.

The trunk highway amendment authorizes the taxation of motor vehicles "on a more onerous basis than other personal property." Present license fees are actually considerably less than the personal property tax would be at present millage rates. The average property tax rate throughout the state in 1946 (payable in 1947) was 102.4 mills. The average tax on a car with a delivery price of $1,500, assessed at one-third of "true and full value" or $500 and subject to a 102.4 mill tax, would be $51.20, more than double the present license fee.

If older cars were to be assessed and taxed on the basis of present inflated used car values, the difference would be still greater.

Truck and Trailer Rates

The 1921 act fixed a basic rate of 2 per cent of factory list price for trucks and trailers, plus 25 per cent for those engaged

in commercial freighting. Minimum fees were $2.00 per ton capacity on trailers while truck minimums varied from $15.00 to $50.00. In 1923 the basic rate was made 2.75 per cent, with minimum fees up to $150, and a special basic rate of 10 per cent on trucks and trailers engaged in commercial freighting. In 1925 three classes were established and basic rates fixed at 2.4 per cent for "T" or farm trucks, 5 per cent on "X" or general purpose trucks, and 10 per cent on "Y" or commercial transportation trucks.

Various other changes have been made from time to time. At present there are five classes of trucks with varying basic rates as follows:

1. "T" or farm trucks, now taxed at 1.92 per cent of list price if under 3,000 pounds capacity, 2.4 per cent if carrying capacity is 3,000 pounds or over. "T" trucks have a rapid depreciation rate, to a minimum of $7.50 for trucks of less than one ton, $10.00 for one ton and under two tons.

2. "X" trucks limited to a 35-mile zone, with some exceptions, taxed at 3.4 per cent of list price, with depreciation to a minimum of $7.50 if under one ton capacity, with varying minimum taxes up to $150 for trucks of six tons rated capacity or over. All contractors' and gravel trucks are permitted to operate on "X" licenses.

3. "Y" trucks without zone or use limitations, taxed on a graduated rate on declared gross weight basis, without allowance for age.

4. "IY" trucks engaged in interstate commerce and taxed on a graduated ton-mile basis.

5. "F" or forest service trucks taxed on a basis of 5 per cent of list price with depreciation to a minimum of $15.00.

Trailers with not more than two wheels, and gross weight under 3,000 pounds, used only with passenger cars, are tax exempt but must be registered.

Trailers in the "TZ" and "XZ" classes are taxed according to use, at the same basic rates as "T" and "X" trucks, with the same rate of depreciation, to a minimum of $2.00 per ton capacity.

Trailers in the "YZ" classification are taxed on a gross weight basis, the same as "Y" trucks. "IZ" trailers, limited to interstate hauling, are taxed on a ton-mile basis.

The present "X" or 35-mile class involves difficult problems of enforcement, due to exceptions to the 35-mile limits, permissible change of situs, and difficulty in determining zone bounda-

ries. It gives an advantage to a truck owner hauling between two cities 70 miles apart since it permits him to designate a situs midway between the two points. Likewise it gives an advantage to interstate haulers located within 35 miles of the state line.

The "F" or forest class and the "IY" or interstate ton-mile class both involve problems of enforcement out of proportion to the small number of trucks registered in these classes.

Gross weight on a truck-tractor semi-trailer combination may be divided 50-50 between tractor and semi-trailer. As rates on greater tonnage are progressively higher, this gives a decided advantage to the registrant of such vehicles. To illustrate, a single unit truck of 36,000 pounds gross weight in the "Y" classification would be taxed $555, while a truck-tractor and semi-trailer each of 18,000 pounds gross weight would be taxed $115 each or a total of $230.

A similar inconsistency occurs in the "X" class. The minimum tax on a single unit truck of 5 tons rated capacity is $125.00, while the minimum tax on a 1½ ton truck-tractor with a 5-ton semi-trailer would be $15.00 on the tractor and $10.00 on the trailer, or a total of $25.00.

Another inequity has resulted from the use of list price as the tax base for some trucks and gross weight for others. Intent of the "Y" schedule apparently was to tax unlimited use trucks at a higher rate than those limited to specific uses or zones. Actually the smaller new trucks can be registered at a lower fee in the "Y" class than in the "X" class or even in the "T" class. For instance, small truck costing $1,500 would be taxed $51.00 in the "X" class and $28.80 in the "T" class, but if the gross weight is kept under 7,000 pounds it may be registered in the "Y" class for $25.00. Dut to the age allowance, however, the fee in the "T" class would drop below the "Y" fee in the third year and the "X" fee below the "Y" fee in the fifth year, there being no age allowance in the "Y" class. The result is that many of the smaller trucks are registered in the "Y" class when new and changed to the "T" or "X" class when old enough to get the benefit of the depreciation.

"Manufacturer's rated capacity" which is used in determining minimum fees for certain classes of trucks, rarely governs weights of loads carried. One-third of the trucks weighed in the Highway Planning Survey studies had loads more than double the "rated capacity," some had loads five times as great. The average net load of all trucks in the so-called one-and-one-half ton group was 4,900 pounds.

The law makes no mention of house trailers. They are taxed under the same weight schedule as passenger cars, with the same depreciation allowance, but they are given the benefit of the $2

per ton capacity minimum prescribed for other trailers. In view of the relatively low mileage traveled by the average house trailer, a low road-use tax might be justified. On a value basis, however, the minimum fees and even the fees on some of the newer units are very low compared to the tax that would be paid if these trailers were assessed as personal property and taxed at prevailing millage rates.

Passenger Bus Taxes

Busses are taxed in two classes, with higher rates for those defined as engaged in "commercial passenger transportation." Actually commercial passenger transportation is defined to exclude common carrier busses operating within certain boundaries, and these take the same low rates as privately owned busses not used for hire.

The 1921 act taxed busses on the same basic rate as other passenger vehicles, but with an additional 25 per cent if they were over seven passenger capacity and carrying passengers for hire. In 1923 the basic rate on busses engaged in "commercial passenger transportation" was fixed at 10 per cent of value, but busses operating wholly within one city were exempted from the higher rate.

In 1929 this exemption was extended to busses operating within two or more contiguous cities, in 1933 to busses operating within contiguous cities or villages and in 1947 to include "local bus lines operating within the limits of any county containing a city having not less than 225,000 inhabitants and an adjoining county."

Previous to 1948 the tax on a new "local" bus costing $7,000 was $154. Under the weight schedule adopted in 1947 such a bus would take the maximum passenger car fee of $75 the first year, to a minimum of $7.50 the eighth year.

Busses in the "C" classification were changed to a gross weight basis in 1939. The first two years the tax is four times the tax on a "Y" truck, the third and fourth years three times the "Y" tax, the fifth year two times the "Y" tax, to a minimum of $350 for busses of 25 passenger capacity or more. On this basis a "C" bus with a gross weight of 18,500 pounds would pay $460 the first two years and $350 thereafter.

Combined Motor Vehicle and Gas Tax

In any attempt to determine what would be a fair road use tax, license and gas taxes must be considered together.

License fees are sometimes considered as a "ready to serve" charge, similar to the minimum monthly charge for water, gas and electric service. Gas taxes theoretically are a charge based upon road use. Actually some types of vehicles operate more efficiently and economically than others and, consequently, pay less gas tax per ton-mile of operation. Theoretically, license fees can be, and in some states are, used to equalize taxes to some extent in proportion to road use.

During recent months data were obtained on the weights, miles traveled and taxes paid on a large number of cars, trucks and truck-trailer combinations of all classes. The average gross weights, average miles traveled per year, average fuel and license taxes paid per year, the average ton-miles traveled per year (including vehicles and loads carried) and the average mills of revenue per ton mile for passenger cars and the principal classes of trucks, are shown in Table 17.

TABLE 17

AVERAGE WEIGHT, ANNUAL TRAVEL, TON-MILES AND STATE ROAD USER TAX FOR THE SEVERAL CLASSES OF VEHICLES[1]

Class of vehicle	Gross weight in tons	Miles traveled	Fuel tax	License fee	Ton-miles	Road use tax per ton-mile in mills
			Per Annum			
Passenger cars	1.75	7,200	$19.20	$ 9.35	12,600	2.3
"T" trucks	2.96	7,660	22.24	10.65	22,673	1.5
"X" trucks	4.77	16,594	56.54	23.75	79,193	1.0
"Y" trucks	4.87	28,829	96.58	70.03	140,536	1.2
"X-XZ" truck - tractor and semi-trailer comb.	13.14	24,192	144.54	78.39	317,980	0.7
"Y-XZ" truck - tractor and semi-trailer comb.	16.54	50,466	331.78	104.89	834,915	0.5
"Y-YZ" truck - tractor and semi-trailer comb.	16.05	62,935	446.71	342.64	1,009,993	0.8

It may be noted that the units which paid the smallest annual tax paid the largest tax per ton-mile, while those which paid a seemingly large annual tax paid the lowest tax per ton-mile. The discrepancy is particularly noticeable in the case of the truck-tractor and semi-trailer combinations.

Gasoline Tax Refunds

Article IX, Section 5, of the State Constitution authorizes levy of an excise tax on any substance used in propelling vehicles on the public highways. This wording clearly exempted from this tax any gasoline used for any other purpose. As a practical

[1]Data from Highway Planning Survey Loadometer Data, 1947.

method of collecting the tax, the Legislature provided for taxing all inshipments and refunding the tax on gasoline used for other than highway purposes.

The amount of refunds has increased steadily, particularly in recent years. The gross taxes collected on inshipments from 1940 to 1947, and the amount and percentage of refunds, are shown in Table 18.

TABLE 18
TOTAL REFUNDS ON MOTOR FUEL
1940-1947 Inclusive

Year	Total Tax	Refunds	Per cent
1940	$ 20,934,546.83	$ 2,588,828.06	12.36
1941	21,570,475.24	2,719,198.46	12.60
1942	21,818,772.68	2,987,075.89	13.69
1943	17,006,215.00	3,616,180.53	21.26
1944	18,092,574.04	3,914,816.96	21.63
1945	20,514,347.23	4,656,086.72	22.69
1946	26,820,036.25	4,622,504.45	17.23
1947	29,175,017.77	6,004,526.08	20.58
Total	$175,931,985.04	$31,109,217.15	17.68

A study of gasoline tax refunds and exemptions made by the Public Roads Administration shows that in 1946 Minnesota was one of three states which refunded or exempted the tax on from 15 to 19.9 per cent of the total gas used, the other two being Colorado and Texas. Only six states exempted or refunded higher amounts; Montana and Oklahoma being in the 20 to 24.9 per cent bracket, Iowa in the 25 to 29.9 per cent bracket, Kansas and South Dakota in the 30 to 34.9 per cent bracket, while North Dakota refunded or exempted more than 55 per cent.

The increase in the use of power driven farm machinery is well known, as well as the increased use of gasoline for various industrial purposes. Reports by the Commissioner of Taxation show that of the refunds paid in 1947, 92.3 per cent was for gasoline used in agriculture, 7.4 per cent for industrial usage and 0.3 per cent miscellaneous.

The possibility that a portion of the refund is made on fraudulent claims has been discussed. Some fraudulent claims are uncovered from time to time by the Petroleum Division of the Department of Taxation, and persons found guilty of making such claims are prosecuted. It has not been shown that fraudulent claims represent any substantial part of the total refunds. Nevertheless, it would seem apparent that the present authorized inspection force is inadequate.

National System of Interstate Highways

The Federal Aid Highway Act of 1944 provided for creation of a National System of Interstate Highways, not exceeding

40,000 miles, so located as to connect the principal metropolitan areas and industrial centers. Three routes in Minnesota, totaling 847 miles and connecting with routes through adjoining states, have been approved by Federal authorities for inclusion in this system as follows:

1. A diagonal route from the state line near Hudson, Wisconsin, through St. Paul, Minneapolis, Monticello, St. Cloud, Sauk Centre, Alexandria, Ashby, Fergus Falls, Barnesville to the state line at Moorhead.

2. A north-south route from the Iowa line at Emmons, through Albert Lea, Owatonna and Faribault, dividing near Savage into alternate routes through St. Paul and Minneapolis, joining near Forest Lake and continuing through Pine City and Moose Lake to Duluth.

3. An east-west route from the state line at La Crescent through Rushford, Preston, Austin, Albert Lea, Blue Earth, Fairmont, Jackson, and Worthington, to the state line west of Luverne.

The 1944 and 1948 Federal Aid Acts did not earmark any funds for the interstate routes, nor give them any priority in improvement. On the contrary, the higher standards set for these routes may in some cases have the effect of delaying rather than expediting improvement. But while somewhat higher standards have been set for the interstate routes, any expectation that all of these routes will become "super highways" is unfounded. Improvements when made will depend on traffic volume, standards being not much higher than ordinarily used for routes of similar traffic volume.

The program of proposed trunk highway improvement includes a considerable amount of work on routes in the interstate system, but no more than is contemplated on other routes of comparable traffic needs. If future Federal Aid authorization should earmark special funds for these roads, the program must be revised accordingly.

VI. COUNTY ROAD SYSTEMS

The county road systems constitute the main secondary or intermediate type rural roads. To a large extent they are the feeder roads connecting the state trunk highways and the local township roads. They also carry a substantial volume of farm-to-market traffic all the way from origin to destination, as well as some intercity traffic.

More than one-third of all farm units are located on the county road systems. Of the 139 incorporated places not on state trunk highways, all but 10 are located on the county road systems.

County roads carry moderately heavy traffic. According to pre-war traffic counts, the state aid roads averaged 100 vehicles per day and the county aid roads 43 vehicles per day. However, there were wide variations; more than 1,800 miles carried less than 10 vehicles per day while 117 miles carried more than 500 vehicles per day.

Present County Road Systems

Under present state laws, there are four classes of roads administered by the county boards, as follows:

1. State aid roads. The county board may designate any established rural road, or any road or street within a village or a city of the fourth class, as a state aid road subject to the approval of the Commissioner of Highways.

2. County aid roads. The county board may designate any rural county or town road as a county aid road. County aid roads may also be designated in the unplatted portion of any village by unanimous vote of the county board.

3. County roads. Any new road established by county board or by district court proceedings becomes a county road until otherwise designated. Also any existing rural road may be designated a county road. "County" roads, while improved by the counties, are maintained by the townships, except in the three large counties. In the three counties of more than 100,000 population, gas tax allotments for county aid roads may be used on all county roads without formality of designation as county aid

roads. Only a few other counties have any county roads not specifically designated as state aid or county aid roads.

4. State aid parkways. The county board may, with the approval of the Commissioner of Highways and the Commissioner of Conservation, designate any established road connecting a trunk highway with a state institution, public park or public recreational area, as a state aid parkway.

Present legal terms for the county road systems are somewhat ambiguous. The term "county roads" is sometimes used to include all roads under county authority, sometimes only applied to roads not designated as state aid or county aid roads. Likewise the terms "state aid" and "county aid" are misleading. Both of these classes of roads are financed partly by state aid allotments from the state road and bridge fund, county aid roads actually to a greater extent than the state aid roads.

Financing County Road Systems

The three principal sources of funds for use on the county road systems are county road and bridge tax levies, allotments from the state road and bridge fund, and Federal aid.

Of the allotments made to Minnesota under the Federal Aid Highway Acts of 1944 and 1948, $2,000,000 has been allotted to the counties for each year covered by these programs. These funds may be used only for construction and only on roads designated as part of the Federal aid secondary system. Non-trunk roads in the F.A.S. system must be designated as state aid roads before improvements are made with Federal aid. Approximately two-thirds of the state aid mileage is in the F.A.S. system.

The state road and bridge fund receives one-third of the net gas tax revenue. Of this amount $1,200,000 is appropriated annually for use on state aid roads and the balance for use on county aid roads. The relatively small income from interest on internal improvement land fund investment and miscellaneous revenue is added to the state aid allotments.

Construction and maintenance of state aid roads are subject to supervision by the Commissioner of Highways, and state aid is paid only after a showing that work has been satisfactorily performed. Construction projects financed with Federal aid are also subject to Federal supervision. At least 40 per cent of the state aid allotments must be used for maintenance.

Allotments for county aid roads are paid in two annual installments, August 1 and February 1. The state exercises no supervision over expenditure of these funds, except the audit by the Public Examiner to see that they are used for road purposes.

Counties may levy up to 10 mills for road and bridge purposes. Larger levies may be made in certain counties under certain circumstances. Laws enacted in 1945 and 1947 permit certain counties to levy up to 15 mills and in some cases up to 20 mills, for two year periods.

A summary of county road and bridge levies shows that for the 12-year period from 1936 to 1947 the average levy for all counties was 5.66 mills. The average 1947 levy was 10.22 mills, excluding Hennepin. Tables showing the average 1936-47 levies, together with the 1946 and 1947 levies, will be found in the appendix.

A wide variation may be found in the county road tax levies. Aside from Hennepin and Ramsey counties with average levies of .76 and .898 mills respectively in the 1936-47 period, the lowest average was Clay County with 4.297 mills and the highest was Isanti with 11.944 mills. In 1947 the lowest outside Hennepin and Ramsey was Murray with 7.05 mills and the highest was Isanti with 24.60 mills.

In the calendar year 1947 receipts from county road tax levies totaled $10,830,159. Receipts from the state included $1,382,195 applicable to state aid roads and $7,227,521 applicable to county aid roads, these figures being actual receipts and not allotments. The state, acting as agent for the counties, received $1,996,161 from Federal aid applicable to county projects, this figure again being actual receipts and not allotments.

Expenditures in 1947 on the state aid system totaled $11,078,475 and on the county aid and county systems $10,125,561, these figures including Federal aid projects in which the state acted as agent for the counties. Comparison with the receipts in the preceding paragraph will show that state and federal grants supplied only 30 per cent of the money spent on the state aid system, while state grants supplied 71 per cent of the money spent on the county aid system. In other words, the so-called "state aid" system had to rely mainly on county tax levies, and the greater part of the receipts from county levies were spent on that system.

Condition of County Roads

The condition of the county road systems, based upon reports by the county highway engineers to the State Highway Department as of January 1, 1948, is shown in Table 19.

From these figures it will be seen that 93 per cent of the county roads have some type of surfacing, soil-surface, gravel or better, but only 5 per cent have higher type surfaces, such as bituminous or concrete. Surface conditions alone cannot be considered an index to the adequacy of the county road systems. A

serious condition has developed on county roads in the past decade, due to the accumulated effects of the curtailment of construction during the depression and the war, combined with the rapid increase in the number of heavily loaded vehicles using the county roads. Many of these roads have neither subgrade strength nor surfaces adequate to carry heavy traffic.

TABLE 19

STATUS OF COUNTY SYSTEMS

January 1, 1948

Type of Improvement	State Aid Roads Miles	County Aid and County Miles	Total Miles
Concrete	57.8	42.2	100.0
High Type Bituminous	79.0	26.9	105.9
Low Type Bituminous	1,559.7	675.1	2,234.8
Gravel or Stone	13,796.6	22,480.9	36,277.5
Soil Surfaced	176.0	949.2	1,125.2
Graded, not Surfaced	373.8	1,303.5	1,677.3
Primitive and Unimproved	173.0	912.0	1,085.0
Totals	16,215.9	26,389.8	42,605.7

Maintenance requirements have made it impossible to spend sufficient funds for construction to meet the growing demands on the county road systems. Highway Planning Survey data showed that in 1935 the counties spent 43 per cent of their road funds for maintenance. By 1940 this had increased to 50 per cent. During the war the demand on the farmers for greater production was accompanied by a rapid increase in average weight of loads hauled on public roads, with consequent need for greater maintenance efforts. In 1943 and 1944 maintenance took 90 per cent of the expenditures. In 1946, in spite of resumption of construction, 73 per cent of the expenditure on county roads went for maintenance.

Damage to county roads during the spring break-up has been particularly severe in recent years. Counties have difficulty in enforcing load restrictions on their large mileage. Haulers who took to the county roads when barred by load restrictions on state highways aggravated the damage. Need of a better means of protecting rural roads during the spring break-up led to enactment of Chapter 505, Laws of 1947, restricting vehicles on county and town roads to four-ton axle loads from March 20 to May 15, unless otherwise posted, with roads in certain northern areas and paved roads in all areas excepted.

Proposed Ten-Year Program

A program considered reasonably adequate to meet anticipated traffic needs in the ten-year period from 1950 to 1959 was presented to the Commission by a committee representing the

County Highway Engineers Association. The estimated cost of the program, based on 1946 costs, is $312,000,000. The miles and estimated cost of each type of work are shown in Table 20.

TABLE 20

PROPOSED COUNTY HIGHWAY PROGRAM

Type of Work	Miles	Estimated Cost
Grading	15,385	$ 90,041,203
Graveling	15,849	20,439,901
Base	8,094	26,159,410
Bituminous	9,743	29,791,775
Maintenance Betterment	8,909	13,544,317
Right-of-Way	.....	2,315,116
Total Construction Cost		$182,291,713
Routine Maintenance	39,583	100,005,373
Miscellaneous County Construction and Anticipated Additions to County Systems	.....	6,030,687
Bridges		24,064,243
Grand Total		$312,392,016

A break-down of the program by counties will be found in the appendix.

The County Engineers' Committee was of the opinion that adequate financial support of the county primary system should eliminate the demand on the Legislature for extension of the trunk highway system.

The proposed ten-year program contemplates generally bituminous surfacing of roads where present-day traffic averages in excess of one hundred vehicles per day. Reasons for such surfacing include conservation of gravel, reduced maintenance costs, better service to traffic and greater safety through elimination of dust. The demand for dustless road surfaces has been accentuated by the increase in average speeds.

Financing Future County Program

Total estimated income of the counties for road and bridge purposes from the three principal sources of revenue for 1948 and 1949 is shown in Table 21.

TABLE 21

COUNTY ROAD REVENUE, 1948 AND 1949

Revenue From:	1948	1949
One-third of gas tax (state-aid and county-aid)	$ 8,100,000	$ 8,200,000
Property tax levies	11,000,000	12,000,000
Federal aid	2,000,000	2,000,000
Totals	$21,100,000	$22,200,000

If county road tax levies are continued at the present average, if the counties continue to receive one-third of a 4-cent gas tax and gas consumption increases moderately, and if Federal aid allotments continue at the rate provided in the 1948 Act, the estimated receipts of the counties for the period covered by the proposed program, 1950 to 1959, would be as follows:

Sources of Revenue	Ten-Year Total
One-third of gas tax	$ 87,337,500
County road tax levies	120,000,000
Federal aid	20,000,000
Total	$227,337,500

From these figures it is obvious that revenues estimated to average $22,533,750 per year will fall far short of furnishing the $31,200,000 per year needed for the contemplated ten-year improvement program. Additional revenue approximating $86,-662,500 will be needed for the ten-year period, or $8,666,250 per year if the program is to be carried out.

While some counties with a relatively low county road tax levy might make higher levies and increase their revenue in this manner, it is apparent that the great majority of counties cannot do so.

The three-year post-war program for which Federal aid was made available by the 1944 Act ended June 30, 1948, but allotments will be available for an additional two years. Although total annual authorizations in the 1948 Act are 90 per cent of the authorizations in the 1944 Act, allocations to the counties have been continued at the $2,000,000 figure.

If county needs were fully met, it is evident that present millage rates must be maintained and increased revenue from gas taxes made available.

Recommendations by County Highway Engineers

Recommendations for changes in the county road laws have been presented to the Interim Commission by two committees, one representing the county highway engineers and the other representing the county commissioners. The recommendations are in agreement on most of the proposed changes but differ on some points.

The recommendations of the county highway engineers were presented first and included the following proposals:

1. The entire system of state aid roads, state aid parkways, county aid roads and county roads, shall be reclassified by the county board as follows:

(a) The board shall designate the main farm-to-market roads of the county as the primary county road system. Such designation shall be limited to the more important non-trunk highways of the county and

shall correspond generally to the present state aid system and the federal aid secondary system. This designation shall be subject to the approval of the Commissioner of Highways.

(b) The balance of the county road system and state aid parkways shall be designated by the board as the county secondary road system.

In designating these systems, the board may abandon roads now designated as state aid, county or county aid roads and it shall be required that the county system, both primary and secondary, shall not exceed forty per cent of the mileage of non-trunk, rural highways, including state aid parkways, in the county.

The primary system may be changed at any time by the county board with the approval of the Commissioner, by additions or deletions; and the county board, within the forty per cent limitation, may change the county secondary by additions or deletions. It is possible that a different rule may be required for the Counties of Hennepin, Ramsey and St. Louis. There is considerable discussion as to the forty per cent limitation. The majority of the counties are now within that limit. Other counties are above that limit and would be required to turn back to the townships a substantial mileage of county and county aid roads. It has been suggested that the limit for the county system should be fifty per cent.

2. One-half of all gas tax apportioned to the counties shall be apportioned as state aid to be expended for construction and maintenance of the county primary road system. The remaining fifty per cent of the fund shall be apportioned to the counties for use on the county secondary system or the county primary, as the board may determine.

It is suggested that some portion of the gas tax be allocated to the counties within the constitutional limitations on the basis of lineal feet of bridges on all non-trunk rural highways of the county. If this suggestion be adopted, the portion of the gas tax thus apportioned would be first set aside and the balance apportioned fifty-fifty, i.e., one-half thereof specifically set aside for the county primary system. The amount of gas tax apportioned on the basis of bridge footage, as certified by the county engineer, would be specifically designated as a county bridge fund to be expended for bridge construction and maintenance only.

3. No road user funds shall be apportioned to the townships or spent on town roads.

4. The counties shall take over the construction and maintenance of all bridges and culverts above a certain specified size on all town roads and completely relieve the townships thereof. It has been suggested that the counties should have jurisdiction of all structures requiring a ten foot clear span, or larger. If this rule is adopted, it would be necessary that the county engineer make decision as to the opening required on new construction.

5. The county road system, both primary and secondary, shall be extended through or into each municipality regardless of size or classification so as to form a complete inter-connecting system. It might be advisable to provide that the planning of such system through the municipality be subject to the approval of the municipal council with the Commissioner making final decision in the case of dispute. It would also be necessary to provide for agreements between the county boards and municipal councils to share in the cost of construction within corporate limits, the same as is now provided for trunk highways.

6. One suggestion was discussed without reaching any conclusion, i.e., that county boards be required to make a specified minimum levy for the county road and bridge fund. The purpose of such suggestion would be to compel the counties to raise sufficient funds to proceed with the improvement of the county system and not to eliminate the millage levy and rely entirely upon increased gas tax receipts.

7. There is now in force a general statute permitting contracts between political subdivisions of the state. It is suggested that there be a definite statute authorizing the townships and villages to contract with the counties for the maintenance of, and snow removal from, town roads and village streets. Such law should doubtless contain a provision permitting the auditor to levy taxes on the property of the township or village to reimburse the county in the event of failure by the township or village to pay. Possibly such law should include cities of the fourth class.

8. The one mill town dragging fund (Sec. 163.06) is probably obsolete and should be repealed.

Recommendations of the County Commissioners

The recommendations of the county highway engineers were considered at the annual meeting of the Minnesota Association of County Commissioners in January, 1948, and arrangements made for a series of district meetings. A committee consisting of one member from each congressional district was selected. This committee met with the Interim Commission early in February. Information on the effect of the proposed changes was submitted to all county boards and discussed at a second series of district meetings. Following these meetings the county commissioners committee early in April presented the following recommendations to the Commission:

1. There is no objection to changing the names of the county road systems from state aid and county aid or gas tax roads to "County Primary" and "County Secondary" systems, as proposed by the County Engineers Association.

2. The counties' share of gas taxes allotted to the counties should be left solely in the hands of the local boards of county commissioners. At least 50 per cent should be spent on the primary system and the balance on the secondary system.

3. In order to give some relief to the townships, all township bridges over 10 feet in length constructed jointly by the county and township should be on a 50-50 basis.

4. In order to give some relief to municipalities, both primary and secondary county road systems should be extended into or through all cities and villages, regardless of classification with the same width as outside the corporate limits.

5. In order that highway development may progress, the statutes should be amended so that no county or township can levy less than seven mills annually for road purposes, except counties having cities of the first class.

6. Ten per cent of the total amount of the counties' share of the gas tax collected by the state should be set aside for bridge purposes and be distributed to the counties in the ratio the number of lineal feet of bridges within each county bears to the total number of feet of such bridges in the state.

7. Uniform standards of construction should be set up for all county primary and secondary roads, whether newly constructed or reconstructed, in all counties throughout the state, as to width of roadbed, grade line, back slopes and drainage, with minimum standards set up for rural and urban territory.

8. The road mileage to be administered by the county should be set at a minimum of 40 per cent and a maximum of 60 per cent of the total rural non-trunk road mileage in each county. It is considered that 50 per cent of the mileage in some townships is too large a burden for the townships to carry, since there are townships in almost every county that have no trunk highways. This would give the county boards some leeway for township equalization in road mileage.

The county boards should be authorized through their respective road levies to grant further aid to the townships, if necessary.

9. A definite statute should be drawn, or present statutes amended to authorize townships and villages to contract with the counties for road maintenance and snow removal when they so mutually agree.

The foregoing recommendations of the county commissioners and the county highway engineers were made in contemplation of the passage of the 50-50 amendment, but are here published for legislative study. The recommendations contain much of merit. The Commission studied them with care but decided to make no specific recommendations pursuant thereto in this report.

Comparison of the recommendations by the county commissioners and those made by the county highway engineers reveals a material difference on only one point; namely, the limitation of mileage of county roads. The engineers recommended that there be a maximum but no minimum, with 40 per cent suggested as a maximum but not unanimously agreed upon. The county commissioners recommended a minimum of 40 per cent and a maximum of 60 per cent.

The county commissioners recommended a statutory minimum of seven mills for the county road tax levy and also a seven mill minimum for town road tax levies. The county engineers suggested consideration of a minimum but made no specific recommendation.

There were some points proposed by each group not touched upon by the other group. Most notable is the recommendation of the commissioners for statutory minimum standards for road construction.

The counties are now authorized to appropriate from the county road and bridge funds to aid townships and certain municipalities. The engineers and commissioners were apparently in agreement that this authority should be continued. They concur in the recommendation that gasoline tax allocated to the counties must all be spent on a planned and integrated system of limited mileage and not widely dispersed on purely local access roads.

Effect of Proposed Limitations on County Road Mileage

Total mileage of rural roads, except trunk highways, was 98,459.00 as of December 31, 1946. Of this total, 41,079 miles were in the county road systems. This is nearly 42 per cent of the total rural non-trunk road mileage.

The mileage of non-trunk roads, the mileage of county roads and the effect of various suggested mileage limitations on the various counties is shown in the Appendix.

If a 40 per cent maximum limitation were established, 45 counties would have to turn back some mileage to the townships. If 40 per cent were established as a minimum, 42 counties would have to take on some additional mileage.

If 50 per cent were established as a maximum, 22 counties would have to turn back some mileage, and 65 counties could take on some additional mileage if they wished.

If 60 per cent were established as a maximum, eight counties would have to turn back some mileage, and seventy-nine counties could, if they wished, take on additional mileage.

VII. THE TOWNSHIP ROAD SYSTEM

Representatives of the State Association of Township Officers were given an opportunity to be heard by the Commission and presented considerable information on town road conditions and finances. No long range program for improvement of town roads, similar to that presented by the county authorities, was offered for town roads. Basic changes in town road laws were suggested by one group appearing before the Commission.

Town roads, like all other systems, face the problem of keeping up with growing traffic demands. Increased use of trucks and school busses has accentuated the need for more improvements. The large number of bridges on town roads needing major repairs or replacement is a serious problem.

The township roads have the largest mileage of any of the road systems, more miles than the total rural mileage of state and county highways. Approximately one-half of all the farm units in the state are located on township roads.

Township roads carry the smallest traffic volume of any of our road systems. Township roads are generally land service roads, serving the rural dwellings located on these roads and providing access to the nearest county or state highways. They carry very little intercity or long distance traffic.

Total mileage of township roads has decreased steadily as the counties have taken over more mileage, particularly since the creation of the county aid system. The report of the 1933 Interim Commission showed a total of 72,577 miles of township roads in 1932 and the 1936 Planning Survey inventory showed 64,822 miles. A summary of the biennial reports of the town clerks to the county auditors, as required by law, showed a total mileage of 59,971 as of September 1, 1947. Due to duplication of town line roads in the reports, actual total is believed to be somewhat less and is estimated at 56,362 miles.

Road and Traffic Conditions

The status of improvement of the township road system, as compiled from the reports of the town clerks to the county auditors, is shown in Table 22.

TABLE 22

STATUS OF TOWNSHIP ROAD SYSTEM
As of September 1, 1947

Type of Improvement	Miles
Pavement	34.08
Bituminous	254.60
Gravel Surfaced	25,743.75
Graded, Unsurfaced	23,355.68
Unimproved	10,583.79
Total	59,971.90

Highway Planning Survey traffic counts in 1936 showed that more than one-half of the town roads carried less than 10 vehicles per day, and the average for all town roads was 13 per day. Estimates of 1946 traffic indicate that the average had increased to 17 vehicles per day. There is considerable variation, a limited mileage carrying heavier traffic than the average county road, but a considerable mileage carrying only the traffic to or from one or two farm units.

Town roads are generally built to considerably lower standards than the county roads as to surface types, width, grade and alignment. In normal times they give reasonably good service to the relatively light traffic, but keeping them open in seasons of heavy snowfall or prolonged rains is a difficult problem.

Bridges are another serious problem. The 1936 road inventory showed 3,949 bridges on local roads below minimum width standards and 1,682 substandard in strength and general condition. These figures include only bridges of 20-foot clear span or over.

Town boards are faced with the same problem which confronts state, county and municipal road agencies; namely, inability to keep pace with growing traffic demands. While the number of heavy type vehicles using town roads is relatively small, there has been a marked increase within the last decade.

Town Road Finances

Principal sources of revenue for town road purposes are the annual town road tax levies. The annual town meeting is authorized to levy up to 15 mills. In emergency the town board may levy an additional 5 mills. The annual town meeting may also levy a town road drainage tax up to 10 mills. Finally, the law requires the auditor of each county to extend a 1-mill tax on all property in unincorporated areas, the proceeds of which are returned to the townships and constitute a town road dragging fund.

Local road taxes levied in 1946 yielded the townships a total of $6,893,437 in 1947. The average levy was about 11 mills. Town road tax levies varied widely, from a minimum average of 4.44 mills in Sherburne County to a maximum average of 22.98 in Houston County. The receipts from town road tax levies were equivalent to $6.80 per capital in unincorporated areas (based on 1940 census figures).

The law permits the county boards to distribute not to exceed 50 per cent of the gas taxes allotted for county aid roads to the townships. Only a limited number of counties make such a distribution and very few distribute the maximum amount. Counties may also make grants to the townships from the county road and bridge fund under certain conditions, and they may do work on town roads, with or without pay. Receipts by the townships from the counties totaled $533,496 in 1947. The counties expended $605,324 for work on town roads in that year and collected a total of $427,236 from the townships in reimbursement.

Township road indebtedness at the end of 1947 totaled $3,325,283. This was a net increase of $1,770,280 over the net debt at the end of 1945, the low point in recent years. Reports on 1948 township road finances have not yet been compiled, but incomplete returns indicate that a further increase in township road indebtedness was incurred.

A table showing taxable township valuations, average township road and bridge tax levies and township road indebtedness, by counties, will be found in the appendix.

Relatively few suggestions for changes in town road laws have been presented to the Commission. Suggested changes in county road laws which would affect the townships have been discussed in preceding sections.

That the townships will benefit from the advancement of the county road program is clear to anyone familiar with Minnesota road history. The original state aid plan, extension of state aid to secondary roads after the trunk highway plan was adopted, and the creation of the county aid or gas tax system in 1929, each in turn has served to relieve the townships of some of their more burdensome roads. Continuation and extension of the policy of granting state aid from gas tax revenues to the counties should relieve the township of upkeep of all except purely local access roads.

Transfer of all town roads to the counties has been suggested. Some states have adopted this plan, and a few states have placed all rural roads under state administration. The Commission is of the opinion that township government should be preserved. It is of the opinion that local access roads can be best administered locally

There are areas in the sparsely settled portions of the state where the township unit for road purposes cannot be economically maintained. Study should be given to enabling legislation which will permit townships in such areas to transfer their road administration to the counties.

Uniform Town Road Tax Plan

One concrete suggestion of special interest was offered by a group of farmers and others representing the Rural Relations Committee of the Brainerd Chamber of Commerce. This committee, after an extensive study of rural roads and particularly town roads over a period of two years, proposes a plan which would permit a uniform town road tax levy throughout the county, to be expended under supervision of the county highway engineer. The findings of the Brainerd committee are summed up in the following paragraphs:

"The pertinent facts brought to our attention in this study were: The tremendous increase in travel on our roads; the changing in methods and amount of travel, without necessary changes in legislation limiting the millage that can be levied for road and bridge purposes; the unequal burden placed on certain townships and in various counties as to the number of miles of road in townships because of certain existing conditions; the fact that people no longer do most of their traveling in their own township as they did when most of our present legislation was enacted; that more than three-fourths of all taxes levied by townships in Minnesota went for road purposes and that 75 per cent of all townships in the counties studied levied the limit set for road and bridge funds; very few townships were able to purchase or hire modern equipment, and those townships that could had difficulty hiring part-time operators to maintain their roads."

The Brainerd report recommends "that legislation be enacted allowing the townships in various counties to come under a unified county set-up, whereby a uniform township road and bridge levy would be spread over said townships and all monies consolidated under the county highway engineer, to be spent under his supervision and discretion. * * * It is the only way we can see by which all townships can avail themselves of efficient operations and practical maintenance of township roads."

Sponsors of the Brainerd plan do not favor any division of gas tax monies between the county and the township. "We feel that by so doing less effective results would be secured and create

a loss of dollar efficiency. Also, it is the feeling of this committee that we should not ask for nor expect grants-in-aid until such time as we have proved that we have first helped ourselves in every way possible."

It is not proposed to make the Brainerd plan compulsory, but make it optional with each county. A majority vote of all the voters in the township or unincorporated areas within any county would be needed to put the plan in operation.

The Brainerd plan is worthy of further study.

VIII. MUNICIPAL ROADS AND STREETS

At the time of the 1940 census, Minnesota had 745 incorporated cities and villages with a population of 1,778,626, or 63.7 per cent of the state's total population.

Latest compilations show a total of 11,260 miles of roads and streets within municipal limits, or about 9 per cent of the state's total road mileage. These roads and streets carry an estimated 43 per cent of the total vehicle miles traveled within the state.

Of the routes within municipal limits, 1,294.3 miles are designated as state trunk highways and 1,237.7 miles as state aid, county aid or county roads. On these routes municipal authorities have a joint responsibility with the State Highway Department or the county boards.

Condition of Municipal Streets

Road problems in municipal areas differ widely from the problems in rural areas. Density of population made it both necessary and possible for the cities and villages to get a start on paving and other high type surfaces before such improvements were considered in rural areas. Except in very thinly populated or newly developed areas, municipal streets are seldom impassable and spring load restrictions are not a problem. The greater part of the municipal mileage is either paved or bituminous treated, at least in the more populous places.

The most serious problem facing the municipalities is that of traffic congestion. This is true not only of the larger cities but to a greater or less degree in all except the very smallest villages. It is reflected in the large number of traffic accidents within municipal areas, discussed elsewhere in this report.

One difficult phase of municipal traffic congestion is the parking problem. If off-street parking could be provided and parking prohibited on main arteries, the traffic capacity of these routes would be greatly increased. This, however, would furnish only partial relief.

Construction of by-passes or belt-lines gives limited relief in some areas by taking through traffic out of the central business district. Recent origin-destination surveys, however, show that the greater proportion of the traffic on highways approaching urban centers is headed for the central business district. Belt-lines built around some of the larger cities, it was found,

serve mainly as distributing routes for traffic entering or leaving the city, and they serve as by-passes for only a relatively small volume of through traffic. By-passes, of course, do not affect the large volume of intra-city traffic.

Any substantial relief to urban traffic congestion will involve widening and improving existing arteries, building new arteries, building grade separation structures and other bridges, installation of traffic control devices, and augmented traffic regulation.

Urban highway construction is complicated by the right-of-way problem. Any major street widening or construction of new routes involves costly right-of-way and removal of buildings. In many cases the cost of right-of-way is as great, and in some cases several times as great, as the cost of the improvements.

Municipal Street Finances

Principal sources of municipal street finances are local tax levies and special assessments on benefited property. In the year 1947 Minnesota municipalities collected $7,929,882 from tax levies and $2,547,250 from special assessments. This total of $10,477,132 collected in property taxes and assessments was equivalent to a per capita tax of $5.89 within incorporated areas (1940 census figures).

The municipalities do not directly control any of the present road user taxes. They share through extension of state highways and some county roads into or through municipalities. In 1947 the state expended $6,898,135 for construction and maintenance of trunk highways, and the counties spent $433,828 on state aid, county aid or county roads, within municipal limits.

The trunk highway routes designated by the constitutional amendment adopted in 1920 included the mileage within municipalities, except that for Duluth, Minneapolis, St. Paul and South St. Paul trunk routes ended at the city limits. The routes within those cities were added to the system in 1933. There is no statutory or constitutional limitation on the amount of trunk highway funds which may be expended within municipal limits. This is governed by traffic needs and left to the discretion of the Commissioner of Highways.

County road funds can be spent only to a limited extent within municipalities. State aid roads can be designated only within cities of the fourth class, and villages. County aid roads can be designated only in the unplatted portion of villages. The town board of any town may spend money to aid in improving or maintaining roads beyond its boundaries leading into it, but only nominal sums are so spent within municipal limits.

Federal aid funds at first were limited to strictly rural roads. This policy has been changed step by step to permit using Federal funds within municipal limits. The most advanced step in this direction was in the Federal Aid Act of 1944, which earmarked special funds for use on Federal aid routes in urban areas, including all places of more than 5,000 population, and adjacent suburbs. In addition thereto, regular Federal aid allotments may be used on all portions of the primary system, rural or urban, and Federal aid secondary funds may be used on F.A.S. routes within municipalities up to 5,000.

A common practice regarding special assessments for street improvements is to collect them in installments over a period of years, financing the projects in the meantime by borrowing. Major projects built at city-wide cost are also frequently financed by bond issues. During 1947 the municipalities issued bonds or notes totaling $1,376,164. In the same year redemptions totaled $1,786,652. Amount outstanding at the end of the year was $8,932,930.

Relief to Municipalities

Direct grants to municipalities from road user revenues (motor vehicle and gas taxes) are not possible under present constitutional provisions. With existing restrictions, relief to the municipalities can come only through expenditures on state and county roads within municipal limits.

The Commission has specifically recommended the extension of state aid roads into or through all municipalities, regardless of size or classification.

It is apparent that a greater proportion of trunk highway funds must be spent within municipal limits in the coming years in carrying out the program for expenditure of Federal aid funds earmarked for projects on Federal aid routes in urban areas. As explained in a previous section pertaining to Federal aid, this program was slow in getting under way due to complexity of plans required, shortages and high costs of bridge materials and right-of-way difficulties caused by the present housing shortage. Other Federal aid funds and state matching funds may also be used within municipal limits, and when the state's program is carried out it will undoubtedly result in substantial relief to many congested urban arteries. No conceivable amount of state or federal funds can furnish all of the improvements which are considered desirable. Furthermore, each improvement made invites new traffic, and congestion will always be a problem in urban areas.

The trunk highway section of the state constitution permits any city, village or borough to levy "wheelage taxes," so called.

A limited number of cities tried this plan in the early twenties and abandoned it. Consideration of this plan has been revived recently as a means of providing additional revenue for street purposes. One of the difficulties encountered in levying wheelage taxes is the problem of collecting the tax from persons who have their business or employment in one city and live in an adjoining city or suburb.

Three Cities of the First Class

Recommendations for relief to municipalities were made by two groups, one representing the cities of the first class, and the other the League of Minnesota Municipalities, embracing cities and villages in all sizes.

The three cities of the first class are Minneapolis, St. Paul and Duluth, located in the counties of Hennepin, Ramsey and St. Louis. These three counties had 39 per cent of the population of the state in the 1940 census, and paid 37 per cent of the motor vehicle and gas taxes collected in 1946. Under constitutional limitations on the state road and bridge fund, no county can receive more than 3 per cent of the allotments in any year, or a total of 9 per cent for the three counties.

A statement filed by the three-city committee says, in part: "The cities in 1920 voted overwhelmingly for the trunk highway amendment when the slogan was 'get the roads out of the mud.' Now we feel that the heavy traffic needs of the large cities, and the smaller cities as well, must be given more thorough consideration. The highway system must be one which will integrate the state trunk system, the major off-trunk city streets and the county secondaries into a unified network. Even under the most favorable provisions for financing, this is about all that can be done within the foreseeable future with highway user tax funds. The remaining city residential streets will have to be constructed and maintained by city funds and assessments, and land use roads by townships or extension of strictly county roads.

"Cities, whether large or small, are no longer able to meet the cost of major streets or highways designed to meet present and future traffic needs from real estate taxes or assessments. An allocation of the gasoline and motor vehicle taxes according to some fair formula is the only available means of meeting these costs."

Recommendations by the League of Minnesota Municipalities

Following the meeting of representatives of the League of Minnesota Municipalities with the Commission, the municipal

street problem was discussed at the annual convention of the League. The League's views on the present situation and its recommendations for legislation were embodied in the following resolutions adopted by the convention:

WHEREAS, nearly 10 per cent of the total highway mileage of the state (outside parks) consists of municipal streets and according to the Highway Planning Survey about 70 per cent of this municipal mileage is not included in either the county or state highways systems and yet the municipal streets (outside the state and county systems) carry about 30 per cent of the traffic (vehicle miles) of the state;

AND WHEREAS, the cost of constructing, maintaining, lighting, policing, etc., of these streets is a heavy burden on abutting property owners and the general taxes of municipalities;

AND WHEREAS, the present constitutional system exempts motor vehicles from property taxation and prevents direct sharing with municipalities of any of the highway-user taxes;

AND WHEREAS, the highway statutes have not gone as far as they may under the constitutional restrictions in using even principal streets as parts of, or extensions of, the county systems;

RESOLVED, that the League of Minnesota Municipalities again call to the attention of the Legislature and its committees the discrimination against municipalities inherent in the present constitutional system as contrasted to the new emphasis on "urban" projects in the recent federal aid highway legislation and the direct sharing with cities recommended by legislative study groups in the states of California and Michigan;

RESOLVED FURTHER, that if the present constitutional system continues, the League urge the Legislature to amend the highway statutes along the following lines:

1. In general, require that in the review and redesignation of county road systems (as recommended by the Highway Interim Committee) the present state aid, county aid and county highways shall be extended into or through municipalities of all classes so as to connect with other such highways or trunk highways and form an integrated highway system.

2. Require that such intra-municipal extensions shall be located by agreement between municipal councils and county boards and in cases of dispute by the highway department. In case such extensions involve state aid or federal aid status, the highway department should participate in three-way agreements.

3. Give councils authority for construction contracts on such intra-municipal extensions if they employ registered engineers on a permanent or consulting basis, or if they use county highway engineers as their agents, for the supervision of such contracts; otherwise, place contract authority in the hands of the county board.

4. Retain in municipalities the general administrative responsibility for such intra-municipal extensions.

5. Require counties to contribute to the cost of construction and maintenance of such intra-municipal extensions, the minimum contribution being equal to the cost of constructing and maintaining such extensions at the same standards as the highways immediately outside the limits with which they connect, as in the case of trunk highways;

6. Require county engineers to act as agents of municipalities on their request in planning and constructing such intra-municipal extensions;

7. Permit cooperative agreements between state, counties, and municipalities on all phases of street and highway matters, and enact a statute that state or county contracts let under such agreements satisfy the bidding procedures in the special assessment statutes.

This resolution was adopted prior to the defeat of the 50-50 gasoline tax amendment. Thereafter the Commission did not adopt the county program referred to in the resolution but did recommend authorization for the extension of all state aid roads into and through all cities and villages so as to form a connected system.

APPENDIX

SUPPLEMENTARY

TABLES

TABLE S-1
MINNESOTA TRUNK HIGHWAY MILEAGE
As of January 1st, 1948

COUNTIES	CONSTITUTIONAL TRUNK HIGHWAY SYSTEM				LEGISLATIVE ADDITIONS TO TRUNK HIGHWAY SYSTEM				[1] Total Mileage
	Paved	Bituminous	Non-Dustless	Total	Paved	Bituminous	Non-Dustless	Total	
Aitkin	64.39	70.14	23.67	158.20	.....	.69	107.90	108.59	266.79
Anoka	39.04	18.85	.....	57.89	.62	28.20	.....	28.82	86.71
Becker	46.14	48.34	.....	94.48	.....	.32	48.46	48.78	143.26
Beltrami	21.04	44.08	.....	65.12	.....	62.96	106.71	169.67	234.79
Benton	21.78	23.23	.....	45.01	.....	4.26	36.16	40.42	85.43
Big Stone	28.18	44.45	.....	72.63	1.15	12.21	24.90	38.26	110.89
Blue Earth	60.75	28.23	3.61	92.59	.15	15.91	60.59	76.65	169.24
Brown	36.52	24.09	.....	60.61	.....	8.38	21.33	29.71	90.32
Carlton	64.32	2.90	.....	67.22	.49	46.87	25.05	72.41	139.63
Carver	26.28	25.11	.....	51.39	.34	36.41	6.85	43.60	94.99
Cass	.57	144.68	11.38	156.63	.....	39.96	73.15	113.11	269.74
Chippewa	7.58	48.14	16.02	71.74	.....	5.34	36.06	41.40	113.14
Chisago	38.59	11.97	.....	50.56	.....	19.71	18.79	38.50	89.06
Clay	55.01	36.35	.....	91.36	.....	.48	85.16	85.64	177.00
Clearwater	17.63	20.85	.....	38.48	.....	30.08	21.67	51.75	90.23
Cook	.01	76.37	.....	76.38	.....	.....	.....	.....	76.38
Cottonwood	15.11	41.24	.....	56.35	.....	4.05	30.08	34.13	90.48
Crow Wing	46.87	51.33	.....	98.20	.46	50.96	.....	51.42	149.62
Dakota	99.46	.....	.23	99.69	25.66	25.68	20.34	71.68	171.37
Dodge	22.93	22.75	10.78	56.46	.....	1.00	18.28	19.28	75.74
Douglas	34.13	25.68	.....	59.81	.....	19.54	31.67	51.21	111.02
Faribault	53.88	17.12	.....	71.00	.....	9.26	6.71	15.97	86.97
Fillmore	53.12	49.57	.....	102.69	.96	26.19	53.85	81.00	183.69
Freeborn	58.27	3.34	12.72	74.33	13.37	.17	4.24	17.78	92.11
Goodhue	65.03	46.45	.....	111.48	.36	6.09	53.92	60.37	171.85
Grant	18.43	10.93	19.37	48.73	.....	22.78	46.37	69.15	117.88
Hennepin	63.83	19.78	.....	83.61	74.39	120.29	.....	194.68	[2]278.29
Houston	24.94	25.97	8.95	59.86	.....	1.00	48.48	49.48	109.34
Hubbard	.32	81.56	.....	81.88	.....	1.68	46.84	48.52	130.40
Isanti	.....	22.98	.04	23.02	.....	47.27	5.57	52.84	75.86
Itasca	50.29	77.84	28.40	156.53	.21	70.46	117.94	188.61	345.14
Jackson	40.44	19.16	.....	59.60	16.46	17.92	8,03	42.41	102.01
Kanabec	.....	57.43	.....	57.43	.....	14.63	29.67	44.30	101.73
Kandiyohi	41.22	37.15	1.85	80.22	.....	19.48	62.33	81.81	162.03
Kittson	6.62	56.41	.....	63.03	.08	25.04	34.95	60.07	123.10

TABLE S-1—Continued

MINNESOTA TRUNK HIGHWAY MILEAGE

As of January 1st, 1948

COUNTIES	CONSTITUTIONAL TRUNK HIGHWAY SYSTEM				LEGISLATIVE ADDITIONS TO TRUNK HIGHWAY SYSTEM				[1] Total Mileage
	Paved	Bituminous	Non-Dustless	Total	Paved	Bituminous	Non-Dustless	Total	
Koochiching	2.76	95.08	72.46	170.30	.44	6.44	98.10	104.98	275.28
Lac qui Parle	28.12	26.98	.....	55.10	.....	20.31	13.56	33.87	88.97
Lake	8.80	45.19	.....	53.99	.....	53.67	.....	53.67	107.66
Lake of the Woods	.....	25.26	6.70	31.96	.....	36.95	.....	36.95	68.91
Le Sueur	12.15	63.23	1.94	77.32	.55	16.27	16.11	32.93	110.25
Lincoln	.....	50.94	13.85	64.79	.....	11.33	.....	11.33	76.12
Lyon	48.56	51.09	.....	99.65	.....	22.99	20.98	43.97	143.62
McLeod	27.64	20.86	3.80	52.30	.82	35.96	9.31	46.09	98.39
Mahnomen	25.96	.....	4.57	30.53	.....	.....	38.13	38.13	68.66
Marshall	25.48	41.21	.....	66.69	.37	20.72	46.33	67.42	134.11
Martin	44.57	11.30	.....	55.87	.....	4.55	19.43	23.98	79.85
Meeker	27.78	42.16	12.23	82.17	.....	10.35	54.60	64.95	147.12
Mille Lacs	35.59	30.95	.....	66.54	.....	20.94	22.76	43.70	110.24
Morrison	25.37	46.67	.....	72.04	.16	45.75	17.21	63.12	135.16
Mower	56.40	20.83	.....	77.23	.....	39.65	.15	39.80	117.03
Murray	30.62	21.20	.....	51.82	.....	15.31	25.61	40.92	92.74
Nicollet	36.22	26.30	5.42	67.94	12.08	10.97	.....	23.05	90.99
Nobles	29.20	16.81	.....	46.01	20.01	9.28	18.49	47.78	93.79
Norman	1.82	50.15	9.98	61.95	.03	17.56	31.59	49.18	111.13
Olmsted	66.58	30.64	.....	97.22	.....	1.30	33.66	34.96	132.18
Otter Tail	57.22	116.38	.....	173.60	.....	74.22	38.38	112.60	286.20
Pennington	4.31	18.26	7.04	29.61	.26	13.13	27.23	40.62	70.23
Pine	50.68	10.29	.....	60.97	.07	59.03	36.46	95.56	156.53
Pipestone	24.09	13.60	.....	37.69	1.02	36.90	.....	37.92	75.61
Polk	91.81	56.90	.....	148.71	.50	4.78	64.57	69.85	218.56
Pope	3.36	58.00	.....	61.36	.....	32.60	31.56	64.16	125.52
Ramsey	30.39	.....	.....	30.39	71.55	34.82	.....	106.37	136.76
Red Lake	8.37	32.18	.07	40.62	.....	10.47	4.02	14.49	55.11
Redwood	60.00	22.75	.....	82.75	.....	1.02	14.81	15.83	98.58
Renville	76.81	35.30	.....	112.11	.....	7.55	15.67	23.22	135.33
Rice	23.29	28.46	15.82	67.57	.32	2.01	47.36	49.69	117.26
Rock	46.18	.....	.....	46.18	.....	.....	17.94	17.94	64.12
Roseau	.....	78.79	.....	78.79	.....	.....	21.92	21.92	100.71
St. Louis	94.91	176.20	14.23	285.34	69.07	78.30	83.86	231.23	516.57
Scott	27.78	9.79	.....	37.57	.....	33.33	2.13	35.46	73.03

TABLE S-1—Continued

MINNESOTA TRUNK HIGHWAY MILEAGE

As of January 1st, 1948

COUNTIES	CONSTITUTIONAL TRUNK HIGHWAY SYSTEM				LEGISLATIVE ADDITIONS TO TRUNK HIGHWAY SYSTEM				[1] Total Mileage
	Paved	Bituminous	Non-Dustless	Total	Paved	Bituminous	Non-Dustless	Total	
Sherburne	53.14	7.70	.....	60.84	.....	2.75	10.01	12.76	73.60
Sibley	40.43	8.67	11.92	61.02	.14	33.22	6.71	40.07	101.09
Stearns	49.26	85.44	18.13	152.83	.....	50.91	.....	50.91	203.74
Steele	62.89	.....	.....	62.89	.....	2.71	13.97	16.68	79.57
Stevens	16.49	25.08	9.72	51.29	.....	.68	21.67	22.35	73.64
Swift	36.34	48.80	.....	85.14	.05	18.41	25.92	44.38	129.52
Todd	9.17	76.07	.....	85.24	.....	29.80	13.05	42.85	128.09
Traverse	.....	45.38	.....	45.38	.56	7.77	23.66	31.99	77.37
Wabasha	30.50	43.19	.....	73.69	.21	10.70	25.30	36.21	109.90
Wadena	6.62	39.49	.....	46.11	.....	3.32	.....	3.32	49.43
Waseca	21.15	10.31	13.00	44.46	.....	.92	23.68	24.60	69.06
Washington	50.60	.51	.....	51.11	.55	67.49	8.95	76.99	128.10
Watonwan	40.06	4.00	.....	44.06	.70	.54	32.30	33.54	77.60
Wilkin	56.76	17.64	.....	74.40	.....	.....	53.35	53.35	127.75
Winona	63.22	15.96	.....	79.18	2.16	7.98	30.66	40.80	119.98
Wright	25.82	45.35	.....	71.17	.....	42.54	.....	42.54	113.71
Yellow Medicine	13.50	84.00	.....	97.50	.....	1.76	31.50	33.26	130.76
Total	2,931.49	3,265.81	357.90	6,555.20	316.32	1,865.23	2,484.71	4,666.26	11,221.46

Notes: [1]Includes one-half of Interstate Bridges. [2]Includes Courtesy Marking on T. H. 7 in Minneapolis.

TABLE S-2

STATE-AID ROAD MILEAGE

As of January 1, 1948

COUNTY	Un-improved	Graded & Drained	Soil Surfaced	Gravel or Stone	Bitumi-nous	P. C. Concrete	Total all Types
Aitkin	.....	2.2	.....	119.8	1.1	.....	123.1
Anoka	.....	11.8	.....	31.1	93.9	3.2	140.0
Becker	15.3	34.9	5.3	97.0	3.1	.....	155.6
Beltrami	.....	4.8	.....	106.1	1.7	.....	112.6
Benton	1.7	3.9	.....	154.3	25.6	.....	185.5
Big Stone	0.9	.....	.....	130.7	2.7	.....	134.3
Blue Earth	4.5	.....	.....	270.1	7.5	.....	282.1
Brown	.....	.....	.....	135.7	1.2	.....	136.9
Carlton	3.0	.....	2.0	104.6	33.0	.....	142.6
Carver	.....	.....	.....	75.7	52.0	.....	127.7
Cass	.....	6.2	64.6	43.3	13.0	.....	127.1
Chippewa	.....	.....	.....	149.2	3.7	.....	152.9
Chisago	4.5	4.1	.....	106.1	18.6	0.6	133.9
Clay	1.5	.....	.....	218.9	.....	.....	220.4
Clearwater	15.5	.....	.....	135.9	.....	.....	151.4
Cook	.....	28.8	.....	32.1	1.2	.....	62.1
Cottonwood	.....	.....	.....	222.1	5.3	.....	227.4
Crow Wing	18.3	2.7	.....	.....	90.5	.....	111.5
Dakota	0.6	.....	.....	220.3	26.1	0.1	247.1
Dodge	.....	4.0	.....	138.1	.....	.....	142.1
Douglas	48.4	7.0	.....	266.5	8.8	.....	330.7
Faribault	.....	.....	.....	156.2	30.5	1.0	187.7
Fillmore	.....	.....	.....	249.4	2.3	.....	251.7
Freeborn	.....	4.3	.....	251.6	7.9	.....	263.8
Goodhue	.....	.....	.....	243.3	0.6	.....	243.9
Grant	.....	1.5	.....	115.3	.....	.....	116.8
Hennepin	.....	.....	.....	80.6	244.4	6.7	331.7
Houston	0.3	.....	.....	83.6	.....	0.2	84.1
Hubbard	5.2	4.4	17.2	33.3	21.0	.....	81.1
Isanti	.....	.....	1.0	111.0	16.0	.....	128.0
Itasca	.....	11.6	.....	90.2	54.2	.....	156.0
Jackson	.....	.....	.....	231.7	14.6	.....	246.3
Kanabec	2.3	9.9	.....	94.1	12.8	.....	119.1
Kandiyohi	6.9	12.3	.....	233.9	7.3	1.0	261.4
Kittson	3.5	0.7	.....	190.9	.....	.....	195.1
Koochiching	.....	.....	.....	93.1	.....	.....	93.1
Lac qui Parle	.....	.....	.....	229.6	.....	.....	229.6
Lake	.....	.....	.....	17.0	29.5	.....	46.5
Lake of the Woods	.....	2.2	.....	70.0	.....	.....	72.2
Le Sueur	.....	.....	.....	286.8	3.3	.....	290.1
Lincoln	.....	6.0	.....	186.9	0.6	0.8	194.3
Lyon	.....	.....	.....	286.5	6.3	0.4	293.2
McLeod	.....	.....	.....	143.9	5.9	.....	149.8
Mahnomen	.....	.....	.....	75.3	.....	.....	75.3
Marshall	5.0	.....	.....	229.5	.....	.....	234.5
Martin	.....	.....	.....	206.5	2.0	.....	208.5
Meeker	.....	.....	.....	132.7	5.3	.....	138.0
Mille Lacs	.....	10.1	.....	108.1	0.5	.....	118.7
Morrison	.....	66.0	6.4	157.6	19.8	.....	249.8
Mower	.....	.....	.....	139.1	61.9	.....	201.0
Murray	.....	5.0	.....	180.8	6.6	0.7	193.1
Nicollet	.....	3.9	.....	142.8	3.7	.....	150.4
Nobles	.....	.....	.....	240.7	12.2	.....	252.9
Norman	9.5	10.0	.....	96.7	0.6	.....	116.8
Olmsted	.....	.....	.....	287.2	5.6	.....	292.8
Otter Tail	.....	.....	.....	320.6	23.7	.....	344.3
Pennington	.....	.....	.....	126.8	0.2	.....	127.0
Pine	14.0	17.3	.....	164.3	.....	.....	195.6
Pipestone	.....	.....	.....	200.5	9.0	.....	209.5
Polk	.....	2.5	.....	308.9	5.0	.....	316.4

TABLE S-2—Continued

STATE-AID ROAD MILEAGE

As of January 1, 1948

COUNTY	Un-improved	Graded & Drained	Soil Surfaced	Gravel or Stone	Bitumi-nous	P. C. Concrete	Total all Types
Pope	.....	5.0	.....	154.7	.....	.....	159.7
Ramsey	.....	.....	.....	.....	130.3	29.5	159.8
Red Lake	.....	2.0	.....	109.4	.....	.....	111.4
Redwood	1.0	.....	.....	227.6	7.6	.....	236.2
Renville	.....	.....	.....	235.2	4.7	.....	239.9
Rice	.....	.....	.....	223.9	2.7	.....	226.6
Rock	.....	13.8	.....	122.9	0.8	.....	137.5
Roseau	0.5	.....	.....	155.6	.....	.....	156.1
St. Louis	.....	.....	.....	160.8	228.5	3.5	392.8
Scott	.....	.....	.....	155.5	4.5	.....	160.0
Sherburne	.....	32.2	.....	83.7	46.5	.....	162.4
Sibley	.....	.....	.....	191.1	6.7	0.5	198.3
Stearns	.....	1.3	.....	332.4	35.0	.....	368.7
Steele	.....	.....	.....	161.9	1.9	.....	163.8
Stevens	9.6	15.3	.....	156.2	.....	.....	181.1
Swift	1.0	9.5	.....	178.5	.....	.....	189.0
Todd	.....	.....	9.5	290.8	4.9	.....	305.2
Traverse	.....	.....	.....	121.0	3.6	.....	124.6
Wabasha	.....	5.8	.....	154.0	1.3	0.3	161.4
Wadena	.....	.....	70.0	63.9	4.8	.....	138.7
Waseca	.....	.....	.....	194.8	11.2	0.3	206.3
Washington	.....	10.8	.....	62.8	24.0	5.0	102.6
Watonwan	.....	.....	.....	171.3	11.1	.....	182.4
Wilkin	.....	.....	.....	170.8	1.1	.....	171.9
Winona	.....	.....	.....	101.2	68.7	4.0	173.9
Wright	.....	.....	.....	247.7	35.8	.....	283.5
Yellow Medicine	.....	.....	.....	214.3	0.7	.....	215.0
Totals	173.0	373.8	176.0	13,796.6	1,638.7	57.8	16,215.9

TABLE S-3

COUNTY AID AND COUNTY ROAD MILEAGE

As of January 1, 1948

COUNTY	Unimproved	Graded & Drained	Soil Surfaced	Gravel or Stone	Bituminous	P. C. Concrete	Total all Types
Aitkin	12.3	.....	.....	347.3	3.0	.....	362.6
Anoka	1.1	62.5	.....	70.4	37.4	.....	171.4
Becker	46.8	76.9	.....	192.8	10.7	.....	327.2
Beltrami	4.6	74.9	.....	350.4	.....	.....	429.9
Benton	1.0	32.0	.....	210.6	0.2	.....	243.8
Big Stone	.....	.....	.....	269.0	0.8	0.5	270.3
Blue Earth	.....	1.5	.....	355.4	1.6	.....	358.5
Brown	.....	.....	.....	142.5	.....	.....	142.5
Carlton	.....	4.5	54.6	222.2	1.5	.....	282.8
Carver	.....	.....	.....	98.2	6.7	.....	104.9
Cass	19.5	.....	392.1	137.1	20.5	.....	569.2
Chippewa	.....	.....	.....	93.9	.....	.....	93.9
Chisago	1.5	.....	.....	156.2	0.8	.....	158.5
Clay	8.8	5.2	.....	416.9	.....	.....	430.9
Clearwater	60.9	20.5	.....	251.0	.....	.....	332.4
Cook	7.6	33.7	.....	57.6	0.8	.....	99.7
Cottonwood	1.4	.....	.....	162.1	.....	.....	163.5
Crow Wing	78.5	18.5	2.2	42.3	119.7	.....	261.2
Dakota	9.9	.....	.....	120.7	4.2	.....	134.8
Dodge	.....	4.3	.....	154.1	.....	.....	158.4
Douglas	121.3	3.0	.....	143.3	3.7	.....	271.3
Faribault	.....	.....	.....	241.1	0.2	.....	241.3
Fillmore	2.6	0.4	.....	157.6	0.4	.....	161.0
Freeborn	.....	2.8	.....	341.5	1.9	.....	346.2
Goodhue	.....	.....	.....	150.4	.....	.....	150.4
Grant	8.0	4.0	.....	292.8	.....	.....	304.8
Hennepin	10.2	2.0	.....	128.7	118.0	2.7	261.6
Houston	.....	.....	.....	146.6	.....	.....	146.6
Hubbard	67.2	92.7	194.6	84.4	1.7	.....	440.6
Isanti	.....	16.6	9.0	175.9	4.2	.....	205.7
Itasca	10.0	2.0	.....	648.3	44.3	.....	704.6
Jackson	.....	4.0	.....	203.6	1.0	.....	208.6
Kanabec	25.1	40.5	.....	224.4	.....	.....	290.0
Kandiyohi	8.7	5.8	.....	418.9	7.3	.....	440.7
Kittson	12.0	34.2	.....	200.5	.....	.....	246.7
Koochiching	.....	48.4	.....	281.4	.....	.....	329.8
Lac qui Parle	.....	.....	.....	253.3	.....	.....	253.3
Lake	.....	4.0	.....	110.9	18.5	.....	133.4
Lake of the Woods	19.3	54.9	.....	265.9	.....	.....	340.1
Le Sueur	.....	.....	.....	209.5	1.2	.....	210.7
Lincoln	5.0	10.3	.....	224.0	3.4	.....	242.7
Lyon	.....	2.0	.....	147.4	.....	.....	149.4
McLeod	.....	.....	.....	159.1	4.1	.....	163.2
Mahnomen	4.5	3.9	.....	150.1	.....	.....	158.5
Marshall	77.7	20.5	.....	434.2	.....	.....	532.4
Martin	.....	.....	.....	340.2	.....	.....	340.2
Meeker	55.4	.....	.....	752.0	.....	.....	807.4
Mille Lacs	.....	37.0	.....	187.2	0.9	.....	225.1
Morrison	40.1	88.9	.....	241.2	11.4	.....	381.6
Mower	.....	.....	.....	115.1	2.3	.....	117.4
Murray	.....	2.0	.....	202.0	1.3	.....	205.3
Nicollet	8.3	.....	.....	130.2	1.2	.....	139.7
Nobles	.....	.....	.....	146.6	.....	.....	146.6
Norman	8.4	9.3	.....	518.5	.....	.....	536.2
Olmsted	.....	.....	.....	38.1	.....	0.1	38.2
Otter Tail	.....	.....	.....	741.8	1.9	.....	743.7
Pennington	9.0	127.1	.....	305.1	1.0	.....	442.2
Pine	76.0	24.0	.....	339.9	.....	.....	439.9
Pipestone	.....	.....	.....	214.5	.....	.....	214.5
Polk	.....	7.5	.....	615.6	1.9	.....	625.0

TABLE S-3—Continued

COUNTY AID AND COUNTY ROAD MILEAGE

As of January 1, 1948

COUNTY	Un-improved	Graded & Drained	Soil Surfaced	Gravel or Stone	Bitumi-nous	P. C. Concrete	Total all Types
Pope	.....	.....	.....	145.0	4.0	.....	149.0
Ramsey	.....	.....	.....	5.9	49.0	8.6	63.5
Red Lake	.....	23.5	.....	271.6	.....	.....	295.1
Redwood	.....	.....	.....	283.6	0.3	.....	283.9
Renville	.....	.....	.....	376.5	3.5	.....	380.0
Rice	13.2	.....	.....	209.0	.....	.....	222.2
Rock	8.0	.....	.....	151.4	0.3	.....	159.7
Roseau	21.8	43.2	.....	552.5	.....	.....	617.5
St. Louis	.....	71.6	.....	2,354.5	102.1	28.6	2,556.8
Scott	.....	2.8	.....	153.4	.....	.....	156.2
Sherburne	1.6	139.4	.....	111.7	5.1	.....	257.8
Sibley	1.7	.....	.....	174.1	.....	.....	175.8
Stearns	17.5	5.2	.....	453.3	8.2	.....	484.2
Steele	.....	2.7	.....	102.1	0.2	.....	105.0
Stevens	.....	1.5	.....	203.7	.....	.....	205.2
Swift	3.5	5.0	.....	412.8	.....	.....	421.3
Todd	.....	2.0	27.4	277.5	0.7	.....	307.6
Traverse	11.9	4.0	.....	283.4	.....	.....	299.3
Wabasha	1.6	.....	2.0	132.6	1.9	.....	138.1
Wadena	5.0	3.0	267.3	63.5	0.6	.....	339.4
Waseca	.....	1.3	.....	147.4	3.8	.....	152.5
Washington	.....	10.2	.....	109.5	27.2	.....	146.9
Watonwan	.....	.....	.....	154.3	8.5	1.0	163.8
Wilkin	3.5	2.5	.....	270.5	0.2	.....	276.7
Winona	.....	.....	.....	147.8	37.5	0.7	186.0
Wright	.....	3.3	.....	144.1	9.2	.....	156.6
Yellow Medicine	.....	.....	.....	256.7	.....	.....	256.7
Totals	912.0	1,303.5	949.2	22,480.9	702.0	42.2	26,389.8

TABLE S-4
TOWNSHIP ROAD MILEAGE
As of September 1, 1947

COUNTIES	Not Improved	Graded & Drained Not Surfaced	Aggregate Surface	Bitumen Surface	Pavement	Total Mileage
Aitkin	227.25	396.25	223.10	.....	.....	846.60
Anoka	22.50	402.13	150.30	56.50	7.50	638.93
Becker	509.50	664.25	156.75	.....	.....	1,330.50
Beltrami	198.50	569.75	44.75	4.00	.....	817.00
Benton	94.50	85.00	75.50	.....	.....	255.00
Big Stone	68.40	122.25	214.85	.....	.....	405.50
Blue Earth	83.25	41.00	539.00	.....	.....	663.25
Brown	6.50	.....	674.70	.....	.....	681.20
Carlton	52.25	351.25	239.25	2.50	.....	645.25
Carver	.....	.....	446.50	2.25	.....	448.75
Cass	858.20	576.25	.....	.....	.....	1,434.45
Chippewa	86.00	32.00	662.50	.....	.....	780.50
Chisago	38.38	171.75	231.55	.....	.....	441.68
Clay	231.75	441.50	129.25	.....	.....	802.50
Clearwater	161.00	191.00	86.00	.....	.....	438.00
Cook	Township	Roads Und	er County	Supervision		
Cottonwood	106.50	210.75	409.25	.....	.....	726.50
Crow Wing	150.50	626.00	60.25	.....	.....	836.75
Dakota	72.75	317.77	167.25	.....	11.00	568.77
Dodge	8.50	29.25	382.25	.....	.....	420.00
Douglas	122.50	167.00	207.75	.....	.....	497.25
Faribault	61.25	24.75	685.75	.....	.....	771.75
Fillmore	155.40	111.70	630.90	.....	.....	898.00
Freeborn	70.00	168.50	372.00	25.50	.....	636.00
Goodhue	102.70	151.30	643.03	.....	.....	897.03
Grant	108.00	182.00	224.00	.....	.....	514.00
Hennepin	17.25	151.90	370.50	49.40	.....	589.05
Houston	97.50	165.05	249.55	.....	.....	512.10
Hubbard	132.75	442.25	6.00	2.50	.....	583.50
Isanti	54.25	353.00	49.50	.....	.....	456.75
Itasca	97.75	257.50	198.75	.....	.....	554.00
Jackson	39.75	56.75	697.37	.....	.....	793.87
Kanabec	55.50	151.50	82.75	.....	.....	289.75
Kandiyohi	150.26	75.00	301.00	.....	.....	526.26
Kittson	444.00	851.50	149.50	.....	.....	1,445.00
Koochiching	109.00	307.00	70.00	.....	.....	486.00
Lac qui Parle	118.25	289.75	465.25	.....	.....	873.25
Lake	2.00	59.50	.....	1.00	.....	62.50
Lake of the Woods	62.20	29.25	7.70	.....	.....	99.15
Le Sueur	14.00	2.50	271.00	.....	.....	287.50
Lincoln	87.25	97.50	339.75	1.25	.....	525.75
Lyon	74.25	175.25	550.25	.....	.....	799.75
McLeod	8.00	290.50	262.50	.....	.....	561.00
Mahnomen	52.00	77.20	155.00	.....	.....	284.20
Marshall	368.00	1,466.00	61.50	.....	.....	1,895.50
Martin	19.75	.....	701.40	.....	.....	721.15
Meeker	9.00	24.00	7.70	.....	.....	40.70
Mille Lacs	100.00	274.87	167.00	.....	.....	541.87
Morrison	259.25	724.75	202.25	25.00	6.00	1,217.25
Mower	77.75	60.00	770.00	.....	.....	907.75
Murray	96.75	51.75	712.50	.....	.....	861.00
Nicollet	51.60	.....	349.75	1.50	.....	402.85
Nobles	100.25	229.50	549.36	.....	.....	879.11
Norman	185.00	436.50	183.75	.....	.....	805.25
Olmsted	83.00	99.25	595.00	.....	0.13	777.38
Otter Tail	638.50	1,089.75	475.25	.....	.....	2,203.50
Pennington	274.50	243.50	21.25	.....	.....	539.25
Pine	164.25	533.25	133.75	.....	.....	831.25
Pipestone	108.00	24.00	318.50	.....	.....	450.50
Polk	439.00	1,222.00	561.00	.....	.....	2,222.00

TABLE S-4—Continued
TOWNSHIP ROAD MILEAGE
As of September 1, 1947

COUNTIES	Not Improved	Graded & Drained Not Surfaced	Aggregate Surface	Bitumen Surface	Pavement	Total Mileage
Pope	131.65	223.25	344.90	.....	.....	699.80
Ramsey	24.75	94.91	92.85	0.50	.15	213.16
Red Lake	73.00	154.00	20.00	.....	.....	247.00
Redwood	47.00	135.00	685.00	.....	.....	867.00
Renville	105.00	338.25	588.00	.....	.....	1,031.25
Rice	109.25	159.00	147.50	.....	1.00	416.75
Rock	61.75	206.75	341.00	4.00	.....	613.50
Roseau	311.25	641.50	68.00	.....	.....	1,020.75
St. Louis	70.15	550.70	528.25	25.00	1.80	1,175.90
Scott	11.50	.....	225.30	.....	.....	236.80
Sherburne	97.85	214.40	40.00	.....	.....	352.25
Sibley	7.00	239.50	356.00	.....	5.00	607.50
Stearns	290.50	423.75	702.27	.....	.....	1,416.52
Steele	41.00	248.75	131.50	5.50	.....	426.75
Stevens	64.50	159.25	308.00	.....	.....	531.75
Swift	131.50	183.50	300.00	.....	.....	615.00
Todd	105.45	499.00	428.25	.....	.....	1,032.70
Traverse	112.00	367.50	190.50	.....	.....	670.00
Wabasha	45.30	81.40	359.80	.....	.....	486.50
Wadena	54.50	299.50	.....	.....	.....	354.00
Waseca	19.25	79.50	237.50	.....	.....	336.25
Washington	162.00	194.95	225.25	32.50	1.50	616.20
Watonwan	14.50	14.50	355.50	.....	.....	384.50
Wilkin	123.50	632.75	187.50	.....	.....	943.75
Winona	48.00	41.70	355.35	15.70	.....	460.75
Wright	48.00	727.70	157.27	.....	.....	932.97
Yellow Medicine	87.00	99.25	675.50	.....	.....	861.75
Totals	10,583.79	23,355.68	25,743.75	254.60	34.08	59,971.90

Note: Compiled from reports of town clerks and county auditors, in accordance with sections 160.10 and 160.11, Minn. Stat. 1945.

TABLE S-5
SUMMARY OF MINNESOTA COUNTY ROAD NEEDS
1950 - 1959

COUNTY	Grading		Graveling		Base		Bituminous		Maintenance Betterment		Estimated R–W Cost	Total Construction Cost	Routine Maintenance		Misc. Co. Constr. & Anticipated Additions to County Systems	Bridges	Grand Total
	Miles	Cost	Miles	Cost	Miles	Cost	Miles	Cost	Miles	Cost			Miles	Cost	Cost	Cost	Cost
1 Aitkin	61.00	384,300	90.00	117,000	2.00	6,960	54.00	108,000				616,260	484.99	1,280,000		142,884	2,039,144
2 Anoka	16.00	96,000	16.00	20,800	90.00	104,400	90.00	270,000	41.00	12,300		503,500	321.70	752,000		14,500	1,270,000
3 Becker	310.40	1,124,875	251.40	226,172	57.00	132,240	91.80	316,592	82.40	67,684	52,240	1,919,803	482.80	1,203,000		90,020	3,312,823
4 Beltrami	264.75	1,588,500	253.50	253,500	15.50	15,500	47.50	142,500	245.75	680,750	52,950	2,733,700	546.00	1,148,500		300,000	4,182,200
5 Benton	168.60	797,500	124.50	127,200	62.50	138,200	77.50	155,000	88.00	88,000	52,000	1,357,900	425.00	728,000		22,500	2,108,400
6 Big Stone	209.50	823,000	238.50	238,500	63.00	94,500	63.00	157,500	35.00	52,500		1,366,000	404.80	877,200			2,243,200
7 Blue Earth	129.60	751,100	129.80	165,830	122.60	429,100	147.60	442,800	154.10	293,200	33,700	2,115,730	631.20	1,488,080		609,066	4,212,876
8 Brown	75.30	451,800	75.30	150,600	61.70	154,250	61.70	154,250	45.20	150,950	37,200	1,099,050	279.40	838,200		381,000	2,318,250
9 Carlton	159.66	755,718	75.55	84,125	121.94	424,351	130.94	456,459	166.00	176,500	2,000	1,899,153	553.00	1,118,050		86,184	3,103,387
10 Carver	94.90	666,070	94.90	123,370	40.20	139,896	40.20	160,800	5.70	17,100		1,107,236		59,825		103,860	1,270,921
11 Cass	99.20	624,960	267.50	347,750	8.70	30,276	172.70	431,750				1,434,736	697.50	1,337,960		88,128	2,860,824
12 Chippewa	47.50	285,000	47.50	73,000	43.00	86,000	43.00	129,000			15,000	588,000	241.20	624,700		175,000	1,387,700
13 Chisago	72.60	435,600	72.60	94,400	79.60	184,700	79.60	238,800	15.60	10,900		964,400	287.10	563,050		64,000	1,591,450
14 Clay	191.50	783,000	80.00	80,000	173.50	399,050	173.50	694,000	70.50	179,500		2,135,550	632.30	1,479,798	800,000	653,424	5,068,772
15 Clearwater	241.00	1,518,300	223.00	289,900	20.00	69,600	20.00	80,000	39.00	10,071		1,967,871	479.20	549,830		61,204	2,578,905
16 Cook	167.50	1,055,250	167.50	217,750	167.50	109,405	84.50	169,000	167.50	67,000		1,618,405	162.30	193,600		182,400	1,994,405
17 Cottonwood	228.50	1,127,300	228.50	274,200	81.50	244,500	109.50	328,500	33.00	94,000		2,068,500	380.60	969,570	170,000	451,710	3,659,780
18 Crow Wing	185.40	1,168,020			15.00	21,460	310.20	775,500	58.50	28,672	20,250	2,013,902	365.30	918,240		258,944	3,191,086
19 Dakota	195.50	1,354,816	195.50	279,565	68.80	175,578	136.90	542,124	114.20	395,704	83,479	2,831,266	376.90	1,089,353		893,232	4,813,851
20 Dodge	102.90	611,010	299.20	598,400	53.00	92,220	65.00	195,000	89.80	44,900		1,541,530	307.80	765,267		291,960	2,598,757
21 Douglas	145.60	917,280	183.45	238,485	86.10	99,876	94.10	376,400	77.15	231,450	20,841	1,884,332	355.10	1,551,604	900,000	28,160	4,364,096
22 Faribault	150.15	697,950	150.15	191,040	138.77	534,380	138.77	471,895	113.50	177,750		2,073,015	429.00	*1,370,130	75,000	170,160	3,688,305
23 Fillmore	82.95	518,300	82.90	207,250	255.30	765,900	257.90	773,700	1.60	3,520	7,000	2,275,670	396.90	1,180,555		580,000	4,036,225
24 Freeborn	325.00	1,717,500	325.00	392,500			500.00	1,750,000				3,860,000	605.30	1,474,900		150,000	5,484,900
25 Goodhue	167.20	1,053,360	167.20	217,360	15.30	45,900	15.30	30,600	48.10	96,200		1,443,420	394.20	1,049,715		225,120	2,718,255
26 Grant	54.25	301,625	54.25	62,875	18.75	65,250	18.75	93,750	78.50	78,500		602,000	411.90	1,058,330	825,000	63,000	2,548,330
27 Hennepin	74.90	898,800	74.90	149,800	410.60	1,437,100	410.60	1,437,100	370.00	1,425,000		5,347,800	587.40	***4,405,500	750,000	1,305,000	11,808,300
28 Houston	186.70	1,064,885	188.30	324,946			40.55	81,100				2,070,931	230.70	582,150		760,800	3,413,881
29 Hubbard	112.95	590,769	67.35	72,436	2.50	10,000	33.45	101,996	50.45	50,702		825,903	520.20	604,660		88,800	1,519,363
30 Isanti	182.55	821,800	181.10	235,350	18.70	71,400	108.65	304,220	19.90	22,520	19,000	1,474,290	334.30	679,975		30,960	2,185,225
31 Itasca	305.70	1,925,910	351.60	457,080	288.90	1,675,620	308.50	2,159,500	839.80	213,773		6,431,883	856.90	2,043,525		1,503,642	9,979,050
32 Jackson	189.00	1,008,600	189.00	226,800	100.80	352,800	100.80	298,760	54.40	102,300		1,989,260	501.45	1,376,775		128,000	3,494,035
33 Kanabec	143.00	776,000	143.00	143,000	25.00	125,000	25.00	50,000	31.00	40,500	17,500	1,152,000	404.00	665,500		52,000	1,869,500
34 Kandiyohi	398.38	1,968,226	398.38	447,346	159.60	517,244	159.60	464,884	273.69	336,891	186,764	3,920,355	722.12	1,830,445	296,882	186,144	6,244,526
35 Kittson	49.25	229,750	62.25	93,375	41.60	207,500	42.50	159,375	55.00	165,000		855,000	439.20	975,950		320,400	2,151,350
36 Koochiching	299.85	1,612,250	244.70	318,110	63.70	295,568	63.70	254,800	43.70	174,800	19,000	2,674,528	418.80	926,045	92,605	419,538	4,112,716
37 Lac qui Parle	125.00	748,000	108.00	115,400			52.00	104,000	152.90	304,000	9,000	1,340,720	482.90	1,269,605	210,000	395,108	3,215,433
38 Lake	23.75	138,900	109.32	145,400	78.76	283,400	86.25	276,700	178.75	412,700		1,257,100	179.90	483,100		256,200	1,996,400
39 Lake of the Woods	176.50	708,750	176.50	156,500	17.20	39,904	17.20	51,600	206.50	93,250	21,550	1,071,554	412.00	860,150		266,660	2,198,364
40 Le Sueur	53.00	257,650	53.00	60,650			10.00	40,000			15,000	373,300	498.10	1,496,215		40,320	1,909,835
41 Lincoln	106.50	550,200	106.50	96,000	79.00	137,460	79.00	158,000	13.00	32,500	42,000	1,016,160	436.00	846,165		44,400	1,906,725
42 Lyon	253.50	1,054,250	253.50	281,000	111.00	309,000	111.00	555,000	122.50	254,250	96,000	2,549,500	440.80	1,116,260		656,320	4,322,080
43 McLeod	68.30	430,290	68.30	88,790	89.45	311,286	89.45	268,350	37.25	93,125	12,500	1,204,341	313.00	937,500		177,480	2,319,321
44 Mahnomen	162.00	862,000	162.00	173,800	27.75	64,380	27.75	83,250			20,500	1,210,930	233.80	574,000		280,800	2,066,330
45 Marshall	241.00	1,282,300	125.00	162,500	205.40	714,792	205.40	410,800	400.00	520,000	36,400	3,126,792	784.30	1,038,950		158,400	4,324,142
46 Martin	204.80	971,200	204.80	235,200	103.20	705,900	103.20	404,550	246.70	283,050	119,840	2,719,740	554.30	1,594,250		304,252	4,618,242
47 Meeker	175.22	876,100	175.22	175,220	36.40	96,400	36.40	72,800	140.50	140,500		1,301,020	915.80	2,319,120		387,412	4,007,552
48 Mille Lacs	73.40	462,420	76.90	99,970	38.85	188,811	40.60	81,200	344.10	820,899	10,000	1,663,300	343.80	457,925		82,800	2,204,025
49 Morrison	322.50	2,418,750	322.50	483,750	179.80	625,704	179.80	539,400			48,375	4,115,979	630.60	755,600		101,400	4,972,979
50 Mower	106.11	530,550	64.00	160,000	77.61	181,080	90.61	181,220	31.00	46,500	53,055	1,152,405	318.00	193,825		1,529,142	2,875,372
51 Murray	120.50	690,900	120.50	156,650	84.00	263,320	84.00	239,500	50.50	101,000	71,400	1,522,770	398.20	1,004,460		115,200	2,642,430
52 Nicollet	194.00	1,356,000	194.00	368,400	210.00	1,008,000	210.00	630,000	70.00	181,000		3,543,400	290.10	815,070		387,000	4,745,470
53 Nobles	225.00	1,264,220	225.00	278,130	101.10	453,600	101.10	382,830	127.90	232,300	267,800	2,876,880	395.70	*1,115,700	60,000	148,000	4,200,580
54 Norman	258.00	1,359,600	238.00	355,400	155.25	360,180	155.25	465,750	238.50	198,700	27,325	2,746,955	642.60	1,533,450		377,208	4,657,613
55 Olmsted	159.80	1,598,000	165.50	320,950	186.60	444,010	186.60	373,200			15,500	2,751,660	320.90	1,123,150		186,480	4,061,290
56 Otter Tail	318.50	1,944,500	318.50	318,500	251.50	628,750	251.50	628,750	222.00	529,500	26,000	4,076,000	1,080.00	2,430,400		225,210	6,731,610
57 Pennington	172.30	393,245	172.30	92,495	5.00	29,000	5.00	15,000	153.20	84,580		614,320	558.40	1,201,630		100,800	1,916,750
58 Pine	279.80	1,549,310	279.80	363,740	224.70	390,978	224.70	561,750			45,000	2,910,778	634.90	1,367,300		660,000	4,938,078
59 Pipestone	151.00	954,400	151.00	113,500	43.00	25,800	43.00	150,500	425.90	861,780	151,200	2,257,180	424.00	783,550		48,105	3,088,935
60 Polk	235.20	1,360,400	235.20	267,620	201.30	836,700	201.30	402,600	37.50	93,750		2,961,070	941.40	2,199,200		259,200	5,419,470
61 Pope	169.15	1,065,645	294.95	383,435			4.00	8,000	30.14	60,280	42,287	1,559,647	308.70	783,900		25,920	2,369,467
62 Ramsey	78.00	230,000			114.00	342,000	143.00	607,750				1,179,750	223.50	2,235,000		50,000	3,464,750
63 Red Lake	140.00	690,950	136.00	122,750	36.00	72,000	36.00	72,000	136.00	145,000	3,500	1,106,200	410.00	**730,000	900,000	373,500	3,109,700
64 Redwood	177.00	728,750	177.00	264,000	184.50	573,600	184.50	381,000	41.00	151,750		2,099,100	514.90	1,547,865		823,300	4,470,265
65 Renville	135.50	753,300	93.85	105,280	94.15	218,428	70.00	175,000	332.99	188,193		1,440,201	708.79	925,201		60,320	2,425,722
66 Rice	264.50	1,666,350	200.00	260,000	74.50	216,050	74.50	186,250				2,328,650	451.80	1,139,052		56,160	3,523,862
67 Rock	208.00	988,000	208.00	228,800	76.50	272,100	76.50	191,200	307.00	61,400	106,800	1,848,300	289.20	660,900	211,200	133,760	2,854,160
68 Roseau	112.75	598,250	755.70	755,700	1.00	5,000	1.75	10,500	58.00	87,000		1,456,450	772.80	850,850		204,786	2,512,086
69 St. Louis	539.60	5,496,000	539.60	1,079,200	663.00	3,315,000	663.00	1,989,000				11,879,200	645.30	5,688,810		1,136,520	18,704,530
70 Scott	89.50	542,000	89.50	89,500	59.60	107,280	59.60	149,000	41.10	20,550		908,330		770,000		30,000	1,708,330
71 Sherburne	34.10	214,830	34.10	44,330	8.75	5,075	8.75	17,500	20.80	31,200		312,935	420.20	1,002,800		176,160	1,491,895
72 Sibley	138.00	707,500	138.00	125,900	77.00	77,000	77.00	154,000	145.00	34,287	24,000	1,182,687	371.00	837,340		61,984	2,082,011
73 Stearns	276.00	1,738,800	276.00	276,000	90.00	64,500	187.00	561,000	12.00	44,400	54,000	2,738,700	838.98	1,764,579		360,240	4,863,519
74 Steele	155.00	890,000	155.00	450,000	30.00	90,000	83.00	249,000	22.00	44,000		1,723,000	268.70	537,400		210,000	2,470,400
75 Stevens	256.00	1,612,600	388.00	504,400	30.00	104,400	30.00	60,000	89.00	89,000	2,000	2,372,400	385.20	488,139		18,816	2,879,355
76 Swift	288.65	1,818,495	288.65	375,245	93.60	325,728	93.60	374,400	93.55	150,025		3,043,893	609.70	1,361,450		223,200	4,628,543
77 Todd	355.57	2,157,163	378.23	378,230	158.02	352,841	170.71	341,420	174.24	348,480	6,000	3,584,134	612.20	1,254,310		142,388	4,980,832
78 Traverse	184.00	811,500	184.00	206,650	57.50	166,750	61.00	122,000	167.45	182,465		1,489,365	393.40	992,100	500,000	194,064	3,175,529
79 Wabasha	117.00	1,328,154	117.00	293,000	61.00	432,000	61.00	228,000	66.00	315,000	41,000	2,637,154	294.20	1,008,000		380,820	4,026,954
80 Wadena	396.80	1,649,950	396.80	329,990	31.20	88,800	31.20	68,640	58.90	71,250	46,700	2,255,330	478.10	821,175		297,500	3,374,005
81 Waseca	135.30	852,390	135.30	175,890	185.20	644,496	185.20	555,600			202,950	2,431,326	358.70	964,800		196,800	3,592,926
82 Washington	111.20	700,560	111.20	144,560	30.40	91,200	39.10	117,300	6.00	12,000		1,065,620	248.35	621,140		70,160	1,756,920
83 Watonwan	158.00	995,400	158.00	235,400	105.00	426,300	105.00	315,000				1,972,100	343.90	863,770			2,835,870
84 Wilkin	208.00	1,040,000	208.00	270,400	52.00	60,320	52.00	182,000	37.00	13,700		1,566,420	439.60	737,740		100,000	2,404,160
85 Winona	210.70	2,062,100	116.30	257,200	102.70	357,396	102.70	308,100	57.30	107,816	56,510	3,149,122	359.90	1,864,220		405,288	5,418,630
86 Wright	142.49	901,750	142.49	157,310	123.97	223,408	159.77	319,540	108.35	239,400	22,000	1,863,408	427.35	1,125,050	240,000	212,920	3,441,378
87 Yellow Medicine	210.00	866,007	210.00	339,351	75.00	233,550	75.00	155,850	100.00	375,100		1,969,858	512.20	1,142,545		50,000	3,162,403
Totals	15,385.23	90,041,203	15,849.09	20,439,901	8,094.02	26,159,401	9,743.30	29,791,775	8,909.46	13,544,317	2,315,116	182,291,713	39,582.53	100,005,373	6,030,687	24,064,243	312,392,016

*Miscellaneous County Construction.
**Replacement Cost (Grade and Gravel).
***Paving (County System).

TABLE S-6

TABULATION SHOWING EFFECT OF 40, 45, 50 AND 60 PERCENT LIMITATIONS ON RURAL COUNTY MILEAGE

COUNTY	Total Non-trunk Rural Mileage as of 12-31-46	Rural State Aid and Co. Aid Mileage as of 12-31-46	Rural County Mileage under 40% Limitation	Effect of 40% Limitation	Rural County Mileage under 45% Limitation	Effect of 45% Limitation	Rural County Mileage under 50% Limitation	Effect of 50% Limitation	Rural County Mileage under 60% Limitation	Effect of 60% Limitation
Aitkin	1,207.33	478.60	482.93	+ 4.33	543.30	+ 64.70	603.67	+ 125.07	724.40	+ 245.80
Anoka	687.40	308.70	274.96	− 33.74	309.33	+ .63	343.70	+ 35.00	412.44	+ 103.74
Becker	1,804.18	478.70	721.67	+ 242.97	811.88	+ 333.18	902.09	+ 423.39	1,082.51	+ 603.81
Beltrami	1,275.64	529.70	510.26	− 19.44	574.04	+ 44.34	637.82	+ 108.12	765.38	+ 235.68
Benton	680.45	416.50	272.18	− 144.32	306.20	− 110.30	340.23	− 76.27	408.27	− 8.23
Big Stone	784.98	394.80	313.99	− 80.81	353.24	− 41.56	392.49	− 2.31	470.99	+ 76.19
Blue Earth	1,240.00	620.30	496.00	− 124.30	558.00	− 62.30	620.00	− .30	744.00	+ 123.70
Brown	893.80	274.10	357.52	+ 83.42	402.21	+ 128.11	446.90	+ 172.80	536.28	+ 262.18
Carlton	966.49	409.90	386.60	− 23.30	434.92	+ 25.02	483.24	+ 73.34	579.89	+ 169.99
Carver	635.97	217.10	254.39	+ 37.29	286.19	+ 69.09	317.99	+ 100.89	381.58	+ 164.48
Cass	2,008.60	694.60	803.44	+ 108.84	903.87	+ 209.27	1,004.30	+ 309.70	1,205.16	+ 510.56
Chippewa	963.93	235.20	385.57	+ 150.37	433.77	+ 198.57	481.96	+ 246.76	578.36	+ 343.16
Chisago	659.36	257.70	263.74	+ 6.04	296.71	+ 39.01	329.68	+ 71.98	395.62	+ 137.92
Clay	1,740.21	621.30	696.08	+ 74.78	783.09	+ 161.79	870.10	+ 248.80	1,044.13	+ 422.83
Clearwater	889.87	471.00	355.95	− 115.05	400.44	− 70.56	444.94	− 26.06	533.92	+ 62.92
Cook	280.54	154.30	112.22	− 42.08	126.24	− 28.06	140.27	− 14.03	168.32	+ 14.02
Cottonwood	1,052.49	375.40	421.00	+ 45.60	473.62	+ 98.22	526.24	+ 150.84	631.49	+ 256.09
Crow Wing	1,266.05	336.50	506.42	+ 169.92	569.72	+ 233.22	633.03	+ 296.53	759.63	+ 423.13
Dakota	874.56	352.40	349.82	− 2.58	393.55	+ 41.15	437.28	+ 84.88	524.74	+ 172.34
Dodge	684.08	293.90	273.63	− 20.27	307.84	+ 13.94	342.04	+ 48.14	410.45	+ 116.55
Douglas	1,054.13	566.40	421.65	− 144.75	474.36	− 92.04	527.06	− 39.34	632.48	+ 66.08
Faribault	1,148.90	408.70	459.56	+ 50.86	517.01	+ 108.31	574.45	+ 165.75	689.34	+ 280.64
Fillmore	1,264.51	386.60	505.80	+ 119.20	569.03	+ 182.43	632.26	+ 245.66	758.71	+ 372.11
Freeborn	1,223.48	592.30	489.39	− 102.91	550.57	− 41.73	611.74	+ 19.44	734.09	+ 141.79
Goodhue	1,234.02	384.80	493.61	+ 108.81	555.31	+ 170.51	617.01	+ 232.21	740.41	+ 355.61
Grant	873.56	397.30	349.42	− 47.88	393.10	− 4.20	436.78	+ 39.48	524.14	+ 126.84
Hennepin	967.28	456.60	386.92	− 69.68	435.28	− 21.32	483.64	+ 27.04	580.36	+ 123.76
Houston	691.27	226.50	276.51	+ 50.01	311.07	+ 84.57	345.64	+ 119.14	414.76	+ 188.26
Hubbard	1,055.11	510.00	422.04	− 87.96	474.80	− 35.20	527.56	+ 17.56	633.07	+ 123.07
Isanti	750.91	326.30	300.36	− 25.94	337.91	+ 11.61	375.45	+ 49.15	450.55	+ 124.25

TABLE S-6—Continued

TABULATION SHOWING EFFECT OF 40, 45, 50 AND 60 PERCENT LIMITATIONS ON RURAL COUNTY MILEAGE

COUNTY	Total Non-trunk Rural Mileage as of 12-31-46	Rural State Aid and Co. Aid Mileage as of 12-31-46	Rural County Mileage under 40% Limitation	Effect of 40% Limitation	Rural County Mileage under 45% Limitation	Effect of 45% Limitation	Rural County Mileage under 50% Limitation	Effect of 50% Limitation	Rural County Mileage under 60% Limitation	Effect of 60% Limitation
Itasca	1,513.45	842.10	605.38	− 236.72	681.05	− 161.05	756.72	− 85.38	908.07	+ 65.97
Jackson	1,172.53	443.80	469.02	+ 25.22	527.64	+ 83.84	586.26	+ 142.46	703.51	+ 259.71
Kanabec	651.47	399.00	260.59	− 138.41	293.16	− 105.84	325.74	− 73.26	390.88	− 8.12
Kandiyohi	1,209.50	681.60	483.80	− 197.80	544.28	− 137.32	604.75	− 76.85	725.70	+ 44.10
Kittson	1,724.98	428.20	689.99	+ 261.79	776.24	+ 348.04	862.49	+ 434.29	1,034.99	+ 606.79
Koochiching	759.15	403.40	303.66	− 99.74	341.62	− 61.78	379.57	− 23.83	455.49	+ 52.09
Lac qui Parle	1,321.09	477.60	528.44	+ 50.84	594.49	+ 116.89	660.55	+ 182.95	792.65	+ 315.05
Lake	254.00	179.40	101.60	− 77.80	114.30	− 65.10	127.00	− 52.40	152.40	− 27.00
Lake of the Woods	543.41	405.70	217.36	− 188.34	244.53	− 161.17	271.71	− 133.99	326.05	− 79.65
Le Sueur	750.49	480.80	300.20	− 180.60	337.72	− 143.08	375.25	− 105.55	450.29	− 30.51
Lincoln	899.05	422.80	359.62	− 63.18	404.57	− 18.23	449.52	+ 26.72	539.43	+ 116.63
Lyon	1,195.69	426.80	478.28	+ 51.48	538.06	+ 111.26	597.85	+ 171.05	717.41	+ 290.61
McLeod	799.17	305.70	319.67	+ 13.97	359.63	+ 53.93	399.58	+ 93.88	479.50	+ 173.80
Mahnomen	668.19	232.10	267.28	+ 35.18	300.69	+ 68.59	334.10	+ 102.00	400.91	+ 168.81
Marshall	2,587.62	757.20	1,035.05	+ 277.85	1,164.43	+ 407.23	1,293.81	+ 536.61	1,552.57	+ 795.37
Martin	1,206.11	540.50	482.44	− 58.06	542.75	+ 2.25	603.05	+ 62.55	723.67	+ 183.17
Meeker	1,060.83	905.90	424.33	− 481.57	477.37	− 428.53	530.41	− 375.49	636.50	− 269.40
Mille Lacs	777.63	335.80	311.05	− 24.75	349.93	+ 14.13	388.81	+ 53.01	466.58	+ 130.78
Morrison	1,895.59	598.80	758.24	+ 159.44	853.02	+ 254.22	947.78	+ 348.98	1,137.35	+ 538.55
Mower	1,140.65	302.90	456.26	+ 153.36	513.29	+ 210.39	570.33	+ 267.43	684.39	+ 381.49
Murray	1,168.67	388.30	467.48	+ 79.18	525.90	+ 137.60	584.33	+ 196.03	701.19	+ 312.89
Nicollet	653.03	285.80	261.21	− 24.59	293.86	+ 8.06	326.51	+ 40.71	391.82	+ 106.02
Nobles	1,217.04	379.30	486.82	+ 107.52	547.67	+ 168.37	608.52	+ 229.22	730.22	+ 350.92
Norman	1,430.94	639.10	572.38	− 66.72	643.92	+ 4.82	715.47	+ 76.37	858.56	+ 219.46
Olmsted	1,050.63	321.90	420.25	+ 98.35	472.78	+ 150.88	525.31	+ 203.41	630.38	+ 308.48
Otter Tail	3,077.11	1,051.60	1,230.84	+ 179.24	1,384.71	+ 333.11	1,538.56	+ 486.96	1,846.27	+ 794.67
Pennington	1,129.40	555.60	451.76	− 103.84	508.24	− 47.38	564.70	+ 9.10	677.64	+ 122.04
Pine	1,428.73	608.20	571.49	− 36.71	642.93	+ 34.73	714.37	+ 106.17	857.24	+ 249.04
Pipestone	819.38	400.50	327.75	− 72.75	368.72	− 31.78	409.69	+ 9.19	491.63	+ 91.13
Polk	2,924.93	928.10	1,169.97	+ 241.87	1,316.22	+ 388.12	1,462.46	+ 534.36	1,754.96	+ 826.86

TABLE S-6—Continued

TABULATION SHOWING EFFECT OF 40, 45, 50 AND 60 PERCENT LIMITATIONS ON RURAL COUNTY MILEAGE

COUNTY	Total Non-trunk Rural Mileage as of 12-31-46	Rural State Aid and Co. Aid Mileage as of 12-31-46	Rural County Mileage under 40% Limitation	Effect of 40% Limitation	Rural County Mileage under 45% Limitation	Effect of 45% Limitation	Rural County Mileage under 50% Limitation	Effect of 50% Limitation	Rural County Mileage under 60% Limitation	Effect of 60% Limitation
Pope	967.01	301.40	386.80	+ 85.40	435.15	+ 133.75	483.51	+ 182.11	580.21	+ 278.81
Ramsey	408.27	201.70	163.31	− 38.39	183.72	− 17.98	204.14	+ 2.44	244.96	+ 43.26
Red Lake	661.05	397.10	264.42	− 132.68	297.47	− 99.63	330.52	− 66.58	396.63	− .47
Redwood	1,289.78	492.20	515.91	+ 23.71	580.40	+ 88.20	644.89	+ 152.69	773.87	+ 281.67
Renville	1,592.14	605.20	636.86	+ 31.66	716.46	+ 111.26	796.07	+ 190.87	955.28	+ 350.08
Rice	823.51	444.80	329.40	− 115.40	370.58	− 74.22	411.76	− 33.04	494.11	+ 49.31
Rock	848.36	280.30	339.34	+ 59.04	381.76	+ 101.46	424.18	+ 143.88	509.02	+ 228.72
Roseau	2,100.75	763.80	840.30	+ 76.50	945.35	+ 181.55	1,050.38	+ 286.58	1,260.45	+ 496.65
St. Louis	3,997.00	2,895.30	1,598.80	−1,296.50	1,798.66	−1,096.66	1,998.50	− 896.80	2,398.20	− 497.10
Scott	518.64	300.60	207.46	− 93.14	233.39	− 67.21	259.32	− 41.28	311.18	+ 10.58
Sherburne	732.03	410.70	292.81	− 117.89	329.41	− 81.29	366.02	− 44.68	439.22	+ 28.52
Sibley	924.79	368.20	369.92	+ 1.72	416.16	+ 47.96	462.39	+ 94.19	554.87	+ 186.67
Stearns	2,158.13	809.70	863.25	+ 53.55	971.16	+ 161.46	1,079.07	+ 269.37	1,294.88	+ 485.18
Steele	649.25	264.80	259.70	− 5.10	292.16	+ 27.36	324.63	+ 59.83	389.55	+ 124.75
Stevens	842.92	372.40	337.17	− 35.23	379.31	+ 6.91	421.46	+ 49.06	505.75	+ 133.35
Swift	1,183.88	598.60	473.55	− 125.05	532.75	− 65.85	591.94	− 6.66	710.33	+ 111.73
Todd	1,552.21	599.70	620.88	+ 21.18	698.49	+ 98.79	776.11	+ 176.41	931.33	+ 331.63
Traverse	1,021.28	390.10	408.51	+ 18.41	459.58	+ 69.48	510.64	+ 120.54	612.77	+ 222.67
Wabasha	730.86	283.30	292.34	+ 9.04	328.89	+ 45.59	365.43	+ 82.13	438.52	+ 155.22
Wadena	763.75	453.90	305.50	− 148.40	343.69	− 110.21	381.88	− 72.02	458.25	+ 4.35
Waseca	654.71	350.60	261.88	− 88.72	294.62	− 55.98	327.35	− 23.25	392.83	+ 42.23
Washington	842.23	234.00	336.89	+ 102.89	379.00	+ 145.00	421.11	+ 187.11	505.34	+ 271.34
Watonwan	689.76	334.00	275.90	− 58.10	310.39	− 23.61	344.88	+ 10.88	413.86	+ 79.86
Wilkin	1,334.00	427.40	533.60	+ 106.20	600.30	+ 172.90	667.00	+ 239.60	800.40	+ 373.00
Winona	765.27	346.40	306.11	− 40.29	344.37	− 2.03	382.64	+ 36.24	459.16	+ 112.76
Wright	1,270.75	387.10	508.30	+ 121.20	571.84	+ 184.74	635.37	+ 248.27	762.45	+ 375.35
Yellow Medicine	1,247.11	461.00	498.85	+ 37.85	561.20	+ 100.20	623.55	+ 162.55	748.26	+ 287.26
Totals	98,459.00	41,079.00	39,383.60	−1,695.40	44,306.58	+3,227.58	49,229.50	+8,150.50	59,075.40	+17,996.40

TABLE S-7

COUNTY ROAD AND BRIDGE TAX LEVIES, 1947, AND AVERAGE LEVIES, 1936-1947

COUNTY	1947 Levy	12-Year Average	COUNTY	1947 Levy	12-Year Average
	Mills	Mills		Mills	Mills
Aitkin	14.14	8.799	Martin	10.20	5.411
Anoka	8.48	7.523	Meeker	15.00	10.787
Becker	20.00	9.445	Mille Lacs	15.00	9.687
Beltrami	18.31	10.103	Morrison	14.62	10.774
Benton	17.10	10.650	Mower	10.15	9.413
Big Stone	15.00	5.914	Murray	7.05	5.527
Blue Earth	8.33	4.777	Nicollet	8.57	6.807
Brown	10.71	6.664	Nobles	12.40	7.793
Carlton	15.00	9.911	Norman	13.88	10.164
Carver	15.00	11.688	Olmsted	8.52	8.097
Cass	7.20	4.740	Otter Tail	15.00	9.474
Chippewa	15.00	6.816	Pennington	15.00	11.146
Chisago	13.04	10.175	Pine	14.92	9.749
Clay	10.21	4.297	Pipestone	12.10	7.643
Clearwater	16.60	7.357	Polk	14.91	9.041
Cook	10.00	9.343	Pope	13.70	7.741
Cottonwood	14.70	9.714	Ramsey	1.54	.898
Crow Wing	13.01	10.103	Red Lake	13.87	7.870
Dakota	9.46	7.828	Redwood	9.40	8.436
Dodge	14.90	9.710	Renville	8.27	7.628
Douglas	15.00	8.269	Rice	10.32	7.614
Faribault	9.40	7.226	Rock	7.60	5.204
Fillmore	15.00	10.201	Roseau	20.00	10.815
Freeborn	11.00	6.164	St. Louis	9.32	6.361
Goodhue	11.76	7.920	Scott	10.84	9.418
Grant	13.86	7.338	Sherburne	12.08	10.930
Hennepin		.760	Sibley	12.21	9.890
Houston	17.76	10.675	Stearns	12.88	8.896
Hubbard	10.57	6.662	Steele	9.25	7.221
Isanti	24.60	11.944	Stevens	9.00	6.335
Itasca	15.45	11.737	Swift	17.20	7.489
Jackson	11.82	7.776	Todd	17.72	11.488
Kanabec	18.00	11.229	Traverse	12.48	6.481
Kandiyohi	14.36	8.272	Wabasha	14.00	9.810
Kittson	19.55	10.904	Wadena	14.00	8.542
Koochiching	19.47	7.969	Waseca	15.00	7.902
Lac qui Parle	8.35	4.589	Washington	15.00	8.548
Lake	10.10	9.952	Watonwan	9.50	6.659
Lake of the Woods	11.64	8.495	Wilkin	8.77	7.316
Le Sueur	14.49	9.884	Winona	15.00	10.258
Lincoln	17.27	10.802	Wright	14.34	9.720
Lyon	7.62	6.274	Yellow Medicine	11.30	7.758
McLeod	12.50	8.119			
Mahnomen	13.65	5.686			
Marshall	14.70	10.631			

TABLE S-8

1946 VALUATIONS OF MINNESOTA COUNTIES AND TAXES LEVIED TO BE COLLECTED IN 1947

COUNTY	1946 Taxable Valuation	1946 Road and Bridge Tax Levy	1946 Total County Tax Levy	1946 Road and Bridge Tax Levy	1946 Total County Tax Levy
	Dollars	Dollars	Dollars	Mills	Mills
Aitkin	1,892,778	18,928	213,298	10.00	112.69
Anoka	6,164,541	54,987	207,499	8.92	33.66
Becker	6,080,955	91,214	268,778	15.00	44.20
Beltrami	3,775,599	37,756	224,081	10.00	59.35
Benton	4,551,078	65,087	205,255	14.30	45.10
Big Stone	5,400,038	70,038	142,513	12.97	25.95
Blue Earth	20,426,110	145,025	438,363	7.10	20.00
Brown	13,684,231	152,307	310,633	11.13	22.70
Carlton	7,421,028	74,210	252,315	10.00	34.00
Carver	9,267,354	139,009	246,048	15.00	25.95
Cass	2,385,890	22,189	208,050	9.30	87.20
Chippewa	7,953,360	100,053	286,187	12.58	35.35
Chisago	4,468,553	55,946	160,059	12.52	35.34
Clay	10,386,384	103,864	278,375	10.00	26.65
Clearwater	1,467,132	17,004	128,492	11.59	87.58
Cook	968,371	9,684	42,609	10.00	44.00
Cottonwood	9,852,877	98,529	219,500	10.00	21.05
Crow Wing	8,999,675	80,007	322,457	8.89	35.83
Dakota	17,693,218	150,038	410,466	8.48	23.11
Dodge	7,263,838	75,544	181,234	10.40	24.95
Douglas	7,272,816	104,001	264,536	14.30	36.30
Faribault	13,912,364	134,255	308,485	9.65	21.05
Fillmore	12,406,828	124,068	284,736	10.00	22.95
Freeborn	15,773,655	145,118	372,287	9.20	21.69
Goodhue	16,435,642	160,083	359,119	9.74	21.85
Grant	4,897,091	70,028	150,586	14.30	29.82
Hennepin	282,294,903	327,264	5,774,619	1.16	21.35
Houston	5,193,024	77,855	191,726	15.00	36.92
Hubbard	1,801,255	20,012	124,557	11.11	69.15
Isanti	3,303,073	42,081	165,072	12.74	49.35
Itasca	14,893,473	200,317	599,240	13.45	40.88
Jackson	12,261,416	115,012	253,666	9.38	20.00
Kanabec	2,143,871	27,463	136,663	12.81	63.66
Kandiyohi	12,434,015	122,106	296,963	9.82	23.55
Kittson	4,710,168	69,946	191,298	14.85	39.19
Koochiching	3,490,960	34,910	218,324	10.00	62.54
Lac qui Parle	10,548,030	70,039	237,781	6.64	21.95
Lake	1,548,282	15,483	57,680	10.00	37.61
Lake of the Woods	639,378	7,889	65,525	12.34	102.49
Le Sueur	9,521,705	88,171	203,571	9.26	21.35
Lincoln	6,155,794	85,012	178,005	13.81	28.90
Lyon	12,352,249	100,053	283,564	8.10	22.55
McLeod	11,804,725	131,032	289,027	11.10	23.80
Mahnomen	1,294,709	14,993	78,653	11.58	60.75
Marshall	5,139,148	61,156	300,916	11.90	51.79
Martin	16,417,943	150,060	341,879	9.14	19.15
Meeker	9,736,315	146,044	268,264	15.00	27.50
Mille Lacs	3,099,580	30,996	193,290	10.00	62.36
Morrison	7,314,640	107,964	281,614	14.76	38.50
Mower	18,390,391	180,041	418,013	9.79	22.73
Murray	10,213,711	75,071	216,151	7.35	20.09
Nicollet	7,965,701	70,018	186,718	8.79	23.05
Nobles	14,913,711	174,490	375,585	11.70	23.95
Norman	5,265,477	75,033	213,050	14.25	40.45
Olmsted	25,102,678	200,069	483,228	7.97	19.25

TABLE S-8—Continued

1946 VALUATIONS OF MINNESOTA COUNTIES AND TAXES LEVIED TO BE COLLECTED IN 1947

COUNTY	1946 Taxable Valuation	1946 Road and Bridge Tax Levy	1946 Total County Tax Levy	1946 Road and Bridge Tax Levy	1946 Total County Tax Levy
	Dollars	Dollars	Dollars	Mills	Mills
Otter Tail	14,967,178	145,481	404,427	9.72	26.95
Pennington	4,141,656	41,423	200,253	10.00	47.33
Pine	3,611,957	36,120	263,131	10.00	72.85
Pipestone	7,843,401	85,101	198,518	10.85	25.05
Polk	13,833,498	135,015	440,630	9.76	28.85
Pope	6,396,197	90,059	195,086	14.08	30.50
Ramsey	155,299,860	358,743	4,374,356	2.31	28.10
Red Lake	2,068,533	20,064	107,419	9.70	50.00
Redwood	14,538,033	114,850	273,002	7.90	17.70
Renville	15,827,720	134,536	411,836	8.50	23.25
Rice	12,665,222	120,066	312,198	9.48	24.65
Rock	9,603,324	79,995	155,135	8.33	16.15
Roseau	2,847,406	24,972	132,769	8.77	46.33
St. Louis	173,589,896	1,359,730	4,672,996	7.833	26.83
Scott	6,262,795	65,008	165,025	10.38	26.35
Sherburne	2,440,653	30,508	118,195	12.50	47.26
Sibley	11,307,582	123,366	236,635	10.91	20.85
Stearns	20,631,868	226,950	601,493	11.00	29.45
Steele	10,120,678	97,158	258,101	9.60	25.15
Stevens	6,088,468	56,988	157,547	9.36	24.52
Swift	6,995,089	85,340	244,044	12.20	32.15
Todd	7,296,084	111,557	345,614	15.29	47.37
Traverse	5,074,092	70,023	140,097	13.80	27.61
Wabasha	8,059,499	115,009	265,722	14.27	32.97
Wadena	2,801,332	27,227	114,082	9.70	40.62
Waseca	8,574,797	85,748	212,528	10.00	24.44
Washington	8,842,730	111,242	286,065	12.58	32.35
Watonwan	7,713,724	75,193	209,902	9.75	25.80
Wilkin	6,272,480	57,017	164,569	9.09	24.23
Winona	17,837,433	178,376	419,719	10.00	23.53
Wright	10,629,930	123,097	288,054	11.58	27.05
Yellow Medicine	10,693,740	106,937	275,525	10.00	23.60
Total	1,335,628,586	9,612,451	35,755,275		
Average per county	.....	.....	.....	7.19+	26.77+

TABLE S-9

TOWNSHIP VALUATIONS, ROAD AND BRIDGE TAX LEVIES, AND DEBT INFORMATION[1]

COUNTY	Township Taxable Valuations in 1946	Average Road and Bridge Tax Mill Rate[2]	Township Road and Bridge Debt As of Dec. 31, 1946		Final Payment Due
			Bonds	Notes	
	Dollars	Mills	Dollars	Dollars	Year
Aitkin	1,408,796	15.39	41,626	.....	1961
Anoka	3,514,509	12.60	.....	.....	.....
Becker	4,248,514	17.09	3,500	.....	1956
Beltrami	1,331,477	13.86	23.300	.....	1956
Benton	2,731,044	8.84	34,000	.....	1966
Big Stone	4,163,690	9.16	.....	.....	.....
Blue Earth	11,652,214	11.28	.....	5,000	1949
Brown	8,549,858	10.93	.....	.....	.....
Carlton	2,693,471	15.00	5,300	.....	1951
Carver	7,080,500	12.28	.....	2,525	1948
Cass	1,890,984	13.88	17,014	.....	1960
Chippewa	5,456,263	16.70	2,000	.....	1950
Chisago	3,042,680	16.35	.....	.....	.....
Clay	6,738,074	12.47	.....	.....	.....
Clearwater	1,112,865	16.39	41,500	.....	1953
Cook	754,624	20.00	8,300	.....	1948
Cottonwood	8,177,553	8.67	35,000	.....	1961
Crow Wing	3,749,547	15.51	5,720	.....	1953
Dakota	6,673,023	12.19	.....	.....	.....
Dodge	5,934,947	15.39	6,000	.....	1955
Douglas	4,978,554	12.88	.....	.....	.....
Faribault	10,610,500	16.73	.....	.....	.....
Fillmore	9,506,299	18.94	186,000	.....	1966
Freeborn	10,323,795	10.94	.....	.....	.....
Goodhue	10,356,616	14.95	249,500	.....	1960
Grant	4,038,587	10.13	.....	.....	.....
Hennepin	10,804,134	11.01	9,000	.....	1956
Houston	4,063,463	22.98	129,000	.....	1959
Hubbard	1,333,280	8.79	1,500	.....	1951
Isanti	2,635,969	16.72	.....	.....	.....
Itasca	3,878,294	15.22	5,100	.....	1962
Jackson	10,385,614	8.77	.....	.....	.....
Kanabec	1,633,205	14.68	7,500	.....	1956
Kandiyohi	9,155,923	11.15	.....	.....	.....
Kittson	3,994,295	12.90	2,700	.....	1952
Koochiching	597,102	15.20	1,500	.....	1948
Lac qui Parle	8,805,380	10.43	.....	.....	.....
Lake	997,089	15.00	.....	.....	.....
Lake of the Woods	465,145	8.88	800	.....	1948
Le Sueur	6,903,056	10.39	.....	.....	.....
Lincoln	5,171,003	11.70	.....	.....	.....
Lyon	9,269,806	7.68	.....	.....	.....
McLeod	8,457,719	9.41	.....	.....	.....
Mahnomen	1,047,370	15.54	21,750	.....	1959
Marshall	4,401,132	12.31	600	.....	1949
Martin	12,364,643	9.64	.....	.....	.....
Meeker	7,840,570	9.44	.....	5,000	1948
Mille Lacs	2,011,981	15.02	9,480	.....	1956
Morrison	5,013,422	13.41	12,700	.....	1956
Mower	9,771,425	13.89	.....	1,800	1948
Murray	8,944,639	11.06	.....	.....	.....
Nicollet	5,985,404	9.13	.....	.....	.....
Nobles	11,387,421	8.40	2,000	.....	1948
Norman	4,318,960	10.63	.....	.....	.....
Olmsted	9,253,308	15.25	28,000	.....	1956

TABLE S-9—Continued

TOWNSHIP VALUATIONS, ROAD AND BRIDGE TAX LEVIES, AND DEBT INFORMATION[1]

COUNTY	Township Taxable Valuations in 1946	Average Road and Bridge Tax Mill Rate[2]	Township Road and Bridge Debt As of Dec. 31, 1946		Final Payment Due
			Bonds	Notes	
	Dollars	Mills	Dollars	Dollars	Year
Otter Tail	9,793,316	18.52	90,000	.....	1966
Pennington	1,893,858	9.26	1,600	.....	1950
Pine	2,512,247	15.23	57,890	.....	1960
Pipestone	5,727,324	7.53	.....	.....	.....
Polk	10,036,548	12.97	78,800	.....	1965
Pope	5,075,419	11.30	20,000	.....	1966
Ramsey	8,018,106	5.39	.....	.....	.....
Red Lake	1,556,774	10.88	.....	.....	.....
Redwood	11,759,860	9.19	11,000	6,500	1957
Renville	12,895,967	12.29	.....	.....	.....
Rice	7,258,798	12.81	.....	.....	.....
Rock	7,998,713	10.17	18,000	.....	1955
Roseau	2,173,452	15.93	13,525	.....	1953
St. Louis	35,368,640	13.42	448,650	.....	1958
Scott	4,524,396	12.04	.....	.....	.....
Sherburne	1,784,419	4.44	.....	.....	.....
Sibley	9,567,158	10.26	.....	.....	.....
Stearns	11,238,950	16.37	288,000	10,500	1964
Steele	6,547,019	13.86	.....	.....	.....
Stevens	4,640,246	11.07	.....	.....	.....
Swift	5,363,821	14.08	2,300	.....	1955
Todd	5,687,711	14.82	25,000	.....	1952
Traverse	4,360,422	9.42	700	.....	1947
Wabasha	5,601,270	14.26	87,000	.....	1966
Wadena	1,497,711	9.78	730	.....	1948
Waseca	6,415,006	12.68	.....	6,324	1948
Washington	4,585,525	16.07	.....	.....	.....
Watonwan	6,264,545	11.63	.....	.....	.....
Wilkin	5,196,991	9.33	.....	.....	.....
Winona	7,156,654	7.86	.....	.....	.....
Wright	7,953,970	18.93	.....	.....	.....
Yellow Medicine	8,590,970	10.95	5,400	.....	1949
Total	540,655,542	.....	2,038,985	37,649	.....

[1]Eight counties have unorganized townships. Valuations and tax mill rates are included in the respective county totals.

[2]Includes road and bridge, drag, special road and bridge, snow removal, emergency road and bridge and gravel tax levies. Debt service tax levies are not included.

TABLE S-10
ANALYSIS OF 1948 PASSENGER CAR REGISTRATIONS
To April 1, 1948

Year Model		Motorcycles and Scooters	WEIGHT IN POUNDS															Totals	Percent
			Under 2000	2001 - 2200	2201 - 2400	2401 - 2600	2601 - 2800	2801 - 3000	3001 - 3200	3201 - 3400	3401 - 3600	3601 - 3800	3801 - 4000	4001 - 4200	4201 - 4400	4401 - 4600	4601 - 4800	4801 or more		
1948	No. Veh.	299	39	177	114	27	586	312	4054	7106	1293	761	580	316	42	1	1	15	15,385	2.16
	Fees	$ 984.31	$ 429.00	$ 3,009.00	$ 2,052.00	$ 513.00	$ 11,720.00	$ 6,552.00	$ 90,201.50	$ 181,203.00	$ 35,234.00	$ 23,400.00	$ 20,155.00	$ 14,220.00	$ 2,268.00	$ 57.00	$ 65.00	$ 1,125.00	$ 391,774.50	5.41
1947	No. Veh.	3489	159	370	13	199	2639	1156	28380	19682	7201	3104	2462	2071	522	94	2	321	68,216	9.56
	Fees	11,488.39	1,574.10	5,661.00	210.60	3,402.90	47,502.00	21,848.40	568,451.40	451,701.90	176,640.53	85,918.72	77,011.36	83,875.50	25,369.20	4,822.20	117.00	21,667.50	1,574,200.21	21.75
1946	No. Veh.	2033	30	343	2	275	1440	468	26403	9893	4803	1680	1907	662	285	50	4	362	48,577	6.81
	Fees	6,692.64	247.50	4,373.00	27.00	3,919.00	21,600.00	7,371.00	440,666.00	189,253.00	98,173.00	38,741.00	49,696.00	22,342.00	11,543.00	2,138.00	195.00	20,362.00	910,399.00	12.58
1942	No. Veh.	491	102	50	130	1107	25	1151	9668	4498	2464	468	633	237	67	12	16	96	20,622	2.89
	Fees	1,616.37	510.00	375.00	975.00	8,302.50	187.50	8,632.50	72,510.00	33,735.00	18,480.00	3,510.00	4,747.50	1,777.50	542.70	102.60	156.00	1,080.00	155,113.80	2.14
1941	No. Veh.	83	63	71	326	2659	51	11767	40216	15205	1934	5018	379	462	232	15	61	183	78,579	11.01
	Fees	273.24	315.00	532.50	2,445.00	19,942.50	382.50	88,252.50	301,620.00	114,037.50	14,505.00	37,635.00	2,842.50	3,465.00	1,740.00	112.50	457.50	1,372.50	589,342.50	8.14
1940	No. Veh.	123	371	259	1604	753	12741	18843	19420	2697	1697	3912	389	352	51	45	24	326	63,113	8.84
	Fees	404.92	1,855.00	1,942.50	12,030.00	5,647.50	95,557.50	141,322.50	145,650.00	20,227.50	12,727.50	29,340.00	2,917.50	2,640.00	382.50	337.50	180.00	2,445.00	473,347.50	6.54
1939	No. Veh.	171	115	42	842	755	13972	24881	4987	2015	3826	369	374	6	20	0	1	200	52,290	7.33
	Fees	562.93	575.00	315.00	6,315.00	5,662.50	104,790.00	186,607.50	37,402.50	15,112.50	28,695.00	2,767.50	2,805.00	45.00	150.00	0	7.50	1,500.00	392,175.00	5.42
1938	No. Veh.	236	103	309	1	1486	9431	21845	2685	5354	3239	373	316	4	41	39	3	219	45,345	6.35
	Fees	776.91	515.00	2,317.50	7.50	11,145.00	70,732.50	163,837.50	20,137.50	40,155.00	24,292.50	2,797.50	2,370.00	30.00	307.50	292.50	22.50	1,642.50	340,087.50	4.70
1937	No. Veh.	128	67	738	6507	14493	1077	35639	5510	10346	4306	833	105	7	116	29	10	94	79,810	11.18
	Fees	421.38	335.00	5,535.00	48,802.50	108,697.50	8,077.50	267,292.50	41,325.00	77,595.00	32,295.00	6,247.50	787.50	52.50	870.00	217.50	75.00	705.00	598,575.00	8.27
1936	No. Veh.	76	52	22	221	15	39754	4227	18645	4111	945	405	93	176	12	15	37	203	68,881	9.65
	Fees	250.19	260.00	165.00	1,657.50	112.50	298,155.00	31,702.50	139,837.50	30,832.50	7,087.50	3,037.50	697.50	1,320.00	90.00	112.50	277.50	1,522.50	516,607.50	7.14
1935 or older	No. Veh.	.....	1602	1396	6079	13554	50577	74939	11969	5828	2347	1274	515	2240	737	163	93	1120	172,831	24.22
	Fees	.....	8,010.00	10,470.00	45,592.50	101,655.00	379,327.50	562,042.50	89,767.50	43,710.00	17,602.50	9,555.00	3,862.50	16,800.00	5,527.50	1,222.50	697.50	8,400.00	1,296,232.50	17.91
Total Vehicles.....		7129	2703	3777	15839	35323	132293	195228	171837	86735	34155	18197	7753	6533	2125	463	252	3139	713,649	100.00
Total Fees.....		$23,471.28	$14,265.60	$34,695.50	$120,114.60	$268,999.60	$1,038,032.00	$1,485,461.40	$1,947,568.90	$1,197,562.90	$465,732.53	$242,949.72	$167,892.36	$146,567.50	$48,790.40	$9,414.80	$2,250.50	$61,822.00	$7,237,855.01	100.00
Percent Veh.....		.....	.....	.53	2.22	4.95	18.54	27.35	24.08	12.15	4.78	2.55	1.09	.92	.30	.06	.04	.44	.....	100.00
Percent Fees.....		.....	.....	.48	1.66	3.72	14.34	20.52	26.91	16.55	6.43	3.36	2.32	2.03	.67	.13	.03	.85	.....	.....

TABLE S-11
ANALYSIS OF 1948 CLASS "T" TRUCK REGISTRATIONS
To April 1, 1948

Rated Capacity		Model T	1929 and Previous	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	Total Vehicles	Total Fees
½ Ton	Vehicles	340	2606	1163	1343	338	406	712	1531	1944	1978	1451	1485	1429	1936	352	1	.....	177	2017	1233	425	22867	.....
	Fees	$1,700.00	$19,545.00	$ 8,722.50	$10,072.50	$ 2,535.00	$ 3,045.00	$ 5,340.00	$11,482.50	$14,580.00	$14,835.00	$10,882.50	$11,137.50	$10,717.50	$14,520.00	$2,643.52	$ 7.50	.....	$1,750.53	$19,867.45	$22,847.49	$ 8,500.00	.....	$194,731.49
¾ Ton	Vehicles	.....	126	128	96	47	12	29	104	550	774	475	236	585	661	208	.....	.....	.....	352	430	118	4931	.....
	Fees	.....	945.00	960.00	720.00	352.50	90.00	217.50	780.00	4,125.00	5,805.00	3,562.50	1,770.00	4,387.50	4,957.50	1,560.00	.....	.....	.....	3,625.60	7,946.40	2,888.64	.....	44,693.14
1 Ton	Vehicles	.....	1383	311	80	6	17	2	15	21	55	172	128	135	271	78	.....	.....	75	334	479	261	3823	.....
	Fees	.....	10,372.50	2,332.50	600.00	45.00	127.50	15.00	112.50	157.50	412.50	1,290.00	960.00	1,012.50	2,032.50	585.00	.....	.....	960.75	4,619.22	11,409.78	6,955.65	.....	44,000.40
1½ Ton	Vehicles	.....	1705	1294	1786	748	958	1881	1728	1882	1758	788	672	791	791	330	3	112	207	576	605	272	18887	.....
	Fees	.....	17,050.00	12,940.00	17,860.00	7,480.00	9,580.00	18,810.00	17,280.00	18,820.00	17,580.00	7,880.00	6,720.00	7,910.00	7,910.00	3,392.40	35.01	$1,900.64	4,609.89	16,721.28	22,735.90	10,953.44	.....	228,168.56
2 Ton	Vehicles	.....	16	1	1	.....	4	16	24	6	4	26	1	12	18	.....	.....	.....	13	204	374	125	845	.....
	Fees	.....	480.00	30.00	30.00	.....	120.00	480.00	720.00	180.00	120.00	780.00	30.00	360.00	540.00	.....	.....	.....	453.05	7,250.16	16,351.28	6,452.50	.....	34,376.99
2½ Ton	Vehicles	.....	.....	.....	.....	.....	.....	.....	1	.....	2	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	4	.....
	Fees	.....	.....	.....	.....	.....	.....	.....	30.00	.....	60.00	.....	.....	.....	30.00	.....	.....	.....	.....	.....	.....	.....	.....	120.00
3 Ton	Vehicles	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....
	Fees	.....	.....	.....	.....	60.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	60.00
Total Vehicles		340	5836	2897	3306	1140	1397	2640	3403	4403	4571	2912	2522	2952	3678	968	4	112	472	3483	3121	1201	51358	.....
Total Fees		$1,700.00	$48,392.50	$24,985.00	$29,282.50	$10,472.50	$12,962.50	$24,862.50	$30,405.00	$37,862.50	$38,812.50	$24,395.00	$20,617.50	$24,387.50	$29,990.00	$8,180.92	$42.51	$1,900.64	$7,774.22	$52,083.71	$81,290.85	$35,750.23	.....	$546,150.58
% of Vehicles		.66	11.36	5.64	6.44	2.22	2.72	5.14	6.63	8.57	8.90	5.67	4.91	5.75	7.16	1.88	.01	.22	.92	6.78	6.08	2.34	.....	.....
% of Fees		.31	8.86	4.57	5.36	1.92	2.37	4.55	5.57	6.93	7.11	4.47	3.78	4.47	5.49	1.50	.01	.35	1.42	9.54	14.87	6.55	.....	.....

TABLE S-12
ANALYSIS OF 1948 CLASS "X" TRUCK REGISTRATIONS
To April 1, 1948

Rated Capacity		1929 and Previous	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	Total Vehicle Registration	Total Revenue	Percent of Vehicles	Percent of Revenue
½ Ton	Veh.	1581	637	1029	404	507	1020	1500	2246	1828	1210	1471	1855	2336	633		34	188	914	424	111	19928		29.18	
	Rev.	$11,857.50	$ 4,777.50	$ 7,717.50	$ 3,030.00	$ 3,802.50	$ 7,650.00	$11,250.00	$16,845.00	$13,710.00	$ 9,675.00	$11,032.50	$13,912.50	$17,520.00	$ 4,988.04		$ 707.88	$ 4,049.52	$ 25,043.60	$ 13,890.24	$ 5,434.56		$ 186,893.84		13.28
¾ Ton	Veh.	69	78	52	10	33	50	157	470	810	427	258	492	544	167	1	1	72	165	120	40	4016		5.88	
	Rev.	517.50	585.00	390.00	75.00	247.50	375.00	1,177.50	3,525.00	6,075.00	3,202.50	1,935.00	3,690.00	4,080.00	1,469.60	$ 32.44	21.32	1,865.52	4,791.60	4,299.60	1,550.40		39,905.48		2.83
1 Ton	Veh.	469	60	36	10	49	78	65	255	71	308	220	193	717	170	3	63	108	322	353	70	3620		5.30	
	Rev.	3,517.50	450.00	270.00	75.00	367.50	585.00	487.50	1,912.50	532.50	2,310.00	1,650.00	1,447.50	5,377.50	1,618.40	52.32	1,778.49	3,800.52	14,132.58	18,786.66	4,105.50		63,256.97		4.49
1½ Ton	Veh.	541	385	723	431	688	1688	2613	3399	3415	2385	2375	3472	4145	2150	13	843	968	2305	2147	369	35055		51.32	
	Rev.	8,115.00	5,775.00	10,845.00	6,465.00	10,320.00	25,320.00	39,195.00	50,985.00	51,225.00	35,775.00	35,625.00	52,080.00	62,175.00	32,809.00	270.40	26,310.03	40,288.16	119,906.10	133,136.36	25,656.57		772,276.62		54.89
2 Ton	Veh.	86	25	45	19	49	85	97	99	91	123	40	197	146	47	10	42	104	1646	1411	130	4492		6.58	
	Rev.	2,580.00	750.00	1,350.00	570.00	1,470.00	2,550.00	2,910.00	2,970.00	2,730.00	3,690.00	1,200.00	5,910.00	4,380.00	1,410.00	300.00	1,931.58	7,000.24	96,291.00	102,946.56	10,947.15		253,886.53		18.05
2½ Ton	Veh.	68	13	4	17	3	4	25	28	10	5	22	19	38	116	15	60	126	59	69	20	721		1.06	
	Rev.	2,040.00	390.00	120.00	510.00	90.00	120.00	750.00	840.00	300.00	150.00	660.00	570.00	1,140.00	3,480.00	705.30	4,231.80	11,849.04	7,495.95	9,762.12	3,134.00		48,338.21		3.44
3 Ton	Veh.	8	51	22	6	5	3	5	4	4	17	25	3	9	27		1	22	23	20	21	276		.40	
	Rev.	480.00	3,060.00	1,320.00	360.00	300.00	180.00	300.00	240.00	240.00	1,020.00	1,500.00	180.00	540.00	1,620.00		60.00	2,136.20	2,789.90	2,964.40	3,455.13		22,745.63		1.62
3½ Ton	Veh.	30			1	1	63		2	4		1								13		115		.17	
	Rev.	1,800.00			60.00	60.00	3,780.00		120.00	240.00		60.00								3,355.82			9,475.82		.67
4 Ton	Veh.	1		10	1		1	13		2									10			38		.06	
	Rev.	85.00		850.00	85.00		85.00	1,105.00		170.00									1,442.00				3,822.00		.27
4½ Ton	Veh.													1								1			
	Rev.													85.00									85.00		.01
5 Ton	Veh.							1	1	1									2	2		18		.02	
	Rev.							125.00	125.00	125.00								1,284.69	439.88	657.66			2,757.23		.20
5½ Ton	Veh.																								
	Rev.																								
6 Ton	Veh.																		11			11		.02	
	Rev.																		1,784.97				1,784.97		.13
6½ Ton	Veh.																	11				11		.01	
	Rev.																	1,364.00					1,364.00		.10
7½ Ton	Veh.	2																				2			
	Rev.	300.00																					300.00		.02
Total Vehicles		2855	1249	1921	899	1335	2992	4476	6504	6236	4475	4412	6231	7936	3310	42	1044	1610	5457	4559	761	68304			
% of Vehicles		4.18	1.83	2.81	1.31	1.95	4.38	6.55	9.53	9.13	6.55	6.46	9.13	11.62	4.85	.06	1.53	2.36	7.99	6.67	1.11				
Total Revenue		$31,292.50	$15,787.50	$22,862.50	$11,230.00	$16,657.50	$40,645.00	$57,300.00	$77,562.50	$75,347.50	$55,822.50	$53,662.50	$77,790.00	$95,297.50	$47,395.04	$1,360.46	$35,041.10	$73,637.89	$274,117.58	$289,799.42	$54,283.31				
% of Revenue		2.22	1.12	1.63	0.80	1.18	2.89	4.07	5.51	5.36	3.97	3.81	5.53	6.77	3.37	.10	2.49	5.23	19.48	20.61	3.86		$1,406,892.30		

TABLE S-13
ANALYSIS OF 1948 CLASS "Y" TRUCK REGISTRATIONS
To April 1, 1948

Gross Wt.	7,000		9,000		11,000		13,000		15,000		17,000		19,000		21,000		23,000		25,000		27,000		29,000		31,000		33,000		35,000		37,000		39,000		41,000	Totals	
Fee Paid	$25.00		$40.00		$55.00		$70.00		$85.00		$100.00		$115.00		$130.00		$170.00		$210.00		$250.00		$290.00		$330.00		$405.00		$480.00		$555.00		$630.00		$705.00	by Year	
Yr. Model	Veh.	Fees	Veh.	Fees	Veh.	Fees	Veh.	Fees	Veh.	Fees	Veh.	Fees	Veh.	Fees	Veh.	Fees	Veh.	Fees	Veh.	Fees	Veh.	Fees	Veh.	Fees	Veh.	Fees	Veh.	Fees	Veh.	Fees	Veh.	Fees	Veh.	Fees	Veh.	Fees
1948	797	$ 19,925	96	$ 3,840	52	$ 2,860	37	$ 2,590	38	$ 3,230	90	$ 9,600	25	$ 2,875	35	$ 4,550	12	$ 2,040	35	$ 7,350			35	$10,150													1,258	$ 69,010
1947	4,945	123,625	447	17,880	419	23,045	225	15,750	316	26,860	317	31,700	261	30,015	614	79,820	151	25,670	111	23,310	39	$ 9,750	3	870	3	$ 990			1	$ 480			12	$7,560			7,864	417,325
1946	4,563	114,075	296	11,840	297	16,335	248	17,360	388	32,980	354	35,400	456	52,440	300	39,000	120	20,400	81	17,010	111	27,750	44	12,760	15	4,950	1	$405									7,274	402,705
1945	287	7,175	130	5,200	89	4,895	13	910	46	3,910	77	7,700	115	13,225	131	17,030	71	12,070	5	1,050			1	290	1	330											966	73,785
1944	54	1,350	45	1,800	22	1,210	14	980	12	1,020	51	5,100	78	8,970	21	2,730	5	850	20	4,200					8	2,640											330	30,850
1943	5	125	13	520	12	660	1	70							1	130					1	250															33	1,755
1942	316	7,900	58	2,320	71	3,905	51	3,570	73	6,205	97	9,700	34	3,910	144	18,720	38	6,460	5	1,050																	887	63.740
1941	743	18,575	79	3,160	105	5,775	72	5,040	76	6,460	163	16,300	85	9,775	78	10,140	8	1,360	12	2,520					16	5,280											1,437	84,385
1940	574	14,350	135	5,400	30	1,650	73	5,110	79	6,715	122	12,200	98	11,270	28	3,640			32	6,720	1	250															1,172	67,305
1939	302	7,550	63	2,520	39	2,145	36	2,520	40	3,400	40	4,000	43	4,945	86	11,180	4	680	5	1,050	2	500															660	40,490
1938	202	5,050	72	2,880	6	330	28	1,960	5	425	15	1,500	30	3,450	26	3,380	1	170	1	210																	386	19,355
1937	156	3,900	34	1,360	41	2,255	21	1,470	33	2,805	4	400	12	1,380	1	130																					302	13,700
1936	103	2,575	11	440	6	330	4	280	19	1,615	2	200	2	230	4	520			1	210					2	660											154	7,060
1935	85	2,125	40	1,600	11	605	6	420	14	1,190	2	200	4	460			1	170																			163	6,770
1934	58	1,450	8	320	2	110			2	170					2	260																					72	2,310
1933	14	350	1	40	12	660			1	85																											28	1,135
1932	15	375	4	160			1	70							1	130																					21	735
1931	19	475			1	55	6	420			1	100																									27	1,050
1930	2	50	2	80			15	1,050	1	85																											20	1,265
1929	17	425	12	480	1	55	4	280			2	200							1	210									12	$5,760							49	7,410
Total	13,257	$331,425	1,546	$61,840	1,216	$66,880	855	$59,850	1,143	$97,155	1,343	$134,300	1,243	$142,945	1,472	$191,360	411	$69,870	309	$64,890	154	$38,500	83	$24,070	45	$14,850	1	$405	13	$6,240			12	$7,560			23,103	$1,312,140

TABLE S-14

INCORPORATED PLACES NOT LOCATED ON STATE TRUNK HIGHWAYS

County	Place	Pop.
Aitkin	Palisade	202
Anoka	Bethel	188
	Centerville	195
Beltrami	Funkley	26
Big Stone	Odessa	316
Blue Earth	Good Thunder	457
Brown	Comfrey	555
	Hanska	461
Carlton	Thomson	104
	Wrenshall	168
Carver	Benton	*
	Hamburg	198
	New Germany	247
Cass	Boy River	175
	East Gull Lake	199
	Federal Dam	269
	Lakeshore	205
Clay	Comstock	134
Clearwater	Leonard	111
Crow Wing	Cuyuna	176
	Manganese	62
	Manhattan Beach	86
	Pelican Lakes	114
	Riverton	141
	Trommald	166
Dakota	New Trier	79
	Vermillion	107
Douglas	Forada	96
	Carlos	187
	Millerville	182
	Miltona	116
Faribault	Bricelyn	601
	Delavan	321
	Easton	332
	Frost	278
	Walters	154
Fillmore	Ostrander	163
Freeborn	Conger	131
	Hayward	184
	Hollandale	219
	Myrtle	133
Goodhue	Dennison[1]	216
Hennepin	Deephaven	1,026
	Hanover[2]	241
	Island Park	526
	Loretto	*
	Medicine Lake	*
	Minnetonka Beach	229
	Rogers	274
	Tonka Bay	261
Isanti	Isanti	354
Itasca	Zemple	165
Jackson	Okabena	210
Kandiyohi	Lake Lillian	271
Lac qui Parle	Boyd	523
	Louisburg	94
	Marietta	400
	Nassau	208
Le Sueur	Heidelberg	71
	Kasota	604
	Kilkenny	214
Lincoln	Arco	243
	Hendricks	740
McLeod	Lester Prairie	423
	Winsted	660
Mahnomen	Waubun	438
Marshall	Viking	337
Martin	Granada	431
	Northrup	134
	Ceylon	549
Morrison	Bowlus	304
	Elmdale	121
	Flensburg	275
	Harding	117
	Hillman	110
	Sobieski	171
	Upsala	347
Mower	Elkton	117
	Sargeant	138
Murray	Dovray	128
	Iona	365
Nobles	Dundee	222
	Kinbrae	107
	Lismore	311
	Round Lake	430
	Rushmore	423
	Wilmont	361
Norman	Gary	300
	Perley	246
Otter Tail	Underwood	353
	Urbank	142
	Vergas	351
Pennington	Goodridge	174
Pine	Denham	90
	Henriette	148
Pipestone	Edgerton	815
	Hatfield	73
	Woodstock	253
Polk	Lengby	195
	Winger	301

INCORPORATED PLACES NOT LOCATED ON STATE TRUNK HIGHWAYS (Continued)

County	Place	Pop.
Red Lake	Oklee	414
Redwood	Belview	409
	Clements	240
	Delhi	174
	Lucan	226
	Milroy-	261
	N. Redwood	211
	Seaforth	148
	Wabasso	604
	Wanda	191
Rice	Nerstrand	251
Rock	Hills	450
	Kenneth	148
	Steen	200
St. Louis	Brookston	135
	Franklin	515
	Iron Junction	107
	Kinney	462
	Leonidas	440
	Meadowlands	142
	Winton	224
Scott	New Market	199
Stearns	Holdingford	527
	New Munich	305
	Pleasant Lake	*
	Spring Hill	57
	St. Rosa	*
	St. Anthony	90
	St. Martin	183
	St. Stephens	247
Wabasha	Hammond	252
	Millville	175
Wadena	Nimrod	*
Washington	Birchwood	91
	Mahtomedi	874
Watonwan	La Salle	139
	Odin	198
Wilkin	Tenney	89
Winona	Altura	258
	Rollingston	324
Yellow Medicine	Hazel Run	126
	St. Leo	*
	Wood Lake	436

*Not shown in census 1940 reports.
1Part in Rice County.
2Part in Wright County.
NOTE: Places are classified as "not on" trunk highway if highway is outside corporate limits.