

THESIS

Roads — Michigan

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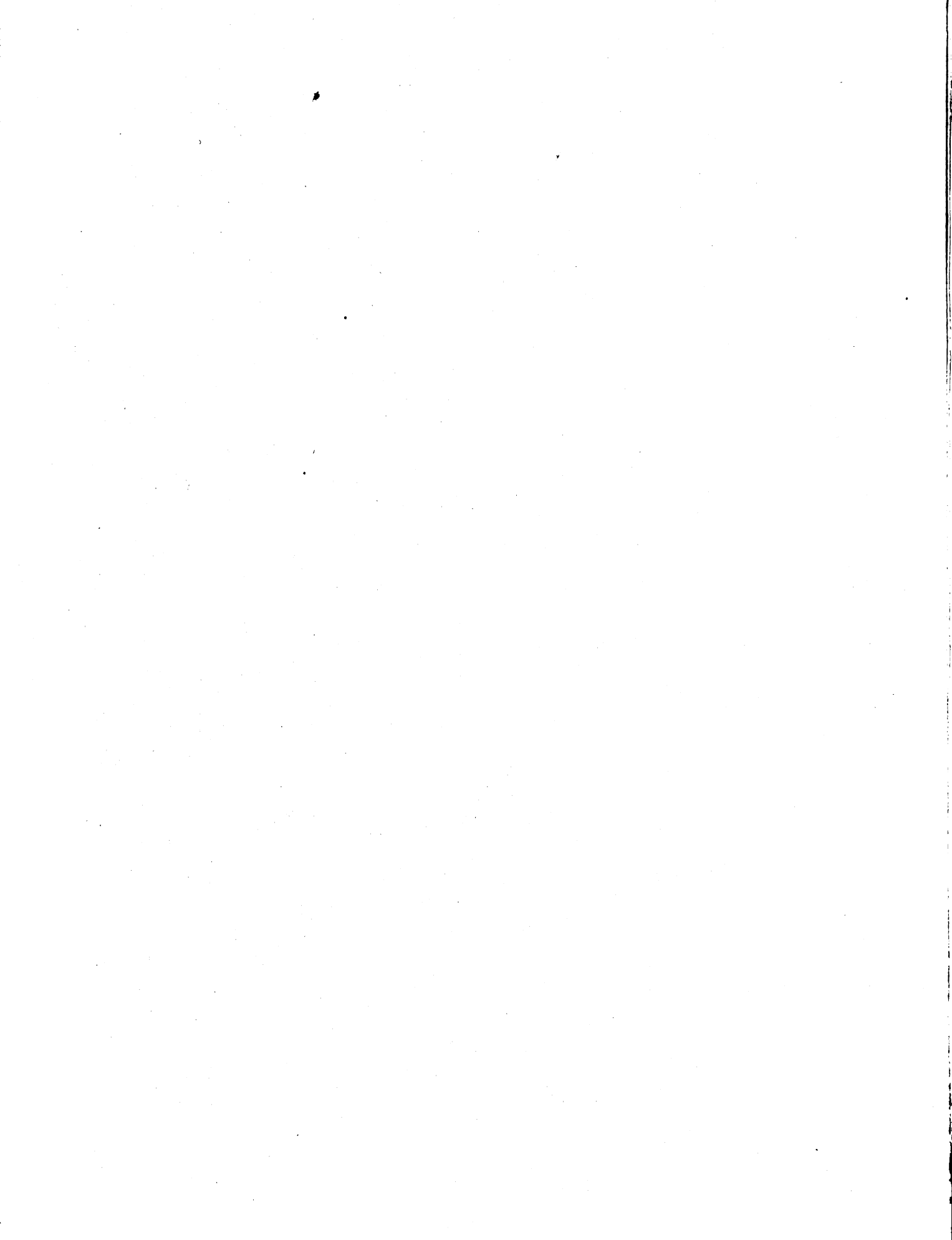


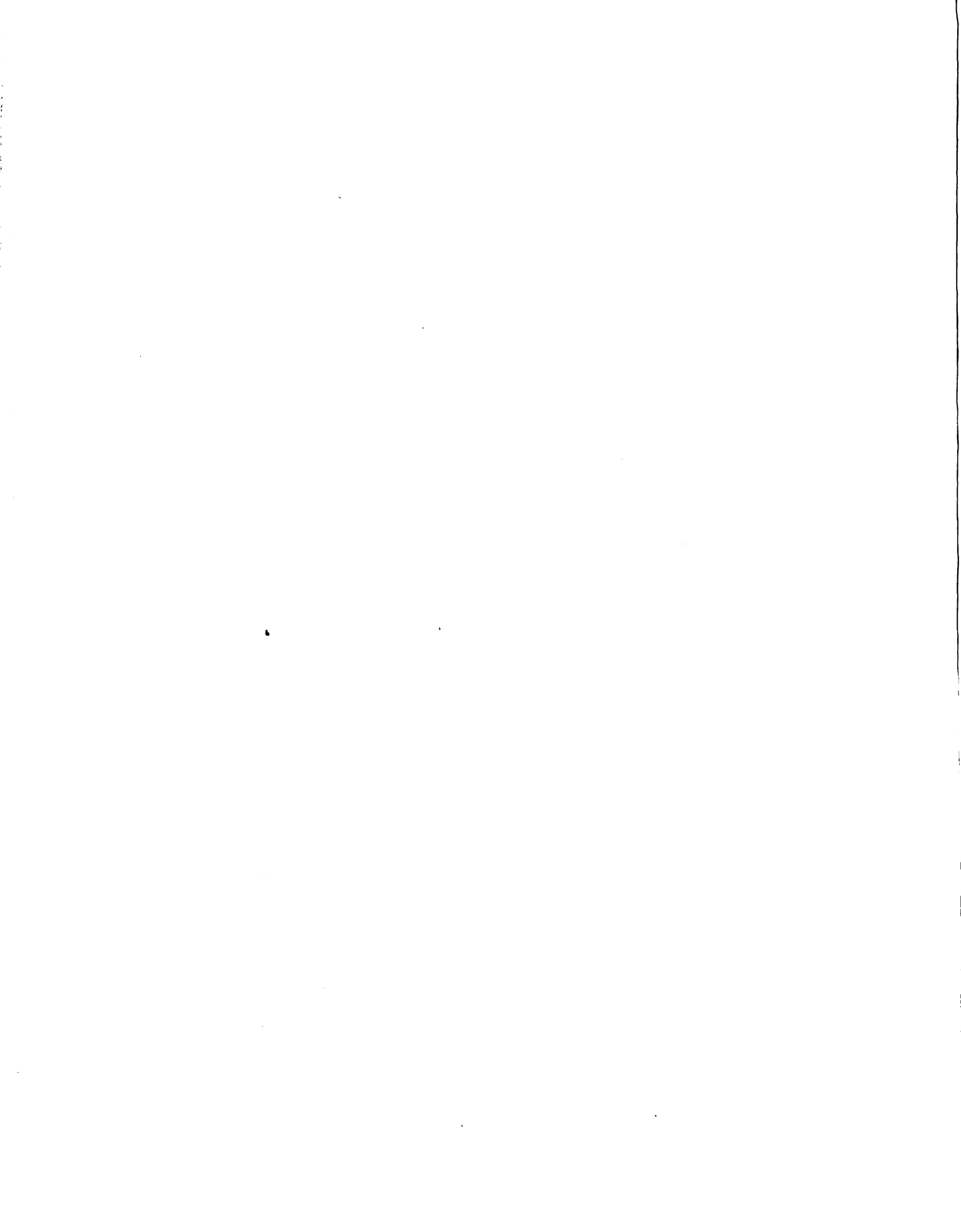
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**A STUDY OF THE TOWNSHIP ROAD SITUATION IN MICHIGAN
WITH SUGGESTED REVISIONS.**

**A THESIS
Submitted to the Faculty of
MICHIGAN STATE COLLEGE**

By

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**Candidate for Degree of
Civil Engineer.**

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THEBIS

1

A STUDY OF THE TOWNSHIP ROAD SITUATION IN MICHIGAN
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OUTLINE OF WORK.

I. Introduction.

(a) Importance and scope of the Township Road Problem.

(b) Purpose of writing and application of this thesis.

II. Township Highway Legislative Provisions, Extracts of laws affecting Township Road matters and referred to in balance of thesis.

III. Application of Township Highway Laws and their operation. A discussion of these applications and the present practices under these laws.

IV. Suggested Revisions.

Such revisions of statutes and practices which make for a more sound and conservative Township Highway Policy, stimulate activity and insure progress. (Township maps systematically laid out and programs to be adopted toward their completion).

V. Suggested Standards:

Alignment, grades, mapping, cross-sections, surfaces, maintenance practices, (Road plans, pictures and drawings).

VI. Assistance to Townships.

Work of State, Counties and College to assist in problem.

VII. Finance.

The Taxation problem affecting Township roads.
Suggested remedies.

1 3

CHAPTER I.

INTRODUCTION.

(a)

"Honest labor coupled with the fruits of honest thought make smooth the pathway to contentment."

Whether "contentment" be our peace of mind, or any city, town, hamlet or tiniest community, the truth of the quotation is evident. With the township road system of Michigan where matters of both finance and highway practice are local considerations, the value of fundamental soundness is especially significant.

In the mind of the general public the township highway situation has seemed of such minor importance as to approach the insignificant. An analysis of a few facts and figures will show that this impression is far from the actual.

Over the state as a whole the representative mileages are classified roughly as follows:

State Trunk Line Roads	<u>7,000</u>
County Roads	<u>13,300</u>
Township Roads	<u>57,000</u>

These figures show that the mileage of Township roads is 2.7 times that of the State Trunk Line and County Roads combined. This preponderance of mileage seems certainly to lend a great measure of importance.

On this mileage of Township roads there is spent

each year for repair and improvement work from twelve millions to fifteen millions of dollars. The expenditure of this sum of public moneys would indicate again that this is no small undertaking.

From the economic standpoint the importance of the secondary highways is becoming more and more evident each year. The development of the automobile is largely responsible for this.

In the first place, the number of automobiles owned in rural and small town communities compared with population shows a rapidly increasing percentage per capita each year.

Secondly, the economical marketing of products and the general business of the community is demanding the speed and adaptability of the truck haul. This is especially true in the sections of the state having specialized products such as dairy products, beets, fruit, etc. This traffic makes necessary a higher type of highway than was needed for the horse drawn vehicles and one which is passable for more months of the year. Considerable areas of agricultural lands previously next to valueless because of transportation difficulties will be made to pay a profit by making markets economically accessible.

Third, a great portion of the states area which has been unproductive of returns since the close of lumbering operations is once more coming into its own. The extensive improvements on the primary highways has brought the sportsman, the lover of nature, and the pleasure bent, to enjoy their

leisure in the great out-doors. Each year they are travelling further and visiting new sections, until few sections having anything to offer in the line of natural beauty but have now their constantly growing summer caravan of tourists. The primary highways are bringing these tourists to or near the sections having to offer them these natural beauties, but it remains for the secondary roads to take these folks thru and into these sections and to make every last point of interest accessible to them.

It may seem as though to humor the tourist and ease his path is a very minor consideration but economically he is a force to be reckoned with. For the past two years the moneys brought to the State by the tourist from outside our boundaries amounted to considerably more than the value of any crop produced in those years. The net results are preponderously greater because our God-given beauties required little in the way of cash outlay to make them acceptable to the tourist.

The foregoing points, coupled with the recognized fact of the natural increase in land values as a result of increased accessibility and availability of markets, establish beyond a doubt the fact that the township road problem is one of immense and increasing importance.

(b)

In a casual reading of the material in this thesis it may appear that some of the thoughts expressed may seem

6

somewhat visionary and even perhaps overdone. It is not the intent of the writer to appear over-zealous or to create illusions but to offer conscientious opinion and honest thought in these matters, with the hope that the material will serve as a sound basis for later discussion of this important subject.

CHAPTER II.

TOWNSHIP HIGHWAY LEGISLATIVE PROVISIONS.

The following pages of this section will contain a number of extracts of constitutional and legislative provisions.

An analysis will show that many of these provisions are in themselves the basis of some of the existing conditions and make way for unsound practices.

However, in most cases, the intent of these provisions is good, the thought is plain, and it is firmly believed that with some measure of centralized control in their enforcement, and some means of a check on results obtained, that a good measure of progress might be possible.

It was felt that, even tho this compilation of extracts interrupts the continuity of reading this work, they are better collected under a single chapter than arranged as a series of footnotes. Reference will be made by paragraph number.

TOWNSHIP OFFICERS.

1. Constitutional Provisions. There shall be elected annually on the first Monday of April in each organized township one supervisor, one township clerk, one commissioner of highways, one township treasurer, not to exceed four constables and one overseer of highways for each highway district, whose powers and duties shall be prescribed by law. Const. Art. VIII, Sec. 18.

2. There shall be elected in each organized township not to exceed four justices of the peace, each of whom shall hold the office for four years and until his successor is elected and qualified. At the first election in any township they shall be classified as shall be prescribed by law. A justice elected to fill a vacancy shall hold the office for the residue of the unexpired term. Const. Art. VII, Sec. 15.

3. Township Officers to be Elected. At the annual township meeting there shall be an election for the following officers: One supervisor, one township clerk, one treasurer, one commissioner of highways, as many overseers of highways as shall be provided for by law, so many justices of the peace as there are by law to be elected in the township, and so many constables as are to be elected, not exceeding four in number. R.S. of '46, Ch. 16, Sec. 8, paragraph 2054.

4. Officers: The regulation of township affairs legally concerns none but the people of the township and cannot be lawfully vested in any officers imposed upon the township from

without. An appointment of a supervisor for the remainder of the term of his predecessor is a valid temporary appointment, though it may not prevent an election. A township temporarily represented by an appointed supervisor has the same voice upon the board of supervisors that it had while represented by the supervisor elected to such office.

5. Compensation of Township Officers. The following township officers shall be entitled to compensation at the following rates for each day of ten hours actually and necessarily devoted by them to the service of the township in the duties of their respective offices, to be verified by affidavit, whenever required by the township boards:

6. The officers composing the township boards, board of registration, board of health, inspectors of election, clerks of the poll and commissioners of highways, five dollars per day and at the same rate for parts of days.

SUPERVISORS.

7. Dispute as to Improvement of Roads to be Decided by Supervisor. In a township which has returned to the system of statute labor, in case of dispute between the commissioner of highways and any person interested in improvement of roads as to the manner of making the same, or the value of the work, the matter in dispute shall be submitted to the supervisor of the township, and his decision shall be final.

8. Supervisor to Levy Taxes for Highways. A

certified copy of the record of the proceedings of the township meeting or township board, fixing and determining the amount of highway improvements and road repair taxes, shall be transmitted by the township clerk to the Supervisor of his township on or before the first day of October in each year, and such taxes shall be levied and collected in the same manner as moneys for general township purposes are levied and collected. The taxes so levied shall be carried out in two separate columns in the tax roll, one as the road repair tax and the other as highway improvement tax, and the township treasurer shall keep separate accounts of the same. Act 283, of 1909, Ch. II, Sec. 6.

TOWNSHIP TREASURER.

9. Payments from Township Highway Funds. No moneys

shall be disbursed from any township highway fund, except upon an order drawn by the township clerk in the manner provided by law for the drawing of orders upon other funds of townships. Act 258, 1919, Sec. 1.

The township highway commissioner shall draw under his hand an order directed to the township clerk for all disbursements of township highway funds.

Upon the receipt of orders from the township highway commissioner as herein provided for, the township

clerk shall draw his order upon the township treasurer in the same manner and form as is provided by law for the disbursement of other township funds.

COMMISSIONER OF HIGHWAYS.

10. Elected Annually. There shall be elected annually on the first Monday of April in each organized township one supervisor, one township clerk, one commissioner of highways, one township treasurer, not to exceed four constables and one overseer of highways for each highway district, whose powers and duties shall be prescribed by law.

11. Powers of Legislature. The legislature may by general law provide for the laying out, construction, improvement and maintenance of highways, bridges and culverts by the State and by the counties and townships thereof and by road districts; and may authorize counties or districts to take charge and control of any highway within their limits for such purposes. The legislature may also by general law prescribe the powers and duties of boards of supervisors in relation to highways, bridges and culverts; may provide for county and district road commissioners to be appointed or elected, with such powers and duties as may be prescribed by law; and may change and abolish the powers and duties of township commissioners and overseers of highways. The legislature may provide by law for submitting the question of adopting the county road system to the electors of the counties and such

road system shall not go into operation in any county until approved by a majority of the electors thereof voting thereon. The tax raised for road purposes by counties shall not exceed in any one year five dollars upon each one thousand dollars of assessed valuation for the preceding year. Const. Art. VIII, Sec. 26.

12. Authority for Building, Etc., Highways, Bridges, Culverts, Drains, Etc. Public highways and private roads may be established, opened, improved and maintained within this state under the provisions of this act, and the counties, townships, cities, villages and districts of this state shall possess the authority herein prescribed for the building, repairing and preservation of bridges and culverts; the draining of highways, cutting of weeds and brush in the improvement of highways and the duties of state, county, township, city, village and district highway officials shall be as defined in this act.

13. Width, How Laid Out, Altered or Discontinued. Public highways shall not be less than four rods in width, except when laid out and established in the manner hereinafter prescribed, and they may be laid out, altered or discontinued under the provisions of this chapter.

First, By the commissioner of highways of any township, within his township, upon the written application of seven or more freeholders of such township;

Second, By the joint action of the commissioners of

highways of adjoining townships, on the line between such townships, on the written application of seven or more freeholders of each township, addressed to the commissioner of either township;

Third, By the concurrent action of the commissioner of highways of any township and the municipal authority of any adjoining city or village having by law, jurisdiction in laying out streets or highways, on the line between such township and such city or village, on the written application of seven or more freeholders of each township, city, or village;

Fourth, Commissioners of highways shall also have power to lay out and establish highways on section lines, through uninclosed and unimproved lands, without the application required by the first subdivision of this section.

14. Survey of Highways. Paragraph 345, Sec. 16. Whenever a highway shall be laid out or altered, the commissioner, mayor or president of any city or village shall cause an accurate survey to be made of the center line thereof describing the commencing and terminating points of the same from some established corner of a regular subdivision of a section, or other determinable point. Bearing trees or monuments shall also be noted at such commencement and termination and at each angle along the line of the road when practicable. Whenever a road not on a section, quarter section, or some other regular subdivision line of a section,

crosses a section line, the distance from the last preceding angle in such road to such section line shall be noted; also the distance from the point of intersection to the nearest section corner post, quarter post, or meander post on one side of such point, if there be one within one mile, and the premises belonging to any highway shall be a parcel of land not less than two rods wide on each side of the line of survey. When the survey is made, permanent monuments shall be established by the surveyor every eighty rods along the line of such highway.

15. Public Highways Defined. Paragraph 4307, Sec. 20. All highways regularly established in pursuance of existing laws, all roads that shall have been used as such for ten years or more, whether any record or other proof exists that they were ever established as highways or not, and all roads which have been or which may hereafter be laid out and not recorded, and which shall have been used eight years or more, shall be deemed public highways, subject to be altered or discontinued according to the provisions of this act. All highways that are or that may become such by time and use, shall be four rods in width, and where they are situated on section or quarter section lines, such lines shall be the center of such roads, and the land belonging to such roads shall be two rods in width on each side of such lines.

Commissioner to Cause Roads to be Recorded.

Paragraph 4308, Sec. 21. The commissioner of highways of each township shall cause all roads in his township coming within the purview of the last preceding section, the records of

which may be defective, and all others, the records of which are defective, to be ascertained, described and entered of record in the township clerk's office.

16. Road Repair and Highway Improvement Taxes.

Paragraph 4318. Sec. 1. The highways in every organized township in this State shall be laid out, improved and maintained by two money taxes; one tax shall be known as the road repair tax, and shall be assessed on all property in the township outside of the limits of incorporated villages, which tax shall not exceed fifty cents on each one hundred dollars valuation according to the assessment roll of the last preceding year, except in townships with an assessed valuation of less than five hundred thousand dollars where the tax shall not exceed one dollar on each one hundred dollars valuation, according to the assessment roll of the last preceding year; and the other tax shall be known as the highway improvement tax and shall be assessed on all taxable property in the township, including that within the limits of incorporated villages, which tax shall not exceed fifty cents on each one hundred dollars valuation, according to the assessment roll for the last preceding year, except in townships with an assessed valuation of less than five hundred thousand dollars where the tax shall not exceed one dollar on each one hundred dollars valuation, according to the assessment roll of the last preceding year.

- 17. Commissioners Annual Account. Paragraph 4319.

Sec. 2. The commissioner of highways in each township shall

render to the township board at the annual meeting thereof in each year on account in writing, stating:

First, The amount of road repair tax received by him during the preceding year, a summary of the expenditures from that fund, the amount of outstanding liabilities, if any, and the amount of such road repair fund, if any, over and above such expenditures and liabilities;

Second, The amount of highway improvement tax received by him during the preceding year, a summary of the expenditures from that fund, a statement of the permanent improvements made on roads and bridges and of the condition of the roads and bridges so improved, the amount of outstanding liabilities, if any, and the amount of the highway improvement fund, if any, over and above such expenditures and liabilities;

Third, The amount of all other moneys received for highway purposes with a statement of the application thereof;

Fourth, An estimate of the amount of road repair tax which, in his judgment, should be assessed for the ensuing year, not exceeding the amount named in section one of this chapter;

Fifth, The permanent improvements which, in his judgment, should be made on the roads and bridges during the next ensuing year and the amount of highway improvement tax which should be levied for that purpose, not to exceed the amount named in section one of this chapter.

18. Statement to be Presented at Town Meeting.

Paragraph 4520, Sec. 3. The township board shall cause such



statement to be presented at the next annual township meeting, but a failure to render such statement or to present the same to the township meeting shall not affect the right of the electors of the township to vote at such meeting the amount of road repair tax and road improvement tax to be assessed, or of the township board to fix and determine the same as provided elsewhere in this act.

19. Amount of Taxes to be Determined at Town Meeting.

Paragraph 4321, Sec. 4. At the annual township meeting held in each organized township the electors shall, by a majority of those present and voting, who do not reside in any incorporated village, determine the amount of road repair tax to be raised for the ensuing year, and at the said meeting the electors shall also, by a majority of all those present and voting, including residents of incorporated villages in such organized township, determine the amount of highway improvement tax to be raised for the ensuing year.

20. Expenditure of Road Repair Tax. Paragraph 4326.

Sec. 9, as amended by Act 97 of 1923. The commissioner, acting with the township board, may divide the township into one or more road districts in each surveyed township, in each of which districts an overseer of highways shall be elected: Provided, That the repair tax shall be expended or worked in the road district where assessed. The commissioner and township board of any township in which may be located an unincorporated village, or in the event that such unincorporated

18

village is located in more than one township, the commissioners and township board of the townships to be affected thereby, may create of the territory embraced by such unincorporated village a separate road district, for which road district there shall be elected an overseer in the same manner as overseers are elected in the township. And in case such unincorporated village is located in more than one township, the overseer of each township shall have supervision of that territory embraced in such unincorporated village as may be located in his township. Such overseers shall from time to time report to the commissioner any defects in the highways within their respective districts, and shall, when required by the commissioner, supervise the working and repairing of roads and the building and repairing of roads, and the building and repairing of bridges therein. The overseer or overseers of any road district comprising an unincorporated village, as provided in this section, upon the written application of a majority of the taxpayers residing therein, may authorize such additional part of the road repair tax assessed in said district as may not be necessary for the repairs of highways therein, but not less than one-fourth thereof, used for the construction, repair and improvement of sidewalks within the limits of said district. The taxpayers of any unincorporated village which is or may be formed into separate road districts, may raise such a sum or sums of money in the repair fund of such district, but not in excess of fifty cents per hundred dollars, as

provided in this section, as they may deem necessary for the construction and maintenance of sidewalks and streets in such unincorporated village and in addition to the money raised for the whole township. Such additional tax shall not be raised except on an affirmative, viva voce vote of a majority of the taxpayers in such unincorporated village, taken either at the annual township meeting or at a special meeting held in and for said village. Such special meeting shall be called either by the township board or boards, if such village is in more than one township, and at the request of five taxpayers in said village, but in all other respects as provided by the general law for calling township meetings, or it may be called by five or more taxpayers in said village posting a notice, signed by them, in three or more public places in said village, stating the time, place and purpose of such meeting. The money raised thereby shall be expended for sidewalks and streets in said village, under the direction and supervision of the township board and highway commissioner of the township or townships in which such unincorporated village is located. The overseer or overseers, when such unincorporated village may be located in more than one county, may also from time to time, by writing signed by him or them and filed with the clerk of such township or townships, authorize such additional portion of the repair tax of such village as in his or their judgment is not needed for the annual repairs of the highways therein, to be anticipated for one or more years, not exceeding three, and thereupon any

person or corporation, resident or owning property within such village, and assessed for highway repair tax in the district within which such district is situated, may, in the year so designated in such order, anticipate his, her or its assessment for road repair tax for such time as he, she or it may see fit within the limits so prescribed by the overseer of that part of the road district in which such repairs shall be made, and it shall be the duty of such overseer to give to such person or corporation a certificate signed by him, showing the amount of road repair tax paid by such person or corporation; and in each succeeding year, upon presentation of such certificate, such person or corporation shall be allowed and credited by the overseer of highways of that part of the district in which such repairs or the construction of sidewalks shall have been made, with the payment of the road repair tax so assessed to him, her or it for such year, until such credit shall equal the amount of the road repair tax so stated in said certificate to have been anticipated, and such overseer shall endorse thereon a statement signed by him showing such credit or allowance.

The supervision of road work and the repair of highways and bridges shall be under the charge of the overseers, subject to such directory control of the township board and highway commissioner as is herein prescribed: Provided further, That upon complaint in writing to the township board by any ten or more resident taxpayers that the road repair fund is being unequally and unjustly applied, or work improperly performed,

the township board may direct the expenditures of such road repair fund or the manner of performing such work: Provided further, That not to exceed twenty-five dollars shall be expended by the highway commissioners in any one year for tools or machinery, without the consent of the township board: Provided further, That not exceeding one hundred dollars shall be expended from the road repair fund on any one mile of highway, unless otherwise directed by the township board.

21. Expenditure of Highway Improvement Fund. Paragraph 4527. Sec. 10, as amended by Act 52 of 1925. The highway improvement fund shall be expended by the township highway commissioner, under the direction of the township board, in laying out, building and permanently improving or repairing highways and bridges and in the employment of labor, purchasing of materials, tools or machinery to be used therefor. The commissioner of highways, under the direction of the township board, may contract for such tools or road machinery as they may deem advisable, to be paid for in not to exceed four years' time, but in no one year shall the payment made thereon exceed one-fourth the amount of the allowable highway improvement tax: Provided, That one-half of that portion of the township highway improvement fund tax which is assessed and collected within any incorporated village, or part thereof, shall annually be expended within the village where collected by the common council of such village, for building, permanently improving or repairing of the highways and bridges now in use

in such village; and the township board shall collect and turn over to such village all State award moneys that may be due or owing on account of such building, permanently improving or repairing the highways within the village in accordance herewith.

22. Highways and Bridges to be Kept in Reasonable Repair.

Paragraph 4328. Sec. 11. It shall be the duty of the highway commissioner to see that all highways and bridges are kept in reasonable repair, and in condition reasonably safe and fit for public travel. He shall employ and direct the employment of such labor as he may deem necessary and advisable, and all disbursements from the highway improvement fund or the road repair fund shall be made upon his warrant, drawn on the township treasurer and countersigned by the township clerk.

23. Persons Assessed Given Preference in Performance of Work. Paragraph 4329. Sec. 12. In the performance of all road repair work those assessed for highway taxes in each respective district where such work is to be done, shall be given preference in the performance of such work. Work to be paid for from the road repair fund shall be completed on or before the first day of September in each year: Provided, That not exceeding one-quarter of the amount of such tax may be kept by the highway commissioner for later necessary repairs, or for plowing, relling or removing snow in winter.

24. When Overseer to Have Supervision of Work. Paragraph 4330. Sec. 13. If the highway commissioner be unable to take charge of the work on highways and bridges because of sickness,

absence or any other reason, or in case of a vacancy in the office of township highway commissioner through death, resignation or otherwise, the overseer of highways residing in the same road district as the former highway commissioner resided shall have charge and supervision of all work, and shall act in the place and stead of the highway commissioner, until a new highway commissioner shall be appointed or elected, and shall have all the powers and duties of such township highway commissioner, and in such case warrants drawn by him and countersigned by the township clerk shall be paid by the township treasurer.

25. Compensation of Commissioner and Overseer.

Paragraph 4331. Sec. 14. The township highway commissioner and the overseer of highways shall be entitled to such compensation as the township board shall decide. The compensation of the highway commissioner shall be paid from the general fund of the township, in the same manner as other township officers are paid. The compensation of the overseer of highways shall be paid from the road repair fund, on approval of the township board.

26. Work, Except Repairs, Shall Have in View Permanent Improvement. Paragraph 4332. Sec. 15, as amended by Act 68 of 1917. All work hereafter done upon roads and bridges, except such work as may be required for repairs, shall have in view the permanent improvement of such roads and bridges. Before beginning such permanent improvement on any highway or bridge, the commissioner shall cause a survey of the highway to be made



by a competent surveyor or engineer, who shall prepare complete plans for the work contemplated establishing both the location and grade of the highway or bridge. In counties working under the county road system the county highway engineer shall be employed for this purpose and he shall exercise such supervision over construction as will insure that the plans and specifications are strictly followed. No contracts shall be let nor work paid for which shall cost to exceed five hundred dollars, whether bridges or road work, without the approval of said county highway engineer. In counties not working under the county road system any competent engineer or surveyor may be employed, but if any highway is being built for state reward, the employment of such engineer or surveyor shall be approved by the state highway commissioner. The plans as submitted, or as may be amended by the surveyor or engineer at the suggestion of the board, shall be adopted by resolution of such township board, which fact shall be certified by the township clerk on the plans, giving the date of such adoption, after which they shall be filed with the township clerk, and copies thereof shall be filed with the township treasurer. Thereafter all parts of such roads shall be graded and turnpiked in accordance with the grades thus established before the same shall be graveled or macadamized, and it shall be unlawful for the highway commissioner to issue any orders for permanent improvement work, for the township clerk to countersign such orders, or the treasurer to pay same, unless

the survey has been made, the plans made and adopted, and the work done in accordance therewith, and any one of the officials, who shall do what is prohibited in this paragraph knowingly, shall be guilty of a misdemeanor and shall be liable to a fine of not more than twenty-five dollars, and in default of payment may be confined in the county jail not more than twenty-five days, in the discretion of the court. The highway shall be constructed in such manner as to form a turnpike sufficiently crowning to shed water, with gutters or ditches adequate for drainage. The width of the turnpike shall be not less than eighteen feet between side ditches and all bridges shall have a clear roadway of at least sixteen feet, and shall be capable of carrying a fifteen ton moving load.

27. Repairs After One Year. Paragraph 4333. Sec. 16. After any such turnpike shall be used for one year, the rutts shall be filled, after which it shall be graveled or macadamized in cases where gravel or crushed stone can conveniently be obtained. If it be desired to put on gravel or stone when grading has been completed, the turnpike shall first be thoroughly compacted. In graveling or macadamizing any highway, the gravel or stone shall be placed on the center thereof, in a mass not less than nine feet wide, and not less than six or more than twelve inches deep, in the discretion of the highway commissioner.

COUNTY ROAD LAW.

28. Board of County Road Commissioners. Paragraph 4352. Sec. 6, as amended by Act 356 of 1917. In any county where the county road system has been or shall hereafter be adopted, a

board of county road commissioners consisting of three members shall be elected by the people of such county. In the first instance such commissioners shall be appointed by the board of supervisors or elected at a general or special election called for that purpose, as shall be ordered by the board of supervisors. If such commissioners are appointed they shall hold office only until the first day of January in the year in which the next regular session of the legislature is held. If such commissioners are to be elected at a general election, notice thereof, embodying a copy of the resolutions of the board of supervisors, giving the number and terms of the office of the board of commissioners to be elected, shall be published by the clerk in the newspaper or newspapers selected by the board of supervisors as required by section three of this chapter and act; if a special election is called for the election of such commissioners, a like notice shall be given by the clerk, which notice shall be posted and published in such newspapers as required by said section three of this chapter and act. The regular election of county road commissioners shall be held at the general election of the first Tuesday after the first Monday in November, and the term of office of such county road commissioners shall commence on the first day of January in the year following their election. The notice thereof shall be given at the time notice is given of the general election of county officers: Provided, That the election of county road commissioners, as herein provided, shall not be

mandatory in any county which contains twelve surveyed townships or more, either entire or fractional as determined by the government survey thereof. In such county or counties the board of supervisors may, by a majority of its members-elect, appoint such county road commissioners: Provided further, That in any county in which the board of road commissioners shall consist, at the time this amendment takes effect, of less than three members, the board of supervisors, at the first regular meeting thereafter, or at a special meeting called for that purpose, shall appoint such additional members as may be necessary. At the time of such appointment the board of supervisors shall designate the date of expiration of the initial term of each commissioner so appointed, so that the term of a commissioner shall expire on the thirty-first day of December of each even year.

STATE REWARD.

29. Road Institutes. Paragraph 4380. Sec. 3. The highway commissioners of the several townships in each and every county in the State, and the county highway commissioners in counties working under the county road law, shall if deemed advisable by the state highway commissioner, meet annually in a road institute, at such time and place as the state highway commissioner may designate, there to consider such matters as he may present to their attention, and to discuss such matters

of road improvement as may be of special interest to such township and county highway commissioners, and every township highway commissioner may collect from his township the same per diem as in actual road work, and his actual expenses in attending such institute shall, if reasonable, be allowed by the township board and shall be paid by said township.

30. Township Road Maps. Paragraph 4585. The state highway commissioner shall keep a complete record of the doings of the state highway department, which record shall be the property of the State, and shall as soon as possible make a map of every township in the State showing roads and the condition of the roads, together with marks indicating where road material can be found, and what kind and what quality.

COMMISSIONERS AND OVERSEERS.

31. Expenditure Over \$50 and Not exceeding \$500. Part of paragraph 4473. Sec. 3. In all cases involving an expenditure of an amount over fifty dollars and not exceeding five hundred dollars, in the repairing or construction of roads or bridges in any township of this State, the commissioner shall submit the proposed expenditure to the township board, and upon the arrival of the said board, the commissioner may make such repairs or cause them to be made; may do the construction work or cause it to be done; may buy the necessary materials and have the necessary help.

32. When Proposed Expenditure is Over \$500. But if the proposed expenditure is of an amount greater than five hundred dollars, the commissioner shall first submit the same to the township board, and upon approval of the said board, the commissioner shall advertise for sealed proposals for the doing of such work and the making of such repairs, and together with the township clerk, subject to the approval of the township board, shall contract with the lowest bidder giving good and sufficient security for the performance of the work: Provided That in case it shall appear to the commissioner and board acting together, in such manner that it seems to them clearly shown, that there has been collusion among the bidders, they may contract privately with any one of the bidders or with some one who was not a bidder, but at a price not to exceed that of the lowest bidder. The contract so made shall be approved in writing by the supervisor in order to be valid as against the township. Not less than ten days' notice shall be given by the commissioner of the time and place of letting such contract by putting up notices in at least five of the most public places in his township. Upon performance of the work by the contractor, if approved and accepted by the commissioner and supervisor, there shall be drawn and signed by such commissioner, and countersigned by the township clerk, orders upon the township treasurer for the amount of said contract. It shall be unlawful for any township officer to be in any way interested directly or indirectly in any such contract. Any contract in which any such township officer

is so interested shall be absolutely void: Provided, however, That in case the township board shall decide to do the work by day labor, the plans and specifications together with all bids received thereon, and the reason in writing, for not letting the job by contract, shall be filed in the office of the township clerk: Provided further, That if a bridge is to be repaired or built at a cost greater than five hundred dollars, the township board or highway commissioner may apply to the state highway commissioner who shall assign a competent civil engineer to prepare plans and specifications for the same, or decide as to the merits of the various plans on which tenders may have been received before the contract is let, and pass upon the completed structure before the contractor for the same shall be paid.

33. Commissioner to Erect Guide-Posts. Paragraph 4475.

Sec. 5. The commissioner shall cause guide-posts, with proper inscriptions and devices thereon, to be erected and kept in repair on all important road crossings on roads leading into cities and villages at distances of from three to five miles out from such cities and villages, and at the intersection of all such roads in his township as he may deem necessary.

OVERSEERS OF HIGHWAYS.

34. Overseer to be Chosen by Each Road District. There shall also be elected at such meeting (the annual township

meeting) to be chosen viva voce, or in such manner as the meeting may direct, one overseer of highways for each road district, and no elector except a resident of the district where the overseer is chosen, or an elector of the township having taxable property in such district, shall vote for said overseer, and as many poundmasters as the meeting may direct; Provided, If there shall be but one road district in the township the overseer of highways for that district shall be elected by ballot in the same manner as other township officers are elected: Provided further, That the township board may, by resolution, direct that all overseers of highways in any township shall be elected, in their respective districts, by ballot in the same manner as other township officers are elected. Act 285 of 1909, Ch. XIII, Sec. 6, being part of paragraph 4482, as amended by Act 212 of 1917.

35. Overseer Must be Resident Taxpayer of District. No person shall be eligible to the office of overseer of highways who is not a resident taxpayer in the district for which he is elected or appointed, and no person shall hold the office of commissioner and overseer at the same time.

36. Overseers to Have Charge of Road Work and Repair of Highways and Bridges. The supervision of road work and the repair of highways and bridges shall be under the charge of the overseers, subject to such directory control of the township board and highway commissioner as is herein prescribed: Provided further, That upon complaint in writing to the township

heard by any ten or more resident taxpayers that the road repair fund is being unequally and unjustly applied, or work improperly performed, the township board may direct the expenditures of such road repair fund or the manner of performing such work:

Provided further, That not to exceed twenty-five dollars shall be expended by the highway commissioners in any one year for tools or machinery, without the consent of the township board:

Provided further, That not exceeding one hundred dollars shall be expended from the road repair fund on any one mile of highway, unless otherwise directed by the township board.

37. Road Repairs to be Completed September First. Work to be paid for from the road repair fund shall be completed on or before the first day of September in each year: Provided, That not exceeding one-quarter of the amount of such tax may be kept by the highway commissioner for later necessary repairs, or for plowing, rolling or removing snow in winter.

CHAPTER III.

APPLICATION AND OPERATION OF TOWNSHIP ROAD LAWS.

The State constitution provides (laws Par.1), for the election of the Township Highway commissioner at the April election each year.

It is the purpose of the writer in administering this project, to maintain files of information from which valuable statistics may be compiled. In line with this there is obtained after the Spring elections each year a complete list of the results of these elections. This list when complete furnishes not only information regarding the current personnel in office, but also a record of the changes or turnover in these offices.

In some of our Counties the affairs seem to run more slowly than in others so that the results of the 1927 elections are not complete. The figures for the year past are complete however, and show some interesting data. It is hoped that the accumulated data may be kept over a period of years so that the figures themselves may be used in our later suggestions to stimulate proper thought and activities toward a more sound Township Highway policy.

The following tabulation by counties shows the information compiled to date on the changes in the office of Highway Commissioner. This will show the total number of townships in each county, the number and percentage of highway

commissioners not returned to office in 1926, and an incomplete but enlightening record of the changes in the present year.

A small percentage of the townships had not reported in 1926. These are not listed as change.

County	Total Number of Twp. Twps.	Number of Hy. Commrs. changed 1926	Percent- age changed	Number of Hy. Commrs. changed 1927	Percent- age changed.
Alcona	11	7	64	6	55
Alger	8	4	50	7	88
Allegan	24	7	29		
Alpena	8	3	37	4	50
Antrim	15	4	27	4	27
Arenac	12	4	33	6	50
Baraga	5	4	80	4	80
Barry	16	5	31	4	25
Bay	14	4	29		
Benzie	12	2	17	6	50
Berrien	22	8	36		
Branch	16	10	63	9	56
Calhoun	20	2	10		
Cass	15	11	73	9	60
Charlevoix	15	5	33		
Cheboygan	20	11	55		
Chippewa	16	9	56		
Clare	16	8	50		
Clinton	16	5	31		
Crawford	6	1	17	4	67
Delta	14	6	43		
Dickinson	7	4	57		
Eaton	16	8	50		

County	Total Number of Twp. Twps.	Number of Hy. Commrs. changed 1926	Percent- age changed	Number of Hy. Commrs. changed 1927	Percent- age changed.
Emmet	16	7	44	6	38
Genesee	18	7	39		
Gladwin	16	5	31	7	44
Gogebic	7	5	71	4	57
Gd. Traverse	13	8	62		
Gratiot	17	5	29		
Hillsdale	18	6	33	11	61
Houghton	14	7	50	6	43
Huron	28	4	14		
Ingham	16	7	44		
Ionia	16	7	44		
Iosco	11	4	36		
Iron	7	2	29	5	71
Isabella	16	8	50		
Jackson	19	10	53		
Kalamazoo	16	6	37	4	25
Kalkaska	12	5	42	5	42
Kent	24	6	25	11	42
Keweenaw	5	1	20	2	40
Lake	15	5	33	6	40
Lapeer	18	6	33	3	17
Leelanau	11	3	27	3	27
Lenawee	22	7	32		

County	Total Number of Twp.	Number of Hy. Commrs. changed 1926	Percent- age changed	Number of Hy. Commrs. changed 1927	Percent- age changed
Livingston	16	4	25	8	50
Luce	4	1	25	3	75
Mackinac	11	4	36	6	55
Mason	15	3	20		
Manistee	14	4	29	2	14
Marquette	19	10	53	15	79
Mason	14	2	14		
Mecosta	16	4	25		
Menominee	14	6	43		
Midland	16	7	44		
Missaukee	15	6	40	5	33
Monroe	15	4	27		
Montcalm	20	9	45		
Montmorency	8	4	50	3	38
Muskegon	17	4	24	3	18
Newaygo	24	9	37		
Oakland	25	11	44		
Oceana	16	2	12	5	31
Ogemaw	14	7	50		
Ontonagon	11	8	73	7	64
Osceola	16	4	25	6	38
Oscoda	6	2	33	2	33
Otsego	10	3	30		

County	Total Number of Twp.s.	Number of Hy. Commrs. changed 1926	Percent- age changed	Number of Hy. Commrs. changed 1927	Percent- age changed
Ottawa	17	3	18	6	33
Presque Isle	14	5	36	6	43
Rosecommon	10	7	70		
Saginaw	27	7	26		
Sanilac	26	5	19		
Schoolcraft	8	3	37		
Shiawassee	16	4	25	6	38
St. Clair	23	5	22		
St. Joseph	16	3	19		
Tuscola	23	4	17	8	35
Van Buren	18	6	33		
Washtenaw	20	7	35		
Wayne	19	7	37		
Wexford	16	7	44	6	38
Totals	1296	453	3085	233	1870
Averages	15.6	5.5	37.2	5.7	45.7

These data based on information thus far available show an average of more than forty percent turnover each year in the office of highway commissioner. It is also a record of conditions existing in a great many townships; personal prejudice, selfish interest over community interest, and the ebb and flow of factional differences and local political strife. These elements disrupt the continuity of these offices.

It may seem to the casual observer that new talent each year makes for healthy highway conditions, and in some cases the change is an actual advantage. All too frequently a candidate is elected to office of highway commissioner because under the past seasons regime he was unable to get attention to the roads in his immediate vicinity, and he took this means to insure the efforts on his roads for the current year. The past commissioners had their own sections to serve, and to satisfy each section of the township, a representative of each is rotated in office.

Consistent progress on a township road system as a whole is next to impossible with this line of reasoning. The results are that short patches of roads have been semi-improved, promiscuously over the system. The improvement is not continuous or consecutive and frequently is allowed to disintegrate for lack of proper maintenance.

This practice is so evident in some sections that it is only necessary to drive over the township system and pick out the most recent improvement work to locate the

home of the highway commissioner.

When these local sections have been completed the interest of the commissioner lags and from the results accomplished over the remainder of the year it is often deemed advisable by the whole community to put a new candidate in office the following year. This is far from economy and efficiency. In a single year, with 40 to 100 miles to administer, with little or no previous experience in construction and repair of roads, it is hardly probable that the incumbent commissioner can do much more than attend to drastic needs and learn the character of and remedies for the problems confronting him. The frequent annual turnover in this office means that the public are realizing for their money only the poorest and least efficient of this officers service and not building experience that will later enable them to get the ultimate value for the dollar.

For the first year of office, the road money is literally and actually spent largely for the education and development of experience for the Highway commissioner, and with the frequent annual changes in this office it would seem that a great measure of the road funds are thus spent toward education and little benefit realized from the results of this education.

There are also elected each year (Par. 3) a number of overseers of highways and in some sections there are also elected certain path-masters (Act 266 P.A. 1913) whose duties are (according to the act) provided for by law. The



intent of the provisions are clear but the actual provision of duties and powers are vague indeed.

In a number of townships visited the path-masters were in number from two to sixteen, each assigned to a district and drawing his pro-rata share of the appropriated funds to administer in his own way. The commissioner (upon whom the responsibility rested) in entering the various districts to check up on the work done, offers suggestions and otherwise attempting to administer his office is frequently told that path-masters or overseers are also elected by the people and are not responsible to the commissioner, that they will function according to their own dictates and in the interest of their own individual neighbors.

The commissioner is frequently told, in no uncertain terms, to go his way, and has no effective recourse in bringing pressure to bear to gain his desired results. The people upon whom his own office depends are selfishly interested locally, and has the commissioner's hands tied.

It is believed that it was the intent of the law and constitutional provisions that any path-masters or overseers in office should work under the direction of, and in harmonious relationship with the Township Highway Commissioners, and that the Commissioner in turn should carry out the needs of the township as a whole as expressed by the Township Board.

Any organization the responsibilities for which are placed upon the head, and whose head has no powers over the under-personnel, is unsound and will not function efficiently,

42

economically, and in the interests of the community as a whole.

Par. 21 of Laws states that the improvement money should be spent under direction of the Board which means that the improvement work should be under said Board's direction.

Par. 24 states that the overseer is to have supervision of work in the absence by illness, etc., of the Highway commissioner.

This provision does not seem to make this officer "lord of his domain" as far as the highway affairs of his district is concerned, but should imply the utmost in studied co-operation toward given ends.

Under the existing provisions there is room for efficiency. A study of the laws would impress one with the thought that, if they were lived up to literally, there would be a smooth-working and an efficient organization. They are sufficiently plain in their interest. However, provisions for the regulation of local matters which are administered locally seem at least to lack the "teeth" which would enforce good practice uniformly thruout the state.

There has been an effort made to prescribe the attitude with respect to highway improvement work. Par. 26 of the laws provides that "work, except repairs, shall have in view permanent improvement." Where any improvement money is raised at all, this provision in itself should assure progress in proportion to the funds raised.

48

In the face of this, in the majority of Townships, this progress is not evident.

If there is a division of opinion as to when the "so called" permanent improvements are to be made, the improvement money is frequently changed over (by approval) to the repair fund. Repairs may be anything from patching a hole to actual new construction provided that the maximum allowable money per mile is not exceeded. The Commissioner or district overseers administer the repair funds and with proper amounts of pressure and persuasion this may be placed anywhere and in any manner. The usual effect is that by such an attitude the whole township is deprived of any actual progress in improvement work on the system as a whole.

If there was sufficient importance placed on the enforcement of this provision and the path made clear of politics for this to function, progress would be evident in some degree.

The writer has had occasion and opportunity to study conditions in a large number of representative townships. While most of these occasions were voluntary and in the line of daily contacts, several were the result of special invitations from individual taxpayers and rural organizations to assist in analysing their particular situation with a view of improvement thru suggestions presented by them to the public officers.

The situations which they recognized and to which they took exception were similar to those which have existed unquestioned for years in a great number of townships. The fact

44

that the questionable practices had been recognized in a few townships was evidence of progress (of thought at least) in these.

The legislature of 1913 passed an act, one chapter of which (Chapter 25, Act 266, P.A. 1913) provided for the office of Pathmaster. This served in many cases to so distribute authority in the expenditure of Township Highway funds, even with responsibility still on the Commissioner as to make progress practically impossible. The fact that in most townships this practice has given way to the "overseer" plan speaks volumes against the Pathmaster system. However, there are still far too many Townships where pathmasters are elected. Those communities where this practice is still in effect are in most cases ones where little progress is evident from year to year even tho the highway funds raised each year ranks well with the average over the state for similar counties.

In a few isolated cases a fair measure of progress has been made, not in spite of, but due largely to the pathmaster system. In these townships, however, a keen public interest was evident in the minds of the pathmasters in office. They seem to be working with more or less of a unified idea, and a concerted effort toward some measure of continuity of improvement work. With this commendable attitude much work could be accomplished by an un-organized mob.

In one particular township, the board testified that they had tried all methods of administration open to them by law and had reverted to the pathmaster system. They reported,

and their road map bespoke the fact, that all other means had failed and that actual progress was being obtained under this system. A discussion of the conditions in this locality with disinterested but well informed observers led the writer to believe that their present progress was not due to the virtues of the pathmaster system as to three other factors.

First, - The community had spent previously an appreciable sum annually and had received so little in return that the attention of every taxpayer was focused on results.

Second, - The entire township was an evenly distributed, productive agricultural area, and the highway needs practically the same over the entire area. The fact of equal needs coupled with equal valuations and similar economic conditions of the residents, made necessary a development over large areas.

Third, - the attitude of the prevailing nationality called for a widely distributed popular control of affairs, and a natural aversion toward allowing any unified authority in the control of expenditure of moneys to which they had contributed.

That results and some degree of progress is being obtained under any system is indeed commendable. However, this township's results would not, in the writer's opinion, place them in the position of a model for the other townships to emulate. An analysis of their progress showed that, under a thoroughly sound system of highway administration, results 25 to 40% in excess that obtained at present is far from being impossible.

Should the board of directors of a private corporation pass resolutions defining that their executives must show preference by employing certain persons regardless of their qualifications, and still expect these executives to show economical progress, it would be expected that the respect of the organization for their governing body would immediately cease. In the face of this logic we find in Paragraph 23 of the legal extracts, a provision that "Persons assessed be given preference in performance of work".

It is commendable of a good number of townships that this provision has lost its force. The persons entitled to this preference have been educated to the proper belief that economical and efficient results are obtained only by experienced members of an organization whose interest and attention to this public work is primary and not secondary.

There are still townships however where this preference is demanded. In these places the persons interested ascertain the amount of their assessment, and obtain from the township officers a "road warrant". This instrument in one column states the number of hours of either team or individual work which the person is entitled to. In another column there is provided a space for recording the number of hours of work done. There is scarcely an exception to the fact that these two columns always balance, that the hours of work done is always the same as the hours of work allowed.

Considerable of this "work done" is questionable as to economical productiveness. The writer has listened to

statements of the offenders themselves, made boastingly as to the way in which they had "put in their time". The accomplishments boasted of showed some typical examples as these:-

Going thru the motions of the work, but conseiously "soldiering" or inefficiently performing.

Entire half days spent in sociable conversation over a jug of cider, usually in some shady spot.

Hours spent in friendly chat on the road with the team hitched to the road scraper. This is a common occurrence and may be seen by anyone driving the public highways almost any day.

Hauling short loads of gravel or other surfacing material. When the teams should be able to haul from one to $1\frac{1}{2}$ cubic yards of material, wagons are brought to the job the capacity of whose boxes are only a fraction of this amount. It is easily seen that half capacity loads will double the cost of getting this material to the job.

These offences are all committed by persons whom the commissioner responsible for the work may not discharge. The generalship of Napoleon, the persuasiveness of Webster, the fortitude of Job, and the psychological understanding of Blackford would all be required in a single mind to accomplish economical results under such handicaps.

The methods employed to accomplish items of improvement work are nearly as varied as the number of the personnel.

The practices by these large numbers of inexperienced men, each operating independently, are such that large sums of money are practically wasted each year.

Miles of gravel, hauled long distances by teams and handled under costly methods, is placed on roads upon which no preliminary work is done. The grades are narrow, there is no attempt at proper drainage, the gravel is dumped "a load in a place", and the surface left with such a crown as to make travel unsafe. These factors, coupled with faulty alignment, bring about conditions which show up particularly when the road is to be properly improved. When the alignment is corrected and the grade and drainage is taken care of, it is often found that a large part of the efforts and materials have been wasted.

The interference with the needed progress is not only seen in the material side as mentioned before, but the local political factors contribute their share. One common example of this was seen in a "Thumb" county just recently. Each of the many overseers in one township had a particular improvement project which he was fostering. Each ones' interest being local and not for the good of the township as a whole, each one voted for his own project and against all the others. The results were that not one of the projects gained a majority vote, and the road money all went into the repair fund.

The foregoing are a few of the admitted difficulties encountered in administering township road matters under the

existing provisions. The casual reader may get the impression that the viewpoint is rather pessimistic. The actual value received per dollar of road funds invested in the last decade makes the outlook under present conditions indeed pessimistic.

The problem is not impossible of solution. Suggested revisions toward a more sound plan of operation are offered in the next chapter.

CHAPTER IV.

SUGGESTED REVISIONS.

The suggestion of revisions usually brings to mind more complicated legislation, amendments to present laws, and otherwise making the political structure more ponderous. It is the writers opinion, and that of a great many others with whom he has conferred, that it is necessary to simplify rather than to complicate matters.

Several plans of revision have been suggested and discussed, but only one thus far seems to stand the test of soundness of policy. Some of the other factors will be mentioned that their relative merits may be discussed.

One plan was presented by a member of a county association of township highway officials. These men had recognized the fact that the first year in office the services of the highway commissioner were in most cases costly and inefficient, and that if repeated in office at least for a second year, there would be some opportunity for the township to capitalize on the education and experience gained during the first year. The plan which they presented called for an amendment to the constitution changing the term of office of the highway commissioner from one year to a two year term.

This suggestion showed thought in the right direction, and in a fair number of townships this change would be an advantage. This one change, however, cannot be expected to

make sound a system in which there are still left so many avenues for deviation. In a large number of townships in which personal contacts were made, the application of this change was kept in mind. Observations indicated that with the two year term of office the second year would prove to be a period of little progress. When the present incumbent had completed improvements to his liking on the roads in his immediate vicinity, and patched a few holes over the rest of the township, his interest in the office would have waned. Progress on any definite system would be at a standstill.

All too many of the commissioners take office with a single track purpose and an attitude of vindictiveness. The past commissioners did for themselves and the present officers have in mind primarily catching up on favors before the rest of the township is considered.

In townships where the commissioners are far-sighted enough to look to the needs of the township as a whole, the two year term of office would certainly be a decided advantage.

Another plan suggested was to change the time of election of highway commissioner to the Fall rather than Spring. This would enable the officer elected to put a little thought on the problems when time for thought was available. Then, having made his study of the problems and having determined upon how he is to meet them, this usual first year of usual inefficiency is made productive of some results. This plan too has a great deal of merit and is an improvement upon the present system. Still there would be no control of accomplishment,



and no assurance that the improvement work done, if any, will be on any unified system or that there will be any continuity of effort toward any definite goal.

The law provides that the duties of the highway commissioner may be regulated by the legislature. With this in mind another plan was presented; that the legislature be asked to relieve this officer of any active duties, and that the work of the townships, especially improvement work be done by contract. The commissioner could then act only as an inspector for the township to make sure that the specifications of the township were carried out.

It is felt that in a great many townships, this plan would work out as an improvement over present standards of workmanship and greater ultimate economy. This should not be the case. When a community is spending its own money to effect improvements to fill a local need, the local interest should make the standard of workmanship the best. From the standpoint of economy, the township in doing its own work could, with the margin of profit expected by any contractor, increase the mileage of improvement or reduce the cost of any given mileage by this amount.

Act No. 202 of the Public Acts of 1925, offers legally another solution to the difficulty. This act, in essence, provides that the township may enter into contract with the County Road Commission of their county for the improvement and maintenance of the township's roads; that the money raised in the ordinary way in the township be paid to the County for this

work. The county may use its own equipment on this work and charge for the use of this equipment according to the State rental tables.

There is a further provision that if the township is in any way dissatisfied with this arrangement it may terminate this contract upon action of the board and ninety days notice given the County.

The fact that such a bill was even considered by the State legislature was evidence of a recognition of the shortcomings of the present system. In the writer's opinion this measure is a step toward eventually relieving the townships of any control over these roads at some future time if they are not more soundly administered by the townships.

A study of the effects of this bill showed that in the year 1926 only one township (Alpine Twp., Kent County) had submitted wholly to a trial. This arrangement covered only a one year trial. Whether they will continue this year is a matter not ascertained to date.

With the more efficient equipment and the greater experience of the County organization, it was only fair to expect that a greater mileage of roads was kept fit for travel than was possible under the past system. This was accomplished too at no increase in the road funds raised.

A number of other cases were reported where township and county had entered into agreement for the improvement or maintenance of certain of the township's roads. This was provided for under Section 12 of the same act.

The fact that the provisions of this act were not more universally accepted by the townships seems to be proof in itself that, as a remedial measure, the act is not filling the need. Fundamentally it is substituting another organization whose interest in the work at hand may be keen, but whose interest in the welfare of the community cannot be expected to equal that which we should expect of the township.

More regarding the possible work of the counties on these roads will be touched upon later in this thesis.

Considerable criticism has been offered on the functioning of the present form of township organization, and the shortcomings of several of the suggested improvement measured analysed. It seems now in order to present a conception of a more or less ideal township organization which will stand the test of economic soundness, and which should function as efficiently as it is possible to expect of political bodies.

Even with these revisions there will still be possible leaks, political prejudices and some avenues of waste, but it is felt that if carefully followed out in principle, and functioning along lines which will be discussed later, that a tremendous increase in the amount and quality of improvement on these secondary roads will be possible at no greater expenditure of money. It is also conscientiously felt that, with an organization which is sound and with the operation of a plan which will show a greater return in results per dollar invested, there will be built up a community feeling which will go far toward eliminating petty politics and factional and sectional differences.

The plan may seem somewhat drastic, however it is actually as simple as it is reasonable. Briefly stated it will entail the following:

An amendment to Section 18, Article VIII of the State Constitution which will cause to be stricken out the portions which cause to be elected each year "one commissioner of highways, and one overseer of highways for each highway district". According to the information received, it is the custom in this state for the Governor to appoint every sixth year a committee to consider and submit such amendments to, and revisions of the State Constitution. The year 1926 was the end of the last six year period, but the fact that nothing has been done in this direction for a considerable time back might be reason for such a step in the early future. A substitution for these officers will be provided for in the personnel structure of the organization outlined.

Any subsequent legislation regulating the powers and duties of Highway commissioners, highway overseers or pathmasters should be repealed.

Either by Constitutional amendment or by legislative enactment, there should be provided that the Township Board of each township shall, in matters pertaining to the highways of their township, act as a Board of Township Highway Commissioners in much the same manner as the Boards of County Road Commissioners in the several Counties. Their duties and powers shall be prescribed by law.

The Township Board should then appoint or employ in

each Township a Superintendent of highways at an annual or monthly salary consistent with his experience and abilities and the demands of the position. Only such a Superintendent should be employed whose abilities and experience will assure efficiency and full value for the money to be expended, and his period of service should continue as long as he continues to render satisfactory service. His powers and duties should be prescribed by the township board, and he should act in cooperation with, and carry out the will of this board. This position should be free of political influence, and its operation should be for the interest of the township as a whole.

The Township Board should hold the Superintendent strictly accountable for the efficient and economical progress of the work under his direction, and may, if in accordance with their judgment and the interest of the township, discharge the Superintendent should he fail to render satisfactory service and employ another who can give satisfaction. The Superintendent should then be empowered to employ such labor forces as are necessary and advisable for the efficient progress of the work outlined. The employment of labor should be on the open market and on the same basis as private industry without regard to influence, residence, amount of property owned or taxes paid. The Superintendent should have the power to employ or discharge any members of his labor organization according to his discretion and the efficient prosecution of the work.

The assistants employed by the /superintendent should be paid on a per diem basis and should be held only in

sufficient numbers and for such time as actually needed for the satisfactory progress of the work.

This is all that need be said regarding the personnel. The organization is far more simple and should function far more efficiently than the present one. It is fundamentally sound, and the legislative provisions to make it possible could be simple, direct and easily understood.

Even with a soundly perfected personnel organization, in order to insure the uniform and economical progress in township highway matters thruout the state, it is necessary that the operations of this organization be further regulated. Briefly, the regulations should consist of a definite plan of action, and a definite program upon which to work in order that the projected work on the plan is to be carried out.

The reasons for these elements will be obvious when a few points are considered. The past operations of the State Highway Department offer a good example in this. Just a few years back, the construction of State road projects was as promiscuous almost as is the case with the townships at the present time. Short pieces of road were built "hit and miss" in various parts of the state with little regard to their continuity on any given system. The results were that little progress was noticeable under this practice. It was only after the State had adopted a definite Trunk Line system comprising what were to be the primary routes of the State, and confining their construction operations to these routes, that actual progress was evident. While matters of methods employed and some other factors in

State highway matters have been questioned in the past, the fact remains that the system is fundamentally sound, and the progress made has placed this state in an enviable position among our sister states.

Following the adoption of the State Trunk Line system, it followed as a logical sequence that the counties should formulate a system of county roads to supplement the state system. These routes were outlined with due regard to trunk line locations and to the outlines of the surrounding counties. It was necessary that the county systems be approved by the State. The counties caused the projects on their routes to be properly surveyed, and are proceeding logically in their improvement work in a definite program according to the importance of the projects and the funds provided. The progress in the counties is such that with few exceptions, they can point in the near future to the end of their actual construction operations. The projects on their systems will have been completed, and their major operations reduced to problems of maintenance.

Not until the State and County organizations had actually outlined and adopted such definite systems, and applied their improvement programs logically and consistently on these systems, was there any marked and apparent progress. If these factors were necessary for results for the State and County organizations, they would seem doubly necessary for the Townships where the control is spread out over six times the mileage and fifteen times the number of organizations.

It is suggested as necessary and fundamental that the

Boards of the various townships actually prepare a map of their townships. This map should show all the road locations within the township regardless of their character. On this map then should be laid out the State and County roads as they affect the township. These State and County roads are the primary routes, and in order that they be accessible to every resident of the township, there should be worked on the township road locations a system of feeder roads, laid out in such a way as to serve the most people with the fewest miles.

To give force to such a township system it may be necessary and advisable to have the system formally adopted at the town meeting. It should be made necessary according to law that a copy of this map be filed with the Board of County Road Commissioners, and at the end of each construction season, that the season's improvement work be posted on the County's copy as well as other copies. The amount of improvement work posted each year compared with the amount of money spent for this work would serve as a check on the value received.

The Township Feeder routes should be surveyed by a competent surveyor in order that they be placed in their proper position in relation to the Government Land Survey. The survey would eliminate the necessity for changes in location after money had been spent on these roads for improvement or heavy repair work. With the location definitely established, any proper work done on these routes, such as grading, drainage, etc., will serve as a step toward final improvement.



With the map prepared and approved, and the routes established, there should then be ascertained the amount of money available for improvement work each year. Knowing the nature of the improvement work to be done and its approximate cost per mile, there should be established a definite program of improvement work. This program to cover a period of years accordingly as the number of miles possible of improvement in one year is contained in the mileage of the entire feeder system. The improvement program should also be adopted formally at the town meeting.

The improvement projects on the feeder routes should commence in every case at their junction with the primary roads, or at towns or villages, and continue outward into the country. In this way the routes will gradually be made to serve more and more people, and as each is reached, the entire distance to the primary roads will have been improved.

This practice may seem like slow progress especially in those townships where a very little money is raised each year for improvement work, however, as small as the sum may be, if applied religiously to this system and according to a definite year to year program, results will be apparent in a period of years. In townships where progress seems most hopeless, an analysis of their expenditures over the past twenty years will show that if they had applied this money in some such sound and logical way as outlined above, they would have today from ten to twenty miles of improved road on their system. It is only in this way that they will ever even visualize the end of their improvement work.

If no change is made in the personnel organization administering township road matters, it is still more essential that some such plan and program is adopted and followed in order that continuous and economical results may be assured.

To aid in eliminating poor judgment in improvement work, it should be further provided that the improvement program as devised by the townships be submitted to the Board of County Road Commissioners for approval before any funds are expended.

The revisions suggested in this chapter, while drastic, are not radical. They are extremely rational, they are sound, and it would seem that they would be easy of accomplishment. They may need to be enlarged upon or may need further revision, but they will form the elements of a system which will be productive of results and economical progress, and are food for a tremendous amount of constructive thought.

If some such sound policy is not pursued by the townships in administering their road matters, it is felt that the time is not far distant when this work will be taken out of the hands of the townships entirely. It is easy to conceive of the adoption, by the State Highway Department of both a primary and a secondary Trunk Line system; the primary system to comprise the routes on the present trunk line system, and the secondary system comprise the routes which are at present defined as County roads. All the rest of the mileage of public highways then shall be considered County roads, and as such

will be administered by the county organizations. This step would be considered drastic, but seems to be the only alternate line of reasoning.

On the following pages are sample township road maps laid out in accordance with the principles outlined in this chapter.

The following Township road maps Figures 1 to 11 will show what is meant by having the township routes mapped out into a system in order that they may be improved according to some definite program.

Figure 1 shows the efficient manner in which the township system was laid out in Polkton Township, Ottawa County. The community is primarily agricultural with the village of Coopersville as their shipping point. The road system seems to indicate that this market is easily available.

Figure 2 shows the layout of Township roads of Alpine Township, Kent County. The roads in this township were under County maintenance in 1926 under the provisions of Act 202, P. A. 1925. This practice seemed economical and successful in this township the year it was tried. It is not known whether they will continue in this way or take the roads back under township care.

Figure 3 shows the road map of a township in which every farmer in the township will be supplied with an improved road to market. The system was worked out so as to accomplish this with an absolute minimum number of miles to the system.

Figure 4 shows (in red) the layout of the Township Feeder system in one Township. For years they had been spending nearly \$4,000.00 annually and had practically no improved roads to show for their efforts. After working out this system it is planned to spend \$5,000.00 per year on a definite improvement program.

Figure 5 shows over 5 miles to be built by the end of a two year period (narrow black lines). Figures 6 and 7 show progress at four and six years respectively. At the end of the sixth year nearly 14 miles will be completed. Progress will show up only on a definite plan and program.

In Figure 8 is a typical Township condition where roads have been built in short stretches promiscuously over the township and not a part of any general plan.

Figure 9 shows the way in which all the improved patches were incorporated into a general plan of roads that actually served.

In Figure 10 the Township represented was well supplied with mileage on the primary road systems. The Township was low as to valuation, little agricultural, plenty of cut-over and burned lands and no township roads. One small and a part of one large lake were within the borders, as well as a few streams abounding in fish. The lakes and streams were inaccessible in many places by way of the primary roads. The lay-out and improvement of the township system as in Figure 11 makes both lakes and streams accessible to

tourists and sportsmen, made way for purchase of cottage sites, increased valuation of the lake property and made a ready market for garden farmers. Much can be done by intelligent work in this respect.

POLKTON TOWNSHIP
OTTAWA COUNTY
TOWNSHIP ROAD MAP

STATE T.L. ———
COUNTY RD. ———
TOWNSHIP RD. ———
SECTION LINE - - - -

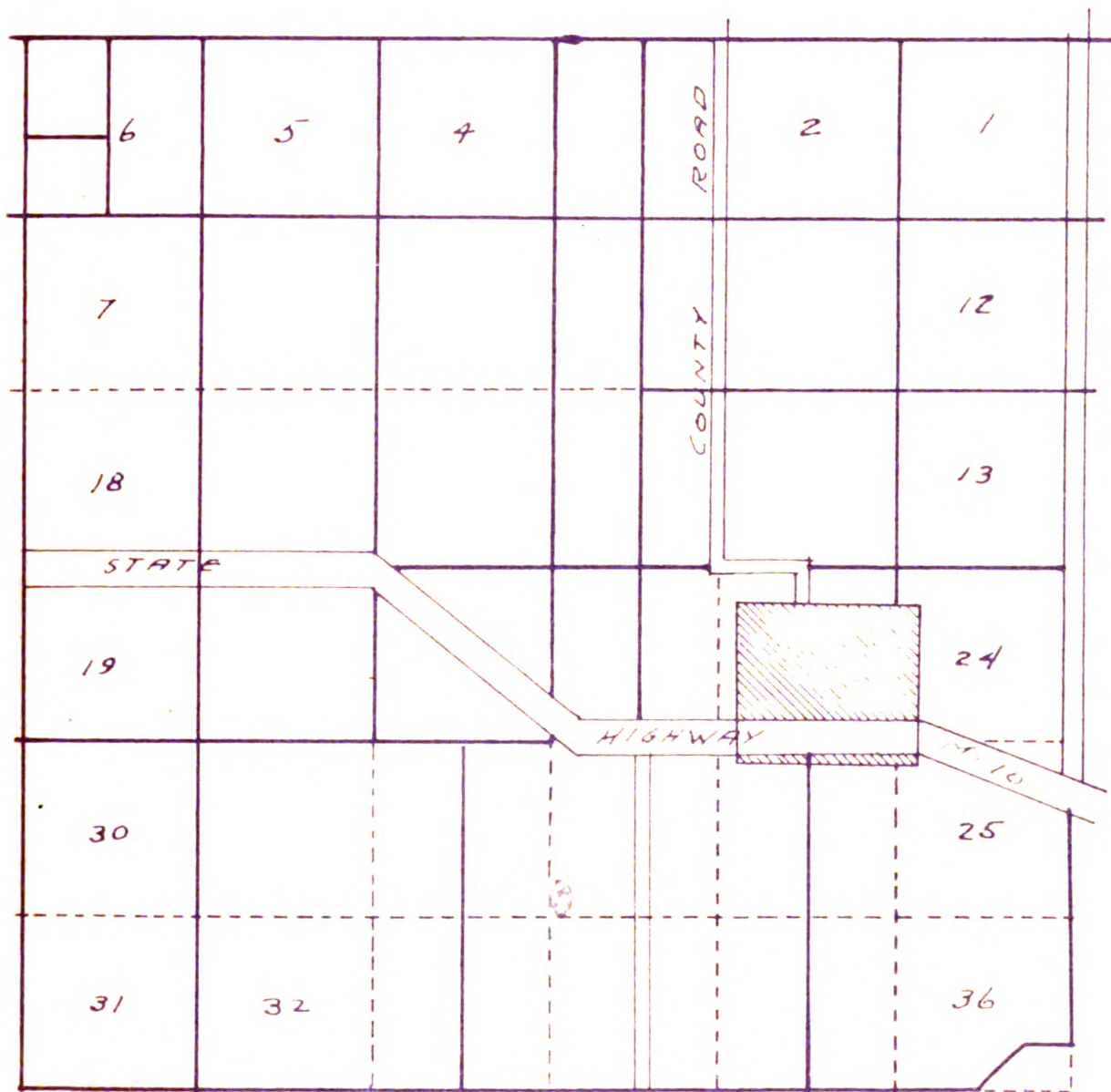


Figure 1.

ALPINE TOWNSHIP KENT COUNTY TOWNSHIP ROAD MAP

STATE T L
COUNTY RD
TOWNSHIP RD
SECTION LINE

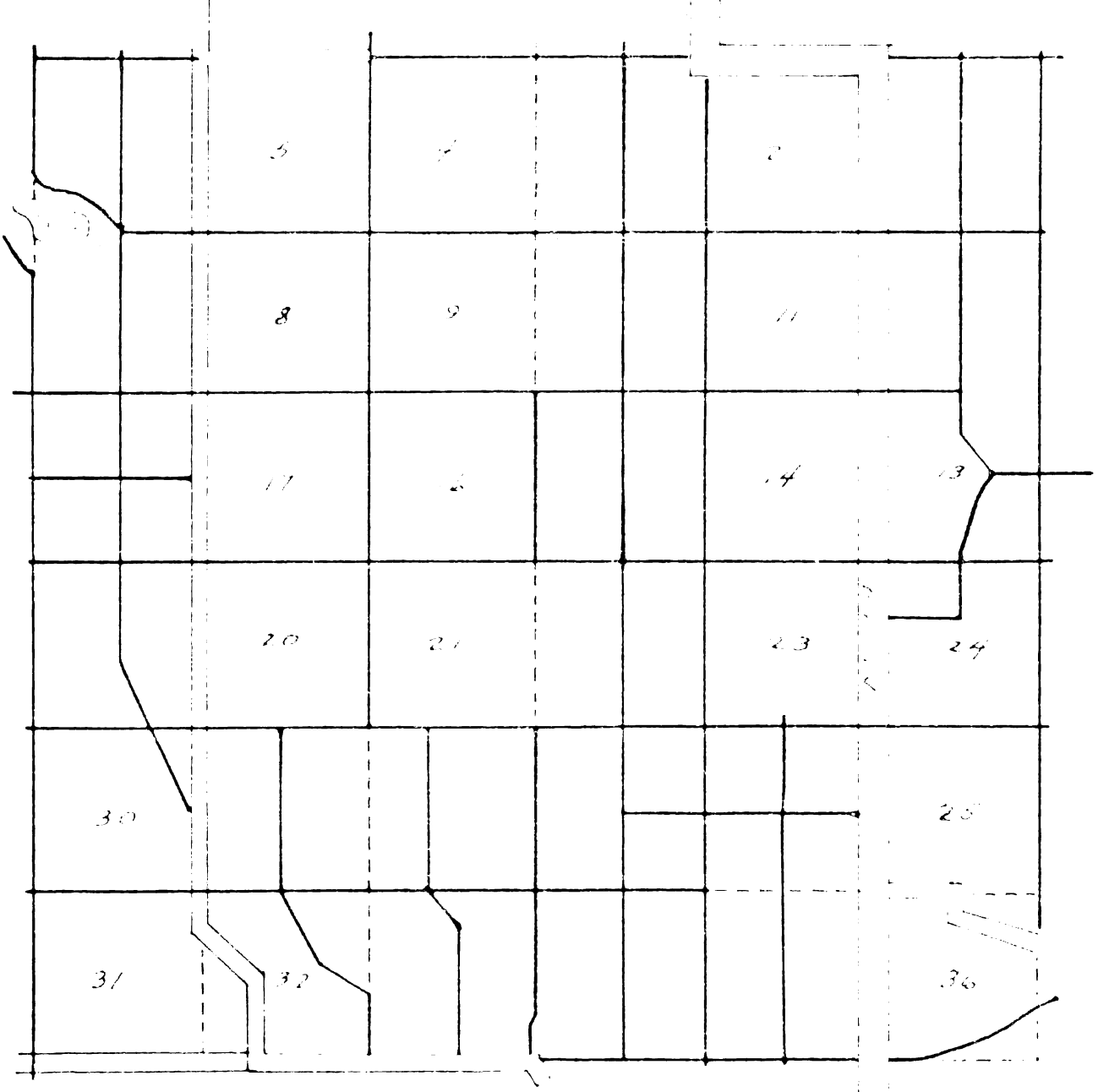


Figure 2.

[REDACTED] TOWNSHIP MAP
[REDACTED] COUNTY

TOWNSHIP ROAD MAP

STATE T.L. ---
COUNTY RD ---
TOWNSHIP RD ---
SECTION LINE ---

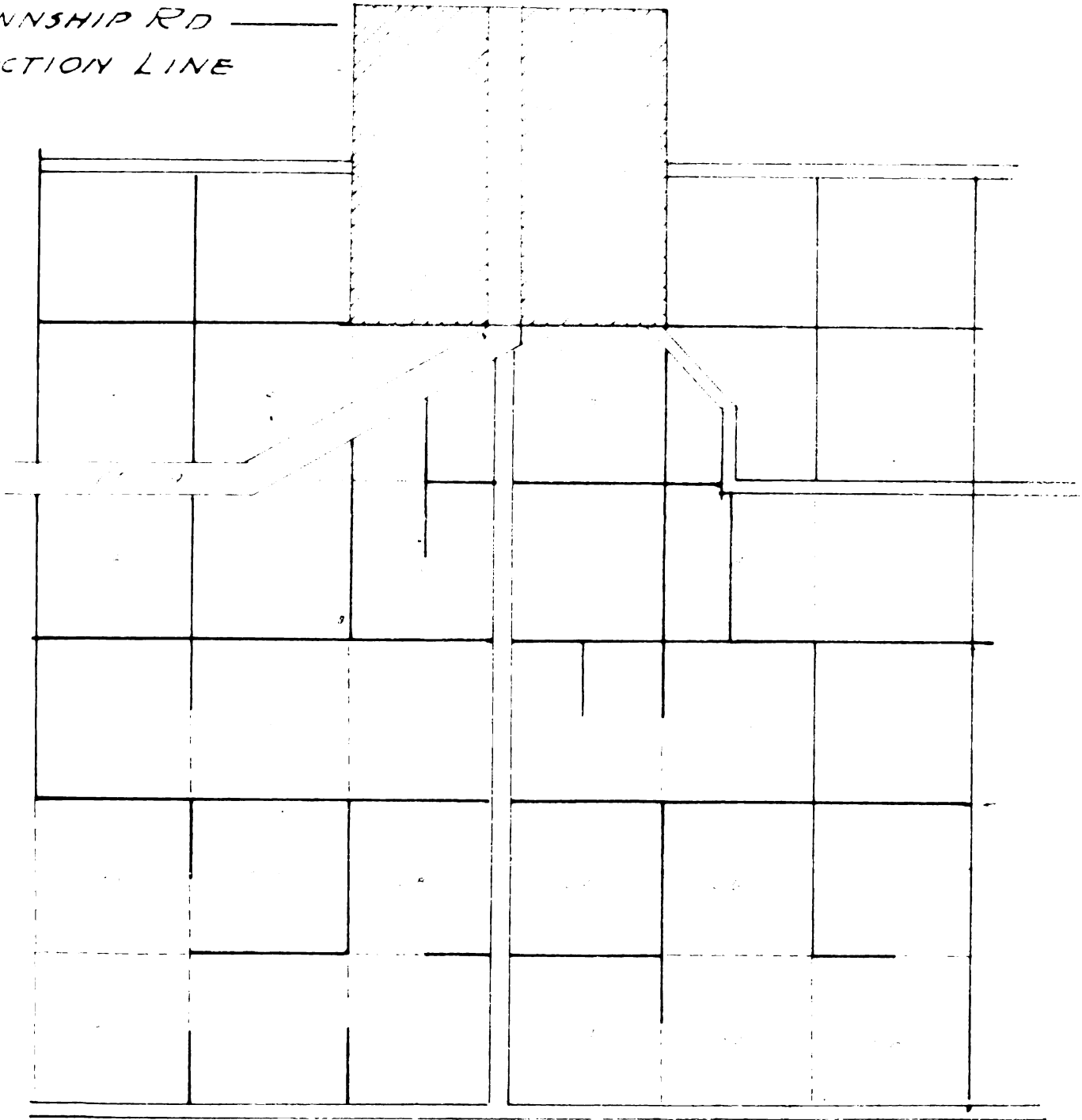



Figure 3.

TOWNSHIP OF COUNTY OF

MAP OF TOWNSHIP ROAD SYSTEM


 STATE ROADS
 COUNTY ROADS
 TWP ROADS
 SECTION LINE.

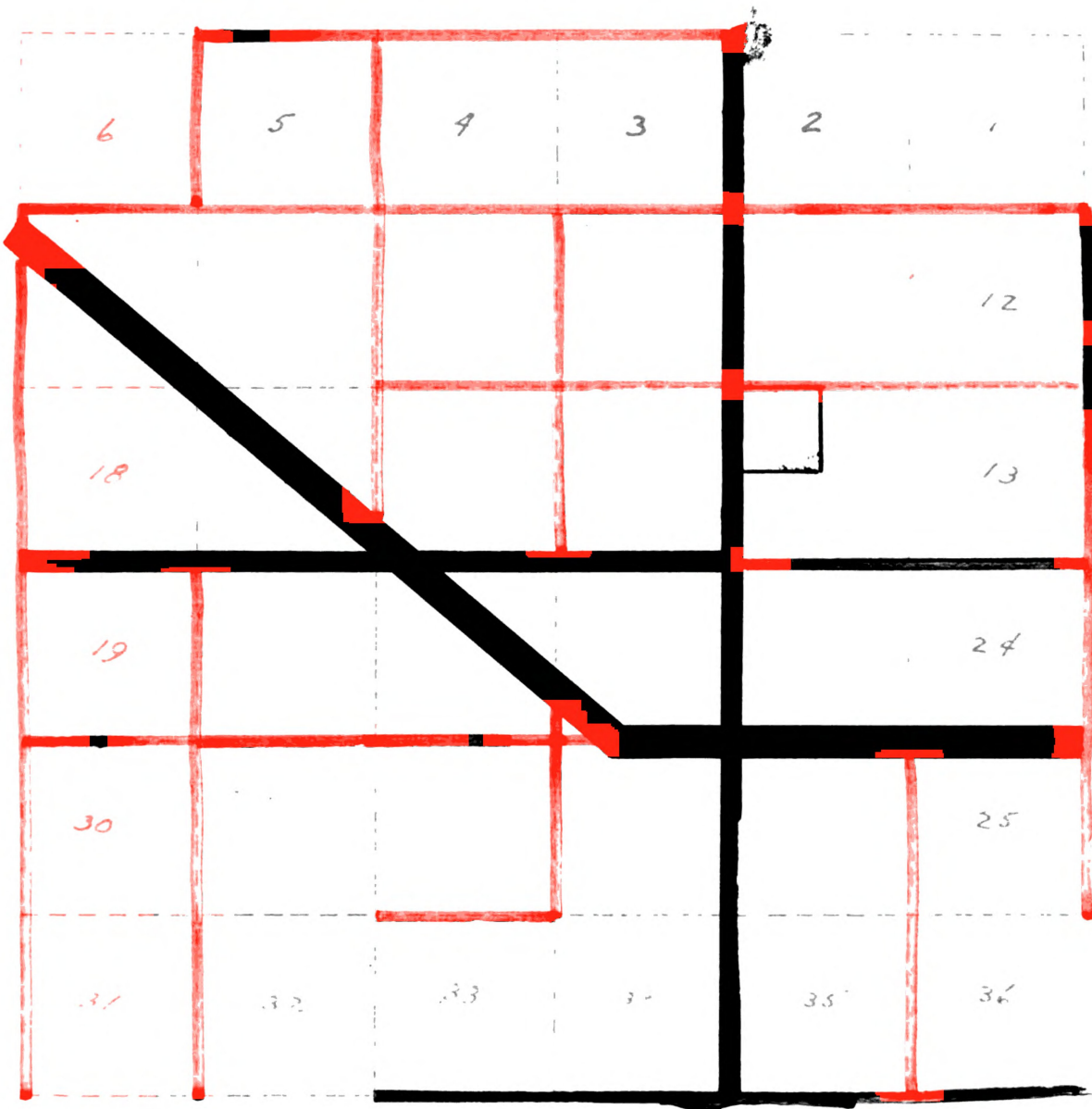
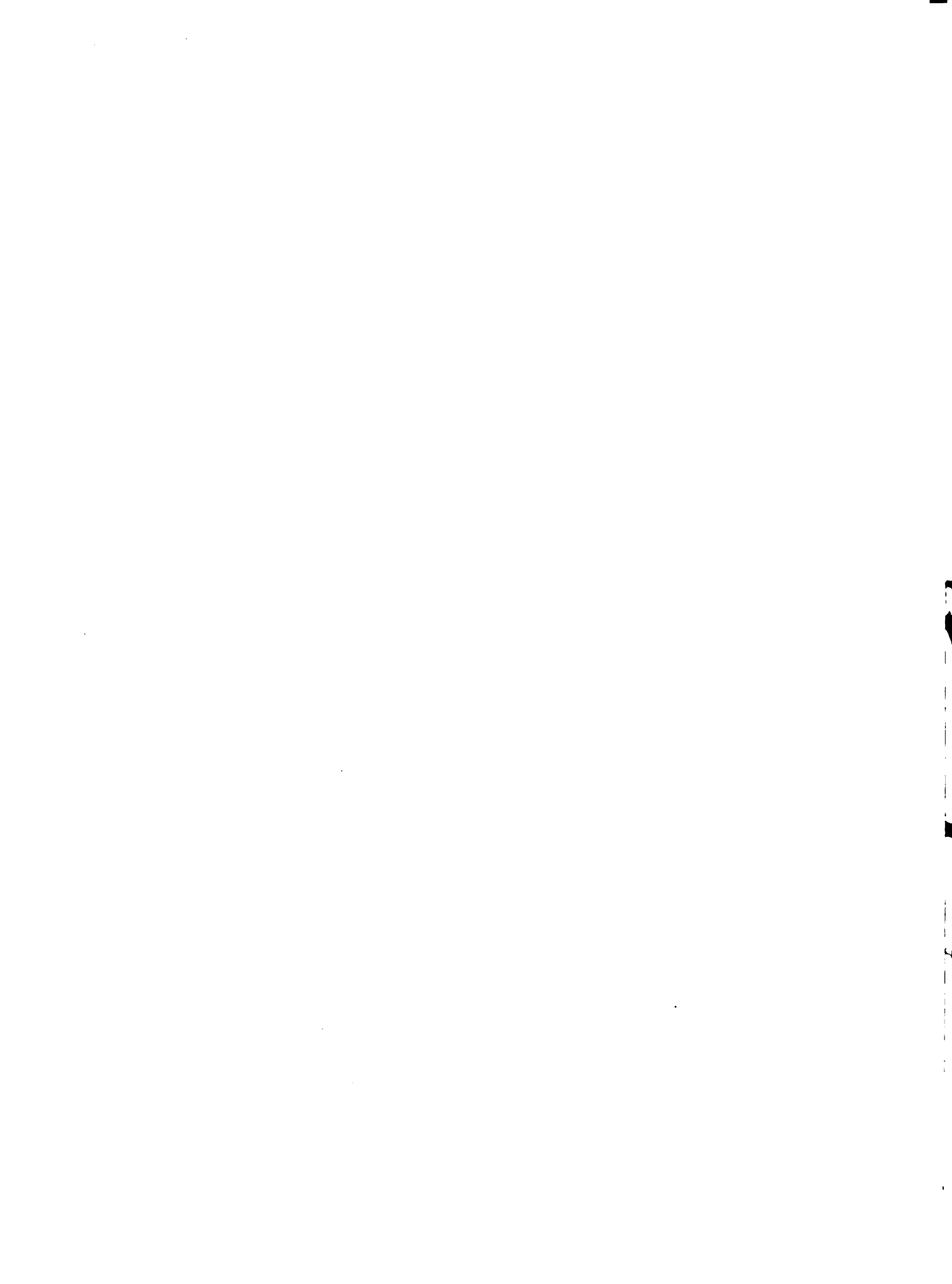


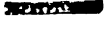



Figure 4.



TOWNSHIP OF COUNTY OF

MAP OF TOWNSHIP ROAD SYSTEM.

-  STATE ROADS
-  COUNTY ROADS
-  TWP ROADS
-  SECTION LINE.

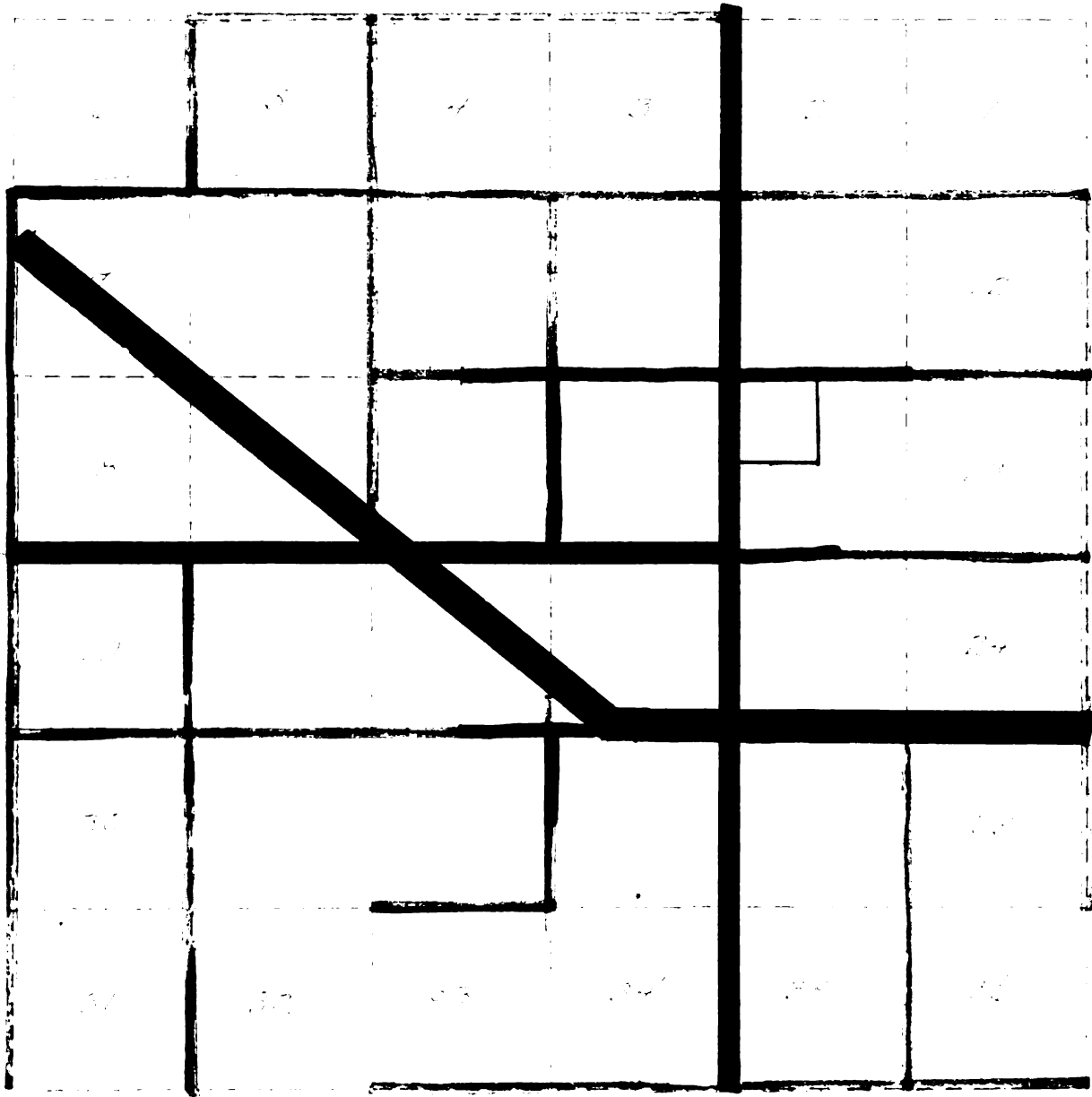


Figure 5.

TOWNSHIP OF
COUNTY OF

MAP OF TOWNSHIP ROAD SYSTEM

STATE ROADS
COUNTY ROADS
TWP ROADS
SECTION LINE.

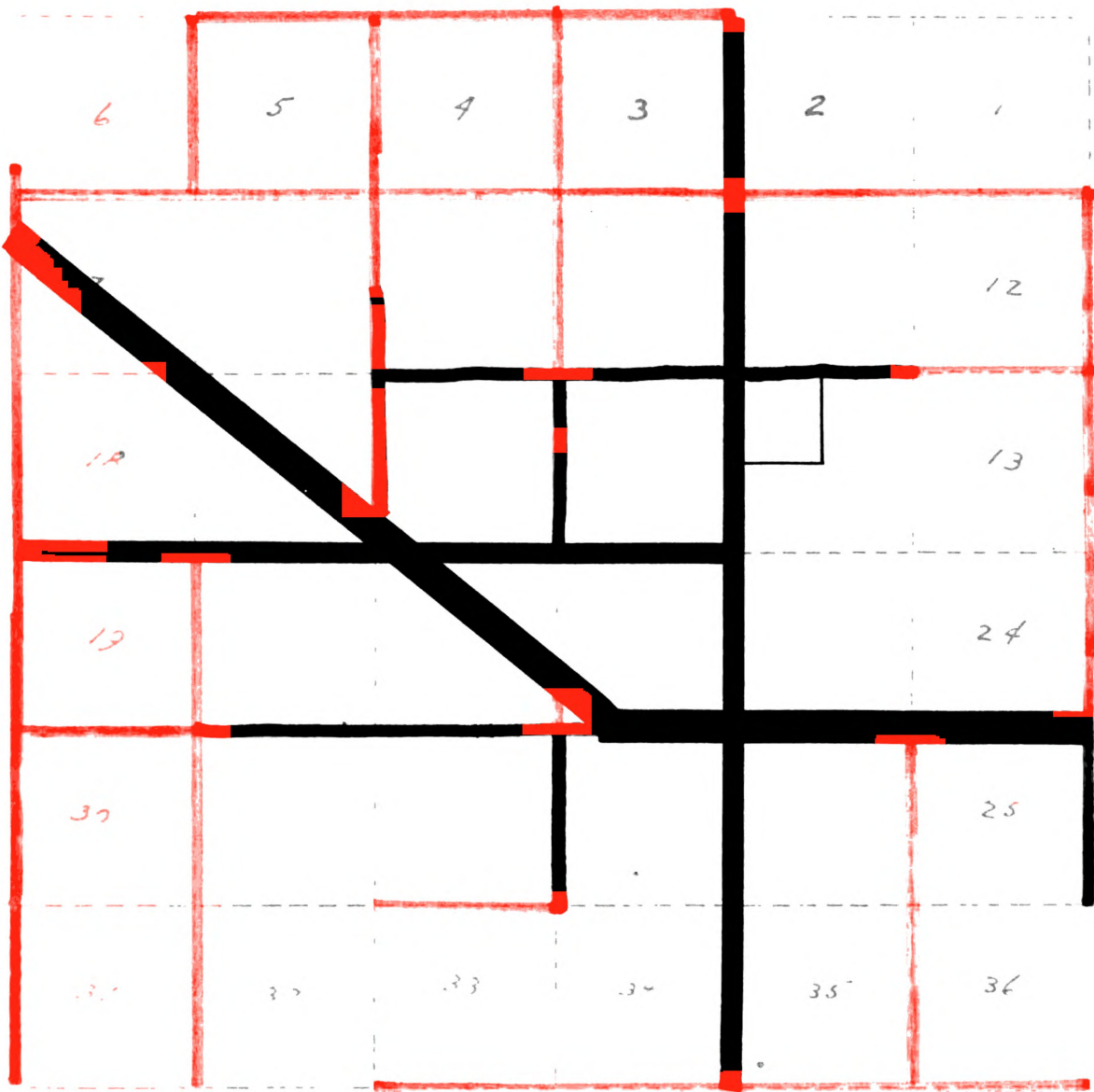
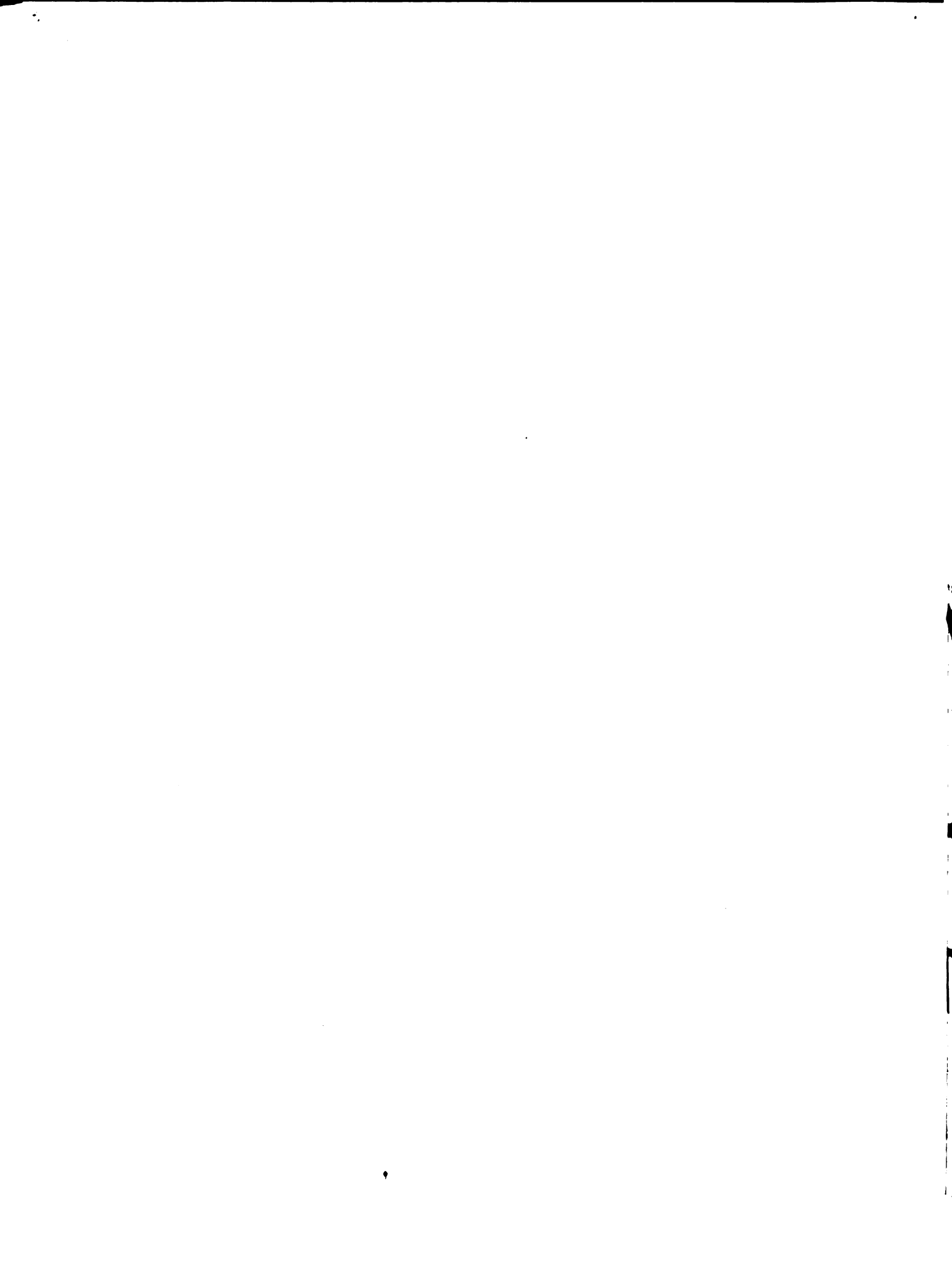


Figure 6.



TOWNSHIP OF COUNTY OF

MAP OF TOWNSHIP ROAD SYSTEM.

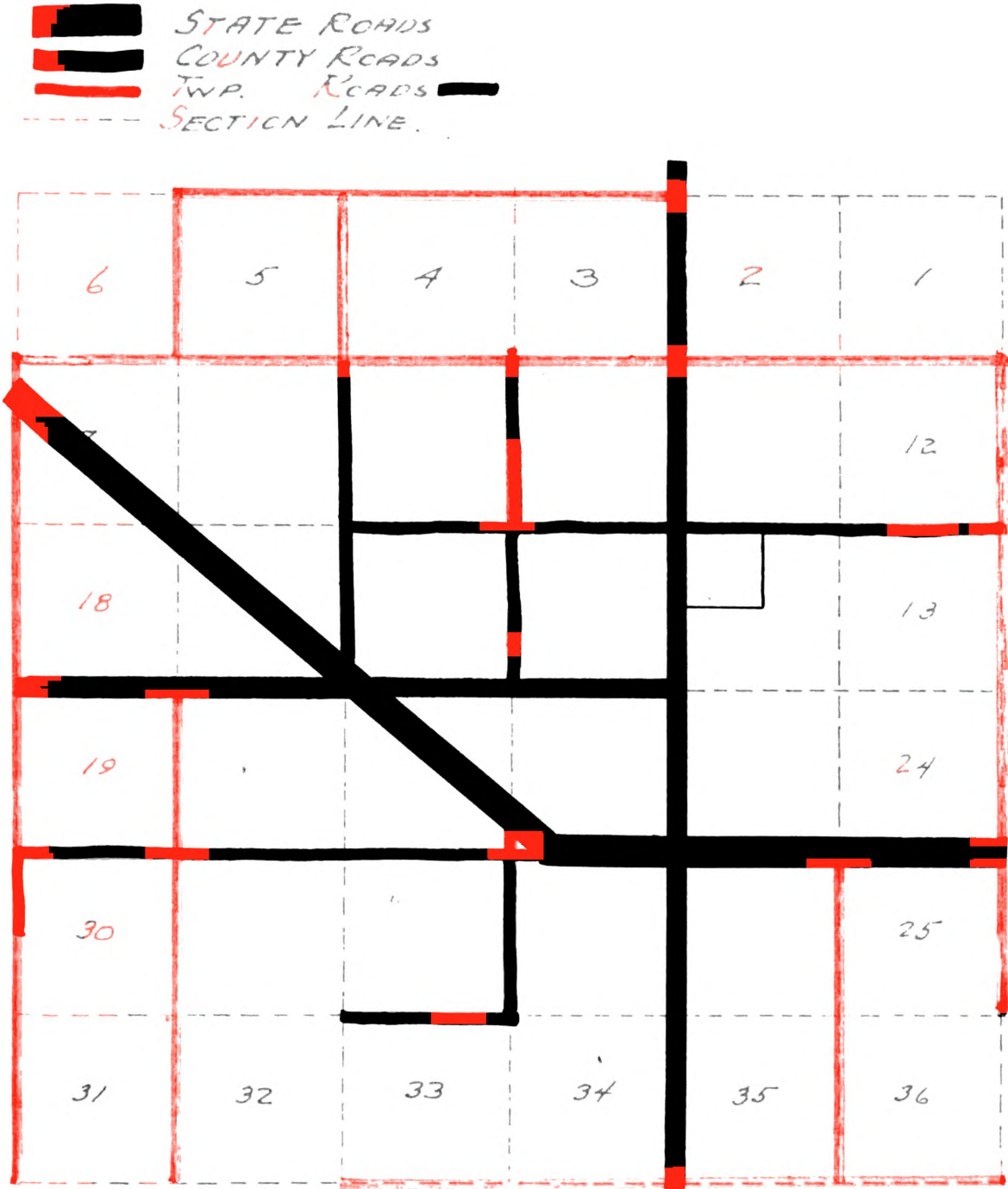



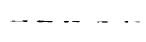


Figure 7.

TOWNSHIP 0.th
COUNTY 1st

MAP OF TOWNSHIP ROAD SYSTEM

 STATE ROADS
 COUNTY ROADS
 TWP ROADS
 SECTION LINE.

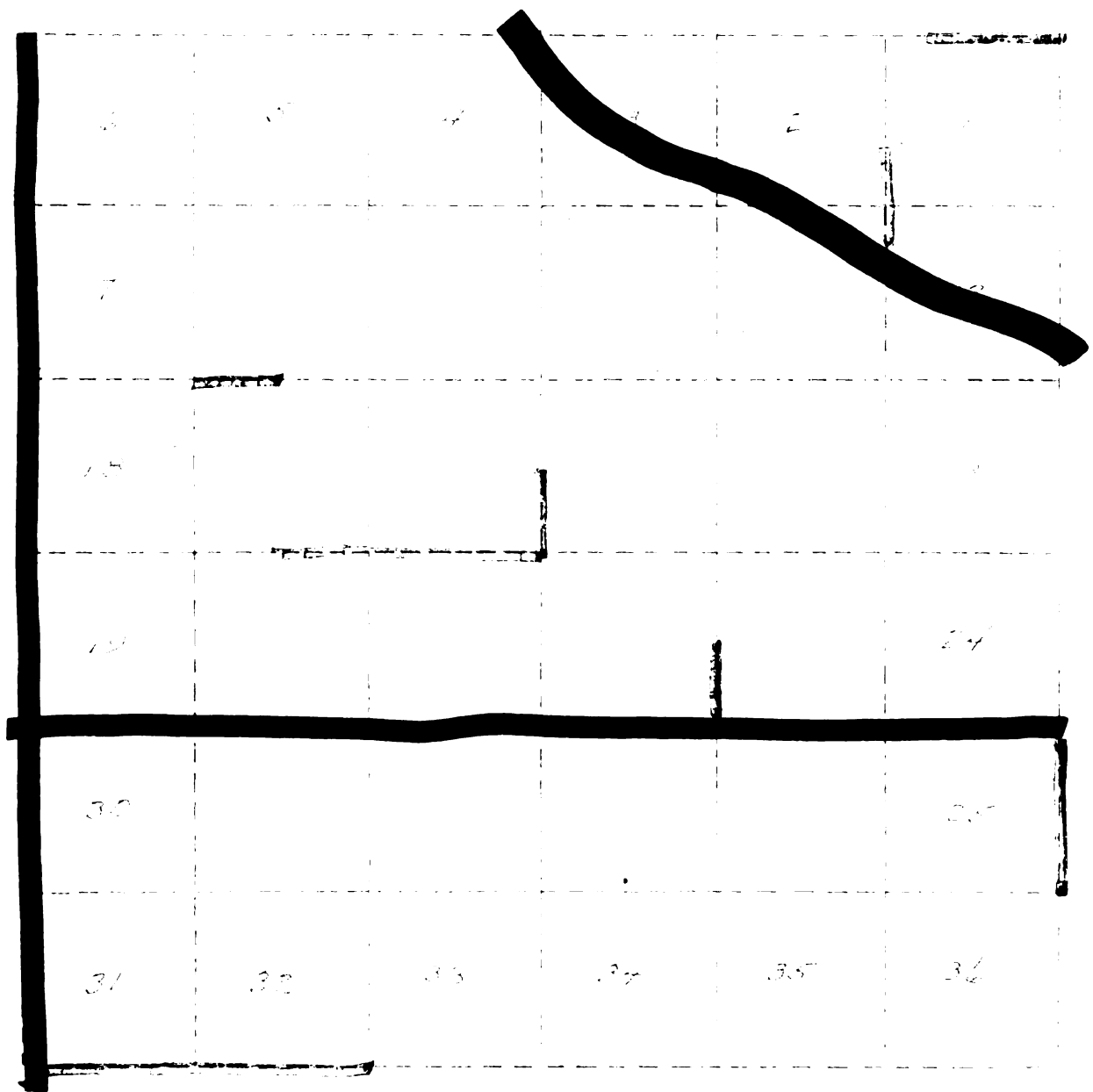






Figure 8.

TOWNSHIP OF
 COUNTY OF
 MAP OF TOWNSHIP ROAD SYSTEM.

 STATE ROADS
 COUNTY ROADS
 TWP. ROADS
 SECTION LINE.

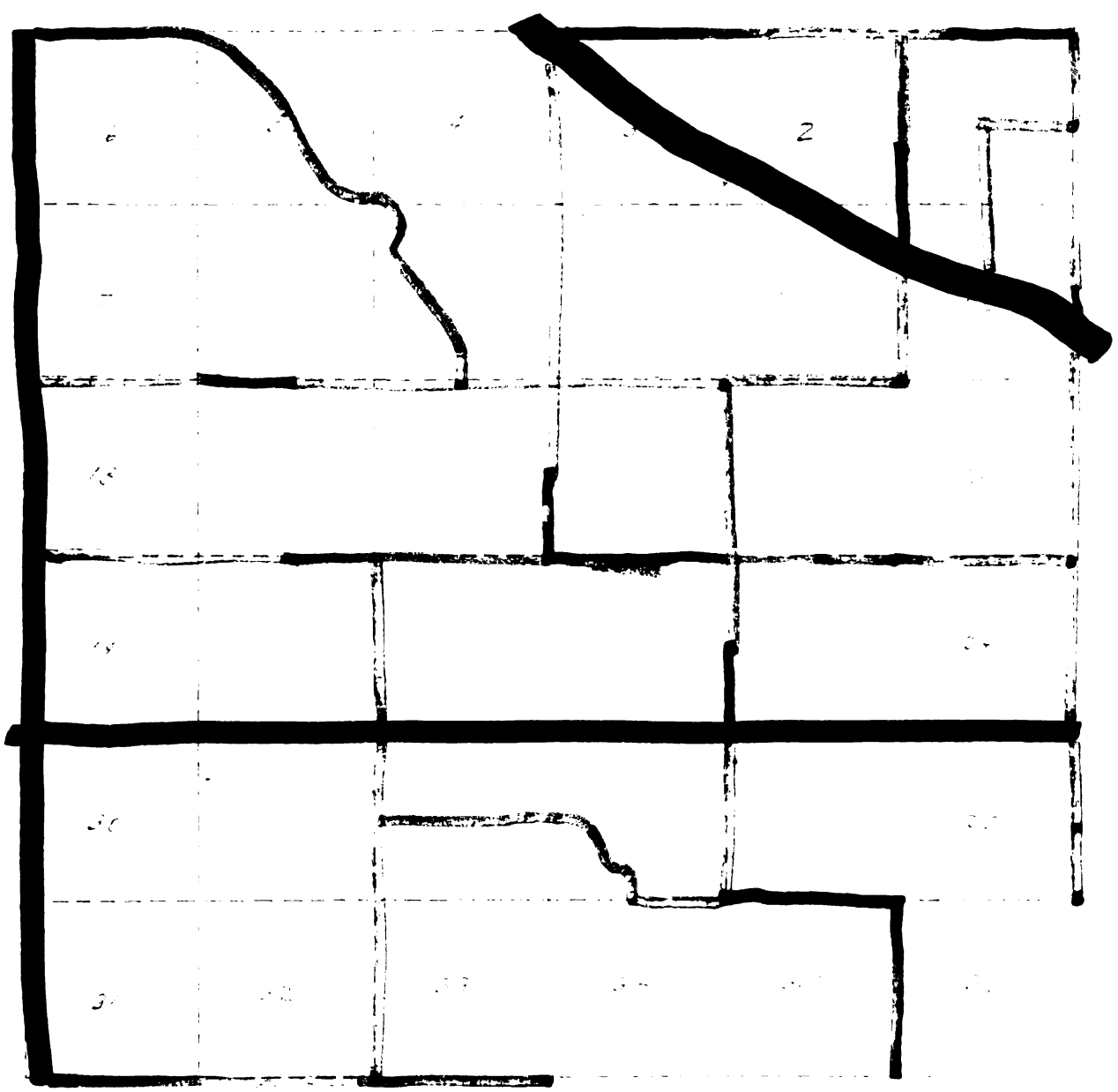


Figure 9.

TOWNSHIP OF _____
COUNTY OF _____

MAP OF TOWNSHIP ROAD SYSTEM

== STATE ROADS
== COUNTY ROADS
--- TWP ROADS
- - - SECTION LINE.

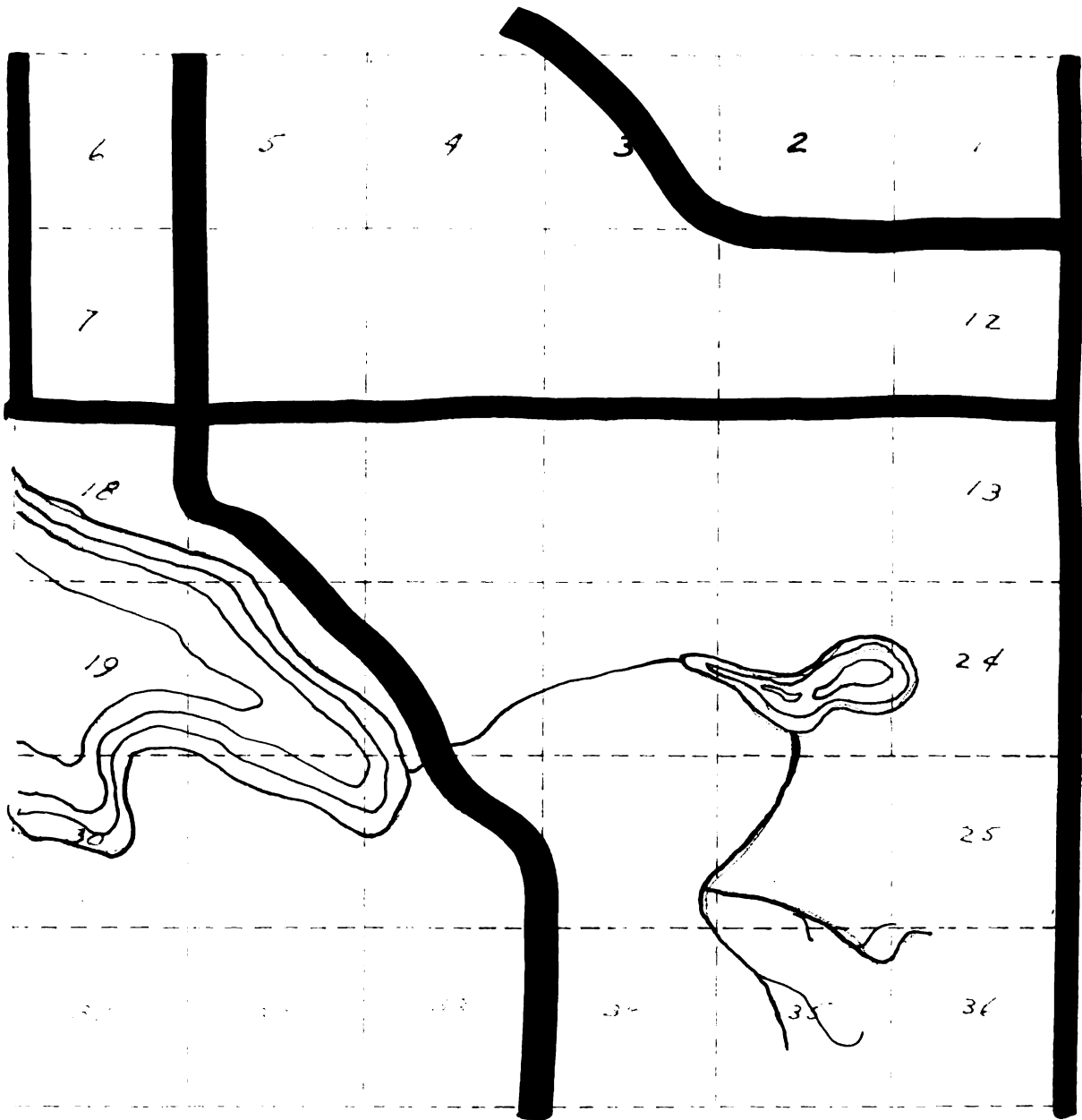


Figure 10.

TOWNSHIP OF
COUNTY OF
MAP OF TOWNSHIP ROAD SYSTEM.

-  STATE ROADS
-  COUNTY ROADS
-  TWP ROADS
-  SECTION LINE.

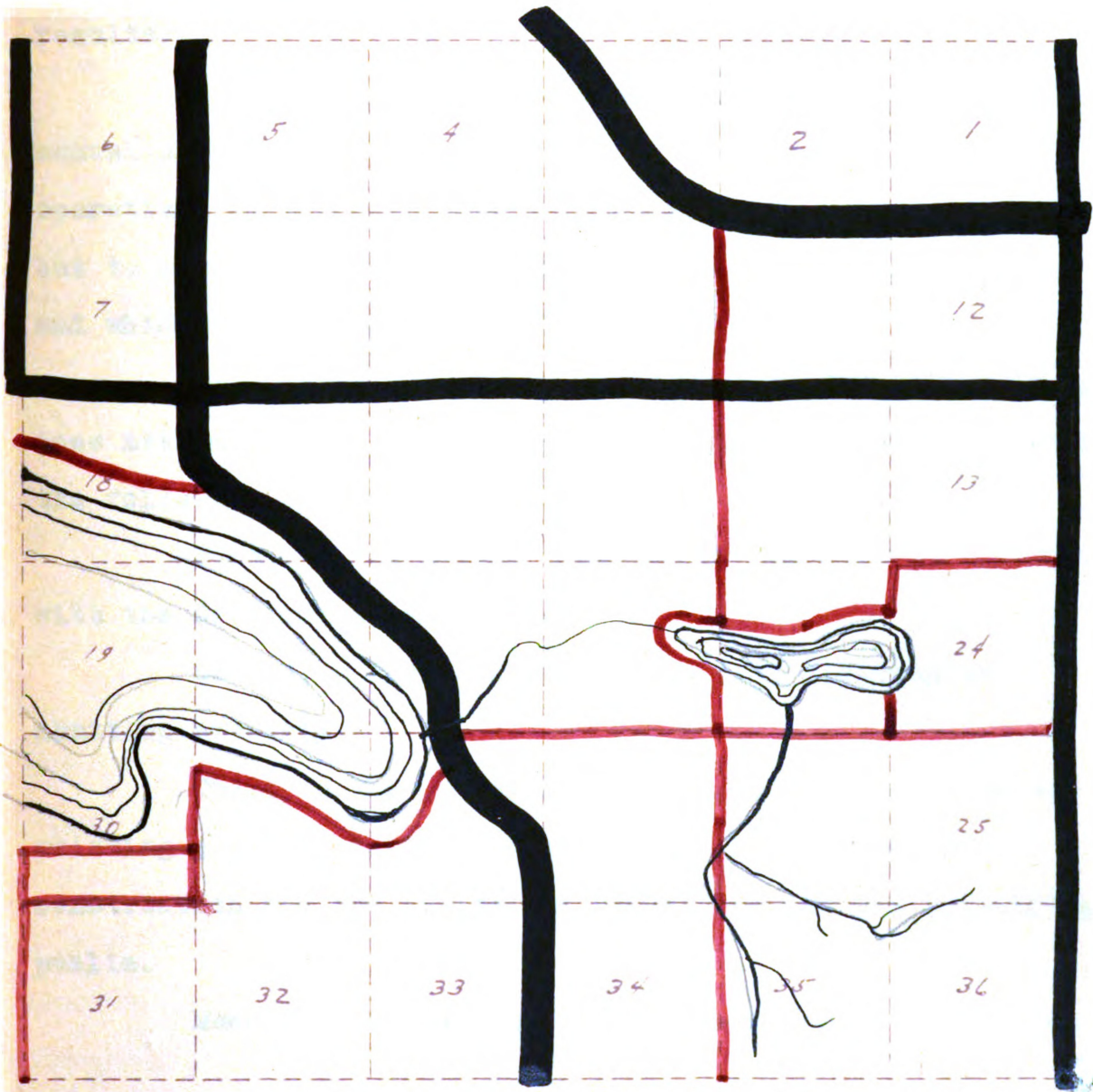


Figure 11.

CHAPTER V.

SUGGESTED STANDARDS.

With the legal obstructions to good practice removed, a sound organization developed and operation on a pre-arranged plan and program, it is time now to consider some standards by which may be obtained uniform good results.

It is not the intent of this thesis to offer a manual or handbook containing instructions in all the operations on township road construction and maintenance, but to comment upon some of the factors felt to be important and which are frequently overlooked.

The importance of proper alignment of township roads does not seem to be recognized. The alignment has to do with the following considerations:

First, - The proper location of the road in relation with the Government land survey.

Second, - The relation of the road location to abutting property.

Third, - The relation of the road location with the existing physical features which affect the economy of construction and the safety and convenience of the travelling public.

Much the greater portion of the mileage of township

roads is made up of so-called section line routes. On these routes it is a comparatively simple matter to properly align these roads in accordance with the section markers established by the Government land survey.

When it is found necessary to deviate from the established section lines due to physical features, grading costs, safety, etc., it is still more important that a proper survey be made. The amount and nature of encroachment upon the abutting property should be determined and satisfactory arrangements made with the owners before any funds are spent on actual improvement work. Observations have shown that numerous difficulties have resulted from indiscriminate placement of improvement work, and the resulting costs and dissatisfaction would indicate that a proper center line survey would prove not only more sound but more economical as well.

The important factor in favor of proper alignment and grades is the fact that improvement work intelligently done need not be repeated. A grade built, even though it must remain unsurfaced for some time, is a step toward final completion of the improvement. If extensive work is done and later the line or grade must be changed, the cost of the first operations is practically wasted.

After the projects are surveyed a plan and profile drawn for the improvement would aid materially in the uniformity of the work, and should aid those responsible for the work in its efficient planning and execution.

The centerline of survey should be plainly marked by stakes offset sufficiently as to be out of the way of excavation operations, and at intervals not to exceed 100 feet. The plan and profile should refer to these stakes. The plan should show the centerline of the survey, and in relation to this the fences, property lines, drainage structures, trees which may affect construction, and other necessary topographic features. The profile should show the ground line, new grade line, and figures to indicate the centerline cut or fill, and cut or fill from side stakes to the new grade. It is also usually a help to have shown the cross-sections at each stake interval and indicate thereon the position of slope stake points or outside limits of construction work.

A sample print of plan and profile is shown herewith. A brief study will show its value as a tentative standard for surveyors of township roads to follow. (Pocket in back cover).

As a result of observed difficulties in the field a few limits are suggested in the specifications for improvement work. The grades should be built full 24 feet wide for reasons of utility, safety and ultimate economy. The final crown in the 24 foot roadway should not exceed 9 inches. Excessive crowns are needless, they are dangerous, and serve to concentrate traffic in the center of the roadway and not utilizing the full width.

No culverts should be placed which have a diameter of less than 12 inches. Observations have shown that sizes less

than this are poor economy.

The matter of surfacing on township roads is entirely an economic question. A road should be surfaced to meet the traffic requirements economically. When a road surface can no longer be maintained economically under its present traffic demands then it should be advanced to a higher type. Frequently it is found that the cost of maintaining certain roads having poor surfaces or no surface at all is greater than the interest and amortization charges on sufficient money to adequately improve it, or advance it to a higher type.

Figures 18 to 20 adequately describe certain maintenance practices usually abused and corrective and preventive measures to be employed. These are from a study of practices worked out in Ionia County.



The graph shows a signal that is periodic and oscillatory. The signal starts at a low level, rises to a peak, falls to a trough, rises to a second peak, and then falls to a low level. The peaks are approximately at the 1/4 and 3/4 marks of the vertical axis.

1/2 1/4 3/4

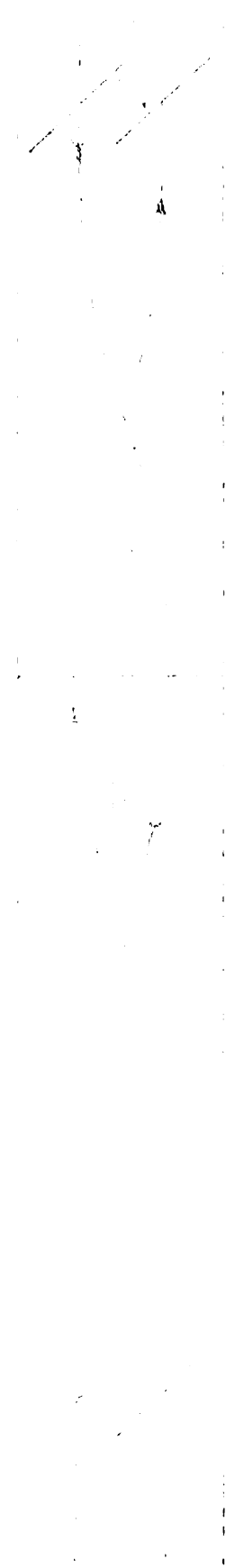
1870

1870

1870

Handwritten text, possibly a signature or name, oriented vertically.

Handwritten scribble or signature on the right margin.



1. The diameter of the shaft is 10 mm.
 2. The length of the shaft is 100 mm.
 3. The diameter of the hole is 8 mm.
 4. The diameter of the groove is 6 mm.
 5. The diameter of the chamfered end is 12 mm.
 6. The diameter of the chamfered end is 12 mm.
 7. The diameter of the chamfered end is 12 mm.
 8. The diameter of the chamfered end is 12 mm.
 9. The diameter of the chamfered end is 12 mm.
 10. The diameter of the chamfered end is 12 mm.

CHAPTER VII.

ASSISTANCE TO TOWNSHIPS.

Until a few years ago it was possible for the townships to obtain some small assistance from the State under so-called State Reward. The Township would, after having had their application approved, build their road projected up to certain specifications. A certain sum of money per mile was then paid to the Township by the State toward the construction cost. Then six percent of the reward was paid by the State each year as a maintenance reward provided the maintenance was satisfactory to the State.

The tremendous sums necessary for State Trunk Line construction and maintenance in the last few years has led to the abandonment of the State Reward practices. The State Reward roads were usually built by the townships on the primary routes. The present day functioning of the State and County organizations has done away with the necessity for this activity by townships.

The Covert Act or Assessment District plan aided the townships in some respects. This Act enabled the abutting property owners along and near a given road project to raise money by bonding or otherwise for the improvement of their road. Frequently the County would bear a share of this cost and would later take the road over for maintenance as part of the County system.

Other than these two ways there has been no general aid given the township.

Certain counties have specific arrangements offering some help to their townships. The Board of County Road Commissioners of Huron County sets up a fund each year of \$1,500.00 to be paid to townships under a sort of reward system. Not more than \$500.00 is paid to any one township in the year, and not more than three such rewards are paid in any year. For the township to be eligible their application must be approved, their project must be surveyed, and they must build the road up to reasonable specifications outlined by the county. While the actual financial assistance in this case is small this practice has done much toward stimulating progress and good workmanship.

Assistance by the counties under the provisions of the Kirby Bill, Act 202, P.A. 1925, has been discussed previously in this thesis. The fact that so little interest has been shown in the possibilities of this Act would lead one to believe that it has failed to meet the need.

One plan presented at the Eaton County Township Good Roads Association by one of their members had considerable merit. It was suggested that the townships, after adopting and gaining the approval of their plan and program, prepare the grade and drainage structures to certain specifications after which the county would assume responsibility for the surfacing. The matter of maintenance could be taken care of by either the county or the township. Where the county is in

-31

position to take on more mileage on the county system this plan would offer an opportunity without the tremendous responsibility which would be incurred by taking over township roads "in the rough".

The assistance of the College has been of necessity confined to an advisory capacity. In the past year meetings were held in 45 counties to which were invited the entire township boards, the county road organization, and any others who were interested. The meetings were in general well attended. The meetings covered five to six hours. The entire problem of organization and practices was taken up, slides and motion pictures were exhibited, and sufficient time given to open discussion of the subjects at hand. It was the general opinion that a great deal of benefit was derived from these institutes. Further assistance was rendered by the College by the preparation and issue of Bulletin No. 6 of the Engineering Experiment Station entitled "Manual of Township Roads". This bulletin took up in detail matters of organization, surveys, plans, equipment, and a thorough treatment by pictures and text of road improvement and maintenance practices. Copies were distributed to each of the 1296 townships and were extremely well received.

The assistance by the College is being continued, and it is hoped that a very few years efforts will serve to raise the standards of practice and the value of the road dollar many fold.

CHAPTER VII.

THE TAX PROBLEM.

The ideal system of taxation for Township improvement and repair is still a matter which is far from being satisfactorily settled. Several factors must be considered in reaching any conclusions tending toward a sound solution. Some of the important factors are these:

1. There is a taxable limit beyond which the load will become unbearable to the property owners.

2. The highway is only one of the items which must be supported by taxes, and while this item is important, it should be relegated to its position of relative importance among the other necessities.

3. The property most benefited should bear the greatest share of the cost, and yet it should be also recognized that the agencies making necessary the improvement should also bear a share.

The relative merits of the "pay as you go" plan versus the "bond issue for extended payment and immediate results" plan will not be discussed in this paper. The controversy is still open and not nearly settled in many state departments in the country. There are many excellent points in favor of either system. One particular fact regarding the matter of bonding is that the term of the bonds

should not be longer than the economical life of the improvement. This fact is frequently overlooked and results later in a double load to carry.

The present method of township highway financing is by the spreading of the local road tax the limit of which is five miles per dollar or fifty cents per \$100.00 valuation. With this sum it is possible to make some measure of real and actual progress on the improvement program in most of the townships. In some of the townships this limit already constitutes a burden which is hard to bear.

In the townships where the valuation is a million dollars or more the limit of money raised amounts to \$5000.00 or more. This sum properly administered will show some progress. However, there are a great many townships in which the valuation is less than half a million dollars, and where the lands are poor as to productiveness. In these townships only a fraction of the five miles for road purposes is possible. Extreme care in the administering of these small sums is necessary in order that even a small measure of progress is to be evident from year to year.

Several difficult problems have come up in townships having some specialized industries, and while there have been some suggestions offered they are still far from solution. As an example of these cases, a group of townships in a county largely devoted to dairy products offered these reasons for the need of some change of policy:

1. That by actual mileage analysis their cars and trucks travelled more than ninety percent of their mileage on the township roads.

2. That, by virtue of their having to travel the low type roads, their fuel consumption and maintenance costs were tremendously greater than would be the case if they were travelling on the improved State roads.

3. That in paying the cost for the excessive fuel consumption, they were paying an excessive tax the benefit of which went to the state system and none to the upkeep of the township roads which they were rapidly destroying.

4. That, since it is sound that agencies which tend toward the destruction of the roads should bear a portion of the cost of the improvement and maintenance in proportion to their ability to destroy, then a portion of this excessive tax should be returned to the townships where it originated to be used for this purpose.

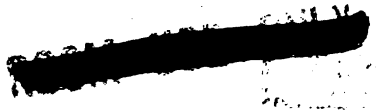
These points all appear sound except that, if state-wide, the cost of administering the tax as suggested under item (4) would be out of proportion to the benefits derived.

In some states, Illinois for example, one-third of the gas tax is distributed each to the state, county and township and seems to work out equitably. However it appears to be the opinion of men whose reason is respected that further division of the gas tax funds in this state at this time is not sound.

It was suggested, however, that a plan which would stand the test of reasonableness could be worked out with a one cent addition to the present gas tax. This additional money thus derived could be distributed according to the needs of the different sections by setting up a fund in the various counties, administered by the Board of Bounty Road Commissioners under state supervision and paid out to the townships in the nature of rewards. The roads built by the townships, in order to merit reward, must be built up to certain reasonable specifications and on some predetermined township system, and under some measure of county supervision. This would serve not only to offer financial assistance in the improvement of the township roads but to stimulate tremendously the improvement activities on the part of the township organizations.

Many other plans have been suggested, varying in principle from toll roads to a state-wide poll tax, and the elements of some of these may in time offer the solution to this problem. The urgent need of improvement on the township systems and the importance of the problems involved is being recognized and it is felt that the fact of recognition is a marked advance toward satisfactory culmination.

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Sheet no. 2



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