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1906

BEING THE

ANNUAL REPORTS

OF THE VARIOUS

Departments and Institutions

For the Year 1905.

VOLUME II.

AUGUSTA
KENNEBEC JOURNAL PRINT
1906

State Road built by Town of Skowhegan.
A fine example of what can be done for our village streets.

FIRST ANNUAL REPORT

OF THE

COMMISSIONER OF HIGHWAYS

FOR THE

STATE OF MAINE

FOR THE YEAR

1905.

AUGUSTA
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STATE OF MAINE.

OFFICE OF COMMISSIONER OF HIGHWAYS,
AUGUSTA, January 1, 1906.

To His Excellency, William T. Cobb, Governor, and the Honorable Council:

I have the honor to present the first annual report of the Commissioner of Highways.

Very respectfully,

PAUL D. SARGENT,
Commissioner.

INTRODUCTION.

Had we been elected road commissioner of any of the towns or cities in Maine last spring, we would at first have made a thorough inspection of all the roads in that town for the purpose of learning their mileage and condition, and as far as possible, their needs. We would have taken a team and driven over every mile of road in that town and made notes of everything that appeared to need attention.

We would have decided from this inspection which would have taken several days the relative amounts of travel on the different roads in the township and in this way would have formed a pretty good idea of the roads needing attention first or those of the most importance. Every foot of road that in our judgment was reasonably safe for travel would have been put down in our note book as such and it would have been recommended to the selectmen or street committee under whose authority we were, that such portions of the roads as had received the comment "safe" should be taken care of through the season with the least possible outlay—that just enough money should be spent upon them to keep them safe until such time as money could be had to permanently improve them.

These roads would have been cared for under the system of maintenance described in this report.

We would probably have spent a few days in meeting and consulting with local commissioners of adjoining towns, exchanging ideas on matters of mutual interest pertaining to work under our immediate charge.

Furthermore, if after the street money had been appropriated, the season's work laid out and forces organized and work begun, there appeared to be in use among the foremen and crews methods and habits of doing work or conducting any part of the highway administration which could or should be improved,

attention of the proper authorities would have been called to these matters.

We have tried in a measure to conduct the work of this office along the lines indicated above; substituting for one town the 474 cities, towns and plantations of our State which administer their own road affairs and the ninety-six unorganized townships and plantations in which the county commissioners assess and direct the expenditure of the road taxes. Of necessity our work has largely been done by correspondence. Such information as we have obtained has been tabulated and will be found in tables 1 and 2. It will be seen from these tables that there are in the State 25,529.69 miles of road of all classes upon which, during the last five years, an average annual expenditure of $1,377,196.14 has been made.

We wish to say here that for the most part, municipal and county officers have been prompt, courteous and careful in replying to our inquiries for information and we thank them one and all. The few towns that have been tardy in making returns have undoubtedly had good reason for their delay.

Any man who has had to deal with road affairs will appreciate the difficulties presented in knowing where to begin on a system of improvement. If any one appreciates this for a town or city let him imagine the problem for a State. We realize that improvement must begin somewhere and believing that all progressive road legislation everywhere is aimed primarily at the improvement of country roads rather than city streets, such suggestions as this report takes up are those which we believe can be applied directly to country roads with beneficial results.

No investigation as to bridges and sidewalks has been undertaken and no recommendations on these subjects appear in this report. It is our purpose to take up these matters during 1906.

AN ACT TO PROVIDE FOR THE APPOINTMENT OF A COMMISSIONER OF HIGHWAYS AND ECONOMY IN MUNICIPAL EXPENDITURES.

Section 1. The governor, with the advice and consent of the council, within thirty days after approval of this act, shall appoint a suitable person, who shall be a civil engineer, as commissioner of highways; who shall hold his office for the term of four years and until his successor is appointed and qualified, and shall receive an annual salary of two thousand five hundred dollars, and in addition thereto one thousand dollars for assistant, or clerk hire, the actual amount paid out for his traveling expenses within this state, and such other expenses, not exceeding fifteen hundred dollars annually, as may be incurred in the executing of the duties of his office as hereinafter provided, the same to be approved by the governor and council.

Section 2. Said commissioner of highways shall be provided with an office at the state capitol. It shall be the duty of said commissioner to compile statistics relating to the public ways in the cities and towns of the state, and to make such investigation relating thereto as he shall deem expedient, in order to secure better and more improved highways in the state. It shall be his duty by means of maps, charts, cuts, drawings, prints, publications, printed or written articles, lectures, or otherwise, to disseminate knowledge throughout the state concerning the best known economical methods for the building and maintaining of highways, including bridges and sidewalks, in the cities and towns of the state, and particularly to impart such information, in manner as aforesaid, to the county commissioners of counties, the street commissioners of cities, the selectmen of towns, and other municipal officers whose duties it may be to have the care and management of the expenditure of money and the building and keeping in repair of the highways in the state.

Said commissioner may be consulted by, and shall give advice to, without charge, all officers of counties, cities, and towns, having care and authority over the public ways, as to their construction, maintenance, alteration, and repair, but such advice shall not impair the legal obligation of any such county, city, or town officer. Said commissioner shall hold each year, under the auspices of the county commissioners, a meeting in each county, for the open discussion of questions relating to the building and maintaining of public ways, of which due notice shall be given to the towns and cities in each county by the said county commissioners.

Section 3. He shall make an annual report to the governor and council of his doings, and expenditures of his office, together with such statements bearing upon the construction and maintenance of ways, and suggestions and recommendations concerning the same, as he deems appropriate, including recommendations for any legislation which to him seems expedient and necessary. His report shall be transmitted to the secretary of state on or before the first Wednesday of January of each year. All maps, plans, statistics and other valuable facts collected and

compiled under his direction, shall be preserved in his office, and become the property of the state.

Section 4. County commissioners and city and town officers having the care of and authority over public ways and bridges throughout the state shall, on request, furnish said commissioner any information which they may possess and required by him, concerning ways and bridges within their jurisdiction.

(Approved March 24, 1905.)

WORK OF THE OFFICE.

As will be seen by reading the act creating the office of Commissioner of Highways, no authority is vested in the commissioner; his work affecting existing methods of construction, maintenance and administration of roads must be wholly in an advisory capacity.

Aside from carrying on investigations pertaining to road conditions in the State, the work of the office has been in correspondence and consultation with local road commissioners and selectmen and with several boards of county commissioners. In performing this pleasant duty we have visited some fifty-odd towns and met nearly all the boards of county commissioners in the State. Personal inspection of the roads in the towns visited has been made with the local officers and various problems of construction have been discussed upon the ground. Road administration, methods of doing work, organization of forces, proper season for doing work, and other phases of the question of producing better results on our roads more economically, have been discussed. In some instances we have been called in consultation by county commissioners as to particular construction to be used in the State road work and we are glad to state that our advice has been followed.

We have met several times by their request, the commissioners of Somerset county under whose direction a State-aid bridge between the towns of Bingham and Concord is being built. We regret that owing to the multitude of interests demanding our attention in starting the work of the office we have been unable to furnish such superintendence for this and other bridge jobs as we would liked to have done. No work of such consequence should be attempted without the superintendence of a competent inspector. We believe such superintendence has prevailed in the case just mentioned through the services of E. E. Greenwood, C. E., of Skowhegan, whom the Somerset commissioners employed upon our suggestion. This office has been in touch

with this work from the start and we believe a first-class job in every respect will be had.

We have also been consulted by the Kennebec county commissioners in regard to the bridge built this year across the Sebasticook river at Benton.

We have inspected the pile trestle with draw, under construction at Wiscasset and made inspection of the completed draw bridge at Milbridge across the Narraguagus river. At Wiscasset some piles were seen in the work which should have been rejected. At Milbridge a thorough job has been done in a workmanlike manner.

Early during our term of office we visited the Massachusetts Highway Commission at their finely appointed offices in Boston. From the individual members of the commission, and their principal assistant engineer and several division engineers, with whom we spent several days in the field, inspecting work completed and under progress, many valuable suggestions were received and the thanks of this office are due to each of the above. Thanks are also due the Commissioners of Vermont and New Hampshire both of whom were visited with profit to ourselves and we hope ultimately to road work in general throughout our State.

In August we addressed the county commissioners of Maine in their annual convention at Houlton, upon the matter of uniformity and system in constructing State roads in the different counties, and as a result a committee was appointed to confer with the State Highway Commissioner and draw up a specification to govern future State road building. The points settled were width, crown, limiting grades, foundation and drainage, culverts and bridge sub-structures, and method of applying surfacing material. The address in full and the specifications enlarged into general instructions for properly doing State road work will be found in this report. Together they form our main discussion on improved construction.

We feel that results are not accomplished in many instances on account of a lack of appreciation by many voters of the responsibility of putting a good man into the position of road commissioner; also that road forces are not organized and held together until all construction is completed; that road construction is not carried on at the proper season to return the most

value for money expended; and above all that our system of road accounting should be thoroughly reorganized so that some means may be had of knowing results accomplished for funds expended. These points will be found briefly discussed in this report.

We cannot expect to revolutionize road building in one year. It must, like other reforms, be brought about gradually—a step at a time. We have on this account, thought it advisable to confine ourselves to the few points outlined above. If the suggestions made appear to be founded on common sense, we hope some of them at least may be put into practice.

The matter of proper time for holding county road meetings was discussed with the county commissioners at their annual convention and the decision was that the meetings should be held in April. This will be directly after all the annual town meetings and before the road commissioners will have begun the season's road work. Thus opportunity will be afforded for discussing problems to be met the coming season and such suggestions and hints as appeal to the individual commissioners will be fresh in their minds when the season's work is undertaken.

SUGGESTIONS AS TO ROAD ADMINISTRATION.

ELECT THE BEST ROAD BUILDER IN EACH TOWN TO THE OFFICE OF ROAD COMMISSIONER AND KEEP HIM THERE.

In the first place we desire to speak of the expensive and unbusinesslike system of selecting a new man to fill the office of road commissioner each year in a large number of the towns in this State. It is usually conceded that "Experience is a good teacher." It must be admitted that it is the only teacher that the road commissioners in Maine have had. We have had no road schools, we have had no road conventions, few road papers and magazines are read, we believe. A great many of the commissioners in this State do not even know the commissioner in their next town. Consequently each man who holds the office of road commissioner is to a greater or less extent educated for his work at the expense of the town he serves. It would not seem to be good policy to pay for this education every year. As the result of his work is felt by all classes, probably as much as is that of any other town officer, every precaution should be taken to secure for this position a man of good judgment and when once found, every effort should be made to retain him in office. Such a man would become more valuable to a town each year. He would come to regard road work as his profession or calling and would constantly seek to perfect his knowledge of methods, and of proper treatment for various conditions and soils with which he would have to deal. He would know thoroughly after a year or two, every foot of road in the town. He would be able after treating a piece of road to watch that road and take care of it and if the treatment failed he would know why, and would improve upon that method when occasion arose for treating another road under similar conditions.

There are some towns in the State where the custom prevails of electing three commissioners and some in which no commissioner is elected and the selectmen have charge of the roads.

The custom as we understand it in the latter case is for the selectmen to appoint someone to have charge of the road work.

We would like to see every town elect one road commissioner and give him authority over the roads, subject of course to general supervision by the selectmen, but this supervision only to extend to passing upon the expediency of unusual expenditure for specific purposes, such as permanently improving certain sections of road, and the general character of the improvement. This settled, the road commissioner should be left unhampered to carry out the work according to his own best judgment. He should be authorized to employ such foremen as may be necessary when it is desirable to prosecute more than one job at a time in order to take advantage of season of the year or other favorable conditions for doing work. When more than one crew is employed the commissioner should have general oversight over each crew. He should lay out the work and see it often enough to know that it is being properly executed, and that each foreman thoroughly understands his instructions and is carrying them out. The road commissioner stands between the taxpayer and results, and too great care cannot be used in selecting the proper man. The best road builder in each town is the man who should occupy the position.

ORGANIZING ROAD FORCES.

As soon as the season's work has been determined upon, after a thorough inspection of all the roads, some systematic plan for its prosecution should be made. Generally the poorest sections of those roads carrying the heaviest traffic should receive first attention; other roads being taken up according to their importance. There is one place in every road so bad that it governs the load hauled over the entire stretch of road. That is the place that first needs improvement—be it hill to be cut down, swamp to be drained, or what not. For executing all work the road commissioner should organize such force or forces as in his judgment will accomplish results in the most economical manner. Every man in the crew should be hired to do a particular duty and should be employed doing the particular thing for which he has been hired until all of the work of that particular kind that it is proposed to do has been finished. That is the secret of the contractor's success, and his ability to do work cheaply.

He has perfect organization of forces and a system for doing each piece of work undertaken.

In other words, if road machine work is to be done, organize a crew to work with the road machine, and by all means hold every man and team with the machine until all this class of work has been completed. Too much time and money has been spent in the past "breaking in" teams and instructing teamsters and road machine operators in each of the several districts in many towns.

When once work has been started nothing but unsuitable weather should interfere with its continuous prosecution. There is no time work can be done so cheaply as when a crew is organized. The continual getting ready to begin, and quitting work takes a lot of time and is consequently expensive. Moreover, with a regular force and continuous operation, work can be pushed to completion at the proper season of the year.

Under the old labor system, one day the "surveyor" had half a crew and the next twice as large a force as he needed.

When crews are organized for road work, local help as far as possible should be hired, provided only that those desiring employment will be on hand every day as long as the commissioner needs their services.

Why do we not learn the value of organization and system in construction and maintainance work and apply it to our highway administration? Look, if you please, at the telephone construction and repair crews that traverse our State several times each year. If the companies did not find from experience that it was more economical to pay expenses, from place to place, of an organized force they would never do it, but would hire a new force in every town in which there was work to be done. The same thing is true of construction work on railroads. Every road has its construction crew which moves about from place to place over the line during the season for construction work. Economy is the fundamental and guiding principle in both the cases just instanced.

Is it the fact that municipalities are so rich that they can afford to overlook the economies practiced by corporations like the above? Or would our towns be richer if they practiced the lessons of economical management set before them by the organized and systematic methods employed in the construction and maintenance work above referred to?

Towns which have been in the habit of allowing road taxes to be worked out should remember that a properly organized force under good supervision will produce results at a much less cost than is possible under the old system. Every good citizen should advise the municipal officers to organize a road force and prosecute road work in a thoroughly businesslike manner. They should not only advise, but demand that this be done and then uphold the officials in carrying out the work along these lines. Results will surely tell.

PROPER SEASON FOR ROAD WORK.

We believe a considerable amount of money is annually expended on roads in Maine for which adequate return is not received by reason that the work is not done at the proper season. There is a proper time for building new, or rebuilding old earth roads, just as much as there is a proper time for doing farm work, and that time is as early in the spring as the ground settles after the frost has left it. In fact, the very time that spring farm work is being carried on is the time that earth roads should be repaired and rebuilt. The absolute necessity of doing the farm work is recognized and it is done. The importance of doing road work at the same time is apparently not appreciated for it is not generally done. Undoubtedly the scarcity of labor in some communities makes it impossible to carry on both classes of work at the same time. This is an argument for organizing a force to do the road work, which has just been discussed.

We believe that all road machine work should be completed in May and June if possible; and likewise any work which requires the tearing up of the road surface—foundation and drainage work—except in very wet localities, where it may be necessary to wait for the ground to dry out. During these months the ground is moist and plastic and can be worked more cheaply than when it is dry and hard and is broken up with difficulty and then into chunks and cakes. Moreover, it is then in better condition to pack and consolidate under traffic.

After a whole season's compaction by travel, with the touching up now and then that the surface would be entitled to receive to keep it free from ruts and inequalities, the road would be in excellent condition to withstand the destructive effects of fall rains and winter frosts. A road built, or torn up and rebuilt,

late in the season will not consolidate under traffic, but will be open and porous, and in a favorable condition to absorb all moisture falling on its surface, instead of turning it away as a properly constructed and consolidated road should. The only result to be expected when autumn rains fall upon a road newly constructed without the use of a heavy roller is a muddy road, and one generally much worse than it would have been, had the work been left undone until the proper time the following spring.

There is the added benefit derived by users of the road, in having a good road all summer instead of a worn out one to travel. If road improvement cannot be done early in the season we believe it should not be done at all with the equipment available in most towns.

These suggestions as to proper time for doing road work we feel should especially apply to State road building, a large portion of which we believe is done just in time to be within the limit prescribed by law. In our opinion the amendments to the State Road law changing the date for completion of roads from August 1st to September 1st, and later to October 1st, were wrong. Moreover, the present date allows too little time for the county commissioners to thoroughly inspect all work, especially in large counties.

HIGHWAY ACCOUNTING.

Another point which we believe should receive attention is highway accounting and records of highway work.

" Cannot give you record of expenditure—bills destroyed."

"We keep one general account for all items of highway expense." "Impossible to give this."

These are sample replies from fully 70 per cent of the towns in this State in answer to our inquiry, "Please give expenditures for roads, bridges and sidewalks, separately." We believe that there are towns in this State paying out money each year for building the same piece of road. Where are we going to look to find out? There should be, if nothing else, a plain record book with a page for each section of road and street in the town, the limits of which can be defined by some prominent, physical objects, in which each time an expenditure is made on any section of road it should be noted against this section, with a short description of the work done, material used, and labor performed, with prices for labor, material and superintendence, carried out.

The following form is suggested simply as an idea.

Town of Denmark.

Road to Sweden—J. Jones Farm to Trout Brook—¼ mile.

1903. May 10 to 15. Cut bushes and grubbed out roots.			
3 men 5 days - 15 days at $1.50.....	$22 50		
Widened and turnpiked with machine			
2 days at $10.00....	20 00	$42 50	
June 1 to 5. Graveled above			
300 double loads of gravel			
from Gray pit at 10 cents.....	$30 00		
5 teams 5 days hauling ½ mile			
25 days at $3.50	87 50		
Loading—3 men in pit 5 days,			
15 days at $1.50.....	22 50		
Spreading—1 man 5 days at $1.50..	7 50		
Superintendence 5 days at $2.50....	12 50	160 00	
June 15, filling ruts, raking rocks, etc.....	1 50		
July 15, filling ruts, raking rocks, etc.....	1 50		
September 10, filling ruts, raking rocks, etc....	75		
October 5, clearing ditches.....	2 50	6 25	
		$208 75	

The above figures are assumed to be approximately what a job of this nature would cost. Labor is figured at $1.50 per day of ten hours; and teams at $3.50 per day for ten hours. A load of gravel has been assumed as one cubic yard, which a team can haul over a fair road. This would weigh about one and one-fourth tons. Above quantity will give a surface of gravel 12 feet wide and six inches deep.

A similar record should be kept for sidewalk and bridge work. Towns would then know what results they were getting for their expenditure. This would also be a valuable record for the road commissioner to refer to from time to time, to see how particular construction has stood. He could also by referring to former years' work, make comparisons of cost of present results with those of former years. This would be an incentive to economical management and should lead to results at a gradually diminishing cost.

The problem every manufacturer is studying today is how to cheapen production and make larger profits. Transportation companies are studying the problem of lowering the cost of transportation and are doing so by reducing curvature and grades, laying heavier rails, building heavier bridges and using more powerful locomotives in order to haul larger train loads.

Cheaper production and transportation are brought about primarily as the result of keeping cost systems which show the cost of work in every department which has to do with the building or production of the toy, tool or machine; or the hauling of a ton of freight a mile. When these costs are excessive in any one deparment, steps are taken to find out why, and to reduce the cost in that department. A careful system of highway accounting would lead to similar results in our highway work.

ROAD MAINTENANCE.

We have thought for a long time that some system of daily, semi-weekly or weekly maintenance of country roads should be substituted for the customary annual, and in too few towns monthly, system of inspection and repairs. We shall have to point once more to the lesson of economy, which all railroads set before us by their system of daily inspection and repair.

The following, written by Hon. J. O. Sanford in 1896, so fully coincides with our ideas on this matter, that we present it and earnestly recommend a careful perusal and trial of the system here outlined:

Ordinarily, the chief work done by country people on highways is repairing the damage consequent upon neglect. Why this neglect? Simply because the people are trying to follow old, obsolete methods poorly adapted to these times of intense business energy and economy.

Much may be learned from the methods employed in maintaining the railroads. The means adopted to keep up our highways would be considered extravagant for them. The principle of economy forces them to a better system—one of constant and continuous work of repairing.

In the spring of 1904, with the purpose of adopting better methods for road management, I asked the people of my town for the office of road commissioner, and being elected to that office I proceeded to institute a system of continuous inspection

and repairs. Being familiar with all the roads of the town and the uses to which they are put, I divided them into sections and made choice of the men who should have charge of and keep each section. My next task was to see other men and endeavor to enthuse each with some spirit of improvement. They were reminded that the value of their farms depended upon the condition of the road. They were assured that the roads were to be improved, and urged to use their best endeavors in inaugurating reform in our methods of road management.

Each man was furnished with a good, new shovel and a pass book in which to charge for each and every hour he spent upon the road. He was instructed to go over his section as soon as the ground was bare of snow, or as soon as the water began to flow, to see to it that the water was kept off the road; to go over the road every day if necessary while the snow was going and during the rainy season, for it is then that the most damage is done; and that when so passing over the road he should remedy all slight defects where a few shovelfuls of earth or gravel would prevent a bad mud hole later on. These men were told that the old way of working the road once a year had been abandoned, and that it was expected that a few hours' work each week, when it would not seriously interfere with their farm work, would accomplished all that was expected.

The main road through the town, six miles long, not only takes the travel of the other roads, but is the thoroughfare by which the inhabitants of other towns reach the city with their produce, lumber, wood, and a great deal of heavy trucking. The best farmers live along this road and have enough business of their own without caring for a section of road. Because of this, and for various other reasons, I conceived the idea of employing one man to keep this road, and therefore engaged a faithful man with his horse, the town furnishing a cart.

He was employed from spring till fall, and his instructions were to begin at one end and work one mile each day, covering the entire route each week, and fixing the worst mud holes (and there were many), using the best road material at hand; and at the close of each day to pass over the mile worked, gathering the loose stones, putting them where they would give no more trouble.

I will say here that the maintenance of this road was and had been a great burden to the town, and its condition was far from

satisfactory to the traveling public. When the man employed learned what was expected of him he shrank from the task, saying, " What can I do to keep this road when a large gang of men with great expense has failed to keep it? " He was only persuaded to make the attempt by the assurance that the responsibility and any bad results would rest on the commissioner.

There was much ridicule and prejudice against this system of management for a time. The man employed was instructed not to participate in any discussion of the subject, not to answer questions relative to the road or his work upon it, and to refrain from talking about the matter generally on penalty of being discharged. Other people talked and ridiculed, but the work went on, and after a few weeks the condition of the road improved and people noticed the fact. They also discovered that the expense was not large; that all the work done was remedying defects and at the same time preventing greater ones. And so the work went on and prejudice died out. At the next annual town meeting the people without opposition continued the system, and at the last town meeting elected the road commissioner for three years with the same system of road management.

The general results are that much better roads are secured at less expense, and the tax rate for highways has been reduced each year, as the roads grew better, and as we learned to maintain them free from damage at less cost.

I will say we do something more for the roads than is here indicated. What we do is for maintaining or holding them, and at the same time improving. But these roads should be built according to modern ideas of road construction; so we set apart a portion of the road fund for permanent improvement, building up each year a piece or section of the main road in a thorough manner and of good material, and constructing culverts of stone in a permanent way. After the road is put in good condition one man can easily keep and care for a long stretch.

Very truly yours,

J. O. SANFORD,

Vermont Board of Agriculture.

STAMFORD, VT., November 10, 1896.

We believe there are faithful men in every town who would do work of this character under the direction of the road commissioner, in a satisfactory manner. No doubt at the beginning

it would be necessary to have men employed continuously on each section of road the commissioner should lay out. After one or two seasons the sections could be lengthened or the men employed 1, 2 or 3 days per week or every other week. This could be best arranged as the development of the system indicated. Some of the things that these section men might find to do on nearly every road are the following:

Keeping ruts and holes filled to preserve surface and crown of the road.

Keeping the surface free from loose stones and other obstructions.

Keeping ditches clear from dead leaves, roots, grass, brush and all obstructions to a free flow of water.

Keeping culverts clear at both ends and making good ditches to carry all drainage away from the road.

Cutting bushes and grubbing out the roots, at first clearing a narrow strip on each side of the traveled way and gradually working out over the entire right of way.

We have discussed this matter with nearly fifty local road commissioners during the past season and hope some of them will decide to try the system the coming season.

By this system, too, roads that have been reconstructed in the spring would, we believe, get the attention they so much need at intervals through the summer, which would in a large measure make them more permanent and lasting.

CONSTRUCTION WORK BY CONTRACT.

One other matter which it seems to us that towns should consider, is the advisability of doing highway work of considerable magnitude by the contract system, instead of by day work. In nearly all states where systematic improvement is carried on under state supervision, it is a requirement of law that the work must be done by contract. This requirement is the outgrowth of a study of the practice of all leading business corporations, as well as leading individual business men. Experience has taught these corporations and business men that it is a money making proposition to hire their construction work done by men especially equipped, and with forces especially organized to do the particular work they want done. For road work this system involves a plan showing location of road and its direction and

width; a profile showing cuts and fills to be made, and final grade of finished surface; also a cross section showing shape, form, and dimensions of finished grade and surface. If culverts and bridges are to be built in the section to be improved, plans of these must also be included. The whole is supplemented by a written specification describing in detail each part of the work to be performed, class of materials to be used, and such general statements as will give a full and clear understanding, between both parties, of just what is required to be done.

The plans and specifications show the standard to be reached by the contractor before he can expect his money. If work is done by contract, the road commissioner or some special inspector, appointed for the purpose, must see that all the provisions and stipulations of the contract and specifications are carried out, before the work is accepted, and final payment to the contractor made. We believe in order to do any highway work by contract, towns must at their annual meeting authorize the road commissioner, or some other person, to make contracts for the same. See Revised Statutes 1903, chapter 23, section 75.

IMPROVEMENT OF COUNTRY ROADS.

Instead of reporting in detail defects that we have seen we prefer to state that country roads in general may be improved in the following ways:

By cutting out the bushes and grubbing out the roots.

By straightening the graded portion of the road and taking out the short, sharp and dangerous corners and curves:

By widening the roads.

By improving the drainage.

By cutting down the hills.

CUTTING OUT BUSHES.

There are miles of our country roads upon which no marked improvement can be made until the bushes are first removed. Indeed, the thorough removal of these bushes would be of great value to the roads, in allowing the sun and wind to dry the surface early in the spring. When bushes are removed, the roots should be grubbed out, and both bushes and roots piled neatly and burned as soon as dry. Under no circumstance should they be thrown into the side ditches, back against the fences or upon adjoining land. Highway rights of way should present as neat an appearance as do the railroad rights of way and if the above suggestions are followed in performing this work and a little care taken in cleaning up after the work is completed our roadsides can gradually be made permanently attractive.

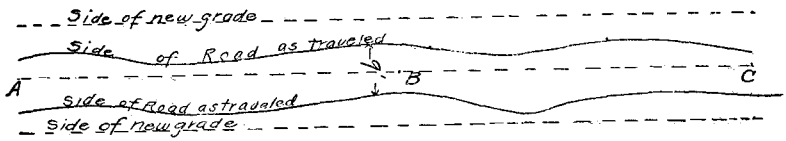
STRAIGHTENING THE ROAD.

There are in nearly every town, stretches of road made up of several short courses, and before improvement is undertaken on any of these, all short, sharp corners and curves should be eliminated as far as possible.

Many of our roads present a crooked appearance, when in reality the location is a straight line, the crooks having been made

when the road was graded to relieve the builders from grubbing out a stump or removing a boulder. If improvement is contemplated on a road in this condition, by all means let a beginning be made by straightening the grade so that the finished road will bear the marks of good workmanship. By the use of a few stakes for lining up new work, road commissioners will, in widening roads, be able to make use of all of the old grade and have a good straight road as a result.

The following sketch may illustrate:



Sketch showing method of straightening old roads
No scale -

FIG. 1.

The heavy lines show sides of road as now graded. A, B & C, are three range poles or tall stakes set in line on old grade. Dotted lines show sides of improved road as staked out at equal distances from A, B & C. Stakes should be set along these side lines at such points as will clearly indicate to the graders just where work is to be done. With a little care and practice commissioners will find that good results in alignment can be obtained by this method.

WIDENING THE ROAD.

We have heard the remark that the roads are continually growing narrower. We have seen roads with three distinct ditches on each side. We presume that this condition exists, first on account of lack of proper supervision when the roads were repaired; second because the bushes had grown over the ditch and prevented the road machine from being run to the back of the original ditch; and third on account of difficulty in getting teamsters to put their teams into the ditch. It seems to us that a good road commissioner would have had the bushes removed, told the teamsters where they must drive, and compelled them to do so or leave the work, and consequently have maintained the road at its full width. Roads should be at least

wide enough for two teams to pass each other without getting into the ditches or driving through the bushes. Sixteen feet is about as little as will comfortably accommodate two truck wagons. The width must be suited to the amount of traffic passing over the road, and must be governed by local conditions.

A poorly drained earth road will wear better if wide, than when narrow, as the traffic will then be more evenly distributed over the surface and in consequence there will be less liability of the traffic forming deep ruts during the mud seasons. These ruts increase in depth rapidly and are exceedingly detrimental to any road.

DRAINAGE.

For three or four months in the summer season many of our country roads are pleasant roads to travel. During the spring and fall however these same roads are in many instances mires. To improve this condition the cause must be removed, the water must be kept away from them and that which falls on them speedily taken away. Subdrainage will keep the subsoil water away from the road foundations and proper crown and surface drainage will carry away that which falls upon their surface.

As indicated elsewhere, we believe there is no one thing which will return better results for money expended on roads than will drainage. When we have perfect control of the water under and upon our roads we will have a nearly perfect road system, regardless of surface. Keeping water out of the foundation prevents frost which causes the spring mud. For different styles of subdrainage see specifications for State Road. Also see crown and surface ditches.

CUTTING DOWN HILLS.

Next to securing perfect drainage attention should be directed to reducing steep grades in order that the benefits arising from improving other portions of the road may not be lost by the inability of teams to haul a full load up the grades. It should be determined positively that no better route can be obtained around the hill, before money is laid out on the hill, in permanent improvements, as it will probably be impossible to change the location after much permanent work has been done. Cutting off the tops of hills and filling at the bottom will be the only way of reducing grades where the old location is followed. One-half

of the road may be excavated and scraped out at a time, leaving the other half for traffic to use. The worst hill should be treated first and completed, before work is begun on others.

SUGGESTIONS FOR MAINTENANCE WORK.

In maintaining or repairing the surface of any road, filling depressions and ruts, material like that composing the surface should be used in order that a perfect union or bond between the old material and the new may be obtained, and the resulting surface be uniform.

No one would think of repairing a macadam or crushed stone road with clay; neither should surface depressions or ruts in a clay or other earth road be filled with stone. In the latter case a depression, if filled with stone will become a hard spot, on either side of which the travel will make a new depression, thus giving two depressions or mud holes in place of the original one.

Sods and vegetable matter should not be used upon the surface of any road unless it be sand. On first thought it might be said that this material would toughen the surface, but it wears out or decays quickly and will never unite with the original surface. When sods are placed within a foot of the surface frost coming out of the ground causes a cleavage of the sod from the adjoining earth over or under it thereby making open spaces for the accumulation of water which will cause either mires or washouts in the road.

In repairing roads by use of the road machine all sods brought to the center of the road from the shoulders and sides should be raked out and carried away. The old worn out material, too, that has been washed from the center or surface of the road upon the shoulders and into the ditches is not fit to surface or grade a good road with; properly it should be scraped up and hauled away and put on the slope of some embankment. There is more or less manure in the road washings and it will be good fertilizer to use whenever it is desired to encourage the growth of sods to prevent washing of slopes.

Bringing this worn out dust and dirt upon the center of a road and leaving it seems to us to be about on a parallel with the housewife sweeping all dust and dirt from the corners and edges of a room into the center of the floor and leaving it to be scattered and tracked over the room again. There is not a house-

holder in the State of Maine who would countenance that kind of house cleaning. We hope public sentiment will at no very distant day denounce this system of road repairing, which we believe is too prevalent.

More new material drawn upon the roads in wagons is what is needed and less dependence on road machine work. The latter is all right to grade and shape roads with, and keep them shaped, but as ordinarily used it simply puts upon the road year after year material that is more or less worn out.

When ditches ae cleaned out, the mud taken from them should be cast to the back side of the ditch or loaded into wagons and carried away. It is a detriment to the road surface and if put upon it will only wash back into the ditch.

When rocks are raked out of the road they should be gathered up and hauled away. Too often they are left beside the wheel rut where passing travel works them back into the road or into the ditch only to be handled over again. They should be deposited in piles outside the traveled way, but upon the road location, and later used in drainage work.

SAND ROADS.

A sand road is in its best condition to sustain traffic when it is moist and if no other treatment can be given it, bushes and trees should be grown along its sides to shade it and keep it as moist as possible. To this end, it is desirable to have a sand road no wider than is actually necessary to accommodate the traffic. Only slight ditches for carrying away surface water should be provided.

A good treatment for a sand road is to excavate the center of the road with the road machine about six inches deep, making the bottom as even as possible. Then spread a layer of clay eight inches deep in the excavation, taking care to have all the clay of one texture and of even thickness as any variation in texture of material or in thickness of same will result in rough and uneven surface due to soft and yielding places.

After smoothing the clay and tamping it or rolling it, about two inches of sand should be spread upon the surface. This may be harrowed in and then the surface rolled; or it may be left for the travel to work into the clay. After the sand has united with the clay, more sand should be spread upon the sur-

face. Gradually the clay will become saturated with sand and a hard smooth surface will be the result which will give excellent satisfaction.

Clay may be spread directly upon a sand road, without excavating as outlined above, but no shoulders will then be had to keep the clay from working off into the side ditches and to hold it just where it is needed, under the travel.

Sand roads may also be temporarily improved by covering the surface with shingle shavings, planer shavings, sawdust, or tanbark. Dead leaves, meadow hay or straw will also afford temporary relief. If grass can be grown on the surface of the road it will strengthen it materially, the roots of the grass acting as a binder for the particles of sand and keeping them from shifting about and working on one another.

We might add that sand is used successfully as a foundation for macadam or crushed stone roads in New Jersey and Massachusetts. It is only necessary to shape the subgrade and roll it before spreading the macadam. Of course it affords excellent subdrainage and this is the secret of the success of this foundation.

CLAY ROADS.

A clay road must be kept dry to give best results. It will need deeper surface ditches and more crown than any other natural earth road. Subdrainage will do a great deal for a clay road. In fact no permanent results can be expected of a road on this foundation unless it is thoroughly subdrained.

Sand added to the surface of a clay road will harden it and keep it from being sticky in wet weather. It should be added in thin layers—say two to three inches—and as the travel works it into the clay more sand added. Of course if gravel or crushed stone can be had it will give more satisfactory results after the foundation has been properly prepared.

We believe a great amount of good would result to miles and miles of our clay roads if they were kept in shape and taken care of by the use of the King Split Log Drag described elsewhere in this report.

This treatment has proved very satisfactory to clay roads in the West and as the expense involved is practically nothing we would heartily recommend a trial of this device on the clay roads in this State. We feel sure that the results would be beneficial.

Equipment used in Town of Bridgton for making Winter Roads. Town owns 12 of these rollers which are kept at different points. Cost of rollers, $50.00 each. Cost of rolling roads reported to average 50 cents per mile for each storm.

SNOW ROADS.

In the tables of road equipment will be found reports of the various devices used for handling snow. It was our intention to take this matter up in the early fall in a bulletin describing and illustrating these implements. After some little correspondence we found that it was impossible to get descriptions and illustrations from some of the manufacturers, and feeling that we must use all alike we dropped the matter entirely.

We have, however, obtained what information we could both in this State and outside the State. From this information we are led to believe that a rolled snow road is very satisfactory. The rolling must begin when there is from eight inches to a foot of snow on the road and each additional eight to twelve inches must be rolled. If side drifts are encountered they must be levelled. The rollers are ordinarily built twelve feet wide, thus making a double track road on any part of which teams can turn out for passing. After being compacted the snow freezes and becomes very solid and in consequence does not melt away as rapidly in the spring as does the loose snow along the sides of the road. On this account the traveled part of the road lasts longer than the sides and therefore it is not necessary to drive in the ditches in the spring. As the snow melts over the ditches first, they are ready to take care of the surface drainage instead of the middle of the road acting as the gutter.

The snow must drift less, too, on a rolled road than on one broken out by shoveling and piling on the sides. By the latter method each storm drifts the road full to the height of the snow which has been thrown out on either side. By rolling the road, no snow is thrown out and consequently the drifting is less.

It has occurred to us that at points where the snow drifts badly every year and considerable expense is involved in keeping the road open, some form of snow fence similar to that used by railroads might be effective in lessening the drifting at these points.

Snow fences are rough board fences erected two or three rods back from the traveled way on the side of the road from which the snow bearing winds come. The eddy caused by the wind sweeping over the top of the fences drifts the snow on the lee side of the fence.

These fences are sometimes made in sections so they can be moved about until the exact distance from the road for best results is found. Built in portable sections there is a heavy base piece to which the post for holding boards is fastened at an angle of about 45 degrees. This post is made steady by a brace from it to the base piece. Boards are nailed to the posts. The fences should be set board side towards the wind.

This principle of fences causing drifts is recognized in section 63 of chapter 23, Revised Statutes 1903, which provides that municipal officers or road commissioners under their direction may take down fences to prevent the drifting of snow, but that they shall be put back in due season, etc. If these fences were placed far enough back from the road they would cause the snow to drift before it reached the road.

In this connection it may be interesting to know that in Ontario, Canada, a study has been made to discover some means of preventing snow from drifting on highways. They have become convinced that wire fences—where fences are built along the highways in open country—are the best means of preventing snow from drifting, as they afford no obstruction to the wind. A great many of the townships in Ontario, grant a bonus to land owners abutting on the highways who replace their old rail fences with wire, and experience has proved to these towns that with wire fences along the roads the cost of keeping the roads open in the winter is very much reduced.

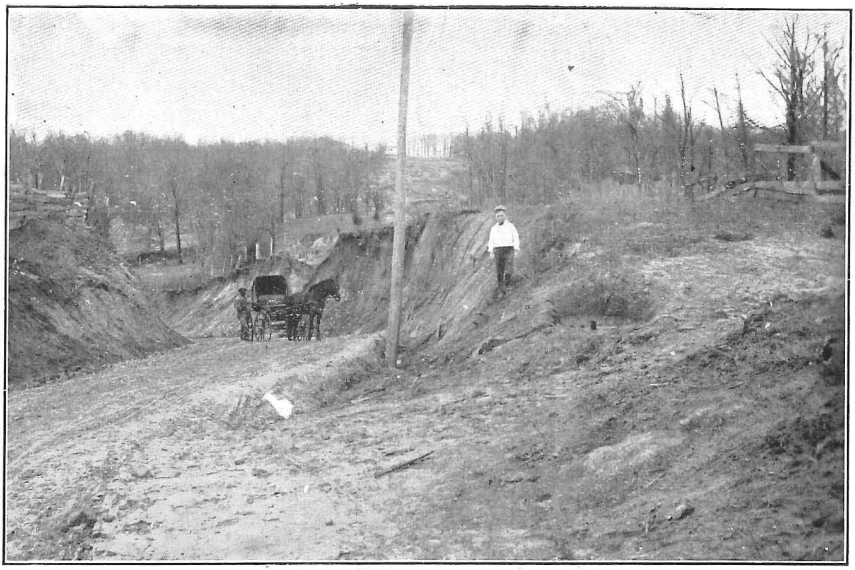


Fig. 1.—The Evolution of a Country Road—1. April 15, 1904.
[At this point the road was straightened and placed on better ground.]
From Lancaster, Practical Road Building in Madison County, Tennessee, Yearbook, U. S. Dept. of Agriculture, 1904.

Fig. 2.—The Evolution of a Country Road—2. May 18, 1904.
[Finishing up the grade of the newly opened road.]
From Lancaster, Practical Road Building in Madison County, Tennessee, Yearbook, U. S. Dept. of Agriculture, 1904.

TYPICAL ROAD IMPROVEMENT AS PRACTISED IN SEVERAL STATES.

The following extract is taken from an article which was printed in the year book of the United States Department of Agriculture, 1904, under the title, "Practical Road Building in Madison County, Tennessee," by Sam C. Lancaster, Chief Engineer, Madison County Good Roads Commission.

The illustrations are typical of the various steps in improved road building as practised nearly everywhere, and show so clearly the progress of the same, that they afford a valuable object lesson from which it is hoped the road commissioners of Maine may learn some points. The author's description of these plates and the particular construction they represent is as follows:

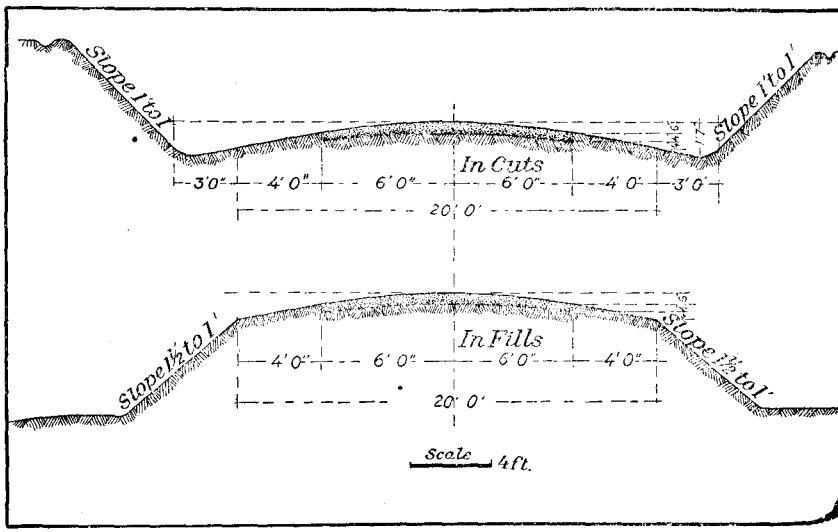


FIG. 1. Standard cross sections of finished road. From Lancaster, Practical Road Building in Madison County, Tennessee, Yearbook U. S. Dept. of Agriculture, 1904.

CONSTRUCTION OF THE ROADS.

A road, like every other piece of human work, is good or bad just in proportion to the amount of skill and ingenuity that has been used in its construction and maintenance.

Many inquiries are received regarding the method of constructing the roads in Madison county, and, in order to impart a more adequate idea of the system used, illustrations showing different stages of the work from start to finish are given. Figure 1 shows standard cross sections of finished road. Plate I, figure 1, shows an old road as it appeared April 15, 1904. The clearing in the distant woods indicates the location of the new road. At this point the road was straightened and put on better ground.

The grading of the road having been completed and rolled with a steam roller, plate I, figure 2, shows the force at work preparing the road for the reception of the first course of stone. It will be noted that the road machine in the distance, which is first used, and which rounds the dirt to the center, is being followed by a small force of laborers, who dress the surface accurately to lines.

The road is again thoroughly rolled with a steam roller, as shown in plate II, figure 1, until the surface no longer yields; all the depressions are filled with earth as they appear, so that when the road is ready for the stone the foundation on which it must rest is as solid as it is possible to make it. In all constructions men have learned the importance of solid foundations. If a road is to resist the wear to which it is subjected, the greatest care must be used in securing the best possible foundation.

The first course of stone, about 4 inches in thickness, is then applied (see plate II, figure 2). It is of a size that will pass through a 3-inch ring. The stone is wet before rolling, the general practice being to sprinkle it thoroughly by means of a portable tank or wagon sprinkler of the type commonly used on city streets. This, however, has been found expensive, especially during extremely hot weather, as the water evaporates rapidly when sprinkled on the hot stone, and it is difficult to haul a heavy tank of water over this coarse, loose material. Therefore, it was arranged to wet each wagon-load of stone as it passed out to the road. If hauled from the city, a convenient hydrant is used. In other cases a running stream is utilized. Where no other source of supply is available, a 3-inch well is

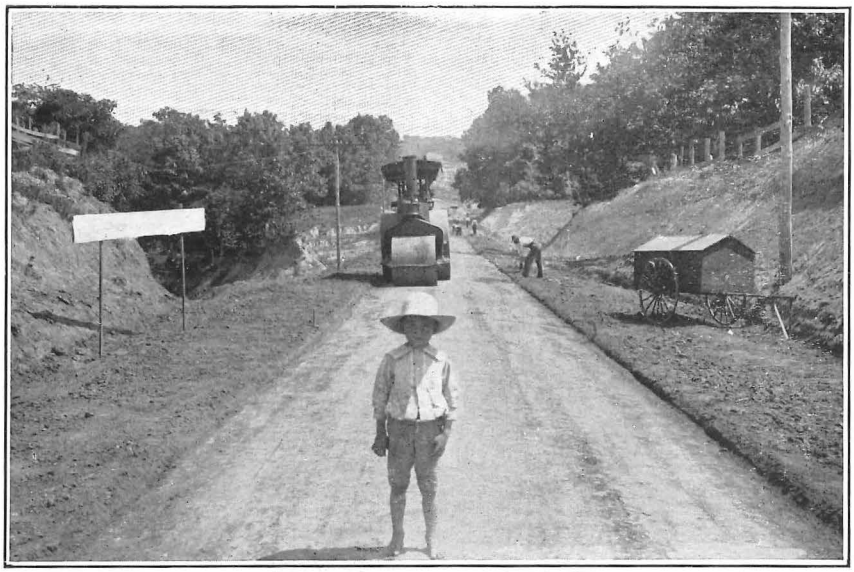


Fig. 1.—The Evolution of a Country Road—3. May 18, 1904.
[Rolling the grade with the 10-ton steam roller.]
From Lancaster, Practical Road Building in Madison County, Tennessee, Yearbook, U. S. Department of Agriculture, 1904.

Fig. 2.—The Evolution of a Country Road—4. May 19, 1904.
[First course of stone, 4 inches thick, applied; now being rolled.]
From Lancaster, Practical Road Building in Madison County, Tennessee, Yearbook, U. S. Department of Agriculture, 1904.

Fig. 1.—The Evolution of a Country Road—5. December 5, 1904.
[Team drawing 12 bales of cotton over finished road where only 2 were drawn before.]
From Lancaster, Practical Road Building in Madison County, Tennessee, Yearbook, U. S. Dept. of Agriculture.

bored, sometimes having a depth of as much as 150 feet, and, with the aid of a portable gasoline or hot-air engine of, say, 2-horsepower, all the water necessary is supplied to properly wet 400 cubic yards of stone per day, and also furnish water for steam roller, teams, etc., at a cost not exceeding $2 per day.

In rolling the stone it should be remembered that it is best to first roll the edges and gradually approach the center of the road, as by this means the material is more thoroughly compressed and the crown is retained.

Having completed the rolling of the first course of stone, a second layer 2 inches thick, of a size which will pass a 1½-inch ring, is spread on as evenly as possible, being thoroughly wet and rolled as before. All depressions are then filled with the same material, and after rolling smooth, still another course is added, the material used being fine screenings, varying in size from that of a pea to the smallest particles. This last course is then wet and is rolled until the whole is thoroughly compacted and bonded into one concrete mass, having a thickness of 6 inches at the center and 4 inches at the sides. (Plate III, fig. 1.) Only a sufficient quantity of this fine material should be used to insure the filling of all voids and to properly bond the top course, a common error being to apply it unevenly or to an excess, which causes it to "pick out" in holes and wear badly.

Care must be taken to see that the road is properly ditched and drained, as no road can stand, however well it may be built, where the all-important question of drainage is neglected. An eminent authority has described a good road as "one with a tight roof and a dry cellar."

Some of the old Roman roads, built of heavy stone and mortar, have a thickness of 3 feet; but the best modern road builders have demonstrated that it is no longer a question of how much is put on, but how well it is put on.

Telford and Macadam dug sufficient stone from the old Roman roads throughout England and Scotland to entirely reconstruct them by the new methods of road building which have been accepted by the civilized world. They appreciated the importance of breaking the stone and placing it so as to cause the particles to wedge together. These eminent men lived before the introduction of our modern road machinery, which has done so much to facilitate the construction of roads as well as to increase their durability.

ROCK CRUSHERS AND ROAD ROLLERS.

Believing that a considerable number of towns in the State are more or less interested in the subject of rock crushing plants and road rollers, and may be contemplating the purchase of such machinery, we attempted to get from manufacturers, price lists and such other information, as would be of value and general interest in this connection. A few manufacturers complied with our request but the most were reluctant to do so, stating that prices would be submitted when called for on specific plants. A study of the prices paid for road machines as listed elsewhere in this report may throw some light on this seeming reluctance.

Such prices as were obtained were found to correspond with tables printed in "Byrne's Highway Construction" by Albert T. Byrne, C. E., published by John Wiley and Son, New York, and with the kind permission of the author we copy from his work such tables of crushers as show prices.

We would suggest to towns contemplating the purchase of such machinery that they correspond with the manufacturers, as a discount off list price is the rule today. Discounts generally vary from 10, to 25 and 5% and should go to the town and not the buyer.

A study of prices paid for plants already owned in the State, too, will be valuable in estimating probable cost of a plant.

There are two styles of crusher—the jaw and the rotary. For preparing road building material the jaw crusher is more extensively used. Crushers are made both portable and stationary. For most of the towns in Maine we would say a portable plant would be more satisfactory and economical especially where field stone and small boulders are abundant and well distributed. By the use of a portable crusher considerable expense of hauling raw material will be eliminated. The crusher can be set up near the road to be surfaced and near the supply of rocks so that the hauling may be reduced to the smallest possible amount, both to and from the crusher.

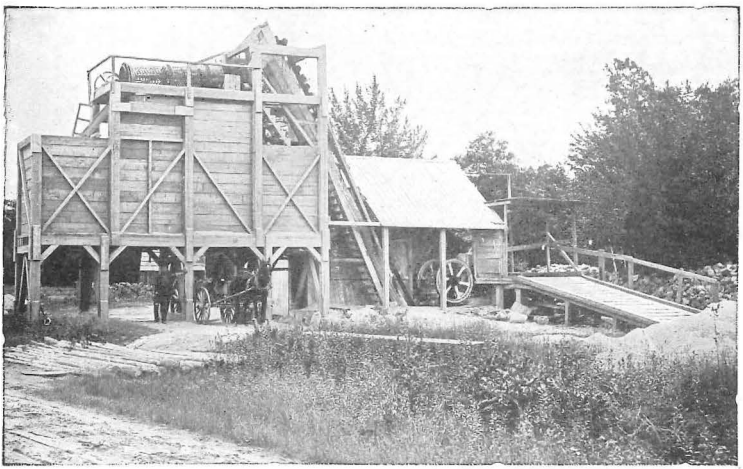


Fig. 2—Crushing and Screening Plant.

Designed for use in small towns, and by contractors, etc., and arranged for delivering crushed stone into carts. Has either three or four Compartment Bins, Crusher, 3-Section Screen, Elevator, and Conveyor for carrying rejections from Screen back to Crusher.

In selecting a site for any plant, provision must be made for a supply of water for the engine. If a ledge of trap rock or some other first quality stone for building can be found in the town it would be better in the long run to set up a stationary crushing plant at the ledge and use this rock even for quite long hauls. Such considerations however need to be carefully investigated for each individual town. A portable plant can be used for crushing at a ledge as well as elsewhere.

A complete crushing plant will include elevator, screens, bins and the engine for running the whole.

With an equipment as above, stone fed into the crusher, is mechanically screened into proper sizes and deposited in the bins from whence it is automatically loaded into wagons.

Without the bins it is necessary to load by hand which materially adds to the cost of the stone.

Through the courtesy of Farrel Foundry and Machine Co., Earle C. Bacon, Engineer, Havemeyer Building, 26 Cortlandt St., New York, we are able to present figure 2, cut of rock crushing plant with screens and bins, in operation; also figures 3 and 4, showing various arrangements of portable plants, without, and with bins.

It should be remembered that a rock crusher prepares material for surfacing roads. It does not and cannot build them. To properly build a road of crushed rock a road roller is essential.

It will shape and consolidate the subgrade which is necessary for best results and prevent the stone from mixing with the earth and becoming lost.

It will consolidate the surfacing material—crushed stone or gravel—as soon as spread; making a road that will not rut under traffic and making a tight roof that will turn surface water into the ditches and prevent it from penetrating into the subsoil under the surface.

A steam roller is also useful for finishing and compacting any kind of a road.

It can be used as a traction engine to draw a road machine in place of horses at a lower cost. It can work upon the center of the road, using a chain for connecting with the road machine which can then be worked in the ditch regardless of any driver.

Rollers are made in two general styles—horse rollers and steam rollers.

The horse roller costs less to buy, more to operate per day, and does not give as good results as can be obtained by using a steam roller. On account of being lighter it takes longer to thoroughly roll any given piece of road, and the feet of the horses drawing it are continually loosening and breaking up the surface which has already been rolled.

The weight of horse rollers varies from two to ten tons. In general the price is about $100 per ton.

There are many makes of steam rollers. They will do all the work of a horse roller and do it in a more satisfactory manner. Reference to the statement of steam rollers owned in the State, with prices paid will give a fair idea as to their cost.

In general it may be said that a good rock crushing plant, having a daily capacity of 75 to 100 tons, can be bought complete with engine to run it for $1,700 to $2,000.

A 6 ton horse roller will cost about $500 or $600. A 10 ton steam roller will cost in the vicinity of $3,000.

It has occurred to us that it might be feasible for two, three or four adjoining towns to buy a plant jointly.

To get the largest return from an investment of this kind the machinery should be run as nearly constantly as possible. Hardly any town would be able to use a plant all the time and as stone can be crushed at any and all seasons of the year several towns owning a portable plant would be able to keep it in operation most of the time. Of course this would necessitate some extra handling and storing of the crushed stone until the proper season for putting it on the roads, but it could be hauled to the road in the winter and deposited in piles along the sides and we believe hauling could be done cheaper then than in the summer. In this connection we might add that there are probably towns in which, during the winter, gravel could be obtained from river banks and other places which are inaccessible in the summer.

Before any town purchases a rock crusher, it should be first ascertained that an abundant supply of suitable stone is to be had at not too great an expense. The Office of Public Road Inquiries at Washington, D. C., have a laboratory equipped for testing samples of stone and will test and report on any road material sent them.

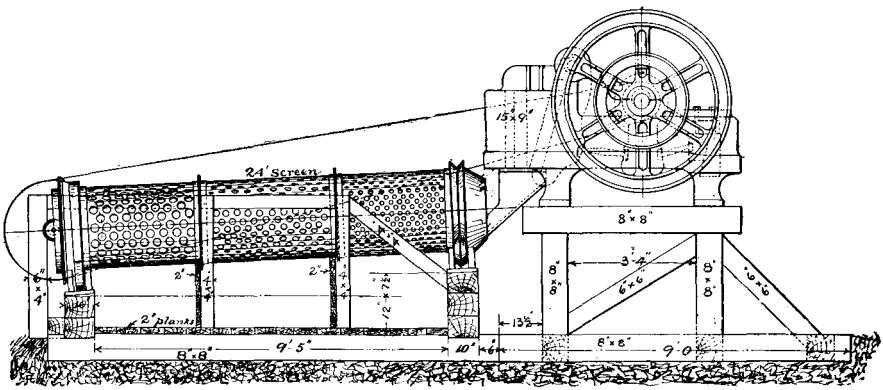


Fig. 3—Crusher with Three Section Screen.

Showing Crusher with Three Section Screen for temporary use. Crushed stone, in three sizes, to be removed from compartments below screen by shovel.

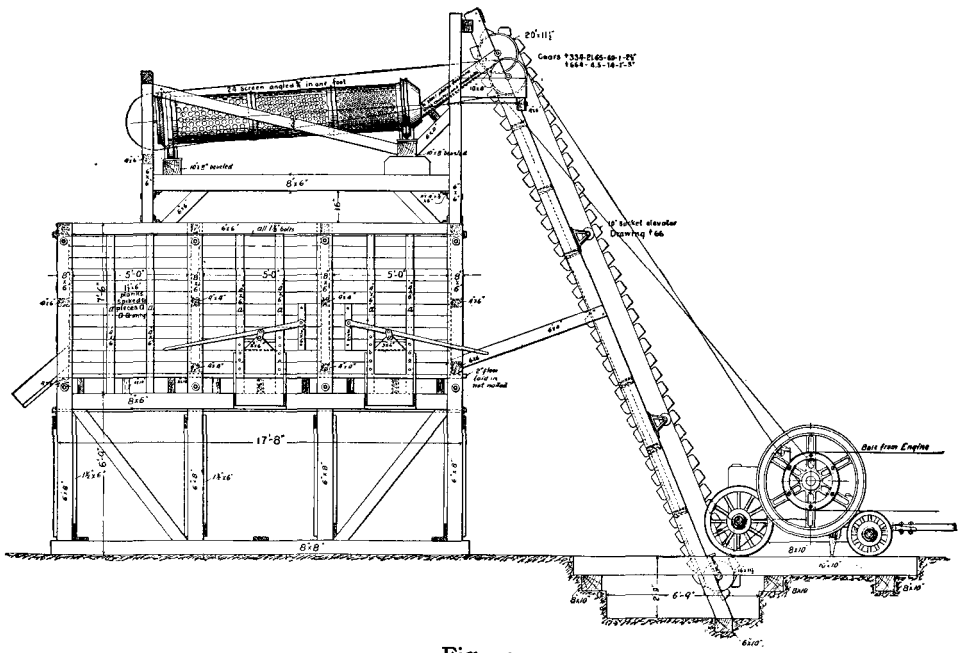


Fig. 4.

Potable Crushing Plant, with Elevator, Screen, three Compartment Portable Bins, and showing Crusher mounted on wheels.

CRUSHERS.

BRENNAN.

Sizes.	Dimensions of receiving openings—inches.	Approximate product per hour in tons to macadam size.	Approximate weight of crusher —pounds.	Proper speed —revolutions of driving pulley.	Horse-power required.	Approximate price.
.....	5×20	8 to 10	7,000	300	8	
.....	7×20	12 to 15	10,000	300	12 to 15	
.....	8×12	8 to 10	8,000	280	8	$750
.....	8×25	15 to 20	13,000	280	15 to 20	1,000
.....	10×25	20 to 30	16,000	280	20 to 30	1,300
.....	12×37	30 to 40	32,000	260	30 to 40	1,800
.....	20×48	60 to 100	72,000	240	80	2,400

Prices from catalogue.

GATES.

00.....	2× 4	.....	500	700	1 to 1½	$125
0.....	4×10	2 to 4	3,300	500	4 to 5	400
1.....	5×12	4 to 8	5,600	475	8 to 10	600
2.....	6×14	6 to 12	7,800	450	12 to 15	800
3.....	7×15	10 to 20	13,800	425	20 to 25	1,200
4.....	8×18	15 to 30	21,500	400	25 to 30	1,200
5.....	10×20	25 to 40	27,000	375	30 to 40	2,500
6.....	11×24	30 to 60	40,500	350	40 to 60	3,500
7½.....	14×30	50 to 125	65,800	350	75 to 125	6,000
8.....	18×42	100 to 150	89,000	350	100 to 150	7,000

FORSTER.

1.....	4× 9	1 to 2	1,800	350	1	$190
2.....	5×15	4 to 7	4,500	300	3	390
3.....	7×18	5 to 8	7,400	300	5	570
5.....	12×24	10 to 14	17,000	250	8	1,000

FARREL.

6½.....	15× 9	5½ to 10	15,000	275	12	$750
7.....	16×10	7½ to 12	16,200	275	15	875
8.....	20×10	12½ to 17½	18,300	275	20	1,050
*9.....	24×15	17½ to 25	26,000	275	25	1,575
*10.....	30×13	22½ to 30	37,600	275	30	2,250
*11.....	30×15	35 to 40	37,600	275	30	2,250
*12.....	36×20	50 to 80	50,000	275	40	2,875
*13.....	36×24	80 to 100	50,000	275	40	2,875

AUSTIN.

3.....	8×15	10 to 14	6,000	300	10	† $725
4.....	10×18	15 to 20	8,000	300	15	† 1,050

BLAKE.

		Cu. yds.				
.....	10× 4	3	4,000	250	4	$275
.....	10× 7	5	8,000	250	6	450
.....	15× 9	7	15,000	250	9	750
.....	20×12	10 to 12	21,000	250	15	1,000
.....	20×15	‡	32,600	150	12	
.....	24×18	‡	37,500	125	12	

Subject to discount.

CHAMPION.

3.....	7½×13	8 to 12	6,000	170	12	$600
4.....	9 ×15	12 to 18	8,500	155	15	800
5.....	11 ×26	25 to 40	19,000	140	25	1,500

Revised by catalogue.
Tables taken from Austin T. Byrne's "Highway Construction," 1903.
*These sizes have two driving pulleys. †On 4 wheels.
‡Coarse or preliminary breaker.

Table of the Usual Dimensions, Weight, Price, etc., of Steel-plate Revolving Screens.

	Diameter—inches.	Length with three sections—ft. and in.	Revolution of pulley.	Size pulley diameter face—inches.	Weight—pounds.	Price for three sections complete.	Price for two sections complete.
1.....	24	10 6	90	30×6½	2,200	$275	$225
2.....	30	12 6	90	36×8	3,550	385	325
3.....	36	12 6	80	36×8	3,900	450	375
4.....	42	12 6	70	36×8½	4,500	550	450
5.....	48	15 6	60	42×9	5,500	700	575
6.....	54	15 6	60	48×10	.....	950	800

Table taken from Austin T. Byrne's "Highway Construction," 1903.

Specifications of Portable Boilers and Engines on wheels.

Horse-power	6	8	10	12	15	20	25	30	35
Diameter of cylinder, inches	5	5	6	7	8	8	9	10	10
Length of stroke, inches	8	8	9	10	10	12	12	12	15
Usual number revolutions	185	240	190	160	160	170	170	170	150
Diameter of pulleys, inches	14 & 32	14 & 32	16 & 36	20 & 44	20 & 44	30 & 48	32 & 54	32 & 54	36 & 60
Face of pulleys, inches	8½ & 8½	8½ & 8½	8½ & 9½	10½ & 10½	10½ & 10½	8½ & 12½	10½ & 12½	10½ & 12½	10½ & 14½
Diameter of boiler, inches	26	28	30	32	32	34	36	36	40
Length of furnace, inches	34	36	38	38	44	52	52	52	52
Height of furnace, inches	30	32	34	38	38	38	40	40	44
Width of furnace, inches	21	22	24	26	26	28	30	30	34
Number of 3-inch tubes	17	20	22	26	26	30	34	34	40
Length of tubes, inches	54	66	72	72	78	90	96	102	102
Shipping weight, complete	4,800	5,000	5,700	6,000	7,100	8,100	9,500	10,500	11,300
Price	$700 00	$724 00	$788 00	$880 00	$931 00	$1,045 00	$1,085 00	$1,277 00	$1,351 00

Table taken from Austin T. Byrnes's "Highway Construction," 1903.

NOTE.—In developing power it is cheaper to get 10 H. P. from an engine of 12 or 15 H. P. than from one rated as 10 H. P.

TABLES OF RETURNS FROM TOWNS.

Table 1. Mileage, classes and condition of highways in the cities, towns and plantations of the State, with appropriations, and expenditures for same; general tax rate and tax rate for highway purposes; also term of service of road commissioner.

Table 2. Highway equipment, road building materials, etc., in the several towns of the State.

EXPLANATION OF TABLES.

Tables 1 and 2 have been compiled from answers received to the following questions, a set of which was sent to the officers of each city, town and plantation in the State; and from returns by the county commissioners for plantations and unorganized townships in which they assess and direct the expediture of road taxes.

For a few towns and cities, and the townships in two counties the returns were made up in this office from such data as we could collect from town and county reports in the State Library and by scaling maps for road mileage.

Questions sent to towns.

Name of town or city making this report; county; name of officer; official title; name of road commissioner; how many years has he served? number of miles of road in township; number of miles of village or city streets; average width of same shoulder to shoulder, or curb to curb; number of miles of country roads; average width of same from shoulder to shoulder; number of miles of gravel road, condition; number of miles of dirt road, condition; number of miles of granite block pavement, width, cost per square yard; number of miles of

macadam road, depth, width, cost per square yard. If you have other classes of road please write us statement of number of miles of each kind.

Give general appropriation for Roads, Bridges, Sidewalks,

For year 1901,
" " 1902,
" " 1903,
" " 1904,
" " 1905.

Please give actual expenditure for each item above,

For year 1901,
" " 1902,
" " 1903,
" " 1904.

Does town own road machine? If so, when purchased? Kind—name of maker? Cost? Do you use same and if so do you get satisfactory results? How much does it cost to run machine per day? How much road do you turnpike in one day on an average at above cost? Does use of road machine have tendency to make the roads narrower each year? How many years on an average will a road that has been turnpiked with machine stand before it has to be turnpiked again? Do you use road machine for smoothing surface of road?

Does town own road roller? Is it steam or horse? What make and pattern? Weight and cost? When purchased? Do you use same? What does it cost to run per day?

If you use special equipment for handling snow please write brief description of same. If possible please give your bill for handling snow, each year—1901-02-03-04.

Does town own rock crusher? What make, size and cost? When purchased? Own elevator? Height and cost? Own screens? Kinds and how many sizes? Own bins? Cost of plant complete? Cost to run per day? How many tons daily capacity? Is plant portable or stationary? Does town own ledge? Is it good? Does town buy rock? At what price?

Does town own gravel pit or pits? If so, how many? What is the character of material? If all kinds are found in pit please give statement as to depth of each kind of material. Does town buy gravel? If so what price per one-horse or two-horse load? Average haul of gravel from pit to road, in feet? Do you think

there are gravel pits in your town not opened? Have you ever prospected for gravel? Describe briefly the nature of the best surfacing material that you use in your town, stating source, available supply and, if you can, cost of same on road.

RECAPITULATION OF TABLE I.

Road Mileage.

It will be seen by the recapitulation of table I, that there is a total of 25,530 miles of all classes of roads and streets in the State.

The mileage of village and city streets is returned as 1,353; of country roads 23,489. These two figures do not balance the total mileage. The discrepancy occurs because several municipalities have not made classification, and their mileage appears only in the column of total miles.

The reports also show that there are 2,238 miles of gravel roads; 22 miles of granite block pavement; 65 miles of macadam streets; and 21,991 miles of dirt roads. This shows that for a long time to come, dirt roads will be a large factor in our public roads system and that the proper construction and maintenance of these roads must command attention.

Road Accounting.

Our questions asked to have appropriations and expenditures classified as to roads, bridges and sidewalks. In giving this information 343 towns gave only one amount and stated that no classification was kept of these several expenditures—that one general appropriation was made and one general account was kept which showed only to whom money had been paid.

Thirty-five of the towns reported separate appropriations for each of the items; 51 towns showed separate appropriations for roads and bridges and nothing for sidewalks and 45 reported a joint appropriation for roads and bridges with a separate appropriation for sidewalks.

In making this division of answers we have put into some one of the classifications of towns making divided appropriations every town that reports such an appropriation for any one of the last five years—for example, of the 45 towns making one appropriation for roads and bridges and another for sidewalks, less

than half have made an appropriation for sidewalks each of the five years; many showing special appropriation for only one year. The same is true of the other groups of towns.

Accordingly it was thought best for purposes of comparison to put all appropriations of the several towns into one lump sum and to figure the resulting amounts as the appropriation for highways. This has been done and will be found in the table. We have also figured the rate of taxation for highway purposes on the basis of valuations and appropriations for 1904. It appears to us that this rate of taxation is the true measure of the burden of maintaining the public ways in each town, and should be used in making comparisons.

Road Expenditures.

Upon these roads, including bridges and sidewalks, an average annual expenditure of $1,377,196.14 has been made for the past five years. Deducting $282,004.79, the average annual expense on account of snow, leaves $1,095,191.35 as the yearly expense of maintaining our highways including bridges and sidewalks.

This amount is sufficient to build over 200 miles of macadam road per annum. If but 25 per cent of this amount were expended for permanent improvement, the result would be an average of 50 miles of macadam road per annum in this State, and we would then be making some advancement toward permanent roads. There is no prospect of the road appropriations being less during the next five years, than they were in the last five. Is it not well to consider whether we should devote some portion of the annual appropriation, for example 25 per cent, to doing permanent work. If appropriations for the next five years shall be equal to those of the last five, and 25 per cent of the amount should be expended permanently, we should find ourselves as a State at the end of that period, with 250 miles of permanently improved road. The increased expenditure on account of State roads, that may be expected during the next five years, would probably add another 100 miles.

It is time the people of the State of Maine should decide whether they will continue to put over one million of dollars per annum into mud, or whether they will take some stand which will give them a good start on a system of permanent roads.

It is interesting while looking at the table of expenditures to make the following comparisons.

Table of Comparisons.

	Twenty cities.	Rest of the State.	Totals and averages for the State.
Miles of road	1,936¼	23,593.53	25,529.69
Percentage of total mileage in State	7.6%	92.4%	100%
Total appropriations for highway purposes	$450,820.47	$849,085.59	$1,299,906.06
Per cent of total appropriations in State	34.7%	65.3%	100%
Average appropriation per mile	$233.93	$35.99	$50.92
Or cities appropriate 7 times as much per mile as rest of State.			
Total expenditures for highway purposes	$490,526.11	$886,670.03	$1,377,196.14
Percentage of total expenditures in State	35.6%	64.4%	100%
Average expenditure per mile	$254.53	$37.58	$53.94
Or cities expend 6.77 times as much per mile as rest of State.			
Total expenditures for snow	$56,308.52	$225,696.27	$282,004.79
Average expenditure for snow per mile	$29.08	$9.56	$11.05
Percentage of highway expense used for snow.	11.4%	25.4%	20.48%
Valuation	$136,566,799	$189,777,524	$326,344,323
Percentage of total valuation for State	41.8%	58.2%	100%
Average tax rate for road purposes on the basis of appropriation	.0033	.00447	.00398
Combined population	224,823	467,275	692,098
Percentage of population in State served by roads	32.5%	67.5%	100%

Term of Office of Road Commissioners.

From the returns to above question it is found that there are 194 road commissioners serving their first year; 96 serving their second year; 81 their third year; 28 their fourth year; 24 their fifth year; 13 their sixth; 11 their seventh; 5 their eighth; 5 their ninth; 5 their tenth; 2 their eleventh; 2 their twelfth; 1 his fifteenth; 1 his seventeenth; 1 his twentieth; and 1 his twenty-second year; the average term of service of all these commissioners being 2 68-100 years.

These figures compiled after our discussion of this point was written, only serve to strengthen our belief that towns should consider seriously the importance of selecting and keeping in office as road commissioner, the best available man.

RECAPITULATION OF TABLE 2.

Gravel and Gravel Pits.

Of the 474 municipalities that assess and expend their own road money, 110 own gravel pits, and 243 buy gravel for highway purposes.

The prices paid vary from one cent to forty cents for double loads. Several of the smaller towns report that they buy what gravel they use at a stated price for the season, which varies in the several towns from five to twenty-five dollars. Returns from 156 of the 208 towns definitely stating price per load paid, indicate that they pay not over five cents single and ten cents double load for their gravel.

Prospecting for Gravel.

One hundred and twenty-six towns report that they have prospected for gravel; 256 say that they have not; while the remainder make no answer.

Pits Not Opened.

From 267 towns we get reports that they have pits not opened; 86 towns report that they have no gravel in the town; 28 are doubtful, while the remainder make no answer.

Best Surfacing Material.

In answer to this question, 183 towns report the use of gravel, and 54 others, gravel mixed with other materials. This gravel includes all varieties as—beach gravel on the seacoast, stream or river gravel inland, pin gravel, and gravel from horsebacks.

Fifty-three towns report the use of the dirt by the roadside for surfacing.

Of the other surfacing materials the reports show the following: 24 towns use gravel and clay; 20 use gravel and loam; 1 uses clay with coat of gravel, gravel on sand over swamp; 3 use gravel and crushed rocks; 2 use gravel and sand; 3 use beach gravel and clam shells; 19 use crushed rocks; 4 use loam; 6 use "hard pan;" 5 use coal ashes; 2 use loam and clay; 3 use rotten stone; 4 use clay on sand and sand on clay; 2 use sand (all they have in town); 1 uses marl; 2 use slate chips; and 1 uses feldspar chips.

Road Machines.

Four hundred and fifty-five towns own their road machines, while ten others hire or borrow from the county commissioners of their counties.

The total number of road machines reported in use is 552, representing a total investment of $96,719.97. The several makes, number of each in use, with highest and lowest price paid is as follows:

American Champion, 327, from $125 to $375.
Western Reversible, 41, from $110 to $350.
Austin-Western, 5, from $200 to $235.
Austin, 12, from $210 to $350.
Climax, 57, from $125 to $275.
Victor, 16, from $150 to $350.
Acme, 10, from $200 to $235.
Indiana Reversible of Fort Wayne, 7, from $165 to $250.
National Reversible, 4, from $100 to $205.
Buckeye, 2, $250 each.
Aurora, 2, from $210 to $225.
Eureka, 1, $150.
Great Western, 1, $200.
McCormick, 1, $250.
Penrock, 1, $250.
Patten, 1, $250.
Machines no name reported, 64.
One town reports "price confidential."

In view of above, we would suggest that towns, before purchasing additional equipment or machinery of any description, make a thorough investigation of prices, and relative merits of all equipment or machinery of the class to be purchased, before placing an order. Some of the above low prices may be on account of turning in old machines as part payment for new ones. Again the price of raw material varies from time to time.

What Is the Cost of Operation Per Day?

Replies to the above question speak for themselves and are valuable for purposes of comparison and for the average which they show. We understand of course the great variety of ele-

ments that have to be considered in making any such comparison, the differences in soils, differences in character of work done, etc., but we feel that when the individual replies to this question are carefully looked over in connection with the corresponding replies to the next, " miles turnpiked per day " and other questions governed by it, some valuable points will be learned. The replies vary from $2.00 per day to $35.00, and an average of the replies obtained is $10.42.

Miles Turnpiked Per Day.

Replies vary from one-twelfth of a mile to four miles, while the methods vary from the thorough making over of the road to the mere smoothing up of the old surface.

Three hundred and seventy-three definite replies were received while 31 could not estimate; the average of the former is .842 of a mile.

When we consider this figure—the average of 373 estimated averages in connection with the average cost per day for operation, $10.42, which is the average of 420 replies, it would seem that these figures should mean something.

Durability of Turnpiking.

To this question 385 replies were received. Three hundred and forty-seven answers gave the time in years that turnpiking would last; this time ranging from 20 years to "until fall rains," the average of all replies being four years and eight months.

The other 38 show more or less caution by qualifying their answers as follows: "Many years if built right;" "two years if not graveled;" "depends on soil;" "short time, roads too narrow;" "unanswerable," etc.

Of course our idea was to obtain an estimate of the average durability.

Does Use of Road Machine Have Tendency to Make Roads Narrower?

In answer to the above question, 437 replies were received, of which 204 answered simply "yes," while 35 qualified their replies as follows: "Yes, formerly;" "yes, but need not;" "yes, on cross

roads;" "too much so;" "yes, unless bushes are cut." One hundred and thirty-seven replied "no," while 57 qualified their replies as follows: "No, a narrow man makes a narrow road, machine not to blame;" "no, human nature to blame, not machine;" "not if properly handled;" "no, depends on commissioner;" "no, road widened;" "no, depends on driver;" "not now, go to back of ditch;" "not if commissioner does his duty," etc.

Taking the replies all together, 239 town officials indicate that in their experience the tendency was towards narrowing and 194 others testify to the contrary, while five express themselves as in doubt.

Do You Use Road Machine to Smooth Road?

Four hundred and forty-four replies received. Three hundred and seventy-eight answer "yes;" 38 use it at certain times or for certain places; 26 answer "no;" one, "not with good results;" and one, "no, use men."

Are Results From Using Road Machine Satisfactory?

The officials of 22 towns answer "no," while 14 express doubt by such answers as, "machine worn out," "doubtful," "not fully," and "not used this year," while on the other hand 361 answer "yes," and 44 others reply as follows: "Quite good," "when used right," "fairly," "in some cases," "yes, for dirt," etc.

What we wished to show by this question was the concensus of opinion in regard to the use of the machine as to whether satisfactory or unsatisfactory results were obtained.

Four hundred and five replies indicate that results are satisfactory, and 36 that results are not.

We would suggest that in our opinion road machines, when properly used, will give satisfactory results.

Give Special Snow Equipment.

The officers of 127 towns report such equipment with a total of 245 separate pieces; of these we find 118 to be snow rollers; 17 to be the old triangle and the balance—110—to be varied

forms of the snow plough, brief descriptions of a part of which, together with names of makers, will be found in the tables.

The remaining towns either report no special equipment or fail to report anything; we assume in a majority of cases they use the triangle or sled with "way stick."

TABLE
Mileage, Classes and Condition
ANDROSCOGGIN

Towns.	Miles, Classes and Condition.								
	Total miles of roads.	Miles of village streets.	Width in feet.	Miles of country roads.	Width in feet.	Miles of dirt roads.	Condition.	Miles of gravel roads.	Condition.
Auburn	263	135	50	128	18	115	Fair...	145	Good
Durham	80	.....	.....	80	17	80	.....	.....	.....
East Livermore	33	8	50	25	.....	33	.....	.....	.....
Greene	80	.....	.....	80	.....	80	.....	.....	.....
Leeds	80	.....	.....	80	12	80	.....	.....	.....
Lewiston	130	60	34	70	24	100	Good..	30	Good
Lisbon	65	20	40	45	22	55	.....	10	Fair.
Livermore	90	.....	.....	90	16	90	Good..	.....	.....
Mechanic Falls	28	18	25	10	20	28	Good..	.....	.....
Minot	125	.....	.....	125	12	125	Poor ..	.....	.....
Poland	80	.....	.....	80	.....	80	.....	.....	.....
Turner	225	7	25	218	18	215	Good..	10	Good
Wales	28	.....	.....	28	16	27½	Fair...	*½	Good
Webster	45	1	20	44	13	44	Fair...	*1	Good
Totals and averages.	1,352	249	35	1,103	17	1,152½	.....	196½	.....

Average tax rate for road purposes, for county, on basis of valuation for 1904
* State road.

AROOSTOOK

Amity	19	.....	.....	19	25	16	Good..	3	Good
Ashland	33	3	40	30	25	28	Fair...	5	Good
Bancroft	25	.....	25	25	25	25	.....	.....	.....
Benedicta	12	.....	.....	12	12	12	.....	.....	.....
Blaine	30	½	40	30	40	30	Fair...	.....	.....
Bridgewater	26	2	20	24	14	16	Good..	10	Good
Caribou	175	9	28	166	20	174	.....	1	.....
Castle Hill	27	.....	.....	27	.....	27	.....	.....	.....
Crystal	22	.....	.....	22	22	20	Poor ..	2	Good
Dyer Brook	13	.....	.....	13	.....	13	Good..	.....	.....
Easton	50	.....	.....	50	14	49	Good..	1	Good
Fort Fairfield	150	5	30	145	15	144	.....	1	Good
Fort Kent	100	5	40	95	33	85	Fair...	15	Good
Frenchville	37	.....	.....	37	.....	37	Fair...	.....	.....
Grand Isle	25	.....	.....	25	18	25	.....	.....	.....
Haynesville	18	.....	.....	18	.....	18	.....	.....	.....
Hersey	13	.....	.....	13	18	13	.....	.....	.....
Hodgdon	60	.....	.....	60	12	58	Fair...	2	Good
Houlton	82	10	35	72	16	42	Fair...	40	Good
Island Falls	28	.....	.....	28	24	28	.....	.....	.....
Limestone	50	1	32	49	20	50	.....	.....	.....
Linneus	35	.....	.....	35	24	35	.....	.....	.....
Littleton	40	.....	.....	40	14	32	.....	8	Good
Ludlow	22	.....	.....	22	.....	20½	.....	*1½	Good
Madawaska	40	.....	.....	40	15	6	.....	.....	.....
Mapleton	50	.....	.....	50	.....	50	.....	.....	.....
Mars Hill	50	1	25	49	15	50	Poor ..	.....	.....
Masardis	18	½	24	17½	20	17½	.....	½	Good
Monticello	46	.....	.....	46	.....	44	.....	2	Good
New Limerick	24	.....	.....	24	22	16	Fair...	8	Good
New Sweden	42	.....	.....	42	22	36	.....	6	Good
Oakfield	52	.....	.....	52	18	50	Fair...	2	Good
Orient	17	.....	.....	17	15	17	Fair...	.....	.....
Perham	30	.....	.....	30	25	29	.....	1	Good

*State road.

No. 1.
of Highways, Expenditures, etc.
COUNTY.

APPROPRIATIONS, EXPENDITURES, TAX RATE, ETC.

Total appropriations for highways, sidewalks, bridges and snow. Averaged for 5 years.	Average per mile.	Total expenditures for highways, sidewalks, bridges and snow. Averaged for 4 years.	Average per mile.	Cost of handling snow. Averaged for 4 years.	Valuation, 1904.	Rate of taxation, 1904.	Rate of taxation for road purposes, 1904.	Population.	Years of service of road commissioner. S-select'n. A-assess'rs
$20,400 00	$77 56	$20,400 00	$77 56	$5,000 00	$6,610,071	.02	.00326	12,951	17
2,500 00	31 25	2,500 00	31 25	1,000 00	334,230	.018	.00748	1,230	S
4,000 00	121 21	4,000 00	121 21	1,500 00	961,816	.023	.00416	2,129	3or4
3,155 00	39 44	3,041 43	38 02	720 00	281,270	.02	.0156	826	1st
1,875 00	23 44	2,275 45	28 44	1,032 75	317,616	.017	.0063	1,065	1st
47,643 28	366 48	47,760 16	367 39	$5,000 00	13,521,600	.02	.0032	23,761	
6,862 50	105 58	6,435 44	99 01	850 00	2,130,170	.016	.0031	3,603	2
2,580 00	28 66	2,546 95	28 99	1,304 75	420,425	.0205	.00618	1,125	9
1,920 00	68 58	2,111 75	75 42	600 00	827,487	.0203	.00242	1,687	2
2,926 66	23 41	3,302 92	26 42	873 99	317,150	.0183	.0107	808	
3,500 00	43 75	3,500 00	43 75	1,000 00	682,694	.021	.00512	1,648	
4,200 00	18 67	4,834 99	21 49	1,880 40	675,885	.018	.0059	1,842	3
960 00	34 29	1,154 00	41 21	450 00	199,427	.0145	.00501	436	2
3,975 00	83 33	4,488 16	99 74	1,254 54	532,990	.017	.0075	1,181	2
$106,497 44	$78 77	$108,351 25	$80 14	$22,466 43	$27,812,831	.0196	.0038	54,242	4 4/12

($27,812,831) and total average appropriations ($106,497.44) is .0038. § Estimated.

COUNTY.

$835 00	$43 95	$706 00	$37 16	$300 00	$59,800	.034	.0117	404	7 ag's
1,585 00	48 03	1,689 29	51 19	310 00	415,833	.028	.0053	1,513	3
700 00	28 00	700 00	28 00	†§150 00	51,749	.032	.0116	318	2
500 00	41 66	500 00	41 66	§100 00	50,165	.04	.001	350	
1,500 00	50 00	1,500 71	50 02	§300 00	179,596	.025	.00835	954	S
1,472 00	56 62	1,472 00	56 62	360 00	328,109	.026	.00609	1,179	1st
5,520 00	31 54	5,622 50	32 13	1,362 50	1,455,291	.023	.00343	4,758	S 3-2-7
400 00	14 81	400 00	14 81	§200 00	90,139	.0245	.00333	567	1st
566 00	25 73	566 00	25 73	§150 00	93,255	.025	.0075	370	2-3-1
690 00	53 08	690 00	53 08	§200 00	79,263	.029	.0082	280	1st
2,355 00	47 10	2,355 00	47 10	475 00	332,850	.033	.00909	1,250	S 2-3
4,915 00	32 77	5,530 08	36 92	1,500 00	1,391,800	.024	.00438	4,181	
4,680 00	46 80	4,725 00	47 25	500 00	396,766	.028	.00117	2,528	1
‖1,750 00	‖47 30	‖1,750 00	‖47 30	.....	107,092	.023	.0163	1,316	5
800 00	32 00	800 00	32 00	§100 00	101,366	.0205	.00709	1,104	3
§800 00	44 44	§800 00	44 44	§100 00	62,573	.022	.013	316	
800 00	61 54	800 00	61 54	150 00	57,076	.037	.0142	199	9
1,500 00	25 00	1,487 50	24 79	360 91	243,389	.028	.0074	1,130	1st
8,170 00	99 63	8,744 62	106 44	1,200 00	2,519,817	.023	.00353	4,686	1st
950 00	33 93	950 00	33 93	§150 00	294,752	.03	.00322	1,063	1st
1,120 00	22 40	1,182 85	23 66	400 00	365,587	.0242	.00274	1,131	1st
1,500 00	42 86	1,500 00	42 86	600 00	210,068	.0224	.00714	834	2
1,980 00	49 50	1,957 50	48 94	900 00	294,671	.023	.00679	956	1st
800 00	36 36	800 00	36 36	§100 00	97,748	.027	.00818	394	1-3-1
1,600 00	40 00	1,600 00	40 00	§150 00	163,512	.0156	.00978	1,698	S
1,100 00	22 00	1,100 00	22 00	350 00	241,091	.027	.00414	853	3
1,670 00	33 40	1,565 73	31 31	§350 00	264,890	.024	.00679	1,183	1-3-1
530 00	29 44	542 64	30 14	125 00	110,602	.032	.00542	438	3
2,180 00	47 40	2,180 00	47 40	500 00	326,544	.0218	.00704	1,332	2
666 66	27 77	809 95	33 33	§250 00	172,050	.0188	.0029	600	3
1,636 80	38 97	1,717 80	40 90	600 00	150,894	.03	.0113	867	7
1,060 00	20 39	1,154 00	22 19	369 00	104,022	.034	.0135	860	1st
520 00	30 59	560 00	32 95	150 00	46,542	.038	.0129	208	1-3-2
1,030 00	34 33	1,081 89	36 06	§300 00	134,873	.025	.0089	580	S

† Town reports, bills destroyed. ‖ In labor.
§ Estimated. Town officials unable to separate. Haynesville made no report.

Mileage, Classes and Condition

AROOSTOOK

Towns.	Miles, Classes and Condition.								
	Total miles of roads.	Miles of village streets.	Width in feet.	Miles of country roads.	Width in feet.	Miles of dirt roads.	Condition.	Miles of gravel roads.	Condition.
Presque Isle	150	.....	.....	150	20	150	Fair...	.....	.....
Sherman	53	.....	.....	53	24	48 3/4	Fair...	.....	.....
Smyrna	20	.....	.....	20	.....	18	Good..	1	Good
Saint Agatha	20	.....	.....	20	30	20	Fair...	.....	.....
Van Buren	40	6	45	34	30	30	Good..	4	Good
Washburn	50	1	30	49	20	48	Good..	2	Good
Westfield	15	.....	.....	15	18	15	.....	.....	.....
Weston	22	.....	.....	22	22	20 1/2	Fair...	1 1/2	Good
Woodland	60	.....	.....	60	20	60	Good..	.....	.....
PLANTATIONS.									
Allagash (4 Townships)	14	.....	.....	14	.....	14	.....	.....	.....
Cary	29	.....	.....	29	.....	29	.....	.....	.....
Caswell	20	.....	.....	20	24	20	.....	.....	.....
Chapman	14	.....	.....	14	20	14	Good..	.....	.....
Connor	15	.....	.....	15	.....	15	Fair...	.....	.....
Cyr	15	.....	.....	15	30	15	Fair...	.....	.....
E (R. 2)	3	.....	.....	3	21	3	Good..	.....	.....
Eagle Lake	12	.....	.....	12	18	15	.....	.....	.....
Garfield (No. 11, R. 6)	5	.....	.....	5	.....	5	.....	.....	.....
Glenwood (No. 2, R. 3)	9	.....	.....	9	12	9	.....	.....	.....
Hamlin	17	.....	.....	17	16	17	Good..	.....	.....
Hammond	5	.....	.....	5	.....	5	.....	.....	.....
Hill	6	.....	.....	6	.....	6	.....	.....	.....
Macwahoc	12	.....	.....	12	22	12	.....	.....	.....
Merrill	21	.....	.....	21	15	21	Fair...	.....	.....
Moro	14	.....	.....	14	.....	14	.....	.....	.....
Nashville (No. 12, R. 6)	5	.....	.....	5	22	5	.....	.....	.....
New Canada	20	.....	.....	20	18	20	Fair...	.....	.....
Oxbow (No. 9, R. 6)	4	.....	.....	4	.....	4	.....	.....	.....
Portage Lake (No. 12 R. 6)	8	.....	.....	8	18	8	Good..	.....	.....
Reed	21	.....	.....	21	20	21	Good..	.....	.....
Saint Francis	11	.....	.....	11	.....	11	Fair...	.....	.....
Saint John	6	.....	.....	6	.....	6	.....	.....	.....
Silver Ridge	10	.....	.....	10	16	10	.....	.....	.....
Stockholm (No. 16, R. 3)	7	.....	.....	7	.....	7	.....	.....	.....
Wade	20	.....	.....	20	24	20	Fair...	.....	.....
Wallagrass	16	.....	.....	16	.....	16	.....	.....	.....
Westmanland (No. 15 R. 4)	6	.....	.....	6	.....	6	Fair...	.....	.....
UNORGANIZED TOWNSHIPS.									
No. 3, R. 2 "Forkstown"	7	.....	.....	7	.....	7	.....	.....	.....
Letter A, Range 2	3	.....	.....	3	.....	3	.....	.....	.....
No. 1, Range 4	8	.....	.....	8	.....	8	.....	.....	.....
No. 16, Range 4	7	.....	.....	7	.....	7	.....	.....	.....
No. 17, Range 4	2	.....	.....	2	.....	2	.....	.....	.....
A, Range 5, "Molunkus"	5	.....	.....	5	.....	5	.....	.....	.....
No. 1, Range 5	6	.....	.....	6	.....	6	.....	.....	.....
No. 7, Range 5	6	.....	.....	6	.....	6	.....	.....	.....

of Highways, Expenditures, etc.—Continued.

COUNTY—CONTINUED.

APPROPRIATIONS, EXPENDITURES, TAX RATE, ETC.

Total appropriations for highways, sidewalks, bridges and snow. Averaged for 5 years.	Average per mile.	Total expenditures for highways, sidewalks, bridges and snow. Averaged for 4 years.	Average per mile.	Cost of handling snow. Averaged for 4 years.	Valuation, 1904.	Rate of taxation, 1904.	Rate of taxation for road purposes, 1904.	Population.	Years of service of road commissioner. S-select'n. A-assess'rs
$4,700 00	$31 33	$5,708 42	$34 72	$1,200 00	$1,566,975	.023	.00319	3,804	1st
2,400 00	45 28	2,233 27	42 14	§400 00	186,415	.033	.0129	980	5
1,270 00	63 50	1,156 00	59 06	§300 00	113,300	.034	.0106	411	S
1,100 00	55 00	1,100 00	55 00	§120 00	95,484	.022	.01047	1,396	S
1,700 00	42 50	1,700 00	42 50	§400 00	318,383	.03	.00628	1,878	1st
1,800 00	36 00	1,796 91	35 94	400 00	249,167	.027	.00803	1,225	S
470 00	31 33	387 50	25 83	§100 00	124,428	.023	.00402	259	3
1,080 00	49 09	1,080 00	49 09	§108 00	52,562	.055	.0228	367	1 3/4 1
1,900 00	31 66	1,832 65	30 54	650 00	180,685	.032	.0094	1,096	1st
594 88	42 49	594 88	42 49	§140 00	76,656	†	*	190	
800 00	27 59	800 00	27 59	§200 00	22,001	.065	.0364	400	
340 00	17 00	350 00	17 50	§50 00	50,732	.0318	.0069	368	1st
500 00	35 71	500 00	35 71	200 00	64,203	.038	.00779	285	1 3/4 3/4
813 40	54 22	813 40	54 22	400 00	62,653	.045	.0153	453	S
710 00	47 33	710 00	47 33	25 00	43,759	.0293	.01599	502	
122 80	40 93	122 80	40 93	16 06	15,750	†	.0064	44	3
700 00	58 33	700 00	58 33	100 00	120,684	.02	.0066	406	1st
187 31	37 46	187 31	37 46	24 22	36,774	†	.005	111	
428 40	47 60	428 40	47 60	40 00	28,422	†	.0142	178	5
465 00	27 35	465 00	27 35	53 98	78,073	.015	.0051	574	A 3
198 82	39 78	198 82	39 78	65 38	54,503	†	.003	116	
130 17	21 70	130 17	21 70	§60 00	24,339	†	.0051	124	A
218 00	18 16	218 00	18 16	34 50	41,650	.021	.0052	153	2
690 00	32 85	762 50	36 24	150 00	74,119	.034	.0135	298	1
560 00	40 00	535 00	38 21	§75 00	46,282	.028	.0108	217	
331 67	66 33	331 67	66 33	§20 00	25,372	†	.0135	32	8
470 00	23 50	425 00	21 25	§100 00	28,429	.026	.0106	419	8
264 52	66 13	264 52	66 13	§25 00	36,304	†	.0083	153	
291 49	36 44	291 49	36 44	§20 00	70,420	†	.003	241	1st
950 00	45 24	950 00	45 24	100 00	112,875	.022	.0088	399	2 2 2
580 00	52 73	580 00	52 73	§75 00	84,637	.0205	.00709	568	1st
415 00	69 16	393 75	65 62	§30 00	36,324	.0084	.0013	371	2
595 00	59 50	595 00	59 50	100 00	31,275	.032	.0019	168	2
540 34	77 76	540 34	77 76	§100 00	61,151	†	.017	191	
760 00	38 00	726 29	36 31	150 00	60,231	.033	.01328	271	3 3/4 3
‡700 00	43 75	700 00	43 75	80 00	47,864	.037	.017	784	
220 82	36 80	220 82	36 80	40 00	25,481	†	.01	100	3
194 90	27 84	194 90	27 84	37 78	21,000	†	.009	8	5
203 51	67 84	203 51	67 84	22 48	14,650	†	.015	11	5
301 41	37 67	301 41	37 67	7 06	22,040	†	.0135		
256 67	36 67	256 67	36 67	§15 00	21,039	†	.012		
123 39	61 69	123 39	61 69	§7 00	22,040	†	.006	101	
374 72	74 94	374 72	74 94	§10 00	26,766	†	.014	74	
186 07	31 01	186 07	31 01	14 08	26,180	†	.007	3	
161 52	26 92	161 52	26 92	24 40	24,400	†	.005	21	

§ Estimated. *1 township, .012; 3 townships, .007.

† County commissioners assess and direct the expenditure of the road taxes.

Wallagrass bridge, 1903, not included. Cost $400.

Mileage, Classes and Condition

AROOSTOOK

Towns.	Miles, Classes and Condition.								
	Total miles of roads.	Miles of village streets.	Width in feet.	Miles of country roads.	Width in feet.	Miles of dirt roads.	Condition.	Miles of gravel roads.	Condition.
No. 8, Range 5	6	.....	.....	6	.....	6	.....	.....	.....
No. 9, Range 5	9	.....	.....	9	.....	9	.....	.....	.....
No. 17, Range 5	6	.....	.....	6	.....	6	.....	.....	.....
No. 14, Range 6	7	.....	.....	7	.....	7	.....	.....	.....
No. 15, Range 6	5	.....	.....	5	.....	5	.....	.....	.....
No. 11, Range 4	4	.....	.....	4	.....	4	.....	.....	.....
Totals and averages.	2,317	44	32.7	2,273	20.6	2,150		116	

Average tax rate for road purposes, for county, on basis of valuation for 1904

CUMBERLAND

Baldwin	50	.....	16	50	12	50	Fair...	.....	.....
Bridgton	140	10	30	130	20	140	Good..	.....	.....
Brunswick	260	16	66	184	32	.....	.....	260	.....
Cape Elizabeth	30	.....	.....	30	20	20	Fair...	10	Fair.
Casco	50	2	35	48	25	30	.....	20	Fair.
Cumberland	72	.....	.....	72	18	36	.....	36	.....
Falmouth	56	.....	.....	56	22	28	Fair...	28	Good
Freeport	260	.....	.....	260	12	260	Fair...	.....	.....
Gorham	300	6	48	294	20	270	Fair...	30	Fair.
Gray	63	3	40	60	12	59	.....	4	Fair.
Harpswell	50	.....	.....	50	14	50	Fair...	.....	.....
Harrison	60	.....	.....	60	.....	60	.....	.....	.....
Naples	60	½	20	60	18	60	Good..	.....	.....
New Gloucester	115	5	20	110	18	90	Good..	25	Good
North Yarmouth	45	.....	.....	45	15	45	.....	.....	.....
Otisfield	72	.....	.....	72	16	72	.....	.....	.....
Portland	138	.....	34	.....	34	.....	.....	.....	.....
Pownal	50	.....	.....	50	15	50	.....	.....	.....
Raymond	60	.....	.....	60	.....	60	.....	.....	.....
Scarboro	110	½	25	109½	22	60	Poor .	50	Good
Sebago	50	.....	.....	50	.....	50	.....	.....	.....
South Portland	60	40	35	20	25	48½	Good..	10	Good
Standish	100	.....	.....	100	15	100	Fair...	.....	.....
Westbrook	50	.....	.....	50	50	25	Fair...	10	Fair.
Windham	100	.....	.....	100	.....	100	Fair...	.....	.....
Yarmouth	40	10	18	30	20	40	.....	.....	.....
Totals and averages.	2,381	93	32.3	2,150	21.5	1,803½	.....	423	.....

Average tax rate for road purposes, for county, on basis of valuation for 1904

of Highways, Expenditures, etc.

COUNTY—CONCLUDED.

APPROPRIAITONS, EXPENDITURES, TAX RATE, ETC.

Total appropriations for highways, sidewalks, bridges and snow. Averaged for 5 years.	Average per mile.	Total expenditures for highways, sidewalks, bridges and snow. Averaged for 4 years.	Average per mile.	Cost of handling snow. Averaged for 4 years.	Valuation, 1904.	Rate of taxation, 1904.	Rate of taxation for road purposes, 1904.	Population.	Years of service of road commissioner. S-select'n. A-assess'rs
$199 82	$33 30	$199 82	$33 30	$21 48	$22,175	†	.009	.....	.....
434 42	48 27	434 42	48 27	22 58	22,580	†	.016	26	.....
263 34	43 89	263 34	43 89	§10 00	21,600	†	.0232	144	.....
235 92	33 70	235 92	33 70	§10 00	22,040	†	.012	21	.....
198 26	39 65	198 26	39 65	§7 00	22,036	†	.006	38	.....
167 30	41 82	167 30	41 82	§6 00	33,059	†	.0048	.....	.....
$91,180 33	$39 35	$93,372 22	$40 26	$19,419 41	$15,663,142	.0252	.0058	60,344	2

($15,663,142) and total average appropriations ($91,180.33) is .0058.
§ Estimated. Town officials unable to separate.
County commissioners assess and direct the expenditure of the road taxes.

COUNTY.

$1,200 00	$24 00	$1,232 78	$24 65	$400 00	$311,496	.0176	.0039	821	1st
3,920 00	28 00	3,920 00	28 00	900 00	1,382,630	.016	.0029	2,868	2
8,534 86	42 67	9,181 02	45 90	1,200 00	3,531,566	.0175	.0021	6,806	3
2,551 45	85 05	2,520 51	84 01	631 71	780,500	.015	.0041	887	$\frac{2}{2}\frac{3}{3}\frac{2}{2}$
1,300 00	26 00	1,346 32	26 93	§300 00	266,650	.017	.0038	783	1st
1,800 00	25 00	1,634 12	22 69	459 50	804,770	.0115	.0022	1,404	$\frac{3}{3}\frac{3}{1}\frac{3}{3}$
3,360 00	60 00	3,400 10	60 70	611 64	1,152,510	.0105	.0031	1,511	$\frac{3}{3}\frac{2}{2}\frac{1}{1}$
2,500 00	96 15	2,500 00	96 15	1,200 00	1,176,926	.0174	.00212	2,339	
4,260 00	14 20	5,009 30	16 70	1,000 00	1,417,214	.0154	.0028	2,549	.....
2,000 00	31 74	1,934 44	30 71	652 66	520,375	.016	.0034	1,388	3
1,920 00	38 40	2,003 25	40 06	313 05	743,169	.0157	.0027	1,750	S
1,550 00	25 83	1,550 00	25 83	525 00	414,932	.018	.0043	969	1st
1,625 00	27 08	1,625 00	27 08	525 00	252,130	.02	.0039	813	3
2,530 00	22 00	2,528 81	21 99	735 63	1,371,355	.01	.0014	1,162	.....
960 00	21 33	940 58	20 90	309 20	319,793	.0143	.0031	642	.....
1,850 00	25 97	1,715 17	23 82	500 00	233,832	.021	.0076	728	2
*160,501 63	1,163 06	172,520 93	1,250 16	6,472 92	49,872,210	.0208	.0032	50,145	11
1,280 00	25 60	1,242 19	24 84	338 09	261,413	.0155	.0048	592	2
1,500 00	25 00	1,500 00	25 00	§400 00	214,252	.024	.007	823	S
3,130 00	24 84	3,130 00	24 84	630 00	1,020,722	.0171	.0028	1,865	1st
950 00	19 00	943 33	18 87	268 23	160,000	.021	.0067	576	3
6,399 47	106 66	6,738 40	112 31	1,000 00	2,713,500	.0206	.0026	6,287	4
2,100 00	21 00	2,100 00	21 00	700 00	666,035	.0185	.0032	1,504	1st
8,700 00	174 00	10,459 22	209 18	§2,000 00	4,152,115	.0195	.00217	7,282	1st
2,428 93	24 29	2,205 69	22 06	1,009 66	994,865	.0175	.0025	1,929	.....
2,430 00	60 75	2,495 83	62 39	434 73	1,393,050	.016	.0016	2,274	4
$231,281 34	$97 14	$246,376 99	$103 48	$23,517 02	$76,128,010	.0195	.00304	100,689	$2\frac{7}{10}$

($76,128,010) and total average appropriations ($231,281.34) is .00304.
§ Estimated.
* Does not include receipts from all sources for streets, simply taxes.

Mileage, Classes and Condition

FRANKLIN

Towns.	Miles, Classes and Condition.								
	Total miles of roads.	Miles of village streets.	Width in feet.	Miles of country roads.	Width in feet.	Miles of dirt roads.	Condition.	Miles of gravel roads.	Condition.
Avon	50	.....	.....	50	12	50	.....	.....	.....
Carthage	40	.....	.....	40	12	39¼	.....	¾	Good
Chesterville	60	3	25	57	20	59	Good..	1	Good
Eustis	12	½	30	11½	16	11¾	.....	¼	Good
Farmington	80	5	45	75	18	78	.....	2	Good
Freeman	48	.....	.....	48	.....	48	.....	.....	.....
Industry	35	.....	.....	35	14	35	Fair...	.....	.....
Jay	127	.....	.....	127	.....	127	.....	.....	.....
Kingfield	23	.....	.....	23	16	23	Good..	.....	.....
Madrid	35	.....	.....	35	14	15	Good..	20	Good
New Sharon	75	1	40	74	20	75	Fair...	.....	.....
New Vineyard	70	.....	.....	70	16	60	.....	10	.....
Phillips	100	5	32	95	15	75	Fair...	25	Fair.
Rangeley	27	4	18	23	12	26	Fair...	1	Fair.
Salem	20	3	18	17	14	20	Good..	.....	.....
Strong	50	2	20	48	14	50	.....	.....	.....
Temple	70	.....	.....	70	14	40	Poor ..	30	Good
Weld	60	1	30	59	16	59	Good..	1	Good
Wilton	65	5	16	60	16	63	Fair...	2	Good
PLANTATIONS.									
Coplin	10	.....	.....	10	10	8	.....	2	.....
Dallas	*12	.....	.....	*12	.....	*12	.....	.....	.....
Lang	8	.....	.....	8	11	5	.....	3	Good
Rangeley	*8	.....	.....	*8	.....	*8	.....	.....	.....
Sandy River, including Greenvale	10	.....	.....	10	9	10	Fair...	.....	.....
UNORGANIZED TOWNSHIPS.									
Wyman, S. ½ No. 4, R. 3, B. K. P	*4	.....	.....	*4	.....	*4	.....	.....	.....
Jerusalem, No. 3, R. 2, B. K. P	*12	.....	.....	*12	.....	*12	.....	.....	.....
Washington	*2	.....	.....	*2	.....	*2	.....	.....	.....
Perkins	*5	.....	.....	*5	.....	*5	.....	.....	.....
East & West ½ No. 6, bet. Phillips and Byron	*2	.....	.....	*2	.....	*2	.....	.....	.....
Totals and averages.	1,120	29½	27.4	1,090½	14.6	1,021	.....	97	.....

Average tax rate for road purposes, for county, on basis of valuation for 1904

* Scaled map for road mileage.

of Highways, Expenditures, etc.

COUNTY.

APPROPRIATIONS, EXPENDITURES, TAX RATE, ETC.

Total appropriations for highways, sidewalks, bridges and snow. Averaged for 5 years.	Average per mile.	Total expenditures for highways, sidewalks, bridges and snow. Averaged for 4 years.	Average per mile.	Cost of handling snow. Averaged for 4 years.	Valuation, 1904.	Rate of taxation, 1904.	Rate of taxation for road purposes, 1904.	Population.	Years of service of road commissioner. S-select'n. A-assess'rs
$1,320 00	$26 40	$1,320 00	$26 40	$450 00	$142,411	.028	.0084	448	2
1,054 40	26 36	1,043 90	26 10	§450 00	142,157	.029	.00703	334	
1,920 00	32 00	2,540 25	42 34	1,075 00	237,075	.026	.0093	709	3
500 00	41 67	500 00	41 67	215 00	154,701	.018	.0036	436	4
6,200 00	77 50	7,616 01	95 00	2,000 00	1,770,480	.012	.0032	3,288	S
1,500 00	31 25	1,500 00	31 25	550 00	99,151	.042	.015	397	S
1,480 27	42 88	1,138 82	32 54	600 00	105,430	.035	.0113	553	S
5,100 00	40 16	6,359 52	50 07	2,000 00	1,566,336	.016	.0038	2,758	S
950 00	41 30	1,101 85	47 90	§300 00	331,468	.025	.0023	693	1st
800 00	22 86	800 00	22 86	400 00	71,321	.028	.0112	326	S
3,100 00	41 33	3,100 00	41 33	2,100 00	372,476	.018	.008	946	
1,600 00	22 85	1,600 00	22 85	600 00	163,485	.0215	.0098	584	2
3,265 00	32 65	3,197 18	31 97	1,324 77	575,562	.0225	.006	1,399	2
2,170 00	43 33	2,170 00	43 33	§300 00	520,163	.017	.0042	961	1st
370 00	18 50	466 57	23 33	175 00	52,209	.022	.0086	195	1st
1,350 00	27 00	1,350 00	27 00	650 00	248,127	.0225	.0062	637	
‡800 00	11 43	1,008 82	14 41	§250 00	133,755	.0165	.006	394	
1,519 29	25 32	1,439 55	23 99	650 00	220,184	.0255	.0068	738	$3\frac{2}{1}$
3,200 00	49 23	4,371 85	67 26	1,200 00	826,469	.0165	.0042	1,647	2
331 32	33 13	331 32	33 13	40 04	44,152	†	.0089	70	1st
353 27	29 44	353 27	29 44	§50 00	46,811	†	.014	172	
219 89	27 48	219 89	27 48	55 00	66,120	†	.0043	87	3
284 21	35 52	284 21	35 52	§30 00	180,552	†	.002	98	
608 03	60 80	608 03	60 80	§75 00	*69,120	†	.0088	78	2
199 12	49 78	199 12	49 78	§10 00	*44,022	†	.0045	33	
558 75	46 56	558 75	46 56	§25 00	*80,640	†	.0068	35	
122 99	61 50	‖122 99	61 50	§10 00	*4,000	†	.0375	20	
321 36	64 27	321 36	64 27	§9 00	*16,000	†	.021	63	
400 00	200 00	‖400 00	200 00	§10 00	*77,790	†	.0051	22	
$41,597 90	$37 14	$46,023 26	$41 09	$15,603 81	$8,296,047	.023	.00501	17,899	2

($8,296,047) and total average appropriations ($41,597.90) is .00501.

§ Estimated for snow money.

* Taken from state assessors' report.

‖ One year only, probably construction work.

‡ Not including $600, 1905, for large bridge.

† County commissioners assess and direct expenditure of road taxes.

Mileage, Classes and Condition

HANCOCK

Towns.	Miles, Classes and Condition.								
	Total miles of roads.	Miles of village streets.	Width in feet.	Miles of county roads.	Width in feet.	Miles of dirt roads.	Condition.	Miles of gravel roads.	Condition.
Amherst	20	.....	.....	20	12	20	Poor..	.....	.....
Aurora	20	.....	.....	20	32	20	.....	.....	.....
Bluehill	70	5	25	65	20	60	Fair...	10	Fair.
Brooklin	30	2	30	28	20	30	Fair...	.....	.....
Brooksville	50	.....	.....	50	16	50	Fair...	.....	.....
Bucksport	100	12	20	88	12	100	.....	.....	.....
Castine	30	15	25	15	20	15	Good..	15	Good
Cranberry Isles	3½	.....	.....	3	16	3½	Good..	.....	.....
Dedham	25	.....	.....	25½	.....	25	Fair...	.....	.....
Deer Isle	80	20	18	60	15	80	Good..	....	.....
Eastbrook	16	.....	.....	16	20	16	Good..	.....	.....
Eden	130	15	25	115	20	100	Poor..	15	Good
Ellsworth	200	25	50	175	25	190	Good..	.....	.....
Franklin	32	3½	20	29	15	20	Fair...	10	.....
Gouldsboro	35	.....	.....	35½	18	34	.....	1	.....
Hancock	52	.....	.....	52	15	48	Good..	4	Good
Isle au Haut	9	.....	.....	9	12	9	.....	.....	.....
Lamoine	28	.....	.....	28	14	28	Good..	.....	.....
Mariaville	27	.....	.....	27	22	27	.....	.....	.....
Mount Desert	62	.....	.....	62	18	62	.....	.....	.....
Orland	80	½	22	79	14	72	Good..	8	Good
Otis	14	.....	.....	14½	18	13½	Fair...	¼	Good
Penobscot	47½	.....	.....	47	17	47½	.....	.....	.....
Sedgwick	36	.....	.....	36½	.....	36	Poor..	.....	.....
Sorrento	12	6	18	6	.....	8	Fair...	4	Good
So. West Harbor	18	2	25	16	20	18	Good..	.....	.....
Stonington	20	1½	20	18	18	19	Fair..	1	Good
Sullivan	26	.....	.....	26½	16	20	Fair...	6	Fair.
Surry	45	.....	.....	45	20	42	Fair...	3	Good
Swan's Island	24	.....	.....	24	16	24	.....	.....	.....
Tremont	22	.....	.....	22	17	22	.....	.....	.....
Trenton	20	.....	.....	20	14	20	Good..	.....	.....
Verona	12	.....	.....	12	20	12	Good..	.....	.....
Waltham	22	.....	.....	22	20	.....	.....	.....	.....
Winter Harbor	16	2	20	14	16	10	Good..	6	Good
PLANTATIONS.									
Long Island	1	.....	.....	1	.....	1	.....	.....	.....
No. 1, Middle Division	2½	.....	.....	2	.....	2½	.....	.....	.....
No. 8, So. Division	2	.....	.....	2	.....	2	.....	.....	.....
No. 33	3	.....	.....	3	22	3	Good..	.....	.....
UNORGANIZED TOWNSHIPS.									
No. 7	1	.....	.....	1	.....	1	.....	.....	.....
No. 9	5	.....	.....	5	.....	5	.....	.....	.....
No. 10	6	.....	.....	6	.....	6	.....	.....	.....
No. 22	7	.....	.....	7	.....	7	.....	.....	.....
No. 28	2½	.....	.....	2½	.....	2½	.....	.....	.....
Totals and averages.	1,504	109½	24.6	1,355	17 1/12	1,371¾	.....	83¼	.....

Average tax rate for road purposes, for county, on basis of valuation for 1904

of Highways, Expenditures, etc.

COUNTY.

APPROPRIATIONS, EXPENDITURES, TAX RATE, ETC.

Total appropriations for highways, sidewalks, bridges and snow. Averaged for 5 years.	Average per mile.	Total expenditures for highways, sidewalks, bridges and snow. Averaged for 4 years.	Average per mile.	Cost of handling snow. Averaged for 4 years.	Valuation, 1904.	Rate of taxation, 1904.	Rate of taxation for road purposes, 1904.	Population.	Years of service of road commissioner. S-select'n. A-assess'rs
$360 00	$18 00	$328 56	$16 43	$125 00	$73,356	.013	.0014	364	5
200 00	10 00	200 00	10 00	§50 00	40,778	.021	.0049	152	1st
2,580 00	36 86	2,539 76	36 28	394 63	561,060	.016	.0044	1,828	1^{2}_{3}
1,010 00	33 67	1,093 48	36 45	110 83	191,124	.022	.0052	936	1st
1,000 00	20 00	1,000 00	20 00	157 50	235,427	.0235	.0042	1,171	1st
4,540 00	45 40	4,959 99	49 60	1,774 25	889,545	.0295	.0054	2,339	S
1,310 00	43 67	1,360 18	45 34	368 25	497,950	.0263	.0027	925	3
286 00	81 71	315 28	90 08	22 02	179,067	.017	.0018	374	2
690 00	23 60	686 98	27 48	116 55	93,820	.024	.0074	327	3
1,397 50	17 47	1,397 50	17 47	200 00	366,257	.02705	.0038	2,047	2
410 00	25 62	400 00	25 00	75 00	50,740	.024	.0099	248	1st
27,289 40	20 99	27,289 40	20 99	800 00	5,736,089	.023	.006	4,379	1^{6}_{5}
7,210 00	36 05	8,742 81	43 71	§2,000 00	1,953,758	.02	.0033	4,297	2
1,337 50	41 80	1,337 50	41 80	225 00	347,680	.0155	.0039	1,201	3
1,615 00	46 14	1,615 00	46 14	229 78	239,516	.0191	.0059	1,259	3
1,261 03	24 25	1,266 22	24 35	39 48	278,391	.0195	.0056	900	6^{2}_{5}
410 00	45 55	440 65	48 96	7 02	71,045	.025	.0056	182	2
670 00	23 93	670 00	23 93	251 00	179,377	.017	.0039	594	3
760 00	28 15	925 00	34 26	100 00	48,928	.03	.0163	218	1st
5,825 00	93 95	6,028 20	97 23	42 31	1,775,275	.016	.004	1,600	6^{3}_{3}-1
1,580 00	19 75	1,929 35	24 12	473 51	264,036	.0265	.0047	1,251	S
200 00	14 29	195 00	13 93	75 00	37,403	.032	.0053	152	3^{2}1
1,580 00	33 26	1,514 00	31 87	513 25	261,737	.021	.0057	1,156	1
980 00	27 22	980 00	27 22	180 00	205,788	.0187	.0049	902	1st
1,200 00	100 00	1,200 00	100 00	65 00	189,554	.0135	.0042	117	2
1,000 00	55 56	1,000 00	55 56	.....	†	.....	.....	†	1st
660 00	33 00	805 71	40 29	28 26	263,452	.0339	.0028	1,648	2
1,785 00	68 65	1,979 23	76 12	800 00	317,165	.0195	.0084	1,034	1^{2}_{13}
930 00	20 67	923 96	20 53	§400 00	172,323	.024	.0058	900	10
550 00	22 92	550 00	22 92	§50 00	145,372	.0224	.0034	758	3
1,050 00	47 73	1,050 00	47 73	§200 00	568,605	.0275	.0047	2,010	1s t
540 00	27 00	540 00	27 00	64 53	129,203	.0255	.0039	459	1 s
361 31	30 11	361 31	30 11	151 31	61,755	.023	.004	234	
390 00	17 73	427 86	19 45	§75 00	75,141	.0145	.004	192	9
1,400 00	87 50	1,468 58	91 79	77 50	372,816	.0234	.004	571	4
82 50	82 50	82 50	82 50	.....	24,951	.018	.006	174	1
160 70	64 28	160 70	64 28	§25 00	*11,682	‡	.012		
84 09	42 04	84 09	42 04	§15 00	*19,200	‡	.004	17	
86 59	28 86	86 59	28 86	35 00	*25,438	‡	.004	82	26
66 11	66 11	66 11	66 11	§10 00	*45,445	‡	.0014	28	
57 60	11 52	57 60	11 52	§10 00	*8,640	‡	.0067		
176 47	29 61	176 47	29 61	§25 00	*45,872	‡	.0038	19	
172 18	26 02	172 18	26 02	§25 00	*33,060	‡	.0052	3	
66 12	26 60	66 12	26 60	§10 00	*66,120	‡	.001	10	
$77,870 10	$51 78	$81,567 13	$54 23	$10,717 78	$17,213,941	.0188	.0045	37,116	$3\frac{1}{3}$

($17,213,941) and total average appropriations ($77,870.10) is .0045.

† Valuation and population included in Tremont.

§ Estimated.

‡ County commissioners assess and direct expenditure of road taxes.

* State assessors valuation used.

Mileage, Classes and Condition

KENNEBEC

Towns.	Miles, Classes and Condition.								
	Total miles of roads.	Miles of village streets.	Width in feet.	Miles of country roads.	Width in feet.	Miles of dirt roads.	Condition.	Miles of gravel roads.	Condition.
Albion	80	.....	....	80	.....	79	Fair...	1	Good
Augusta	118.36	28.01	....	90.35	.....	.....	.....	.....	.....
Belgrade	75	.....	....	75	12	74¼	.....	¾	Good
Benton	50	.....	....	50	20	50	.....	.....	.....
Chelsea	58	.....	....	58	14	56	Poor..	2	Good
China	92	.....	....	92	12	91	.....	1	Fair.
Clinton	80	4	33	76	24	75	Poor..	5	Good
Farmingdale	26	.....	....	26	20	21	Fair...	5	Good
Fayette	60	1	16	59	14	60	Good..	.....	.....
Gardiner	65	45	....	20	.....	.....	.....	.....	.....
Hallowell	25	16	35	9	30	16	Fair...	5	Fair.
Litchfield	106	.....	....	100	15	98	.....	2	Good
Manchester	45	.....	....	45	12	45	Good..	.....	.....
Monmouth	90	2	25	88	16	90	.....	.....	.....
Mount Vernon	72	1	18	71	18	72	.....	.....	.....
Oakland	72	5	40	67	25	72	Good..	.....	Good
Pittston	70	.....	....	70	20	50	Fair...	20	Fair.
Randolph	8	.....	....	8	25	4	Fair...	4	Fair.
Readfield	66	3	26	63	15	61	Poor..	4	Poor
Rome	33	.....	....	33	12	33	Poor..	.....	.....
Sidney	74	.....	....	74	10	73½	.....	.....	.....
Vassalboro	100	6	30	94	15	96	Fair...	4	Good
Vienna	34	.....	....	33½	.....	34	.....	.....	.....
Waterville	53.33	23.70	45	29.63	30	.....	.....	.....	.....
Wayne	45	.....	....	45	12	45	.....	.....	.....
West Gardiner	36	.....	....	36	18	.....	.....	.....	.....
Windsor	50	.....	....	50	15	35	Poor..	15	.....
Winslow	80	.....	....	5	30	40	Good..	40	Good
Winthrop	62	4½	30	57½	15	60	Good..	2	Good
Plantations.									
Unity	4	.....	....	4	20	3½	Good..	½	Good
Totals and averages.	1,823.69	138.72	29	1,607.99	18	1,434¼		111¼	

Average tax rate for road purposes, for county, on basis of valuation for 1904

of Highways, Expenditures, etc.

COUNTY.

APPROPRIATIONS, EXPENDITURES, TAX RATE, ETC.

Total appropriations for highways, sidewalks, bridges and snow. Averaged for 5 years.	Average per mile.	Total expenditures for highways, sidewalks, bridges and snow. Averaged for 4 years.	Average per mile.	Cost of handling snow. Averaged for 4 years.	Valuation, 1904.	Rate of taxation, 1904.	Rate of taxation for road purposes, 1904.	Population.	Years of service of road commissioner. S-select'n. A-assess'rs
$3,300 00	$41 25	$3,245 42	$40 57	$1,000 00	$339,585	.0265	.0058	878	S
27,779 30	234 70	34,267 16	289 52	9,735 02	7,074,372	.0235	.00392	11,683	
2,320 00	30 93	2,694 95	35 93	879 95	405,358	.0192	.0044	1,058	
2,760 00	55 20	2,548 67	50 97	479 79	428,096	.0166	.0054	1,097	2 2 3
1,494 41	25 77	1,662 03	28 65	654 41	216,752	.021	.0042	3,092	S
4,300 00	46 74	4,278 28	46 50	§1,500 00	510,630	.0217	.0078	1,380	S
2,000 00	25 00	2,250 00	28 12	§900 00	518,760	.0245	.0048	1,398	3
2,230 00	85 77	2,230 00	85 77	950 00	554,195	.013	.0039	848	3
2,140 00	35 67	2,140 00	35 67	1,000 00	192,862	.0262	.0104	560	1st
10,462 40	160 96	10,462 40	160 96	§2,000 00	3,521,796	.02	.003	5,501	
4,298 99	171 96	4,942 17	197 69	654 99	1,416,404	.02	.003	2,714	3
2,659 20	26 59	2,775 79	27 76	1,320 00	332,155	.021	.0085	1,057	5
1,796 76	39 93	1,773 23	39 41	781 76	249,560	.0162	.0071	518	4
2,866 66	31 85	3,008 94	33 43	1,166 66	602,345	.0165	.0033	1,236	1st
2,600 00	36 11	2,600 00	36 11	1,100 00	320,407	.016	.0081	906	3
*6,117 93	84 97	6,117 93	84 97	2,537 93	887,144	.026	.0073	1,913	3
2,240 00	32 00	2,521 70	36 02	800 00	456,054	.0185	.0044	1,177	2
600 00	75 00	600 00	75 00	100 00	294,638	.02	.0017	1,077	3
1,360 00	20 61	1,507 22	22 84	§750 00	481,871	.0155	.0033	994	6
1,100 00	33 33	1,046 50	31 71	§350 00	86,080	.034	.0116	420	3
1,880 00	25 41	1,880 00	25 41	§800 00	388,731	.0204	.0049	1,068	S
2,650 00	26 50	2,350 00	23 50	§1,200 00	967,281	.0184	.0026	2,662	S
1,200 00	35 29	1,200 00	35 29	§500 00	117,078	.023	.0102	406	1st
15,150 00	284 00	18,121 54	339 80	§4,000 00	5,353,750	.0235	.0035	9,477	
2,262 50	50 27	2,364 62	52 55	796 88	210,229	.0185	.011	707	6
1,536 59	42 68	1,514 10	42 06	744 12	289,165	.017	.0051	693	2
2,209 31	44 19	2,197 97	43 96	1,109 31	229,565	.0225	.0079	782	S
4,723 40	59 04	5,108 03	63 85	1,395 08	2,044,430	.021	.0021	2,277	4
3,025 00	48 79	3,025 00	48 79	1,200 00	1,146,725	.0132	.0028	2,088	3d
110 00	27 50	110 00	27 50	§20 00	16,022	.01625	.0062	50	
$119,172 45	$65 35	$130,543 65	$71 58	$40,425 90	$29,652,040	.0213	.00402	59,117	3

($29,652,040) and total average appropriations ($119,172.45) is .00402.

§ Estimated.

* Includes $1,000 special appropriation for concrete walks.

Mileage, Classes and Condition

KNOX

Towns.	Miles, Classes and Condition.								
	Total miles of roads.	Miles of village streets.	Width in feet.	Miles of country roads.	Width in feet.	Miles of dirt roads.	Condition.	Miles of gravel roads.	Condition.
Appleton	65	.....	.....	65	.....	65	.....	.....	.....
Camden	50	10	45	40	16	48	.....	2	.....
Cushing	26	.....	.....	26	24	25¾	Fair...	¼	Good
Friendship	26	1	20	25	16	22	Good..	3	Good
Hope	40	.....	.....	40	18	40	.....	.....	.....
Hurricane Isle	1	.....	.....	1	.....	1	Good..	.....	.....
North Haven	25	1	30	24	25	 25	Good..	.....	.....
Rockland	40½	§25	.....	15½	.....	.....	.....	.....	.....
Rockport	45	12	40	33	25	45	Fair...	.....	.....
South Thomaston	40	.....	.....	40	20	40	.....	.....	.....
Saint George	50	.....	.....	50	19	50	.....	.....	.....
Thomaston	30	.....	.....	30	25	20	Fair...	5	Fair.
Union	150	3	40	147	25	100	Poor ..	40	Poor
Vinalhaven	50	4	20	46	20	40	Poor ..	6	Good
Warren	100	2	28	98	18	100	Poor ..	.....	.....
Washington	75	1½	33	73½	16	74½	.....	½	Good
PLANTATIONS.									
Criehaven	*	.....	.....	.....	.....	.....	.....	.....	.....
Matinicus Isle	3	.....	.....	3	.....	3	.....	.....	.....
Totals and averages.	816½	59½	32	757	20½	699¼	.....	56¾	.....

Average tax rate for road purposes, for county, on basis of valuation for 1904

§ Estimated. * No roads.

LINCOLN

Alna	39	.....	.....	39	15	39	.....	.....	.....
Boothbay	50	3	33	47	30	50	.....	.....	.....
Boothbay Harbor	25	10	20	15	12	23	.....	.....	.....
Bremen	30	.....	.....	30	.....	30	Fair...	.....	.....
Bristol	130	.....	.....	130	.....	130	Fair...	.....	.....
Damariscotta	25	4	40	21	22	23	.....	2	Good
Dresden	35	1	.....	35	.....	35	Poor ..	.....	.....
Edgecomb	30	.....	.....	30	.....	30	.....	.....	.....
Jefferson	100	1	32	99	16½	94	Fair...	6	Good
Newcastle	52	2	30	16	.....	50	Good..	2	Good
Nobleboro	40	5	15	35	15	35	Fair...	5	Good
Somerville	30	.....	.....	30	15	30	Fair...	.....	.....
Southport	20	.....	.....	20	15	20	Good..	.....	.....
Waldoboro	120	5	32	115	22	120	Fair...	.....	.....
Westport	30	2	16	28	16	30	Fair...	.....	.....
Whitefield	75	.....	.....	75	12	75	.....	.....	.....
Wiscasset	55	4	.....	51	.....	54½	Fair...	½	Good
PLANTATIONS.									
Monhegan	1¾	¾	16½	1	.....	1¾	Good..	.....	.....
Totals and averages.	887¾	37¾	26	817	17¼	870¼	.....	15½	.....

Average tax rate for road purposes, for county, on basis of valuation for 1904

of Highways, Expenditures, etc.—Continued.

COUNTY.

APPROPRIATIONS, EXPENDITURES, TAX RATE, ETC.

Total appropriations for highways, sidewalks, bridges and snow. Averaged for 5 years.	Average per mile.	Total expenditures for highways, sidewalks, bridges and snow. Averaged for 4 years.	Average per mile.	Cost of handling snow. Averaged for 4 years.	Valuation, 1904.	Rate of taxation, 1904.	Rate of taxation for road purposes, 1904.	Population.	Years of service of road commissioner. S-select'n. A-assess'rs
$1,620 00	$24 92	$1,455 84	$22 40	$511 85	$238,118	.024	.0063	975	3
5,000 00	100 00	6,000 00	120 00	1,400 00	2,301,319	.0185	.0022	2,825	2
600 00	23 07	600 00	23 07	100 95	114,870	.019	.0052	604	S
882 00	33 92	796 67	30 64	35 98	215,995	.021	.0028	814	S
1,478 40	36 96	1,453 58	36 34	646 32	201,444	.017	.0063	599	12
.....	.....	.....	.....	.....	53,335	.01003	.....	257	
610 00	24 40	610 00	24 40	200 00	225,847	.018	.0027	551	1st
10,400 00	256 79	11,708 98	289 11	1,045 49	5,487,181	.022	.0019	8,150	2
3,600 00	80 00	4,625 14	102 78	1,500 00	1,292,360	.0195	.0031	2,314	5
2,000 00	50 00	2,000 00	50 00	600 00	363,401	.023	.0055	1,426	S
2,000 00	40 00	2,000 00	40 00	300 00	385,744	.024	.0051	2,206	3
4,858 60	161 95	5,451 21	181 71	747 17	1,242,951	.0207	.0044	2,688	4
3,080 00	20 53	2,978 11	19 85	918 11	500,359	.022	.0059	1,248	$10\frac{3}{5}$ $\frac{2}{3}$
2,100 00	42 00	2,348 84	46 98	387 78	644,565	.0225	.0035	2,358	7
3,250 00	32 50	3,958 22	39 58	§500 00	791,264	.0154	.0038	2,069	1st
1,800 00	24 00	1,800 00	24 00	600 00	261,581	.0245	.0069	1,019	
†	.....	.....	.....	.....	12,650	.0133	.....	47	
†	.....	.....	.....	.....	37,238	.008	.....	184	
$43,279 00	$53 00	$47,786 59	$58 52	$9,493 65	$14,370,222	.019	.00301	30,406	$4\frac{1}{3}$

($14,370,222) and total average appropriations ($43,279.00) is .00301.

† No appropriation.

COUNTY.

*§$1,000 00	$25 64	$1,000 00	$25 64	§$150 00	$161,483	.018	.0062	444	3
3,002 75	60 05	3,002 75	60 05	502 75	555,202	.0198	.0054	1,766	$3\frac{3}{1}$ $\frac{1}{1}$
2,500 00	100 00	2,500 00	100 00	221 68	1,060,627	.018	.0024	1,926	3
970 00	32 30	844 27	28 14	154 25	131,503	.029	.0066	657	1st
3,400 00	26 15	3,400 00	26 15	1,000 00	783,857	.0215	.0042	2,572	1st
1,180 00	47 20	1,080 41	43 22	325 00	432,049	.02	.0028	876	$1\frac{2}{1}$ 3
2,000 00	57 14	2,081 84	59 48	§400 00	336,767	.01	.0045	882	S
1,260 00	42 00	1,213 94	40 46	288 50	174,651	.019	.0069	607	$2\frac{8}{3}$ $\frac{2}{2}$
2,050 00	20 50	1,967 87	19 68	823 51	406,994	.017	.0069	1,155	1st
3,133 33	60 26	3,238 50	62 28	§500 00	672,668	.0145	.0045	1,075	$1\frac{3}{1}$ $\frac{1}{1}$
1,160 00	29 00	1,325 00	33 12	§500 00	224,148	.0185	.0054	810	3
812 00	27 07	862 50	28 75	§275 00	54,360	.035	.0147	374	S
599 00	29 95	584 24	29 21	28 36	352,112	.0151	.0015	527	10
6,260 00	52 17	6,708 98	55 91	2,195 99	928,835	.022	.0056	3,145	S
430 00	14 33	530 15	17 67	63 83	85,781	.0155	.0052	330	S
1,790 60	23 87	2,125 20	28 34	§650 00	405,568	.0165	.0041	1,156	S
2,500 00	45 45	2,500 00	45 45	§300 00	448,295	.023	.0039	1,273	1st
65 00	37 14	65 00	37 14	.....	35,639	.0112	.0003	94	1st
$34,112 08	$38 42	$35,030 65	$39 46	$8,378 87	$7,250,539	.0188	.0047	19,669	2

($7,250,539) and total average appropriations ($34,112.08) is .0047.

* Not including $657.55 for bridge built in 1902. § Estimated.

Mileage, Classes and Condition

OXFORD

Towns.	Miles, Classes and Condition.								
	Total miles of roads.	Miles of village streets.	Width in feet.	Miles of country roads.	Width in feet.	Miles of dirt roads.	Condition.	Miles of gravel roads.	Condition.
Albany	50	.....	.....	50	25	50	Poor..	.....	.....
Andover	50	1½	30	48½	30	40	Good..	10	Good
Bethel	125	5½	30	119½	18	117¼	Fair...	2¼	Good
Brownfield	75	.....	.....	75	16	75	Poor..	.....	.....
Buckfield	100	2	25	98	15	100	Fair...	.....	.....
Byron	20	.....	.....	20	12	15	Good..	5	Good
Canton	60	3	20	57	18	60	Fair...	.....	.....
Denmark	50	.....	.....	50	.....	50	.....	.....	.....
Dixfield	102	2	50	100	23	101¾	.....	¼	Good
Fryeburg	103	.....	.....	103	.....	103	.....	.....	.....
Gilead	14	2	14	12	14	14	.....	.....	.....
Grafton	8	.....	.....	8	.....	8	Good..	.....	.....
Greenwood	65	1	24	64	14	64	Good..	.....	.....
Hanover	10	2	20	8	12	10	Good..	.....	.....
Hartford	80	.....	.....	80	16	80	.....	.....	.....
Hebron	55	½	12	54½	10	55	Fair...	.....	.....
Hiram	90	3	25	87	15	90	Poor..	.....	.....
Lovell	65	.....	.....	65	12	35	Fair...	30	Fair.
Mason	6	.....	.....	6	16	6	Good..	.....	.....
Mexico	35	5	20	30	14	35	Poor..	.....	.....
Newry	20	.....	.....	20	16	20	Fair...	.....	.....
Norway	100	30	30	70	20	97	Fair...	3	Good
Oxford	80	.....	.....	80	16	80	.....	.....	.....
Paris	150	12	33	138	18	25	Good..	125	Poor
Peru	56	.....	.....	56	14	56	Good..	.....	.....
Porter	63	3	50	60	50	60	.....	.....	.....
Roxbury	§20	.....	.....	§20	.....	§20	.....	.....	.....
Rumford	120	5	40	115	24	118	Good..	1	Good
Stow	21	.....	.....	21	14	.....	.....	.....	.....
Stoneham	25	.....	.....	25	16½	24½	Poor..	½	Good
Sumner	200	.....	.....	200	.....	200	.....	.....	.....
Sweden	50	.....	.....	50	12	50	Good..	.....	.....
Upton	14	.....	.....	14	8	14	Poor..	.....	.....
Waterford	100	.....	.....	100	12	99	Fair...	1	Good
Woodstock	75	3	20	72	11	70	Poor..	.....	.....
PLANTATIONS.									
Lincoln	7½	.....	.....	7½	.....	4½	Good..	3	Good
Magalloway	6	.....	.....	6	.....	6	.....	.....	.....
Milton	14	1	30	13	12	14	.....	.....	.....
UNORGANIZED TOWNSHIPS.									
Andover West Surplus	*1	.....	.....	1	.....	1	.....	.....	.....
Andover North Surplus	*6	.....	.....	6	.....	6	.....	.....	.....
Letter "C"	*2	.....	.....	2	.....	2	.....	.....	.....
"C" Surplus	*1	.....	.....	1	.....	1	.....	.....	.....
Freyburg Acad. Grant	*2	.....	.....	2	.....	2	.....	.....	.....
Riley	*6	.....	.....	6	.....	6	.....	.....	.....
Totals and averages.	2,302	78½	27¾	2,221	16⅔	2,085	.....	181	.....

Average tax rate for road purposes, for county, on basis of valuation for 1904
*Scaled for mileage. §Estimated.

of Highways, Expenditures, etc.

OUNTY.

APPROPRIATIONS, EXPENDITURES, TAX RATE, ETC.

Total appropriations for highways, sidewalks, bridges and snow. Averaged for 5 years.	Average per mile.	Total expenditures for highways, sidewalks, bridges and snow. Averaged for 4 years.	Average per mile.	Cost of handling snow. Averaged for 4 years.	Valuation, 1904.	Rate of taxation, 1904.	Rate of taxation for road purposes, 1904.	Population.	Years of service of road commissioner. S-select'n. A-assess'rs
$1,500 00	$30 00	$1,500 00	$30 00	§$600 00	$133,339	.032	.0112	538	1st
1,060 00	21 20	1,277 35	25 55	648 22	230,156	.024	.0069	727	3
4,000 00	32 00	3,369 33	26 95	1,800 00	848,814	.019	.0047	1,835	S
1,280 00	17 07	1,471 44	19 62	500 00	294,972	.0158	.0051	1,019	1st
2,275 25	22 75	2,407 35	24 07	1,052 50	390,823	.025	.0065	1,139	6
1,020 00	51 00	987 50	49 37	150 00	76,030	.03	.0132	204	b
1,690 00	28 17	1,370 00	22 83	520 00	295,956	.037	.0056	946	2
1,550 00	31 00	1,550 00	31 00	§500 00	302,530	.0145	.005	634	3
2,200 00	21 56	2,882 05	28 26	992 99	311,840	.03	.0071	1,052	4
2,260 00	21 94	2,520 07	24 71	600 00	780,374	.0155	.0026	1,376	1
550 00	39 29	550 00	39 29	175 00	125,835	.018	.0048	340	1^{2}_{1}
460 00	57 50	460 00	57 50	§100 00	62,022	.0185	.0073	81	3
2,530 00	38 92	2,726 07	41 94	613 71	170,247	.032	.0164	741	1st
208 33	20 83	208 33	20 83	§50 00	75,981	.015	.0033	214	1st
1,940 00	24 25	1,940 00	24 25	831 25	245,736	.0195	.0077	660	2
1,440 00	26 18	1,348 98	24 53	466 66	214,125	.023	.007	494	1st
1,800 00	20 00	2,077 48	23 08	431 72	353,786	.0175	.0049	1,015	1st
1,680 00	25 85	1,680 00	25 85	§500 00	385,528	.015	.0047	693	2
270 00	45 00	300 13	50 02	50 00	43,136	.0166	.0046	67	.....
1,680 00	48 00	1,680 00	48 00	200 00	434,119	.035	.0037	816	.....
800 00	40 00	800 00	40 00	§100 00	122,051	.02	.0066	286	2^{2}_{2}
4,660 00	46 60	4,277 74	42 78	1,202 89	1,215,134	.018	.0044	2,902	$\frac{3}{5}1_{1}$
2,400 00	30 00	2,400 00	30 00	750 00	442,911	.025	.0077	1,331	5
5,340 00	35 60	5,547 44	36 98	2,293 67	1,335,220	.02	.0044	3,225	3^{3}_{1}
2,200 00	39 29	2,200 00	39 29	600 00	223,037	.03	.0135	773	1st
1,100 00	17 46	1,147 18	18 21	§400 00	225,509	.022	.0067	886	2
§1,000 00	50 00	§1,000 00	50 00	§150 00	60,380	.05	.016	238	.....
15,095 00	125 79	20,528 35	171 07	§2,000 00	2,898,835	.0185	.0036	3,770	1st
600 00	28 57	600 00	28 57	§100 00	117,862	.0175	.0051	270	3
600 00	24 00	600 00	24 00	§125 00	102,419	.016	.0059	284	1st
2,100 00	10 50	2,100 00	10 50	1,054 04	254,717	.02	.0082	802	1st
627 50	12 55	640 04	12 80	270 81	172,801	.016	.0047	282	2
520 00	37 14	507 45	36 24	§150 00	102,222	.013	.0049	242	1st
2,520 00	25 20	2,705 89	27 06	631 73	280,998	.023	.0077	917	1st
1,833 33	24 44	1,833 33	24 44	599 51	251,233	.021	.0076	816	7
§250 00	33 33	§250 00	33 33	95 00	132,734	.0084	.0019	73	4
230 00	38 33	230 00	38 33	50 00	176,968	.0045	.0013	77	2
540 00	38 57	472 21	33 73	§100 00	61,475	.023	.0075	202	.....
60 44	60 44	60 44	60 44	§5 00	†23,023	‡	.0026	... .	.....
308 80	51 46	308 80	51 46	§100 00	†63,840	‡	.0048	22	.....
303 59	151 79	303 59	151 79	§100 00	†126,444	‡	.0024	7	.....
40 00	40 00	40 00	40 00	§5 00	†61,030	‡	.0006	.....	.....
52 56	26 28	52 56	26 28	§5 00	†19,000	‡	.0027	15	.....
117 58	19 59	117 58	19 59	§10 00	†112,000	‡	.0002	13	.....
$74,692 48	$32 45	$81,028 68	$35 20	$21,679 70	$14,357,192	.0206	.0052	32,024	22

($14,357,192) and total average appropriations ($74,692.48) is .0052.

† Taken from state assessor's returns. § Estimated.

‡ County commissioners assess and direct the expenditure of road taxes.

Mileage, Classes and Condition

PENOBSCOT

Towns.	Miles, Classes and Condition.								
	Total miles of roads.	Miles of village streets.	Width in feet.	Miles of country roads.	Width in feet.	Miles of dirt roads.	Condition.	Miles of gravel roads.	Condition.
Alton	20	.....	.....	20	16	10	Good..	10	Good
Argyle	12	.....	.....	12	20	12	.....	.....	.....
Bangor	259	.....	16½	.....	.....	.....	Fair...	.....	Fair.
Bradford	60	.....	.....	60	16	59½	.....	.....	.....
Bradley	12	2	22	10	22	4	Good..	8	Good
Brewer	35	.....	.....	35	24	35	.....	.....	.....
Burlington	22	.....	.....	22	12	11	Bad ...	11	Good
Carmel	60	.....	.....	60	20	59	.. ....	1	.....
Carroll	25	.....	.....	25	30	25	.....	.....	.....
Charleston	62	1	20	61	20	62	.....	.....	.....
Chester	25	.....	.....	25	15	21	Fair...	4	Fair.
Clifton	20	.....	.....	20	20	14	Fair...	6	Fair.
Corinna	97	3	38	94	18	97	.....	.....	.....
Corinth	75	1	30	74	10	73	Fair...	1	Good
Dexter	*60	.....	.....	60	.....	60	.....	.....	.....
Dixmont	70	.....	.....	70	16	70	Fair...	.....	.....
Eddington	31	.....	.....	31	20	31	Poor ..	.....	.....
Edinburg	6½	.....	.....	6½	.....	6½	Fair...	.....	.....
Enfield	36	.....	.....	36	12	36	Fair...	.....	.....
Etna	42	.....	.....	42	14	41½	Fair...	½	Good
Exeter	100	.....	.....	100	15	100	Good..	.....	.....
Garland	50	1	30	49	16	50	Fair...	.....	.....
Glenburn	35	.....	.....	35	20	25	Fair...	10	Good
Greenbush	40	1	25	39	12	28	Poor ..	12	Poor
Greenfield	22	.....	.....	22	20	22	.....	.....	.....
Hampden	75	3	40	72	33	25	Fair...	50	Fair.
Hermon	75	.....	.....	75	24	.....	.....	.....	.....
Holden	50	.....	.....	50	22	50	Fair...	.....	.....
Howland	27	1	24	26	12	.....	.....	.....	.....
Hudson	30	.....	.....	30	14	30	Fair...	.....	.....
Kenduskeag	30	3	20	27	14	14	Good..	16	Fair.
Kingman	14	1½	30	12½	.....	14	.....	.....	.....
Lagrange	23	.....	.....	23	18	23	Good..	.....	.....
Lee	51	2	50	49	15	51	.....	.....	.....
Levant	50	.....	.....	50	15	40	Fair...	10	Good
Lincoln	75	5	50	70	.....	.....	.....	75	Fair.
Lowell	15	.....	.....	15	12	15	Poor ..	.....	.....
Mattamiscontis	*§6	.....	.....	6	.....	6	.....	.....	.....
Mattawamkeag	21	2	24	19	22	17½	Fair...	3½	Good
Maxfield	14	.....	.....	14	18	14	Good..	.....	.....
Medway	17	.....	.....	17	18	17	Fair...	.....	.....
Milford	27	5	50	22	32	27	Good..	.....	.....
Millinocket	8	5	40	3	30	8	Good..	.....	.....
Mt. Chase	20	.....	.....	20	15	20	Good..	.....	.....
Newburg	36	.....	.....	36	18	36	.....	.....	.....
Newport	51	3	40	48	50	48	Good..	.....	.....
Old Town	125	25	30	100	.....	115	Poor ..	10	Good
Orono	30	6	30	20	20	.....	.....	30	Good
Orrington	60	.....	.....	60	15	30	Good..	30	Fair.
Passadumkeag	17	1	24	16	20	9	Good..	8	Good
Patten	30	6	24	24	24	20	Good..	10	Good
Plymouth	40	.....	.....	40	16	40	Fair...	.....	.....
Prentiss	40	.....	.....	40	20	40	Fair...	.....	.....
Springfield	40	.....	.....	40	22	40	Good..	.....	.....
Stetson	50	1	30	49	20	20	Poor ..	30	Good
Veazie	7	1¼	20	5¾	20	7	Good..	.....	.....
Winn	35	1½	20	33½	15	33½	Fair...	.....	.....
Woodville	25	.....	.....	25	12	25	Good..	.....	.....

* Mattamiscontis and Dexter made no returns. Mileage from maps, and expenditures, etc., from town reports.

of Highways, Expenditures, etc.

COUNTY.

APPROPRIATIONS, EXPENDITURES, TAX RATE, ETC.

Total appropriations for highways, sidewalks, bridges and snow. Averaged for 5 years.	Average per mile.	Total expenditures for highways, sidewalks, bridges and snow. Averaged for 4 years.	Average per mile.	Cost of handling snow. Averaged for 4 years.	Valuation, 1904.	Rate of taxation, 1904.	Rate of taxation for road purposes, 1904.	Population.	Years of service of road commissioner. S-select'n. A-assess'rs
$460 00	$20 00	$400 00	$20 00	$200 00	$75,305	.02775	.0053	314	2
400 00	33 33	477 50	39 79	30 00	56,050	.034	.0071	320	1st
45,200 00	174 51	55,401 54	213 91	§5,000 00	16,345,880	.02	.0028	21,850	1st
1,080 00	18 00	1,216 68	20 28	334 06	241,564	.021	.005	954	1st
300 00	25 00	300 00	25 00	§50 00	172,372	.021	.0017	682	3
4,500 00	128 57	4,560 00	128 57	400 00	1,796,700	.026	.0025	4,835	4
400 00	18 18	400 00	18 18	87 50	138,136	.0125	.0033	394	1st
1,440 00	24 00	1,413 51	23 56	§350 00	278,030	.017	.0054	932	3
600 00	24 00	600 00	24 00	267 50	102,511	.02	.0078	487	1st
2,560 00	41 29	2,560 00	41 29	560 00	271,979	.023	.0094	842	1st
540 00	21 60	540 00	21 60	150 00	63,118	.0235	.0079	363	S
320 00	16 00	347 49	17 37	50 00	56,195	.025	.0071	236	5
1,800 00	18 56	1,800 00	18 56	800 00	416,768	.0184	.0048	1,170	1st
1,850 00	24 67	1,781 66	23 76	423 41	398,986	.014	.0038	1,042	2
*5,340 00	89 00	*6,765 23	112 75	2,468 23	1,052,979	.026	.0047	2,941	
1,720 00	24 57	1,867 61	26 68	§800 00	232,505	.016	.0069	843	2
1,100 00	35 48	1,100 00	35 48	§300 00	154,088	.018	.0081	663	5
160 00	24 62	160 00	24 62	§25 00	18,584	.029	.0094	65	2
1,002 55	27 85	877 45	24 37	§200 00	217,651	.02	.0047	1,062	1st
1,300 00	30 95	1,339 41	31 89	§500 00	120,138	.031	.0133	527	1st
1,680 00	16 80	1,714 12	17 14	867 37	269,963	.0183	.0052	879	1st
1,780 00	35 60	2,026 51	40 53	§700 00	275,049	.0215	.0036	857	4
760 00	21 71	760 00	21 71	§300 00	123,603	.029	.0065	461	4
610 00	15 25	789 51	19 74	§200 00	80,057	.032	.0072	586	1st
430 00	19 55	454 29	20 65	51 25	31,621	.042	.0142	160	3^{2}_{1}
3,600 00	48 00	3,600 00	48 00	1,450 00	664,805	.019	.006	2,182	S
1,460 00	19 47	1,758 27	23 44	§700 00	338,314	.02	.0044	1,183	1st
1,030 00	20 60	1,038 29	20 77	410 37	145,722	.024	.0058	602	3
1,120 00	41 48	1,219 25	45 16	§500 00	251,095	.0275	.0044	519	1
800 00	26 67	800 00	26 67	400 00	94,922	.0285	.0084	430	
550 00	18 33	550 00	18 33	200 00	158,228	.0173	.0035	423	1st
480 00	34 29	567 81	40 56	§150 00	151,646	.028	.004	936	1st
540 00	23 48	518 32	22 54	151 94	193,600	.0165	.0026	574	1st
581 25	11 40	581 25	11 40	§200 00	117,646	.031	.0064	801	2
1,680 00	33 60	1,647 44	32 95	600 00	223,388	.016	.0063	789	4
2,737 91	36 51	2,526 13	33 68	250 00	477,027	.022	.0031	1,731	2
480 00	32 00	398 25	26 55	171 00	68,099	.025	.0059	300	2
§150 00	25 00	§150 00	25 00	§20 60	16,846	.0185	.009	28	
387 50	18 45	387 50	18 45	§100 00	118,278	.025	.0017	527	1
360 00	25 71	376 50	26 89	§100 00	27,742	.029	.0135	115	1
346 00	20 35	281 25	16 54	50 00	57,309	.027	.0022	297	2^{2}_{1}
1,470 00	54 44	1,376 23	50 97	§200 00	290,408	.028	.0055	838	1
1,980 00	247 50	1,752 02	219 00	300 00	673,162	.027	.0025	1,144	1
895 09	44 75	916 47	45 82	250 00	64,371	.046	.0155	299	1
1,080 00	30 00	1,080 00	30 00	400 00	246,752	.017	.0041	734	22
2,888 00	56 63	2,378 91	46 65	500 00	569,147	.0255	.0044	1,533	2
7,120 00	56 96	7,120 00	56 96	600 00	1,679,740	.032	.0029	5,763	3
2,000 00	66 67	2,000 00	66 67	600 00	877,832	.03	.0023	3,257	2
1,605 00	26 75	1,655 00	27 58	736 95	385,235	.0165	.0044	1,266	3
575 00	33 82	575 00	33 82	56 25	44,827	.045	.0112	409	Sev'l
1,680 00	56 00	1,680 00	56 00	200 00	523,843	.021	.0032	1,172	1
1,150 00	28 75	1,314 00	32 85	500 00	160,671	.024	.0112	658	S
575 00	14 37	575 00	14 37	§100 00	71,042	.025	.0063	502	
820 00	20 50	775 00	19 37	100 00	111,596	.03	.0081	532	4
1,350 00	27 00	1,350 00	27 00	500 00	173,850	.021	.0069	503	1st
320 00	45 71	368 46	52 64	§80 00	271,623	.017	.0009	555	1st
470 00	13 43	528 75	15 11	50 00	154,511	.017	.0026	688	2
280 00	11 20	280 00	11 20	§60 00	55,730	.0182	.0054	160	2

§ Estimated.

Mileage, Classes and Condition

PENOBSCOT

Towns.	Miles, Classes and Condition.								
	Total miles of roads.	Miles of village streets.	Width in feet.	Miles of country roads.	Width in feet.	Miles of dirt roads.	Condition.	Miles of gravel roads.	Condition.
Drew	10	.....	.....	10	18	10	Fair...	.....	.....
Lakeville	8	.....	.....	8	6	8	Good..	.....	.....
Grand Falls, No. 2, N. D. B. P. P	7	.....	.....	7	8	7	.....	.....	.....
Seboeis, No. 3, R. 8, N. W. P.	3	.....	.....	3	12	3	Fair...	.....	.....
Stacyville	10¾	.....	.....	10¾	12	10¾	Fair...	.....	.....
Webster	7	.....	.....	7	9	7	Poor ..	.....	.....
UNORGANIZED TOWNSHIPS.									
No. 2, R. 6, W. E. L. S.	6	.....	.....	6	.....	6	.....	.....	.....
No. 1, R. 7, W. E. L. S.	6	.....	.....	6	.....	6	.....	.....	.....
No. 2, R. 7, W. E. L. S.	1	.....	.....	1	.....	1	.....	.....	.....
No. 1, N. D. B. P. P. (Summit)	9	.....	.....	9	.....	9	.....	.....	.....
A, R. 7, W. E. L. S.	7	.....	.....	7	.....	7	.....	.....	.....
Totals and averages.	2,565¼	81½	30⅛	2,229¼	18⅙	1,871½	.....	335¾	.....

Average tax rate for road purposes, for county, on basis of valuation for 1904

PISCATAQUIS

Abbot	50	.....	.....	50	16	50	.....	.....	.....
Atkinson	40	.....	.....	40	12	40	.....	.....	.....
Blanchard	13	.....	.....	13	13	13	Good..	.....	.....
Brownville	34	2	30	32	20	34	.....	.....	.....
Dover	75	5	36	70	30	75	Good..	.....	.....
Foxcroft	55	20	45	25	18	55	.....	.....	.....
Greenville	18	3	66	15	48	14	Fair...	4	Fair.
Guilford	45	8	20	37	16	33	Good..	12	Good
Medford	20	.....	.....	20	18	20	Fair...	.....	.....
Milo	60	3	30	57	20	58½	.....	1½	Good
Monson	58	2	24	56	15	58	Poor ..	.....	.....
Orneville	35	.....	.....	35	12	35	Fair...	.....	.....
Parkman	100	.....	.....	100	18	100	Poor ..	.....	.....
Sangerville	90	3	24	87	20	87	Good..	3	Good
Sebec	45	.....	.....	45	20	45	Good..	.....	.....
Shirley	17	.....	.....	17	25	17	Fair...	.....	.....
Wellington	46	.....	.....	46	16	46	.....	.....	.....
Williamsburg	12	.....	.....	12	12½	12	Good..	.....	.....
Willimantic	25	.....	.....	25	.....	25	Poor ..	.....	.....
PLANTATIONS.									
Barnard	10	.....	.....	10	.....	10	.....	.....	.....
Bowerbank	6	.....	.....	6	.....	6	.....	.....	.....
Elliottsville	6	.....	.....	6	.....	6	.....	.....	.....
Kingsbury	20	.....	.....	20	10	20	Fair...	.....	.....
Lake View	1	.....	.....	1	10	1	Good..	.....	.....
Lily Bay, Unorg. Tp.	7	.....	.....	7	.....	7	.....	.....	.....
Totals and averages.	888	46	34⅜	832	18¾	867½	.....	20½	.....

Average tax rate for road purposes, for county, on basis of valuation for 1904

of Highways, Expenditures, etc.

COUNTY—CONCLUDED.

APPROPRIATIONS, EXPENDITURES, TAX RATE, ETC.

Total appropriations for highways, sidewalks, bridges and snow. Averaged for 5 years.	Average per mile.	Total expenditures for highways, sidewalks, bridges and snow. Averaged for 4 years.	Average per mile.	Cost of handling snow. Averaged for 4 years.	Valuation, 1904.	Rate of taxation, 1904.	Rate of taxation for road purposes, 1904.	Population.	Years of service of road commissioner. S-select'n. A-assess'rs
$435 36	$43 54	$366 70	$36 67	$85 00	$82,964	.0185	.0048	120	
240 40	30 05	240 40	30 05	90 00	73,967	.0065	.0027	129	6
239 62	34 23	239 62	34 23	§75 00	†22,040	*	.005	52	3
103 41	94 47	103 41	94 47	§30 00	†34,470	*	.003	96	15
580 00	53 95	580 00	53 95	115 35	102,724	.014	.0058	347	
148 25	21 18	148 25	21 18	25 00	†14,825	*	.01	124	11
92 33	15 38	92 33	15 38	§25 00	†23,083	*	.004	49	
94 46	15 74	94 46	15 74	§25 00	†23,740	*	.004		
88 16	88 16	88 16	88 16	§10 00	†22,040	*	.004		
176 32	19 59	176 32	19 59	§20 00	†22,040	*	.008	39	
176 64	25 23	176 64	25 23	§20 00	†22,080	*	.008	16	
$122,208 25	$47 64	$134,023 90	$52 25	$26,321 18	$32,892,816	.022	.0037	76,161	2⅕

($32,892,816) and total average appropriations ($122,208.25) is .0037.

§ Estimated.

† Valuation used by county commissioners.

* County commissioners assess and direct the expenditure of the road taxes. Road taxes for 1906 only, taken from State paper. Mileage scaled from maps.

COUNTY.

†$1,240 00	$24 80	$1,375 00	$27 50	§$200 00	$163,847	.03	.0073	716	3
1,000 00	25 00	1,000 00	25 00	§150 00	137,587	.032	.0073	495	1st
690 00	53 08	742 33	57 10	100 00	69,466	.031	.0094	248	1
3,050 00	89 71	3,755 48	110 46	600 00	479,700	.022	.0033	1,570	S
4,100 00	54 67	3,833 51	51 11	1,247 63	917,332	.0155	.0055	1,889	9
2,960 00	53 81	2,960 00	53 81	695 88	716,536	.027	.0042	1,629	4
1,140 00	63 33	1,352 00	75 11	319 00	420,202	.034	.0024	1,117	8
2,500 00	55 56	2,464 18	54 76	664 89	586,730	.022	.0037	1,544	3
350 00	17 50	392 99	19 65	250 00	85,011	.0182	.0041	282	3
2,910 00	43 50	2,944 88	49 08	300 00	579,065	.022	.0079	1,150	S
2,341 25	40 37	2,324 07	40 07	§800 00	233,255	.021	.0066	1,116	$3\frac{3}{4}$–$\frac{1}{4}$
831 25	23 75	812 50	23 21	181 25	101,476	.03	.0103	325	$\frac{1}{2}$
2,260 00	22 60	2,568 51	25 68	§1,000 00	212,046	.0294	.0094	718	1st
2,700 00	30 00	3,159 45	35 10	§1,560 00	477,095	.0254	.0042	1,294	2
1,180 00	26 22	1,380 07	30 67	550 00	161,201	.0235	.0074	593	S
680 00	40 00	704 50	41 44	185 50	75,878	.028	.0092	248	7
1,050 00	22 83	1,328 04	28 87	612 49	102,898	.031	.0097	413	2
235 40	19 62	212 50	17 71	62 53	46,287	.023	.0054	117	10
530 00	21 20	613 70	24 55	124 28	85,266	.024	.007	419	1st
209 25	20 92	209 25	20 92	§80 00	*32,814	‖	.0056	98	
190 94	31 82	190 94	31 82	§40 00	*132,240	‖	.0077	66	
413 31	68 88	413 31	68 88	§100 00	*94,950	‖	.0141	86	
547 80	27 39	547 80	27 39	§170 60	*84,000	‖	.0059	106	2
43 49	43 49	43 49	43 49	§5 00	*144,483	‖	.0003	173	
245 79	35 11	245 78	35 11	§50 00	*127,148	‖	.0012	5	
$33,398 48	$37 61	$35,574 28	$40 06	$9,988 45	$6,267,513	.0225	.0053	16,417	3⅓

($6,267,513) and total average appropriations ($33,398.48) is .0053.

§ Estimated. † $1,800 bridge in Abbot built in 1903, not included.

* Taken from State Assessors' reports.

‖ County Commissioners assess and direct the expenditure of the road taxes.

Mileage, Classes and Condition

SAGADAHOC

Towns.	Miles, Classes and Condition.								
	Total miles of roads.	Miles of village streets.	Width in feet.	Miles of country roads.	Width in feet.	Miles of dirt roads.	Condition.	Miles of gravel roads.	Condition.
Arrowsic	12	.....	.....	12	12	12	Fair...	.....	.....
Bath	*30	.....	....	.....	.....	.....	.....	.....	.....
Bowdoin	74	.....	.....	74	22	71	Fair...	.....	. . . .
Bowdoinham	80	5	54	75	20	80	Fair...	.....	.....
Georgetown	47	.....	.....	47	.....	47	Good..	.....	.....
Perkins	5	.....	.....	5	33	5	Good..	.....	.....
Phippsburg	58	5	12	53	12	48	Fair...	10	Good
Richmond	70	8	28	62	25	70	.....	.....	.....
Topsham	75	2	33	73	16	74½	Fair...	.....	.....
West Bath	27	.....	.....	27	30	27	.....	.....	.....
Woolwich	70	.....	.....	70	.....	66	.....	4	Good
Totals and averages.	548	20	31¾	498	21¼	500½	.....	14	.....

Average tax rate for road purposes, for county, on basis of valuation for 1904

* Bath officials made no report. Mileage scaled, and appropriations taken

SOMERSET

Anson	100	10	33	90	24	.....	.....	.....	.....
Athens	100	1¾	30	98¼	18	.....	Good..	.....	Good
Bingham	60	2	40	58	20	59½	.....	½	Good
Cambridge	35	½	15	34½	10	35	.....	.....	.....
Canaan	80	.....	.....	80	18	80	.....	.....	.....
Concord	35	.....	.....	35	16½	20	Good..	15	.....
Cornville	75	.....	.....	75	10	75	.....	.....	.....
Detroit	25	1	25	24	20	25	.....	.....	.....
Embden	50	.....	.....	50	15	30	Good..	20	Good
Fairfield	100	10	25	90	14	95	Fair...	5	Fair.
Harmony	50	...	.....	50	.....	50	.....	.....	.....
Hartland	50	1¾	40	48½	15	50	Fair...	.....	.....
Madison	100	30	30	70	25	100	.....	.....	.....
Mercer	42	1	25	41	16	52	Good..	.....	.....
Moscow	37	.....	.....	37	14	29	Good..	8	Good
New Portland	80	3	18	77	18	80	Fair...	.....	.....
Norridgewock	100	5	25	95	16	100	Good..	.....	.....
Palmyra	76	.....	.....	76	16	76	.....	.....	.....
Pittsfield	75	8	66	6	67	25	Good..	50	Good
Ripley	30	.....	.....	30	18	.....	Fair...	.....	.....
Saint Albans	70	.....	.....	70	15	69	.....	1	Good
Skowhegan	175	40	35	135	30	135	Good..	40	Good
Smithfield	32	.....	.....	32	20	32	.....	.....	.....
Solon	70	3	50	67	14	70	Good..	.....	.....
Starks	80	.....	.....	80	.....	80	Poor..	.....	.....

of Highways, Expenditures, etc.

COUNTY.

APPROPRIATIONS, EXPENDITURES, TAX RATE, ETC.

Total appropriations for highways, sidewalks, bridges and snow. Averaged for 5 years.	Average per mile.	Total expenditures for highways, sidewalks, bridges and snow. Averaged for 4 years.	Average per mile.	Cost of handling snow. Averaged for 4 years.	Valuation, 1904.	Rate of taxation, 1904.	Rate of taxation for road purposes, 1904.	Population.	Years of service of road commissioner. S-select'n. A-assess'rs
$321 40	$26 78	$321 40	$26 78	§$75 00	$65,507	.026	.0037	180	2
*18,025 00	600 00	*18,025 00	600 00	1,250 00	6,350,774	.023	.0028	10,477	
2,126 28	28 73	2,126 28	28 73	631 66	283,573	.018	.0086	937	
2,545 00	31 81	2,956 16	36 95	842 15	521,708	.019	.0044	1,305	1st
1,201 00	25 55	1,475 93	31 40	129 90	235,850	.024	.0056	799	6
110 00	22 00	110 00	22 00	46 25	42,472	.012	.0029	61	1st
2,788 59	48 08	2,806 00	48 38	363 59	398,724	.02	.0074	1,254	4
3,280 00	46 86	3,080 45	44 01	1,451 03	965,269	.0193	.0037	2,049	S
2,500 00	33 33	2,500 00	33 33	§900 00	1,116,818	.0152	.0022	2,097	
685 00	25 37	685 00	25 37	§100 00	140,410	.02	.0046	291	$\frac{2}{10}$ 1
2,260 00	32 29	2,245 07	32 07	270 07	302,805	.024	.0073	880	
$35,842 27	$65 41	$36,331 29	$66 30	$6,059 65	$10,423,910	.0215	.0034	20,330	3§

($10,423,910) and total average appropriations ($35,842.27) is .0034.
from city report, 1904.

§ Estimated.

COUNTY.

$2,160 00	$21 60	$2,306 30	$23 06	$1,255 66	$655,910	.02	.0023	1,830	1st
2,360 00	23 60	2,412 91	24 13	772 83	304,880	.019	.0066	896	
2,180 00	36 33	2,548 02	42 47	859 34	259,294	.027	.0077	841	S
1,050 00	30 00	1,050 00	30 00	500 00	117,401	.025	.0094	364	1st
2,332 00	29 15	2,332 00	29 15	960 00	285,983	.022	.008	977	S
775 00	22 14	789 10	22 55	258 33	67,980	.022	.0103	291	$\frac{3}{3}$ 2
2,350 00	31 33	2,524 18	33 66	561 39	297,529	.02	.0064	689	S
750 00	30 00	737 50	29 50	§200 00	143,027	.016	.0049	527	$\frac{3}{3}$ 2 1 1
2,000 00	40 00	2,000 00	40 00	§700 00	252,864	.027	.008	567	3
5,000 00	50 00	7,148 44	71 48	1,580 05	1,522,010	.0205	.003	3,878	4
1,280 00	25 60	1,833 33	33 67	419 50	206,531	.021	.0073	571	6
1,960 00	39 20	2,476 25	49 52	700 00	415,893	.022	.006	1,115	4
‖8,100 00	81 00	7,998 39	79 98	1,975 00	1,722,548	.0185	.0044	2,764	$\frac{2}{2}$ 2
1,380 00	32 86	1,380 00	32 86	400 00	159,362	.019	.0094	493	$\frac{2}{2}$
1,220 00	32 97	1,220 00	32 97	200 00	109,512	.0335	.0073	378	1st
2,000 00	25 00	2,000 00	25 00	900 00	254,704	.019	.0079	913	7
3,500 00	35 00	35,000 00	35 00	1,000 00	554,350	.0205	.0063	1,495	3
1,940 00	25 53	2,073 09	27 28	§600 00	318,646	.015	.0075	915	4
4,568 91	60 92	5,208 91	69 45	1,948 91	1,210,360	.023	.003	2,891	2
1,360 00	45 33	1,455 57	48 52	570 36	136,985	.022	.0095	449	1st
2,200 00	31 43	2,187 09	31 24	820 64	367,196	.0198	.0056	1,037	1st
10,800 00	61 71	11,619 76	66 40	2,789 62	3,385,530	.0156	.0028	5,180	6
975 00	30 47	955 81	29 87	485 60	132,666	.0225	.0075	449	1st
2,520 00	36 00	2,213 33	31 62	820 00	359,665	.025	.0078	996	1st
1,690 00	21 12	1,687 50	21 09	800 00	198,000	.028	.0093	636	1

§ Estimated.

‖ Madison spent $21,218.00 for bridges in 1904, not included.

Mileage, Classes and Condition

SOMERSET

Towns.	Miles, Classes and Condition.								
	Total miles of roads.	Miles of village streets.	Width in feet.	Miles of country roads.	Width in feet.	Miles of dirt roads.	Condition.	Miles of gravel roads.	Condition.
Bigelow	6	.....	.....	6	20	6	Fair...	.....	.....
Brighton	50	.....	.....	50	15	50	.....	.....	.....
Carratunk	12	½	10	11	10	6	Good..	6	Good
Dead River	8	.....	.....	8	.....	8	.....	.....	.....
Dennistown	6	.....	.....	6	.....	6	.....	.....	.....
Flagstaff	10	.....	.....	10	12	10	Good..	.....	.....
Highland	12	.....	.....	12	15	12	Good..	.....	.....
Jackman	11½	2	30	9½	20	10½	Fair...	1	Good
Lexington	20	.....	.....	20	.....	20	.....	.....	.....
Mayfield	10	.....	.....	10	15	9	Fair...	1	Good
Moose River	6	.....	.....	6	15	5	Good..	1	Good
Pleasant Ridge	13	.....	.....	13	12	12	.....	.....	.....
The Forks	9	.....	.....	9	.....	9	.....	.....	.....
West Forks	8	.....	.....	8	.....	8	.....	.....	.....
UNORGANIZED TOWNSHIPS.									
Carrying Place	2	.....	.....	2	.....	2	.....	.....	.....
Bald Mountain	2	.....	.....	2	.....	2	.....	.....	.....
Johnson	6	.....	.....	6	.....	6	.....	.....	.....
Parlin	6	.....	.....	6	.....	6	.....	.....	.....
Sandy Bay	6	.....	.....	6	.....	6	.....	.....	.....
Totals and averages.	1,930	119½	31	1,749¾	15	1,561	.....	14½	.....

Average tax rate for road purposes, for county, on basis of valuation for 1904

WALDO

Belfast	150	14	22	136	.....	147	Fair...	3	Fair.
Belmont	29	.....	.....	29	15	29	.....	.....	...
Brooks	44	2	20	42	16	44	Fair...	.....	.....
Burnham	45	1	20	44	20	44	.....	1	Good
Frankfort	35	.....	.....	35	17	35	Poor ..	.....	Good
Freedom	56	1½	40	54½	20	50	.....	5	Fair.
Islesboro	50	.....	.....	50	18	50	.....	.....	.....
Jackson	45	.....	.....	45	13	44	.....	1	Good
Knox	64	.....	.....	64	17	64	.....	.....	.....
Liberty	45	.....	.....	45	17	44	Fair...	¾	Good
Lincolnville	70	1½	18	68½	13	70	Good..	.....	.....
Monroe	80	.....	.....	80	13	80	Fair...	.....	.....
Montville	90	.....	.....	90	15	90	.....	.....	.....
Morrill	25	.....	.....	25	.....	24	Fair...	1	Good
Northport	50	.....	.....	50	12	48	Good..	2	Good
Palermo	60	.....	.....	60	14	60	.....	.....	.....

of Highways, Expenditures, etc.

COUNTY—CONCLUDED.

APPROPRIATIONS, EXPENDITURES, TAX RATE, ETC.

Total appropriations for highways, sidewalks, bridges and snow. Averaged for 5 years.	Average per mile.	Total expenditures for highways, sidewalks, bridges and snow. Averaged for 4 years.	Average per mile.	Cost of handling snow. Averaged for 4 years.	Valuation, 1904.	Rate of taxation, 1904.	Rate of taxation for road purposes, 1904.	Population.	Years of service of road commissioner. S-select'n. A-assess'rs
$312 24	$52 04	$312 24	$52 04	$75 00	*$61,750	‡	.0065	57	
2,500 00	50 00	2,500 00	50 00	500 00	61,935	.031	.004	368	
797 66	66 47	797 66	66 47	60 00	*$87,810	† ‡	.0085	218	2
407 71	50 96	407 71	50 96	75 00	*$38,860	‡	.0095	91	
246 84	41 14	246 84	41 14	60 00	*$34,015	‡	.0063	96	
365 24	36 52	365 24	36 52	25 00	*$45,320	‡	.0095	115	
479 11	39 93	479 11	39 93	80 00	*$40,905	‡	.015	67	5
664 83	57 81	664 83	57 81	125 00	*$118,958	‡	.005	352	
731 09	36 55	731 09	36 55	100 00	*$54,840	‡	.014	231	
636 38	63 64	636 38	63 64	175 00	*$65,993	† ‡	.0012	89	1st
384 82	64 14	384 82	64 14	$75 00	*$75,640	‡	.004	239	2
439 02	33 77	439 02	33 77	§100 00	*$31,233	‡	.016	114	
470 70	52 30	470 70	52 30	$75 00	*$63,888	‡	.0081	157	
424 78	53 10	424 78	53 10	§100 00	*$46,986	‡	.0097	160	
144 42	72 21	144 42	72 21	§20 00	*$96,255	‡	.0617	22	
39 17	19 58	39 17	19 58	§10 00	*$2,650	‡	.0059		
332 38	55 40	332 38	55 40	§25 00	*$45,000	‡	.0089	12	
235 16	39 19	235 16	39 19	§20 00	*$65,700	‡	.0038		
235 30	39 22	235 30	39 22	§20 00	*$68,444	†	.003	9	
$76,297 76	$39 53	$81,504 33	$42 23	$23,797 23	$14,625,008	.0187	.0052	33,539	2⅔

($14,625,008) and total average appropriations ($76,297.76) is .0052.

§ Estimated.

‡ County commissioners assess and direct the expenditure of the road taxes.

† Carratunk and Mayfield assessed own road taxes in 1904.

* State assessors' valuation used.

COUNTY.

$8,500 00	$56 67	$9,071 90	$60 48	$1,000 00	$2,654,526	.0185	.0032	4,615	5
880 00	30 34	879 18	30 32	$300 00	94,969	.027	.0084	352	1st
1,800 00	40 91	1,800 00	40 91	350 00	245,385	.0186	.0073	669	
1,500 00	33 33	1,500 00	33 33	257 05	214,621	.0275	.007	766	2
1,776 66	50 76	1,956 35	55 90	485 65	249,375	.0234	.0076	1,211	2
960 00	17 14	960 00	17 14	$300 00	159,372	.019	.0063	479	2
2,570 91	51 42	2,556 80	51 14	250 91	827,123	.012	.0032	923	2⅔
1,100 00	24 44	1,012 36	22 50	§250 00	140,060	.02	.0071	439	1⅓
1,380 00	21 56	1,380 00	21 56	§300 00	178,557	.023	.0084	558	1st
1,440 00	32 00	1,369 66	30 44	228 43	202,760	.022	.0074	737	2
2,636 66	37 67	3,367 05	48 10	1,416 95	289,267	.024	.009	1,223	2⅓
2,200 00	27 50	2,536 21	31 31	§800 00	256,408	.023	.0098	958	1st
2,450 00	27 22	2,553 92	28 38	603 22	293,489	.0245	.0092	982	3
800 00	32 00	800 00	32 00	§200 00	117,647	.02	.0068	420	S
1,440 00	28 80	1,440 00	28 80	87 50	308,630	.0162	.0049	545	5
2,125 00	35 42	2,738 68	45 64	750 00	170,416	.0265	.0111	757	7

§ Estimated.

Mileage, Classes and Condition

WALDO

Towns.	Miles, Classes and Condition.								
	Total miles of roads.	Miles of village streets.	Width in feet.	Miles of country roads.	Width in feet.	Miles of dirt roads.	Condition.	Miles of gravel roads.	Condition.
Prospect	40	.....	.....	40	12	40	Bad ...	.....	.....
Searsmont	70	.....	.....	70	14	70	.....	.....	.....
Searsport	50	2	33	48	.....	50	Good..	.....	.....
Stockton Springs	45	5	.....	40	19	45	.....	.....	.....
Swanville	30	.....	.....	30	16	20	Good..	10	Good
Thorndike	50	.....	.....	50	14	50	Fair...	.....	.....
Troy	50	.....	.....	50	9	50	.....	.....	.....
Unity	65	2	30	63	16	65	Poor ..	.....	.....
Waldo	40	.....	.....	40	17	40	.....	.....	.....
Winterport	70	3	25	67	20	53	Fair...	17	Fair.
Totals and averages.	1,448	32	26	1,415	15½	1,406	.....	40¾	.....

Average tax rate for road purposes, for county, on basis of valuation for 1904

WASHINGTON

Addison	55	.....	....	55	15	55	.....	.....	.....
Alexander	35	.....	....	35	12	35	Good..	.....	.....
Baileyville	45	.....	....	45	12	45	Poor ..	.....	.....
Baring	13	3	11	10	10	10	Good..	3	Good
Beddington	9	.....	....	9	.....	9	Good..	.....	.....
Brookton	10	.....	....	10	25	10	Fair...	.....	.....
Calais	56	.....	....	56	25	49	Good..	.....	.....
Centerville	5½	.....	....	5½	.....	2½	Good..	3	Good
Charlotte	30	.....	....	30	12	30	Good..	.....	.....
Cherryfield	40	8	26	32	18	40	Good..	.....	.....
Columbia	35	.....	....	35	18	27	Good..	8	Good
Columbia Falls	25	8	20	6	18	21	Good..	4	Good
Cooper	35	.....	....	35	12	35	.....	.....	.....
Crawford	14	.....	....	14	.....	14	.....	.....	.....
Cutler	35	.....	....	35	14	35	Good..	.....	.....
Danforth	20	2	22	18	18	12	Good..	8	Good
Deblois	6	1	16	5	16	6	.....	.....	.....
Dennysville	12	2	20	10	20	.....	.....	12	Good
East Machias	36	.....	....	36	20	36	Good..	.....	.....
Eastport	24	16	20	8	20	9	Good..	15	Good
Edmunds	24	.....	....	24	10	24	Poor ..	.....	.....
Forest City	5	.....	....	5	20	5	Good..	.....	.....
Harrington	40	2	20	38	20	37	Good..	3	Good
Jonesboro	32	12	18	20	16	12	Poor ..	20	Poor
Jonesport	20	2	20	18	15	15	Fair...	5	Fair.
Lubec	45	3	25	42	22	7	Poor ..	35	Good
Machias	30	10	30	20	25	15	Good..	15	Good
Machiasport	30	4	20	26	16	16	Poor ..	14	Poor
Marion	18	4	12	14	10	14	Bad ...	4	Fair.

of Highways, Expenditures, etc.

COUNTY—CONCLUDED.

APPROPRIAITONS, EXPENDITURES, TAX RATE, ETC.

Total appropriations for highways, sidewalks, bridges and snow. Averaged for 5 years.	Average per mile.	Total expenditures for highways, sidewalks, bridges and snow. Averaged for 4 years.	Average per mile.	Cost of handling snow. Averaged for 4 years.	Valuation, 1904.	Rate of taxation, 1904.	Rate of taxation for road purposes, 1904.	Population.	Years of service of road commissioner. S-select'n. A-assess'rs
$1,260 00	$31 50	$1,419 24	$35 48	$400 00	$158,613	.0175	.0057	648	S
1,860 00	26 57	1,860 00	26 57	§650 00	310,062	.018	.0058	949	1st
*2,080 00	41 60	2,125 00	42 50	600 00	595,788	.0192	.0037	1,349	S
1,150 00	25 56	1,150 00	25 56	520 00	237,636	.0225	.005	872	S
1,240 00	41 33	1,338 00	44 60	500 00	136,294	.0235	.011	502	2
1,040 00	20 80	1,264 62	25 29	§600 00	195,845	.017	.0051	497	6
1,440 00	28 80	1,554 51	31 09	§600 00	251,375	.0185	.0048	766	1st
2,125 00	32 69	2,125 00	32 69	§750 00	300,270	.0215	.0083	877	S
960 00	24 00	960 00	24 00	§350 00	129,957	.0175	.0077	468	S
2,880 00	41 14	3,294 60	47 07	§650 00	525,379	.02	.0057	1,623	S
$49,594 23	$34 25	$53,013 08	$36 61	$13,199 71	$9,243,824	.019	.0054	24,185	2½

($9,243,824) and total average appropriations ($49,594.23) is .0054.

§ Estimated.

* Return from Searsport reporting average appropriation for snow roads of $840, making total average appropriation $2,920, came too late for compilation.

COUNTY.

$1,150 00	$20 91	$1,050 00	$19 09	$125 00	$181,258	.028	.0055	1,059	5
800 00	22 86	800 00	22 86	225 00	56,208	.028	.0142	333	1-3-1
640 00	14 22	710 41	15 79	§200 00	72,826	.03	.011	215	3
375 00	28 85	375 00	28 85	25 00	128,591	.015	.0029	231	4
251 66	27 96	243 98	27 11	125 00	29,660	.028	.0071	86	2
235 00	23 50	224 00	22 40	20 50	53,431	.026	.0042	285	1st
8,563 83	152 92	10,211 15	182 34	1,500 00	2,794,872	.0245	.0032	7,655	1st
*207 35	37 70	207 35	37 70	20 40	52,011	.016	.0044	91	8
420 00	14 00	382 97	12 77	75 00	73,244	.025	.0041	315	8
2.300 00	57 50	2,444 25	61 11	201 60	453,855	.03	.0051	1,859	
820 00	23 43	851 51	24 33	81 66	93,526	.029	.0075	516	3
755 00	30 20	785 00	31 40	25 00	134,977	.022	.0057	569	1st
551 80	15 77	551 80	15 77	§30 00	44,051	.023	.0122	207	2-3-1
‖§350 00	25 00	§350 00	25 00	§25 00	36,320	.025	.0096	112	
500 00	14 29	500 00	14 29	62 25	85,174	.044	.0059	565	7
1,260 00	65 00	1,453 92	72 70	200 00	221,512	.03	.005	1,092	3-3-1-1
120 00	20 00	143 59	23 93	§20 00	21,927	.021	.0068	73	4
496 68	41 39	418 24	34 85	27 78	134,176	.0175	.0028	482	3
1,460 00	40 56	1,617 01	44 92	253 86	383,278	.0217	.0044	1,521	6
4,630 00	192 92	4,524 38	188 52	650 00	1,624,653	.028	.0024	5,311	10
1,360 00	56 67	†2,141 64	89 23	53 90	97,259	.038	.0206	492	7
95 00	19 00	95 00	19 00	32 00	9,206	.0255	.0109	151	2
1,000 00	25 00	1,000 00	25 00	§250 00	217,187	.025	.0046	1,165	7
500 00	15 62	500 00	15 62	89 97	101,417	.025	.0049	606	1st
1,240 00	62 00	1,127 12	56 36	§100 00	461,807	.026	.0015	2,124	1st
2,905 00	64 56	2,968 15	65 96	195 76	847,971	.0175	.00307	3,005	5
2,660 00	88 67	2,675 00	89 17	§227 47	770,621	.0236	.003	2,082	
1,020 00	34 00	1,020 00	34 00	§225 00	173,380	.036	.0052	1,218	
‡350 00	19 43	‡350 00	19 43	28 26	32,057	.032	.0109	95	4-3-1-2

* Centreville built stone bridge, cost $504.16, not included.
† Bridges in Edmunds, rebuilt at expense of $6,669.04 in 4 years.
‡ Marion, appropriations and expenditures in labor.
§ Estimated.
‖ Returns from Crawford came too late for tabulation.

Mileage, Classes and Condition

WASHINGTON

Towns.	Miles, Classes and Condition.								
	Total miles of roads.	Miles of village streets.	Width in feet.	Miles of country roads.	Width in feet.	Miles of dirt roads.	Condition.	Miles of gravel roads.	Condition.
Marshfield	15	.....	....	15	18	5	.....	10	Good
Meddybemps	10	.....	....	10	....	10	.....	.....	.....
Milbridge	70	5	33	65	30	70	Good..	.....	.....
Northfield	6	.....	....	6	15	5	Fair...	1	Good
Pembroke	50	10	33	40	24	.....	.....	.....	.....
Perry	60	.....	....	60	20	60	.....	.....	.....
Princeton	24	4	24	20	20	22	Fair...	2	Good
Robbinston	27	.....	....	27	15	20	Bad ...	7	Good
Roque Bluffs	12	.....	....	12	14	6	Good..	6	Good
Steuben	65	.....	....	65	14	65	.....	.....	.....
Talmadge	8	.....	....	8	16	8	.....	.....	.....
Topsfield	20	.....	....	20	20	19	Fair...	1	Good
Trescott	28	.....	....	28	14	3	Fair...	25	Good
Vanceboro	12	6	24	6	18	12	Fair...	.....	.....
Waite	9	.....	....	9	16	9	Fair...	.....	.....
Wesley	13	.....	....	13	14	13	Good..	.....	.....
Whiting	30	.....	....	30	.....	30	Poor..	.....	.....
Whitneyville	12	.....	....	12	15	15	Fair...	10	Fair.
PLANTATIONS.									
Codyville	6	.....	....	6	.....	6	.....	.....	.....
Grand Lake Stream	6	.....	....	6	.....	6	.....	.....	.....
No. 14	12	.....	....	12	.....	12	.....	.....	.....
No. 21	1	.....	....	1	.....	1	.....	.....	.....
UNORGANIZED TOWNSHIPS.									
No. 1, R. 3, Lambert Lake	6	.....	....	6	.....	6	.....	.....	.....
No. 7, R. 2, Kossuth	6	.....	....	6	.....	6	.....	.....	.....
No. 18, East Division	8	.....	....	8	.....	8	.....	.....	.....
No. 19, East Division	7	.....	....	7	.....	7	.....	.....	.....
No. 24, Middle Division	3	.....	....	3	.....	3	.....	.....	.....
No. 29, Middle Division	6	.....	....	6	.....	6	.....	.....	.....
No. 30, Middle Division	3	.....	....	3	.....	3	.....	.....	.....
No. 31, Middle Division	6	.....	....	6	.....	6	.....	.....	.....
No. 26, East Division	1	.....	....	1	.....	1	.....	.....	.....
No. 10, R. 3, Forest	6	.....	....	6	.....	6	.....	.....	.....
No. 8, R. 4, N. B. P. P	3	.....	....	3	.....	3	.....	.....	.....
No. 8, R. 3, N. B. P. P	3	.....	....	3	.....	3	.....	.....	.....
Totals and averages.	1,338½	102	20⅔	1,225½	17⅓	1,080½	.....	211	.....

Average tax rate for road purposes, for county, on basis of valuation for 1904

of Highways, Expenditures, etc.

COUNTY—CONCLUDED.

APPROPRIATIONS, EXPENDITURES, TAX RATE, ETC.

Total appropriations for highways, sidewalks, bridges and snow. Averaged for 5 years.	Average per mile.	Total expenditures for highways, sidewalks, bridges and snow. Averaged for 4 years.	Average per mile.	Cost of handling snow. Averaged for 4 years.	Valuation, 1904.	Rate of taxation, 1904.	Rate of taxation for road purposes, 1904.	Population.	Years of service of road commissioner. S-select'n. A-assess'rs
$400 00	$26 67	$307 75	$20 52	$75 00	$55,369	.0174	.00903	227	3
190 00	19 00	190 00	19 00	39 00	28,987	.037	.0069	154	3
1,720 00	24 57	1,720 00	24 57	300 00	389,465	.027	.0059	1,921	1
211 00	35 17	186 80	31 13	35 00	35,913	.0225	.007	126	2
880 00	17 60	850 00	17 00	§200 00	313,421	.021	.0032	1,652	3
1,110 00	18 50	1,128 00	18 80	176 25	167,628	.026	.0078	1,245	1st
700 00	29 17	700 00	29 17	§125 00	232,940	.025	.003	1,094	$3\frac{3}{4}$ $1\frac{1}{4}$
732 50	27 13	626 61	23 21	200 00	131,996	.0305	.0045	844	1st
237 50	19 79	237 50	19 79	§25 00	27,089	.022	.0083	168	5
1,265 00	19 46	1,265 00	19 46	310 66	171,991	.0275	.0068	901	5
300 00	37 50	300 00	37 50	52 04	46,772	.0187	.0064	93	3
700 00	35 00	726 21	36 31	77 77	84,984	.021	.0082	282	$3\frac{3}{4}$ $2\frac{1}{4}$
925 00	33 04	945 45	33 77	§150 00	54,781	.033	.0183	463	$3\frac{3}{4}$ $2\frac{1}{4}$
210 00	17 50	206 53	17 21	§50 00	149,798	.0165	.0018	550	
300 00	33 33	300 00	33 33	§50 00	26,503	.024	.0113	135	
330 00	25 38	330 00	25 38	§50 00	41,046	.0315	.0091	198	1st
800 00	26 67	800 00	26 67	§75 00	88,614	.022	.009	399	
300 00	25 00	300 00	25 00	§50 00	48,061	.035	.0062	424	20
151 14	25 19	151 14	25 19	§25 00	‖27,608	*	.0055	68	
220 40	36 73	220 40	36 73	§30 00	‖61,728	*	.0046	221	
214 06	17 84	214 06	17 84	§30 00	‖33,090	*	.0065	77	
100 00	100 00	100 00	100 00	§10 00	19,361	.009	.0052	86	1st
150 00	25 00	150 00	25 00	§15 00	‖69,666	*	.0021	113	
216 00	36 00	216 00	36 00	§20 00	‖71,900	*	.0029	46	
120 40	15 05	120 40	15 05	§10 00	‖33,060	*	.0036	15	
220 40	31 49	220 40	31 49	§20 00	‖33,060	*	.0067	9	
110 20	36 73	110 20	36 73	§10 00	‖33,060	*	.0033		
220 40	36 73	220 40	36 73	§20 00	‖49,590	*	.0045	2	
55 10	18 37	55 10	18 37	§5 00	‖60,610	*	.0009		
220 40	36 73	220 40	36 73	§20 00	‖66,120	*	.0033	18	
45 00	45 00	45 00	45 00	.....	‖49,500	*	.0009		
220 00	36 67	220 00	36 67	§20 00	‖43,419	*	.005	46	
146 60	48 87	146 60	48 87	§20 00	‖33,001	*	.0044		
220 40	73 47	220 40	73 47	§20 00	‖69,563	*	.0031		
$50,957 82	$38 07	$53,471 82	$39 95	$7,411 13	$12,236,149	.0251	.0042	45,075	$3\frac{1}{5}$

($12,236,149) and total average appropriations ($50,957.82) is .0042.

§ Estimated.

* County commissioners assess and direct the expenditures of road taxes.

‖ State assessors' valuation used.

Mileage, Classes and Condition

YORK

Towns.	Miles, Classes and Condition.								
	Total miles of roads.	Miles of village streets.	Width in feet.	Miles of country roads.	Width in feet.	Miles of dirt roads.	Condition.	Miles of gravel roads.	Condition.
Acton	60	$\frac{1}{2}$	20	59$\frac{1}{2}$	20	60	Fair...	.....	.....
Alfred	70	5	20	45	20	50	Good..	20	Good
Berwick	125	15	30	110	20	120	Fair...	2	Fair.
Biddeford	40	.....	.....	40	18	40	Good..	.....	.....
Buxton	125	.....	.....	125	30	125	.....	.....	.....
Cornish	52	3$\frac{1}{2}$	25	48$\frac{1}{2}$	19	52	Good..	.....	.....
Dayton	35	.....	.....	35	16	28	Fair...	6	Good
Eliot	40	.....	.....	40	22	20	Fair...	20	Good
Hollis	100	.....	.....	100	16	70	Poor ..	30	Fair.
Kennebunkport	130	5	33	125	30	130	.....	.....	.....
Kennebunk	30	7	.....	23	.....	30	.....	.....	.....
Kittery	60	7	25	53	22	60	.....	.....	.....
Lebanon	125	.....	.....	125	16	125	Good..	.....	.....
Limerick	60	2	20	58	18	60	Fair...	.....	.....
Limington	90	.....	.....	90	12	90	Fair...	.....	.....
Lyman	80	.....	.....	80	14	30	.....	50	.....
Newfield	55	.....	.....	55	16	55	Good..	.....	.....
North Berwick	100	6	30	94	20	100	.....	.....	.....
Old Orchard	25	10	40	15	.....	10	Fair...	15	Good
Parsonsfield	100	.....	.....	100	.....	100	.....	.....	.....
Saco	74	18$\frac{1}{2}$	30	55$\frac{1}{2}$	18	50	Good..	24	Good
Sanford	135	15	40	120	33	135	Poor ..	.....	.....
Shapleigh	75	.....	.....	75	.....	75	.....	.....	.....
South Berwick	140	10	37	130	20	130	Poor ..	10	Good
Waterboro	112	3	35	109	16	112	.....	.....	.....
Wells	120	5	50	115	30	110	Fair...	10	Good
York	150	.....	.....	150	.....	150	Fair...	.....	.....
Totals and averages.	2,308	112$\frac{1}{2}$	31	2,165$\frac{1}{2}$	20$\frac{1}{4}$	2,117	.....	187	.....

Average tax rate for road purposes, for county, on basis of valuation for 1904

of Highways, Expenditures, etc.

COUNTY.

APPROPRIATIONS, EXPENDITURES, TAX RATE, ETC.

Total appropriations for highways, sidewalks, bridges and snow. Averaged for 5 years.	Average per mile.	Total expenditures for highways, sidewalks, bridges and snow. Averaged for 4 years.	Average per mile.	Cost of handling snow. Averaged for 4 years.	Valuation, 1904.	Rate of taxation, 1904.	Rate of taxation for road purposes, 1904.	Population.	Years of service of road commissioner. S-select'n. A-assess'rs
*$2,320 00	$38 67	$2,406 25	$40 10	$1,500 00	$243,809	.02	.0106	778	$\frac{2}{3}^{2}\frac{1}{1}$
1,400 00	20 00	1,380 25	19 72	312 50	296,209	.02	.0051	937	1st
3,110 00	24 88	3,110 00	24 88	§1,200 00	914,094	.0195	.0035	2,280	2
22,937 20	573 43	22,937 20	573 43	§5,000 00	6,905,690	.024	.0024	16,145	4
3,066 66	24 53	3,066 66	24 53	500 00	737,896	.0183	.0041	1,838	$\frac{3}{3}^{2}\frac{1}{1}$
1,455 00	27 98	1,766 21	33 97	539 88	355,559	.021	.0048	984	$\frac{3}{3}\frac{2}{2}\frac{1}{1}$
1,030 00	29 43	1,077 97	30 80	130 00	198,863	.017	.005	473	$\frac{3}{3}\frac{2}{2}\frac{1}{1}$
1,850 00	46 25	1,565 86	39 15	150 00	524,357	.015	.0028	1,458	
1,980 00	19 80	1,935 66	19 36	§500 00	392,504	.022½	.0052	1,274	1st
5,875 00	45 19	5,875 00	45 19	850 00	1,335,530	.0169	.0052	2,123	1
6,400 00	213 33	6,400 00	213 33	500 00	2,196,986	.017	.003	3,228	$\frac{1}{1}\frac{3}{1}\frac{1}{1}$
4,800 00	80 00	4,977 23	82 95	1,000 00	813,462	.026	.0061	2,872	$\frac{3}{3}^{2}\frac{1}{1}$
3,240 00	25 92	3,695 64	29 57	§1,500 00	358,938	.031	.0111	1,335	S
1,545 00	25 75	1,545 00	25 75	650 00	306,478	.015	.0042	874	$\frac{2}{2}\frac{3}{1}\frac{1}{1}$
1,920 00	21 33	1,908 39	21 20	§400 00	310,058	.022	.0058	1,001	$\frac{3}{3}^{2}\frac{1}{1}$
980 00	12 25	980 00	12 25	300 00	311,298	.016	.0039	687	1st
1,520 00	27 64	1,520 00	27 64	§500 00	214,583	.018	.007	676	
2,700 00	27 00	2,824 13	28 24	471 50	671,394	.021	.0045	1,748	S
3,137 50	125 50	2,808 12	112 32	50 00	991,204	.02	.0031	964	5
2,500 00	25 00	2,500 00	25 00	1,000 00	401,710	.017	.00622	1,131	
12,400 06	167 56	12,610 55	170 41	§2,000 00	3,737,207	.0225	.0034	6,122	3
7,180 00	53 19	7,180 00	53 19	1,340 00	2,801,070	.017	.0025	6,078	$\frac{1}{1}^{2}\frac{1}{1}$
1,720 00	22 93	1,768 30	23 58	487 75	237,036	.02	.0089	847	2
3,400 00	24 29	3,400 00	24 29	800 00	1,153,147	.02	.0035	3,188	7
2,000 00	17 86	1,968 31	17 57	408 37	343,760	.017	.0058	1,169	
3,680 00	30 67	3,676 63	30 64	676 63	916,615	.019	.0046	2,007	2
7,777 77	51 85	8,313 66	55 42	748 24	2,191,682	.019	.0033	2,668	1st
$111,924 13	$48 49	$113,197 02	$49 04	$23,514 87	$29,911,139	.0196	.0037	64,885	$1\frac{23}{34}$

($29,911,139) and total average appropriations ($111,924.13) is .0037.

§ Estimated.

* Acton expended $650 to rebuild bridge, not included.

RECAPITULATION

Counties.	Total miles of roads.	Miles of village streets.	Width—feet and inches.	Miles of country road.	Width—feet and inches.	Miles of dirt roads.	Miles of gravel roads.
Androscoggin	1,352	249	35	1,103	17	1,152½	196½
Aroostook	2,317	44	32.7	2,273	20.6	2,150	116
Cumberland	2,381	93	32.3	2,150	21.5	1,803½	423
Franklin	1,120	29½	27.4	1,090½	14.6	1,021	97
Hancock	1,504	109½	24.6	1,355	17.10	1,371¾	83¼
Kennebec	1,823.69	138.72	29	1,607.99	18	1,434¼	111¼
Knox	816½	59½	32	757	20.6	699¼	56¾
Lincoln	887¾	37¾	26	817	17.3	870¼	15½
Oxford	2,302	78½	27.9	2,221	16.9	2,085	181
Penobscot	2,565¼	81½	30.4	2,229¼	18.2	1,871½	335¾
Piscataquis	888	46	34.4	832	18.9	867½	20½
Sagadahoc	548	20	31.9	498	21.3	500½	14
Somerset	1,930	119½	31	1,749¾	15.1	1,561	148½
Waldo	1,448	32	26	1,415	15.6	1,406	40¾
Washington	1,338½	102	20.8	1,225½	17.4	1,080½	211
York	2,308	112½	31	2,165½	20.3	2,117	187
Totals and averages.	25,529.69	1,352.97	.....	23,489.49	.....	21,991.50	2,237.75

Average tax rate for road purposes, for State, on basis of valuation for 1904

OF TABLE No. 1.

Total appropriations for highways, sidewalks, bridges and snow. Averaged for 5 years.	Average per mile.	Total expenditures for highways, sidewalks, bridges and snow. Averaged for 4 years.	Average per mile.	Cost of handling snow. Averaged for 4 years.	Valuation, 1904.	Average rate of taxation in the cities and towns in each county for 1904. (From State Assessors' Report, 1904.)	Average rate of taxation for road purposes in each county, 1904.	Population.	Years of service of road commis'rs. Av. by counties.	Land area in square miles.
	$									
$106,497 44	78 77	$108,351 25	$80 14	$22,466 43	$27,812,831	.0196	.0038	54,242	$4\frac{4}{10}$	485
91,180 33	39 35	93,372 22	40 26	19,419 41	15,663,142	.0252	.0058	60,344	2	6,700
231,281 34	97 14	246,376 99	103 48	23,517 02	76,128,010	.0195	.00304	100,689	$2\frac{7}{10}$	1,005
41,597 90	37 14	46,023 26	41 09	15,603 81	8,296,047	.023	.00501	17,899	2	1,660
77,870 10	51 78	81,567 13	54 23	10,717 78	17,213,941	.0188	.0045	37,116	$3\frac{1}{3}$	1,312
119,172 45	65 35	130,543 65	71 58	40,425 90	29,652,040	.0213	.00402	59,117	3	888
43,279 00	53 00	47,786 59	58 52	9,493 65	14,370,222	.019	.00301	30,406	$4\frac{1}{5}$	328
34,112 08	38 42	35,030 65	39 46	8,378 87	7,250,539	.0188	.0047	19,669	2	520
74,692 48	32 45	81,028 68	35 20	21,679 70	14,357,192	.0206	.0052	32,024	$2\frac{2}{5}$	1,892
122,208 25	47 64	134,023 90	52 25	26,321 18	32,892,816	.022	.0037	76,161	$2\frac{1}{5}$	3,332
33,398 48	37 61	35,574 28	40 06	9,998 45	6,267,513	.0225	.0053	16,417	$3\frac{1}{3}$	3,772
35,842 27	65 41	36,331 29	66 30	6,059 65	10,423,910	.0215	.0034	20,330	$3\frac{4}{7}$	260
76,297 76	39 53	81,504 33	42 23	23,797 23	14,625,008	.0187	.0052	33,539	$2\frac{2}{3}$	3,644
49,594 23	34 25	53,013 08	36 61	13,199 71	9,243,824	.019	.0054	24,185	$2\frac{1}{2}$	705
50,957 82	38 07	53,471 82	39 95	7,411 13	12,236,149	.0251	.0042	45,075	$3\frac{1}{5}$	2,452
111,924 13	48 49	113,197 02	49 04	23,514 87	29,911,139	.0196	.0037	64,885	$1\frac{18}{24}$	920
1,299,906 06	50 92	1,377,196 14	53 94	282,004 79	326,344,323	.....	.00398	692,098	2.68	29,895

($326,344,323) and total average appropriations ($1,299,906.06) is .00398.

TABLE

Mileage, Classes and Condition

THE TWENTY CITIES

CITIES.	MILES, CLASSES AND CONDITION.								
	Total miles of roads.	Miles of city streets.	Width in feet.	Miles of country roads.	Width in feet.	Miles of dirt roads.	Condition.	Miles of gravel roads.	Condition.
Auburn	263	135	50	128	18	115	Good..	145	Good
Augusta	118⅓	28	.....	90⅓	.....	.....	.....	.....	.....
Bath	30	.....	.....	.....	.....	.....	.....	.....	.....
Bangor	259	.....	.....	.....	.....	.....	Fair...	.....	Fair.
Belfast	150	14	22	136	.....	147	Fair...	3	Fair.
Biddeford	40	.....	.....	40	18	40	Good..	.....	.....
Brewer	35	.....	.....	35	24	35	.....	.....	.....
Calais	56	.....	.....	56	25	49	Good..	.....	.....
Eastport	24	16	20	8	20	9	Good..	15	Good
Ellsworth	200	25	50	175	25	190	Good..	.....	.....
Gardiner	65	45	.....	20	.....	.....	.....	.....	.....
Hallowell	25	16	35	9	30	16	Fair...	5	Fair.
Lewiston	130	60	34	70	24	100	Good..	30	Good
Old Town	125	25	30	100	.....	115	Poor..	10	Good
Portland	138	.....	34	.....	34	.....	.....	.....	.....
Rockland	40½	25	.....	15½	.....	.....	.....	.....	.....
Saco	74	18½	30	55½	18	50	Good..	24	Good
South Portland	60	40	35	20	25	48½	Good..	10	Good
Waterville	53⅓	23⅔	45	12	45	.....	.....	.....	.....
Westbrook	50	.....	.....	50	50	25	Fair...	10	Fair.
Totals and averages.	1,936⅙	471⅙	35	1,020⅓	27 5/12	939½	.....	252	.....

Average tax rate for road purposes, for cities in the State, on basis of valuation

No. 1—A.

of Highways, Expenditures, etc.

OF THE STATE.

APPROPRIATIONS, EXPENDITURES, TAX RATE, ETC.

Total appropriations for highways, sidewalks, bridges and snow. Averaged for 5 years.	Average per mile.	Total expenditures for highways, sidewalks, bridges and snow. Averaged for 4 years.	Average per mile.	Cost of handling snow. Averaged for 4 years.	Valuation, 1904.	Rate of taxation, 1904.	Rate of taxation for road purposes, 1904.	Population.	Years of service of road commissioner.
$20,400 00	$77 56	$20,400 00	$77 56	$5,000 00	$6,610,071	.02	.00326	12,751	17
*27,779 30	234 62	34,267 16	289 52	9,735 02	7,074,372	.0235	.00392	11,683	
†18,025 00	600 83	18,025 00	600 83	1,250 00	6,350,774	.023	.0028	10,477	
45,200 00	174 51	55,401 54	213 91	§5,000 00	16,345,880	.02	.0028	21,852	
8,500 00	56 67	9,071 90	60 48	§1,000 00	2,654,526	.0185	.0032	4,615	5
22,937 20	573 43	22,937 20	573 43	§5,000 00	6,905,690	.024	.0024	16,145	4
4,500 00	128 57	4,500 00	128 57	400 00	1,796,700	.026	.0025	4,835	4
8,563 83	152 92	10,211 15	182 34	1,500 00	2,794,872	.0245	.0032	7,655	1
4,630 00	192 92	4,524 38	188 52	650 00	1,624,653	.028	.0024	5,311	10
7,210 00	36 05	8,742 81	43 71	§2,000 00	1,953,758	.02	.0033	4,297	2
10,462 40	160 96	10,462 40	160 96	§2,000 00	3,521,796	.02	.003	5,501	
4,298 99	171 96	4,942 79	197 69	654 99	1,416,404	.02	.003	2,714	3
47,643 28	366 48	47,760 16	367 39	5,000 00	13,521,600	.02	.0032	23,761	
7,120 00	56 96	7,120 00	56 96	600 00	1,679,740	.032	.0029	5,763	
160,501 00	1,163 06	172,520 93	1,250 16	6,472 92	49,872,210	.0208	.0032	50,145	2
10,400 00	256 79	11,708 98	289 11	1,045 49	5,487,181	.022	.0019	8,150	2
12,400 00	167 56	12,610 55	170 41	§2,060 00	3,737,207	.0225	.0034	6,122	3
6,399 47	106 66	6,738 40	112 31	1,000 00	2,713,500	.0206	.0026	6,287	4
15,150 00	284 00	18,121 54	339 80	§4,000 00	5,353,750	.0235	.0035	9,477	
8,700 00	174 00	10,459 22	209 18	§2,000 00	4,152,115	.0195	.00217	7,282	1
$459,820 47	$233 93	$490,526 11	$254 53	$56,308 42	$136,566,799	.....	.0033	224,823	

and appropriations shown in this table is .0033.

* Appropriations and expenditures for city of Augusta taken from auditor's account, page 86 of printed report for year ending March 1, 1905. No returns received.

† Appropriations for city of Bath taken from city report for year ending January 31, 1905, page 96. Expenditures assumed to be same as appropriations. Mileage scaled from maps. No returns received.

§ Estimated.

TABLE No. 1—B.

Cities and Towns Reporting Granite and Macadam Pavements.

Cities and Towns.	Granite Pavement.			Macadam Roads.			
	Length.	Width.	Cost per square yard.	Length.	Width—feet.	Depth—inches.	Cost per square yard.
Auburn	2 miles	55 feet	$1 85	¾ mile	18	8	$0 63⅔
Lewiston	2 7/10 m.	34 feet	1 50	2½ m.	28	12	1 00
Houlton	.....	.....	.....	1 mile	20-25	6-18	
Sherman	.....	.....	.....	4¼ m.	15	9	50
Portland	11 87/100 m	34 feet	*	10 28/100	34	6-12	.65-1 25
South Portland	½ mile	38 feet	1 75	1 mile	25	14	27
Westbrook	.....	.....	.....	10 m.	.....	10	
Eden	.....	.....	.....	5 m.	25	6	40
Ellsworth	½ mile	3 feet	.....	10 m.	25-35	15	
Hallowell	.....	.....	.....	3½-4 m.	30	12-36	
Waterville	½ mile	60 feet	.....	1 m.	15	8	1 50
Rockland	4,143 ft.	43 f. 7 i.	.....	1,290 ft.	23½		
Rockport	300 feet	41 f. 3 i.	2 00				
Boothbay Harbor	.....	.....	.....	2 miles	25	8	about 80
Rumford	.....	.....	.....	1 mile	24	18	85
Bangor	1½ m.						
Topsham	.....	.....	.....	¼ mile	33	12	1 25
Skowhegan	.....	.....	.....	3 miles	35	12	50
Calais	.....	.....	.....	7 miles	20	8	25
Biddeford	1¾ m.	50 feet	.....	1¾ m.	36-50	16	
North Berwick	.....	.....	.....	225 ft.	20	18	80½
Saco	1,500 ft.	49½ feet	.....	600 ft.	49½	9	1 00

*$2.00-$2.25 with cement joints.

Highway Equipment, Road Building Materials, etc.

TABLE

Highway Equipment, Road Building Materials,

ANDROSCOGGIN

Towns.	Does town own gravel pits?		What is character of material?	Does town buy gravel and at what price? S-single, D-double, horse loads.	Has town prospected for gravel?	Are there pits in town not opened?	Give nature of best surfacing material.
Auburn	Yes	.	Fine gravel.	No	Yes	Yes	Gravel
Durham	No	..		10c D	Yes	Yes	Gravel
East Livermore	No	..		No	No	Yes	
Greene	No	..		5c S., 10c D	No	Yes	
Leeds							
Lewiston		2	Mixed	15c cu. yard.	No		Crushed rock.
Lisbon		1	Gravel	5c S., 10c D.	Yes	Yes	
Livermore	No	..		$5 per year	No	Yes	
Mechanic Falls		1	Rocky	No	No	Yes	Gravel
Minot							
Poland*.							
Turner		2	Mixed	7c S., 10c D.	Yes	Yes	Gravel
Wales	No	..		No		Yes	Gravel
Webster	No	..		5c S., 10c D.	Yes	Yes	Gravel, poor.

* No report received from Poland.

AROOSTOOK

Amity		2	Sandy	No	No	No	Gravel
Ashland	No	..		No	No	Yes	
Bancroft	No	..	Loamy	No	No		Common soil.
Benedicta							
Blaine	No	..		No	No	Yes	Common soil.
Bridgewater		1	Loamy	8c D	Yes		Loam
Caribou		1	Mixed	No	Yes	Yes	"Hard pan".
Castle Hill	No	..					
Crystal	No	..			Yes	Yes	Gravel
Dyer Brook	No	..		No		Yes	"Pan"
Easton		1	Sandy	No			
Fort Fairfield	No	..		No		No	River gravel.
Fort Kent	No	..		No	No	Yes	River gravel.
Frenchville	No	..		No	No	No.	
Grand Isle	No	..		Yes.			
Haynesville	*						
Hersey		1	Mixed	No	Yes	No	Gravel
Hodgdon	No	..		4c D		Yes	Gravel
Houlton	Yes	.	Sandy	No	Yes	Yes	Gravel
Island Falls							
Limestone	No	..		No			
Linneus	No	..		No	No	Yes	Gravel
Littleton	No	..	Loamy	Yes	No	Yes	Gravel
Ludlow	No	..		By the year.	No	No	Gravel
Madawaska	No	..		No.			
Mapleton	No	..		No			
Mars Hill	No	..		By the year.	Yes	Yes	Gravel
Masardis	No	..		8c D	No	Yes	River gravel.
Monticello	No	..		By the year.	No	Yes	Gravel
New Limerick	Yes	.	Rocky	10c D	No	Yes	Gravel
New Sweden	No	..		No	No	Yes	Common soil.
Oakfield	No	..		No	No	Yes	

* No report received from Haynesville.

No. 2.

etc., in the Several Towns of the State.

COUNTY.

Give number, kind § and cost of road machines.	Give cost of operation per day.	Give miles turnpiked per day.	Give durability of turnpiking.	Does use of machine have tendency to narrow roads?	Does town use machine for smoothing surface?	Are results from use satisfactory?	Give special snow equipment.
6 A. C., $225	$13 50 to 22 50	1	3 or 4 y	No...	Yes .	Yes .	Holly Breaker.
1 second hand A. C., $40	12 00	½	1 to 3	Yes .	Yes .	Yes .	
1 A. C., $200	12 00	1	1 to 3	Yes .	Yes .	Yes .	
1 A. C., $180, old mach .	12 00	.....	3 to 4	.....	Yes .	Yes .	
1, $200	12 50	2	.....	No...	Yes .	Yes .	
1 C., 2 W., $225	12 50	½	3	No...	Yes .	Yes .	Scrapers.
2 A. W., $235	8 00	½ to 1	4 to 5	No...	Yes .	Yes .	
1 A. C., $235 ..	10 to 18 75	½	1 to 10	Yes .	Yes .	Yes .	Two rollers.
1 A. C., $175	10 00	.....	.....	No...	Yes .	Yes .	Holden Br'ker.
1 C., $200, 1 W., $200	10 00	.....	.....	No...	Yes .	Yes .	
2 A. C., $225	14 00 to 20 00	½	3	No...	Yes .	Yes .	
1, $210	15 00	½	5	Yes .	Yes .	Yes .	Sled with V.
1 A., $200	14 00	½	3	Yes .	Yes .	Yes .	No.

§ A. C.—American Champion; A. W.—Austin Western; C.—Climax; W.—Western; A.—Austin.

COUNTY.

1 A. C., $250	$15 00	1	3	Yes .	Yes .	Yes .	Snow plows.
1 C., $125	16 00	¾	4	No...	Yes .	Yes .	Roller.
1 C	15 00	½	3	No...	Yes .	Yes .	
No.							
1 W. R	8 to 11 00	.....	2 to 3	Yes .	Yes .	Yes .	Roller & plane.
1 A. C	15 00	1	2	Yes .	Yes .	Yes .	Plow.
3 A. C., $225	14 50	¼	5	No ..	Yes .	Yes .	Roller & plow.
1 A. C., $270	.....	.....	.....	Yes .	Yes .	Yes .	Plows.
1	10 00	.....	1	Yes .	Yes .	No...	
1 A. C. & 2 new mach..	10 00	½	2	Yes .	Yes .	Yes .	Patent plow.
1 old & 1 new A. C., $225	14 00	½	.....	No...	Yes .	Yes .	Plow.
2 A. C., $360 each	15 00	½	4 to 5	Yes .	Yes .	Yes .	Plow.
1 W. R., $175	25 00	½	10	No...	Yes .	Yes .	Plow.
1 A. C., $350	20 00	½	6 to 7	Yes .	Yes .	No...	Plow.
2, $215 each	12 25	1	3	Yes .	Yes .	No...	Plow.
2 A. C., $200 each	11 00	1 to 2½	1	Yes .	Yes .	Yes .	2 plows.
1	10 00	.....	5	No...	Yes .	Yes .	Plow & rollers.
1 A. C., $210	12 00	½	1	Yes .	Yes .	Yes .	Plows.
3 A. C., $600 for three ..	10 00	½	6	Yes .	Yes .	Yes .	
1 A. C., $250	7 50	½	1	No...	Yes .	Yes .	Plows.
2 A. C., 1 old W., $225	10 00 to 14 00	.....	1 to 3	Yes .	Yes .	No...	2 plows.
2 A. C., $250 each	10 00 to 12 00	½	1 to 3	Yes .	Yes .	No...	Plows.
1 A. C	20 00	½	3	No...	Yes .	Yes .	
2 W. R	12 00 to 15 00	½	.....	Yes .	Yes .	No...	Plow.
1 A. C., $275	10 00	1	10	Yes .	Yes .	Yes .	Plow.
1 A. C., $250	14 00	½	1 to 3	No...	Yes .	Yes .	Plows.
1 A. C., $250	25 00	½	4	No...	Yes .	Yes .	Plow.

§ A. C.—American Champion; C.—Climax; W. R.—Western Reversible; W.—Western.

Highway Equipment, Road Building Materials,

A ROOSTOOK

Towns.	Does town own gravel pits?	What is character of material?	Does town buy gravel and at what price? S-single, D-double, horse loads.	Has town prospected for gravel?	Are there pits in town not opened?	Give nature of best surfacing material.
Orient	No...	.....	No.....	No...	Yes .	Gravel.....
Perham	Yes .	Loamy	.....	Yes .	.....	Round gravel
Presque Isle	Rent	.....	$15 each pit.	No...	Yes .	River gravel..
Sherman	No...	.....	No.....	Yes .	Yes .	Crushed rock
Smyrna	No...	.....	5c S., 10c D..	No...	No...	.....
St. Agatha	No...	.....	No.....	No...	Yes .	
Van Buren	2	Sandy.....	Yes	Yes .	Yes .	Gravel.....
Washburn	No...	.....	$5 per year .	Yes .	Yes .	River gravel..
Westfield	No...	.....	No.	No...	Yes .	Common soil.
Weston	No...	.....	$5 per year .	No...	Yes .	.....
Woodland	1	Mixed	.....	No...	Yes .	Common soil.
PLANTATIONS.						
Allagash						
Cary						
Caswell	No...	.....	No.....	.....	.....	Gravel.....
Chapman	3	Rocky	No.....	No...	Yes .	Coarse gravel
Connor	No...	.....	No.....	No...	.....	.....
Cyr	No...	Loamy	No.....	No...	No...	Beach gravel.
E	2	Good.....	No.....	Yes .	Yes .	Gravel.....
Eagle Lake	No...	.....	No.....	.....	.....	.....
Garfield						
Glenwood	No...	.....	No.....	No..	Yes .	.....
Hamlin	No...	.....	No..	No...	.....	.....
Hammond						
Hill	No...	.....	No.....	No...	Yes .	Gravel.....
Macwahoc	3	Good.....	5c D	Yes .	Yes .	Gravel.....
Merrill	.....	Loamy	.....	Yes .	No...	Gravel.....
Moro						
Nashville	No...	.....	No.....	.....	.....	.....
New Canada	No...	.....	No.....	.....	No...	.....
Oxbow						
Portage Lake	No...	.....	No.....	No...	Yes .	.....
Reed	No...	.....	No.....	Yes .	No...	Gravel.....
St. Francis	.....	.....	.....	No...	Yes .	Beach gravel.
St John	3	.....	No.....	No...	.....	.....
Silver Ridge	No...	.....	No.....	No...	No...	Road dirt.....
Stockholm						
Wade	No...	.....	No.....	No...	No...	Beach gravel.
Wallagrass	No...	.....	No.....	No...	Yes .	Common soil.
Westmanland						

etc., in the Several Towns of the State.

COUNTY—CONCLUDED.

Give number, kind § and cost of road machines.	Give cost of operation per day.	Give miles turnpiked per day.	Give durability of turnpiking.	Does use of machine have tendency to narrow roads?	Does town use machine for smoothing surface?	Are results from use satisfactory?	Give special snow equipment.
1 A. C., $235	$15 00	1/10	4 to 8 y	Yes .	Yes .	Yes .	Plows.
1 A. C., $235	$10 00 to 15 00	.....	2 to 15	No...	Yes .	Yes .	Plow.
1 A. C	15 00	1/2	3 to 4	No...	Yes .	Yes .	
1 A. C., $200	9 00	1/2	2	No...	Yes .	Yes .	3 snow rollers.
1 A. C., $225	10 00 to 15 00	1/2	5 to 6	No...	Yes .	Yes .	
1 V., $260; 1 A. C., $225	15 00 to 18 00	1	3 to 4	No...	Yes .	Yes .	Plow.
3 C., $225 each	12 00 to 14 00	3/8	.....	No...	.....	Yes .	
1 A. C., $245	.....	.....	5	No...	Yes .	Yes .	
1 A. C., $225	10 60	.....	6 to 8	No...	Yes .	Yes .	
1 A. C., $233.50	15 00	1/2	2	Yes .	Yes .	Yes .	P ow.
1, $250	.....	.....	.....	No...	Yes .	Yes .	Plow.
1 2nd hand W., $150	12 00	1/4	1	Yes .	Yes .	Yes .	2-track plow.
1 A. C., $250	16 50	1	2	No...	Yes .	Yes .	Plow.
No.	.....	.....	.....	.....	.....	.....	No.
1 A. C., $250	30 00 to 35 00	1/2	.....	No...	Yes .	Yes .	
No.							
1	13 00	2	.....	No...	Yes .	Yes .	Plow
Co. Com. supply	16 00	1	2	No...	Yes .	Yes .	
1 A. C., $210	12 00	.....	1	No...	Yes .	Yes .	Road machine.
1 A. C., $250	25 00	1/2	5	Yes .	Yes .	Yes .	Plow.
1, $150	12 00	1	3	Yes .	Yes .	Yes .	
No.							
1 A. C., $225	25 00	3/4	.....	No...	Yes .	Yes .	
1 A. C., $250	25 00	1/2	5	Yes .	Yes .	Yes .	
1 A. C., $150	20 00	1/2	4	No...	Yes .	Yes .	Plows.
1 A. C., $250	18 00 to 20 00	1/4	6	No...	Yes .	Yes .	
1 A. C., $225	20 00	1	2	Yes .	Yes .	Yes .	Plow.
No.	20 00	1/2	2 to 4	No...	.....	Yes .	
No.							

V —Victor; C.—Climax; W.—Western; A. C.—American Champion.

Highway Equipment, Road Building Materials,

CUMBERLAND

Towns.	Does town own gravel pits?		What is character of material?	Does town buy gravel and at what price? S-single, D-double, horse loads.	Has town prospected for gravel?	Are there pits in town not opened?	Give nature of best surfacing material.
Baldwin	No...		.....	No	No...	Yes .	Common soil.
Bridgton	No...		.....	No. Given .	No...	No...	.....
Brunswick	.....		.....	10c D.....	No...	Yes .	Crushed rock.
Cape Elizabeth	.....		Rocky	15c D.....	Yes .	Yes .	Sea gravel....
Casco	No...		.....	No	.....	.....	Gravel.....
Cumberland		2	Sandy, poor	5c S., 10c D..	Yes .	Yes .	Gravel.....
Falmouth	No...		.....	10 to 25c D..	Yes .	Yes .	Gravel.....
Freeport		1	Coarse	4c S., 8c D ..	No...	Yes .	Gravel.....
Gorham		8	Mixed ...	2½c S., 5c D..	Yes .	Yes .	Gravel.....
Gray		2	Coarse	10c S., 20c D.	Yes .	Yes .	Coarse gravel
Harpswell	No...		.....	Yes, by scow	No...	Yes .	Beach gravel.
Harrison	No...		.....	Free	No...	Yes .	Gravel.....
Naples	No...		.....	No	No...	No...	.....
New Gloucester	No...		.....	10c D.....	No...	Yes .	.....
North Yarmouth		3	Mixed	3c S., 6c D...	No...	Yes .	Gravel.....
Otisfield	No...		.....	No	No...	Yes .	Gravel... ....
Portland		4	.....	25c D.....	Yes .	Yes .	.....
Pownal	No...		.....	5c D...	No...	Yes .	.....
Raymond	No...		.....	No	No...	Yes .	Gravel.....
Scarboro..		3	Coarse	10c D.....	No...	Yes .	Gravel.....
Sebago	No...		.....	No	No...	No...	Common soil.
South Portland		3	Coarse	15c D.....	Yes .	No...	Gravel.....
Standish	.....		.....	.....	.....	Yes .	Common soil.
Westbrook	No...		.....	25c D.....	No...	No...	Coal ashes....
Windham	No...		.....	5c D.....	Yes	.....	Gravel.....
Yarmouth		2	Sandy	8c S., 10c D..	Yes .	Yes .	Cinders.....

FRANKLIN

Avon	No...		.....	No	No...	Yes .	Loam .....
Carthage	No...		.....	2½c S., 5c D..	Yes .	Yes .	.....
Chesterville		1	Sandy.....	5c D.....	No...	Yes .	Gravel.....
Eustis	No...		.....	5c S., 10c D..	Yes .	No...	Gravel.....
Farmington	No...		.....	Some. 15c D	Yes .	Yes .	Gravel.....
Freeman	.....		.....	.....	No...	Yes .	Dirt .....
Industry	No...		.....	.....	No...	Yes .	.....
Jay	No...		.....	No	.....	.....	Gravel.....
Kingfield	No...		.....	No	No...	Yes .	.....
Madrid	No...		.....	No	No...	Yes .	.....
New Sharon	Yes .		Mixed	No	No...	Yes .	"Hard pan" ..
New Vineyard	No...		.....	5c S., 10c D..	Yes .	Yes .	Decayed rock
Phillips	No...		.....	No	Yes .	Yes .	Gravel.....
Rangeley	No...		.....	10c D.....	No...	No...	Common soil.
Salem		6	Coarse	No	No...	Yes .	Gravel.....
Strong	No...		.....	No	Yes .	Yes .	Gravel.....
Temple	No...		.....	No	No...	Yes .	Loam .....
Weld	No...		.....	No	No...	Yes .	Loam .....
Wilton	No...		.....	No	No...	Yes .	Crushed rock.
PLANTATIONS.							
Coplin	No...		.....	No	.....	Yes .	River gravel .
Dallas. Lang. Rangeley.		2	Coarse	No	No...	Yes .	Gravel.....
Sandy River		1	Sandy	No	No...	Yes .	Gravel.....

etc., in the Several Towns of the State.

COUNTY.

Give number, kind§ and cost of road machines.	Give cost of operation per day.	Give miles turnpiked per day.	Give durability of turnpiking.	Does use of machine have tendency to narrow roads?	Does town use machine for smoothing surface?	Are results from use satisfactory?	Give special snow equipment.
1 A. C., $300	$12 00	2 to 3	1 y	Yes	Yes	Yes	Rollers.
1 W., 1 V., 1 C, $225 each.	10 00	1	5 to 10	Yes	Yes	Yes	12 rollers.
2 A. C., $450 for 2	8 00	2	1	Yes	Yes	Yes	Rollers.
1 Acme, $200.	15 00	¾	4	No...	Yes	Yes	
1 A. C., $225	16 00	1	1	No...	Yes	Yes	
1	11 00 to 12 00	2	.....	Yes	Yes	Yes	
2 A. C., 1, $250; 1, $200	8 00	½	2	No...	No...	Yes	Triangle.
2	7 00 to 10 50	.....	.....	No...	Yes	Yes	
1 A. C., $250	8 00 to 10 00	1	10	No...	Yes	Yes	
1 C, $225	25 00	2½	4	Yes	Yes	Yes	
2 A. C., $190, each	9 00	1	4	Yes	Yes	Yes	Roller.
1 C	.....	.....	.....	No...	Yes	Yes	Holden break.
1 I. R., $250	25 00	.....	.....	No...	Yes	Yes	Roller.
1 A. C., $250	9 50	⅓	5	No...	Yes	Yes	Hapgood Rol's.
1 A. C., $250	15 00	⅕	3	No...	Yes	Yes	
1, $210	18 00	½	5	No...	Yes	Yes	2 rol's, 3 breaks.
1 A., 1 C., 1 A. C	8 00	.....	3	.....	Yes	Yes	
1 A. C., $235	9 00	⅓	.....	Yes	Yes	Yes	
1 A. C., $200	12 00	½	2	No...	Yes	Yes	
1 new & 1 old A. C., $225.	12 00 to 14 00	¼	5	Yes	Yes	Yes	
1 A. C., $260	10 00 to 12 00	2 to 3	1	Yes	No...	Yes	Wood rollers.
1 E., $150	15 00	1/10	3	No...	Yes	Yes	
1 A. C., $375	12 00	1	.....	Yes	Yes	Yes	Rollers.
1 A. C	8 00	¾	3 to 4	Yes	Yes	Yes	1 horse plow.
1 A. C	9 90	⅛	1	Yes	Yes	Yes	3 rollers.
1 A. C., $250	15 00	1 to 2	3 to 4	Yes	Yes	Yes	No.
1							

§ A. C.—American Champion; W.—Western; V.—Victor; C.—Climax; I. R.—Indiana Reversible; A.—Austin; E.—Eureka.

COUNTY.

1 A. C., $250	$15 00	2	5	Yes	Yes	Yes	
1 W. R., $350	12 00 to 12 50	.....	.....	Yes	Yes	Yes	
1 I. R., $204.05	15 00	¼	5	No...	Yes	Yes	
No	14 00	.....	3	No...	Yes		
1 A. C., $200; 1 C., $225	18 00	½	5	No...	Yes	Yes	Roller, breaker
1 C., $200	12 00	1 to 2	†2 to 6	Yes	No...	Yes	
1 C., $225	12 00	3 to 4	3	No...	Yes	Yes	
2 A. C	20 00	2	3	Yes	Yes	Yes	7 Holly plows.
1 A. C	15 00	.....	2 to 10	No...	Yes	Yes	No.
1 C	13 50	2	4	No...	No...	Yes	
1 A. Price confidential	15 00	.....	1 to 20	Yes	Yes	Yes	
1 C., $200	15 00	1½	3	Yes	No...	No...	No.
1 A. C., $225	15 00	1	3	No...	Yes	Yes	
1 C., $185	8 50	.....	2 to 4	Yes	Yes	Yes	Roller.
1 C., $160	12 00	½	1	Yes	Yes	Yes	
1 A. C., $200	10 00	1	5	No...	Yes	Yes	
1 A. C., $200	12 00	1	2	Yes	Yes	Yes	
2 A. C., $250 each	12 00	1	.....	No...	Yes	Yes	Holly plow,
2 A. C., $200 each	*18 00	½	5 to 6	Yes	Yes	Yes	7 Holly plows.
Co. Com. furnish	12 00	½	2	Yes	Yes	Yes	
Co. Com. furnish	6 50	2	2	No...	Yes	Yes	Triangle.
1 A. C ‡	12 00	1	.....	Yes	Yes	Yes	No.

§ A. C.—American Champion; W. R.—Western Reversible; I. R.—Indiana Reversible; C.—Climax; A.—Acme. *6 horses, 5 men. † Hilly 2, level 4 to 6 years.
‡ Owned in company with two other plantations.

Highway Equipment, Road Building Materials,

HANCOCK

Towns.	Does town own gravel pits?	What is character of material?	Does town buy gravel and at what price? S-single, D-double, horse loads.	Has town prospected for gravel?	Are there pits in town not opened?	Give nature of best surfacing material.
Amherst	.....	.....	.....	Yes	Yes	Gravel
Aurora	No...	.....	No.	.....	No...	Gravel
Bluehill	1	Sandy	5c S., 10c D.	No...	Yes	Stone dust
Brooklin	No...	.....	No.	No...	.....	Beach gravel.
Brooksville	No...	.....	No.	Yes	No...	Stone chips...
Bucksport	No...	.....	5c S.,10-15c D	Yes	.....	.....
Castine	No...	.....	15c S., 25c D.	No...	Yes	Beach gravel.
Cranberry Isles	No...	.....	10c S.	No...	Yes	.....
Dedham	No...	.....	No.	Yes	Yes	.....
Deer Isle	.....	.....	No.	No...	No...	.....
Eastbrook	No...	.....	No.	No...	.....	Dirt by road.
Eden	No...	.....	*$1.20 S., $2 D	No...	.....	Crushed rock.
Ellsworth	No...	.....	5c S., 10c D..	No...	Yes	.....
Franklin	No...	.....	3c S., 5c D...	No...	Yes	Gravel
Gouldsboro	No...	.....	5c S., 10c D..	No...	Yes	Dirt by road.
Hancock	No...	.....	5c S., 8c D...	No...	Yes	Gravel
Isle au Haut	No...	.....	10c D.	No...	Yes	Gravel
Lamoine	No...	Gravel	No.	Yes	Yes	Gravel
Mariaville	No...	Mixed	No.	.....	No...	.....
Mount Desert	No...	Mixed	*50c S., $1 D.	No...	No...	.....
Orland	No...	.....	10c D	No...	Yes	Brick clay
Otis	No...	.....	3c S., 5c D...	No...	Yes	Gravel
Penobscot	No...	.....	No.	No...	Yes	Clay
Sedgwick	No...	Mixed	2 to 4c D	No...	Yes	Clam shells...
Sorrento	.....	.....	5c S., 8c D...	Yes	No...	Gravel
Southwest Harbor	No...	.....	10c S.	No...	No...	.....
Stonington	No...	Beach grav.	*25c S., 60c D	Yes	Yes	.....
Sullivan	No...	.....	6c S., 10c D..	Yes	Yes	Gravel
Surry	No...	.....	2½c S., 5c D..	No...	Yes	Gravel
Swan's Island	No...	.....	5c S	No...	.....	Stone chips...
Tremont	No...	.....	.....	No...	No...	Common soil.
Trenton	No...	.....	No.	No...	No...	Common soil.
Verona	No...	.....	No.	No...	.....	Common soil.
Waltham	No...	.....	2½c S.	No...	.....	Gravel
Winter Harbor	No...	.....	20c D	Yes	Yes	Gravel
PLANTATIONS.						
Long Island						
No. 8						
No. 33	No...	.....	No.	Yes	No...	Loam

* Delivered.

etc., in the Several Towns of the State.

COUNTY.

Give number, kind§ and cost of road machines.	Give cost of operation per day.	Give miles turnpiked per day.	Give durability of turnpiking.	Does use of machine have tendency to narrow roads?	Does town use machine for smoothing surface?	Are results from use satisfactory?	Give special snow equipment.
1 C., $250	$10 00	3/4	3 y	Yes .	Yes .	Yes .	No.
1 W. R., $200	8 00	3/4	2 to 3	Yes .	Yes .	Yes .	
2 new A. C., $253 & $200.	12 50	1-3/4	5 to 6	Yes .	Yes .	Yes .	No.
1 A. C., $265	7 50	.....	1	Yes .	Yes .	Yes .	No.
2 A. C	$10 00 to 12 00	1-1/2	2	Yes .	Yes .	Yes .	
2 A. C., $150-$225	8 50 to 13 00	2-1/2	3 to 5	No...	Yes .	Yes .	
1 V	9 00	1	10	No...	Yes .	Yes .	
No.							
1 A. C., $310	9 75	.....	3	Yes .	Yes .	Fair.	Plow.
1 A. C	20 00	1/2 to 1	1 to 3	Yes .	Yes .	Yes .	
No.							
3 A. C., $250 each	15 00 to 20 00	1/2	3	Yes .	Yes .	Yes .	Wheel'r plows.
1 C., 1 A. C., $225 each	15 00	.....	1	No...	Yes .	Yes .	Osgood plow.
1 W. R	10 00	1-1/2	1	Yes .	Yes .	Yes .	
2 A. C., $225 each	15 00	2-1/2	2	Yes .	No...	Yes .	
1 A. C., $265	12 50	1-3/4	3 to 5	No...	Yes .	Yes .	
1 A. C., $225	15 00	1-1/2	2	No...	Yes .	Yes .	No.
1 A. C., $250	15 00	1-1/2	3	Yes .	Yes .	Yes .	
1 W. R., $250	12 00	.....	.....	No...	.....	Yes .	
2 A. C., $225 each	15 00	.....	.....	Yes .	No...	Yes .	
1 A.C.,1 V.,$500 for both	8 00	1/2 to 3/4	2	Yes .	Yes .	Yes .	
1 old machine, $50	10 00	.....	4	Yes .	Yes .	Yes .	
1, $200	9 00	.....	2	Yes .	Yes .	Yes .	No.
1 A. C., $215	14 00	.....	.....	Yes .	Yes .	Yes .	
1, $350	18 00	.....	.....	Yes .	No...	No.	
No	.....	.....	.....	Yes .			
No	.....	.....	2	.....	Yes .	Yes .	
1 A. R., $250	10 00	1/2	2 to 3	Yes .	Yes .	Fair.	No.
1 A. C., $250	10 00	1	2	Yes .	Yes .	Yes .	No.
1 A. C	8 00	.....	.....	.....	Yes .	Yes .	
1 A. C., $250	8 00 to 10 00	.....	3 to 10	Yes .	Yes .	Yes .	
1 A. C., $250	8 00	.....	.....	Yes .	.....	Yes .	No.
1 C., $250	8 00	.....	1 to 2	Yes .	Yes .		
1 I. R., $235	7 50	.....	.....	No...	Yes .	Yes .	
Hire one	12 00	1	2	Yes .	Yes .	.....	No.
1 poor 2nd hand I.R.,$20	$18 00	3/4	2	No...	No...	Fair.	

§ A. C.—American Champion; C.—Climax; W. R.—Western Reversible; V — Victor; A. R.—Austin Reversible; I. R.—Indiana Reversible.

Highway Equipment, Road Building Materials,

KENNEBEC

Towns.	Does town own gravel pits?	What is character of material?	Does town buy gravel and at what price? S-single, D-double, horse loads.	Has town prospected for gravel?	Are there pits in town not opened?	Give nature of best surfacing material.
Albion	No		No	No		Gravel
Augusta	*					
Belgrade	No		2½c S., 5c D	No	Yes	Gravel
Benton	No		10c D	Yes	Yes	Gravel
Chelsea	No		10c D	Yes	Yes	Gravel
China	No		$10 per year.	Yes	No	Gravel
Clinton	No		5c S., 10c D.	No	Yes	Gravel
Farmingdale	No		15c D	Yes	Yes	
Fayette	1	Rocky	No		Yes	
Gardiner	*					
Hallowell	1	Mixed	No	Yes	No	Stone chips
Litchfield	No		Yes		No	
Manchester	No		No	No	Yes	Gravel
Monmouth	2	Mixed	10c D	No	Yes	
Mt. Vernon	No		3c S., 5c D	No	No	Gravel
Oakland	No		Given	No	Yes	Gravel
Pittston	1	Rocky	12½c S	No	Yes	Gravel
Randolph	No		10c D	Yes	No	Red gravel
Readfield	No		5c D	Yes	Yes	Gravel
Rome	No		No	No	Yes	
Sidney	No		No		Yes	Common soil.
Vassalboro	No		5c S., 10c D.	Yes	Yes	Gravel
Vienna	No		10c D	No	Yes	
Waterville	No		10c S., 20c D.	Yes	Yes	Bank gravel
Wayne	No		No	No	Yes	
West Gardiner	No		10c D		Yes	Gravel
Windsor	No		3c S., 5c D	Yes	Yes	Gravel
Winslow	No		5c S., 10c D.	Yes	Yes	Gravel
Winthrop	No		7½c D	Yes	Yes	Gravel
PLANTATION.						
Unity	No		1c D	No	No	Gravel.

* No report received from Augusta or Gardiner.

etc., in the Several Towns of the State.

COUNTY.

Give number, kind§ and cost of road machines.	Give cost of operation per day.	Give miles turnpiked per day.	Give durability of turnpiking.	Does use of machine have tendency to narrow roads?	Does town use machine for smoothing surface?	Are results from use satisfactory?	Give special snow equipment.
1 A. C., $225 ..... *	$22 00	¾	2 to 3 y	Yes .	Yes .	Yes .	
2 C., $212.50 each	13 00	½	5	Yes .	Yes .	Yes .	2 rollers.
1 A. C., $195	20 00	¾	5	No...	Yes .	Yes .	
1 C., $265.40	15 00	.....	.....	Yes .	Yes .	No...	
1 C., $225	20 00	1	3 to 4	Yes .	Yes .	Yes .	
1 V., $250	21 00	½	5	Yes .	Yes .	Yes .	
1, $250	12 00	....	.....	No...	Yes .	Yes .	
1 C., $200 ..... *	15 00	¼ to ½	3	No...	Yes .	Yes .	1 roller.
1 A. C., $200.	7 50	.....	1	No...	Yes .	Yes .	Roller.
1 A. C., $125.	15 00	.....	.....	Yes .	Yes .	Yes .	
1 A. C., $225.	11 00	.....	3 to 6	Yes .	Yes .	Yes .	
1 A. C., $225.	16 00	½	5	No...	.....	Yes .	
1 A. C., $200.	17 00	¾	4 to 5	Yes .	Yes .	Yes .	
1 W. R., $175	11 50	½	2	No...	Yes .	Yes .	Roller.
2 A. C., $250 each	16 00	½	10	No...	Yes .	Yes .	
1 A. C.	20 00	.....	.....	No...	Yes .		
2 A. W., $200	17 00	½	3	.....	Yes .	Yes .	No.
1 A. C., $200.	16 00	1	3	Yes .	No...	No...	
1 A. C., $200.	11 00	¼	4	Yes .	Yes .	No...	Rollers.
1 New W., $225..	20 to 30	½	.....	No...	No...	Yes .	
1 C	20 00	.....	4	Yes .	Yes .	Yes .	No.
1 C	12 00	.....	.....	.....	Yes .	Yes .	
1 A. C., $225	18 00	½	4	No...	Yes .	Yes .	
1 A. C., $200	14 00	½	.....	No...	Yes .	Yes .	
1 Ac., $225.	18 00	1	2 to 4	Yes .	Yes .	Yes .	Triangle.
1 C., 1 I. R., $200 each...	15 00	¾	7 to 8	Yes .	Yes .	Yes .	
1 N. R., $100	19 00	½	3 to 4	Yes .	Yes .	Yes .	

§ A. C.--American Champion; C--Climax; V.--Victor; W. R.--Western Reversible; A. W.—Austin Western; W.--Western; Ac.—Acme; N. R.--National Reversible; I. R.—Indiana Reversible; New W.--New Western.

* No report received from Augusta or Gardiner.

Highway Equipment, Road Building Materials,

KNOX

Towns.	Does town own gravel pits?	What is character of material?	Does town buy gravel and at what price? S-single, D-double, horse loads.	Has town prospected for gravel?	Are there pits in town not opened?	Give nature of best surfacing material.
Appleton	No...	.....	No	.....	Yes .	.....
Camden	No...	.....	15c S., 25c D.	No...	Yes .	Rock chips ...
Cushing	No...	.....	8c D	Yes .	Yes .	.....
Friendship	No...	.....	4c S., 6c D...	No...	Yes .	.....
Hope	No...	.....	10c D.....	No...	Yes .	Gravel.....
Hurricane Isle	.....	.....	.....	.....	.....	Granite chips
North Haven	No...	.....	No.....	.....	No...	.....
Rockland	No...	.....	*$1.40 D	No...	Yes .	Gravel.....
Rockport	1	Good.....	15c per yard	No...	Yes .	Rock chips...
South Thomaston	No...	.....	70c per cu.yd	No...	Yes .	Gravel.....
St. George	No...	.....	5c S., 10c D..	.....	Yes .	Gravel.....
Thomaston	No...	.....	8c D	No...	Yes .	Lime rock....
Union	}	Mixed	5c S., 10c D..	Yes .	No...	Common soil.
Vinalhaven	No...	.....	5c S., 10c D..	No...	No...	Crushed rock.
Warren	No...	.....	10c D.....	No...	Yes .	Gravel.....
Washington	No...	.....	1c D	Yes .	Yes .	Gravel.....

LINCOLN

Alna	No...	.....	Yes	Yes .	Yes .	.....
Boothbay	No...	.....	10c D.....	No...	Yes .	Clam shells ..
Boothbay Harbor	No...	.....	5c S., 10c D..	Yes .	Yes .	Coal ashes....
Bremen	No...	.....	5c S., 10c D..	Yes .	Yes .	Gravel.....
Bristol	No...	.....	5c S., 10c D..	No...	.....	.....
Damariscotta	No...	.....	20c D	Yes .	No...	Common soil.
Dresden	No...	.....	8c D.....	No...	.....	.....
Edgecomb	No...	.....	No.....	No...	Yes .	Common soil.
Jefferson	No...	.....	No.....	Yes .	Yes .	Gravel.....
Newcastle	No...	.....	10c S	No...	Yes .	Dirt.....
Nobleboro	No...	.....	7c S., 15c D..	No...	Yes .	Gravel.....
Somerville	No...	.....	No.....	.....	.....	.....
Southport	No...	.....	No.....	No...	No...	Common soil.
Waldoboro	No...	.....	5c S., 10c D..	No...	Yes .	Gravel.....
Westport	No...	.....	No.....	No...	Yes .	Common soil.
Whitefield	No...	.....	5c D.....	Yes .	Yes .	Common soil.
Wiscasset	No...	.....	10c D.....	Yes .	Yes .	Broken stone.
PLANTATION.						
Monhegan	No...	.....	No.....	.....	No...	Loam, gravel.

*Delivered.

etc., in the Several Towns of the State.

COUNTY.

Give number, kind§ and cost of road machines.	Give cost of operation per day.	Give miles turnpiked per day.	Give durability of turnpiking.	Does use of machine have tendency to narrow roads?	Does town use machine for smoothing surface?	Are results from use satisfactory?	Give special snow equipment.
2 A. C., 1, $250, 1, $225	$16 00	.....	.....	No...	Yes .	Yes .	No.
2 A. C., 1, $300, 1, $250	11 50 to 16 00	1½	2 y	Yes .	Yes .	Yes .	No.
1 C., $200	15 00	⅔	.....	No...	Yes .	Yes .	No.
1 A. C., $225	14 00	2	1	No...	Yes .	Yes .	No.
1 A. C	14 00	1	2	Yes .	Yes .	Yes .	
1 C., $275	12 00	¼	4	No...	Yes .	Yes .	
2 W. R	8 00	.....	2	No...	Yes .	Yes .	No.
1 C., $201	8 75	.....	3	No...	Yes .	Yes .	No.
1	10 00 to 12 00	.....	.....	Yes .	Yes .	Yes .	No.
1 A. C., $250	25 00	1	2 to 3	Yes .	No...	Yes .	
1 A. C., $325	12 00	½	1	Yes .	Yes .	Yes .	
2 A. C	12 00	2	1	No...	No...	Yes .	
1 A. C., $250	11 50	2	2	No...	Yes .	Yes .	
1 A. C., 1 V	12 00	.....	1	Yes .	Yes .	No...	
1 A. C., $250	17 00	2	4	Yes .	Yes .	Yes .	

§ A. C.—American Champion; C.—Climax; W. R.—Western Reversible; V.—Victor.

COUNTY.

1 W., $235	11 00	1	3 to 6	No...	Yes .	Yes .	
1 W. R	19 50	2½	2	Yes .	Yes .	Yes .	
1 A. C., $300	17 00	2	1	No...	Yes .	No...	No.
1 A. C., $250	16 00	.....	.....	Yes .	No...	Fair.	
3 machines							
1 old V	17 00	1 to 2	1 to 2	No...	Yes .	Yes .	No.
1 W., $200	15 00	2	2	Yes .	No...	Poor	Triangle.
1 N., $175	20 00	3	1	Yes .	No...	Yes .	
2 A. C., $250 each	12 00 to 14 00	1½	1	No...	Yes .	Yes .	
3 old ones, 1 new I, $165	18 00	2	1	Yes .	Yes .	Yes .	No.
1 A. C., $125	15 00	1	1	Yes .	Yes .	Yes .	
2 C., $150 each	10 00	2	2	Yes .	Yes .	Yes .	
No	.....	.....	.....	.....	.....	.....	No.
3	22 00	1	3	Yes .	Yes .	Yes .	
No							
2	12 00 to 15 00	.....	.....	Yes .	Yes .		
1 W., $110	28 00	2	2	No...	Yes .	Yes .	
No	.....	.....	.....	.....	.....	.....	No.

§ W—Western; W. R.—Western Reversible; A. C.—American Champion; V.—Victor; N—National; I—Indiana; C—Climax.

Highway Equipment, Road Building Materials,

OXFORD

Towns.	Does town own gravel pits?	What is character of material?	Does town buy gravel and at what price? S-single, D-double, horse loads.	Has town prospected for gravel?	Are there pits in town not opened?	Give nature of best surfacing material.
Albany	No...		No.		No.	
Andover	5 or 6	Mixed	No.	Yes	Yes	Gravel
Bethel	No...		5c S., 10c D.		Yes	Gravel
Brownfield	No...		No.		No...	Clay
Buckfield	No...		No.	No...		
Byron	3	Mixed	3c D	No...	Yes	Gravel
Canton	No...		No.	Yes	Yes	Gravel
Denmark	No...		No.	No...	Yes	"Hard Pan"
Dixfield	No...		No.	No...		
Fryeburg	No...		10c D	Yes	Yes	
Gilead	No...		No.	No...	Yes	Dirt at hand
Grafton	No...				Yes	
Greenwood	No...			No...	Yes	
Hanover	Yes		No.	No...	Yes	
Hartford	1	River grav.	No.			Gravel
Hebron	No...				Yes	Gravel
Hiram	1	Mixed	$6 per year	No...	No...	
Lovell	1	Rocky	10c D	No...	Yes	
Mason	No...		No.	No...	Yes	
Mexico	No...			No...	Yes	No gravel
Newry	No...		No.	No...		
Norway	3	Rocky	No.	No...	No...	Gravel
Oxford	No...		No.	Yes	Yes	Clay, Sand
Paris	1	Fine	5c S., 10c D.			Gravel
Peru	No...		No.	No...	Yes	
Porter	No...		5c S., 10c D.	No...		Clay marl
Roxbury	*					
Rumford	No...		10c S., 20c D.	No...	Yes	
Stoneham	No...		6c D	Yes	No...	
Stow	No...		No.	No...	Yes	Gravel
Sumner	No...		No.			
Sweden	No...		No.	No...		Dirt
Upton	No...		No.			Gravel
Waterford	No...		5c D			
Woodstock	No...					
PLANTATIONS.						
Lincoln	No...		Yes			
Magalloway	2	Sandy	No.			
Milton	1	Sandy	No.	No...	Yes	Loam

* No report received from Roxbury.

etc., in the Several Towns of the State.

COUNTY.

Give number, kind § and cost of road machines.	Give cost of operation per day.	Give miles turnpiked per day.	Give durability of turnpiking.	Does use of machine have tendency to narrow roads?	Does town use machine for smoothing surface?	Are results from use satisfactory?	Give special snow equipment.
1 A. C., $275	$10 00	½	2	Yes	Yes	Yes	
1 A. C., $248	.....	.....	4 to 5	Yes	Yes	Yes	2 rollers.
2 A. C., $185 each	16 00	⅓	3	No...	Yes	Yes	
1, $212.50	10 00	⅓	4 to 5	Yes	Yes	No...	
1 A. C	18 00	½ to 1	2 to 4	No...	Yes	Yes	
1 A. C., $225	15 00	½	5	Yes	Yes	Yes	
1 Ac., $200	15 00	½	.....	Yes	Yes	Fair.	Rollers.
1 A. C., $210	9 00	.....	4	No..	No...	Yes	3 rollers.
1 Ac., $225	15 00	.....	4	Yes	No...	Yes	
1 A. C., $235	10 00	.....	.....	.....	Yes	Fair.	2 rollers.
1 A. C., $175	7 00	½	3 to 5	No...	Yes	Yes	No.
1, $211	7 50	.....	.....	No...	Yes	Yes	
1 A. C., $225	.....	.....	1 to 3	No...	Yes	Yes	No.
1 W. R.	10 00	1	2	No...	Yes	Yes	
1 W. R., $175; 1 A. C., $225	18 00	1½	1 to 10	Yes	Yes	Yes	Triangle.
1 Great W., $200	.....	.....	.....	Yes	.....	.....	None.
1 W, 1 Au, $225	20 00	.....	3 to 5	Yes	Yes	Yes	6 Hap. rollers.
1 Ac., $235	16 00	2	3	No...	Yes	Yes	
1 N. R., $200	15 00	1	.....	No...	No...	Yes	Road machine
1 W. R., $250	15 00	.....	2 to 6	No...	Yes	Yes	No.
1 A. C., $250	8 00	1	1	Yes	Yes	Yes	
1 McC, 2 B., $250 each	7 50	2	1	Yes	Yes	Yes	Rollers.
1	7 00	½	3 to 10	Yes	Yes	Yes	7 Holden brk's
3 A. C., $185-$200	15 00	½ to 1	5	No...	Yes	Yes	Triangle.
1 A. C., $225	16 00	2	2	No...	No...	Yes	
1, $200	.....	.....	2 to 3	Yes	.....	Yes	
5 C., $200 each	15 00	⅓	.....	No...	Yes	Yes	1 roller.
1 W. R.	22 00	1	.....	Yes	Yes	Fair.	
1 A. C., $250	9 00	½	.....	Yes	.....	Yes	Roller.
1 C.	16 00	.....	.....	Yes	Yes	No...	No.
1 A. C., $225	17 00	½	8	No...	No...	Yes	5 rollers.
1 W. R	9 00	1 to 2	1	No...	No...	Yes	2-track plow.
1 C., $225; 1 W., $225	8 00 to 10 00	1	1 to 5	.....	Yes	Yes	8 rollers.
1 C., $225	12 00	1	.....	Yes	.....	No...	
1 P, $250	8 20	3	2	No...	Yes	Yes	Roller.
Hire for 1 day.							
1 2d hand, $50	10 50	1	3	Yes	Yes	Yes	

§ A. C.—American Champion; Ac.—Acme; W. R.—Western Reversible; W.—Western; Au.—Aurora; McC.—McCormick; B.—Buckeye; C.—Climax; P.—Penrock.

Highway Equipment, Road Building Materials,

PENOBSCOT

Towns.	Does town own gravel pits?	What is character of material?	Does town buy gravel and at what price? S-single, D-double, horse loads.	Has town prospected for gravel?	Are there pits in town not opened?	Give nature of best surfacing material.
Alton	No...	.....	No.....	No...	Yes .	Gravel.....
Argyle	No. .	.....	....	No...	No...	.....
Bangor	1	Mixed	10 to 40c D ..	Yes .	Yes .	Gravel.....
Bradford	No...	.....	2½c S., 5c D..	No...	Yes .	Gravel.....
Bradley . .	1	Mixed	No.....	No...	Yes .	Gravel.....
Brewer	3	Rocky	10c S., 15c D.	Yes .	No...	Crushed rock.
Burlington	No...	.....	No.....	No...	Yes .	Pin gravel....
Carmel	No...	.....	No.....	No...	Yes .	Common dirt.
Carroll	No...	.....	No.....	Yes .	Yes .	Gravel.....
Charleston	No...	.....	5 to 25c D ...	No...	Yes .	Gravel.....
Chester	No...	.....	No.....	Yes .	Yes .	Common soil.
Clifton	1	Mixed	No.....	No...	Yes .	Gravel.....
Corinna	No...	.....	8c S., 15c D..	No...	No...	Gravel.....
Corinth	No...	.....	5c S., 10c D..	Yes .	Yes .	Gravel.....
Dexter*						
Dixmont	No...	.....	.....	Yes .	Yes .	Common soil.
Eddington	1	.....	5c S., 10c D..	.....	.....	.....
Edinburg	No...	.....	No.....	No. .	No...	.....
Enfield	No...	.....	No.....	No...	No...	.....
Etna	Yes,1	Rocky	No.....	Yes .	Yes .	Gravel.....
Exeter	No...	.....	No.....	.....	.....	.....
Garland	No...	.....	5c D	No...	Yes .	Gravel.....
Glenburn	No...	.....	5c D	No...	Yes .	Gravel.....
Greenbush	No...	.....	No.....	No...	Yes .	Gravel.....
Greenfield	No...	.....	No.....	No...	Yes .	Sandy loam..
Hampden	No...	.....	5c S., 10c D..	No...	Yes .	Gravel.....
Hermon	2	Mixed	10c D.....	No...	Yes .	Gravel.....
Holden	1	Rocky	No.....	.....	No...	.....
Howland	No...	.....	Yes	Yes .	.....	Coal clinkers.
Hudson	1	Slaty.....	No.....	.....	.....	Gravel.....
Kenduskeag .	No...	.....	5c S., 10c D..	No...	Yes .	Common soil.
Kingman	No...	.....	5c D	No...	Yes .	.....
Lagrange	2	Mixed	.....	.....	Yes .	Gravel.....
Lee	1	Mixed	No.....	.....	.....	.....
Levant	No...	.....	5c S., 10c D..	Yes .	Yes .	Gravel.....
Lincoln..	1	Rocky	10c D	No...	Yes .	.....
Lowell	No...	.....	No.....	No...	Yes .	.....
Mattamiscontis*						
Mattawamkeag	1	Coarse	10c D	Yes .	Yes .	Loam .....
Maxfield	No...	....	No.	No...	Yes .	Gravel.....
Medway	No...	.....	No.....	No...	.....	Common soil.
Milford	No...	.....	10c D	Yes .	No...	.....
Millinocket	No...	.....	Given	No...	Yes .	Pin gravel....
Mt. Chase	No...	.....	50c D	No...	Yes .	Gravel.....
Newburg	1	Good.....	.....	No...	Yes .	Common soil.
Newport	1	Sandy	No.....	No...	No...	Coal ashes....
Old Town	1	Mixed	10c D	Yes .	Yes .	Gravel.....
Orono	4	Rocky	20c D	No...	Yes .	Pin gravel....
Orrington	No...	.....	8c D	No...	Yes .	Gravel.....
Passadumkeag	1	Good.....	No.....	No...	Yes .	Gravel.....
Patten	1	Rocky	5c S., 10c D..	Yes .	Yes .	Gravel.....
Plymouth	No...	.....	10c D	No...	Yes .	Gravel.....
Prentiss	.....	.....	.....	.....	.....	.....

*No report from Dexter or Mattamiscontis.

etc., in the Several Towns of the State.

COUNTY.

Give number, kind§ and cost of road machines.	Give cost of operation per day.	Give miles turnpiked per day.	Give durability of turnpiking.	Does use of machine have tendency to narrow roads?	Does town use machine for smoothing surface?	Are results from use satisfactory?	Give special snow equipment.
1 A. C., $195	$10 00	¼	5y	Yes	Yes	Yes	
1 W. R., $140	12 00	¼ to ½	1 to 10	Yes	Yes	Yes	
5 A. C	8 00	.....	1	Yes	Yes	Fair.	
1 A. C., $272	$12 00 to 15 00	¼	.....	Yes	Yes		
1 A. C	7 00	.....	4 to 5	Yes	Yes	Yes	
1 A. C., $265	10 00	½	2 to 4	No...	Yes	Yes	
1 V., $150	9 00	1½	5 to 6	No...	No...	Yes	
1 A. C., $225	15 00	¼ to ½	3 to 8	No...	Yes	Yes	
1 A. C., $300	10 00	....	.....	Yes	.....	Yes	No.
1 A. C., $200	12 00	¼	5	Yes	Yes	Yes	
1 W. R., $300	10 00 to 15 00	½	3 to 4	Yes	Yes	Yes	2 plows.
1 W. R., $225	10 00	½	1 to 3	Yes	Yes	Yes	No.
1 A. C., $250	15 00	½	3 to 10	No...	Yes	No.	
1 A. C., $210	13 00	¼	7	No...	Yes	Yes	
1 A. C., $200	15 00	.....	.....	Yes	Yes	Yes	
1 C., $200	14 00	½	.....	Yes	Yes	Yes	
1 A. C., $225	11 75	.....	10	Yes	Yes	Yes	
1 A. C., $225	.....	.....	.....	.....	Yes	Yes	No.
2 A. C	12 75	1	3 to 10	No...	Yes	Yes	
1 A. C., $205	16 50	½	10	No...	Yes	Yes	
1 A. C., $225	.....	.....	.....	Yes	Yes	Fair.	No.
1 A. C., $225	12 00	½	7	Yes	Yes	Yes	No.
1 A. C., $200	6 00	.....	.....	Yes	Yes	Yes	
1 A. C., $235	10 00	½	4	Yes	Yes	Yes	Plow.
1 A. C., $221	16 00	½	5	No...	Yes	Yes	
1 new A. C., $200	10 00 to 12 00	.....	1 to 15	Yes	Yes	Yes	No.
2 A. C., $210	10 00	½	.....	No...	Yes	Yes	
1 A. C., $225	16 00	.....	.....	.....	No...	Yes	
1 A. C	10 00	1	6 to 8	Yes	Yes	Yes	
1 V., $225	10 00	½	6 to 10	Yes	Yes	Fair.	
1 V., $225 or $250	6 00 to 9 00	.....	.....	Yes	Yes	Yes	No.
1 A. C., $225	12 00	1	10	Yes	Yes	Yes	
1 A. C., $175	15 00	1	10	No...	Yes	Yes	
1 A. C	15 00 to 18 00	.....	1	Yes	Yes	No...	
2 A. C., $225 each	14 75	1	5	No...	Yes	Yes	
1 A. C., $235	7 50	2	.....	No...	.....	Yes	
1 A. C., $250	9 00	¼	3	Yes	Yes	Yes	No.
1 A. C., $215	8 00	½	1	No...	Yes	Yes	No.
No.							
1 A. C., $200	15 50	.....	.....	No...	Yes	Yes	
1, $225	10 00	.....	3	Yes	Yes	Yes	Roller.
1 A. C	15 00	1	.....	Yes	Yes	Yes	2-track plow.
1 A. C	14 00	1½	.....	No...	Yes	.....	Triangle.
1	10 00	½	2	No...	Yes	.....	Triangle.
1 A. C., $205; 1 N.R., $205	12 00 to 15 00	¼	2	No...	Yes		
1 A. C	8 00	½	6	No...	Yes		
1 A. C., $210	14 00	½	.....	Yes	Yes		
1 old A. C., $225	10 00	¼	10 to 15	No...	Yes		
2 A. C., $200 each	7 50	1½	.....	No...	Yes		
1 A. C., $225	15 00	½	.....	No...	Yes		
1 A. C., $225	2 00	½	5	No...	Yes		

§A. C.—American Champion; W. R.—Western Reversible; V.—Victor; C.—Climax; N. R.—National Reversible.

Highway Equipment, Road Building Materials,

PENOBSCOT

Towns.	Does town own gravel pits?		What is character of material?	Does town buy gravel and at what price? S-single, D-(double, horse loads.	Has town prospected for gravel?	Are there pits in town not opened?	Give nature of best surfacing material.
Springfield	No...			No.	No...		Gravel.
Stetson		1	Mixed	10c S., 20c D.	No...	Yes	Gravel.
Veazie	No...			5c S., 10c D.	No...	Yes	Gravel.
Winn	No...			No.	Yes	No...	Common soil.
Woodville	No...						
PLANTATIONS.							
Drew	No...			No.	No...	Yes,2	
Lakeville					No...	Yes	
Grand Falls		5	Rocky	No.	No...	Yes	
Seboeis	Yes			No.			Gravel.
Stacyville	No...			No.			Crushed rock.
Webster	No...			No.	No...	Yes	

PISCATAQUIS

Abbot		1	Sandy	No	No...	No...	
Atkinson		2	Loamy	No	No...		Common soil.
Blanchard	No...			No	No...	Yes	
Brownville		1	Good	No	No...	Yes	Pin gravel.
Dover		1	Mixed	No	Yes	Yes	
Foxcroft		1	Slaty	No	No...	Yes	"Hard pan"
Greenville	No...			No	No...	Yes	Gravel.
Guilford		1	Sandy	No	No...	Yes	Gravel.
Medford	No...			Yes, 12½c D.	No...	Yes	Gravel.
Milo		1	Rocky	No	Yes	Yes	
Monson	No...			No	No...	No...	Slate chips
Orneville	No...			No	No...	No...	Common soil.
Parkman	No...			No	No...	Yes	
Sangerville		1	Mixed	No	No...	No...	Gravel.
Sebec	No...			No	No.	Yes	Common soil.
Shirley	No...			No	No...	Yes	Common soil.
Wellington	No...			No	No...	Yes	
Williamsburg	No...			No	No...	Yes	
Willimantic	No...			No		Yes	Gravel.
PLANTATIONS.							
Barnard							
Bowerbank							
Elliottsville							
Kingsbury	No...			No	No...	Yes	
Lake View	No...			No	No...	No...	

etc., in the Several Towns of the State.

COUNTY—CONCLUDED.

Give number, kind § and cost of road machines.	Give cost of operation per day.	Give miles turnpiked per day.	Give durability of turnpiking.	Does use of machine have tendency to narrow roads?	Does town use machine for smoothing surface?	Are results from use satisfactory?	Give special snow equipment.
1 A. C., $215	$15 00	1	3y	No...	Yes .	.....	Patent Plow.
1 A. C., $250	$10 00 to 12 00	¼ to ½	2 to 5	Yes .	Yes .		
1, $200.							
1 W. R., $250	12 00	½	3	Yes .	Yes .		
1 I. R., $225	15 00	1	1 to 3	Yes .	Yes .	.....	Plow.
1 A. C., $250	15 00 to 25 00	⅜	4	Yes .	Yes .	.....	No.
1, $175	12 00	⅛	4	Yes .	Yes .		
No.							
Hire one	.....	.....	.....	.....	Yes .		
1 C., $210	8 00 to 11 00	.....	1	Yes .	Yes .	.....	2-track plow.
Hire one	12 00	½	2	Yes .	Yes .		

§ A. C.—American Champion; W. R.—Western Reversible; C.—Climax; I. R.—Indiana Reversible.

COUNTY.

1 Am. Champ., $225	$15 00	1	.....	.....	Yes .	Yes .	
1 Am. Champ., $215	9 00	.....	.....	Yes .	Yes .	Yes .	
No	.....	.....	.....	Yes .	.....	.....	2-track plow.
1 Am. Champ., $215	10 00	⅕	3 y	Yes .	Yes .	Yes .	
Am. Ch., $225, 3d used	18 00	½	8	No...	Yes .	Yes .	2 rollers.
1 American Champion	15 00	.....	.....	.....	Yes .	Yes .	
1 Am. Champ., $375	10 00	⅕	5	Yes .	Yes .	Yes .	Plow.
1 Am. Champ., $215	14 00	⅓	4	No...	Yes .	Yes .	
1 Am. Champ., $250	10 50	¼	8 to 10	.....	Yes .	Yes .	No.
1 Am. Champ., $200	11 00	⅙	5 to 15	No...	Yes .	Yes .	
1 Am. Champ., $225	18 00	⅓	4 to 5	No...	Yes .	Yes .	No.
1 Am. Champ., $250	12 00	⅓	3	No...	Yes .	Yes .	
1 Am. Champ., $200	12 00 to 15 00	¾	2 to 4	Yes .	Yes .	Yes .	
1 Am. Champ., $200	15 00	⅓	3	No...	Yes .	Yes .	
1 Am. Champ., $225	13 00	½	1	No...	Yes .	Yes .	Machine knife.
1 Am. Champ., $220	8 00	.....	2 to 5	No...	Yes .	Yes .	
1 Am. Champ., $200	12 00	½	3	Yes .	Yes .	Yes .	
1 Am. Champ., $225	12 00	⅓	10	Yes .	Yes .	Yes .	Sled with w'gs.
1 old one	12 00 to 15 00	.....	3 to 10	.....	Yes .	Yes .	Plow.
Hire one	13 00	⅓	4	Yes .	Yes .	Yes .	
No.							

Highway Equipment, Road Building Materials,

SAGADAHOC

Towns.	Does town own gravel pits?	What is character of material?	Does town buy gravel and at what price? S-single, D-double, horse loads.	Has town prospected for gravel?	Are there pits in town not opened?	Give nature of best surfacing material.
Arrowsic	No...	.....	Yes	Yes .	Yes .	.....
Bath	*					
Bowdoin	No...	.....	3c D	No...	Yes .	Gravel.....
Bowdoinham	No...	.....	.....	.....	.....	Feldsp'r chips
Georgetown	No...	.....	3c S	.....	No...	Gravel.....
Perkins	No...	.....	No	No...	Yes .	Gravel.....
Phippsburg	1	Loamy	5c S., 10c D..	Yes .	Yes .	.....
Richmond	No...	.....	10 to 20c.....	Yes .	Yes .	Gravel.....
Topsham	No...	.....	10c D.....	No...	Yes .	Gravel.....
West Bath	No...	.....	†	.....	.....	.....
Woolwich	No...	.....	10c D.....	Yes .	Yes .	Gravel.....

* No report received from Bath. † 15 to 25c S.. 20 to 50c D.

SOMERSET

Anson	No...	.....	10c D.....	Yes .	No...	Gravel.....
Athens	No...	.....	No.....	No...	Yes .	Slate ledge ...
Bingham	No...	.....	5c S., 10c D..	No...	Yes .	.....
Cambridge	No...	.....	No.....	.....	.....	.....
Canaan	No...	.....	No.....	.....	.....	.....
Concord	Yes .	Mixed	No.....	No...	No...	Gravel.....
Cornville	No...	.....	No.....	No...	No...	.....
Detroit	No...	.....	10c D.....	No...	No...	Common soil.
Embden	3	.....	No.....	No...	Yes .	Gravel.....
Fairfield	1	Mixed	10c D.....	Yes .	Yes .	Gravel.....
Harmony	No...	.....	No.....	.....	Yes .	.....
Hartland	No...	.....	10c D.....	No...	No...	Gravel.....
Madison	No...	.....	25c D.....	No...	Yes .	Gravel.....
Mercer	No...	.....	No.....	No...	.....	.....
Moscow	No...	.....	No.....	No...	Yes .	Gravel.....
New Portland	No...	.....	No.....	Yes .	Yes .	Clay or sand .
Norridgewock	No...	.....	5c S., 10c D..	Yes .	No...	Gravel.....
Palmyra	No...	.....	No.....	.....	Yes .	.....
Pittsfield	No...	.....	3c D.....	No...	No...	Gravel.....
Ripley	No...	.....	No.....	No...	No...	.....
St. Albans	No...	.....	5c S., 10c D..	No...	Yes .	No surfacing .
Smithfield	No...	.....	No.....	.....	.....	.....
Skowhegan	No...	.....	.....	.....	.....	.....
Solon	No...	.....	10c D.....	No...	Yes .	Gravel.....
Starks	No...	.....	No.....	.....	.....	.....
PLANTATIONS.						
Bigelow	No...	.....	No.....	No...	.....	.....
Brighton	No...	.....	No.....	.....	.....	.....
Carratunk	No...	.....	1c S., 2c D...	No...	Yes .	Gravel.....
Dead River						
Dennistown						
Flagstaff	No...	.....	.....	No...	.....	Common soil.
Highland	No...	.....	No.....	Yes .	Yes .	Gravel.....
Jackman	No...	.....	5c D.....	No...	No...	Gravel.....
Lexington						
Mayfield	No...	.....	5c D.....	Yes .	Yes .	Pin gravel....
Moose River	No...	.....	5c D.....	No...	Yes .	Gravel.....
Pleasant Ridge	No...	.....	No.....	.....	.....	.....
The Forks						
West Forks						

etc., in the Several Towns of the State.

COUNTY.

Give number, kind§ and cost of road machines.	Give cost of operation per day.	Give miles turnpiked per day.	Give durability of turnpiking.	Does use of machine have tendency to narrow roads?	Does town use machine for smoothing surface?	Are results from use satisfactory?	Give special snow equipment.
1 W. A. P. & Co., $250 ..	$10 00 to 12 00	1	2 to 3 y	Yes .	Yes .	Yes .	
2 A. C	14 00	¼	3 to 6	Yes .	Yes .	Yes .	
1 W., $200, 1 A. C., $200 .	14 00	⅔	3	Yes .	No...	No...	
1 A., $200	12 00	⅓	3	Yes .	Yes .	Yes .	
1 second hand, $50	20 00	2½	1	Yes .	Yes .	Yes .	Plow.
1 A. C., $233	12 00 to 15 00	2	3	Yes .	No...	Yes .	
1 A.C.,$162.50,1 W.,$162.50	13 50	¼	5 to 6	No...	Yes .	Yes .	Holley breaker
1 A. C	15 00	1 to 2	1	Yes .	Yes .	No...	
1 A., $250	8 00 to 12 00	.....	.....	No...	Yes .	Fair.	
2 A. C., $250 each	14 00	2	1	Yes .	Yes .	Yes .	

§ W. A. P & Co.—W. A. Patten & Co.; A. C.—American Champion; A.—Austin; W—Western.

COUNTY.

2 A. C., $225 each	12 50	¾	2 to 4	No...	Yes .	Yes .	Rollers.
1 A. C., $238	13 00	½	4 to 5	No...	Yes .	Yes .	No.
1 A. C., $225	12 00	1	6 to 8	Yes .	Yes .	Yes .	
1.....	12 00	.....	.....	Yes .	Yes .	Yes .	
1 A. C., $200	16 00	1	3	Yes .	Yes .	Yes .	
1 A. C., $225	10 00 to 18 00	½ to 1	2 to 10	Yes .	Yes .	Yes .	
1 A. C	12 50	⅛	4 to 5	Yes .	Yes .	Yes .	
1 A. C	14 00	½	5	No...	Yes .	Yes .	
2 A. C., $225	12 00	½	.....	Yes .	Yes .	Yes .	
1 C	15 00 to 16 00	.....	10	No...	Yes .	Yes .	Triangle.
2 A. C., $425	12 00	⅕	5	No...	Yes .	Yes .	
1, $225	12 00 to 14 00	1	6 to 10	Yes .	Yes .	Yes .	Farm roller.
1 A. C., $225	13 00	.....	3	No...	Yes .	Yes .	
1 A. C., $225	12 00	¾	7 to 8	No...	Yes .	Yes .	
1 A. C., $225	16 00	½	3 to 5	Yes .	Yes .	Yes .	
2 A. C., 1, $250, 1, $225 ...	15 00	1	3 to 4	No...	Yes .		
2 A. C., $150	13 00	¼	3 to 8	No...	Yes .	Yes .	No.
1 A. C., $225	12 00	⅛	4	Yes .	Yes .	Yes .	
2 C., $225 each	15 00	⅛	6 to 8	Yes .	Yes .	Yes .	Plows.
1 A. C	12 00 to 15 00	.....	1 to 4	Yes .	Yes .	Yes .	
1 V.,$215;2 A.C.,$200 each	15 95	⅜ to 1	1 to 6	Yes .	Yes .	No...	Triangles.
1 W. R., $200	15 00	½	3	Yes .	Yes .	Yes .	
3 A. C., 1 C., $250.....	12 00	1	1	Yes .	Yes .	Yes .	Rollers.
1 A. C. $225.....	12 00	½	2 to 10	Yes .	Yes .	Yes .	
1 A. C	14 00	.....	2	Yes .	Yes .	Yes .	
Hire one.....	9 00	.....	3 to 5	Yes .	Yes .	.....	Farm rollers.
1 A. C., $200	12 00	⅔	2	No...	Yes .	Yes .	
1 A. C., $225	10 00	1½	3 to 4	No...	Yes .	Yes .	
1 A. C	10 00	.....	.....	No...	.....	Yes .	Roller.
1 A. C., $215	12 00	1	1	No...	Yes .	Yes .	
1 A. C., $225	12 00	½	1	No...	Yes .	Yes .	
1 A. C., $250	12 00	½	3	No...	Yes .	Yes .	
1 A. C., $245	10 00	1	5	No...	Yes .	Yes .	Plow.
1 A. C., $225	13 00	1	1	No...	Yes .	Yes .	

§ A. C.–American Champion; C.–Climax; V.—Victor; W. R.—Western Reversible

Highway Equipment, Road Building Materials,

WALDO

Towns.	Does town own gravel pits?	What is character of material?	Does town buy gravel and at what price? S-single, D-double, horse loads.	Has town prospected for gravel?	Are there pits in town not opened?	Give nature of best surfacing material.
Belfast	No...	.....	10c S., 15c D.	Yes .	Yes .	Gravel .....
Belmont	No...	.....	.....	.....	.....	.....
Brooks	2	Mixed	No.....	No...	Yes .	Gravel .....
Burnham	No...	.....	10c D.....	No...	Yes .	.....
Frankfort	No...	.....	5c D.....	Yes .	.....	Gravel .....
Freedom	No...	.....	5c D.....	Yes .	Yes .	Common soil.
Islesborough	No...	.....	Gravel, 40c*	Yes .	Yes .	Beach gravel.
Jackson	No...	.....	5c D.....	Yes .	Yes .	Gravel .....
Knox	No...	.....	2½c S., 5c D..	No...	No...	Gravel .....
Liberty	No...	.....	.....	Yes .	Yes .	Gravel .....
Lincolnville	No...	.....	.....	No...	No...	Common soil.
Monroe	2 or 3	.....	5c.	No...	No...	Gravel .....
Montville	Yes .	Rocky	No.....	.....	.....	Gravel .....
Morrill	No...	.....	2½c S., 5c D..	No...	No...	Gravel .....
Northport	No...	.....	5c D.....	No...	Yes .	Beach gravel.
Palermo	No...	.....	No.....	.....	No...	Gravel .....
Prospect	No...	.....	5c S., 10c D..	No...	No...	Gravel .....
Searsmont	No...	.....	5c S., 10c D..	No...	Yes .	Common dirt.
Searsport	No...	.....	5c S., 10c D..	No...	No...	Beach gravel.
Stockton Springs	No...	.....	No.....	No...	Yes .	Common soil.
Swanville	No...	.....	10c S., 15c D.	Yes .	Yes .	Gravel .....
Thorndike	No...	....	No.....	No...	Yes .	Gravel .....
Troy	No...	.....	No.....	No...	.....	.....
Unity	No...	.....	No.....	.....	.....	.....
Waldo	Yes .	Mixed	2c D.....	Yes .	Yes .	Gravel . .....
Winterport	1	Sandy.....	5c S., 10c D..	No...	Yes .	Gravel .....

* Delivered.

WASHINGTON

Addison	No...	.....	3c S., 5c D ..	Yes .	No...	Gravel.....
Alexander	No...	.....	$100 per yr..	Yes .	Yes .	Gravel.....
Baileyville	No...	.....	No	No...	Yes .	Common soil.
Baring	2	Gravel.....	5c S., 10c D..	Yes .	No...	.....
Beddington	No...	.....	No	.....	.....	Gravel.....
Brookton	No...	.....	No	No...	Yes .	"Hard pan" ..
Calais	2	.....	10c S., 20c D.	Yes .	No...	Crushed rock.
Centerville	No...	.....	4c D...	Yes .	Yes .	Gravel.....
Charlotte	No...	.....	No	.....	No...	Common soil.
Cherryfield	No...	.....	5c S., 8c D...	Yes .	No...	Gravel.....
Columbia	No...	.....	4c D.....	No...	Yes .	Gravel.....
Columbia Falls	2	Sandy	4c S., 6c D...	Yes .	Yes .	Gravel.....
Cooper	No...	.....	No	No...	Yes .	Gravel.....
Crawford	No...	.....	No	No...	.....	Common soil.
Cutler	No...	.....	No	Yes .	No...	Gravel.....
Danforth	No...	.....	Yes	No...	Yes .	Broken slate.
Deblois	.....	.....	.....	.....	.....	.....
Dennysville	3	Sandy.....	10c D.....	Yes .	Yes .	Pin gravel....
East Machias	No...	.....	5c S., 10c D..	No...	Yes .	Gravel.....
Eastport	No...	.....	5c S., 10c D..	Yes .	No...	Beach gravel
Edmunds	No...	.....	6c S., 10c D..	Yes .	.....	Gravel.....
Forest City	2	Excellent...	No	No...	Yes .	Gravel... ....
Harrington	No...	.....	5c S., 10c D..	Yes .	Yes .	Gravel.....
Jonesborough	No...	.....	3c S., 5c D...	Yes .	Yes .	Loam .....
Jonesport	No...	.....	5c S , 10c D..	Yes .	Yes .	.....
Lubec	No...	.....	5c S., 10c D..	No...	Yes .	Beach gravel.
Machias	No...	.....	15c D.....	Yes .	Yes .	Gravel.....
Machiasport	No...	.....	10c D.....	No...	Yes .	Beach gravel.

etc., in the Several Towns of the State.

COUNTY.

Give number, kind§ and cost of road machines.	Give cost of operation per day.	Give miles turnpiked per day.	Give durability of turnpiking.	Does use of machine have tendency to narrow roads?	Does town use machine for smoothing surface?	Are results from use satisfactory?	Give special snow equipment.
1 W. R., $250; 1 Ac., $225.	$16 00	3	2 y	Yes .	Yes .	No...	Roller.
1 C., $200	20 00	½	2 to 3	Yes .	Yes .	Yes .	
2 A. C	9 00 to 15 00	1	1	No...	Yes .	Yes .	3 rollers.
1 C., $225	12 00	.....	.....	Yes .	Yes .	Yes .	
1 A. C.	13 00	.....	5 to 8	Yes .	Yes .	Yes .	
1 A. C., $250	14 00 to 16 00	½	1	Yes .	Yes	Yes .	Triangles.
1 C., $235	.....	.....	.....	.....	Yes .		
1 2d hand A. C., $75	12 00	1	2	No...	Yes .	Yes .	No.
1 A. C., $200	15 00	½	3 to 5	No...	Yes .	Yes .	3 rollers.
1 A. C., $225	10 50	½	2	Yes .	Yes .	Yes .	
1 A. C., $210	20 00	.....	.....	Yes .	Yes .	Yes .	No.
1	12 00 to 18 00	.....	.....	.....	Yes .	Yes .	
2 A. C., $225 each	12 00 to 15 00	¼ to ½	1 to 10	No...	Yes .	Yes .	
1 A. C., $218	10 00 to 12 00	½	1 to 2	Yes .	Yes .	Fair.	
1 A. C., $210	12 50	1	2	Yes .	Yes .	Yes .	
1 A. C.	14 50	¾	5	Yes .	Yes .	Yes .	
1, $275	12 50	½	1	Yes .	Yes		
1 A. C., $200	15 00	½	.....	Yes .	Yes .	Yes .	
1 Ac.	6 00	.....	1	No...	Yes .	Yes .	
1 W. R., $225	10 00	2½	3	Yes .	Yes .	Yes .	
1 A. C., $225	8 00	1	1	Yes .	Yes .	Yes .	
1 A. C.	12 00	.....	2 to 3	Yes .	Yes .	Fair.	
1 A. C	10 00	1	2	Yes .	Yes .	Yes .	
1 A. C., $210	12 00	1	10	No...	Yes .	Yes .	
1 C., $225	12 00	¾	.....	Yes .	Yes .	Yes .	No.
1 A. C., $200	20 00	1	5 to 6	No...	Yes .	Yes .	

§W. R.—Western Reversible; Ac.—Acme; C.—Climax; A. C.-American Champion.

COUNTY.

Yes	$10 00	½	.....	No...	Yes .	Yes .	
1 A. C., $245	16 00 to 20 00	1	2	.....	Yes .	Yes .	No.
1 A. C., $235	15 00	1½	2	Yes .	Yes .	Yes .	
1 A, $250	10 00	¼	1	Yes .	Yes .	Yes .	
1 W. R., $245	9 00	.....	6	Yes .	Yes .	Yes .	
1 V., $225	10 00	.....	.....	No...	Yes .	Yes .	
1 A. C., $225, last one	7 50	1	5	No...	No...	Yes .	Road machine.
1 A. C., $250	12 00	1	2	No...	Yes .	Yes .	
1 A. C., $225	8 50	2 to 3	3	Yes .	Yes .	Yes .	
1 A. C., $215	7 00	1	5	No...	No...	Yes .	
1 A. C., $250	8 00	.....	5	Yes .	Yes .	No...	No.
1, $240	14 00	¾	2	No...	Yes .	Yes .	
1 A., $250	12 50	1	2	Yes .	Yes .	Yes .	No.
1 V., $350	10 00	1	3	Yes .	.....	Yes .	
1 A. C., $250	8 00	⅝	3	No...	Yes .	Yes .	Plow.
No.							
1 A. C., $240.70	6 00	½	2 to 6	Yes .	Yes .	Yes .	No.
1 A. C., $300	7 00	¾	2	Yes .	Yes .	Yes .	
1 V., $250	10 00	⅝	5	Yes .	Yes .	Yes .	
No.							
No.							
1 A., $250	8 00	½	6 to 8	No...	Yes .	Yes .	
1 A. C	11 00	¾	4	Yes .	No...	No...	
1 A., $350	10 00	.....	3 to 5	No...	Yes .	No...	
1 A. C., $185	12 00	¼	5	Yes .	Yes .	Yes .	
1 A	7 00	½ to ¾	.....	No...	Yes .	Yes .	No.
1 A. C	7 00	½ to ¾	.....	No...	Yes .	Yes .	

§ A. C.-American Champion; W. R.-Western Reversible; A.-Austin; V.-Victor.

Highway Equipment, Road Building Materials,

WASHINGTON

Towns.	Does town own gravel pits?	What is character of material?	Does town buy gravel and at what price? S-single, D-double, horse loads.	Has town prospected for gravel?	Are there pits in town not opened?	Give nature of best surfacing material.
Marion	2	Sandy	10c S., 12c D.	Yes	No...	Gravel
Marshfield	No...		5c S., 10c D.	Yes	Yes	Gravel
Meddybemps	No...		No	Yes	Yes	
Millbridge	No...		5c S., 8c D.	Yes	No...	Gravel
Northfield	No...		6c D	Yes	Yes	
Pembroke	No...		4c S., 8c D.	No...	Yes	Beach gravel.
Perry	No...		5c S., 10c D.	No...	Yes	Beach gravel.
Princeton	1	Gravel	50c D			Gravel
Robbinston	No...		5c to 8c D.	No...	No...	Sea gravel.
Roque Bluffs	No...		Given	Yes	No...	Gravel
Steuben	No...					
Talmadge	No...		No	No...	Yes	
Topsfield	No...			Yes		Gravel
Trescott	No...		5c S., 10c D.	No...	Yes	Gravel
Vanceboro	No...		No			Loam
Waite	No...					
Wesley	No...		7c D	Yes	Yes	Gravel
Whiting	2	Good	6c S., 10c D.	Yes		
Whitneyville	No...		10c D	Yes	Yes	Gravel
PLANTATIONS.						
Codyville	No...		No			Gravel
Lambert Lake						
No. 14						
No. 18						
No. 21	Yes					

YORK

Acton	No...		No			Common soil.
Alfred	No...		5c S., 10c D.	Yes	Yes	Marl & gravel.
Berwick	No...		5c S., 10c D.	No...	No...	Rotten stone.
Biddeford	2	Mixed	8c S., 12c D.	Yes	Yes	Crushed stone
Buxton	No...		5c S., 10c D.			
Cornish	No...		Loam, 10c D	No...	Yes	
Dayton	1		10c D	No...	Yes	Gravel
Eliot	2		12c D	Yes	No...	Rotten stone.
Hollis			5c S.,10-15c D	No...	Yes	Gravel
Kennebunkport	2		10c S., 20c D.		Yes	
Kennebunk	1	Mixed	No	No...	Yes	
Kittery	1	Mixed	15c D	Yes	Yes	Gravel
Lebanon	No...		No			
Limerick	No...		No			
Limington	No...		No	No...		
Lyman	1	Gravel	5c S., 10c D.	Yes	Yes	
Newfield	No...		No	No...	Yes	
North Berwick	No...		10c D	Yes	Yes	
Old Orchard	No...		8c S., 15c D.	Yes	No...	
Parsonsfield *						
Saco	1	Sandy	7c S., 10-15c D	Yes	Yes	Trap rock.
Sanford	No...		Yes			
Shapleigh			No	No...		
South Berwick	No...		10c S., 15c D.		Yes	Gravel
Waterboro	No...		5c S., 10c D.	No...	No...	Gravel
Wells	5	Pair	†	No...	Yes	Gravel
York	1	Mixed	15c D	Yes	Yes	Gravel

* No report from Parsonsfield.

† 3c to 15c S., 5c to 25c D.

etc., in the Several Towns of the State.

COUNTY—CONCLUDED.

Give number, kind§ and cost of road machines.	Give cost of operation per day.	Give miles turnpiked per day.	Give durability of turnpiking.	Does use of machine have tendency to narrow roads?	Does town use machine for smoothing surface?	Are results from use satisfactory?	Give special snow equipment.
No.							
1 A. C., $250	18 00 to 20 00	½-¾	4 to 5 y	Yes	Yes	Yes	
1 A. C., $250	14 00	½-¾	1	No...	Yes	Yes	
1 A. C., $210	12 00	1	1	No...	Yes	Yes	
1 A., $250	16 50 to 18 50	1¾	1	No...	Yes	No...	
1, $225	10 00	½-¾	5	Yes	Yes	Yes	
1 A. C., $250	10 00	½-¾	3	Yes	Yes	Yes	
1	12 00	.....	.....	No...	Yes	Yes	
2 V., one $200; one $250.	8 00 to 10 00	½-¾	1 to 3	Yes	Yes		
1 2nd hand A. C., $25	7 00	.....	.....	No...	Yes	Yes	
1 A. C., $210	7 50	½	1	No...	Yes	Yes	
1 A., $300	9 00	½-¾	4	No...	Yes	Yes	
1, $225	10 00	1	6	Yes	Yes	Yes	No.
No.							
1 A. C., $250	15 00	½	3 to 4	No...	Yes	Yes	
1 A. R	.....	.....	3 to 4	Yes	Yes	No.	
1 A., $300	10 00	1	6 to 10	No...	Yes	Yes	
1 A. C	.....	.....	.....	Yes	.....	Yes	
1, $250	9 00	½	3	Yes	Yes	Yes	
No.							
No.							

§ V.—Victor; A. C.—American Champion; A.—Austin; A. R.—Western Reversible; A. R.—Austin Reversible.

COUNTY.

1 C., $225	$20 00	1	2 to 10 y	No...	Yes	Yes..	
1 W. R., $250	12 00 to 15 00	½ to ¾	2 to 4	Yes	Yes	No...	
1	20 00	½-¾	3	No...	Yes	Yes..	
2	5 00 to 8 50	.....	.....	.....	Yes	No...	Roller.
2 C., $200 each	30 00	1	.....	No...	Yes	Yes	Rollers.
Yes, 1, $196.22	8 00	.....	1	Yes	Yes	Yes	Rollers.
1 A. C., $250	12 00	1	15	Yes	Yes	Yes	No.
1 C,. $230	14 00	½-¾	3	Yes	Yes	Yes	No.
1 A. C	10 50	.....	.....	.....	Yes	Yes	Roller.
1 $200	10 00	½	4	No...	Yes	Yes	
1	.....	.....	.....	Yes	Yes	Yes	3 rollers.
1 A. C., $200.50	8 00	1	3	No...	Yes	Yes	Roller.
Yes.							
2	12 00	.....	.....	Yes	Yes	Yes	
2	12 00	.....	.....	Yes	Yes	Yes	6 rollers.
1 2d hand A. C., $150	8 00	.....	3 to 5	No...	Yes	Yes	No.
1 C., $238.85	20 00	1	2 to 3	No...	Yes	Yes.	
No.							
Hire one.	7 00	.....	.....	No...	Yes	Yes	
2 A. C.; 1 Ac.; 1 W., $250	5 00	.....	.....	.....	Yes	Yes	
1 A. C	.....	1 to 5	.....	Yes	Yes	Yes	Roller.
1 C., $200	20 00	¾ to ⅞	2 to 3	Yes	Yes	Yes	
No.							
2	10 00 to 12 00	.....	.....	Yes	Yes	No...	4 snow rollers.
1, $225	7 25 to 10 75	½-¾	1	Yes	Yes	Yes	
1 V.; 1 A. C	14 00	½	4	Yes	Yes	Yes	

§ C—Climax; W. R.—Western Reversible; V.—Victor; Ac.—Acme; W.—Western.

STATEMENT OF ROCK CRUSHING PLANTS AND ROAD ROLLERS OWNED IN THE STATE.

Compiled from Data Furnished by Towns For Table 2.

ROCK CRUSHERS.

Auburn—Owns "one man" Climax portable crusher; purchased 1901; 20 foot elevator; 4 screens, fine to 3 inches, and bins; cost of plant, $1,800; cost of daily operation, $19.25, detail not given; capacity, 100 tons. City buys rock at 75 cents per cubic yard delivered.

Lewiston—Owns No. 2 1-2 Climax stationary crusher; purchased 1903; 10 by 20 inch jaws; have 20 foot elevator; three screens and bins; cost of plant exclusive of boiler and engine, $1,831; owns and uses 25 H. P. boiler and engine to run plant; cost of engine, $316; cost of boiler, $570; cost of daily operation, engineer, $2.25; two men feeding crusher, $3.00; other labor, $3.75; 1 team, $3.50; coal, etc., $2.50; total, $15.00; daily capacity, 150 to 175 tons. City buys rock at $3.75 per cubic yard delivered.

Houlton—Owns No. 8 Acme stationary crusher; purchased 1901; 8 by 16 inch jaws; 10 foot elevator; 3 rotary screens and 3 bins; owns and uses 20 H. P. engine and boiler combined; cost of all of the above equipment, including 3 ton horse roller, $2,000; cost of daily operation, engineer, $3.00; 3 men at $1.75, $5.25; fuel, $1.50; water, $ .75; oil and waste, $ .50; total, $11.00; capacity, 60 to 80 tons; rock is given to town.

Sherman—Owns Climax portable crusher; purchased 1903; 9 by 16 inch jaws; 15 foot elevator; 3 rotary screens and bins; owns and uses 15 H. P. engine and boiler (but reports that 20 H. P. would be better); cost of above plant complete, $1,760; cost of daily operation, $35, detail not given; capacity, 120 tons; rock is given to town.

Brunswick—Owns one Champion portable crusher; purchased 1900; 16 inch jaws; no elevator; 1 screen, 3-4 inch mesh, and no bins; owns and uses 12 H. P. engine and boiler; cost, "As near as can be found out, the crusher and engine cost about $700;" cost of daily operation, $9.00, detail of cost not given; daily capacity, about 18 cubic yards.

Portland—Owns one Climax portable crusher; 9 by 15 inch jaws; 20 foot elevator; 3 rotary screens and bins; cost not given; also owns one Blake stationary crusher; 9 by 16 inch jaws; 19 foot elevator; 3 rotary screens and bins; cost not given; cost of daily operation for the two plants together, $22.50, exclusive of quarry expense; capacity of combined plants, 100 tons. City owns ledge of fair quality. City buys crushed stone at $1.45 per ton f. o. b., Portland.

So. Portland—Owns Gates No. 2 portable crusher; purchased 1890; 6 by 14 inch jaws; no elevator, screens or bins; owns and uses 20 H. P. engine and boiler; cost of complete plant as above, $2,700; cost of daily operation, $10.00, detail not given; capacity, 30 tons.

Westbrook—Owns Blake stationary crusher; 20 foot elevator; 3 screens and 3 bins; cost, $1,400; owns and uses 20 H. P. boiler and engine; cost, $1,100; cost of daily operation, engineer, $2.50; fuel, $1.50; total, $4.00. City owns good ledge, also buys crushed rock at $1.40 per ton, f. o. b., cars.

Eden—Owns one Climax portable crusher; purchased 1902; 9 by 16 inch jaws; 16 foot elevator; 3 section rotary screen and bins; cost, $2,000; cost of daily operation, $25.00; capacity, 40 tons; also owns one National stationary crusher; 9 by 16 inch jaws; 12 foot elevator; 3 section rotary screen and bins; cost, $2,000; cost of daily operation, $25.00; capacity, 40 tons. Town owns good ledge; buys rock at 12 cents per yard, in ledge; buys crushed stone at $2.25 to $2.50 per yard.

Ellsworth—Owns Acme stationary crusher; purchased 1895; 8 by 16 inch jaws; 25 foot elevator; 3 screens and bins; owns and uses 15 H. P. engine and boiler; cost of complete plant as above, $2,500; cost of daily operation, including all expense of quarrying, breaking, hauling and feeding stone to crusher, also labor and fuel for running plant, $50.00; capacity, 100 tons. City owns ledge of fair quality.

Waterville—Owns crusher which is not used.

Camden—Owns crusher which has not been used for five years.

Rockland—Owns No. 4 Champion portable crusher; purchased 1903; 9 by 15 inch jaws; 28 foot elevator; screen into 5-8, 1 1-2 and 2 1-2 inch sizes; has three bins; cost, $2,450, with Ajax 20 H. P. engine and boiler, mounted on wheels; cost of daily operation not given; capacity, 100 to 150 tons per day. City buys stone at $50.00 to $100 per year.

Boothbay Harbor—Owns Blake stationary crusher; purchased 1904; 18 foot elevator; 3 screens and bins; cost, $850; cost of daily operation, $13.00, detail not given; capacity, 75 tons. Town buys stone at 25 cents per ton.

Rumford—Owns Champion portable crusher; purchased 1901; 9 by 15 inch jaws; cost, $900; 15 foot elevator, cost $110; 4 screens and 4 bins; owns and uses 20 H. P. gasoline engine; cost, $600; cost of complete plant as above, $2,000; cost of daily operation, 8 men at $1.65, $13.50; team labor, $5.00; gasoline, $1.80; total, $20.00; capacity, 50 tons. Town owns good ledge.

Bangor—Owns Climax portable crusher; purchased 1900; 18 by 20 inch jaws; 28 foot elevator; 3 size revolving screen and 4 bins; owns and uses 15 H. P. boiler and engine; cost of complete plant as above, $2,600; cost of daily operation, including cost of blasting, crushing and hauling away, $50.00; capacity, 50 to 100 tons. City owns poor ledge and does not buy stone.

Brewer—Owns No. 4 Climax portable crusher; purchased 1905; 12 by 28 inch jaws; 14 foot elevator; 3 size revolving screen and 3 bins; owns and uses 20 H. P. engine and boiler; cost of complete plant as above, $1,850; cost of daily operation, 6 men at $1.75, $10.50; 1 man at $1.25; engineer, $2.50; 2 single teams at $2.50, $5.00; total, $19.25; capacity, 150 tons on 2 inch opening.

Eddington—Owns Champion No. 4 portable crusher; purchased 1905; 9 by 15 inch jaws; 19 foot elevator; 3 size revolving screen and 3 bins; cost, $1,050, with extra set of dies; hires 20 H. P. engine to run same; cost of daily operation, engineer, $2.50; wood and oil, $2.50; 1 man to feed, $2.00; 1 helper, $1.50; 3 men loading teams at $1.50, $4.50; 4 teams at $3.00, $12.00; total, $25.00; capacity, 60 tons crushed fine. Rocks given to town.

Old Town—Owns Farrel stationary crusher; purchased 1905; 9 by 15 inch jaws; elevator; 3 size screen and no bins; owns and

uses 25 H. P. boiler and engine; cost of complete plant as above, (all second hand), delivered and set up, $1,400; cost of daily operation, engineer, $2.50; 2 men on platform at $1.75, $3.50; 2 men, horse and cart, $4.50; coal and oil, about $3.75; total, $14.25; capacity, 150 tons; pays 10 cents per cubic yard for field rock, cost of digging and hauling, 35 cents per yard; total, 45 cents per yard.

Topsham—Owns Climax crusher; purchased 1901; reports cost as $1,500.

Skowhegan. Owns No. 2 Climax stationary crusher; purchased 1902; 9 by 16 inch jaws; has elevator; 4 size screen and 4 bins; owns and uses 15 H. P. engine and boiler; cost of complete plant as above, $2,456; cost of daily operation, $12.50; capacity, 40 to 60 tons. Town does not own ledge; buys rock at 40 cents per ton.

Calais—Owns Blake stationary crusher; purchased 1890; 12 by 20 inch jaws; 15 foot elevator; 2 oscillating screens and bins; owns and uses 25 H. P. engine and boiler; complete cost of plant as above, $2,127; cost of daily operation, labor $4.00, fuel, etc., $1.20; total, $5.20; capacity, 85 tons. City owns good ledge.

Biddeford—Owns stationary crusher; purchased 1902; name and size not given; 3 screens and bins; owns and uses 12 H. P. engine and 30 H. P. boiler; cost of complete plant as above, $2,500; cost of daily operation, engineer, $2.50; two men feeding crusher at $1.50 each, $3.00; total labor, $5.50; uses one-half ton coal, $2.50; total, $8.00; capacity, 35 to 45 tons. Plant located on private property, owner gives rock for city use.

ROAD ROLLERS.

Auburn—Owns Buffalo Pitts, 10 ton, steam roller; purchased 1904; cost, $3,000; cost of operation per day, $6.50.

Lewiston—Owns Kelley-Springfield, 20 ton, steam roller; purchased 1894; cost, $5,000; cost of operation per day, $5.25. Also owns 2 horse rollers; cost of operation per day, $7.00 for large one, $3.50 for small one.

Houlton—Owns Acme, 3 ton, horse roller; purchased 1901; cost about $200; cost of operation per day, 1 man and 4 horses, $8.00.

Brunswick—Owns Champion horse roller; purchased 1893; weight not given; cost, $375; cost of daily operation, $8.00.

Portland—Owns Buffalo Pitts, 12 ton, steam roller; purchased 1901; cost, $2,965; cost of daily operation, $6.00 to $8.00; also owns Aveling and Porter, 15 ton, steam roller; cost not given; cost of daily operation, $6.00 to $8.00.

Eden—Owns Buffalo Pitts, 14 ton, steam roller; purchased 1897; cost, $3,500; cost of daily operation, $6.50.

Ellsworth—Owns Acme, 5 ton, horse roller, purchased about 1898; price not given; cost of daily operation, $12.00, three two-horse teams at $4.00 per day.

Waterville—Owns 10 ton, steam roller; cost, $3,000; cost of daily operation, $10.00.

Rockland—Owns Buffalo Pitts, 10 ton, steam roller; purchased 1903; cost, $3,075; cost of daily operation, $5.50.

Vinalhaven—Owns Champion, 2 1-2 ton, horse roller; purchased 1896; cost, $325; cost of daily operation, $9.00.

Boothbay Harbor—Owns Climax, 5 ton, horse roller; purchased 1902; cost, $369.57; cost of daily operation, $9.50.

Rumford—Owns Champion, 4 ton, reversible, horse roller; purchased 1902; cost, $400; cost of daily operation, $10.00.

Stoneham—Owns 2 ton, horse roller; cost not given; cost of daily operation, $15.00.

Bangor—Owns Kelley-Springfield, 20 ton, steam roller; cost, $3,696.60; cost of operation per day, engineer, $4.00; coal, $2.00; oil, $ .50, and sundries; total, $7.00 to $10.00.

Topsham—Owns 2 ton, horse roller; purchased 1902; cost, $300; cost of daily operation, $10.00.

Skowhegan—Owns 3 1-2 ton, stone roller; cost not given; cost of daily operation, 2 men and four horses at $4.00 per day, $8.00. Town occasionally hires steam roller from city of Waterville; rent paid, $10.00 per day including wages of engineer.

Belfast—Owns 2 ton, granite, horse roller; purchased 1890; cost, $70.00. Does not use it.

Calais—Owns Buffalo Pitts, 14 ton, steam roller; purchased 1903; cost, $3,150; cost of daily operation, $3.00.

Lubec—Owns second hand, 2 1-4 ton, horse roller; purchased 1904; cost not given; cost of daily operation, $8.00.

Biddeford—Owns Kelley-Springfield, 18 ton, steam roller; purchased 1894; cost, $3,000; cost of daily operation, engineer, $2.50; coal, $3.00; total cost, $5.50.

York—Owns Champion, reversible, 3 1-2 ton, horse roller; purchased 1903; cost, $295; cost of operation per day, $6.00.

STATE ROADS.

PROVISIONS OF LAW RELATING TO STATE ROADS.

Revised Statutes of 1903, Chapter 23, as Amended by Chapter 115, Public Laws of 1905.

Section 99. Upon the request of the municipal officers of any town, the county commissioners of the county wherein said town is located, shall designate that highway running through said town which in their judgment is the main thoroughfare, and said highway shall be known as a state road.

Section 100. Towns establishing state roads as aforesaid may, on complying with the conditions hereinafter set forth, receive from the state one-half of the amount actually expended in permanent improvement of said roads, not exceeding three hundred dollars a year; provided, that no town shall receive such state aid unless its expenditure for such road shall amount to at least one hundred dollars, and shall have been exclusive of and in addition to the amount regularly raised in such town for highways and bridges; and provided, also, that the amount so expended shall be used before the first day of October in permanent improvement of a portion of said road, and in a manner satisfactory to the county commissioners of the county wherein said road is located. Said permanent improvement shall be on a continuous portion of said road for at least one year. Such aid shall be paid from the state treasury on and after the first day of January, upon certificate by the governor and council, as provided by the following section.

Section 101. Municipal officers of towns improving state roads under the foregoing provisions shall annually before the first day of November make returns under oath to the county commissioners of their county of the amount appropriated and expended by their town in such permanent improvements, the

amount of road improved, and the character of the work done. The county commissioners shall inspect the roads so improved and if they are satisfied that the provisions of the preceding sections have been complied with, they shall certify to the governor and council the sum which said town is entitled to receive from the state. Any town dissatisfied with their decision may appeal to the governor and council. The governor and council shall issue a certificate to the treasurer of the town for such amount as they adjudge such town entitled to receive from the state treasury.

Section 102. Towns desiring to take advantage of the provisions of sections ninety-nine to one hundred and five inclusive, may, through their municipal officers, make application therefor to the secretary of state, and he shall record such applications in the order in which they are received.

Section 103. No town which receives by special act or appropriation assistance from the state in the construction or repair of its highways or bridges shall be entitled to the benefits of sections ninety-nine to one hundred and five inclusive during the year in which such assistance is given.

Section 105. The word "town" in the six preceding sections shall be construed as meaning cities, towns or organized plantations. Nothing therein contained shall be construed as changing the existing control of highways by counties or towns or as limiting or changing their liabilities therefor.

(Section one hundred and four is repealed.)

ADDRESS BY COMMISSIONER SARGENT.

Upon invitation of the Aroostook county commissioners, the following address was delivered before the annual convention of the County Commissioners of Maine, at Houlton, August 2, 1905.

Mr. Chairman and Members of the Convention:

I want to thank you first of all for your invitation to be present at this convention, because it affords me an opportunity to get acquainted with practically all of the county commissioners of our State. I realized as soon as I was appointed to my present position, that a large part of my work must necessarily be done

through and with the various boards of county commissioners. This, of course, on account of our present State Aid law, which puts the laying out of state roads, the superintendence of their construction and their final acceptance or rejection in the hands of the county commissioners.

When it became known that a Commissioner of Highways had been appointed, the officers of many towns assumed that authority over the state roads had been vested in him, and I have had several requests to make layouts of the same, and give advice as to their construction. I have in most instances referred the applicants to the commissioners of their county, as I have not been able to learn from many of your boards just what you required to be done, and I have felt, that until we had some understanding, it would be useless for me to lay down principles for the construction of state roads, when I had nothing to say about their acceptance.

I will say, that from what I have seen of state roads built the past few years and from what I have learned from the few boards of county comissioners whom I have met and advised with, that I feel that our state road law is being wisely and fairly interpreted on the whole. I have a feeling however, that the work lacks uniformity. That is, that all boards do not require the same standard of work. If this is so it is a matter that needs consideration, for all parts of our State should be used alike in this work. I endeavored to find out just what each board required, as you all know, by addressing a letter to each board, early in June, asking for copy of such specifications and circulars as were used in connection with this work. So far, I have had replies from eleven boards. Of these eleven boards three forwarded printed specifications, and the others outlined in a general way about what they required. All recognize that each individual case requires its own treatment, which of course is correct, generally speaking.

I will read the three specifications which I received.

One is as follows:

"Road to be graded to a width of not less than 16 feet and well graveled with not less than 300 cubic yards of gravel to a mile.

All culverts to be built of stone or iron pipe.

All bridges to have substructures of split stone."

Another reads:

"Road to be graded to a width of not less than 20 feet. Graveled with not less than 400 cubic yards of gravel per mile.

All culverts to be made of split stone or iron pipe.

All bridge to have substructures of split stone."

The third reads:

"That a good road should be at least 22 feet in width.

All bridges and culverts should be from 22 to 24 feet in width.

That the drainage should be perfect and the ditches so constructed that the water will not remain in them.

That a coating of gravel, or gravel and clay, according to the nature of the soil, should be used from four to eight inches thick."

These specifications are all good, but I think they can be improved and should be made more explicit, that is, supplemented by more or less instruction outside of the bare statements. How much more businesslike it is to send to a town whose officers apply to you for instructions regarding "state road" a good, clear, printed statement of just what you will require, than to write the thing all out each time an inquiry comes in; or in lieu of this to take the time and expense of making a trip to tell the municipal officers the same thing. A part of the verbal instruction may be forgotten, whereas the printed specification will be a constant reminder, and from it points would undoubtedly be learned that would be applied to the general town work, with beneficial results.

Let us consider for a moment that we are going to build 100 miles of steam railroad. The survey has been made and the location completed and the contracts let for construction. We will suppose, if you please, that there is no general contractor for the whole line but that the company deals with say twenty contractors, letting to each one, sections varying from two to ten miles in length. The contractors start in on construction, clearing and grubbing right of way, building culverts and bridges, making excavations and fills. One by one they finish their work, and move to the next job.

We will now take a walk or a ride over the entire 100 miles of grade and we find that it is impossible to tell what part of the work each contractor did. There is nothing to indicate where one man left off and another began.

The reason for this, as you all know, is because all the work was done under one specification. As a matter of fact the speci-

fication was the first thing the company decided upon. Whether they should build a standard or narrow gauge, single or double track road. What the limiting grades would be, and what the character of their culverts and bridges would be. The road was financed on this basis, surveyed and located, with the specification in mind; contracts let and the work done according to specification. The construction work was actually performed by twenty different men, yet we find every cut or fill the whole length of the line, the same width as every other cut or fill. The same general statement applies to every other class of the work.

We can hardly conceive that each of our twenty contractors has had identically the same material to use. Probably all classes of material have been met, gravel, clay, sand, ledge; in one place the road might have crossed a bog that needed corduroy before it would hold up the grade. At some bridge abutment a pile foundation that was not planned for has been put in. Springs have been opened, that have needed underdraining, and so we might go on enumerating local conditions that have been met and overcome.

The finished roadbed, however, in every case conforms to the general specification.

The point of the illustration you have undoubtedly guessed before this; the road runs through perhaps twelve or fifteen towns and possibly two or three counties. The builders have encountered the same problems that our local road commissioners meet, and that you county commissioners, as an advisory board, each in your own country, are called upon to dispose of. But do the finished roads in each county conform to one specification?

I have always been a believer that a great many economic principles could be borrowed from the railroads and applied with profit to highway work in general. I am going to say now that the first principle that should be applied is that of having a standard for our state road work, or in other words, a uniform specification for doing this work.

In preparing or recommending such a specification we should be guided largely, I believe, by prevailing practice in those states which have had several years of experience along this line of work. As far as their practice can be applied to our needs and to our local conditions it certainly seems to me it should be adopted.

The pioneers in any movement take such position and make such recomendations as they believe to be right. If experience shows any part of their position or recommendations to have been wrong and capable of improvement, then by elimination and selection, gradually a finished or more perfect system of practice is evolved. So with state road specifications—those states which have passed through a dozen years of experience must certainly have discovered the weak points in their original recommendations and have revised these recommendations or supplemented them with points learned by experience, until they now recommend and use only what experience has proved to be best.

Accordingly by taking as a guide prevaling standards in those states oldest in the art of improved road building we should have the advantage of starting in this State with the correct guiding principles of improved construction as developed by their years of experience. This should save us from costly errors. A rough way of putting the above might be to say "We will steal, as far as we are able to use it, the experience of other states."

Consequently the recommendations in this paper are based largely on the experience of neighboring states as I see them in their present standards for state road work, and are such as I believe will apply to conditions in this State.

WIDTH.

The first thing the specifications I have read touch upon is width, and I believe that is the first thing we should settle. To determine the proper width of a road, of course we must consider the amount and character of traffic passing over it. It is obvious that travel will be more congested as we approach cities and large villages, and less crowded the farther away from them we get. These are local conditions, that could best be determined by observation of the traffic for stated periods at regular intervals through a year. Past experience of those using the road would help to determine whether it was wide enough or whether it should be widened before being improved.

What our specifications should deal with is the proper width of "main traveled thoroughfares" leading from one town to another. After an extended study of this question the Massachusetts Highway Commission have adopted a standard width of 21 feet.

This gives width enough for two teams to pass each other while at the same point one team is standing on the side of the roadway.

From a day's travel with one of their division engineers over some 70 or 80 miles of road of this width, I was led to believe it was wide enough for any of our inter-town roads. On the trip I mention we met all kinds of traffic from heavy truck teams to light pleasure vehicles, and many automobiles, and there was sufficient width to accommodate all.

I might say in passing that this 21 feet of width is divided as follows: 15 feet of hard road or traveled way, with a three foot dirt shoulder on either side.

New Hampshire, after two years of preliminary investigation, has just inaugurated a system of state aid, and in conversation with their state engineer a few weeks ago, he told me his specification for width outside of cities and towns, on main traveled ways, was 15 feet of traveled way and three foot shoulders on each side.

From the circular letter of Hon. Charles W. Gates, State Highway Commissioner of Vermont, to the local road commissions this year, I quote the following in relation to width. "A good standard for country roads twenty feet with a well built track of twelve feet, and four foot shoulders."

I do not believe the roads in Maine need to be any wider than they do in the neighboring states just referred to.

Let me say that I do not think that all roads that will eventually be improved will need to be of the same width as the "main traveled thoroughfares." A less width will do for roads leading into these main thoroughfares. They should be known by some other name, or put into another class. It may be necessary indeed to have three or more classifications. That is a matter that can be determined only after a thorough study of our roads as a system.

SURFACING MATERIAL.

The next thing the specifications I have read deal with is gravel. By this is meant the wearing surface of the road. The specifications are faulty in not specifying how this gravel should be spread and those specifying 400 or 300 cubic yards per mile I consider very blind. I will confess I was some little time in figuring out just how much gravel would have to be spread to

come within this specification. Taking the 20 foot roadway and 400 cubic yards of gravel, I arrived at this result: One and one-fourth inches of gravel for the whole width or two and one-half inches for a width of 10 feet. I doubt if any board considers it necessary to spread gravel the whole width of the road, or at least, as thick on the sides of the road as in the center. But I do not learn this from any of your specifications. That point would undoubtedly be explained verbally or left to the judgment of the local commissioners, the latter allowing for considerable variation in the work.

As indicated above, our neighbors have adopted the method of spreading gravel or broken stone on the central 12 or 15 feet of the roadway, making the shoulders of natural earth. This method of placing the surfacing material has long been in use by those who have made a study of economic road building. These shoulders make a side support for the gravel or crushed stone, and keep it from crowding and washing into the side ditches. They should be thoroughly compacted by rolling or tamping and finished on the same or a little steeper transverse slope than that given the hardened part of the road.

By this method full return is received for the expenditure on account of surfacing material. It is placed and held on the part of the road used by the traffic. Experience has shown that the dust and worn particles that wash from the surface of a macadam road have a tendency to harden the earth shoulders, and after a little they will hold up any unloaded wagon without rutting. When rutted by heavy teams they should, on any kind of a road, be immediately repaired.

CROWN.

One of the most important things in finishing any road, is to give it crown, that is making it higher at the center than at the sides. This is not touched upon by any specification I have read. Experienced road builders have learned that crowning a road and keeping it crowned adds materially to the wearing qualities of the road by quickly turning all surface water to the side ditches, thereby keeping the surface dry and hard, and free from ruts caused by water soaking into the surface and softening the same.

On my recent trip to Massachusetts above referred to, the first point of difference between their roads and the roads in

Maine which caught my eye was the crown. In the case of roads built by the Massachusetts Highway Commission, the standard of crown is three-fourths inch per foot on the hard surface, gravel or macadam, and one inch per foot on the shoulders. All authorities that I have read or consulted agree that some crown is essential; of course the amount depends upon the surface material and should be more for a soft material like clay or loam, and less for well compacted gravel or macadam. Crown is finished in two ways, either as the arc of a circle or as two straight lines sloping downward and outward and rounded a little where they join at the center. I do not think the special form of crown is so important to us at present as is the importance of finishing the road with a crown.

Use Road Machine to Give Crown.

As far as I know we have few road rollers in the State, but we do have a considerable number of road machines and I believe one of the best uses that can be made of a road machine is in keeping the surface of a gravel or dirt road smoothed and planed down by two or three trips of the machine over the roads in the summer. I would especially recommend this treatment on new sections of road say after the road has been used a month or six weeks and depressions, ruts and bunches have begun to appear. The machine should be run over the road taking a light cut off the bunches and depositing the material in the ruts and hollows.

The proper time for doing this work would be after a rain storm when the material was moist and in good condition to pack.

This work should be done with the object of crown in view and I believe good results would be obtained.

Brush Harrow for Giving Crown.

This smoothing may also be accomplished by a brush harrow, same as we have all seen used for keeping the surface of a race track smooth and free from ruts. A considerable number of these harrows are in use in every farming community for smoothing fields after grain has been harrowed in.

To fill ruts and preserve crown of a road the harrow should be modified by inserting the brush into the head piece at an angle

of 45 degrees and giving the head piece a cutting edge, so that when drawn along the road the loose material will be worked from the sides toward the center.

Split Log Drag.

A new implement for maintaining a smooth surface and keeping a road crowned is the split log drag invented by D. Ward King of Missouri. This is constructed by splitting a log (preferably hard wood) from eight to ten feet long and ten to twelve inches in diameter lengthwise in halves. These halves are placed 30 inches apart, with the split faces to the front, so that the sharp edges shall act as scrapers. The two halves are fastened in this position by three cross bars or spreaders of hard wood inserted into two-inch auger holes and wedged. A plank is put upon the cross bars upon which the driver stands. A chain for drawing is attached either around the forward ends of the outer cross bars directly behind the front log, or better, into eye bolts in the front log near each end. The hitch should be at such a point in the chain that the drag will move at an angle of about 45 degrees to the direction of the road.

It is claimed that great work has been done with this implement in some of the western states in giving crown and hard surface to clay and other natural earth roads. To obtain best results it must be used immediately after every rain storm. The idea is that the puddled clay is smoothed and shaped by the drag and then dried and baked by the wind and sun.

If any of these devices are used for smoothing a gravel road with earth shoulders, care should be taken not to draw the earth from the shoulders upon the gravel. A good gravel surface may be spoiled in this way. Probably the best way to smooth a gravel road with earth shoulders, is by men using rakes.

This matter of finishing roads and touching them up a little here and there, as the travel indicates that attention is needed, costs very little in comparison with results obtained in wearing quality of the road, and satisfaction to users. It is a point that I believe has been overlooked in a great many towns in our State.

Let me say here that to get the best results, the subgrade should be given the same crown as the finished surface or possibly a bit flatter as it is customary to spread the surface coat thicker at the

center than at the sides. Of course to obtain best results both subgrade and surface coat, or the road metal, as some builders call the wearing material, should be rolled thoroughly and evenly.

The crown should be more on a hill than on the level on account of the greater tendency on the hills for the surface water to follow the wheel ruts and make them deeper.

CULVERTS AND BRIDGE SUBSTRUCTURES.

As to culverts and bridge substructures, our specifications are good, calling as they do for a permanent class of work. I would like to be assured that every board demanded this class of work. The only special care needed here is to secure good foundations and be sure the opening is large enough to accommodate more than the largest known flow of water.

On account of the general distribution of good building stone throughout our State, I would say that split stone culverts will probably be found cheaper than iron pipe, area of waterway considered.

DRAINAGE.

Now as to drainage: The builder who carries out the provision of this specification, "that the drainage should be perfect and the ditches so constructed that the water will not remain in them," is bound to have pretty nearly a perfect piece of road. I do not remember that I have ever seen or heard a more concise statement of what drainage should be.

As every one knows, water is the great enemy of roads, and every precaution should be taken to secure as nearly as possible, perfect drainage. Drainage alone will often change a bad road into a good one, while on the other hand the best road may quickly go to ruin for lack of drainage.

Hardly any builder would think of constructing or repairing a piece of road without making surface ditches, and with the single exception of a natural sand road which is improved by being kept moist, these surface ditches should always be carefully constructed. The best form is with broad flaring sides which are least liable to cleave off and fill the bottom of the ditch with mud, thereby obstructing the free flow of water and causing the liability of a washout in the road.

On a side hill or on a road passing around the point of a hill provision must be made for surface water falling on that part

of the hill which slopes upward from the road. Generally only one ditch—that on the side towards the hill—will have to be designed to take care of this extra water. This point should not be overlooked.

All ditches should be built on a true grade and should lead to some natural watercourse away from the road.

Right here there occurs to my mind a point which I have thought for a long time has been neglected. That is the failure to effectually carry drainage away from our roads. Many times water can be found standing in side ditches, where it remains until soaked up by the roadbed, evaporated or turned into frost. Wherever this is seen steps should be taken to lower the grade at once, so that the water will drain off. The inspection of ditches after a shower or rain storm will show just where the grade needs to be lowered, and when a ditch is found free from these pools the grade is known at once to be all right.

But a more serious and careless oversight it seem to me is in draining into swamps and bogs across which the road runs and then making no provision for carrying the drainage away. Occasionally no outlet can be found and the only remedy is to raise the grade across the swamp until it is high enough above the water to insure a dry roadbed; but in most cases there is a natural outlet upon which if a little work were done a great improvement would result.

Objection may be made that the town will be doing work outside the road limits and will be improving somebody's land. So much the better; this should be reason enough for the adjacent property owners to join hands with the town authorities and both receive improvement at reduced cost.

As to legal rights of towns to do this work reference may be made to sections 26 and 27 of chapter 21, Revised Statutes 1903, which takes the matter up fully, setting forth the conditions under which "the municipal officers of any town may construct drains and ditches to carry water away from any highway or road therein, over or through any land of persons or corporations when they deem it necessary for public convenience or for the proper care of such highway or road."

Paved Ditches.

If the grade of the road and the ditch is quite heavy, and the material liable to wash and scour, it may be necessary to pave the bottom and sides of the ditches with flat field stones. If care is taken in selecting these stones and placing them a very good job can be done. You have all seen the gutters of city streets paved this way with brick, granite blocks or cobble stones.

Underdrainage.

Frequently the necessity for underdraining will exist, especially in clay and other heavy soils. I believe neglect of this has been one of the greatest and most serious oversights in our road building in the past. We have in this State pursued a course of putting surface material on our roads, year after year, and as you all know we are almost as much in the mud now as we ever were.

How much time have we spent building road foundations and draining them? Why should we expect to build a good road without a foundation any more than to build a house or any other structure without a foundation? How long would our brick and granite blocks, permanent structures as we call them, be permanent and lasting if set on the surface of the ground? Does the good foundation on which they rest have anything to do with preserving their superstructures?

We can never have good roads until we have good foundations for them, especially in this northern climate where frost goes so deep. By good foundation is meant dry foundation; a perfectly drained foundation; one in which the action of the frost will be reduced to a minimum.

The best way to tell where subdrainage is needed is by watching the roads in the spring of the year. Wherever the road breaks up badly when the frost "comes out" you may be sure that no lasting improvement can be made unless the place is first thoroughly subdrained.

Subdrains should be laid below the frost and should be carried to some outlet. In many cases they will drain springs or provide for the removal of water from the foundation derived from waterbearing strata opening under the road. Consequently they should be in working condition at all seasons of the year.

From Farmers Bulletin No. 136, U. S. Department of Agriculture, Earth Roads by Maurice O. Eldridge, Assistant Director Public Roads Inquiries, I quote the following: "When water is permitted to remain in the foundation of a road through the winter, it freezes, expands, and loosens the soil. One hundred volumes of water make when frozen, 109 volumes of ice. When the warm spring weather comes, this ice melts, and as there is no place for the water to go, the ruts in the springy soil become deeper and deeper until wagons often sink to their hubs and horses flounder laboriously through the resulting slough. The remedy, therefore, is to get rid of the water in the foundation of the road, and get rid of it before it has time to soften the substructure or freeze."

There are various forms of subdrains; probably the most efficient is the tile drain with the ditch over it filled with stone. Good results can be obtained with a rock filled drain or a blind drain laid in the center of the road. One drain though, on the side of the road, is nearly as efficient and is in a much better place for repairs without breaking up the road surface and interrupting traffic. In the absence of rocks or tile, resort is sometimes had to bundles of wood fagots, placed in the bottom of the ditch, so as to leave an opening at the bottom.

GRADES.

None of your specifications touch upon the matter of grades. We all know that there are few stretches of road in this State of any length where steep grades are not found. We also know that the load taken by truck teams is generally limited to what can be hauled over the steepest hill on the route. No system of road improvement should be inaugurated which does not contemplate a limiting grade. It does not appear to be good economy to improve the level stretches of road so that a larger load can be hauled than was the case before improvement, and to have in the same road hills so steep that, for example, only half the load drawn on the level can be taken over them with the same team.

It has been determined by experiment that a team can exert enough extra force on a spurt, to haul any ordinary load over a six per cent grade of reasonable length. Indeed, short grades of 10 per cent can be overcome when surface conditions afford good foothold for horses.

Maintenance expense on steep grades is excessive and the liability of accident is also large. Consequently grades should be lowered as much as possible that larger loads may be hauled and maintenance expense reduced.

Without making further discussion of the matter I will say that in most of the states now building state aid roads under state supervision, a grade of 6 per cent or 6 feet rise in one hundred has been adopted as the standard which shall not, except in rare cases, be exceeded. I think we can safely follow the lead of states which have had a dozen or more years' experience in permanent road building and recommend to town authorities, that before doing permanent surface work on hills, the grade should be reduced to 6 per cent if possible without too great an outlay. This of course can in many cases be acomplished by cutting down the top of a hill and filling in at the bottom. It would be desirable to complete a job of this kind in one year and put a good surface and proper ditches on the hill. If funds are not available to reduce the grade sufficiently in one year, it would seem to be in the line of good judgment to allow the work to be distributed over two or more years.

Oftentimes a bad hill can be avoided by building a new piece of road around it. If the work of reducing a grade on present location is to be quite expensive, a survey to ascertain its cost, as well as a survey of possible routes around the hill, should be made. Then comparisons of cost and relative advantages or disadvantages can be intelligently made.

We have taken up a few of the leading points that to my mind should be covered by a set of specifications for doing state road work. I do not pretend to say that the suggestions here offered cannot be improved upon or that the ground has been fully covered.

I would like to see some action taken by this convention towards the adoption and use of a standard specification or set of instructions for this work. One step towards systematizing the work will then have been accomplished. Then when we have worked out some system of continuous lines of road between centers of population and improved them according to our specification, we will be able to ride or walk over our State road and find that it will be impossible to tell what part of the

work each town has done. Our road work will then have the marks of uniformity such as we noted on our sample railroad.

Such criticism as I have made of the specifications now employed on our State road work is done, not in a spirit of fault finding and dissatisfaction, but only with the idea of learning how the work corresponds in different parts of our State. I have discussed them from the view of one who knows very little of the exact conditions under which the work is carried on. It seems to me that credit is due those boards who have established a standard, and require it to be lived up to. On the other hand I have no doubt that each board has handled the question in the manner that has seemed best suited to the needs of its locality.

SPECIFICATIONS FOR STATE ROAD WORK.

Adopted by County Commissioners in Annual Convention, August, 1905.

ACTION OF CONVENTION.

The convention appointed a committee of five as follows: Hon. Nahum Hinckley of Hancock, Hon. A. B. Nealey of Androscoggin, Hon. Charles E. Dunn of Aroostook, Hon. Frank S. Adams of Sagadahoc and Hon. George D. Clark of Franklin, who met the Commissioner of Highways and discussed a specification. Together they settled upon the following points which were submitted to the convention and approved.

OUTLINE SPECIFICATIONS.

Width of road 21 feet.

Limiting grade 6% if possible.

Surface: Gravel or best material obtainable in vicinity; to be spread over center 12 feet of road, between earth shoulders; to be 8 inches deep at center and 6 inches deep at sides.

Crown to be 12 inches if road is surfaced with gravel; to be 15 inches if surfaced with loam or clay.

Subdrains to be used where necessary; laid not less than 3½ feet deep, on a true grade and carried to an outlet. Use land

Annual Convention of County Commissioners of Maine. Meeting at Houlton, August 2 and 3, 1905.
This Convention voted to adopt uniform specification for State road building.

tile for best results. If this cannot be had use box, or blind stone drain.

Telford foundations to be used where soil is wet and yielding. Width and depth to depend on locality.

Culverts to be built of stone, concrete or iron pipe; care being taken to secure a good foundation, and sufficient waterway.

Bridge substructures to be of stone or concrete.

Guard rails or fences to be built at all bridge approaches and on high embankments.

The convention then authorized the commissioner to elaborate these specifications and supplement them with more or less instruction and agreed to recommend their use to towns building state road in 1906.

Accordingly the commissioner has drawn up the following specifications or instructions which have been submitted to, and endorsed by, each member of the committee.

In justice and fairness to the member from Aroostook we quote the following from a letter received with his endorsement of the specifications. "You will recollect that I differed with the majority of the committee at the meeting in Houlton, relating to the width of the road, also to the height of the crown. * * * I think you will find that a road twenty-one feet wide with one-fifth crown will be too flat for this county. I think that the metaled part in this county should be at least fifteen feet. A sixteen hundred pair of horses with forty barrels of potatoes on a jigger wagon meeting another team with like weight and load will want plenty of room to pass. I am only making these suggestions for Aroostook county."

GENERAL STATEMENT.

The dimensions of state roads should not be less than as suggested in these specifications. They may be more when local conditions warrant.

If possible to secure a good surfacing material it should be used in all cases. However, if this cannot be done without incurring too great expense, attention should be given to the other points taken up in this specification and the surface finished of the natural earth. If this is done, more crown may be needed than is here recommended.

Remember that cutting down the grade of hills, building sub-drains and foundations are all forms of permanent work that

cannot be too strongly urged on any kind of a road, unless exception be made as to draining a sand road.

The thought should constantly be in mind that we are improving our earth roads with the ultimate end in view that at some later date they will form the foundations for a permanent surface.

The following specifications, or rather instructions, were adopted by the county commissioners at their annual convention in Houlton, Maine, August 2, 1905, for the guidance of town officials in building state roads.

DEFINING ROADS.

We would recommend before state road work is done, that the limits of the road be defined and marked with suitable monuments, and a record and plan of the location be filed in the town clerk's office and with the county commissioners.

CLEARING AND CLEANING RIGHT OF WAY.

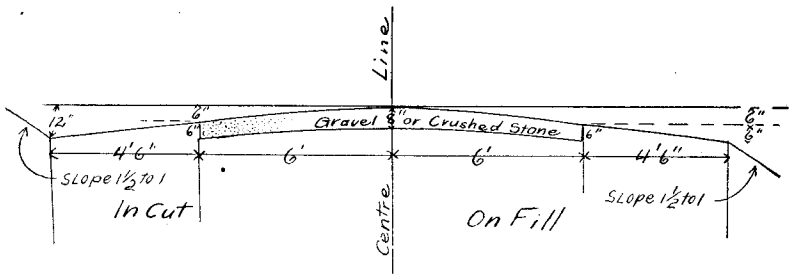
All stumps, roots, bushes, rubbish and trees within the limits of the right of way, should be thoroughly grubbed out, piled up and burned, for the entire length of the proposed new construction; except where new embankments more than one foot high are to be built. Then stumps may be left in the ground after they have been cut close to the surface. The right of way on new work, and on all roads for that matter, should always present a neat and clean appearance.

THE GRADED PORTION of the road should occupy the center of the right of way.

WIDTH OF ROAD.

In general, state roads should be finished not less than twenty-one feet wide. This width on the finished surface to be made up as follows:

The center twelve feet shall constitute the metaled or hard portion of the road with shoulders of four and one-half feet on either side composed of the natural earth.



Standard State Road Section

Scale 4 ft

LIMITING GRADES.

We would recommend that all hills on state roads should be reduced to a grade of not more than six per cent or a rise of six feet in one hundred, unless in exceptional cases and for short lengths of grade.

This of course can in many cases be accomplished by cutting off the top of a hill and filling in at the bottom. Oftentimes a bad hill can be avoided by building a new piece of road around it. If the work of reducing a grade on present location is to be quite expensive a survey, to ascertain its cost, as well as a survey of possible routes around the hill, should be made. Then comparisons of cost and relative advantages can be intelligently made.

CROWN.

The finished road should show a crown of at least twelve inches obtained as follows:

On the metaled portion of the road crown to be at the rate of one inch drop for each foot out from the center of the road towards the sides. (See standard section above.)

On the earth shoulders the crown shall be at the rate of one and three-eighths inches drop per foot.

SLOPES.

Sides of cuts and embankments should be finished at a slope of one and one-half horizontal, to one vertical. That is, for each foot of depth of cut or embankment there must be one foot and a half of horizontal width, on each side, besides the width of the finished road.

This is the natural slope of ordinary earth. Wet clay will require a flatter slope. Ledge cuts may be finished on a slope of one-fourth horizontal to one vertical.

SURFACE MATERIAL.

The gravel or crushed stone should be spread twelve feet wide, eight inches thick at the center and six inches thick at the sides after rolling with the best roller obtainable in the vicinity.

It is customary in making a surface of crushed stone to screen the stone into three sizes as follows: 2½, 1, and ½ inch.

The coarse stone is spread on the bottom and rolled, then the one-inch size and finally the half-inch. Some builders sprinkle each course before rolling, others sprinkle only the last course.

The first course should make 5 inches at the center and 4 inches at the sides after thorough rolling. The next course two inches at the center and one and one-half inches at the sides after rolling. The last course, or screenings, ½ inch and dust, should be spread so as to make one inch at center and ½ inch at sides after thorough rolling. It is customary to saturate and roll this course to force it into the spaces of the course beneath, where it acts as a binder, making an impervious roof to shed water as well as a hard, smooth, wearing surface.

Gravel to give best results, should be screened into the same general sizes as crushed stone and applied and rolled in a similar manner.

The best gravel for road purposes is composed of angular fragments of stone and carries from 16 to 20% of clay or clayey loam which acts as a binder.

More binding material is a detriment and if it appears in excess of 20% the gravel should be screened to remove the excess which will only act to absorb water and make mud.

Any gravel that stands in a nearly vertical face in a pit and has to be picked before it can be shoveled will generally be good road gravel.

If loam overlays the pit it should be stripped off to prevent the possibility of its being mixed with the gravel.

SUBGRADE.

Subgrade should be so constructed as to form a longitudinal trench 12 feet wide, the sides of which shall be the earth shoulders referred to above. Said trench should be six inches deep at the sides and have a crown of 4 inches as shown on cross section of the road.

The shoulders should be finished as explained under Crown, and will form a continuous transverse surface with metaled part of the road. If shoulders are built up by filling, the best material obtainable should be used. They should be cut square, after thorough rolling or tamping, to the proper width for spreading the gravel or crushed stone, in order to form a perfect support for the same on the sides.

In all cases it is important that the subgrade be carefully constructed. If possible the subgrade should be thoroughly compacted by rolling or tamping that any soft and yielding spots may be discovered, filled and brought to proper grade before the road metal is applied.

ROLLING.

When rolling is done it should be started at the sides and carried towards the center in order to preserve the crown.

DRAINAGE.

The importance of good drainage cannot be overestimated. A well drained road is a good road regardless of what composes its surface.

Water is the natural enemy of roads, and no expense should be spared to provide for its speedy removal, both from the surface and the foundation of all roads.

Surface drainage should be secured by side ditches. These should be broad and shallow. They should be built on a true grade and carried to an outlet leading away from the road. These outlets should be provided as often as possible. It is better to dispose of water in small quantities as large volumes may become very destructive.

If a road is on a side hill it may be advisable to make a surface ditch six or eight feet back from the edge of the cut on the side towards the hill to prevent the surface water from washing over the slope of the cut and overflowing the side ditches of the road.

SUBDRAINAGE.

A sand or gravel foundation will generally give satisfaction without particular attention to subdrainage; a clay soil rarely will, and to make a good foundation, it must be subdrained. Sometimes however water is forced up thorough these pervious soils—sand and gravel—from below and in these cases subdrains must be constructed to carry away this water and keep it from rising to the surface and saturating the foundation.

Frost is very destructive to roads. Water makes frost, so the more water that can be removed from the foundation of a road the better and more permanent will the road be.

The best results will be obtained by using round porous tile pipe. It should be laid true to grade and line on an unyielding bottom. The joints should be made with collars, or covered with a strip of tarred paper. The tiles should be held firmly in place by small stones or by gravel carefully tamped around the pipe. No large stones should be allowed to rest against or upon the pipe. The trench should be filled to the top of the subgrade with small field stone. In some localities it may be impossible to fill the ditch with stone. If it becomes necessary to partly or wholly fill the trench with earth, the most porous material in the vicinity should be used. If the trench is partly filled with stone and topped with earth, a layer of meadow hay, brush or sod with the turf side down should be placed over the stone to prevent the top filling from settling into the voids between the stones.

A box drain of flat stones or brick may be substituted for the tile. A blind drain will give good results too. For this use stone 3 inches to 8 inches in diameter in bottom and grade to fine at top. Subdrains should be laid at least three and one-half feet deep. They should be laid below the frost and carried to an outlet.

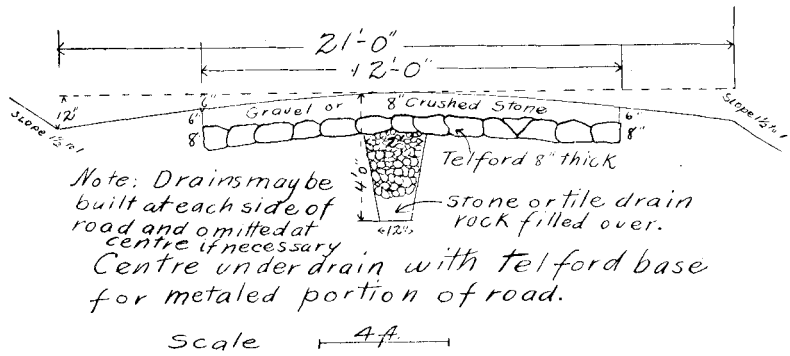
TELFORD FOUNDATION.

In very wet and yielding soils it may be necessary to strengthen the foundation by laying telford. This should be of the same width as the metaled portion of the road, 12 feet. Stones for this purpose should be sound and hard. They should be from four to ten inches in width and six to twenty inches in length and not less than eight inches in depth. They should be placed with their broadest side down and smaller end or point

up and laid as close as possible lengthwise across the road. Any small spaces between the stones should be filled in with wedge-shaped bits of stone driven in solidly. Any projecting points should be knocked off by hammers. This foundation should be thoroughly rolled or sledged to prevent the possibility of any loose or shifting stones being left under the surfacing coat. These of course would have a tendency to settle and give way under the surface and cause inconveniences, to say nothing of wholly defeating the ends for which the foundation is used—namely, to distribute the pressure of wheel loads over as much area of soil as possible thereby preventing ruts.

Over the telford should be placed the road metal as described above.

A combination of telford laid over a center subdrain should make a strong foundation. There may be localities requiring two subdrains, one on each side of the road, and the telford foundation as well as a proper preparation for the surfacing material, although in such cases the following treatment will generally prove efficient and is more economical.



"V" DRAIN.

After seven or eight years of construction and careful watching of results, the Massachusetts Highway Commission designed and have used for three or four years a foundation called the "V" drain.

Briefly described this foundation is as follows:

Center of road is excavated full width of metaled portion, of varying depth according to soil condition, but always deeper at center than at sides. On the standard cross section of this foun-

dation, as designed by the said commission the following dimensions appear.

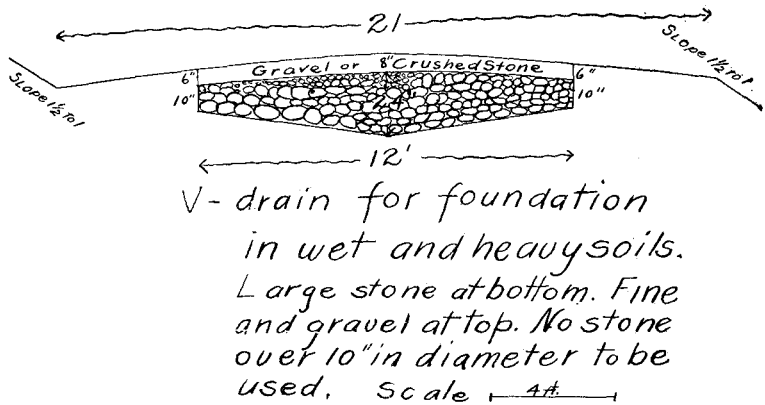
Depth at center, 18 inches (sometimes increased to 24 inches).

Depth at sides, 4 inches (sometimes increased to 12 inches).

The following note of explanation appears, "Cobble filled—large stones at bottom, small stone and gravel at top. No stone larger than eight inches to be used in this foundation."

This foundation is used on cuts and on fills. Side outlets are usually provided about every 100 feet. The surface of the rock filling is finished with a crown and is rolled. The gravel or macadam is laid directly on this foundation.

From the report of the Massachusetts Highway Commission for 1905, work done in 1904, the following is quoted: "On no state road has there been a failure of well laid telfording foundations, neither has there been a failure of any V shaped drains since the building of the first one by the commission three years ago. They are apparently as effective as the telfording foundation and side drains combined and cost much less to build."



For our climate we would say, that V drains should be at least 24 inches deep at the center and not less than ten inches deep at the sides. As with other ditches and drains, the grade of the bottom should be carefully and easily constructed.

The surface of the stone should be finished with a crown, and should be rolled or pounded down.

The gravel or crushed stone should be laid directly upon this stone foundation.

We would especially recommend that towns pay particular attention to the above remarks, as to drainage, and as far as possible put them into practice in all town work.

CULVERTS.

Culverts should be built of split stone, concrete or iron pipe. The main features to be observed in building culverts are:

To properly locate them.

To make them long enough.

To give them sufficient grade to clear themselves.

To thoroughly pave the bottoms and be sure that the paving extends under both side walls.

Paving constructed as described above under telfording, will be found satisfactory.

To provide an apron at each end of the culvert to prevent undermining. This should be one stone of sufficient length to extend from outside to outside of side walls (for culverts 3 by 3 feet and under) and be not less than 18 inches square.

Side walls should be of large well shaped stones, laid on their natural beds, well bonded and joints well broken. At least one-quarter of the stones should be headers and should extend clear through the wall. Joints should not exceed one and one-half inches. The covering stones should be entirely sound and should extend clear across each side wall. No covering stone should be less than 12 inches thick.

It would be preferable to lay all culverts in cement mortar. For this purpose a well and favorably known brand of Portland cement should be used. Sand for mortar should be sharp, clean and free from loam and vegetable matter.

Mortar should be composed of one part of cement to not more than three parts of sand. It should be mixed in small batches and used as soon as mixed.

CONCRETE.

Concrete should be composed of angular fragments of sound, durable stone, which should be clean, and free from dirt. No stone being over two and one-half inches in its largest dimension. The stone should be mixed with Portland cement and sand in the following proportions: Cement one part, sand two parts, and stone five parts.

Mixing. These ingredients should be thoroughly mixed by being turned several times when dry and again after adding sufficient water.

The concrete should be carefully deposited in place and rammed until water flushes to the surface. A good clean grade of gravel may be substituted for the broken stone.

If iron pipe is used for culverts it should be carefully laid on a well compacted foundation and its ends protected by buttress walls.

OFF TAKE DITCHES.

Particular attention should be paid to providing good and sufficient off take ditches at the ends of all culverts and at such points as surface water is turned away from the road. The value of a culvert or surface ditch may be entirely lost unless this important point receives attention.

BRIDGE ABUTMENTS.

Bridge Abutments should be built of a good class of split stone or concrete masonry—If stone is used it should be of the best quality obtainable in the vicinity and should be laid in Portland cement mortar, made as specified above.

The following will give a good class of work.

Head and Wing Walls will be built of quarry faced granite laid in cement mortar in regular courses with horizontal beds and vertical joints, the thickness of the courses to decrease regularly from the bottom to the top of the wall.

Joints shall not exceed one and one-fourth inches.

Dressing. All stone shall be dressed with square and true beds and joints before being placed in the wall and no dressing allowed upon a stone after it is once set.

The vertical joint of one and one-fourth inch shall extend back into the wall at least eight inches.

Headers. At least one-fourth of the stone shall consist of headers. They should be laid directly over stretchers, and should be not less in width than in depth and should maintain their full size into the heart of the wall.

Stretchers shall be at least as wide as they are deep and in length not less than two and one-half times their depth.

Backing shall consist of good, large sound stone, laid in mortar as nearly in courses as may be and so as to make a thorough bond with the face wall.

All joints must be filled with mortar and spawls, and each course should be thoroughly grouted before laying the next.

Copings, Bridge Seats, etc., should be finished as required for each particular case.

Foundations must be built to meet local requirements.

Any masonry or bridge work of consequence should be built under the direction of an engineer and only upon plans and specifications made to suit local conditions.

GUARD RAILS.

Guard Rails, or substantial fences should be built at all bridge approaches and along the sides of high embankments.

These specifications or instructions for doing state road work are prepared to point the way towards a good class of permanent road work.

Our state road law contemplates such a class of work as is here outlined. Remember that quality, not quantity should be the governing feature in this as in all road work.

APPROVED:

NAHUM HINCKLEY, Com'r Hancock County.
A. B. NEALEY, Com'r Androscoggin County.
CHARLES E. DUNN, Com'r Aroostook County.
FRANK S. ADAMS, Com'r Sagadahoc County.
GEORGE D. CLARK, Com'r Franklin County.

Committee of convention to confer with State Highway Commissioner and draw up Specifications.

APPROVED:

PAUL D. SARGENT,
State Highway Commissioner.

STATE ROAD WORK, PRIOR TO 1905.

Herewith are presented results accomplished by the several towns building state roads in 1904 as reported by the county commissioners to the governor and council. These reports vary so much in form, many not showing length and width of road constructed, that it is impossible to compute the mileage of improved roads in the State resulting from the operation of the state road law.

Cost of each piece of work is also shown that comparison of results accomplished may be made as far as data will permit.

SUGGESTIONS.

These returns would be much more valuable for purposes of comparison and as records if length and width of the road improved was shown in each instance. It would be well too, to have a statement of the amount of material of each class that was used in the construction of each section of road. Amount, kind and dimensions of all subdrainage and foundation work, should also be shown. We recommend to county commissioners that future returns of state road work be made according to these suggestions.

As suggested elsewhere, we believe state road work should be done in May and June. We hardly feel competent to criticize the action of our last two legislatures in extending the time for completing state roads from August first to September first and later to October first, because we do not know under what conditions the amendments were made. We feel however, that a mistake was made. To get best results, work must be done in the early season. A dollar will do more work then and the work will last longer. From the number of towns we saw building state road last September we were led to believe that it was the general practice in the State to defer this work until that month.

We would suggest to towns that the experiment of doing the work early be tried, that results accomplished might be compared with those of former years when the work was done late.

We have been told by some commissioners who have built state road that boulders have been used for drainage and foundation work. We would caution commissioners against this practice which we feel sure will give more or less trouble later on. As indicated in the specifications for state road building we would limit the size of stone used in foundations and subdrains to eight or ten inches in diameter.

A great many low places too, have been graded up with solid stone filling, sometimes three or more feet deep. This seems to us an unnecessary expense. The Romans in their road building operations, used foundations of stone three feet thick, built in layers or courses, laid in lime mortar. Modern methods of road building have developed thorough underdrainage and a telford base as being permanent, not too expensive and on the whole satisfactory. Accordingly we should drain the low places, raise the grade with earth and upon the grade lay a telford base over which, earth, gravel, or a crushed stone surface may be constructed.

If by using the proper construction 200 rods of road can be built in place of 100 at the same cost, it behooves towns to be sure before undertaking any road work that they are using the most economical construction. The one aim should be to do work *thoroughly* and *permanently* and *no more.*

PROGRESS OF STATE ROAD MOVEMENT.

Following the statement of work done in 1904, will be found tables showing towns in each county that have built state road each year, their expenditures for the same; and aid each has received from the State.

By reference to the recapitulation table it will be seen that in the year 1901, twelve towns built state road; expended $3,025.30; and received as state aid $1,175.00.

In 1902, ninety-nine towns built state road; expended $21,670.32; and received as state aid $9,507.36.

In 1903, 206 towns built state road; expended $69,877.10; and received as state aid $28,722.65.

In 1904, 244 towns built state road; expended $83,797.56; and received as state aid $33,485.49.

The grand total expended in the four years on state road is $178,370.28; the total amount of state aid paid on account of this work is $72,890.50.

From these figures it would seem that state aid for road building was a popular measure. It may also be added that a larger number of towns have built state roads in 1905 than in any previous year.

In connection with this statement of work done in the past we had hoped to present a map of the State showing layout of state roads in the different counties, but as only a few boards of county commissioners have returned the maps sent to them, with these layouts indicated thereon, we are unable to do this.

WORK OF 1904.

ANDROSCOGGIN COUNTY.

Durham. Turnpiking and graveling. Cost, $202.70; aid, $101.35.

Lisbon. The road is 30 to 32 feet wide, of even grade, covered from 10 to 15 inches with clay gravel. Cost, $403.08; aid, $200.

Mechanic Falls. Laying a blind stone drain in center of road; building a culvert and turnpiking a distance of 29 rods. Cost, $200; aid, $100.

Poland. Removing center of road and filling with stone two feet deep and 12 feet wide. Cost, $200; aid, $100.

Wales. Built one stone culvert; bed of road rubbled with stone and covered with gravel, good depth. Cost, $200; aid, $100.

Webster. Straightening road, building three culverts, turnpiking and graveling one foot deep. Cost, $300; aid, $150.

AROOSTOOK COUNTY.

Ashland. From the L. S. Coffin house in Ashland village, southerly on said road toward J. B. Bartlett's, consisting of widening street, graveling and draining. Cost, $220.54; aid, $100.

Bridgewater. From near G. W. Huntley house, southerly, to McKeen hill (so called) including bridge across Whitney brook, and in swamp south of J. L. Smith's, consisting of turnpiking and graveling. Cost, $400; aid, $200.

Caribou. Continuing the permanent improvement made in 1903, consisting of ditching, building up with rock and covering same. Cost, $400; aid, $200.

Dyer Brook. Extending from north line of land of John McLellan to about six rods beyond the south line of land of James White, consisting of turnpiking, ditching and draining. Cost, $318; aid, $100.

Easton. Between Easton Center and Spragues Mills, consisting of shaping up road with rock and gravel. Cost, $400; aid, $200.

Fort Fairfield. Between the Maple Grove starch factory and Bridge street in Fort Fairfield village, consisting of turnpiking and building up with rock and gravel. Cost, $500; aid, $200.

Haynesville. On the "Ferry road," (so called) north from Ferry bridge, consisting of building up road with rock and dirt. Cost, $141.95; aid, $50.

Hodgdon. Commencing where last year's work left off in the Nickerson swamp and building 12 rods with stone, covered with 226 loads of gravel. Also in the Sherman swamp, building 22 rods, scraping out the middle of road, filling in rock, covering with gravel and building one stone culvert. Cost, $300; aid, $150.

Houlton. Being that part of Court street or the "Calais road" (so called) lying between the residences of Alonzo P. Harragan and the David Harragan homestead, a distance of 395 feet, same being macadamized 21 feet wide. Cost, $504.75; aid, $200.

Limestone. From near the residence of Chas. McLaughlin northerly to the spring near J. B. Durepo and Son's starch factory, consisting of building up with rock and gravel. Cost, $200; aid, $200.

Linneus. On the Oakfield road, building around ledge or Hemlock hill (so called), consisting of turnpiking, ditching and draining. Cost, $350; aid, $150.

Ludlow. From Henry Hanson's east line easterly on said state road, consisting of repairs with rock and gravel. Cost, $200; aid, $100.

Mapleton. In the swamp about 100 rods from east line of town, consisting of 41 rods of road built from field stone pounded by hand until well broken and made quite smooth on the surface and covered with a light coat of *screened gravel.* Cost, $405; aid, $200.

Masardis. Between Masardis village and Squapan stream, consisting of turnpiking, grading, cutting bushes and blasting. Cost, $400; aid, $100.

Monticello. From the B. & A. station to the main road, a distance of 100 rods graveled to a depth of eight inches, and 14 feet wide; and on main road turnpiked, ditched and graveled about 180 rods; also permanent improvement on the hill near E. B. Jewett's farm. Cost, $300; aid, $150.

New Sweden. From where work of 1903 ended northerly to corner near postoffice, thence westerly to line between lots 116 and 117, consisting of turnpiking 27 feet wide and three feet high; draining, blasting and filling. Cost, $237.83; aid, $100.

Oakfield. From the Linneus line westerly through the Daggett swamp, consisting of turnpiking, carting on gravel, and draining; 12 and 20 inch tiling used for culverts. Cost, $500; aid, $200.

Orient. In the Sprague swamp, so called, consisting of building up with rock and gravel. Cost, $200; aid, $100.

Perham. Continuing from work of 1903 and consisting of building up with rock and gravel. Cost, $250; aid, $100.

Presque Isle. Continuing easterly from where the work of 1903 ended 61 rods, consisting of ditching and widening road to 25 feet; graveling, building one bridge and putting in one drain tile culvert. Cost, $404.63; aid, $200.

Sherman. From Sherman Mills village to the town line near Braggville, consisting of building up the low places with crushed rock; the town having bought a complete rock crushing plant. Cost, $800; aid, $200.

Smyrna. From the Ludlow line westerly to the Dunn brook, consisting of building up with rock and gravel, ditching and putting in granite culverts. Cost, $410; aid, $200.

Van Buren. From opposite the mills of the St. John Lumber Company, a distance of 150 rods, consisting of turnpiking and graveling. Cost, $720.23; aid, $200.

Washburn. Consisting of grading down the Munson hill. Cost, $100; aid, $50.

Weston. From the Danforth line to a bridge near Otis Gilpatrick's house, consisting of turnpiking, ditching, draining and putting in stone culverts. Cost, $205; aid, $100.

Woodland. From schoolhouse through the swamp to the top of hill near Gerald Burgess' dwelling house, consisting of building up with rock and gravel. Cost, $200; aid, $100.

Macwahoc Plantation. From Macwahoc bridge westerly to plantation line, consisting of carting on gravel. Cost, $175; aid, $50.00.

Merrill Plantation. From a rise in the road ten rods from Charles E. Fitzgerald's north line to Roach Bros., north line, 327 rods; same being 25 feet wide and crowned accordingly, consisting of turnpiking, ditching and draining. Cost, $400; aid, $200.

CUMBERLAND COUNTY.

Bridgton. Middle of road excavated 3 feet deep, 6 feet wide and 27 rods in length and filled with stone; then 75 rods in length was covered with gravel; two water courses repaired and lengthened with split stone. Cost, $200; aid, $100.

Casco. Roadbed put in good shape, 102 rods in length, and 25 feet in width; covered with clay and gravel 6 to 15 inches deep; two water courses repaired with stone. Cost, $200.46; aid, $100.

Cumberland. Roadbed formed and covered with earth, 9 inches or less, then with gravel, 5 inches deep and 20 feet wide, for 21 rods; width from ditch to ditch, 25 feet. Cost, $216; aid, $100.

Freeport. Stone excavated, depth, 6 inches to 1 1-2 feet; width, 1 to 5 feet; earth excavated 6 inches to 1 1-2 feet; width, 20 feet; covered with crushed stone, 6 inches and gravel 2 inches deep, and 18 feet wide; length of road worked, 100 feet. Cost, $198.79; aid, $99.40.

Gorham. Some soft places were excavated and filled with stone; hill graded down considerably, by carting from top and filling at bottom; stone filling was used to widen road; this was covered with 8 inches of earth and all covered with gravel for 1,500 feet long, 18 feet wide, 6 inches deep. Cost, $500; aid, $200.

Gray. Partly covered with stone and all with gravel for a distance of 50 rods; width of stone filling 12 feet; gravel 20 feet; width of road, 24 feet; two water courses built of stone. Cost, $200; aid, $100.

Harrison. For a distance of 20 rods earth and stone were excavated, 3 feet deep, and for 75 rods, in length; covered with earth and gravel 9 inches in depth, 15 feet wide. Three water courses built of split stone. Cost, $230; aid, $100.

Naples. Widened with stone for a distance of 124 feet and five feet in width; stone covered with 60 loads of earth; all covered with 250 loads of gravel; two water courses built of 8 and 12 inch tiling. Cost, $200; aid, $100.

Scarborough. Good roadbed with drainage; covered with earth filling 4 inches; gravel 6 inches. Cost, $200; aid, $100.

South Portland. Roadbed covered with 10 inches of crushed stone and 6 inches of gravel for a distance of 800 feet; width of road 25 feet. Cost, $595.95; aid, $200.

Westbrook. Twelve hundred feet of said road was thoroughly macadamized. Cost, $2,500; aid, $200.

Windham. Stone excavated on one part of road and filled in on another; stone excavation and filling covered with 1 foot of earth; whole length of road worked 75 rods; covered with 10 inches of gravel and clay. Cost, $405; aid, $200.

FRANKLIN COUNTY.

Avon. Stonework, $184.75; work on earth, $20.23. Cost, $204.98; aid, $100.

Carthage. Ninety rods, ditched and graveled. Two hundred and thirty-six loads gravel at .50, $118; 34 days, 7 1-4 hours work at $1.50, $51.60; 9 days 7 hours work at $2.00, $19.40; paid for gravel, $10.00; paid for tools broken, $1.00. Cost, $200; aid, $100.

Jay. Excavated on Jay hill above where the work was done last year, to the depth of three feet; and eight feet wide; filled with stone; covered with earth; length 30 rods. Cost, $406.30; aid, $200.

Rangeley. Carting gravel; grading; blasting; removing rocks. Cost, $300; aid, $150.

Salem. One stone culvert built; road widened; stones blasted, etc. Cost, $180; aid, $90.

Strong. Three stone culverts. Cost, $200; aid, $100.

Weld. Length, 3-4 mile; 5 stone culverts put in; repairing bridge abutments; iron water pipe for water course, 50 feet; 50 rods filling done. Cost, $400; aid, $200.

Wilton. Said improvements were as follows: For crushed stone, $88.20; for stone culvert, $102.10; freight on stone, $51.18; labor and filling, $393.20. Cost, $634.68; aid, $200.

HANCOCK COUNTY.

Bluehill. Laying 5 inch tile from the bridge built by the State in part in 1903 near the house of W. M. Abbott on Green's hill, so called, and running to the corner near the house of F. P. Greene, a distance of 1,250 feet, with two turnouts; thence along main street to the corner near Nahum Hinckley's house, a distance of 985 feet with three turnouts; tile is laid 3 1-2 feet deep, straight so that no water can stand in it, joints covered with tarred paper and then filled with gravel, 1 foot deep, then filled with the earth removed. Cost, $382.28; aid, $191.14.

Brooklin. Length of road improved, 100 rods; width, 18 feet; center drain 3 feet wide and 3½ feet deep entire length; drain at bottom, filled in with small rock, 1½ feet, then 1 foot of eel grass; the whole covered with dirt and well rounded up. Cost, $300; aid, $100.

Brooksville. Three hundred and thirty-five feet graded and 180 feet of ledge blasted out of the ditch on hill near A. Blodgett's; 570 feet of stone drain laid three and one-half feet deep and filled with stone within one foot of the top and then filled with dirt and gravel. Cost, $202.18; aid, $100.

Dedham. Twenty-nine rods of road was underdrained and widened. Cost, $100; aid, $50.

Ellsworth. Commencing at the place where work was discontinued in 1903, fifty rods of road have been built with crushed rock; a knoll of about two feet has been leveled off, graded and two stone culverts have been built. Cost, $602.40; aid, $200.

Gouldsboro. The length of road improved is three hundred and ten feet; the width eighteen feet; depth of stone foundation sixteen inches covered with shale and gravel. Cost, $375; aid, $187.50.

Hancock. On the hill at North Hancock near the railroad crossing a ditch was blasted through the ledge on the upper side of the road for about 100 feet, and the road turnpiked for 100 feet more. The road between the spans on the Kilkany bridge was covered with clay and gravel to a depth of eight inches in the center for a distance of 200 feet. On the hill at the western

end of the bridge a ditch was dug 2 feet deep and 3 feet wide, for about 100 feet, and filled with stone, after which it was turnpiked and graveled to a depth of four inches. Commencing on the eastern end of where the work was done last year, near the carrying place, a piece of road 320 feet long was turnpiked and graveled to a depth of six inches, about 100 feet of which was covered with a rock bed before it was turnpiked, and a stone culvert 21 feet long 2 by 2½ feet was built. On the hill near, a ditch was made on the upper side of the road by blasting through about 100 feet and turnpiking about 100 feet more. On the west side of the carrying place, a piece of road 240 feet in length was dug out in the center 6 feet wide and 2 feet deep and filled with stone after which it was turnpiked and graveled to a depth of 4 inches and a new stone culvert 21 feet long 2 by 2½ was put in. Cost, $400; aid, $200.

Lamoine. Commencing at and connecting with the tile laid in 1903; thence running N. five degrees and thirty-five minutes west, 44 rods to stone post No. 52; thence running N. 16° and 45′ W. 8 rods and 12 feet towards stone post No. 53; whole distance 52 rods and twelve feet. Said road is underdrained with 4 inch tile laid 3½ feet below the surface, bedded in 6 inches of clean gravel; road bed properly turnpiked and well graveled. Road is 22 feet wide in which is one culvert laid with 6 inch sewer pipe 1 and ½ feet below the surface. Cost, $201.65; aid, $100.

Orland. Three hundred and forty-five feet of road was center drained with five inch tile and the top of the road graded, graveled and side drained. Cost, $241.96; aid, $100.

Mariaville. A piece of road forty-five feet long and twenty-two feet wide, built of stone seven feet high at approach of bridge and five feet high at outer end. It is built on a roadbed of small stones three to four feet deep which were put there some time ago to stop the road from washing at high water. Cost, $200; aid, $100.

Otis. Three hundred and thirty feet in length by 18 feet in width were repaired and rebuilt with center drainage, rock filling covered with clay and gravel. Cost, $140.35; aid, $50.

Sedgwick. About one-fourth of a mile turned in with road machine and well graveled; underdrain laid from three feet to four feet deep. Cost, $241.38; aid, $75.

Stonington. Two hundred and twenty-five feet of road twenty-two feet wide filled to the height of five feet with three feet stone wall and two feet of gravel on top. Top of hill cut a length of one hundred feet from one to three feet, reducing the grade of the hill seven feet. The two hundred and twenty-five feet which was built up was railed on both sides with inch wire and iron posts, seventy-five rods of stone wall was removed along the road and ledge blasted out near the top of the hill. Cost, $398.58; aid, $150.

Sullivan. The last year's job (Baker hill) was finished. The character of the work was cuts and fills. The remainder of the money was expended by continuing from the hill in a southerly direction about 200 feet which was also cuts and fills. Cost, $301.27; aid, $150.64.

Surry. A stone bridge was built of split stone near the Blue-hill town line. Three hundred yards in length of road near East Surry was turnpiked and thoroughly graveled. Cost, $149.40; aid, $50.

Trenton. The length of road is 49 feet, built across tide water of logs laid up in abutments, well bolted together with 7-8 inch bolts, filled inside with rocks within 14 inches of the cap log, a roadbed of loam 14 inches deep and 18 feet wide with 6 inches of gravel on top. Cost, $150; aid, $50.

Waltham. By raising the road on the flat by putting in stone and gravel. On the hill, drain pipe was used for a distance of about twenty-five rods, covered and graded. Cost, $155.57; aid, $75.

Winter Harbor. Two hundred and fifty feet of road made with rock foundation, 1 foot and six inches deep covered with dirt and gravel; 1 culvert built of cut stone covered with cut stone, size in clear 2½ by 1½ feet full width of road, then continue to shore 40 feet with rock sides and plank covering. Cost, $266; aid, $100.

KENNEBEC COUNTY.

Augusta. The roadbed was well rounded, graded and thoroughly rolled with a ten ton steam roller; then a layer of crushed rock was put on to a depth of six inches in center and three inches at sides and thoroughly rolled; the crushed rock finished road being 12 feet wide the entire distance. Cost, $600; aid, $200.

Belgrade. Claying and graveling sandy road. Cost, $400; aid, $200.

Benton. Split granite culvert laid up in Portland cement, the filling on both sides of said culvert being gravel. The road was raised by carting on clay and covering with heavy coat of gravel. Cost, $246; aid, $100.

Chelsea. Grading and widening the hill in the highway; reducing said grade four feet six inches; covering same with a good coat of gravel. Cost, $118.15; aid, $50.

China. One hundred rods opened and filled with stone; covered with gravel; five stone culverts. Cost, $400; aid, $200.

Clinton. Eighteen rods of highway raised from one foot, to two and one-half feet; stones for foundation covered with gravel. Cost, $380; aid, $100.

Farmingdale. Filling with stone and graveling six hundred feet in length; one stone culvert. Cost, $199.93; aid, $99.96.

Litchfield. Thirty rods filled with stone and well covered with gravel. Cost, $150.50; aid, $50.

Manchester. Nineteen rods of road excavated two and one-half feet deep, and twelve feet wide and filled with stone, dirt replaced and then graveled to a depth of ten inches; six rods graveled without any stones put in. Cost, $188.15; aid, $94.07.

Mount Vernon. Made good stone culvert; removed large stone; widened the road. Cost, $200; aid, $100.

Pittston. Heavy graveling and making a nice stone culvert. Cost, $440.14; aid, $200.

Randolph. Filling of coarse gravel, fifteen inches in depth; covered with fine gravel, eight inches in depth at center, to four inches on sides, with a width of twenty feet; deep gutters at the sides. Cost, $402.80; aid, $200.

Readfield. Excavated forty-four rods in length, sixteen feet wide, from two to three feet in depth; laid underdrain; filled with rock, replaced dirt; graveled. A fine piece of road. Cost, $450; aid, $200.

Sidney. Removing dirt from middle of road to the depth of about twenty inches; nine feet in width; filling with rocks; covering with dirt about twelve inches. Cost, $401.89; aid, $200.

Vassalboro. Cleaned out the ditches; hauled on five hundred loads of good gravel. Cost, $200; aid, $100.

Wayne. Underdrained in a wet place; excavated seven feet wide, (and in places) four feet deep, for twenty-two rods in length; made one good stone culvert. Cost, $250; aid, $100.

West Gardiner. Excavated thirty-four rods; filled with stone; dirt put back; graveled twenty feet wide. Cost, $269.74, aid, $100.

Windsor. Grading down a knoll; filled up with large stones on the bottom; smaller stones next; and covering lastly with gravel on both sides of a split stone culvert; culvert being 20 feet long, with open space of 3½ feet by 3 feet. Cost, $200; aid, $100.

Winthrop. Graveling; ten hundred and fifty feet in length, twenty-two feet in width; from one foot to one and one-half feet in depth; also laying three hundred and sixty feet of drain tile. Cost, $486.97; aid, $200.

KNOX COUNTY.

Appleton. The road was opened, filled in with stone and covered with gravel. Stone walls and bushes by the roadside were removed and stone culverts constructed. One hundred and sixty rods were built this year. Cost, $200; aid, $100.

Camden. The roadbed was excavated to a depth of 24 to 40 inches and then filled in with coarse rock, and this covered with fine rock and a deep covering of gravel. The gutters were paved. About 400 feet in length was completed. Cost, $591.99; aid, $200.

Cushing. The roadbed, being low, was raised with coarse rock, and surface made with finer rock and coarse gravel. A good stone culvert was built to secure good drainage. About 600 feet was completed this year. Cost, $150.30; aid, $75.

Hope. The work consisted of carting on rock on top of the roadbed thus raising the whole roadbed nearly two feet, making a surface of gravel. 780 feet was completed. Cost, $200; aid, $100.

North Haven. The roadbed for a part of the distance was excavated to the depth of two feet, filled in with coarse stone and covered with gravel; ledges were blasted to secure good drainage and the whole road built in a workmanlike manner. Cost, $212.60; aid, $100.

Rockland. The road was excavated to a depth of two feet, and then filled with large ledge rock at the bottom. This was

covered with chips of the same material, and the chips were covered with gravel as a surface. Cost, $485.37; aid, $100.

Rockport. Said road was built up with stone and covered with a thick coating of gravel, thus making a good surface. Good drainage was secured; 500 feet of road was built. Cost, $599.14; aid, $200.

South Thomaston. The road was built of rock and covered with coal ashes and gravel, and the work was done in a thorough and workmanlike manner. Five hundred feet of road was built. Cost, $1,037.99; aid, $100.

St. George. The roadbed was first covered with coarse stone, then with granite chips, and the whole was covered with crushed stone, and rolled with a heavy stone roller weighing several tons, making a very solid roadbed. 1,236 feet of road was built. Cost, $600; aid, $200.

Thomaston. The roadbed was excavated from 18 to 24 inches and filled with heavy lime rock; a layer of chips; and topped off with a good coat of cinders. All culverts were rebuilt and constructed in such a manner as to give good drainage. 600 feet of road was built this year. Cost, $641.50; aid, $200.

Union. The roadbed was opened, filled in with coarse rock, and then well surfaced with finer rock and gravel, good drainage secured. Length of road built, 350 feet. Cost, $200.20; aid, $100.

Vinalhaven. The roadbed was excavated to the depth of two feet and filled in with stone and coarse gravel. Good drainage was secured and the whole road built to stand. 223 feet were completed this year. Cost, $276.08; aid, $100.

Warren. The center of the roadbed was removed to the depth of 2 and ½ feet, and in width ten feet. The road was then filled in with coarse rock and covered with finer rock, then surfaced with a good covering of gravel. The road built was 224 feet in length. Cost, $490.76; aid, $200.

Washington. Said roadbed was excavated to a depth of three feet; seven feet in width; and then filled in with stone, and covered with gravel, and the whole done in a workmanlike manner. The length of road built was one hundred and fourteen rods, and the road completed August 27, 1904. Cost, $221.53; aid, $100.

LINCOLN COUNTY.

Alna. Stone crossing and drain, $40; tile for drains, $10; labor, teams, loam and gravel, $175. Total cost, $225; aid, $100.

Boothbay Harbor. Blasting; grading; walling the highway; building a culvert. Cost, $300.44; aid, $100.

Bremen. Dug trench 4 feet wide, 3 feet deep and forty rods long; filled with rock, covered first with shingle hair, then earth and lastly with about one foot of gravel loam, the gravel extending about five rods beyond the trench each way; grade of the old roadbed was raised; a stone culvert built and railed. Cost, $260; aid, $100.

Jefferson. One hundred and twelve rods ditched and filled with stone; five culverts relaid and two larger ones with split stone; graded and graveled the whole distance. Cost, $525; aid, $200.

Newcastle. Straightening and widening road near brick church. Cost, $115; aid, $57.50.

Southport. Blasting, draining and widening the road for about one-fourth mile, beginning at the hill where they left off last year. Cost, $200.03; aid, $100.

Whitefield. Building split stone abutments for a bridge; filling the approaches to the same; grading and graveling 68 rods of road. Cost, $489.15; aid, $200.

OXFORD COUNTY.

Albany. Length of road improved, 56 rods; width, 22 feet; amount of gravel filling, 56 rods by 22 feet; one water course of stone. Cost, $205; aid, $100.

Andover. Length of road improved, 49 rods; width, 20 feet; two water courses of stone; two water culverts of split stone; excavation, 357 yards, earth and stone; amount of stone filling, 33 rods long, 2 feet deep, 3 feet wide; length of graveling, 22 rods, 20 feet wide, and 1½ feet deep. Cost, $265.60; aid, $125.

Bethel. Length of road improved, 48 rods; amount of excavation, 750 yards; amount of stone filling in roadbed, 750 yards; amount of gravel put on to cover, 250 yards; two split stone culverts. Cost, $496.44; aid, $200.

Dixfield. Width of road worked two rods; length of road worked 40 rods; gravel filling 1 foot in depth. Cost, $300; aid, $100.

Fryeburg. Length of road improved, 478 feet; width of road improved, 24 feet; excavation, 7,648 feet; length of stone filling, 478 feet by 16 feet by 1 foot; length of gravel filling, 478 feet by 18 feet by 1 foot. Cost, $402.98; aid, $200.

Greenwood. Length of road improved, 300 feet; width 25 feet; length of excavation (ledge) 150 feet; width 15 feet; depth 6 feet; amount of stone filling, 150 feet in length; 12 feet in width; 10 feet in depth. Cost, $315; aid, $150.

Lovell. Length of road improved, 32 rods; width 27 feet; one culvert of stone; amount of excavation, 6 inches by 32 rods by 27 feet; stone filling, 8 inches by 32 rods by 12 feet; earth filling 6 inches by 32 rods by 16 feet; gravel filling 12 inches by 32 rods by 16 feet. Cost, $194.15; aid, $97.07.

Mexico. Length of road improved, 160 rods; width 20 feet; amount of excavation, 400 yards; earth filling, 700 yards by 20 feet by 2 feet deep; gravel filling, 300 yards by 20 feet wide by 1½ feet deep. Cost, $450; aid, $200.

Norway. Length of road improved, 180 rods; width 26 feet; water courses (one bridge 15 feet); culvert, one stone; amount of excavation, 200 yards; earth filling, 15 rods by 15 feet by 10 inches; gravel filling, 160 rods by 20 feet by 8 inches. Cost, $400; aid, $200.

Oxford. Length of road improved, 412 feet; width 30 feet; amount of stone filling, 412 feet by 5 feet by 17 feet; gravel filling, 412 feet by 24 feet by 1½ feet. Cost, $500; aid, $150.

Paris. Length of road improved, 75 rods; width, 25 feet; amount of excavation, 75 rods by 25 feet by 6 inches; graveling and filling, 75 rods by 16 feet by 1 foot. Cost, $225; aid, $100.

Rumford. Length of road improved, 1 mile; width 24 feet; water courses, six; culverts, six, four of split stone, two of pipe; amount of stone filling, ¾ mile long, 10 inches deep, 24 feet wide; excavation 500 yards. Cost, $3,000; aid, $200.

Stow. Length of road improved, ⅓ mile; width 18 to 20 feet; four stone water culverts; amount of earth filling, ⅓ mile by 18 to 20 feet by 7 inches; gravel filling, ⅓ mile by 18 to 20 feet by 7 inches. Cost, $210; aid, $100.

Stoneham. Width of road worked, 22 to 26 feet; length forty rods; gravel filling, 1 foot deep; water culverts, one constructed of split stone. Cost, $230; aid, $75.

Sumner. Length of road improved, 101 rods; width 20 feet; water culverts, four, all of stone; amount of excavation, 100

yards; stone filling, 285 yards by 20 feet by 2 feet; earth filling, 1,100 yards by 20 feet by 1 foot; gravel filling, 20 feet by 6 inches. Cost, $400; aid, $200.

Waterford. Length of road improved, 110 rods; width 25 feet; water culverts, three of split stone; graveling and filling 110 rods by 20 feet wide by 2½ feet deep. Cost, $400; aid, $200.

Woodstock. Length of road worked, 888 feet; width from ditch to ditch, 28 feet; amount of stone filling, 12,618 cubic feet, viz.: 338 feet long, 28 feet wide, 16 inches deep; amount of earth filling, 6,309 cubic feet, viz.: 338 feet long, 28 feet wide, 8 inches deep; one water course 88 feet long, 10 inch tiling; one stone culvert, 20 by 24 inches made of split stone; one 12 inch tile culvert. Cost, $400; aid, $200.

PENOBSCOT COUNTY.

Alton. Length of road improved, 227 feet; width, 24 feet; stone filling, 3½ feet deep; earth, 1 foot deep, 18 feet wide; gravel, 1 foot deep, 16 feet wide. Cost, $200; aid, $100.

Argyle. Length of road improved, one-half mile of first-class turnpiking; 20 to 24 inches grade; 20 to 24 feet wide from ditch to ditch; seven water courses; three culverts (drain tile); one stone culvert and three wooden culverts. Cost, $250; aid, $50.

Bangor. Stone filling, 1 foot deep, 25 feet wide, 400 feet in length; earth and gravel 1 foot deep and 1,100 feet in length; three culverts of stone and three water courses of stone; width of road 25 feet; length of road worked 1,500 feet. Cost, $1,000; aid, $200.

Bradford. Excavation and stone filling, 2 feet deep, 4½ feet wide; 116 rods in length; earth filling, 1 foot deep; 20 feet wide; gravel, 6 inches deep, 16 feet wide; width of road from ditch to ditch, 30 feet; four water courses; one stone culvert. Cost, $400; aid, $200.

Brewer. Excavation, 2 feet deep, 24 feet wide, 371 feet in length; earth and gravel, 18 inches deep; width of road from ditch to ditch, 32 feet. Cost, $257; aid, $100.

Carmel. Excavation, 8 feet wide, 2½ feet deep, 42 rods in length; stone filling, 8 feet wide, 1½ feet deep; with 1½ feet of earth and gravel on top of stone filling; width of road, 30 feet from ditch to ditch; one stone culvert; driveway 19 feet. Cost, $213.88; aid, $104.94.

Carroll. The road was excavated for a length of 16 rods and filled with stone, 3 feet deep, 3 feet wide; covered with earth 1½ feet deep; and gravel 6 inches deep; one split stone culvert; width of the road, 36 feet from ditch to ditch. Cost, $208.32; aid, $100.

Clifton. Excavation and stone filling 2 feet deep and 8 feet wide for a length of 27 rods; one stone culvert; stone filling covered with 10 inches of earth and 6 inches of gravel; width of road, 24 feet from ditch to ditch. Cost, $157.30; aid, $50.

Corinna. Stone filling, 2½ feet deep; 16 feet wide; 24 rods in length; earth filling 6 inches deep, 30 feet wide; gravel, 6 inches deep, 20 feet wide; width of road from ditch to ditch, 30 feet; two water courses; one culvert of stone. Cost, $402; aid, $200.

Dixmont. Excavation, three hundred sixty-six cubic yards; stone filling, 2½ feet deep, 4 feet wide, 40 rods in length; covered with earth 1½ feet deep and gravel 6 inches deep, 14 feet wide; one stone culvert; width of road from ditch to ditch, 26 feet. Cost, $202.75; aid, $100.

Eddington. Excavation, 58 rods, 2 to 2½ feet deep, 10 feet wide; stone filling, 10 feet wide, 2 feet deep; covered with earth, and 4 inches of gravel 9 feet wide; and 30 rods more (82 rods in all) hard gravel road; two stone culverts; width of road, 30 feet from ditch to ditch. Cost, $285.74; aid, $142.87.

Etna. Stone filling, 740 feet in length, 20 to 30 inches deep, eight feet wide; covered with earth and gravel, 18 inches deep; one stone culvert. Cost, $221.74; aid, $50.

Exeter. Excavated a piece of wet road 25 rods long, 12 feet wide and three feet deep; stone filling 10 feet wide and two feet deep; covered with shingle sawdust and 1½ feet of earth; one stone culvert; width of road from ditch to ditch, 32 feet. Cost, $217.40; aid, $50.

Garland. Stone filling 3 feet deep, 20 feet wide and 20 rods long at the foot and up the slope of a steep hill, changing the grade to a very easy one; said filling was graveled the whole length to a depth of sixteen inches. Cost, $386.18; aid, $100.

Greenbush. Graded 40 rods of turnpike, 24 feet from ditch to ditch; covered with gravel 8 inches deep; the road being all sand and not requiring drainage, the gravel makes a good surface which the road never had before. Cost, $210; aid, $105.

Hampden. Excavation, 3 feet deep, 8 feet wide, 65 rods in length; stone filling, 2 feet deep, 8 feet wide, 65 rods in length; earth, 1 foot deep, 16 feet wide, 65 rods in length; gravel, 6 inches deep, 12 feet wide, 65 rods in length; width of road from ditch to ditch, 30 feet. Cost, $516.15; aid, $200.

Hermon. Worked 21 rods of road; stone filling, 16 rods long, 25 feet wide; 5 rods long, 10 feet wide; all from 1½ to 2 feet deep; covered with 6 inches of earth and 6 inches of gravel. Cost, $200; aid, $100.

Holden. Stone filling, 18 inches deep, 20 feet wide and 54 rods long, on a low, wet piece of road; covered with two feet of earth and 10 inches of gravel; one stone culvert; width of road from ditch to ditch, 27 feet. Cost, $215; aid, $100.

Howland. Turnpiked road 1,750 feet long, 24 feet wide from ditch to ditch; covered with gravel and coal clinkers, 6 inches deep, 18 feet wide; one stone culvert. Cost, $233.81; aid, $100.

Kingman. Earth excavation, 15,000 feet, taken from top of hill and put on stone filling in hollow at bottom, reducing grade of hill; stone filling, 4½ feet deep, 14 feet wide, 128 feet long; earth filling, 5 feet deep, 20 feet wide, 140 feet long; length of road worked 500 feet. Cost, $399; aid, $199.50.

Lee. Stone filling; gravel covering; two stone culverts; lowered hill; fine hard gravel road; in all ½ mile in length. Cost, $252.33; aid, $100.

Levant. Excavation, 1,118 feet in length, 14 to 20 feet wide, 14 inches to 3 feet deep; stone filling, 610 feet long, 14 inches deep and 14 feet wide; stone filling, 283 feet long, 2 feet deep and 20 feet wide; stone filling, 225 feet long 2 to 3 feet deep, 20 feet wide; total 1,118 feet; stones covered whole distance one foot or more deep with earth and gravel; one culvert, stone sides and covering. Cost, $392.95; aid, $196.48.

Lincoln. Gravel to the depth of 2 feet and width of 40 feet on 766 feet of street; the street properly shaped and drained and forty feet from ditch to ditch. Cost, $292.76; aid, $100.

Mattawamkeag. Raising the road through a wet place to the height of one foot for about one-quarter of a mile; graveled the same for ½ mile with 280 loads of gravel; also made 3 split stone culverts; width of road worked, 24 feet from ditch to ditch. Cost, $311.98; aid, $100.

Maxfield. Stone filling, 1 to 3 feet deep for 6 rods; culvert of split stone laid in cement. Cost, $243.25; aid, $100.

Newburg. Stone filling, 1½ feet deep, 20 feet wide, 21 rods in length; earth and gravel covering, 2 feet deep, 20 feet wide. Cost, $213.98; aid, $100.

Newport. Excavation, 22,720 cubic feet; stone filling, 2½ feet deep, 13 feet wide, 42 rods in length. Cost, $401.37; aid, $200.

Old Town. Stone filling, 3 feet deep, 6 feet wide and 850 feet long; covered with earth 10 inches deep and gravel 10 inches deep; 4 water courses and two stone culverts; road 46 feet from ditch to ditch. Cost, $600; aid, $200.

Orono. Excavated four feet deep, five feet wide, five hundred feet in length; stone filling, same as excavation; covered with earth one foot; gravel six inches; width of road, 27 feet; whole length of road worked 600 feet; one culvert, 3 foot boiler shell. Cost, $294.85; aid, $100.

Orrington. Excavation, 2 feet deep, 9 feet wide, 27 rods in length; covered with earth 8 inches deep; with gravel on top, 6 inches deep, 12 feet wide; worked in all 52 rods; width from ditch to ditch, 29 feet; one stone culvert. Cost, $201.05; aid, $100.

Passadumkeag. Stone filling, 24 feet wide, 2 feet deep, 19 rods long; width from ditch to ditch, 24 feet; one stone culvert; length of road worked, 93 rods (gravel turnpike), 19 rods stone filling. Cost, $375.26; aid, $165.88.

Patten. Stone filling, 2½ feet deep, 25 feet in width and 8 rods in length; gravel, 12 inches deep, 24 feet wide, 66 rods in length. Cost, $407.96; aid, $200.

Plymouth. Excavation, 22 inches deep, 11 feet wide and 70 rods long; earth and gravel, 6 inches deep, 25 feet wide; width from ditch to ditch, 25 feet. Cost, $298.17; aid, $100.

Springfield. Stone filling, 18 inches deep, 24 feet wide, 25 rods in length; gravel, 8 inches deep, 22 feet wide; length of road worked, one mile; width of road, 24 feet; 7 culverts, wood and stone. Cost, $300; aid, $150.

Stetson. Excavation, 32 rods in length, 2½ to 3½ feet in depth, 9 feet wide; stone filling, same as above; 18 inches of earth and 4 inches of gravel; length of road worked, 55 rods; 24 feet from ditch to ditch; two stone culverts. Cost, $318.75; aid, $100.

Winn. Excavating from top of hill two feet; using the same with large amount of rock for filling each side of hill, thereby

State Road built by Town of Newport, 1905.

Old road at this point was narrow and closely followed natural surface of ground. Note good width, reduction of grade approaching R. R. crossing, and guard rails. Foundation is solid stone.

making an easy grade; length of road worked, 209 rods; four water courses; five stone culverts; road 25 feet wide from ditch to ditch. Cost, $200; aid, $100.

PISCATAQUIS COUNTY.

Blanchard. Building bridge and approaches, 16 rods. Cost, $187.09; aid, $93.55.

Brownville. Building one stone culvert; widening the road; cutting good ditches; and putting in a heavy coat of gravel the entire length. Amount of road improved 180 rods. Cost, $444.91; aid, $200.

Dover. Removed the earth from the center of the road; filled with small stones to the depth of about 2 feet; covered with gravel; widened the road. Road improved, about 55 rods. Cost, $400.42; aid, $200.

Foxcroft. Widened road; built split granite culverts; blasted and removed ledge; excavated; filled with rocks and covered with earth; road improved, 105 rods. Cost, $404.86; aid, $200.

Guilford. Widened and turnpiked road; put in stone and tile culverts, through swamp; filled with rocks and covered with gravel; road improved, about 200 rods. Cost, $306.23; aid, $100.

Milo. Road widened to 35 feet; large amount of ledge blasted and removed to make ditches; the whole section of said road well covered with gravel; road improved, 25 rods. Cost, $725.83; aid, $200.

Monson. Widened road; blasted and removed ledge and rocks; made stone culverts, made fill, cut down hill; road improved, about one mile. Cost, $405.02; aid, $200.

Parkman. Cut down hills; widened road; put 18-inch tiling for culverts, took out stones. Road improved, ¾ of a mile. Cost, $234.75; aid, $100.

Sangerville. Widening road; blasting and removing ledge; putting in stone and tile culverts. Road improved about ¾ of a mile. Cost, $406.25; aid, $200.

Sebec. Removed earth to ledge; filled with rocks and covered with dirt; widened road; road improved, 40 rods. Cost, $205; aid, $100.

Shirley. Filled with rocks and covered with dirt; widened road; put in stone culverts; road improved nearly ¾ of a mile. Cost, $359.50; aid, $100.

Wellington. Blasted and removed rocks; lowered hill; made fill; widened road; made stone culverts. Road improved about ⅓ of mile. Cost, $237.38; aid, $100.

Williamsburg. Built stone culvert; turnpiked 155 rods of road; 24 feet wide; blasted ledge and rocks. Cost, $109.20; aid, $50.

Willimantic. Built stone culverts, widened road, carted on gravel. Road improved, 111 rods. Cost, $100.10; aid, $50.

SAGADAHOC COUNTY.

Arrowsic. Blasted and removed ledge; filled. Cost, $407; aid, $200.

Bowdoin. Blasted and removed ledge on Tarr hill, so called, built up the approaches; and filled with gravel. Cost, $483.46; aid, $200.

Bowdoinham. Blasted and removed ledge; filled in with gravel. Cost, $400; aid, $200.

Phippsburg. Blasted rock; filled with gravel. Cost, $400.56; aid, $200.

Richmond. Stone work and gravel. Cost, $577.28; aid, $200.

Topsham. Length of road 518 feet; width 34 feet. Improvements consisted of filling with crushed rock of good thickness and well rolled. Cost, $849.66; aid, $200.

Woolwich. Blasted and removed ledge; drained; filled with gravel. Cost, $400.86; aid, $200.

SOMERSET COUNTY.

Athens. Blasted ledge for ditches; filled with stone and gravel; constructed three water courses of stone and cement; length of road improved 140 rods. Cost, $352.12; aid, $176.06.

Canaan. Blasted ledge from roadbed; ditches filled at foot of the hill with stone and gravel; constructed one stone culvert; road improved 29 rods. Cost, $195; aid, $92.50.

Cornville. Excavated 25 rods of earth; filled with stone; covered with gravel; constructed one culvert of split stone. Cost, $241.21; aid, $100.

Detroit. Excavated road 480 feet long, 12 feet wide; filled with stone to a depth of 2 feet; covered with earth to depth of one foot; constructed one stone culvert. Cost, $200; aid, $100.

Embden. Excavated roadbed; filled with gravel and stone; constructed two stone culverts; length of road worked, 30 rods. Cost, $210; aid, $100.

Harmony. Raised roadbed with stone and gravel; length, thirty rods; cut down hill, length, 10 rods. Cost, $200; aid, $100.

Hartland. Worked road 24½ rods by blasting ledge from road and ditches; filled roadbed with stone and gravel; constructed one stone culvert. Cost, $218.85; aid, $100.

Madison. Excavated 75 rods of roadbed; filled with stones; covered with gravel. Cost, $433.65; aid, $200.

New Portland. Worked 80 feet of road; filled with stone and gravel; constructed one stone culvert. Cost, $388.69; aid, $194.34.

Norridgewock. Worked 28 rods of road; excavated roadbed; filled with stone and gravel. Cost, $400; aid, $200.

Palmyra. Filled 40 rods of road with stone to a depth of one foot, and width of 19 feet; covered same with earth and gravel to a depth of one foot. Cost $400; aid, $200.

Pittsfield. Excavated 130 rods of roadbed; filled with stone and gravel. Cost, $396.19; aid, $198.09.

St. Albans. Excavated 770 cubic yards of earth; filled with stone; covered stone with earth to depth of 1½ feet and gravel to depth of 8 inches. Cost, $400; aid, $200.

Skowhegan. Constructed six culverts of split granite and cement. Cost, $574.37; aid, $200.

Brighton Plantation. Worked 31 rods of road; blasted ledge from ditches; filled road with stone and gravel; constructed one water course of split stone. Cost, $200; aid, $100.

WALDO COUNTY.

Belfast. Excavated ditch 1,400 feet in length, 3 to 4 feet deep, and 6 feet wide; laid a drain of field rocks at bottom; ditch nearly filled with rocks; then filled with dirt; over all a thick layer of beach gravel. Cost, $527.75; aid, $150.

Brooks. Excavated a ditch 59 rods in length, 3 feet wide and 3 feet deep; ditch filled with small stone; also widened the

bridge; length of road constructed 109 rods. Cost, $225; aid, $100.

Burnham. Built culvert; made a fill with stone and dirt. Cost, $200; aid, $100.

Frankfort. Continued, running north, from state road of 1903; raised to prevent tide from flowing over said road; used 700 tons of granite; 500 yards of clay; 200 yards of gravel. Cost, $400; aid, $200.

Freedom. Raised about 20 rods of main road about five feet by carting stone and making a fill about 18 feet wide; blasted out ledge for ditch; made large culvert; covered all with a coat of gravel. Cost, $200; aid, $100.

Islesboro. Beginning at the north end of the road improved in 1903, a trench was dug in center of road to near store of F. S. Pendleton & Company; then a rock drain was laid, small rocks filled in on top and soil filled in to top of the road; side ditches were cleared; then road was covered with gravel. Cost, $406.63; aid, $200.

Jackson. Blasted ledge; cut bushes; took out stumps and logs; underlaid with rocks; built culverts; graded with earth. Cost, $256.37; aid, $100.

Knox. Opened and filled with rocks; put in three culverts; straightened; widened to about 25 feet. Cost, $213.45; aid, $100.

Lincolnville. Straightened; widened; put in culvert; graded; removed rocks, etc. Cost, $200; aid, $100.

Monroe. Widened road a distance of 113 rods; widened out bridge 8 feet; underdrained road 7 rods. Cost, $318.70; aid, $100.

Montville. Commenced at W. J. Bean's store and ran east 143 rods, to near residence of Mrs. John L. Bean. All of this opened and filled with stone; three culverts were built and two covered with stone; width of road is about 28 feet. Cost, $410.38; aid, $200.

Morrill. Section of road opened about 7 feet wide and 4 feet deep; filled with rock; another section about 30 rods raised, widened, and graveled; two large stone culverts built. Cost, $400; aid, $200.

Northport. A trench 665 feet long and 3 1-2 feet wide and 3 1-2 feet deep at one end and 2 1-2 feet deep at the other, filled

State Road built by City of Calais, 1905.
From photograph taken immediately after long, hard rain in November. Note good shape of road and absence of deep ruts after three days' rain.

with rock and covered and graded. Also 200 feet more of roadway graded; ditch 216 feet long dug in field; covered watercourse in bottom of trench. Cost, $200; aid, $100.

Palermo. Began at the river bridge, opened the road 8 feet wide, 2 feet deep; filled the ditch with rocks; covered the same with earth for a distance of 70 rods. Cost, $400; aid, $200.

Searsmont. Laid covered drain 25 rods, 18 by 24 inches; raised road and covered with gravel about 75 rods; made stone causeways, etc. Cost, $401.60; aid, $200.

Searsport. Made a ditch 25 rods long, 4 feet wide and 3 1-2 feet deep; laid open double drain; covered with flat rock; filled with small rock; graveled the same. Cost, $205; aid, $100.

Swanville. Road widened; straightened; built large culvert; filled; raised about 2 feet; graveled top; length, 20 rods. Cost, $100; aid, $50.

Thorndike. Opened the road and scraped out the dirt to the depth of 2 feet, or more, filled the same with stone and covered with dirt about 40 rods; built a culvert of stone; graded; rebuilt the road for the distance of 160 rods. Cost, $201.75; aid, $100.

Troy. Improved about 80 rods of road, by opening about one half, and filling with stone; the remainder by laying stringers lengthwise of the old road and covering with cedar and covering all with gravel. Cost, $560; aid, $200.

Unity. Made a ditch six feet wide and three and one-half feet deep, opened drain at bottom, and filled with rocks, covered with dirt and gravel. Cost, $215; aid, $100.

Winterport. Cut bushes; removed roots; opened ditches; turnpiked and graveled Cove hill from a point opposite Frank Peter's shop, to a point near Mrs. Rose Sullivan's, a distance of 220 rods; also built a new stone culvert 45 feet long near Mrs. Rose Sullivan's. Cost, $308.03; aid, $100.

WASHINGTON COUNTY.

Addison. Graded and graveled. Cost, $100; aid, $50.

Alexander. Graded and graveled. Cost, $200; aid, $100.

Calais. Two thousand one hundred feet of macadam road, with four iron culverts. Cost, $400; aid, $200. (Cost, City Report, $1,773.32.)

Columbia. Graded and graveled one-half mile; two iron culverts. Cost, $200; aid, $100.

Danforth. Graded and graveled; one stone culvert. Cost, $200; aid, $100.

Eastport. Graded and graveled. Cost, $400; aid, $200.

Lubec. Graded and graveled; three iron culverts. Cost, $400; aid, $200.

Perry. Graded and graveled; two stone culverts. Cost, $200; aid, $100.

Princeton. Macadamized 40 rods of road. Cost, $400; aid, $200.

Robbinston. Graded and graveled; one stone culvert. Cost, $200; aid, $100.

Vanceboro. Graded one-half mile; put in one stone culvert. Cost, $110; aid, $55.

YORK COUNTY.

Berwick. Filled 15 inches deep with rotten stone; covered the same with 6 inches of finer grade of rotten stone; roadbed 22 feet wide and 30 feet from ditch to ditch. Cost, $325; aid, $100.

Buxton. Made a roadbed of stone 14 feet wide; graveled the same 28 feet wide. Cost, $304.10; aid, $100.

Dayton. Roadbed constructed of clay 33 feet wide at base, and graded with clay to a height of 2 1-2 feet; at center of same placed 525 loads of gravel, bringing the roadbed to a height of over 3 feet at the center and preserving a true grade to the sides; constructed two culverts, the funnel of the smallest being 15 by 27 inches, built of square stone. Cost, $400; aid, $200.

Eliot. Excavated roadbed to the width of 10 feet. Filled with stone 10 inches deep; covered with gravel; width of roadbed 22 feet; length of road built, 600 feet. Cost, $264.75; aid, $125.

Hollis. Excavated roadbed to the width of 8 feet; filled with rocks; covered with 14 inches of gravel; length of road built, 550 feet. Cost, $260.30; aid, $130.15.

Kittery. Began at the west end of the road built in 1903, and ran west for a distance of 850 feet; road was excavated 8 feet wide and one foot deep; filled with stone and rolled down; covered with small stone and well rolled; graveled 23 feet wide and one foot deep. Cost, $638.30; aid, $200.

Newfield. Filled the roadbed to the depth of from 1 to 2 1-2 feet, with rocks; covering the same with coarse gravel, to the depth of 18 inches in the center with proper grade to the outer

edge; width of roadbed 22 feet; length of road built 736 feet. Cost, $400; aid, $200.

North Berwick. Excavated the roadbed and filled with stone; graded with crushed stone and used steam roller on same. Cost, $402.69; aid, $200.

Parsonsfield. Excavated the road 18 inches deep, and 16 feet wide; filled the same with stone; covered stone with dirt; graveled the same to the depth of 18 inches; extending on each side of the excavation the distance of three feet, making the roadbed 22 feet in width; length of road built, 530 feet. Cost, $300; aid, $100.

Shapleigh. Graveled the roadbed; opened the ditches; put in stone culvert 33 feet long. Cost, $325; aid, $162.50.

York. Placed in the bottom a layer of field stones 12 feet wide; covered with a layer of gravel 8 inches deep; wet and rolled with a four ton roller; put on another layer 6 inches deep in the same manner; a crown of 2 feet from center of roadbed; road is 22 feet wide, which does not include the portion occupied by the street railway; length of road built 850 feet. Cost, $600; aid, $200.

TABLE No. 3.

Showing Expenditures for Construction of State Roads and amounts of State Aid received by Towns which have taken advantage of the State road law.

ANDROSCOGGIN COUNTY.

Towns.	1901.		1902.		1903.		1904.	
	Cost.	Aid.	Cost.	Aid.	Cost.	Aid.	Cost.	Aid.
Auburn								
Durham					$212 62	$100 00	$202 70	$101 35
East Livermore								
Greene					218 46	50 00		
Leeds								
Lewiston								
Lisbon					414 66	200 00	403 08	200 00
Livermore								
Mechanic Falls					200 00	100 00	200 00	100 00
Minot								
Poland			$200 00	$100 00			200 00	100 00
Turner								
Wales			200 00	100 00	200 00	100 00	200 00	100 00
Webster					200 00	50 00	300 00	150 00
Totals			400 00	200 00	1,445 74	600 00	1,505 78	751 35
Total number of towns				3		7		7

AROOSTOOK COUNTY.

Amity								
Ashland			200 00	100 00	563 00	200 00	220 54	100 00
Bancroft					250 00	125 00		
Benedicta								
Blaine								
Bridgewater			200 00	100 00	200 00	100 00	400 00	200 00
Caribou			200 00	100 00	400 00	200 00	400 00	200 00
Castle Hill					206 00	100 00		
Crystal								
Dyer Brook			200 00	100 00	400 00	200 00	318 00	100 00
Easton					217 00	100 00	400 00	200 00
Fort Fairfield			200 00	100 00	400 00	200 00	500 00	200 00
Fort Kent								
Frenchville								
Grand Isle								
Haynesville							141 95	50 00
Hersey								
Hodgdon			200 00	100 00	200 00	100 00	300 00	150 00
Houlton			200 00	100 00	403 65	200 00	504 75	200 00
Island Falls								
Limestone					206 52	100 00	200 00	200 00
Linneus							350 00	150 00
Littleton								
Ludlow					200 00	100 00	200 00	100 00
Madawaska								
Mapleton					204 00	100 00	405 00	200 00
Mars Hill								
Masardis			200 00	100 00	200 00	100 00	400 00	100 00
Monticello					200 00	100 00	300 00	150 00
New Limerick								
New Sweden					255 15	127 00	237 83	100 00
Oakfield					400 00	200 00	500 00	200 00
Orient					202 50	100 00	200 00	100 00
Perham			178 52	89 26	210 55	105 00	200 50	100 00
Presque Isle					206 00	100 00	404 63	200 00
Sherman			200 00	100 00	400 00	200 00	800 00	200 00
Smyrna			200 00	100 00	400 00	200 00	410 00	200 00
Saint Agatha								
Van Buren					286 00	143 00	720 23	200 00
Washburn					200 00	100 00	100 00	50 00
Weston							205 00	100 00
Woodland			200 00	100 00	400 00	200 00	200 00	100 00

Expenditures and State Aid for State Roads—Continued.

AROOSTOOK COUNTY—CONCLUDED.

Plantations.	1901.		1902.		1903.		1904.	
	Cost.	Aid.	Cost.	Aid.	Cost.	Aid.	Cost.	Aid.
Allagash								
Cary	$	$						
Caswell	200 00	100 00	$200 00	$100 00				
Chapman								
Connor								
Cyr								
E								
Eagle Lake								
Garfield								
Glenwood								
Hamlin								
Hammond								
Macwahoc			200 00	100 00	$150 00	$75 00	$175 00	$50 00
Merrill			200 00	100 00			400 00	200 00
Moro								
Nashville								
New Canada								
Oxbow								
Portage Lake								
Reed								
Saint Francis								
Saint John								
Silver Ridge								
Stockholm								
Wade								
Wallagrass								
Westfield								
Westmanland								
Totals	200 00	100 00	2,978 52	1,489 26	7,360 37	3,575 00	9,593 43	4,100 00
Total number of towns		1		15		26		28

CUMBERLAND COUNTY.

Baldwin								
Bridgton							200 00	100 00
Brunswick								
Cape Elizabeth								
Casco					200 00	100 00	200 46	100 00
Cumberland							216 00	100 00
Falmouth			200 00	100 00	200 00	100 00		
Freeport					203 10	100 00	198 79	99 40
Gorham					400 00	200 00	500 00	200 00
Gray			200 00	100 00	200 00	100 00	200 00	100 00
Harpswell								
Harrison							230 00	100 00
Naples							200 00	100 00
New Gloucester								
North Yarmouth								
Otisfield								
Portland								
Pownal								
Raymond								
Scarboro			200 00	100 00	304 66	152 00	200 00	100 00
Sebago								
South Portland					600 00	300 00	595 95	200 00
Standish								
Westbrook							2,500 00	200 00
Windham			200 00	100 00	200 00	100 00	405 00	200 00
Yarmouth								
Totals			800 00	400 00	2,307 76	1,352 00	5,646 20	1,599 40
Total number of towns				4		8		12

Expenditures and State Aid for State Roads—Continued.

FRANKLIN COUNTY.

Towns.	1901.		1902.		1903.		1904.	
	Cost.	Aid.	Cost.	Aid.	Cost.	Aid.	Cost.	Aid.
Avon			$200 00	$100 00	$241 49	$120 00	$204 98	$100 00
Carthage					200 00	100 00	200 00	100 00
Chesterville								
Eustis								
Farmington								
Freeman								
Industry								
Jay			200 00	100 00	200 14	100 00	406 80	200 00
Kingfield								
Madrid								
New Sharon								
New Vineyard	200 00	100 00			300 00	150 00		
Phillips								
Rangeley	200 00	100 00	200 00	100 00	300 00	150 00	300 00	150 00
Salem					245 94	122 00	180 00	90 00
Strong	200 00	100 00	200 00	100 00	200 00	100 00	200 00	100 00
Temple								
Weld					200 00	100 00	400 00	200 00
Wilton			200 00	100 00	418 40	200 00	634 68	200 00
PLANTATIONS.								
Coplin								
Dallas								
Greenvale								
Lang								
Rangeley								
Totals	600 00	300 00	1,000 00	500 00	2,305 97	1,142 00	2,526 46	1,140 00
Total number of towns		3		5		9		8

HANCOCK COUNTY.

Amherst								
Aurora								
Bluehill					$209 93	$104 97	$382 28	$191 14
Brooklin							300 00	100 00
Brooksville			$200 00	$100 00	200 00	100 00	202 18	100 00
Bucksport			201 23	100 00				
Castine								
Cranberry Isles								
Dedham			100 00	50 00			100 00	50 00
Deer Isle								
Eastbrook								
Eden								
Ellsworth					400 00	200 00	602 40	200 00
Franklin								
Gouldsboro							375 00	187 50
Hancock					200 00	100 00	400 00	200 00
Isle au Haut								
Lamoine					223 98	100 00	201 65	100 00
Mariaville							200 00	100 00
Mount Desert								
Orland							241 96	100 00
Otis							140 35	50 00
Penobscot								
Sedgwick					291 46	145 73	241 38	75 00
Sorrento								
Stonington					300 00	150 00	398 58	150 00
Sullivan					412 00	200 00	361 27	150 64
Surry							149 40	50 00
Swan's Island								
Tremont								
Trenton			200 00	100 00	192 87	96 44	100 00	50 00
Verona								
Waltham							155 57	75 00
Winter Harbor					300 00	150 00	266 00	100 00

Expenditures and State Aid for State Roads--Continued.

HANCOCK COUNTY—CONCLUDED.

Plantations.	1901.		1902.		1903.		1904.	
	Cost.	Aid.	Cost.	Aid.	Cost.	Aid.	Cost.	Aid.
Long Island								
No. 8								
No. 33								
Totals			$701 23	$350 00	2,730 24	1,347 14	4,758 02	2,029 28
Total number of towns				4		10		18

KENNEBEC COUNTY.

Albion					$			
Augusta			$200 00	$100 00	1,500 00	$200 00	$600 00	$200 00
Belgrade					200 00	100 00	400 00	200 00
Benton							246 00	100 00
Chelsea					232 75	100 00	118 15	50 00
China					400 00	200 00	460 00	200 00
Clinton							380 00	100 00
Farmingdale					400 00	200 00	199 93	99 96
Fayette								
Gardiner								
Hallowell			200 00	100 00	200 00	100 00		
Litchfield					200 00	100 00	150 00	50 00
Manchester							188 15	94 07
Monmouth								
Mount Vernon					252 53	150 00	200 00	100 00
Oakland								
Pittston							440 14	200 00
Randolph							402 80	200 00
Readfield					408 37	300 00	450 00	200 00
Rome								
Sidney					400 00	300 00	401 89	200 00
Vassalboro			200 00	100 00	409 53	200 00	200 00	100 00
Vienna			200 00	100 00	204 90	100 00		
Waterville								
Wayne			200 00	100 00	200 00	100 00	250 00	100 00
West Gardiner					207 90	100 00	269 74	100 00
Windsor							200 00	100 00
Winslow								
Winthrop							486 97	200 00
PLANTATION.								
Unity								
Totals			1,000 00	500 00	5,215 98	2,250 00	5,983 77	2,594 03
Total number of towns				5		14		19

KNOX COUNTY.

Appleton	208 24	100 00	199 95	99 98	200 00	100 00	200 00	100 00
Camden							591 99	200 00
Cushing					200 00	100 00	150 30	75 00
Friendship								
Hope							200 00	100 00
Hurricane Isle								
North Haven			413 33	100 00	291 83	145 00	212 60	100 00
Rockland							485 37	100 00
Rockport			297 74	100 00	382 55	141 00	599 14	200 00
South Thomaston			191 07	50 00	157 09	75 00	1,037 99	100 00
Saint George					358 28	154 00	600 06	200 00
Thomaston					632 00	200 00	641 50	200 00
Union							200 20	100 00
Vinalhaven					277 08	138 00	276 08	100 00
Warren							490 76	200 00
Washington			178 83	50 00	302 36	151 00	221 53	100 00

Expenditures and State Aid for State Roads—Continued.

KNOX COUNTY—CONCLUDED.

Plantations.	1901.		1902.		1903.		1904.	
	Cost.	Aid.	Cost.	Aid.	Cost.	Aid.	Cost.	Aid.
Criehaven								
Matinicus Isle								
Totals	208 24	100 00	1,280 92	399 98	2,801 19	1,204 00	5,907 46	1,875 00
Total number of towns		1		5		9		14

LINCOLN COUNTY.

Alna							$225 00	$100 00
Boothbay					$322 50	$100 00		
Boothbay Harbor			$700 00	$100 00	510 86	100 00	300 44	100 00
Bremen							260 00	100 00
Bristol								
Damariscotta								
Dresden								
Edgecomb					220 36	100 00		
Jefferson			428 86	100 00	403 35	100 00	525 00	200 00
Newcastle					459 00	50 00	115 00	57 50
Nobleboro								
Somerville								
Southport					200 08	100 00	200 03	100 00
Waldoboro								
Westport								
Whitefield					406 20	100 00	489 15	200 00
Wiscasset								
PLANTATION.								
Monhegan								
Totals			1,128 86	200 00	2,522 35	650 00	2,114 62	857 50
Total number of towns				2		7		7

OXFORD COUNTY.

Albany							205 00	100 00
Andover							265 60	125 00
Bethel					468 20	200 00	496 44	200 00
Brownfield								
Buckfield								
Byron								
Canton								
Denmark								
Dixfield							300 00	100 00
Fryeburg							402 98	200 00
Gilead								
Grafton								
Greenwood			200 00	100 00	302 79	150 00	315 00	150 00
Hanover								
Hartford								
Hebron								
Hiram								
Lovell	200 00	100 00	200 00	100 00	207 65	103 82	194 15	97 07
Mason								
Mexico							450 00	200 00
Newry								
Norway			200 00	100 00			400 00	200 00
Oxford					337 00	168 50	500 00	150 00
Paris							225 00	100 00
Peru								
Porter								
Roxbury								
Rumford							3,000 00	200 00
Stow					200 00	154 00	210 00	100 00

Expenditures and State Aid for State Roads—Continued.

OXFORD COUNTY—CONCLUDED.

Towns.	1901.		1902.		1903.		1904.	
	Cost.	Aid.	Cost.	Aid.	Cost.	Aid.	Cost.	Aid.
Stoneham					$316 50	$158 00	$230 00	$75 00
Sumner							400 00	200 00
Sweden					150 00	75 00		
Upton								
Waterford							400 00	200 00
Woodstock					600 00	200 00	400 00	200 00
Totals	200 00	100 00	600 00	300 00	2,582 14	1,209 32	8,394 17	2,597 07
Total number of towns		1		3		8		17

Oxford County plantations built no State roads.

PENOBSCOT COUNTY.

Alton					235 60	117 00	200 00	100 00
Argyle			300 00	100 00	300 00	150 00	250 00	50 00
Bangor			684 96	100 00	7,896 50	200 00	1,000 00	200 00
Bradford							400 00	200 00
Bradley								
Brewer					201 63	100 00	257 00	100 00
Burlington								
Carmel			189 98	94 99	190 27	95 14	213 88	104 94
Carroll							208 32	100 00
Charleston			104 27	52 13				
Chester								
Clifton					135 53	67 72	157 30	50 00
Corinna					400 00	200 00	402 00	200 00
Corinth					510 00	200 00		
Dexter	201 85	100 00	205 00	100 00	398 00	199 00		
Dixmont							202 75	100 00
Eddington			268 00	100 00	276 65	135 32	285 74	142 87
Edinburg								
Enfield								
Etna	715 21	100 00	715 21	100 00	249 22	124 61	221 74	50 00
Exeter					215 99	107 99	217 40	50 00
Garland					171 56	85 78	386 18	100 00
Glenburn								
Greenbush					250 00	125 00	210 00	105 00
Greenfield								
Hampden					404 68	200 00	516 15	200 00
Hermon							200 00	100 00
Holden			200 00	100 00	200 00	100 00	215 00	100 00
Howland					299 61	149 80	233 81	100 00
Hudson								
Kenduskeag								
Kingman							399 00	199 50
Lagrange					423 73	200 00		
Lee							252 33	100 00
Levant			254 55	100 00	358 79	179 39	392 95	196 48
Lincoln			203 39	100 00	400 00	200 00	292 76	100 00
Lowell								
Mattamiscontis								
Mattawamkeag					383 14	191 57	311 98	100 00
Maxfield							243 25	100 00
Medway								
Milford					200 50	100 25		
Mt. Chase								
Newburg			221 14	100 00	204 25	102 12	213 98	100 00
Newport					374 35	187 17	401 37	200 00
Old Town					570 91	200 00	600 00	200 00
Orono					263 76	131 88	294 85	100 00
Orrington			220 81	100 00	202 79	101 40	201 05	100 00
Passadumkeag			211 71	100 00	263 17	131 58	375 26	165 88
Patten			234 71	100 00	216 85	108 43	407 96	200 00
Plymouth					297 73	148 86	298 17	100 00
Prentiss					368 50	184 25		

Expenditures and State Aid for State Roads—Continued.

PENOBSCOT COUNTY—CONCLUDED.

Towns.	1901.		1902.		1903.		1904.	
	Cost.	Aid.	Cost.	Aid.	Cost.	Aid.	Cost.	Aid.
Springfield	.....	.....	$225 00	$100 00	$200 00	$100 00	$300 00	$150 00
Stetson	.....	.....	.....	.....	.....	.....	318 75	100 00
Veazie	.....	.....	.....	.....	.....	.....	.....	.....
Winn	.....	.....	200 00	100 00	400 00	200 00	200 00	100 00
Woodville	.....	.....	.....	.....	.....	.....	.....	.....
Totals	917 06	200 00	4,438 79	1,547 12	17457 61	4,824 26	11280 93	4,464 67
Total number of towns	.....	2	.....	16	.....	33	.....	36

Plantations of Penobscot county have not built State roads.

PISCATAQUIS COUNTY.

Abbot	.....	.....	.....	.....	.....	.....	.....	.....
Atkinson	.....	.....	.....	.....	.....	.....	.....	.....
Blanchard	.....	.....	200 00	100 00	222 55	111 00	187 09	93 55
Brownville	.....	.....	.....	.....	325 88	167 00	444 91	200 00
Dover	.....	.....	.....	.....	.....	.....	442 00	200 00
Foxcroft	.....	.....	.....	.....	300 95	150 00	404 86	200 00
Greenville	.....	.....	.....	.....	.....	.....	.....	.....
Guilford	.....	.....	.....	.....	328 35	164 00	306 23	100 00
Medford	.....	.....	.....	.....	.....	.....	.....	.....
Milo	.....	.....	.....	.....	238 25	119 00	725 83	200 00
Monson	.....	.....	200 00	100 00	208 79	100 00	405 02	200 00
Orneville	.....	.....	200 00	100 00	209 55	100 00	.....	.....
Parkman	.....	.....	.....	.....	274 09	137 00	234 75	100 00
Sangerville	.....	.....	.....	.....	200 43	100 00	406 25	200 00
Sebec	.....	.....	200 00	100 00	206 81	100 00	205 00	100 00
Shirley	.....	.....	200 00	100 00	202 50	100 00	359 50	100 00
Wellington	200 00	100 00	200 00	100 00	202 15	100 00	237 38	100 00
Williamsburg	.....	.....	.....	.....	.....	.....	109 20	50 00
Willimantic	.....	.....	.....	.....	200 00	100 00	110 00	50 00
Totals	200 00	100 00	1,200 00	600 00	3,120 30	1,548 00	4,578 02	1,893 55
Total number of towns	.....	1	.....	6	.....	13	.....	14

Plantations of Piscataquis county have not built State roads.

SAGADAHOC COUNTY.

Arrowsic	.....	.....	.....	.....	435 99	200 00	407 00	200 00
Bath	.....	.....	.....	.....	.....	.....	.....	.....
Bowdoin	.....	.....	200 00	100 00	402 84	200 00	483 46	200 00
Bowdoinham	.....	.....	.....	.....	214 66	100 00	400 00	200 00
Georgetown	.....	.....	.....	.....	300 00	150 00	.....	.....
Perkins	.....	.....	.....	.....	.....	.....	.....	.....
Phippsburg	.....	.....	.....	.....	360 38	180 00	400 56	200 00
Richmond	.....	.....	.....	.....	.....	.....	577 28	200 00
Topsham	200 00	100 00	200 00	100 00	491 06	200 00	849 66	200 00
West Bath	.....	.....	.....	.....	.....	.....	.....	.....
Woolwich	.....	.....	.....	.....	415 84	200 00	400 86	200 00
Totals	200 00	100 00	400 00	200 00	2,620 77	1,230 00	3,518 82	1,400 00
Total number of towns	.....	1	.....	2	.....	7	.....	7

SOMERSET COUNTY.

Anson	.....	.....	.....	.....	.....	.....	.....	.....
Athens	.....	.....	200 00	100 00	223 82	111 91	352 12	176 06
Bingham	.....	.....	.....	.....	375 00	187 50	.....	.....
Cambridge	.....	.....	.....	.....	.....	.....	.....	.....
Canaan	.....	.....	.....	.....	.....	.....	195 00	92 50
Concord	.....	.....	.....	.....	.....	.....	.....	.....
Cornville	.....	.....	.....	.....	130 08	65 04	241 21	100 00
Detroit	.....	.....	.....	.....	225 98	100 00	200 00	100 00

Expenditures and State Aid for State Roads—Continued.

SOMERSET COUNTY—CONCLUDED.

Towns.	1901.		1902.		1903.		1904.	
	Cost.	Aid.	Cost.	Aid.	Cost.	Aid.	Cost.	Aid.
Embden	.....	.....	$200 00	$100 00	$262 00	$100 00	$210 00	$100 00
Fairfield	.....	.....	.....	.....	.....	.....	.....	.....
Harmony	.....	.....	200 00	100 00	200 00	100 00	200 00	100 00
Hartland	.....	.....	200 00	100 00	.....	.....	218 85	100 00
Madison	.....	.....	.....	.....	.....	.....	433 65	200 00
Mercer	$.....	$.....	.....	.....	.....	.....	.....	.....
Moscow	200 00	100 00	.....	.....	.....	.....	.....	.....
New Portland	.....	.....	200 00	100 00	310 52	150 00	388 69	194 34
Norridgewock	.....	.....	.....	.....	400 00	200 00	400 00	200 00
Palmyra	.....	.....	.....	.....	200 00	100 00	400 00	200 00
Pittsfield	.....	.....	200 00	100 00	315 00	157 50	396 19	198 09
Ripley	.....	.....	.....	.....	238 23	100 00	.....	.....
Saint Albans	.....	.....	200 00	100 00	312 57	150 00	400 00	200 00
Skowhegan	.....	.....	.....	.....	400 00	200 00	574 37	200 00
Smithfield	.....	.....	.....	.....	.....	.....	.....	.....
Solon	.....	.....	.....	.....	.....	.....	.....	.....
Starks	.....	.....	.....	.....	.....	.....	.....	.....
PLANTATION.								
Brighton	.....	.....	200 00	100 00	200 00	100 00	200 00	100 00
Totals	200 00	100 00	1,600 00	800 00	3,793 20	1,821 95	4,810 08	2,260 99
Total number of towns	.....	1	.....	8	.....	14	.....	15

Brighton the only plantation in Somerset county building State road.

WALDO COUNTY.

Belfast	.....	.....	200 00	100 00	509 30	200 00	527 75	150 00
Belmont	.....	.....	.....	.....	.....	.....	.....	.....
Brooks	.....	.....	.....	.....	404 74	200 00	225 00	100 00
Burnham	.....	.....	.....	.....	300 00	150 00	200 00	100 00
Frankfort	.....	.....	200 00	100 00	412 00	200 00	400 00	200 00
Freedom	.....	.....	.....	.....	.....	.....	200 00	100 00
Islesboro	.....	.....	.....	.....	400 00	200 00	406 63	200 00
Jackson	.....	.....	200 00	50 00	200 00	100 00	256 37	100 00
Knox	.....	.....	.....	.....	208 62	100 00	213 45	100 00
Liberty	.....	.....	.....	.....	420 00	100 00	.....	.....
Lincolnville	.....	.....	142 00	71 00	200 00	100 00	200 00	100 00
Monroe	.....	.....	.....	.....	.....	.....	318 70	100 00
Montville	.....	.....	200 00	100 00	410 52	200 00	410 38	200 00
Morrill	.....	.....	200 00	100 00	425 00	200 00	400 00	200 00
Northport	300 00	75 00	.....	.....	211 00	100 00	200 00	100 00
Palermo	.....	.....	200 00	100 00	400 00	200 00	400 00	200 00
Prospect	.....	.....	.....	.....	400 00	200 00	.....	.....
Searsmont	.....	.....	.....	.....	290 00	145 00	401 60	200 00
Searsport	.....	.....	.....	.....	197 95	98 98	205 00	100 00
Stockton Springs	.....	.....	.....	.....	.....	.....	.....	.....
Swanville	.....	.....	.....	.....	.....	.....	100 00	50 00
Thorndike	.....	.....	.....	.....	210 22	100 00	201 75	100 00
Troy	.....	.....	200 00	100 00	401 30	200 00	560 00	200 00
Unity	.....	.....	.....	.....	.....	.....	215 00	100 00
Waldo	.....	.....	.....	.....	.....	.....	.....	.....
Winterport	.....	.....	.....	.....	440 17	200 00	308 03	100 00
Totals	300 00	75 00	1,542 00	721 00	6,440 82	2,993 98	6,149 66	2,800 00
Total number of towns	.....	1	.....	8	.....	19	.....	21

WASHINGTON COUNTY.

Addison	.....	.....	.....	.....	200 00	100 00	100 00	50 00
Alexander	.....	.....	200 00	100 00	210 68	100 00	200 00	100 00
Baileyville	.....	.....	.....	.....	.....	.....	.....	.....
Baring	.....	.....	.....	.....	.....	.....	.....	.....
Beddington	.....	.....	.....	.....	.....	.....	.....	.....
Brookton	.....	.....	.....	.....	.....	.....	.....	.....
Calais	.....	.....	.....	.....	616 00	200 00	400 00	200 00

Expenditures and State Aid for State Roads—Continued.

WASHINGTON COUNTY—CONCLUDED.

Towns.	1901.		1902.		1903.		1904.	
	Cost.	Aid.	Cost.	Aid.	Cost.	Aid.	Cost.	Aid.
Centerville								
Charlotte								
Cherryfield								
Columbia					$200 00	$100 00	$200 00	$100 00
Columbia Falls			$200 00	$100 00	200 00	100 00		
Cooper					100 00	50 00		
Crawford								
Cutler								
Danforth					300 00	150 00	200 00	100 00
Deblois								
Dennysville								
East Machias								
Eastport			200 00	100 00	200 00	100 00	400 00	200 00
Edmunds								
Forest City								
Harrington			100 00	50 00	363 48	100 00		
Jonesboro								
Jonesport					200 00	100 00		
Lubec			200 00	100 00	200 00	100 00	400 00	200 00
Machias								
Machiasport								
Marion								
Marshfield								
Meddybemps								
Milbridge								
Northfield								
Pembroke								
Perry							200 00	100 00
Princeton					400 00	200 00	400 00	200 00
Robbinston			200 00	100 00	235 00	100 00	200 00	100 00
Roque Bluffs								
Steuben								
Talmadge								
Topsfield			100 00	50 00	300 00	100 00		
Trescott			200 00	100 00				
Vanceboro							110 00	55 00
Waite								
Wesley								
Whiting								
Whitneyville								
Totals			1,400 00	700 00	3,725 16	1,600 00	2,810 00	1,405 00
Total number of towns				8		14		11

Plantations of Washington county have not built State roads.

YORK COUNTY.

Acton								
Alfred								
Berwick							325 00	100 00
Biddeford								
Buxton			200 00	100 00	400 00	200 00	304 10	100 00
Cornish			200 00	100 00				
Dayton					400 00	200 00	400 00	200 00
Eliot			200 00	100 00	447 50	175 00	264 75	125 00
Hollis							260 30	130 15
Kennebunkport								
Kennebunk								
Kittery					400 00	100 00	638 30	200 00
Lebanon								
Limerick			200 00	100 00	200 00	100 00		
Limington								
Lyman								

Expenditures and State Aid for State Roads—Concluded.

YORK COUNTY—CONCLUDED.

Towns.	1901.		1902.		1903.		1904.	
	Cost.	Aid.	Cost.	Aid.	Cost.	Aid.	Cost.	Aid.
Newfield					$400 00	$200 00	$400 00	$200 00
North Berwick							402 69	200 00
Old Orchard								
Parsonsfield							300 00	100 00
Saco								
Sanford								
Shapleigh							325 00	162 50
South Berwick								
Waterboro			200 00	100 00	200 00	100 00		
Wells					400 00	100 00		
York			200 00	100 00	600 00	200 00	600 00	200 00
Totals			1,200 00	600 00	3,447 50	1,375 00	4,220 14	1,717 65
Total number of towns				6		9		11

RECAPITULATION

Counties.	1901.			1902.		
	Number of towns receiving State aid.	Expenditures for work done.	Aid received from the State.	Number of towns receiving State aid.	Expenditures for work done.	Aid received from the State.
Androscoggin	.....	.....	.....	2	$400 00	$200 00
Aroostook	1	$200 00	$100 00	15	2,978 52	1,489 26
Cumberland	.....	.....	.....	4	800 00	400 00
Franklin	3	600 00	300 00	5	1,000 00	500 00
Hancock	.....	.....	.....	4	701 23	350 00
Kennebec	.....	.....	.....	5	1,000 00	500 00
Knox	1	208 24	100 00	5	1,280 92	399 98
Lincoln	.....	.....	.....	2	1,128 86	200 00
Oxford	1	200 00	100 00	3	600 00	300 00
Penobscot	2	917 06	200 00	16	4,438 79	1,547 12
Piscataquis	1	200 00	100 00	6	1,200 00	600 00
Sagadahoc	1	200 00	100 00	2	400 00	200 00
Somerset	1	200 00	100 00	8	1,600 00	800 00
Waldo	1	300 00	75 00	8	1,542 00	721 00
Washington	.....	.....	.....	8	1,400 00	700 00
York	.....	.....	.....	6	1,200 00	600 00
Totals	12	$3,025 30	$1,175 00	99	$21,670 32	$9,507 36

OF TABLE No. 3.

1903.			1904.			Totals.	
Number of towns receiving State aid.	Expenditures for work done.	Aid received from the State.	Number of towns receiving State aid.	Expenditures for work done.	Aid received from the State.	Total expended in each county, 1901-1904 inclusive.	Total aid received from the State in each county, 1901-1904 inclusive.
6	$1,445 74	$600 00	6	$1,505 78	$751 35	$3,351 52	$1,551 35
26	7,360 37	3,575 00	28	9,593 43	4,100 00	20,132 32	9,264 26
8	2,397 76	1,352 00	12	5,646 20	1,599 40	8,753 96	3,351 40
9	2,305 97	1,142 00	8	2,526 46	1,140 00	6,432 43	3,082 00
10	2,730 24	1,347 14	18	4,758 02	2,029 28	8,189 49	3,726 42
14	5,215 98	2,250 00	19	5,983 77	2,594 03	12,199 75	5,344 03
9	2,801 19	1,204 00	14	5,907 46	1,875 00	10,197 81	3,578 98
7	2,522 35	650 00	7	2,114 62	857 50	5,765 83	1,707 50
8	2,582 14	1,209 32	17	8,394 17	2,597 07	11,776 31	4,206 39
33	17,457 61	4,824 26	36	11,280 93	4,464 67	34,094 39	11,036 05
13	3,120 30	1,548 00	14	4,578 02	1,893 55	9,098 32	4,141 55
7	2,620 77	1,230 00	7	3,518 82	1,400 00	6,739 59	2,930 00
14	3,793 20	1,821 95	15	4,810 08	2,260 99	10,403 28	4,982 94
19	6,440 82	2,993 98	21	6,149 66	2,800 00	14,432 48	6,589 98
14	3,725 16	1,600 00	11	2,810 00	1,405 00	7,935 16	3,705 00
9	3,447 50	1,375 00	11	4,220 14	1,717 65	8,867 64	3,692 65
206	$69,377 10	$28,722 65	244	$83,797 56	$33,485 49	$178,370 28	$72,890 50

PRACTICAL BENEFITS OF GOOD ROADS.

Anticipating that the people of Maine would prefer to know the practical rather than the theoretical benefits of good roads, we sent the following letter to about 200 people living on the line of State roads in Massachusetts, New York and New Jersey, representing various occupations and walks in life. A large number of replies was received, and nearly all enthusiastically answered our questions in the affirmative. Owing to lack of space we print but a few of the replies, but they are representative of the sentiment expressed by all.

LETTER.

AUGUSTA, October 2, 1905.

Dear sir:—

While making an investigation of highway conditions in the State of Maine, we are planning to issue a circular for general distribution explaining some of the systems of state highway supervision and some of the systems of modern construction in use elsewhere together with a review of benefits that would accrue to the people of this State provided some such system was in operation here.

Your State has been working along these lines for a term of years and I am anxious to learn from a number of your citizens who have used improved highways, their candid opinion as to the utility and practicability of the same.

Accordingly I am asking you to write me a short, frank letter for publication, setting forth in your own language such benefits, if any, as *you* have received from the use of improved highways. If any benefits that you can measure in a dollars and cents way please make a statement covering this. Please state your business and say whether or not you live on the line of an improved road, and if not how far away from one.

I will suggest some of the questions that would naturally arise in one's mind when investigating this matter.

Have real estate values increased?

If so to what extent?

Have people living in the country been able to get to market with produce, or for supplies at any and all seasons of the year except perhaps during snow blockades?

Have they been able to haul larger loads than formerly?

Have scholars in the country been able to attend school more regularly than before?

Has farm life been rendered more agreeable and attractive for both young and old by reason of increased social advantages?

These questions pertain almost wholly to advantages for people living in the country but we all know that whatever benefits and makes prosperous a rural community redounds to the benefit of the cities.

If you can give us any special advantages or benefits which have accrued to city dwellers—or merchants we would appreciate these too.

We believe that the testimony of those who have enjoyed the advantages of improved roads will be interesting and instructive to our people and that the consensus of opinion expressed by these letters should carry conviction to our citizens of an enquiring mind.

I trust you will pardon the liberty I have taken in making this request but I feel you will be glad to give to the people of Maine the benefit of your experience in this connection and if possible help them to decide for or against good roads understandingly.

Your name has been sent me by a responsible and honored citizen of your State as one who would be glad to answer queries of this kind and I trust you will see your way clear to comply with this request.

Thanking you in advance, I am,

Respectfully yours,

PAUL D. SARGENT,

Commissioner.

REPLIES.

CINNAMINSON, N. J., October 5, 1905.

To the Commissioner of Highways, State of Maine:

In reply to your letter of the second inst. in regard to the benefits *if any* I have received from improved highways, I would say that I was a farmer until 15 years ago, when I gave up the farm in favor of my son who is still running it. I am now a director in the First National Bank of Camden, also a Director in the Burlington County Safe Deposit and Trust Company at Morristown, N. J.

It is a rather difficult matter to bring the benefits down to a dollars and cents basis because of other factors which have to be reckoned with in determining results; for instance we cannot tell what would have happened if certain other things had not happened.

I live upon the line of an improved road leading from Philadelphia to New York, ten miles from the former place, and before the road was improved 25 baskets of promiscuous farm produce would make a big two-horse load, after the road was improved the average load has not been less than 100 baskets, some farmers taking as many as 150 baskets to a load, but this last number is exceptional; also before improvement it would take a team all day to make the round trip of about 23 miles to the heart of the city; since improvement, it requires an average of about seven hours. Now assuming that a team and driver would be worth $4.00 per day, the regular price here, it would cost sixteen cents per basket for a farmer to land his produce in the market in the first case and but four cents per basket in the latter, allowing the seven hours to make a day.

It must be evident to every unprejudiced observer that the farmers in this section would have been out of business had not the road been improved.

It must be evident also that the farmer does not get all the benefit, for the citizen consumer shares a part of it, for it often happens during the glut of the season that farm produce sells for less than sixteen cents per basket. This is a sufficient justification I think for asking the cities to help pay for improving country roads. This is true of everything the resident of the city uses or consumes. It can be delivered to him much more cheaply over a good road than a bad road.

Now as to increase in value of real estate, I would say that the Civil War was conducted upon an inflated paper currency and land went up to abnormal figures and since the resumption of specie payments, land has been falling, but I can say that the good roads improvement has arrested the decline. Other factors also enter into the consideration of this branch of the subject, such as opening up for cultivation the fertile prairies of the West which come in competition with our land which must be fertilized at great expense.

As to the other questions of pleasanter farm life I may say that we have telephones and free rural delivery which may lay claim to part of the honor of adding to the attractions of farm life.

I will enclose with this an article which I wrote by request for a local newspaper, giving an inside history of the New Jersey State Aid law which you may use, or any part of it, for the promotion of the cause of good roads. I could not make it very full without being personal, as I did not desire to hurt the feelings of those who so strenuously opposed its enactment for they are just as strenuous now in advocacy of it as they were then against it.

As I look back in retrospect I can remember the fancy names given me by my opponents such as "crank," "an impractical schemer," and one kind neighbor said "Mr. Conrow was a little off in his upper story," but I am glad to say, that I am on the outside of the insane asylum still, and that we have the roads the best of all. I may say further that it was a continuous campaign of education to get the act through the legislature and approved by the Governor and then the Freeholders would not build us a road without being compelled by the Supreme Court. I was afraid they would get the law repealed before we could get one specimen road built for an object lesson; since then the roads have spoken for themselves.

I write these things for the purpose of giving you a pointer and not to laud my own actions at all.

Very truly yours, etc.,

CLAYTON CONROW.

SOMERVILLE, N. J., October 9, 1905.

To Mr. Paul D. Sargent:

Replying to the request of the Commissioner of Highways for the State of Maine, for information pertaining to the advantages derived from improved roads in the State of New Jersey, I would respectfully state that I have the honor to be engineer of the county of Somerset in the latter state and an experience of more than ten years in such position enables me to give information on many topics connected with such roads.

As to real estate values—real estate men report that rent receipts from city properties have declined from one-third to one-half, while properties in surburban districts were in demand and increasing in value. These results have been ascribed to good roads and to trolley lines, tending, it will appear, to relieve the congestion of the cities. People will go to sections where they can have the benefit of pure air and other rural advantages.

Road improvement promises to settle many of the evils of over-populous cities. Country life is cheaper and in consequence of improved highways, is becoming daily less and less isolated.

Rural free mail delivery follows very closely the lines of improved highways and consequently farm life is brought more and more into touch with our great urban centers. Rural free delivery has been long enough before the public to be accurately measured in its effects. The farm is brought thereby into closer contact with the outside world. A more accurate and immediate knowledge of market prices is diffused and the rural producer is placed on a surer footing.

The general tendency of improved roads is to scatter population, decreasing the concentration of cities, and developing country districts, thus enhancing the values of rural properties.

Farm lands along improved highways have advanced in value while lands remote from such improvement remain at about their former figures.

By means of good roads the produce of county districts may be conveyed to market at less expense. Where formerly one ton was carried, two tons may now be carried with the same motive power. In connection with this the grades should be considered as well as the character of the improved surface. Here in New Jersey grades have been considered quite as important as any other feature of the work. Our aim has been to lessen all

grades, if at all possible, to a maximum grade of seven per cent or less, and this has been of incredible advantage to heavy traffic and consequently loads of four or five tons with two horses are not uncommon.

During recent years public schools in large cities and towns have been developed to a remarkable degree. Courses of study have been added that were not contemplated a few years back and most of such schools are able to furnish education of an advanced type. By reason of the improved highways children in country districts may avail themselves of these advantages. Centralized schools send out vehicles at the expense of the district to convey such children to and from their homes, and such transfers are most easily and frequently effected where public roads are good. The attendance at schools under such circumstances is more regular and much larger than before such arrangement. Good roads favor also the use of the bicycle by scholars living remote from educational centers.

Church attendance is increased also by reason of good roads.

Farm life, once the dread of many, especially of the farmer's wife and family, has been to a marked degree stripped of its drawbacks, and communication having become so much easier, the farmer's wife and daughters patronize daily improved highways to their own satisfaction and to the advantage of the town and city merchant. Whatever helps the rural districts contributes to the welfare of the city, and vice versa, and public road improvement does certainly contribute more than any other one thing to this end.

If space and time permitted many other features and results of road improvement might be considered, but the foregoing are among the most noticeable.

As evidence of the estimation in which public roads are held in this county, I may say that while not more than seven or eight miles can be conveniently and properly built in one year, yet petitions for more than one hundred miles to be improved are filed with the proper authorities and more are being received all the while. The public is in full sympathy with the movement with no opponents, that I am aware of.

JOSHUA DOUGHTY, JR.,
County Engineer.

MARLBORO, N. J., December 27, 1905.

Friend Mr. Sargent:

My Dear Sir:—I trust you will pardon me for not writing an answer to yours of October 2d; they say it is better late than never, but it is better never late. I have been more busy than ever, but determined to send a reply as soon as possible; hence, these few lines today.

You ask what benefits we derive from the improved roads. It affords us a basis upon which we can make our calculations, lay our plans and then be able to carry them out. For instance, if we have a number of loads of farm produce which should be put in market at a certain time, we can estimate how many teams it will take to haul these loads, to a certainty, in a given time, nothing to prevent except heavy snow-drifts and these must be removed to enable the mail to go through; or if you wish to catch a train, you can figure how many minutes it will take to get you there, and this every day and without tiring your horse or your patience; beside this, you won't have to wash your wagons and horses every day if rainy weather.

I am a farmer by occupation and have been for 35 years. I was appointed road supervisor of all Monmouth county by the Board of Freeholders, April 10, 1905, for three years, and am doing all in my power to better the condition of public travel.

I live along a public road but not a road improved by the State Road Aid. I only wish I did, for I know it would increase the value of my farm at least 25 per cent.

There is a stone road about one mile from my place built under the State Road Act, three and one-half miles long that cost the county and state over $28,000—eight thousand per mile—built three years ago, and is just as good today as it was when first built, at a cost to maintain it of about $800 per year. Before this road was built the farmers along the line of the road could not get to the railroad station any day in the year even with a good team, and over twelve barrels of potatoes to a load, now with a poor team they cart from 20 to 25 barrels and that every day when they wish.

I learned from the station agent, who attends the railroad station along the line of this road, that since the completion of this stone road the amount of freight from his station had more than doubled.

Before the stone road was built the farmers, many of them, went to the boat with their produce, now they all go to the railroad. When they first began to build stone roads in Monmouth county, in the year 1896, it was the opinion of most all careful, practical business men that they were going to be expensive and consequently makes our taxes too high. These very same men now are asking for all the stone roads they can get. There are in fact today more petitions sent to the State Road Commissioner for his approval than will be built in ten years hence.

I remember very well talking with a very prudent, careful, public business man, when they began to talk of building these roads. "Why," said he, "In less than ten years they will bankrupt the county." Nine of those years have passed, and this same careful business man is now doing all he can to get more stone roads, and the county tax is but a trifle higher than it was nine years ago. Now these are facts that can be verified.

We have now in Monmouth county 83 18-100 miles of road improved under the State Road Act, at a cost of $400,000, and several miles not completed.

Yours most respectfully,

H. W. BUCK.

Supervisor of County Roads for Monmouth County,

RUSSELL, MASS., Oct. 19, 1905.

Paul D. Sargent, Esq., Commissioner of Highways, State of Maine:

Yours of 2d at hand inquiring about the use and benefits derived by our state highway in Massachusetts.

I am in the wood and lumber business, and live on one of the first state highways constructed in Massachusetts, and have seen the many benefits we all derive from the beautiful road we have in this section. We do not now, as formerly, have to stop teaming through "mud time" in the spring and fall, for this road is in condition to use at all seasons of the year, unless it is through heavy snow blockades, and we are of the opinion the snow does not pile up so deep on our broad smooth roads as it did formerly. We are able to draw much larger loads with ease to our teams, and do it quicker than formerly.

We are using about 12 miles of this highway and can assure you it has been a great saving in cost of transportation from our

village to the larger towns. It has made real estate, and especially farms along the line of our state highway more valuable, and they are in greater demand by prospective buyers.

On account of such nice highways there are express teams run some 22 miles to Westfield and Springfield, our principal markets, and people along the route can send their produce and give orders and receive small packages and freight delivered at their door the same day at a nominal cost.

The state highway brings the farming community in closer touch with the cities, increasing their trade relations to a much larger amount than formerly; the city people can get out into the country with more pleasure, and it is considered a mutual benefit by both city and country people along our line.

One of the benefits I find, which has not been enlarged upon as much as it ought to be, is the education and instruction it gives to the different officials and road builders all over the state wherever the state highways are built, showing the process of building a good permanent highway.

I know in our own town which has nearly seven miles of state highway, all our other roads are worked in a much more satisfactory manner, and are giving better satisfaction. So we not only have a very fine state highway, but all our other roads are improving on account of the knowledge gained by the construction of such roads in our vicinity.

Very respectfully,

E. D. PARKS.

SPRINGFIELD, MASS., October 14, 1905.

Mr. Paul D. Sargent, Commissioner, Augusta, Maine:

Dear sir:—

Yours of the 2d came duly to hand. Our mill is situated on the old Albany turnpike, some 22 miles west of Springfield, and we have a state macadamized road past it reaching to Huntington, one and one-half miles,—our shipping and receiving point. Of course, we have a large amount of teaming to do and we can truly say it has been of great benefit to us, being able to haul much larger loads with the same number of teams, one three horses abreast and one team pulling coal mostly in a four-wheel dump cart, carrying 6,000 pounds. Since the road has been

established, we have increased the capacity of our mill twice, now making more than double what we did when the road was first built, and using no more horses, but have increased the size of the wagons and use larger horses, five in all. We also advocate wide tires, not less than five inches in width. It makes a great difference in the wear of the road. We would not, however, always advocate making it a state road when you have on hand good gravel, but would want the road built in the same manner as the state road, slightly crowned and plenty of waterways, so that the water can be quickly disposed of after a storm and the melting of the snow in the spring. But in the meantime you must have the gravel road *well rolled,* as much as you would the stone one. The old saying is, you know, that as soon as the road is built, you want to begin to repair it. That may not be true literally, but holds good to a great extent. I think if all the roads both in the city and country were looked after in that way, the expense of maintenance would be much less. "A stitch in time saves nine." Now as to the increase in the value of property, we think it does help and calls more people about you. Farmers, wood and timber men and all can get their wares to market much easier. As to the scholars getting to school easier, we cannot say about that, but it does make the country a great deal more attractive and agreeable to both young and old, and in time increases the population. From our experience, we would not want to settle in any section of the country where they did not have A 1 roads.

Yours very truly,
CHAPIN & GOULD PAPER COMPANY,
H. A. GOULD, *President.*

BLACKINGTON, MASS., October 13, 1905.

Hon. Paul D. Sargent, Commissioner of Highways, Augusta, Me.:

Dear sir:—

Yours of the 9th inst. received and in reply would say that I live on the state road. The five mile section, from the city of North Adams to Williamstown, runs through my farm on the front, between the house and the barn, 1,402 feet or about 85 rods. It is a great improvement having been built about ten years.

The road had become somewhat flattened by wear, so the state resurfaced it this summer and crowned it, so that no water stays on it. It is as smooth as stone and as hard as a fifteen ton roller can pack it. There is no mud or sand. The grade is not over five per cent. A team will handle, with perfect ease, all that a wagon will hold up; 90 hundred is not as much of a load as 20 hundred is on the old road; it is therefore more profitable to work on.

I was commissioner of highways for three years and was on the committee of streets, highways and bridges and I find that good roads are of great value to cities or towns, as such roads are appreciated by every one who travels them. Good roads increase the value of property from ten to fifteen per cent, and in some cases a great deal more. The people would not have this road taken away and the old one put back for any money, and your people will never regret it if they build good roads.

You wanted to know my business; I am a farmer and have a farm of 130 acres that faces the state road.

I would be pleased to show you the roads at any time.

Yours very truly,

W. H. GOVE.

FAYETTEVILLE, N. Y., October 4, 1905.

Mr. Paul D. Sargent, Commissioner of Highways, Augusta, Me.:

Dear sir:—

Your favor of the 2d is at hand. In reply would say that for the most part our state aid road law gives very satisfactory results. About the only persons who object strongly to it are men who have expected that one of the improved roads would be built in front of their property but who have been disappointed when the road was built over some other line. These people, of course, are very apt to develop into very bitter opponents of the system of road improvement.

My observation along the lines of the improved highways leads me to believe that the advance in property has run from 25 to 100 per cent, according to the location and the distance from the railroad. As I do not live on the line of one of these roads, I am unable to give you any actual facts from personal

experience. However, the road by our farm, where I live, has been surveyed for a good road and I trust, if our $50,000,000 bonding plan is adopted at the coming election, which I feel confident will be, that in a couple of years I can give something from personal experience.

Men who live on the improved highways tell me that in some instances they are able to carry twice as great a load to market as they have heretofore, and that they are able to make the trip in better time. Because of these better roads, the children are able to do their own driving in transporting themselves to and from school and thus are able to be more regular in their attendance.

On the whole our people are very much pleased with the plan of road improvement as now carried on in this state.

Yours very truly,

F. E. DAWLEY.

OGDENSBURG, N. Y., October 7, 1905.

Hon. Paul D. Sargent, Augusta, Maine:

My dear sir:—

Your esteemed favor of the 2d inst. making inquiry as to the benefits of improved highways is received and contents noted.

The county of St. Lawrence, New York, in which I reside is purely an agricultural community. The subject of good roads for our county has been agitated more or less for several years, but not until a year ago did it take some definite shape. Our board of supervisors at its last annual meeting carried a resolution, as I recall it, unanimously, to make application, as required by our law, for the construction of about 325 miles of state roads. This will furnish good roads for substantially all of the leading highways of the county, and at an approximate cost of two millions of dollars. The legislature of our state has, pursuant to the provisions of our constitution, twice passed a resolution submitting to the people at the coming fall election a proposition which provided for the bonding of the state in the sum of $50,000,000, and issuing bonds therefor. We have every reason to believe that this proposition will be successfully carried, as we believe that the benefits to flow from the expenditure of such public funds for improved highways have been conclusively

established. Should this proposition carry, as I believe it will, the state will furnish $50,000,000, the various counties $35,000,000, and the towns in which the work is done $15,000,000, making a grand total of $100,000,000, which New York proposes to expend upon its highways during the next ten years.

It may be proper for me to suggest also that our law requires that such improvement of highways must be outside of all cities and incorporated villages. I have given the subject of improved highways and the benefits to be derived by our agricultural communities considerable thought and consideration.

A year ago our state Senate, by resolution, authorized its committee on highways to make a thorough investigation of the entire subject. I was invited by the committee to accompany them on their trip. We started from the city of New York and went over the state roads through Staten Island; thence across into New Jersey and over their state roads to Trenton, returning over another route through New Jersey and New York to Newburg, N. Y. From thence we crossed the Hudson river and went over the New York good roads to Rye, N. Y., which is located on Long Island Sound; from thence to Stanford, Hartford and New Haven over the Connecticut good roads, and from thence to Springfield, Worcester and Boston over the Massachusetts good roads. The trip was made in automobiles and the distance covered was about seven hundred miles. We made minute inquiry of the highway commissioners of these various states and others having charge of the construction and maintenance of such highways, with special reference as to the manner of construction, durability, expense, cost of repairs, facility of moving farm products and the increased value of real estate, together with many other subjects of perhaps minor importance. The committee was accompained by a stenographer, who reduced to writing all the information received, and the testimony thus taken satisfactorily established the following facts: That the price of agricultural lands in all the states traversed which were located upon these improved highways, except certain portions of Massachusetts, had increased in value from 25 to 200 per cent, and were at that time worth from 25 to 200 per cent more than exactly as good farms located elsewhere, but not upon improved highways.

It might be proper to explain that that portion of Massachusetts where we found no substantial increase in the value of real

estate was owing to the fact that the condition of the country was such that agricultural pursuits had been substantially abandoned. The question at once arises as to what has caused this increase in the value of farm property, and it may be briefly described as follows:

First: It does not require more than one-third of the power to move a ton of freight any given distance over good roads than it had theretofore over the roads then existing.

Second: A large amount of time was saved by the rapidity and ease of moving freight.

Third: The roads were in perfect condition during the entire year and thus the markets were accessible at all times.

Fourth: Increased facilities for attending public schools.

Fifth: Large disbursements saved in horse flesh, vehicles and harnesses.

Sixth: Instead of a trip on the highway being one of great labor and annoyance, it has become a genuine pleasure.

The highway commissioners of these various states were unanimous in their statements that they experienced their greatest difficulties in not being able to build highways fast enough to meet the demands of their citizens, as they found every locality making applications for those improvements which had been found so profitable and desirable by those favored with them. Good road making has so far advanced that there can be no question whatsoever but that it is a paying investment to all our citizens. It best serves both the producer and the consumer, and at a cost wholly within the reach of almost every locality.

I sincerely hope to hear that the good people of the Pine Tree State have adopted this system to such an extent that every person who tills the soil or in any way uses its highways will be in possession of its benefits in the very near future.

Very respectfully yours,

GEORGE R. MALBY.

Chairman of the Legislative Finance Committee, State of New York.

STATUTES RELATING TO ROADS.

NOTE: Space will not permit of a complete codification of the above, so only the laws most useful for reference are copied. Words in italics at the beginning of each section are copied from side notes, and are no part of the law.

CHAPTER 23.

WAYS.

LOCATION, ALTERATION AND DISCONTINUANCE OF HIGHWAYS.

SEC. 1. *County commissioners may lay out, alter or discontinue highways* leading from town to town, and grade hills in any such highway. Nothing in any city charter shall be so construed as to deprive them of the power to lay out, alter or discontinue county roads within the limits thereof. Responsible persons may present, at their regular session, a written petition describing a way and stating whether its location, alteration, grading or discontinuance is desired, or an alternative action, in whole or in part. The commissioners may act upon it, conforming substantially to the description, without adhering strictly to its bounds.

SEC. 2. *Notice, how given, proved and recorded.* Being satisfied that the petitioners are responsible, and that an inquiry into the merits is expedient, they shall cause thirty days' notice to be given of the time and place of their meeting, by posting copies of the petition, with their order thereon, in three public places in each town in which any part of the way is, and serving one on the clerks of such towns, and publishing it in some newspaper, if any, in the county. The fact that notice has been so given, being proved and entered of record, shall be sufficient for all interested, and evidence thereof.

SEC. 3. *Costs paid by petitioners on failure.* When their decision is against the prayer of the petitioners, they shall order

them to pay to the treasurer of the county, at a time fixed, all expenses incurred on account of it; and if they are not then paid, they shall issue a warrant of distress against the petitioners therefor.

SEC. 4. *Proceedings before county commissioners—return—shall erect durable monuments.* They shall meet at the time and place appointed, and view the way, and there, or at a place in the vicinity, hear the parties interested. If they judge the way to be of common convenience and necessity, or that any existing way shall be altered, graded or discontinued, they shall proceed to perform the duties required; make a correct return of their doings, signed by them, accompanied by an accurate plan of the way, and state in their return when it is to be done, the names of the persons to whom damages are allowed, the amount allowed to each, and when to be paid. When the way has been finally established and opened to travel, they shall cause durable monuments to be erected at the angles thereof.

SEC. 5. *Return to be filed with clerk—proceedings.* Their return, made at their next regular session after the hearing, shall be placed on file, and remain in the custody of their clerk for inspection without record. The case shall be continued to their next regular term, and at any time on or before the third day thereof, if no appeal from the location be taken, all persons aggrieved by their estimate of damages shall file their notice of appeal. If no such notice is then presented or pending, the proceedings shall be closed, recorded and become effectual; all claims for damages not allowed by them be forever barred; and all damages awarded under the first thirteen sections of this chapter, paid out of the county treasury. But if an appeal from the location be taken in accordance with section fifty-two, then notice of appeal on damages may be filed with the clerk of the county commissioners within sixty days after the final decision of the appellate court in favor of such way, has been certified to him, to the supreme judicial court first held in the county where the land is situated, more than thirty days after such notice of appeal is filed, which court shall determine the same in the same manner as is provided in section eight, when no appeal on location is taken.

SEC. 6. *Proceedings before and after decision respecting increase of damages—provisions of this section shall not apply,*

when location has been determined upon appeal. When a notice of appeal for increase of damages is presented within the time allowed, the case shall be further continued until a final decision respecting damages is made. If they then are of opinion that their proceedings, or any part thereof, ought not to take effect, subject to such damages as have been assessed, they shall enter a judgment that the prayer of the petitioners, or any part thereof, designating what part, is not granted for that reason. Upon such judgment no damages shall be allowed for that part of the prayer of the petitioners not granted, but the costs shall be paid by the county; or if of opinion that such increase of damages should prevent a confirmation of a part or parts only of their proceedings, they shall designate such part or parts, and enter judgment accordingly; and the whole proceedings shall be recorded and become effectual. But the provisions of this section shall not apply when a location has been determined by a committee of the supreme judicial court upon appeal from the decision of the county commissioners thereon. In such case proceedings regarding the location shall become effectual as if no appeal for increase of damages had been taken.

SEC. 7. *Damages, how estimated; to whom awarded; when to be paid.* If any person's property is damaged by laying out, altering or discontinuing a highway or town way, the county commissioners or the municipal officers of towns shall estimate the amount, and in their return state the share of each separately; damages shall be allowed to the owners of reversions, and remainders; and to tenants for life, and for years, in proportion to their interests in the estate taken; but said commissioners or officers shall not order such damages to be paid, nor shall any right thereto accrue to the claimant, until the land over which the highway or alteration is located, has been entered upon and possession taken, for the purpose of construction or use.

SEC. 8. *Appeal from commissioners to supreme court—by agreement, appeal may be determined by committee of reference—appellant to file notice of appeal with county commissioners—costs.* Any person aggrieved by the estimate of damages by the county commissioners, on acount of the laying out or discontinuing of a way, may appeal therefrom, at any time before the third day of the regular term succeeding that at which the commissioners' return is made, to the term of the

supreme judicial court, first held in the county where the land is situated, more than thirty days after the expiration of the time within which such appeal may be taken, excluding the first day of its session, which court shall determine the same by a committee of reference if the parties so agree, or by a verdict of its jury, and shall render judgment for the damages recovered, and judgment for costs in favor of the party entitled thereto, and shall issue execution for the costs only. The appellant shall file notice of his appeal with the county commissioners within the time above limited, and at the first term of the court shall file a complaint setting forth substantially the facts, upon which the case shall be tried like other cases. The clerk shall certify the final judgment of the court to the county commissioners, who shall enter the same of record, and order the damages therein recovered to be paid as provided in section seven. The party prevailing recovers costs to be taxed and allowed by the court, except that they shall not be recovered by the party claiming damages, but by the other party, if on such appeal by either party, said claimant fails to recover a greater sum as damages than was allowed to him by the commissioners. The compensation of the committee shall be the same as commissioners would have for like services, to be allowed by the court and paid from the county treasury upon the certificate of the clerk of courts.

SEC. 9. *Time allowed for removing growth, and opening way.* The owners of land taken shall be allowed not exceeding one year after the proceedings, regarding the location, are finally closed to take off timber, wood or any erection thereon. A time not exceeding two years shall be allowed for making and opening the way.

SEC. 10. *Way discontinued before damages paid, proceedings.* When the way is discontinued before the time limited for the payment of damages, the commissioners may revoke their order of payment, and estimate the damages actually sustained, and order them paid. Any person aggrieved may have them assessed by a committee or jury, as herein provided.

SEC. 11. *County commissioners on petition from municipal officers may define doubtful boundaries of highways—and may erect monuments—damages—appeals for increase of damages.* When the true boundaries of highways duly located are doubtful, uncertain or lost, the county commissioners of the county

wherein such highway is located, upon petition of the municipal officers of the town wherein the same lies, shall, after such notice thereon as is required for the location of new ways, proceed to hear the parties, examine said highway, locate and define its limits and boundaries by placing stakes on side lines at all apparent intersecting property lines, and at intervals of not more than one hundred feet, and cause durable monuments to be erected at the angles thereof, make a correct return of their doings, signed by them, accompanied by an accurate plan of the way, and if any real estate is damaged by said action, shall award damages to the owner as in laying out new highways. Said municipal officers shall maintain all highway monuments, and replace them forthwith when destroyed. If any appeal for increase of damages is taken, and the commissioners are of opinion that their proceedings hereunder, or any part thereof, ought not to take effect, they shall enter a judgment that the prayer of the original petitioners or any part thereof, designating what part, is not granted for that reason. Upon such judgment no damages shall be allowed for that part of the prayer of the petitioners not granted, but the costs shall be paid by the county.

WAYS IN TWO OR MORE COUNTIES.

SEC. 12. *Petitions respecting ways in two or more counties, proceedings on them—notices.* When a petition is presented respecting a way in two or more counties, the commissioners receiving the petition being satisfied as aforesaid, may call a meeting of the commissioners of all the counties, to be held at a time and place named, by causing an attested copy of such petition and of their order thereon, to be served upon their chairmen; and they shall give notice of such meeting by causing a like copy to be published in the state paper and in one paper, if any, printed in every such county, and by posting it in three public places in each town interested, and serving it on the clerk thereof. These notices shall be posted, served and published thirty days before the time of meeting.

SEC. 13. *Proceedings, how continued and closed.* Each county must be represented at such meeting by a majority of its commissioners. A majority of those present may decide upon the whole matter. The duty of carrying that judgment into effect, shall be performed in each county by its own commis-

sioners in the manner respecting ways wholly within it. When each county is not so represented, those present may adjourn the meeting to another time.

SEC. 14. *Appeals, how taken.* When proceedings have been had by the county commissioners on a petition for laying out, altering, grading or discontinuing a way in two or more counties, an appeal may be taken in the manner provided in case of a way wholly in one county.

SEC. 15. *Proceedings in cases of appeals.* When an appeal is so taken, it shall be filed with the commissioners of, and subsequent proceeding shall be had in, the county where proceedings originated and the commissioners with whom such appeal is filed shall immediately give notice of such appeal to the commissioners of all the counties interested, and the clerk of courts shall certify the final judgment of court to the commissioners of all said counties.

TOWN AND PRIVATE WAYS.

SEC. 16. *Power of municipal officers respecting town and private ways—notice, how given—duty of officers in laying out way.* The municipal officers of a town may on petition therefor, personally or by agency, lay out, alter or widen town ways, and private ways for any inhabitant or for owners of cultivated land therein, if such inhabitant occupies, or such owner has cultivated land in the town which such private way will connect with a town way or highway. They shall give written notice of their intentions, to be posted for seven days, in two public places in the town and in the vicinity of the way, describing it in such notice, and they shall determine whether it shall be a town way or a private way; and if a private way, whether it shall be subject to gates and bars.

SEC. 17. *Municipal officers may lay out a winter road for hauling wood, hay, lumber, etc.—return of location—town not liable for damage.* They may lay out a way as aforesaid for the hauling of merchandise, hay, wood or lumber, to be used only when the ground is so covered with snow that such hauling shall not break the soil. When so laid out, they shall state in their return the purposes for which it is laid, and that it shall be used only in the winter season, and shall order the persons for whose accommodation it is laid, to pay into the town treasury an amount equal to the damages of such location for the benefit of

the owner of the land over which it is laid, and the expenses of such location, and it shall not be accepted by the town until such amount is so paid. No town shall be liable for damage to any person traveling on such way.

SEC. 18. *After municipal officers have laid out, town may accept.* A written return of their proceedings containing the bounds and admeasurements of the way, and the damages allowed to each person for land taken, shall be made and filed with the town clerk in all cases. The way is not established until it has been accepted in a town meeting legally called after the return has been filed, by a warrant containing an article for the purpose.

SEC. 19. *Towns may discontinue ways.* A town, at a meeting called by warrant containing an article for the purpose, may discontinue a town or private way; and the municipal officers shall estimate the damages suffered by any person thereby.

SEC. 20. *Damages for ways, how estimated and paid—appeal may be taken to supreme judicial court.* The damages for a town way shall be paid by the town; for a private way, by those for whose benefit it is stated in the petition to be, or wholly or partly by the town, if under an article in the warrant to that effect it so votes at the meeting accepting such private way; or by cities, if it is proposed in the return laying out such way. Any person aggrieved by the estimate of such damages may have them determined as provided in section eight, by written complaint to the supreme judicial court, returnable at the term thereof next to be held within the county where the land lies, after sixty days from the date of the establishment, alteration or discontinuance of such way by the town at its town meeting. The complaint shall be served at least thirty days before said term by delivering in hand an attested copy to the clerk of the town where the land lies, and by posting attested copies in two public and conspicuous places within said town and in the vicinity of the way. But the final judgment shall be recorded in said court, and shall not be certified to the county commissioners. When any person aggrieved by the estimate of damages for his land taken for a town or private way, honestly intended to appeal therefrom and has by accident or mistake omitted to take his appeal within the time provided by law, he may at any time within six months after the expiration of the time when said

appeal might have been taken, apply to any judge of the supreme judicial court in term time or vacation, stating in his said application the facts of his case, and said judge, after due notice and hearing, may grant to such petitioner permission to take his said appeal to such term of said court as said judge shall direct, and on such terms as said judge shall order, and the subsequent proceedings thereon shall be the same and with the same effect as if said appeal had been seasonably taken.

SEC. 21. *Town or private way, neglect or refusal of municipal officers to lay out or alter; proceedings—county commissioners to hear and decide—appeal.* When the municipal officers unreasonably neglect or refuse to lay out or alter a town way, or a private way on petition of an inhabitant, or of an owner of land therein for a way leading from such land under improvement to a town or highway, the petitioner may, within one year thereafter, present a petition stating the facts to the commissioners of the county at a regular session, who shall give notice thereof to all interested and act thereon as is provided respecting highways. When the decision of the municipal officers is in favor of such laying out or alteration, any owner or tenant of the land over or across which such way has been located, shall have the same right of petition. When the decision of the commissioners is returned and placed on file such owner or tenant or other party interested has the same right to appeal to the supreme judicial court as is provided in sections fifty-two to fifty-five inclusive; and also to have his damages estimated as provided in section eight.

SEC. 22. *When such way may be opened.* No such way shall be opened or used until after sixty days from its acceptance by the town, and if within that time notice of such appeal or petition is filed with the town clerk, such way shall not be opened or used until finally located by the appellate tribunal.

SEC. 23. *Towns unreasonably refusing to accept, or to discontinue.* When a town unreasonably refuses to discontinue a town or private way, or to accept one laid out or altered by the selectmen, the parties aggrieved may, within the time, and in the manner provided in section twenty-one, present a petition to the commissioners, who shall in like manner proceed and act thereon, and cause their proceedings to be recorded by their own and by the town clerk; and the rights of all parties may be preserved and determined as provided in the two preceding sections.

SEC. 24. *Town ways acted on by county commissioners cannot be acted on by towns for what time.* When a town way has been laid out, graded or altered by the commissioners, their proceedings cannot be affected by any action of the town, within five years; and when one has been discontinued by them, it cannot be again laid out by the town, within two years. The commissioners have the same power to alter or discontinue such ways, for five years, as they have respecting highways.

SEC. 25. *County commissioners may fix amount of grading—order half the expenses to be paid by the county.* The county commissioners, in laying out new ways, or altering or grading ways already laid out, may direct the amount of such grading, which shall be stated in their return; and they may order a portion of the expense of such altering or grading, not exceeding fifty per cent thereof, to be paid to the town in which the altering or grading has been done, from the county treasury.

SEC. 26. *Towns may re-instate town ways discontinued by county commissioners—damages—proviso.* When a town has accepted a town way, and said town way is subsequently discontinued by the county commissioners on appeal, before such road has been opened for travel, such town may, at its annual meeting, held within three years thereafter, by a majority of the voters present and voting, re-instate and lay out such town way, under an article for such purpose in the warrant. The damages shall be assessed, and the owners of the land over which said way passes shall be notified thereof by the municipal officers, within twenty days after said meeting; and any person aggrieved by the estimate of damages may have them determined in the manner provided in section twenty in case of town ways laid out on petition. A town way so re-established and laid out shall not be discontinued for five years thereafter.

SEC. 27. *Municipal officers may vacate location of streets in certain cases—proceedings—damages, by whom paid, and how determined.* When land has been plotted and a plan thereof made, whether recorded or not, showing the proposed location of streets thereon, and lots have been sold by reference to said plan, the municipal officers of the town or city where such land is situated, may on petition of owners of the fee in such of said proposed streets as are named in the petition, vacate in whole or in part the proposed location of any or all such streets as have

not been accepted and located as public ways. The proceedings shall be the same as in case of the location of town ways. All damages thereby occasioned shall be paid by the petitioners, and parties aggrieved by the estimate of damages may have them determined in the manner provided respecting damages caused by the location of town ways and with the same right of appeal.

SEC. 28. *Lands shall not be taken from a railroad for any way without notice and hearing.* No private way, town way, city street or highway, taking land of any railroad corporation, shall be located, unless a notice of the time and place of the hearing upon said location has been served upon the station agent of said railroad within such town or city, if any, otherwise upon such agent whose station is nearest to the land proposed to be so taken, at least seven days before the time for such hearing.

SEC. 29. *Ways, crossing railroad tracks, how laid out—manner and conditions of crossing, to be determined by railroad commissioners—expense of building, how borne—commissioners shall report to railroad corporations and municipal officers—appeal may be taken to supreme judicial court—proceedings—costs, how taxed.* Town ways and highways may be laid out across, over or under any railroad track, in the same manner as other town ways and highways, except that before such way shall be constructed, the railroad commissioners, on application of the municipal officers of the city or town wherein such way is located, or of the parties owning or operating the railroad, shall, upon notice and hearing, determine whether the way shall be permitted to cross such track at grade therewith or not, and the manner and conditions of crossing the same and the expense of building and maintaining so much thereof as is within the limits of such railroad shall be borne by such railroad company, or by the city or town in which such way is located, or shall be apportioned between such company and city or town, as may be determined by said railroad commissioners. Said commissioners shall make a report in writing of their decision thereupon, file the same in their office and cause to be sent by mail or otherwise to each of the railroad corporations, and the municipal officers of the city or town as the case may be, interested therein, a copy of such decision. Such decision shall be final and binding upon all parties unless an appeal therefrom shall be taken and entered at the next succeeding term of the supreme

judicial court, to be held in the county where the crossing is located, more than thirty days after the date of the filing of the report. The appellant shall within fourteen days from the date of the filing of such report, file in the office of the board of railroad commissioners, its reasons for appeal and fourteen days at least before the sitting of the appellate court, it shall cause to be served upon such other interested corporations or municipality a copy of such reasons for appeal, certified by the clerk of the board of railroad commissioners. The presiding justice, at such term of court, shall make such order or decree thereon as law and justice may require. Exceptions may be taken to such order or decree. The final adjudication shall be recorded as provided in section thirty-two of this chapter. Costs may be taxed and allowed to either party at the discretion of the court.

SEC. 30. *Such ways already laid out, how maintained.* In case of such ways already so laid out, over or under any railroad track, and not at grade, the expense of building and maintaining so much thereof as is within the limits of such railroad, shall be borne as provided in the preceding section; the question shall be determined upon application of any company whose track is so crossed, made within sixty days after written notice has been served thereon by the municipal officers of any town in which such way is located, requesting such company to build and maintain so much of such way as is within the limits of its road.

SEC. 31. *Ways over lands used for stations.* No way shall be laid out through or across any land or right of way of any railroad corporation, used for station purposes, unless after notice and hearing the railroad commissioners adjudge that public convenience and necessity require it. When the tribunal having jurisdiction over the laying out of such way is satisfied, after hearing, that public convenience and necessity requires such laying out, such proceedings shall be suspended and petition filed by such tribunal with the railroad commissioners for their adjudication hereunder.

SEC. 32. *Adjudications to be recorded.* Adjudications of the railroad commissioners relating to ways shall be recorded in the office in which the location of the way must be recorded.

ASSESSMENT OF DAMAGES UPON ABUTTERS ON CITY STREETS.

SEC. 33. *Damages caused by laying out, widening, altering or discontinuing city streets, may be assessed in whole or in part upon abutters—notice of hearing to be published for one week.* Whenever the city council lay out any new street or public way, or widen or otherwise alter or discontinue any street or way in a city, and decide that any persons or corporations are entitled to damage therefor, and estimate the amount thereof to each in the manner provided by law, they may apportion the damages so estimated and allowed, or such part thereof as to them seems just, upon the lots adjacent to and bounded on such street or way, other than those for which damages are allowed, in such proportions as in their opinion such lots are benefited or made more valuable by such laying out or widening, alteration or discontinuance not exceeding in case of any lot the amount of such benefit; but the whole assessment shall not exceed the damages so allowed. Before such assessment is made, notice shall be given to all persons interested of a hearing before said council, at a time and place specified, which notice shall be published in some newspaper in said city at least one week before said hearing.

SEC. 34. *Owners to be notified of assessment.* After said assessment has been made upon such lots or parcels and the amount fixed on each, the same shall be recorded by the city clerk, and notice shall be given within ten days after the assessment by delivering to each owner of said assessed lots resident in said city a certified copy of such recorded assessment, or by leaving it at his last and usual place of abode, and by publishing the same three weeks successively in some newspaper published in said city, the first publication to be within said ten days, and said clerk within ten days shall deposit in the post office of said city, postage paid, a certified copy of such assessment directed to each owner or proprietor residing out of said city, whose place of residence is known to said clerk, and the certificate of said clerk shall be sufficient evidence of these facts, and in the registry of deeds shall be the evidence of title in allowing or assessing damages and improvements, so far as notice is concerned.

SEC. 35. *Arbitration when amount of assessment is not satisfactory—board of arbitration, how nominated.* Any person not satisfied with the amount for which he is assessed, may, within

ten days after service of the notice provided for by the preceding section in either manner therein provided, by request in writing given to the city clerk, have the assessment upon his lot or parcel of land determined by arbitration. The municipal officers shall nominate six persons who are residents of said city, two of whom selected by the applicant, with a third resident person selected by said two persons, shall fix the sum to be paid by him, and the report of such referees made to the clerk of said city, and recorded by him, shall be final and binding upon all parties. Said reference shall be had and their report made to said city clerk within thirty days from the time of hearing before the municipal officers as provided in section thirty-three.

SEC. 36. *Assessments shall create a lien on land assessed, also on buildings thereon—sale at public auction if assessment is not paid—deed shall pass title—redemption.* All assessments made under the provisions of section thirty-three, shall create a lien upon each and every lot or parcel of land so assessed, and the buildings upon the same, which lien shall continue one year after said assessments are made, and within ten days after they are made, the clerk of said city shall make out a list of all such assessments, the amount of each, and the name of the person against whom the same is assessed, and he shall certify the list and deliver it to the treasurer of said city; if said assessments are not paid within three months from the date thereof, the treasurer shall sell, at public auction, such of said lots or parcels of land upon which such assessments remain unpaid, or so much thereof, as is necessary to pay such assessments and all costs and incidental charges; he shall advertise and sell the same within one year from the time said assessments are made, as real estate is advertised and sold for taxes under chapter ten, and upon such sale, shall make, execute and deliver his deed to the purchaser, which shall be good and effectual to pass the title of such real estate; the sum for which such sale shall be made, shall be the amount of the assessment and all costs and incidental expenses. Any person to whom the right by law belongs, may at any time within one year from the date of said sale redeem such real estate by paying to the purchaser or his assigns the sum for which the same was sold, with interest thereon at the rate of twenty per cent a year, and the costs of re-conveyance.

SEC. 37. *Action may be maintained by city—amount which may be recovered.* If said assessments are not paid, and said

city does not proceed to collect said assessments, by a sale of the lots or parcels of land upon which such assessments are made, or does not collect, or is in any manner delayed or defeated in collecting such assessments by a sale of the real estate so assessed, then the said city, in the name of said city, may maintain an action against the party so assessed for the amount of said assessment, as for money paid, laid out and expended, in any court competent to try the same, and in such action may recover the amount of such assessment, with twelve per cent interest on the same from the date of said assessment, and costs.

WHEN WAYS ARE TO BE OPENED.

SEC. 38. *Way located by county commissioners must be opened in six year—by town officers, in two years.* When a town way, private way or highway, is wholly or partly discontinued by the commissioners, a time shall be fixed for it. And when laid out by them the way shall be regarded as discontinued, if not opened within six years from the time allowed therefor. When town or private ways are finally located by municipal officers, unless the land is entered upon and possession taken for said purpose within two years after the laying out or alteration, the proceedings are void.

SEC. 39. *Commissioners may cause highways to be opened when towns neglect—payment of expenses.* When a town way or highway is not opened and made passable by the town liable, or a hill therein has not been graded, within the time prescribed therefor by the commissioners, they may, after notice to the town, cause it to be done by an agent, not one of themselves, on petition of those interested. The agent shall make a written contract therefor and file a copy of it in the clerk's office; and the commissioners shall forthwith certify to the assessors of the town interested, the time when such contract is to be completed, and the amount to be paid therefor. They may examine the doings of their agent, and at pleasure remove him and appoint another. His account shall not be allowed without notice to the town. When the contract has been completed and the accounts allowed, the town shall pay the amount expended, with the expenses of the agent for superintendence, and for procuring the allowance of his account. If the town neglects to pay for thirty days, a warrant of distress shall be issued by the commissioners to collect the same.

SEC. 40. *Record location of highway, when lost or disregarded—proceedings—any justice of supreme judicial court to issue summary notice, etc.* When a highway is laid out through a town and an agent appointed by the county commissioners to open and make it, and the record location thereof cannot be found on the face of the earth or consistently applied thereto, or said agent is not making said highway according to the record location, the municipal officers or town agent, may file a bill in equity in the supreme judicial court, setting forth the facts aforesaid and praying an injunction to stay the proceedings of said road agent; and any justice of said court shall issue a summary notice to said road agent to appear before him to answer said petition; and on a hearing of the parties may issue a temporary injunction upon such terms and conditions as he deems reasonable; and subsequent proceedings on the bill shall be similar to proceedings in equity in other cases.

SEC. 41. *Plantations liable as towns and have same powers.* Plantations required to assess a state or county tax, have like powers and are subject to like liabilities and penalties as towns respecting ways. Their assessors have like powers and shall perform like duties, as municipal officers of towns, respecting them.

ACTIONS FOR DAMAGES AND COSTS.

SEC. 42. *Damages.* A person entitled to receive payment of damages or costs, may, after thirty days from demand on the treasurer of the county, or town, or on the party liable therefor, recover them in an action of debt.

WAYS IN PLACES NOT INCORPORATED.

SEC. 43. *County commissioners may lay out, alter, or discontinue highways in unincorporated townships.* The county commissioners, on petition as provided in section one, may lay out, alter or discontinue a highway on any tract of land in their county, not within any town or plantation required to raise money to make and repair highways; and all expenses for making and opening the same shall be paid by the owners thereof, excluding lands reserved for public uses, in proportion to their interest in the lands over any part of which it is laid, except as provided in chapter nine, section fifty-six.

SEC. 44. *Notice of hearing, how given.* If they think that there ought to be a hearing, they shall cause notice to be given of the time and place appointed therefor, by service of an attested copy of the petition with their order thereon, upon the owners of such lands, if known, fourteen days before that time, and if unknown, by a publication thereof in the state paper for six successive weeks, the last, thirty days before that time. No proceedings shall take place until it is proved that such notice has been given.

SEC. 45. *Procedure.* After hearing the parties at the time and place appointed, they may proceed as provided in section four.

SEC. 46. *Appeal—no person appearing to prosecute; proceedings—appointment of committee—notice of time and place of hearing—duties of committee—proceedings on report—judgment of appellate court to be carried out—when appellant or prosecutor is to pay costs—how collected.* Any party interested in such decision may appeal therefrom to the supreme judicial court, to be entered at the term thereof first held after such decision, in said county. And all further proceedings before the commissioners shall be stayed until a decision is made in the appellate court. If no person appears at that term to prosecute the appeal, the judgment of the commissioners shall be affirmed. If the appeal is then entered, not afterwards, the court may appoint a committee of three disinterested persons, who shall be sworn, and if one of them dies, declines or becomes interested, the court shall appoint another in his place, and they shall cause notice to be given of the time and place of hearing before them, by publication thereof in the state paper for six successive weeks, the last publication to be fourteen days, at least, before the day of hearing, and personal notice to the appellant and to the chairman of the county commissioners, thirty days, at least, before the time set for hearing; they shall view the route, hear the parties, and make their report at the next or second term of the court after their appointment, whether the judgment of the commissioners should be in whole or in part affirmed, or reversed, which, being accepted and judgment thereon entered, shall forthwith be certified to the clerk of the commissioners. If the judgment of the commissioners in favor of laying out, grading or altering a way as prayed for, is wholly

reversed on appeal, the commissioners shall proceed no further. If their judgment is affirmed in whole, or in part, they shall carry into effect the judgment of the appellate court; and in all cases, they shall carry into full effect the judgment of the appellate court, in the same manner as if made by themselves; and the party appealing or prosecuting shall pay the costs incurred since the appeal, if so adjudged by the appellate court, which may allow costs in such cases to the prevailing party, to be paid out of the county treasury. The compensation of the committee shall be the same as commissioners would have for like services, to be allowed by the court. The costs allowed to the prevailing party, and the fees of the committee shall be collected as provided in section three.

SEC. 47. *No new petition for one year.* If the final decision of the commissioners or of the committee is against the prayer of the petition, no new petition for the same road shall be entertained by the commissioners for one year thereafter.

SEC. 48. *County commissioners may lay out, alter or discontinue highways, on same petition—proceedings—appeal.* County commissioners in their counties may, upon the same petition, lay out, alter or discontinue highways, through a town or towns or a plantation or plantations, and tracts of land not in any town or plantation, and in respect to that part of the highway situate in any town or plantation required by law to raise money to make and repair highways, the same proceedings shall be had as are now provided by law in case of a petition to lay out, alter or discontinue highways leading from town to town; and in respect to that part of the highway not situate in any town or plantation required by law to raise money to make and repair highways, the same proceedings shall be had as are now provided by law in case of a petition to lay out, alter or discontinue a highway in places not incorporated. The time and place of hearing upon such petition shall be according to section forty-four; in case of an appeal to the supreme judicial court, the appeal may be made at any time after the return of the commissioners has been placed on the files, and before the next term of said court in the county; and the proceedings upon the appeal shall be according to section forty-six. If no appeal is made, the case shall be continued to the next regular term after the regular term to which the return is made.

SEC. 49. *Liability of persons crossing or entering upon land for purpose of hauling supplies, etc.* When it is necessary for any person or persons, by themselves, men or teams, to cross or enter upon any tract of land outside of the thickly settled portion of any town, for the purpose of hauling supplies, wood, bark, logs or lumber, or to yard or land the same, such person or persons shall not be liable in an action of trespass therefor, *provided,* the bond is furnished as provided in the following section, but the person or persons carrying on said lumbering operation, shall be liable for all the actual damage done to said land by said men and teams so crossing said land.

SEC. 50. *Damages, how ascertained in case of disagreement—bond—amount of bond, and hearing thereon, when part of owners of land are unknown.* Should the person or persons carrying on said lumbering operation, and the owners of said land, be unable to agree upon said damages, such person or persons before crossing, or entering upon said land for the purposes aforesaid, as provided by the preceding section, shall give bond to the owners of said land with sufficient sureties, and in such sum as the county commissioners in the county in which said land lies, shall determine and approve, conditioned to pay such sum as said owners of said land may recover as damages, and costs as provided by section fifty-one. In case all or a part of the owners of said land are unknown, the county commissioners shall before fixing the amount of the bond, appoint a time and place for hearing thereon, and give notice thereof by publication in the county paper two successive weeks, the last publication to be seven days before said hearing, and in such case the bond shall be given to the treasurer of the county for the use and benefit of all the owners in proportion to their respective rights in the land.

SEC. 51. *Damages may be fixed by county commissioners—tender may be made—costs, how paid.* Should the person or persons carrying on said lumbering operation, and the owners of said land be unable to agree upon said damages, either party may, within twelve months from the time said bond is approved, apply to the county commissioners of the county in which said land lies and cause said damages to be ascertained and determined in the same manner and under the same conditions and restrictions as are prescribed by law in the laying out of rail-

roads. Failure to apply for damages within said one year shall be held to be a waiver of the same. The person or persons liable for said damages may make a tender to any land owner damaged under the provisions of the two preceding sections, and if such land owner recovers more damages than the amount tendered him for such, he shall recover costs and the expenses of the county commissioners; otherwise the person or persons liable for said damages shall recover costs and such expenses. A tender made to any person who owns an undivided interest in land thus damaged shall be sufficient under this section.

WAYS IN INCORPORATED PLACES.

SEC. 52. *Parties interested may be heard by commissioners, on petition for laying out highway—may appeal from decision—stay of proceedings.* Parties interested may appear jointly or severally, at the time of hearing, before the commissioners, on a petition for laying out, altering, grading or discontinuing a highway; and any such party may appeal from their decision thereon, at any time after it has been placed on file, and before the next term of the supreme judicial court in said county, at which term such appeal may be entered and prosecuted by him, or by any other party who so appeared. And all further proceedings before the commissioners shall be stayed until a decision is made in the appellate court.

SEC. 53. *On appeal, committee appointed; proceedings.* If no person appears at that term to prosecute the appeal, the judgment of the commissioners may be affirmed. If the appeal is then entered, not afterwards, the court may appoint a committee of three disinterested persons, who shall be sworn, and if one of them dies, declines or becomes interested, the court may appoint some suitable person in his place, and they shall give such notice as the court has ordered, view the route, hear the parties, and make their report at the next or second term of the court after their appointement, whether the judgment of the commissioners should be in whole or in part affirmed or reversed; which being accepted and judgment thereon entered, shall forthwith be certified to the clerk of the commissioners.

SEC. 54. *If judgment of commissioners is reversed, no further proceedings—if judgment is affirmed, shall carry into effect judgment of appellate court—costs—compensation of*

committee—proviso. If the judgment of the commissioners in favor of laying out, grading or altering a way, as prayed for, is wholly reversed on appeal, they shall proceed no further; and in all cases when the judgment of the commissioners is reversed on appeal, no petition praying, substantially, for the same thing shall be entertained by them for two years thereafter. If their judgment is affirmed in whole or in part, they shall carry into effect the judgment of the appellate court; and in all cases they shall carry into full effect the judgment of the appellate court in the same manner as if made by themselves; and the party appealing or prosecuting shall pay the costs incurred since the appeal, if so adjudged by the appellate court, which may allow costs in such cases to the prevailing party, to be paid out of the county treasury. The compensation of the committee shall be the same as commissioners would have for like services, to be allowed by the court. The costs allowed the prevailing party, and the fees of the committee, shall be collected as provided in section three; *provided, however,* that this section shall not apply to any case where the judgment has been reversed on account of informality in the proceedings.

SEC. 55. *Committee, when to be sworn.* All such committees, whether agreed on or appointed on appeal from the county commissioners, may be sworn at any time before viewing the route and hearing the parties.

LIABILITY FOR REPAIR OF WAYS, AND FOR INJURIES.

SEC. 56. *Ways to be kept open and in repair.* Highways, town ways and streets, legally established, shall be opened and kept in repair so as to be safe and convenient for travelers with horses, teams and carriages. In default thereof, those liable may be indicted, convicted and a reasonable fine imposed therefor.

SEC. 57. *Towns neglecting to repair ways, three persons may petition commissioners—time and place for hearing, and notice—prescribe repairs and fix time for making—if they find way safe, shall dismiss petition—costs—if way repaired since.* When a town liable to maintain a way, unreasonably neglects to keep it in repair, as aforesaid, after one of the municipal officers has had five days' actual notice or knowledge of the defective condition, any three or more responsible persons may peti-

tion the county commissioners for the county, setting forth such facts, who, if satisfied that such petitioners are responsible for the costs of the proceedings, shall fix a time and place near such defective way, for a hearing on such petition, and cause such notice thereof to be given to the town and petitioners as they may prescribe. At the time appointed, the commissioners shall view the way, alleged to be out of repair, and hear the parties interested, and if they adjudge the way to be unsafe and inconvenient for travelers, horses, teams and carriages, they shall prescribe what repairs shall be made, fix the time in which the town shall make them, give notice thereof to the municipal officers and award the costs of the proceedings against the town. If they adjudge the way to be safe and convenient, they shall dismiss the petition and award the costs against the petitioners. If they find that the way was defective at the time of presentation of the petition, but has been repaired before the hearing, they may award the costs against the town, if in their judgment justice requires it.

SEC. 58. *Petition, how and when presented—return of proceedings.* Such petition may be presented to said commissioners at any of their sessions, or in vacation to their chairman, who shall procure the concurrence of his associates in fixing the time and place in the order of notice, and cause the petition to be entered at their next session. And they shall make full return of their proceedings on the petition, and cause the same to be recorded as of their next regular term after the proceedings are closed.

SEC. 59. *Towns neglecting to make repairs—agent to be appointed—notice upon his account—towns liable for his account when allowed—when warrant of distress to issue therefor.* If the town neglects to make the repairs prescribed by the commissioners, within the time fixed therefor in such notice to the town, they may cause it to be done by an agent, not one of themselves. Such agent shall cause the repairs to be made forthwith, and shall render to the commissioners his account of disbursements and services in making the same. His account shall not be allowed without such notice to the town, as the commissioners deem reasonable. When the account is allowed, the town becomes liable therefor, with the agent's expenses in procuring the allowance of his account, and interest after such allowance,

and said commissioners shall render judgment therefor against the town in favor of the agent. If a town neglects to pay said judgment for thirty days after demand, a warrant of distress shall be issued by the commissioners to collect the same.

SEC. 60. *Ways on line between towns, how divided—liability of towns.* When a way is established on a line between towns, their municipal officers shall divide it crosswise, and assign to each town its proportion thereof by metes and bounds, which, within one year thereafter, being accepted by each town, at a legal meeting, shall render each town liable, in the same manner as if the way were wholly within the town; when a division of it is not so made, the selectmen of either town may petition the county commissioners, who shall give notice by causing a copy of such application with their order thereon appointing a time and place of hearing, to be served upon the clerk of each town thirty days, or by causing it to be published in some newspaper printed in the county for three weeks, previous to the time appointed; and after hearing the parties, they may make such division.

SEC. 61. *Ways laid out between towns, how divided, for repair.* A highway may be laid out on the line between towns, part of its width being in each, and the commissioners may then make such division of it and enter the same of record, and each town shall be liable in all respects, as if the way assigned to it were wholly in the town.

SEC. 62. *Snow to be trodden down—sudden injuries to be repaired—damage may be recovered of town.* When any ways are blocked or encumbered with snow, the road commissioner shall forthwith cause so much of it to be removed or trodden down, as will render them passable. The town may direct the manner of doing it. In case of sudden injury to ways or bridges, he shall, without delay, cause them to be repaired. And all damage accruing to a person in his business or property, through neglect of such road commissioner or the municipal officers of such town, to so render passable, ways that are blocked or encumbered with snow, within a reasonable time, may be recovered of such town by a special action on the case.

SEC. 63. *Mail routes, apparatus for opening—fences may be taken down to prevent drifting—to be replaced.* There shall be furnished and kept in repair in each section of the town, through

which there is a mail route, some effectual apparatus for opening ways obstructed by snow, to be used to break and keep open the way to the width of ten feet, and the municipal officers of towns, or any road commissioner under their direction, may take down fences upon the line of public highways when they deem it necessary to prevent the drifting of snow therein; but they shall in due season be replaced, in as good condition as when taken down, without expense to the owner.

SEC. 64. *Trees may be planted.* A sum not exceeding five per cent of the amount raised for repair of ways and bridges may be expended by a road commissioner under the direction of the municipal officers, in planting trees about public burying-grounds, squares and ways, if the town by vote authorizes it.

SEC. 65. *Materials may be taken from lands not enclosed or planted.* A road commissioner may remove any obstacle, which obstructs or is likely to obstruct a way, or render its passage dangerous. He may dig for stone, gravel or other material suitable for making or repairing ways in land not enclosed or planted, and remove the same to the ways. If the land from which such materials were taken is not within the limits of the way, the owner of it shall be paid therefor in money by the town, to be recovered after demand and refusal by the road commissioner, in an action as on an implied promise.

SEC. 66. *Duties of road commissioners.* Road commissioners shall go over the roads in their towns or cause it to be done, in April, May, June, August, September, October and November in each year, remove the loose obstructions to the public travel, and whenever so directed by the selectmen, remove all shrubbery and bushes growing within the limits of highways, not planted or cultivated therein for the purpose of profit or ornamentation, having care for the proper preservation of shade trees, and repair such defects as may occur from time to time, rendering travel dangerous, or they shall give notice of such defects to the municipal officers, under a penalty of five dollars for neglect of such duty.

SEC. 67. *Water courses not to be so made as to do injury; remedy.* No road commissioner without written permission from the municipal officers, shall cause a water-course to be so constructed by the side of a way as to incommode any person's house or other building, or to obstruct any one in the prosecution

of his business. Any person so aggrieved may complain to the municipal officers, who shall view the water-course and may cause it to be altered as they direct.

SEC. 68. *Damages by raising or lowering streets how determined.* When a way or street is raised or lowered by a road commissioner or person authorized, to the injury of an owner of adjoining land, he may, within a year, apply in writing to the municipal officers and they shall view such way or street and assess the damages, if any have been occasioned thereby, to be paid by the town, and any person aggrieved by said assessment, may have them determined, on complaint to the supreme judicial court, in the manner prescribed in section twenty of this chapter. Said complaint shall be filed at the term of the supreme judicial court, next to be held within the county where the land is situated, after sixty days from the date of assessment.

SEC. 69. *When appropriation insufficient, procedure.* When the amount appropriated is not sufficient to repair the ways a road commissioner may, with the written consent of the selectmen, employ inhabitants of the town to labor on such ways, to an amount not exceeding fifteen per cent of the amount so appropriated and in addition thereto.

SEC. 70. *Towns may raise and assess moneys for bridges and ways.* Towns shall annually raise money to be expended on town ways and highways, and for the repair of bridges, and the same shall be assessed and collected, as other town taxes, and expended for said purposes, by a road commissioner or commissioners, or by the selectmen as each town may determine.

SEC. 71. *When and how money shall be expended.* Sixty-five per cent of the highway taxes assessed shall be expended upon the highways prior to the fifteenth day of July, and the balance at such time as the commissioner, or in case no commissioner is elected, as the selectmen deem for the best good of the public.

SEC. 72. *Powers and duties of road commissioner—shall give bond—compensation—make monthly statement.* The road commissioner under the direction of the selectmen, shall have charge of the repairs of all highways and bridges within the towns and shall have authority to employ the necessary men and teams, and purchase timber, plank and other material for the repair of highways and bridges. He shall give bond to the satis-

faction of the selectmen, and be responsible to them for the expenditure of money, and discharge of his duties generally. His compensation shall be such sum as the towns shall annually vote therefor, which sum shall, in no case be less than one dollar and fifty cents a day, for every day of actual service; and he shall render to the selectmen monthly statements of his expenditures, and receive no money from the treasury except on the order of the selectmen.

SEC. 73. *Commissioner shall keep account of expenditures—accounts shall be kept by selectmen, if commissioner is not chosen.* He shall keep accurate accounts, showing in detail, all moneys paid out by him, to whom and for what purpose; he shall settle his accounts on or before the twentieth day of February, annually, and the same shall be reported in the annual town report in detail. In case no commissioner is elected by a town at its annual meeting, the selectmen of said town shall keep accurate accounts showing in detail all moneys paid out by them for the repair of bridges and ways, to whom and for what purpose, and the same shall be reported in the annual town report in detail.

SEC. 74. *Wide wheels and watering troughs, abatement for—public drinking troughs and fountains.* A town at its annual meeting may authorize its assessors to abate not exceeding three dollars of the tax of any person, upon proof that he has owned and used on the ways during that year cart wheels having felloes not less than six inches wide. And they shall abate three dollars from the tax of any inhabitant, who shall construct, and during the year keep in repair a watering trough beside the highway, well supplied with water, the surface of which shall be two and a half feet or more above the level of the ground, and easily accessible for horses and carriages, if the assessors think such watering trough for the public convenience. If more than one person in the same locality claims to furnish it, the municipal officers shall decide where it shall be located. Such officers may establish and maintain such public drinking troughs, wells and fountains within the public highways, squares and commons of their respective towns, as in their judgment the public necessity and convenience require; and towns may raise and appropriate money to defray the expense thereof.

SEC. 75. *Ways may be opened or repaired by contract.* Towns may authorize their road commissioners or other persons to make contracts for opening or repairing their ways.

SEC. 76. *Persons injured by defect in highways may recover damages—limitation—when sufferer must give previous notice—county commissioners or town officers must be notified in writing within 14 days—loss of life, damages for, how recovered—view may be ordered at trial.* Whoever receives any bodily injury, or suffers damage in his property, through any defect or want of repair or sufficient railing, in any highway, town way, causeway or bridge, may recover for the same in a special action on the case, to be commenced within one year from the date of receiving such injury, or suffering damage, of the county or town obliged by law to repair the same, if the commissioners of such county, or the municipal officers or road commissioners of such town, or any person authorized by any commissioner of such county or any municipal officer, or road commissioner of such town, to act as a substitute for either of them, had twenty-four hours' actual notice of the defect or want of repair; but not exceeding two thousand dollars in case of a town; and if the sufferer had notice of the condition of such way previous to the time of the injury, he cannot recover of a town unless he has previously notified one of the municipal officers of the defective condition of such way; and any person who sustains injury or damage, as aforesaid, or some person in his behalf, shall within fourteen days thereafter, notify one of the county commissioners of such county, or of the municipal officers of such town, by letter or otherwise, in writing, setting forth his claim for damages and specifying the nature of his injuries and the nature and location of the defect which caused such injury. If the life of any person is lost through such deficiency, his executors or administrators may recover of such county or town liable to keep the same in repair, in an action on the case, brought for the benefit of the estate of the deceased, such sum as the jury may deem reasonable as damages, if the parties liable had said notice of the deficiency which caused the loss of life; at the trial of any such action the court may, on motion of either party, order a view of the premises where the defect or want of repair is alleged, when it would materially aid in a clear understanding of the case.

SEC. 77. *Repair within six years, proof of way.* When on trial of any such action or indictment, it appears that the defendant county or town has, within six years before the injury, made repairs on the way or bridge, it shall not deny the location of such way or bridge.

SEC. 78. *No liability if load exceeds six tons.* No town is liable for such an injury when the weight of the load, exclusive of the carriage, exceeds six tons. Proof of its weight must be made by the plaintiff.

SEC. 79. *Slippery sidewalk no cause of action for pedestrian.* No town is liable to an action for damages to any person on foot, on account of snow or ice, on any sidewalk or cross-walk, nor on account of the slippery condition of any sidewalk or cross-walk.

SEC. 80. *Railroad company may be notified of suit against town for defective crossing.* In an action against a town for damages alleged to have occurred by reason of a defect in a railroad crossing, constituting part of a highway which said town is obliged to keep in repair, the railroad company owning or occupying such crossing, may be notified of the pendency of the suit, and take upon itself the defense of the same.

SEC. 81. *Liability of railroad company.* In such trial, after notice as provided in the preceding section, if the plaintiff recovers, and the jury finds specially that the damage was occasioned by the fault of such company, it shall be liable to the defendants in said suit in an action of debt for all damage and costs paid by them.

SEC. 82. *Notice to company.* The notice required in section eighty, shall be by copy of the writ served upon the company at least thirty days before the sitting of the court in which it is returnable, or by such notice as the court may order after entry.

SEC. 83. *One indictment only at a term.* One indictment only for neglect to open ways or to keep them in repair shall be presented against a town at the same term of court; but it may contain as many counts as are necessary to describe all portions of ways alleged to be defective. The word "highway" used therein includes town ways, causeways and bridges.

SEC. 84. *Agents appointed to expend fines; their duties.* All fines imposed shall be appropriated to the repair of such ways. The court imposing them shall appoint one or more agents to

superintend their collection and application. Within three months after collection, they shall make return of their doings to the clerk of the court, to remain on file for the inspection of those interested, and subject, on their motion, to be audited and corrected by the court. If an agent is guilty of gross neglect of duty, or fraudulently misapplies or retains the fine, he forfeits to the town double its amount, to be recovered by indictment.

SEC. 85. *Clerk of court to certify fines to assessors; how collected and paid.* When a fine is imposed on a town, the clerk of the court shall certify it forthwith to the assessors; who shall assess the amount thereof, as other town taxes, certify the same to said clerk, and cause the amount to be collected by their collector, who shall pay the same to such agent at such time as the court orders. If not paid by that time, the clerk, on application of such agent, shall issue a warrant for its collection, as the treasurer of state may do for the collection of a state tax.

SEC. 86. *If way is not repaired in four months, fine to be collected.* If the assessors neglect to make such assessment and to certify it to the clerk, and the defective way is not repaired to the acceptance of such agent within four months after notice of the fine, the court may issue a warrant to collect of the town the fine and costs, or the unpaid part thereof.

SEC. 87. *When gates, bars, and fences on ways may be removed.* Any person may take down and remove gates, bars or fences, upon or across any highway or town way, unless they are there to prevent the spread of infectious disease, or were placed there by license of the county commissioners or municipal officers of the town. To those granting such license, a person aggrieved by such removal may apply, and on proof that such erections were made by their license, they may order them to be replaced by the person who removed them.

SEC. 88. *Road commissioners may remove logs and lumber as a nuisance; proceedings—materials may be sold.* When logs, lumber of other obstructions, without necessity are left on such ways, any road commissioner, or when no road commissioner is chosen, one of the municipal officers, may remove them; and he shall not be liable for loss or damage thereof, unless occasioned by design or gross negligence. When no one appears to pay the expense and trouble of removal, he may sell at public auction so much thereof, as is sufficient for the purpose,

with charges of sale, posting notice of the time and place of sale in two public places in the town seven days prior thereto. The person, through whose neglect or wilful default they were left, may be prosecuted as for a nuisance.

SEC. 89. *Persons convicted of nuisance to pay, if materials are not sufficient.* When any thing has been adjudged to be a nuisance and to be abated, and the materials of which it is composed do not, on sale as aforesaid produce sufficient to pay the charges of prosecution, removal and sale, the court may order the deficiency to be raised by levy on the personal property of the person convicted of causing such nuisance.

SEC. 90. *When buildings and fences on a street or way for twenty years become bounds—when it takes forty years—estoppel created by writing under seal.* When buildings or fences have existed more than twenty years fronting upon any way, street, lane or land appropriated to public use, the bounds of which cannot be made certain by records or monuments, such buildings or fences shall be deemed the true bounds thereof. When the bounds can be so made certain, no time less than forty years will justify their continuance thereon, and on indictment and conviction they may be removed. Persons owning lands beside a highway or town way, on which are buildings or fences that encroach within the limits of said way, may by a writing under seal, by them signed and acknowledged, and recorded in the registry of deeds for the county in which the land lies, admit to the municipal officers of the town in which said way exists, the true bounds or limits of said way, and the extent of their wrongful occupancy thereof. And thereafter such persons, and all claiming title under or through them, shall be estopped from asserting any right to the continuance of such buildings or fences within said limits, for the full term of forty years from the date of such deed.

SEC. 91. *Towns required to maintain guide-posts at crossings of ways—penalty.* Towns shall erect and maintain at all crossings of highways, and where one public highway enters another, substantial guide-posts not less than eight feet high, and fasten to the upper end of each a board, on which shall be plainly printed, in black letters on white ground, the name of the next town on the route, and of such other place as the municipal officers direct, with the number of miles thereto, and a figure of a

hand with the forefinger pointing thereto; and for any neglect herein, towns are subject to indictment, and fine not exceeding fifty dollars.

SEC. 92. *Town officers to erect guide-posts—plantations obligated as towns.* If the municipal officers of any town unreasonably neglect to cause a guide-post to be erected in their town as provided by law, they forfeit five dollars for each month's neglect, to be recovered in an action on the case by any person suing therefor. Plantations assessed in state or county taxes, and their officers, are under the same obligations and subject to the same penalties in these respects as towns.

SEC. 93. *Excavations near ways, how to be made; responsibilities.* Persons desiring to make an excavation near a street or public way, may make written application to the municipal officers setting forth its nature and extent, and requesting their direction thereon; such officers shall in writing direct whether it may or not be made, and if permitted, the manner of making it; and when so made, no liability is incurred thereby. If not so made, the person making it is liable to the town, in an action on the case, for all damages occasioned by the repair of the way, or paid to persons injured by defects therein, caused by such excavation.

SEC. 94. *Ice bridges may be made—penalty for injuring.* Ice bridges may be constructed and maintained by persons for their own and the public use across any river or body of water, when its ordinary navigation is obstructed by ice. Whoever wilfully destroys such bridge to prevent its use, forfeits not less than five, nor more than twenty dollars, to be recovered by complaint, half to the complainant, and half to the state. No person shall take down or injure any fence or occupy any land for the construction or use of such a bridge without consent of the owner first obtained.

REPAIR OF PRIVATE WAYS OWNED IN COMMON.

SEC. 95. *Owners of private ways and bridges may call meetings; proceedings.* When four or more persons are owners and occupants of a private way or bridge, any three of them may make written application to a justice of the peace to call a meeting, who may issue his warrant setting forth the time, place and purpose thereof, a copy of which shall be posted at some

public place in the town seven days before such time. When so assembled they may choose a clerk and a surveyor, to be sworn, and they may determine what repairs are necessary, and the materials to be furnished or amount of money to be paid by each owner therefor and the manner of calling future meetings.

SEC. 96. *Surveyor's duties; penalty for neglect of owners to pay.* The surveyor so chosen, with respect to such way or bridge, has the powers of a road commissioner. For refusing to accept the trust or to take the oath he forfeits four dollars, to be recovered as provided in section ninety-eight. If any owner or occupant, on requirement of the surveyor, neglects to furnish his proportion of labor, materials or money, the same may be furnished by the other owners and occupants, and recovered of him in an action on the case.

SEC. 97. *Owners may contract for repair, and cause money to be assessed and collected.* The owners, at such meeting, may authorize a contract to be made for making and keeping such way or bridge in repair, by the year or for a less time; may raise money for that purpose, and choose assessors to assess it on such owners and occupants in proportion to their interests, who shall deliver their assessment with a warrant for its collection to the surveyor. Such warrant shall be in substance such as is prescribed for collection of town taxes. The surveyor shall collect the same as town taxes are collected; and be liable for neglect of duty, as town collectors are for similar neglects.

SEC. 98. *Penalties and process.* Money recovered under the two preceding sections is for the use of such owners. In any process for its recovery, a description of them in general terms as proprietors and occupants of the way or bridge, clearly describing it therein, is sufficient. Such process is not abated by the death of any owner, or by the transfer of his interest.

STATE ROADS.

SEC. 99. *Towns may establish state roads.* Upon the request of the municipal officers of any town, the county commissioners of the county wherein said town is located, shall designate that highway running through said town which in their judgment is the main thoroughfare, and said highway shall be known as a state road.

SEC. 100. *Towns establishing state roads may receive state aid in improving the same—when money shall be expended—when aid shall be paid.* Towns establishing state roads as aforesaid may, on complying with the conditions hereinafter set forth, receive from the state one-half of the amount actually expended in permanent improvement of said roads, not exceeding three hundred dollars a year; provided, that no town shall receive such state aid unless its expenditure for such road shall amount to at least one hundred dollars, and shall have been exclusive of and in addition to the amount regularly raised in such town for highways and bridges; and provided, also, that the amount so expended shall be used before the first day of October in permanent improvement of a portion of said road, and in a manner satisfactory to the county commissioners of the county wherein said road is located. Said permanent improvement shall be on a continuous portion of said road for at least one year. Such aid shall be paid from the state treasury on and after the first day of January, upon certificate by the governor and council, as provided by the following section.

SEC. 101. *Municipal officers shall make return to county commissioners—commissioners shall inspect the road improved and certify to governor and council.* Municipal officers of towns improving state roads under the foregoing provisions shall annually before the first day of November make returns under oath to the county commissioners of their county of the amount appropriated and expended by their town in such permanent improvements, the amount of road improved, and the character of the work done. The county commissioners shall inspect the roads so improved and if they are satisfied that the provisions of the preceding sections have been complied with, they shall certify to the governor and council the sum which said town is entitled to receive from the state. Any town dissatisfied with their decision may appeal to the governor and council. The governor and council shall issue a certificate to the treasurer of the town for such amount as they adjudge such town entitled to receive from the state treasury.

SEC. 102. *Towns taking advantage of sections 99-105 must make application to secretary of state.* Towns desiring to take advantage of the provisions of sections ninety-nine to one hundred and five inclusive, may, through their municipal officers,

make application therefor to the secretary of state, and he shall record such applications in the order in which they are received.

SEC. 103. *Towns receiving special aid not entitled to benefits of.* No town which receives by special act or appropriation assistance from the state in the construction or repair of its highways or bridges shall be entitled to the benefits of sections ninety-nine to one hundred and five inclusive during the year in which such assistance is given.

SEC. 105. *The word "town" construed—existing control of highway not changed.* The word "town" in the six preceding sections shall be construed as meaning cities, towns or organized plantations. Nothing therein contained shall be construed as changing the existing control of highways by counties or towns or as limiting or changing their liabilities therefor.

(Section one hundred and four is repealed.)

NOTE: Ditches and drains may be constructed by municipal officers when necessary for care of highways, c. 21, § 26. Page 226 this volume.

Municipal officers to grant permits for opening streets, c. 55, § 6, for erection of poles and wires therein, c. 55, § 17; as to damages occasioned thereby, c. 55, §§ 7 and 10.

Owners of unincorporated tracts of lands may raise money for roads, c. 58, § 14.

Protection of ways from overflow, c. 94, §§ 37-42.

Penalty for advertising upon rocks or other natural objects in highway, c. 128, § 13.

Penalty for injuring guide-boards, c. 128, § 19.

For the references see Revised Statutes, 1903.

ADDITIONAL SECTIONS REFERRING TO HIGHWAYS, ETC.

REVISED STATUTES—CHAPTER 21, SECTIONS 26 AND 27.

HIGHWAY DITCHES AND DRAINS.

SEC. 26. *Towns may construct ditches and drains through lands of persons and corporations—shall be under control of municipal officers—liability for damages if not kept in repair.* The municipal officers of a town may at the expense of the town construct ditches and drains to carry water away from any high-

way or road therein, and over or through any lands of persons or corporations when they deem it necessary for public convenience or for the proper care of such highway or road, *provided* that no such ditch or drain shall pass under or within twenty feet of any dwelling-house without the consent of the owner thereof. Such ditches or drains shall be under the control of said municipal officers and wilful interference therewith shall be punished as is provided by statute for obstruction in a traveled road. If such town does not maintain and keep in repair such ditches and drains, the owner or occupant of the lands through or over which they pass, may have his action against the town for damages thereby sustained.

SEC. 27. *Procedure.* Before land is so taken, notice shall be given and damages assessed and paid therefor as is provided for the location of town ways.

REVISED STATUTES—CHAPTER 4.

SEC. 13. *Election of road commissioner—selectman not to be road commissioner.* Each town at its annual meeting may elect by major vote a road commissioner, who shall hold his office for the term of one year from the date of his election. Any town may, at its option, elect not more than three commissioners, whose powers and duties shall be the same as prescribed for a single commissioner. No person shall, at the same time, hold the office of road commissioner and selectman.

SEC. 14. *Officers chosen by ballot—town agent, compensation.* Moderator, town clerk, selectmen, assessors and overseers of the poor, treasurer, auditor, school committee, town agent and road commissioners shall be elected by ballot, and the other said officers by ballot, or if not so elected, they shall be appointed by the selectmen. The town agent shall act under direction of the selectmen and shall receive from the treasury of the town such compensation for his services as may be fixed by vote of the town; otherwise, as the selectmen shall allow.

SEC. 15. *Commissioner failing to qualify, selectmen to appoint—on failure to elect commissioner, selectmen shall act—municipal officers may appoint certain officers—appointments to be recorded.* If a person elected as road commissioner fails to qualify before the first Monday of April, the office shall be deemed vacant, and shall be filled by the selectmen by appoint-

ment; and in the event of a vacancy caused by death or otherwise, the selectmen shall appoint some competent person to fill out the unexpired term, who shall qualify and perform the duties of said office. If a town fails to elect a road commissioner at its annual meeting, the money raised and assessed for the repair of bridges and ways as provided by section seventy of chapter twenty-three shall be expended for that purpose by the selectmen; if after the choice of any officer not required to be chosen by ballot, there is a vacancy in any such office, the municipal officers may fill such vacancies by the written appointment of proper persons, who shall be summoned by the constable to appear and take the oath of office provided in section twenty-five subject to the penalties provided in section twenty-six. Such appointment and oath shall be recorded as in case of a choice by the town. No person shall be so appointed without his consent.

SEC. 118. *Annual meeting.* Organized plantations shall hold their annual meeting in March, and choose a clerk, three assessors, treasurer, collector of taxes, constable, superintending school committee, one or more surveyors of lumber, and two or more fence viewers; and when money is raised for repair of ways and bridges, may choose one or three road commissioners, as towns may do.

PUBLIC LAWS, 1905—CHAPTER 126.

An Act to provide for the employment of Male Prisoners upon public ways or in preparing materials for the construction or repair thereof.

Male prisoners may be employed upon public ways. Upon written application by the county commissioners of any county, or by the municipal officers of any town, the board of prison and jail inspectors may direct and require that any male prisoner under sentence in any jail shall be employed in labor upon the public ways or in preparing materials for the construction or repair of such ways in such place, and under such regulations as the inspectors may provide. Such county commissioners and municipal officers shall have authority to make such contracts as may be necessary to carry out the foregoing provisions. Prisoners employed as aforesaid shall be subject to all laws and penalties provided for escapes or attempts to escape from jails or workshops.

PUBLIC LAWS, 1905—CHAPTER 152.

An Act to apportion the expense of Bridges between towns.

SEC. 1. *Expense of bridge to be borne in proportion to state valuation of towns.* Whenever a highway hereafter located crosses any river which divides towns, the expense of constructing, maintaining and repairing any bridge across such river shall be borne by such towns in proportion to their last state valuation prior to such location.

SEC. 2. This act shall take effect January one, nineteen hundred and six.

PROGRESS OF ROAD LEGISLATION AND ROAD IMPROVEMENT IN THE DIFFERENT STATES.

From Office of Public Roads, United States Department Agriculture, Washington, D. C.

In the following paragraphs a brief synopsis is given of the road laws in force at this time in the States designated, together with a short statement of work under such legislation. This review has been prepared in co-operation with State officials in each State. No reports are given from States in which no new legislation has been enacted nor substantial progress in road improvement made since our last annual report.

NOTE: The report compiled in 1905, as received from Washington, has been enlarged by making such extracts from the 1904 report as show more clearly the growth of present laws in some states.

CALIFORNIA.—The legislature of 1895 created the State Bureau of Highways, with three commissioners, appointed by the governor, to hold office two years, and appropriated $83,500 for carrying on state road work; in 1897, by legislative enactment, the Bureau of Highways was superseded by the State Department of Highways, with three commissioners to hold office for two years, they to be succeeded by one commissioner, appointed by the governor, for a term of four years and every four years thereafter. In 1897 the legislative appropriations for state road work aggregated $44,900; in 1899, $74,500; in 1901, $23,060; in 1903, $58,360; in 1905, $95,310. Most of the public roads are constructed under the direction of the boards of supervisors of the counties, by direct taxation for that purpose. During the twenty years, 1885 to 1904, inclusive, an aggregate of $49,567,201.31 was expended upon the county roads by the supervisors. There are 50,000 miles of county roads (of which

2,500 miles are "oiled roads") and 147 miles of state roads in use. The roads constructed and maintained by the state are in mountainous regions where the population is sparse and where direct communication between more productive sections is desirable. While California has no "state-aid" road law, the legislature of 1905 appropriated $32,000 for the construction of 75 miles of specified county roads, upon condition that the counties add fifty per cent of the amount, the roads to revert to and be maintained by the counties after construction, which is in progress.

CONNECTICUT.—The legislature has appropriated for the building of state roads, from 1895 to 1902, the sum of $1,233,000 and during the same period the counties have appropriated for the same road work $810,942.55. In the building of state roads the state pays two-thirds of the cost in towns having taxable valuation of over $1,000,000, and three-fourths in towns having taxable valuation less than $1,000,000, the towns paying the balance of the cost. The towns are required to repair state roads, but if they fail to do so the state repairs them and charges the amount to the towns.

The legislature of 1903 appropriated $225,000 to be expended under the direction of the state highway commissioner during the years 1903-4. About 450 miles of road have been built under the direction of the state highway commissioner since 1895 at an average cost of $3,000 per mile for gravel roads and $6,500 for 16 foot macadam roads. This cost includes grading and culverts.

DELAWARE.—The legislature of Delaware in April, 1903, passed a state aid bill which provides for the appointment of three highway commissioners to have charge of the state road work—one in each county. It further provides that the expense of constructing state roads shall be borne equally by the state and the county interested, and $30,000 per year for the following two years was appropriated as the state's share of the expense for road improvement. Ten miles of macadam road have been built in Newcastle county and three miles in Sussex county. Kent county thus far has failed to take advantage of the state aid law. These roads have been much admired and favorably commented upon by all the people of the state who have used them or seen them, and they bear the strongest testimony to the

wisdom of the last legislature in enacting the present law. The roads in Kent county have been built of Brandywine granite and Birdsboro trap rock, at a cost of about $6,000 per mile. The roads are built of macadam, 16 feet wide and eight inches deep, with shoulders on either side extending to the full width of the roadbed, making a permanent highway about 35 to 40 feet in width. In Sussex county, where about three miles of macadam road have been built at about the same cost per mile, the roads have proven to be equally satisfactory, and the people are already beginning to clamor for more roads. In the beginning the strongest opponents of this law were the farmers, but since they have seen the advantages of these roads, especially for themselves, many of the most intelligent farmers have become the strongest advocates of the principles of road building as embodied in the state aid law.

FLORIDA.—A recent act of the legislature sets aside for the improvement of roads the proceeds of the Indian war claims, the payment of which has been authorized by Congress. From this the state will realize over a half million dollars. Another act, adopted June, 1903, provides, that all moneys now in the internal-improvement fund, or which may be derived from the sale of state swamp, or overflowed lands, shall be devoted to the construction of hard roads, being divided among the several counties in proportion to their assessed valuation. Under act of the legislature approved June 3, 1899, all persons confined in county jails for a term of one year or less shall be worked on the public roads.

ILLINOIS.—An act was passed by the last general assembly and approved May 18, 1905, establishing a state highway commission consisting of three persons to be appointed by the governor, the duty of the commission being to investigate and carry on experimental work in road building, kinds of material, systems of drainage, etc. No compensation was provided for but the actual expenses of the commissioners were paid. The act carried an appropriation of $25,000 per annum. Another act was passed at the same session and approved May 18, 1905, authorizing and empowering the employment of convicts and prisoners in the penal and reformatory institutions of the state in the manufacture of tile and culvert pipe for road-drainage apparatus, and in the manufacture of machinery, tools and

appliances for the building, maintaining and repairing of the wagon roads of the state and for preparing road-building and ballasting material, upon the requisition of the state highway commission.

IOWA.—The bill providing for the state highway commission became effective April 13, 1904, the Iowa State College being designated as the highway commission. The duties of the commission are to devise plans of highway construction, and to act as a bureau of information. The second act provided the commission with $7,000 for the biennial period July 1, 1904, to July 1, 1906.

MAINE.—Legislation was enacted in 1901 providing that any city or town may receive from the State treasury one-half the sum actually appropriated and expended on some road within its corporate limits to be designated by the county commissioners as State road. The work to be done under supervision of and accepted by the county commissioners. The maximum amount to be drawn by any town was $100. In 1903 the legislature raised this maximum to $200. In 1905 the maximum was raised to $300.

Legislature in 1905 created the office of commissioner of highways. Duties advisory and consulting when called upon by county and municipal authorities. Also "to compile statistics relating to the public ways and to make such investigation relating thereto as he shall deem expedient, in order to secure better and more improved highways in the State." The law also provides that "said commissioner shall hold each year under the auspices of the county commissioners a meeting in each county, for the open discussion of questions relating to the building and maintaining of public ways, of which due notice shall be given to the towns and cities in each county by the said county commissioners." Law obligates all town or county officers having charge of highways to furnish information concerning same, upon request, to the Commissioner of Highways.

MARYLAND.—Since 1898, $10,000 has been appropriated each year for carrying on the work of the highway division of the State geological survey. A careful and searching inquiry into the road question of the State has been made and several exhaustive reports issued. The highway division reports, among other things, that there are 16,000 miles of roads in the state, of which

497 miles are toll roads. There are about 900 miles of stone, shell, and gravel roads maintained by the counties. It is estimated that the counties spend for road maintenance $600,000 annually and that the people of the state pay about $140,000 annually in tolls. It is estimated that the average hauling distance is 6.7 miles and that the average amount hauled in tons per horse is 0.58 ton. The average cost of hauling 1 ton per mile in Maryland is 26 cents. The cost of properly built macadam roads in Maryland, graded for a width of 20 feet with macadam 12 feet wide, varies from $4,000 to $6,000 per mile.

The general assembly of 1904 passed an act which provides $200,000 annually for the construction of modern macadam roads, under plans and specifications prepared by the state geological survey, one-half of the cost to be paid by the state and one-half by the county. The amount received by each county from the state is the direct proportion the public road mileage of the county bears to the total public road mileage of the state.

MASSACHUSETTS.—Massachusetts appropriates annually $450,000 for construction and $60,000 in 1905 for maintenance. The state pays the entire cost of the road, but 25 per cent of the cost is assessed on the counties. The Commonwealth has appropriated in the aggregate for the building of roads $6,000,000. The Massachusetts Highway Commission, which was established in 1893, has received some contributions from towns and individuals to assist in building roads which amount to $330,000, making a sum total of $6,330,000. The recent legislature appropriated $2,250,000 to be expended for state highways during a period of five years. The average cost per mile of 12 to 15 foot stone roads in Massachusetts in 1904 is $5,750, the depth varying from 3 to 12 inches. Gravel roads 15 feet wide and 6 to 8 inches deep cost from $3,000 to $4,000 per mile. Six hundred and fifteen miles were built or under contract to October 1, 1905. It is estimated by the Massachusetts Highway Commission that there are 20,000 miles of roads in the Commonwealth and that 1,900 miles will ultimately be improved by State aid.

MICHIGAN.—The State Reward Road law enacted by the 1905 legislature provides state rewards to be paid to townships and counties that build gravel or macadam roads; $250, $500, $750

and $1,000 a mile, governed by the kind of road built, when same are approved by the state highway commissioner.

Every township has the right to raise money by bonding to the extent of five per cent of its valuation to build gravel, stone or any other kind of roads or to construct bridges. Any county may adopt the county road law and assess a two mill tax each year to build good roads. County commissioners are elected who hold office twice the number of years that there are commissioners elected, which cannot be more than five, usually three. The state highway department act provides that every road or street official in the state shall make annual reports to the state highway department, and every such official has the right to seek from said department information about material or how best to build roads and bridges.

The functions of the state highway department are—to instruct, to inspect, and to reward.

MINNESOTA.—The legislature of 1905 passed an act, approved April 13, providing for the appointment by the governor of a state highway commission whose duties it shall be to study the best methods of road construction and improvement and to investigate the location of road building materials in the state, and to give such advice, assistance and supervision in the construction of roads as their time and opportunity will permit. For the purpose of aiding in the construction of roads a tax of 1-20 of one mill on all taxable property is made, which is to be apportioned by said commission among the several counties.

NEW HAMPSHIRE.—The legislature of 1905 passed a bill carrying an appropriation of $125,000 per year for six years. The bill provides that all cities and towns in the state shall expend the following amounts to be used for permanent improvement of main highways under the advice of the state engineer: Towns having a valuation of less than two million dollars, one dollar on each one thousand valuation; two million to three million valuation, seventy-five cents on each one thousand valuation; three million to five million valuation, fifty cents on each one thousand valuation; five million to fifteen million valuation, thirty-three and a third cents on each one thousand valuation; fifteen million and upwards, twenty-five cents on each one thousand valuation. Any city or town may apply for State aid, and all such cities or towns as apply must appropriate

and set apart an additional amount equal to fifty per cent of the above amounts. The state apportions to such towns as apply for state aid, for each dollar set apart for the town, an amount based upon the valuation of the town, ranging from three dollars for each dollar set apart for the town, down to twenty cents for each dollar set apart for the city or town. All work performed under state aid is under the direction of the state engineer, acting under the general direction of the governor and council. All applications for any year must be presented before the governor and council before May 1 of such year. Of the two hundred and thirty-five cities and towns in the state, one hundred and ninety-four have applied for state aid for the year 1905. All permanent improvements are to be made on such main roads as shall eventually result in continuous lines throughout the State.

Previous to 1905 all appropriations made by the state for highways have been for certain specific highways in the summer resort region and in a few of the smallest towns.

The law of 1905 also converted about one hundred and twenty-five miles of road into State roads, to be maintained by the state, such roads being entirely in the summer resort region. The above law was passed as a result of a law passed in 1903, providing for the investigation of conditions in the state, and appropriating fifteen thousand dollars therefor.

NEW MEXICO.—In 1893 the legislature appropriated $5,000 to pay other additional expenses which would be incurred in the use of convict labor upon the construction of a road between Santa Fe and Las Vegas, New Mexico. This road will run through some very rough mountain country throughout its almost entire length. There is available about nine miles of good road at the Santa Fe end, and since the spring of 1903 work has been pushed in an endeavor to extend the road already available across the remaining distance, a total of about 40 miles. There has been completed on the Santa Fe end about six miles of this new road, and on the Las Vegas end about four miles of the new road. All of the work has been done in a very substantial manner, and well informed persons state that the road which is being constructed on the Las Vegas end has no superior in any mountain road in the country.

NEW JERSEY.—The total mileage of completed roads constructed under the provisions of the State Aid act was, on July

1, 1905, 1,065. The total cost of these roads to date is $5,430,000. From 1891 to the first of December, 1904, the State expended $1,766,595.10, and the total cost of the work was $5,745,515.28. The counties' expenditure is more than double that of the state. This is due to the fact that all bridges and culverts as well as engineering and supervision fees have been paid by the counties without any assistance from the state. The state's appropriation for good roads has increased from $25,000 in 1892 to $250,000 in 1902, at which point it has since remained until this year when it was increased $20,000 to pay the salary of the supervisors of the new work. The revised state-aid law passed at the last session provided: First, that a road must be at least 33 feet in width to receive state aid. Second, that no survey shall be commenced until the consent of the State Commissioner of Public Roads shall have been first obtained. The third amendment was the proviso that within thirty days after the approval of the plans by the commissioner it should be the duty of the freeholders to advertise for bids. The fourth important amendment was the provision that the state should pay the supervisors appointed by the commissioner, and not the counties, as they had heretofore done. The fifth amendment vests the power and control over the improved roads in the board of chosen freeholders to the exclusion of all township, town, borough, village or other municipal officers. The sixth amendment provides that the county supervisor upon whom the duty devolves of keeping the roads in repair may be summarily dismissed at any time by the state commissioner or the board of chosen freeholders, whenever in his or their judgment such supervisor is incompetent or neglectful in performing his duties. The seventh important amendment gives the county board full power to construct and improve all the necessary approaches to any dwelling along the line of any road, which may have been destroyed or damaged by any alteration in the existing grade, whether within or without the line of such road. The eighth amendment provides that any road or section of road lying within the corporate limits of a city may be transferred by the board of freeholders to the city authorities upon the latter entering into a written agreement to keep up and maintain the same in good repair.

Since 1891, 796.14 miles of stone and 247.39 miles of gravel roads have been built. In addition to all this the local authori-

ties have been encouraged to improve as many more miles without waiting for the State's aid, so that at the present time New Jersey has over 2,200 miles of improved roads.

NEW YORK.—The state aid laws of New York approved March 31, 1898, and which have been amended in many instances are:

1. The Higbie-Armstrong act, which was enacted for the purpose of permanently improving the main traveled roads of the state, leading to or connecting the principal centers of population and known as first-class roads. The law provides that the state shall pay 50 per cent, the counties 35 per cent, and the towns or abutting property owner 15 per cent of the cost of construction in accordance with plans and specifications prepared by the state engineer and surveyor.

2. The Fuller-Plank act, which provides state aid to the towns which by vote have adopted the money system for the improvement, repair and maintenance of the public highways known as second-class roads, or those acting as feeders to the main traveled roads. Under this law the state aid is 50 per cent of the amount levied in each town, which amount is limited to one-tenth of one per cent of the assessed valuation of the towns, excepting those which have assessed valuation of less than $1,000,000.

There are 74,097 miles of public highways in the state of New York. Up to June 1, 1904, nearly 700 miles of road were constructed or in process of construction in accordance with the provisions of the Higbie-Armstrong act. There are 30,893 miles in various towns of the counties of the state which have adopted the money system.

Under the Higbie-Armstrong act the appropriations by the State and counties for the years 1898 to July 1, 1905, were $10,746,707.

Under the Fuller-Plank act the appropriations by the state and towns for the years 1899 to 1905, inclusive, were about $5,540,000, making a grand total of $16,284,000 appropriated by the state, the counties, and the towns for the improvement, repair, and maintenance of public highways within the state.

The total amount of money available from state, counties, and towns for the year 1905, for the improvement, repair, and maintenance of public highways in the state under the Fuller-Plank act is about $1,970,000.

Under the Higbie-Armstrong act there are now on file in the office of the state engineer and surveyor petitions from the various counties of the state for nearly 5,466 miles of road.

The legislature of the state has twice passed a constitutional amendment which provides that the state may bond itself for $50,000,000, $5,000,000 of which is to be available each year for ten years, for the improvement of the public roads. This amendment must be submitted to the popular vote in 1905, before it becomes effective.

NOTE: At last election this was accepted by the voters.

The average cost of macadam roads in 1901 was $7,950 per mile; in 1902, $8,819 per mile, and in 1903, $8,063 per mile. The usual width of such highways is from 12 to 16 feet and the usual thickness 6 inches after rolling. The average cost of 32 miles of gravel roads in Orange county was $2,146 per mile, the usual width 12 to 16 feet, and the average depth 6 inches after rolling. All grading, small bridges, culverts, etc., are included in the cost.

OHIO.—No new legislation was enacted during the past winter, by reason of the fact that the general assembly holds biennial sessions. Under the law establishing the highway department, enacted April, 1904, an appropriation of $10,000 was made for state aid. The law provides that all appropriations for state aid shall be divided equally among the eighty-eight counties of the state. The act establishing the highway department provides for compiling statistics, investigating materials and methods, and gathering and disseminating information in regard to road building. In the construction and improvement of roads under the provisions of this act, one-fourth of the expense is to be paid by the state and three-fourths by the county; one-third of said three-fourths, however, is to be paid by the township. In appropriating the 25 per cent to be paid by the township, 10 per cent will be a charge upon the whole township and 15 per cent a charge upon the abutting property.

PENNSYLVANIA.—The legislature of 1903 adopted a state aid law, which was approved April 15, 1903, creating a state highway department under the direction of a state highway commissioner, and providing that two-thirds of the cost of rebuilding roads is to be borne by the state, one-sixth by the county, and one-sixth by the township. A total appropriation of $6,500,000

was made, distributed as follows: Five hundred thousand dollars for each of the first two years, $1,250,000 for each of the next two years, and $1,500,000 for each of the next two years. Of the foregoing amounts, one-tenth is for the maintenance of improved roads, constructed under the law of 1903, or roads previously built that conform to the state standard. Such aid in maintenance must not exceed one-half of the total expense. That part of the appropriation used for construction purposes is apportioned among the several counties in proportion to their mileage of public roads. About 125 petitions for state aid were on file July 1, 1904, and over 40 miles of road were under construction or in course of preparation for construction.

The legislature of 1905 re-enacted the state-aid law of 1903, with a number of important changes designed to facilitate the actual work of the state highway department. The state's proportion of the expense of road construction was changed from two-thirds, as fixed by the law of 1903, to three-fourths. Additional engineers and clerks were provided for, as the work of the department was too heavy to be kept up by the force originally provided. The appropriation of six and a half millions made in 1903 was unchanged. The legislature also passed a new law making uniform the system of electing road supervisors, and also provided that townships which abolish the "work tax" shall receive in cash from the state a sum equal to 15 per cent of the amount of cash tax collected. Beginning with January 1, 1906, the licensing of all automobiles operated in the state will be in the hands of the state highway department. One of the important provisions of the new state-aid law is that no street railway tracks may be laid on any public road in the state without the approval and consent of the state highway commissioner. The department had under construction, July 1, about 150 miles of road, with over 300 applications on file.

RHODE ISLAND.—The general assembly of the state of Rhode Island has made the following appropriations for the construction, improvement and maintenance of the state highways of the state, as follows: 1903, $100,000; 1904, $100,000; 1905, $100,000. This money to be expended under the direction of the state board of public roads, and they have constructed in the three years, for the above sums, about 65 miles of macadam highway 14 feet wide. The different towns in the state have

built out of their annual highway appropriations about 30 miles in the same three years. The legislature at its last session passed a bill submitting to the voters at the November election the proposition of issuing highway bonds.

There are 2,240 miles of highways in Rhode Island and about 500 miles have been improved by the use of gravel and stone.

SOUTH CAROLINA.—In South Carolina an act was passed authorizing the county commissioners of any county to hold elections to decide upon bonding the county for the permanent improvement of the highways to an amount not to exceed $200,000 or eight per cent of the assessed valuation of that county, the funds so raised to be expended under the direction of said commissioners. Another act was passed permitting counties to work convicts with ten-year sentences in chain gang. Hitherto the counties have not been permitted to work convicts whose terms of sentence exceed five years.

VERMONT.—There has been assessed for state aid annually since 1892, a state tax of 5 mills on the grand list of the state, which is 1% of the total valuation; this has netted about $90,000 per year. To this since 1902 has been added the revenue from the local option license law, which has amounted to about $40,000, annually. To this since 1904 has been added the automobile tax, amounting to about $5,000 per year, making the annual highway fund at the present time amount to about $135,000.

WASHINGTON.—Since the act of 1890, providing for the construction of turnpike roads, several additional enactments have been passed, the law of 1893 providing for petition to county board for improvement, payment by county of one-third, by road district one-third, and by cities and towns and abutting property of remaining one-third of cost. Also, under certain conditions, of paying the whole cost from the general county road fund and issuing bonds. The only county in the state to proceed under this act is the county of Whatcom, where 149 miles of gravel road have been built in 1903. An act was passed providing for the collection of all road, poll, and property tax in cash. The legislation of 1905 created the office of highway commissioner and vested the appointing power in the governor. It also created a state highway board, to be composed of the state auditor, the state treasurer, and the state highway commis-

sioner. There was also created a public highway fund to be raised by the levy of one-fourth of 1 mill tax upon all the taxable property in the state. Washington has no state-aid road law and the duties of the state road officials are at present confined to the construction of twelve state roads under specific appropriations.

WISCONSIN.—Legislation was enacted in 1901 authorizing the levy of special highway taxes in addition to the taxes previously provided for, which in the aggregate might reach 17½ mills on the dollar. In certain cases where a town grades a highway to a width of 24 feet, and wishes to cover not less than 8 feet in width and 4 inches in depth with gravel, crushed rock, or clay and gravel, the county is required to bear one-half the expense of such covering. In 1905 the legislature took the first step toward an amendment to the constitution, which, if ratified by the electors, will enable the state to appropriate money for the construction and improvement of public highways. The sentiment in favor of good roads has been gathering strength for many years and is manifest in the road improvements found in nearly every county in the state.

CONVICT LABOR FOR ROAD IMPROVEMENT.

Extract from bulletin issued January, 1906, by Highway Department of Ohio, compiled by Sam Huston, State Highway Commissioner.

The question of the use of convict labor for the construction of public highways has been and is being agitated in Ohio recently, especially by union labor organizations, and it was deemed wise to publish this bulletin giving results of observations in a number of states where convicts are so used. It is not intended that this bulletin shall be an argument by the writer for or against the question of adoption of the same in our state, but as a fair presentation of conditions as they were seen and a relation of expressions made by different classes of persons who hold all manner of opinions as to the advantages and disadvantages as they appear to those who may have had the best opportunities to see the results accomplished by the system of using convicts on the public highways. Nothing has been suppressed, but the effort has been to give personal views in a most impartial way. Those who expressed themselves as not informed on the subject are not quoted.

Mecklenberg county, North Carolina, is noted for its fine system of convict labor roads, and was the first locality visited.

Mecklenberg county began the work about twenty years ago, and has built about one hundred and fifty miles of improved roads. The material generally used has been surface granite. The roads have cost from $2,500 to $3,500 per mile, exclusive of convict labor, which cost includes maintenance of convicts, quarry leave, haul of material, hired labor and guards, together with cost of machinery. Of the machinery the county owns two complete outfits, crushers, screens, elevators, bins, steam road rollers, etc. Each outfit is worth about $2,500. The work of the convicts includes the building of bridges and culverts. A

concrete mixer has been purchased, and it is proposed to adopt and build concrete abutments as an experiment. All work is in charge of paid experts.

The necessary funds are provided by a tax of 25 cents on the $100 of the tax list of the county, which is $18,627,848, this valuation being about one-half of the true value.

A visit was made to camp on Lodo road. The force consisted of one superintendent, one machinist who was also an engineer, some hired teamsters, three day and one night guard, and forty-one convicts, who are working out sentences of ten years or under. No longer term sentences are put on public highways in North Carolina. The stockade consists of a low, wooden structure, with horizontal windows at sides. These windows have iron gratings and doors hinged below that are closed in cold weather. In a four-foot passage way, through the center, are the stoves for use in very cold weather. The bunks are continuous, are located between the passage way and wall, and a foot or more above the floor. Each convict has a separate straw tick and two brown blankets. The ticks are placed side by side, and the occupant sleeps with his head to the wall. A foot-board to the bunk, about eight inches wide, is used as a seat. Along the foot-board runs a rod with hooks and eyes. This series of rods is passed through the anklet chains of the convicts, and when the hooked rods are drawn taut by a lever the convict cannot move away from his bunk, but is allowed movement of his chain along his bunk a distance of about four feet.

The convicts are kept in the stockade on the Sabbath; have tracts to read and religious services, but are not allowed banjos or other musical instruments. The only holidays are Christmas and Thanksgiving, but they are allowed to see friends once a month.

The food is white flour unleavened bread, can scarcely be called white bread, for breakfast; coarse corn bread for dinner and supper. Molasses is served with grits for supper. They get fat, very fat, pork and milk, no coffee nor tea except on Thanksgiving and Christmas, when they get all they want to drink. A "trusty" colored convict cook was in the kitchen, also a young colored woman, who has separate sleeping quarters.

The work is from sun to sun, with an hour off at noon in winter and an hour and a half in summer. The work is constant

and heavy, without rest or cessation. Punishment is with a strap over an inch wide and about eighteen inches long, exclusive of attachment to handle. The strap is applied by the superintendent to the bared body while the culprit is bent over a barrel.

Two or three whites were among the convicts. The superintendent said they were all the same color to him when they had on the stripes, which they all wore. Trusties were unchained, others had a chain from a ring riveted about the ankle, the other end fastened to the belt. More troublesome ones had two such chains, also stride chains joining the anklets. In the worst cases a "spike" took the place of the riveted rings on one side, having iron spikes projecting eight inches or more forward and back from the ankle. The guard had a repeating rifle, and said he shot low when they tried to run, but once in a while when the range was long a man was killed.

A county commissioner said that more work was gotten out of the men than from hired labor. Two of the county commissioners whom I met expressed the utmost satisfaction with regard to the system and its results.

A United States official who had widely traveled through the South, whose home was in Maryland, said that the worst features of the system were hidden, especially from Northern people, so far as possible. He said the gang is no method of reformation, as a man once on the highway chain-gang is placed beyond respect and sympathy. If a man is brought up for a trivial offense and it appears that he has formerly been on a gang, he has little chance to escape being returned, even on partial evidence against him. Said there was one difference between Southern chain-gang and hell—the former had an end. He said so many in the South were in favor of the system, and did not criticise its evils, because it gave them good roads, and they have no sympathy for the convicts and are not troubled with the apparent barbarity connected with it. This complacent feeling comes from the fact that the large percentage, in fact nearly all of the prisoners are colored, for whom the average Southerner has no thought or sympathy.

A visit was made to two gangs on the streets of Columbia, S. C., that were cleaning out ditches and repairing streets. Each gang consisted of seven convicts, one or two of each gang

being white. In their unkempt condition it is often difficult to tell a white convict from a light-colored negro. One of the gangs had no shackled men and on neither were there any with such chains as worn by the gangs on country roads. One gang had three convicts with rings riveted around their ankles and tied together with short stride chains. The men were not working so effectively and unremittingly as the country road convicts, as they laugh and talk together a considerable portion of the time. The superintendent of streets said that the use of convicts on the public streets of Columbia was a losing operation, for the reason that the punishment administered could not be made so severe as was allowed in the case of refractory convicts on the country roads. Convicts are not allowed to talk to any one passing, unless permission is secured from the guard. During my presence the guard was very severe with a convict that broke this rule, and severely rebuked the men who spoke to him.

No terms of sentence of over ninety days are worked out on the streets of Columbia, those serving longer sentences go to the county gang. City sentences are for drunkenness, wife beating, larceny, vagrancy, etc., and are in money up to forty dollars which are either paid in money or worked out on the gang. Good behavior earns a remission from sentence. When sick the convict is in charge of a physician, and time is counted as though at work.

The food allowed the Columbia convicts consists of grits, fat bacon, molasses, corn bread and peas. For Sabbath dinner fresh beef or beef stew is served, but no coffee, tea or milk at any time. In the stockade at night I saw the supper served in tin dishes, consisting of a piece of coarse corn bread, baked pone fashion in square pans. Each convict received a piece about four and one-half inches square and one inch thick, and a few spoonfuls of molasses.

A railroad man says the system is not reformatory where men work on the streets and roads exposed to the view of the common public. The latter connect the face with the chain-gang, or at least the convict thinks so, and this leads him to give up hope of advancement.

He said the system would not be tolerated in South Carolina if the proportion of whites on chain-gangs was considerable.

A commercial traveler, formerly a guard on a chain-gang, says convicts are not sent to gang on first sentence (North Caro-

lina). Men up for sentence are sometimes told if they are former offenders that they will be sent to gang if they appear before the magistrate again.

Two young colored men, well dressed and intelligent, said colered men were often sent to gang for first offense.

An intelligent colored man, well dressed, the owner of comfortable residence property and a bank account, said there was no show on chain-gang for his race. They are often sent for first offense. The white men on gang are strangers, without friends. Strapping is method of punishment.

Great timidity is shown by the colored people in answering questions at first. There is evident fear of betrayal, and that some discomfort or injury ensue from any declaration of dissatisfaction, until they assure themselves as to the intention of the interviewer. This colored man said that if it came out that he was giving any information or making any complaint he would suffer in some way for it.

I examined the ordinances of Columbia and found none on the question of sentencing to gang for first or second offense. It is thus left to the whim or judgment of the magistrate. County supervisor says no difference between first, second or any other offense is recognized by magistrates or judges.

A business man, an enthusiastic advocate of good roads and of use of convicts for work on same, says no first, second or any other offense is recognized in sentencing men to chain-gang. He said in 1895 the new law was enacted providing for use of prisoners of two years and under. This law is known as Evans Law, was subsequently changed to six years and in 1903 to ten years. County began using convicts ten years ago, but feeling against the system prevented its adoption in the city of Columbia until 1903. He considers it a great thing to have the road work done by the convics, who make more obedient and satisfactory laborers after term on the gang.

A business man (cotton goods) whose residence is in South Carolina, on trip to Philadelphia, said system is a splendid thing for restraint of negroes and improvement of roads; is not reformatory, because colored people cannot be elevated. Said negro women had no virtue. Praised Roosevelt, but deplored Booker Washington incident. Believed system was deterrent in its effect.

A state official at Atlanta said misdemeanor convicts in Georgia were turned over to county control, but state commission retained inspection. Felonies were under state guards. Misdemeanor labor cannot be legally sold to private parties, but law is often circumvented. He said the convict labor on the public highways in the South was really an attempt to reinstate slavery so far as possible. Misdemeanor convicts are worth about twenty-five dollars per month in addition to support and maintenance. Free labor is uncertain after Saturday pay until at least Tuesday. Convicts are required to work from sunrise Monday morning to sunset Saturday night.

An educated colored man, teacher and preacher, who had visited Ohio, said convict labor on public roads was a hellish system, not reformatory because convicts exposed to public view with stripes and chain became despondent and desperate. Turned out without money, no one wants to harbor them, knowing that they come from the chain-gang; they cannot secure work, and are arrested for vagrancy and returned to gang, or become desperate and commit the astrocious crimes that are so frequent in the South. He said he would not be arrested and taken to prison. He would die first. That would be preferable, for the reason that once on the gang that fact, with that of his color, would prevent any chance of creditable life in the future. White convicts, unless desperate characters, are given comparatively easy work. Has seen colored women on work wearing trousers.

A trip was made over a considerable number of miles of the improved roads of Fulton county, Georgia, of which Atlanta is the county seat, with the county superintendent of public works. About two hundred miles of granite, trap and chert macadam have been built with convict labor. Although country roads, they are really boulevards paved twenty to forty feet wide, are in fine condition, the material thoroughly rolled, and when complete six to twelve inches deep. They present the finest county system of roads I have seen in the United States. Fulton is a small county, and the improvement of the main roads is about completed. The first roads were not of first-class construction, and are being taken up and remade.

Three hundred and twenty-five misdemeanor and one hundred felony convicts are now on county work. Last year $125,000

was the amount of general expenses and $10,000 was expended for machines, stock and other equipment. About forty hogs are raised from the waste from six camps. With the completion of one more such camp, any road or part of road in the county will be within four miles of someone of these temporary camps.

Fresh pork so far as grown is given to the convicts as an occasional feast, killing being done on Friday. There is a county farm on which such vegetables as Georgia collards, cabbage, sweet and Irish potatoes, turnips and radishes are raised for use of the camps. Very fat side meat, corn meal, flour, rice and clothing are bought. Each day each convict gets three-fourths of a pound of fat meat and each week two pounds of fresh beef or pork. About seven per cent of the convicts on roads are white. Stockade has floor raised above ground and bunks above the floor. Straw ticks are provided, and each convict has two brown blankets. In summer ventilation is secured by grated windows. Heat in cold weather is secured by wood stoves. Conditions about kitchen and camp appear to be tolerably sanitary. Men worked very hard all the time I was in sight. Work is steady and heavy. Many of the convicts were shackled. Friends are allowed to visit during noon rest, but not on Sabbath. The superintendent was very enthusiastic over his really excellent system of fine roads and the use of convicts thereon. Armed guards were at the crusher, on the road, and in the quarry. The county has an abundant supply of fine stone for macadam construction.

In Atlanta the gang working on Edgewood avenue were making fill for new bridge, and that on Powell street were paving gutters. No stripes are on these street gangs, but, with the exception of trusties and those whose terms were nearly completed, they were shackled. A number had spikes, as described above, on their ankles. The work of the men in Atlanta was more effective than that in Columbia, but not up to the work done by the gangs on the country roads in Fulton county and in Mecklenberg county, North Carolina.

Jefferson county, Alabama, of which Birmingham is the county seat, used convict labor from 1887 to 1893. Cost of keeping and guarding convicts averaged fifteen dollars per month. Punishment was by dark cells and lashing.

A superintendent on public roads said that free labor gives better results. Convict labor was abandoned because it did not pay.

He said it did not reform nor deter others from crime. The system has bad effect on the community, especially on the young, who thus become familiar with the sight of criminals. He believes the poorer result from convict labor on the city streets, as compared with the county roads, arises from the impossibility of administering the severe punishment necessary to secure effective work. In Jefferson county he said the desire for convict labor on the public roads was very limited, and is entirely confined to those with whose work penitentiary labor comes into competition.

A member of the board of revenue of Jefferson county (same as board of county commissioners in Ohio) said he would *never* vote for employing convicts on the roads of the county. Thinks that the carrying around the county and over the public roads of a "county menagerie" is not conducive to public morals and is essentially demoralizing to the younger people who see it and get used to the sight of criminals. The system is not reformatory, nor does it deter from crime, and in Jefferson county was not a paying system.

Road material is abundant in Jefferson county, and about 300 miles have been improved by surfacing with chert. Latterly free labor alone has been used.

Two other county officials in the court house at Birmingham did not believe in convict labor on the public roads.

An elderly gentleman, native of Tennessee, located as an iron moulder at Birmingham during the war and at that time engaged in making Confederate supplies, but now a resident of North Carolina, said that the methods of punishment for disobedience on chain-gang were starving and strapping.

Merchant from Little Rock, Ark., said that people of that state are opposed to system, except politicians who have a rake-off. It is not reformatory, and is opposed because of the abuse of convicts necessary to secure effective work. He does not believe it tends to deter from crime to any extent, and thinks it is demoralizing in that it familiarizes the young of the vicinity with the sight of criminals.

A commercial traveler from Mississippi has observed the system, especially in Lauderdale county, in that state. It has been popular for years, but Mississippi being a state without large cities to provide sufficient convicts to make their use profit-

able on the public roads their use has not been adopted in many counties. He said the governor of the state favors the use of convicts on the public roads, and is probably backed by the majority of the people.

An elderly cotton planter, with plantations in Mississippi and Texas and who resides in Dallas, does not think the system is reformatory, but believes it deters from crime. Does not think the sight of convicts working on the roads is demoralizing in its effect on the young who see it. Road work in Texas by convict labor is not generally adopted, in his view, for the reason of political pull, arising from profit derived from contracts for labor for other work.

Caddo parish, Louisiana, county seat Shreveport, uses convict labor on its county road work. No. 2 camp, which was visited, has at different times from twelve to forty convicts. There are now fourteen at work, with one foreman and one guard, both armed. Each of the latter receives fifty dollars per month. There is also a colored man and woman hired, the latter being cook. Board and clothing for convicts cost thirty-three cents per day. The convicts work from sunrise to sunset. Four bloodhounds are kept at the camp. At night the convicts are confined in a jail on wheels, so that it can be drawn by four to six mules, from one locality of road work to another. The floor of the jail is about four feet above the ground, and the car has a clear height inside of six feet, and is eight by sixteen feet on floor. In the center is an open space for stove in cold weather, and each end has an upper and lower bunk, each bunk accommodating when full nine men, that is, thirty-six convicts in all, but thirty-eight have been placed in the car when over-crowded. One upper bunk is reserved for white convicts, the other three are for colored. In the bunks loose straw is placed, with brown blankets thereon, and others for cover. The food of the convicts consists of fat bacon, beans, corn bread, molasses, grits, and occasionally fresh meat. Coffee is given for breakfast. Friends are allowed to see convicts at any time when they are not at work.

A saloon-keeper, who is enthusiastically in favor of improvement of the public roads and the use of convicts, says he does not consider the public work of the convicts as demoralizing to the young. For keeping the men and enforcing obedience, blood-

hounds and the strap are used. "If they don't work, we work them." He says the county owns a steam road roller, and he believes it is a good thing, but it is not much used. Two to five days are deducted from a sentence of thirty days for good behavior, and, although no work is done on the Sabbath, it is counted in serving sentence. Vagrants are sentenced for twenty-five days and costs, to be worked out at one dollar per day. Sentences can be imposed for so many days work on the chain-gang without privilege of paying in money, but such sentence is not imposed for first offenses.

In Harris county, Texas, of which Houston is the county seat, convicts are used to some extent in repairing roads, but not for construction. The superintendent of roads and bridges says the use of convicts on roads in that locality has proved a dismal failure. Road work by convicts costs twice as much as with free labor, even leaving out of consideration the amount of fines worked out. The cost of maintenance, supervision and guarding of the convicts costs twice as much as to hire the same work done by free labor. The system is very good in theory, but does not pay when put in practice. Union labor at Houston opposes the use of convicts on roads, and wants labor leased to farm and plantation work.

A retired hotel man at Houston thinks the use of convict labor on roads is about as good a way of disposing of the labor of the convicts as any, but thinks the system is demoralizing in its effect on the young people that see the gangs at work and in camp. Does not believe that the system tends to reform, and may harden the convicts.

A clerk of courts said that there is considerable sentiment against convict labor on roads, perhaps not so much now as formerly, but that the greatest opposition is from labor unions, who do not want the convicts on the roads, but desire them leased out to work on sugar farms and plantations.

A politician and planter said some of the counties in Texas use convict labor for repairing the roads, but not so many as formerly. Counties have dropped the system because it did not pay. Effective work could not be enforced without very severe punishment, which the public would not tolerate. He considered it more profitable to have convicts in their cells than to work them on the roads; besides not paying, the system was not reformatory and was demoralizing.

Two members of the State Board of Pardon Advisors, at Austin, said short-term convicts work out their fines at fifty cents per day on farms and thus do not compete with union labor. The state guards, clothes and feeds the convicts, and realizes about twenty-two dollars per month for able-bodied convicts. Formerly convicts were leased without guards, which was abandoned on account of abuse of the prisoners, there being no restraint as to time or quantity of work. They were overworked, sometimes almost day and night. Some counties work their own convicts on roads, but not under jurisdiction of the state, and the result is not satisfactory on account of the difficulty of guarding and securing effective work.

A leading member of the legislature, who has held a number of important public positions, says county work of convict labor has not been generally adopted, because unprofitable, few counties producing convicts in sufficient numbers to pay for the expense of guarding and maintenance of camps. State platforms have declared for convict labor on the roads of Texas, and that without opposition, but persistent lobbies have defeated the movement. Some oppose from mercenary motives, others because effective work cannot be accomplished without resort to brutal methods of punishment or because of the feeling against having free labor compared with convict labor near at hand. Just as young people would dislike to till the soil as freemen, while just across the fence were convicts engaged in the same character of labor, open to the eyes of passers-by.

The superintendent of roads and bridges of Pulaski county (city of Little Rock), Ark., said that county formerly used convicts in road work but abandoned it because it did not pay. Cost of construction of the macadam roads has been very materially reduced since county adopted free labor. The county can hire free labor cheaper than work convicts.

The ex-Secretary of State of Texas said that the opposition to leasing of convicts arises from the abuse connected with the system, and apparently unavoidable, that comes from railroad work where temporary camps must be maintained; that with such camps it is impossible to render to convicts the care and treatment that is due human beings, even if they are criminals. The same abuses and evils are necessarily connected with the temporary camps required in working criminals on the public roads.

In his annual report for 1904, the Secretary of State of Arkansas says:

"There are few states in which the solution of the penitentiary question, involving the care and punishment of the criminals confined therein, has not been a matter at times of serious consideration. In Arkansas the lease system has been tried now for a number of years, and has been a source of much trouble and annoyance. The fair name of the state has not usually been protected by those who reap a profit from the business of handling convict labor, and frequent shifting of camps, with their discomforts, has resulted in a mortality among these victims of their own misdeeds that is shocking when viewed from the standpoint of common humanity. The death rate is appalling, even when compared to the death rate in other states, where a part, if not all, the convicts are leased to private individuals by the state. Either the penitentiary board, the state or the lessees must be censured for laxity in the sanitary conditions of the various camps. So far as the state is concerned, it has derived slight profit up to the present time from any of the contracts the board has made, and if it had made a profit the question of dollars and cents should not be for a moment entertained where health and life are jeopardized through a desire for gain."

Governor Davis has been elected three times on the issue of the evils of leasing convicts.

Of the Northern States, California, Colorado, Illinois, Iowa, New York and Oregon are credited with movement along the line of employment of convict labor in the construction of roads or in the preparation of material for road improvement. In a part of these states the laws only provide for use of convicts in preparing road material and appliances. As this kind of work can be performed in enclosed quarters, and without the unsanitary conditions that arise from temporary camps and from working in public view with all its objectionable features, there can be no objection raised that may not be raised to any employment on which convicts may be used. Very few persons go so far in their advocacy of changing from penitentiary work to that of entirely despensing with convict labor in some form. It is almost universally conceded that employment of some kind is an essential in any reformatory treatment of convicts. Appended to the report will be found the laws of several states as to con-

vict labor on roads, and the following state authorities have, in answer to inquiries, answered as follows:

The Commissioner of Highways of California says:

"This state has no experience with prison labor on public roads. The proposition has been discussed from time to time, but sentiment appears to be strongly against it, and there seems no propability of the practice being adopted in California very soon."

The State Engineer of Colorado, in reference to convict labor on roads, says:

"This statute has been placed in effect by the Commissioners of Fremont county and by the town of South Canon city; both, I am told, bring satisfactory results."

" You will note that the commissioners of the penitentiary are empowered to adopt any special rules for the working, keeping and controlling prisoners while so employed. Whether it has been done I am not informed."

The assistant in charge of good roads investigation of the Iowa State Highway Commission says:

" We are enclosing to you copy of the only laws we have relating to the use of convicts for road building. The provision concerning stone quarried at the peitentiary has been used only to a slight extent."

The State Engineer of New York says:

" This subject is one which has been advocated at different times, as well as the establishment of a state quarry near the state prison at Sing Sing, where a large amount of stone can be procured suitable for road making purposes, but, as stated above, no laws are yet in existence."

Governor Chamberlain, of Oregon says:

"Permit me to say that we have no statute governing the employment of convicts on the highways of this state except that an act was passed in 1903 appropriating a small sum of money and authorizing the employment of convicts upon the construction of roads in and around the state institutions. Faithful service entitles the convict so employed to double time. The work done by the few convicts employed in this work was satisfactory, and the legislature at its session in 1905 adopted a resolution authorizing the executive to appoint a committee of three to examine into the question of employment of convicts on public

roads, reporting their conclusions to the next legislature, with the view of enacting suitable legislation upon the subject."

"An act was passed in 1899 providing that all convicts sentenced to imprisonment in the county jails of the state are subject to the control of the county court where the crime was committed, and said court has full power to put such convicts under the control of any road supervisor, who is vested by the act with the authority of a sheriff, to guard and keep such convicts while in his custody and while they are engaged in working upon the public highways. Persons sentenced to jail for fines may be compelled to work at the rate of one dollar per day until the fine is fully paid. In all cases not less than eight hours shall be considered a day's labor."

Expenditures of the Office.

Commissioner's salary	$1,534 74
Assistant or clerk hire	645 60
Railroad, electric and steamer, fares	275 01
Office supplies, periodicals, etc	310 11
Hotel bills	164 00
Postage	153 20
Team hire	53 75
Telephones and telegrams	19 40
Express	25
	$3,156 06

TABLE OF CONTENTS.