

The Twenty-Eighth Annual Report



Fourth Annual Report

of the

**NEW JERSEY
STATE HIGHWAY COMMISSION**



For the Fiscal Year Ending
June 30, 1921

NEW JERSEY
STATE HIGHWAY COMMISSION

MEMBERS

State Highway Commission

Governor EDWARD I. EDWARDS, *Ex Officio*

HON. GEORGE L. BURTON, Chairman	-	-	-	-	-	-	-	-	South River
JOHN FERRIS	-	-	-	-	-	-	-	-	Jersey City
GEORGE PADDOCK	-	-	-	-	-	-	-	-	Newark
COL. WALTER F. WHITTEMORE	-	-	-	-	-	-	-	-	Newton
THOMAS E. COLLINS	-	-	-	-	-	-	-	-	Elizabeth
ALBERT S. L. DOUGHTY	-	-	-	-	-	-	-	-	Mt. Holly
CHARLES F. SEABROOK	-	-	-	-	-	-	-	-	Bridgeton

A. LEE GROVER, *Secretary to the Commission*

FOREWORD

It is known that it costs as high as \$6,000 to \$8,000 per mile to maintain unimproved highways in anything approaching an adequate condition to carry the present day travel, while the most extravagant estimate to maintain a *permanent* type of highway has not been higher than \$400 per mile; consequently, we must, as a matter of economy, build permanent type highways to stop the wastage of millions of dollars of the State's money.

The proper solution of the highway problem is one of the answers to the reduction of taxes, besides being an open sesame to opportunity and prosperity and happiness of our people. A private corporation, doing business extravagantly, would face bankruptcy; the State cannot go bankrupt, but by unscientific and extravagant means can cause extreme hardships for its citizens.

New Jersey has wisely separated the cost of construction, and the cost of maintenance of its highways, and has, up to the present time, provided funds for each branch. The fund for maintenance, which is the automobile money, would be ample, if all the roads were of the improved permanent type, to maintain all the highways in the State, including State, County and Township under a proper method of control and patrol. So it is most important that the fund for construction be increased so as to hasten this most desirable and economical condition. The answer is up to the people of the State. The organization and equipment of the Highway Department is sufficient for accomplishing the result, and the members of the Highway Commission are fully alive to the situation and striving faithfully to perform their full duty to the State. New Jersey was formerly known as the "Mother of Good Roads." Shall we not bring her back to her former high standing?

GEORGE PADDOCK.

NEW JERSEY STATE LIBRARY

STATE OF NEW JERSEY
STATE HIGHWAY COMMISSION
TRENTON

TRENTON, N. J., DECEMBER 15, 1921.

To His Excellency, Edward I. Edwards, Governor of the State of New Jersey, and the Legislature of New Jersey.

We have the honor to submit the twenty-eighth Annual Report, and the Fourth Annual Report of the State Highway Commission for the fiscal year ending June 30, 1921.

STATE HIGHWAY COMMISSION,

GEORGE L. BURTON,
Chairman.

STATE HIGHWAY COMMISSION

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CHAIRMAN'S REPORT

Honorable Edward I. Edwards, Governor of New Jersey.

YOUR EXCELLENCY:

The State Highway Commission herewith presents its annual report for the fiscal year embraced within the period from July 1, 1920, to June 30, 1921. You will recall that on the former date the members of the present Commission, all of whom you had appointed with the approval of the Senate, took office. This is to render an account of that stewardship for the first year.

It will not be my purpose to go into a lengthy discussion of the year's activities here, as they are related in detail under the reports of the different divisions of the department over which this board is executive head. The results of the year's work of the Commission cannot be accurately stated by the exact mileage of roads completed as part of the new state highway system, owing to the fiscal year ending in the middle of the construction season. This is a condition which should be corrected to make the fiscal year coincide with the construction season and calendar year.

A more accurate picture of the real responsibility resting upon the members of your Commission may be had by referring to subsequent pages in this resume of work which shows that there are 17,000 miles of various roads in this State, including the state, county, township, and borough highways, and not including roads and streets of incorporated cities. Over all of this mileage the commission is exercising either a direct or indirect supervision.

The magnitude of the task is better appreciated when you consider the important factor highways are today in the life of the people. New Jersey is a center of automobile activity. Statistics to be found in this report will show that the percentage of motor vehicles to the mile in this state is 15.3 and in this respect we rank second among the sister states of the Union.

Something further of the responsibility of the commission may be gleaned from the fact that during the past fiscal year this body received, expended and contracted for \$10,000,000 of moneys devoted to road purposes of various kinds.

Situated as it is, between New York and Pennsylvania, this state

is one of the most travelled in the country. Since the motor vehicle has come to be the popular method of transportation for thousands and thousands in our area, to say nothing of the hauling of freight over our roads, you can catch still 'another glimpse of the exacting requirements in road maintenance which the body having control of this governmental function in New Jersey is called upon to meet.

To keep up with this program, the commission, during the twelve months covered by this report, held meetings in thirty-eight out of the fifty-two weeks in the year. On certain occasions it was necessary to hold several sessions a week to transact the pressing business before the board. This work, however, does not by any means tell the whole story of the Commission's actual working hours. Every member of this body has a number of counties over which he presides as resident commissioner. As the result of this arrangement he is required to tour many miles of highways within his sphere of special jurisdiction passing upon contracts completed, inspecting general conditions and ascertaining where improvements are needed. In his territory, too, the individual commissioner is the Mecca for all citizens and local officials having matters to bring before the Board for consideration. Many days have been devoted to duties of the kind just enumerated.

Supervision of highways under modern conditions calls for something more than the question of laying down a durable surface. The public demands that the roads be properly marked, that dangerous curves and grade crossings be eliminated, or properly protected, sturdy bridges be constructed and everything possible be done to clear the way for safe and speedy travel.

The Commission desires to thank the citizens of the State generally for their spirit of cooperation in the upbuilding of a splendid system of roads for the State. Patience must be practiced, for the task is a big one and time is needed to complete it. Every day, however, marks an advance toward the realization of the goal.

Your sympathetic assistance and encouragement during the past year has been very helpful and is highly appreciated. The Legislature's efforts to provide laws which will facilitate the work calls for high commendation. This body must also make mention of the splendid aid received from other State agencies and officials having relations with this department.

The Commission wants also to thank the press of the State and

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their staff writers for aiding in the work of disseminating the facts about the different plans and activities.

The administration of any organization is incapable of accomplishing its aims without a corps of assistants in whom it can reliably place the responsibility for the execution of plans. The commission in this connection would call attention to the report herein presented to it by the Chief Engineer of the department, Mr. Thomas J. Wasser. It better illustrates the high ability and efficiency he possesses and has rendered than any encomiums set down here. It, however, does not adequately relate Mr. Wasser's valuable service.

For the loyalty and enthusiasm of the various division heads and the many employees of the department, the Highway Commission has only the highest meed of praise to bestow.

In conclusion I desire to let you know that among the members of the Commission there has been a single aim—to serve the State to the fullest and justify the confidence of a year ago when you selected them for the work. May I say that seldom has any board worked so harmoniously and with such a fine spirit of comradeship in the public service.

Respectfully submitted by and for the Commission.

GEORGE L. BURTON,
Chairman.

ANNUAL REPORT

PERSONNEL

NEW JERSEY STATE HIGHWAY DEPARTMENT

NEW JERSEY STATE HIGHWAY DEPARTMENT

December 1st, 1920

Executive

HON. EDWARD I. EDWARDS, *Governor*

The State Highway Commission

and

THOMAS J. WASSER, *State Highway Engineer*

Administration

A. LEE GROVER, *Secretary and Chief Clerk*

M. L. HOWELL	-	-	-	-	-	-	-	<i>Chief Auditor and Accountant</i>
CHARLES FISHBERG	-	-	-	-	-	-	-	<i>Assistant Chief Clerk</i>
MISS GRACE WILLIAMSON	-	-	-	-	-	-	-	<i>Chief File Clerk</i>
R. W. WILDBLOOD	-	-	-	-	-	-	-	<i>Purchase Clerk</i>

Construction Division

C. F. BEDWELL, *Construction Engineer*

R. A. MEEKER	-	-	-	-	-	-	-	<i>Right of Way Engineer</i>
C. A. MEAD	-	-	-	-	-	-	-	<i>Bridge Engineer</i>
C. A. BURN	-	-	-	-	-	-	-	<i>Supervisor of State Labor</i>
ROY MULLINS	-	-	-	-	-	-	-	<i>Northern Division Engineer</i>
H. D. ROBBINS	-	-	-	-	-	-	-	<i>Central Division Engineer</i>
J. A. WILLIAMS	-	-	-	-	-	-	-	<i>Southern Division Engineer</i>

Maintenance, Equipment and Projects Division

EDWARD E. REED, *Assistant State Highway Engineer*

A. W. MUIR	-	-	-	-	-	-	-	<i>Superintendent of Maintenance</i>
N. C. APPLGATE	-	-	-	-	-	-	-	<i>Superintendent of Equipment</i>
A. D. BULLOCK	-	-	-	-	-	-	-	<i>Projects Engineer</i>
H. C. SHINN	-	-	-	-	-	-	-	<i>Engineer of Special Assignments</i>

Testing Laboratory

R. B. GAGE, *Chemical Engineer*

J. G. BRAGG	-	-	-	-	-	-	-	<i>Senior Testing Engineer</i>
F. H. BAUMANN	-	-	-	-	-	-	-	<i>Senior Testing Chemist</i>

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STATE HIGHWAY ENGINEER'S REPORT

July 1st, 1921.

Report of the State Highway Engineer of the State of New Jersey to the Chairman and Members of the State Highway Commission of New Jersey for the fiscal year ending June 30th, 1921.

July 1st, 1921.

To the Honorable, the Chairman, and Members of the State Highway Commission of the State of New Jersey.

GENTLEMEN:—

I have the honor to submit to you the report of the State Highway Engineer for the fiscal year ending June 30th, 1921.

REORGANIZATION

Upon my taking office in July 'of 1920, I immediately made a study of the existing conditions in the Department. making a comparison with those of our neighboring states. I found that New Jersey, being much smaller in area than either New York or Pennsylvania, should be organized so the control of the Deparement would be handled directly from the central office located at Trenton, and, with that in view, I worked up plans for the reorganization, both as to policy and methods to be followed in carrying out the work of the Department.

CENTRAL CONTROL

The year 1920, as you know, was one of the most difficult years for prosecuting construction work that has ever been experienced, and the reorganization of the Department was deferred until December 1st, which was the end of the construction season. An organization was created with central control, all of which is shown on the organization chart accompanying this report.

WORKS COMMITTEE

The principal outstanding feature of the organization is what is known as the Works Committee, every division and sub-division of the entire Department being represented on this Committee, which meets weekly and discusses all the problems confronting the Department. This brings the men of the several divisions into closer harmony and

enables the work of the Department to proceed with little or no delay or friction.

After seven months of operation under this organization, I find but few recommendations for changes; these appear later in this report.

ENGINEERING—ADMINISTRATION COSTS

The reports of the several sub-divisions are fully set out in detail and need only my comment thereon, to the extent that the engineering of the Department was carried on at a cost of 4.3% of expenditures and the administration of the Department at an additional 2%, which establishes the fact that the Department was run on an economical basis.

NEW DEPARTURES—SCALES

New departures from the preceding years of the Department include the installation of scales at different locations along the highways, for the purpose of determining overloaded trucks. Upon erection and completion of these scales they were turned over to the Motor Vehicle Department for operation. The maintenance and marking of detours was another innovation, which was appreciated by the motoring public.

BIDS

The method of receiving bids on State Highway work under the percentage of engineer's estimate of cost plan has undoubtedly saved many thousands of dollars to the State as it prevents unbalancing of bids, and has worked out very successfully both in facilitating receiving of bids and the carrying out of the work.

SPECIFICATIONS

The revision of the specifications both as to form and standards simplified the work of preparing them for the several contracts advertised.

SNOW REMOVAL

While I understand it was attempted in 1919, snow removal was never carried out on the large scale that was attempted during the winter of 1920-21. While there were not many snow storms, yet it was clearly demonstrated that it was possible for the State Highway Department to keep all the highways open under any and all conditions. This was successfully demonstrated in the severe snow storm of

February. A feature of the removal of the snow that should not be overlooked was the hearty co-operation of the contractors who worked in conjunction with the Department, accepted assignments of sections of the highways for snow removal, and financed the payrolls which permitted the paying of men promptly, and were then reimbursed by the State for the outlay of the money. Conditions under which they accepted the assignments did not permit of enormous profits; it was a matter of State pride among the contractors that induced them to help out the Department in carrying the snow removal program through successfully. The contractors furnished the men and the Department furnished the equipment.

SNOW REMOVAL EQUIPMENT

Motor equipment necessary for the snow removal program was the same as that used for highway maintenance, except for the snow plows attached. This is equipment that was received from the war surplus material assigned to New Jersey, by the Federal Government and the program could never have been carried out successfully without this equipment unless the State of New Jersey was put to the expense of approximately \$175,000 for rental alone of similar equipment, and then it was not assured that the State would receive positive service. It is regrettable, however, that of all the vast amount of war surplus material the Government has, that some of the more desirable units of equipment could not be turned over to the State at once, the equipment received by the Department requiring considerable work and repairs necessary to put it in a condition serviceable for highway work.

HIGHWAY CONVENTION

The Highway Convention which was held at Trenton in February of this year, and which was attended by employees of the Department, contractors, equipment and material men, representing the road building industry in New Jersey, brought them in close touch with one another under a common cause: "To build roads." Progress made in the construction season to date has justified making the convention an annual affair. Contracts were carried on without the stopping of work on account of misunderstandings on the part of the several employees of the Department and the contractors' superintendents.

HIGHWAY ASSOCIATION

A creation of the Works Committee developed at this convention,

namely, the organization of a "Highway Association." This was formed among the State Highway employees for the purpose of creating an esprit de corps, which you, yourselves, can judge better than anyone else.

DEPARTMENT SUPPORT

One thing that may have had more effect on the employees of the Department supporting the new administration with the spirit they displayed was the receipt of letters written by the former State Highway Engineer to the present State Highway Engineer, commending the Department on the progress made between the time of his resignation and the time the letters were written, in which he stated that the Department was to be commended on the manner in which it maintained the roads.

MOTOR VEHICLE FUND DISTRIBUTION

In the distribution of Motor Vehicle moneys to counties for the coming years, a method was worked out similar to Federal Aid allotments to states, in which the per cent. of allotment to each county was based on a comparison of the area, population, and mileage of county roads within the county to the area, population and mileage of county roads within the State. This will make an equitable distribution to the counties, the money to be applied for the maintenance of county roads.

ROUTE BOOK

A Route Book was published, reproducing all the official papers of the Commission in the acquisition of the several sections of the State Highways, and gives very valuable information.

UNUSUAL MAINTENANCE

As to the maintenance of the highways during 1920 and 1921, an unusual condition prevailed. Just prior to your Commission taking office, approximately 250 miles were added to the mileage to be maintained by the State on the State Highway System, which required immediate maintenance, and the Department was not equipped with men or machinery, and the condition caused by the ruling of the Inter-State Commerce Commission prevented material being received, and it was not until late in September, 1920, that the Maintenance Division was able to make any progress whatever with their work. They did, how-

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ever, successfully cover the roads in such a way as to provide reasonably easy-riding highways. The winter being an open one, the traffic continued uninterrupted, and subjected this temporary maintenance to a very severe test. It was immediately necessary to resurface the roads early this Spring, thus requiring two years' maintenance out of one year's funds.

RECOMMENDATIONS—LEGISLATION

Before concluding, I would recommend that the Commission consider the revision of laws affecting the Department which will enable it to function more readily, simplifying the numbering of highway routes, prevent congestion of traffic by eliminating the gas filling stations from within the right of way, and regulations of location of advertising signs on property adjacent to the highways.

CENTRAL CONTROL

The Bridge Division, the offices of which are now in Newark jointly with the Public Utilities Commission, should be discontinued as soon as practicable, and a bridge division of the Highway Department created, with offices in Trenton.

INSPECTION

The type and method of constructing highways of today requires a higher standard of inspection than that in use in previous years. Men of high caliber and special training, amply paid, will enable the carrying out of work which has been efficiently planned in the office.

COUNTY AND TOWNSHIP AID

The Projects Division, which was centralized this year, is handling Township, State Aid, and Motor Vehicle work prior to the time of construction, and the work is then turned over to the Construction Division for carrying out to its physical completion. The developments brought out by this method warrants me in recommending that the Projects Division handle the construction of the township roads. Relieving the Construction Division of such duties will give more time of the Division Engineers to the main routes. A large program would warrant such a procedure.

OFFICE BUILDING

I recommend the erection of an office building at a convenient location in the city of Trenton where the offices of the several divi-

sions of the Department could be located. The rentals paid for the present offices warrant this expenditure.

SERVICE STATION

For the repair and maintenance of the equipment used in our highway work, I recommend that a service station of a size suitable for the extent of the work intended, be located in close proximity to the city of Trenton, inasmuch as the present rented quarters at Trenton Junction are inadequate, it being the only available place at the time it was secured, and the Department has outgrown the accommodations there.

MARKING OF ROUTES

I further recommend that the Highway Routes be marked with color bands indicating the direction of the route, and marked sufficiently close together to keep the motorists in constant touch with the direction of the route.

HIGHWAY PUBLICATION

I also recommend that a publication with a name typical of highway work be authorized by your Commission for the purpose of creating efficient work by keeping the individual employees of the Department in touch with the work of the other employees of the Department, and giving the public the information regarding the work of the Department that they are unable to obtain in any other way.

CONCLUSION

In conclusion, I desire to express my thanks to your Commission, the employees of the Department, the 1921 Legislature, and all Federal and State Departments that, and County Engineers who, came in contact with our organization, for the hearty support and cooperation accorded it, which enabled me to direct the work of the Department in a manner which produced the progress and results as shown in the condition of the highways at this time.

Respectfully submitted,

T. J. WASSER,

State Highway Engineer.

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ASSISTANT STATE HIGHWAY ENGINEER'S REPORT.

MR. T. J. WASSER,
State Highway Engineer.

Dear Sir:—

The following is a report covering the fiscal year July 1st, 1920, to June 30th, 1921:

On December 1st, 1920, the Maintenance Division, Equipment Division and the Federal, County and Township Projects Division were established under the Assistant State Highway Engineer. This was in line with the reorganization of the other Divisions at the same time.

Mr. A. W. Muir, Superintendent of Maintenance, has charge of the maintenance of State Highways, bridges and roads leading to State Institutions.

Mr. N. C. Applegate, Superintendent of Equipment, has charge of the maintenance, storage and assignment of equipment.

Mr. A. D. Bullock, Projects Engineer, has charge of Federal, County and Township projects.

Mr. H. C. Shinn has charge of special work and investigation.

The report of the chief of each of these sub-divisions will not be given in full, but extracts from these reports will be quoted freely in order to give some idea of the problems confronting them and the work that has been accomplished by each.

MAINTENANCE DIVISION.

At the end of this summary of the work of the Maintenance Division a table is given showing the mileage of highways of different types and the date on which the maintenance was assumed by the Maintenance Division under the State Highway Commission. Much of this mileage was in very poor condition and required extensive repairs. The condition of the labor and material markets, together with the embargoes on the railroads, made it very difficult to get material, and it was necessary to build up very rapidly an organization to carry on this work. The results in the beginning, therefore, were not as good as were anticipated. These difficulties have to some extent been overcome and better results are being obtained.

The following are extracts from Mr. Muir's report on Organization and Snow Removal, together with his recommendations:



METHOD OF MAINTAINING GRAVEL ROADS WITH TRACTOR AND SCRAPERS.
State Highway Route No. 15.

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ORGANIZATION

"At the beginning of the present fiscal year, the entire work of the Division was supervised from the Trenton office, which was in the charge of the Division Engineer of Maintenance, and all orders to Foremen in the field came directly from Trenton. During the year, the organization has been remodelled so that there is now a Superintendent of Maintenance in general charge of the Division with an Assistant Superintendent of Maintenance in the Trenton office, and in the field the State has been divided into four sub-divisions, each in the charge of a Supervisor of Maintenance, to whom report the Foreman in direct charge of the operations in the field, and through whom all orders are issued to the men in the field, except in case of emergency. There is, in addition to these four Supervisors in charge of the road work, a Supervisor of Bridges in charge of the Bridge Maintenance, and reporting to him are a general Foreman of Bridges, and a number of subordinate Foremen.

"The most striking and radical change in the detailed organization of the Division which has been brought about in the present year has been that in connection with the maintenance of gravel roads. At the beginning of the year, all gravel road maintenance was taken care of by means of scrapers hauled by teams, paid on an hourly basis as was all labor used in connection with the teams and scrapers. All hauling of material for use on the gravel roads was done with teams and wagons. This portion of the work has been completely reorganized, and the gravel roads divided into sections having a maximum length of approximately twelve miles. In each of these sections is located a unit whose personnel is made up of a patrolman and two assistant patrolmen. Each unit has a tractor of the track-laying type which hauls two graders, this outfit caring for the scraping of the gravel roads. The hauling of material for the use of these units is taken care of, for the ordinary patrol work, by one 1-ton Ford truck. In addition to these units, there are five units, each under the charge of a Foreman, equipped with a belt conveyor for loading gravel and five 1-ton Ford trucks for hauling material. The duty of these units is to take care of any necessary resurfacing work on the gravel roads wherever the need of such resurfacing may appear; these units being in the nature of floating units as opposed to the patrol units which have a fixed station.

"In general, it is believed that the Division organization is in

much better condition than at the beginning of the year. It is not, however, necessarily in its permanent form, and the matter of organization is under continual observation and study with the idea in view of bringing the same to its highest possible efficiency.

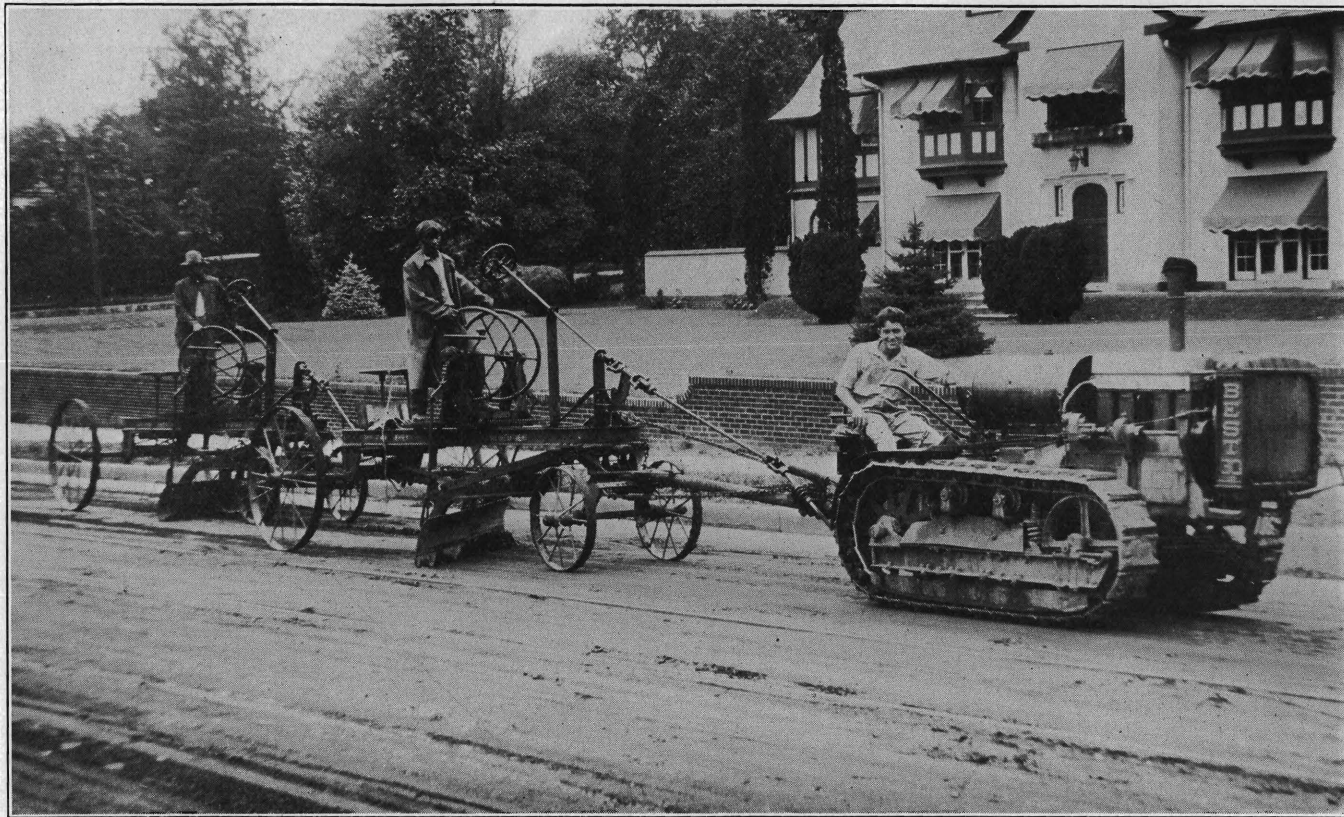
SNOW REMOVAL.

"During the Winter of 1919-1920, the Division first attempted snow removal work on State Highways. There were, originally, in the Department two snow plows, which number was increased during that Winter by twenty, making a total at the beginning of the present year of twenty-two. During the Fall of 1920, this number was further increased by the purchase of fifty-two additional plows for mounting on motor trucks and the equipping of one Holt tractor with a snow plow. This equipment was designed to remove snow on approximately 345 miles of State Highways. There was no particular need for this equipment until February 19, 1921, when a severe snow storm started which lasted, with a break of a few hours, until about noon on February 22d. The fall of snow was heavy, amounting in some cases to approximately eighteen inches. Despite this fact, the Division was able to keep traffic moving at all times on a large proportion of the mileage on which snow removal was undertaken, and practically the entire mileage was open for traffic not later than February 23d. In addition to this mileage, it was necessary, owing to the heavy fall of snow, to do a certain amount of work on an additional mileage of approximately 131 miles.

"The average cost per mile on the original estimated mileage was \$176.35, and on the added mileage \$130.52. The total cost for snow removal for the season was \$78,582.79, with an average cost for the total of approximately 476 miles of \$165.08 per mile.

RECOMMENDATIONS

"Recommendations have been submitted at various times in connection with the work of the Division, and will undoubtedly be submitted from time to time hereafter. At this time, however, I beg to call attention to the fact that, as a general proposition, the maintenance of the gravel roads is a much less serious proposition than is the maintenance of many of the old worn-out macadam and other roads of somewhat higher type which are found in the northern section of the State. It is believed that the gravel roads can be efficiently and satis-



GRAVEL ROAD MAINTENANCE.

State Highway Route No. 15.

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factorily maintained with the organization now in effect. It is, however, an extremely doubtful matter as to whether these roads in the northern portion of the State can be satisfactorily maintained under the traffic to which they are subjected. It is, therefore, recommended that particular stress be laid upon the necessity for the early reconstruction of many of these older roads in the northern portion of the State, and that the construction programs of the next few years be concentrated upon these roads, particular reference being had to Routes No. 1, No. 5, No. 9, and No. 13.

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SCHEDULE OF MILEAGE OF HIGHWAYS UNDER MAINTENANCE

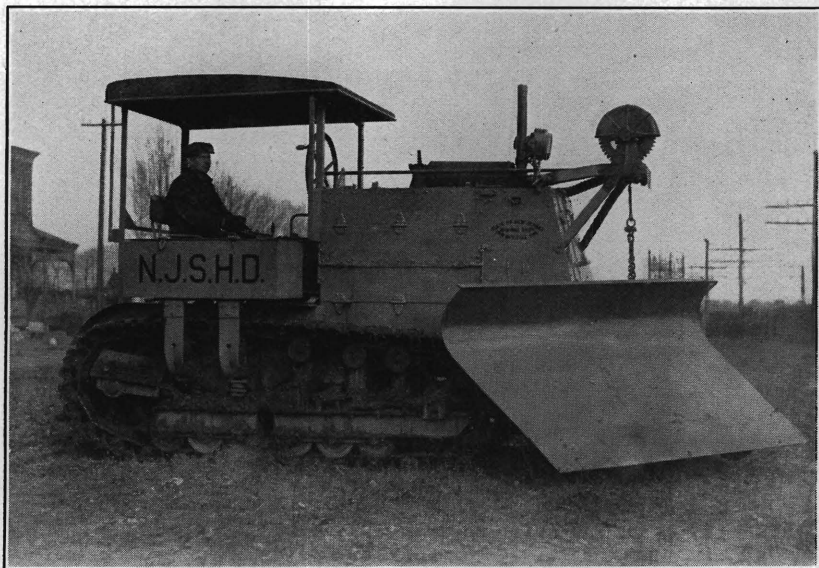
JULY 1st, 1919 to OCTOBER 15th, 1920

Date	Bituminous Concrete No Guarantee	Bituminous Concrete Pavement Under Guarantee	Bituminous Macadam	Water Bound Macadam	Gravel	Concrete	Brick	Dirt Ungraded	Durax	Gravel and Oyster Shells	Total of All Types at End of Each Period
July 1, 1919..	7.228	20.400		4.634							32.262
Sept. 1, 1919..	31.023	9.700	7.864	70.671	5.474	0.950	1.910	11.064			170.918
Dec. 15, 1919..				11.810		0.910					183.638
Jan. 15, 1920..	31.746	12.000	8.520	25.777	4.810						266.491
Mar. 25, 1920..	7.050			4.250					0.220		278.011
May 1, 1920..	13.609		1.950	50.310	169.660	1.700	0.650	4.400		8.600	528.870
June 1, 1920..						1.811					530.681
June 30, 1920..						3.500					534.181
Oct. 15, 1920..	4.200					3.548					537.749
Totals	94.856	37.900	18.334	167.452	179.944	12.419	2.560	15.464	0.220	8.600	537.749

NOTE—Figures (except totals) show mileages of various types acquired at each period stated.



FLEET OF F. W. D. TRUCKS (Excess War Department Equipment) EQUIPPED WITH SNOW PLOWS.



TRACTOR EQUIPPED WITH SNOW PLOW FOR USE IN CLEANING HEAVY DRIFTS.

LIST OF TRUCKS RECEIVED FROM THE GOVERNMENT, NOW IN POSSESSION OF THE HIGHWAY DEPARTMENT

Name	Capacity	Number Received	Type Received	Equipped by us with Dump Bodies	Total	Distributed to Counties and Institutions	Sold	Dismantled for Parts	Total in Possession of Department
H. Aviation.....	3-T.....	19.....	Chassis-Cargo.....	16.....	19.....				19.....
L. Aviation.....	1-T.....	20.....	Cargo.....		20.....				20.....
International.....	2-T.....	6.....	Cargo.....		6.....	2.....	2.....		2.....
Peerless.....	3-T.....	10.....	Cargo.....		10.....			2.....	8.....
Nash Quad.....	2-T.....	45.....	Ammunition-Chassis.....	5.....	45.....	7.....		6.....	32.....
Denby.....	3-T.....	6.....	Dump.....		6.....	2.....		1.....	3.....
Republic.....	1½-T.....	4.....	Cargo.....		4.....	1.....	2.....	1.....	0.....
G. M. C.....	¾-T.....	15.....	Ammunition.....		15.....				15.....
Packard.....	3-T.....	24.....	Cargo.....	12.....	24.....	12.....			12.....
Pierce-Arrow.....	2-T.....	38.....	Cargo.....		38.....	16.....	22.....		0.....
Selden.....	3½-T.....	12.....	Cargo.....		12.....	2.....	7.....		3.....
Hurlburt.....	5-T.....	15.....	Dump.....		15.....				15.....
Hurlburt.....	3-T.....	4.....	Cargo.....		4.....		4.....		0.....
F. W. D.....	3-T.....	14.....	Ammunition.....		14.....	8.....			11.....
Federal.....	5-T.....	10.....	Dump.....		10.....				10.....
Garford.....	6-T.....	2.....	Dump.....		2.....				2.....
Garford.....	3½-T.....	1.....	Dump.....		1.....				1.....
Pierce-Arrow.....	5-T.....	2.....	Cargo.....		2.....				2.....
Diamond-T.....	2-T.....	1.....	Cargo.....		1.....	1.....			0.....
Riker.....	3-T.....	15.....	Cargo.....	15.....	15.....				15.....
Macks.....	5½-T.....	16.....	Dump.....		16.....				16.....
Macks.....	5½-T.....	2.....	Tank.....		2.....				2.....
Macks.....	3½-T.....	2.....	Cargo.....		2.....				2.....
Macks.....	5½-T.....	3.....	Chassis.....		3.....				3.....
Macks.....	5½-T.....	2.....	Cargo.....		2.....				2.....
Ford.....	Model-T.....	41.....	Chassis.....		41.....	Received from the Government—all in use by Highway Department			41.....
Ford.....	1-T.....	6.....	Dump.....	5.....	6.....				6.....
		385			385	46	37	10	242

The above list of Government equipment does not include several cars of touring type which were traded in on new cars. In addition to the above list of trucks received from Government, the department now has in its possession, bought from State Funds, the following trucks, and automobiles:

15—5-T White Dumps
1—3-T Packard
40—1-T Ford Trucks equipped with dump bodies
3— Ford Coupes
10— Touring and Survey Cars

1— Cadillac Sedan
3— Essex Touring
4— Buick Coupes
11— Buick Touring and 1 Buick Roadster.

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EQUIPMENT DIVISION.

Effective July 1st, 1920, all of the equipment in the State Highway Department was placed in the charge of the Equipment Division. This Division provides for the operation, maintenance and repair of all touring cars, trucks, rollers, and other equipment used by the Highway Department.

A building is being rented at Trenton Junction, approximately 50 feet by 500 feet in size. This is used for a garage and repair shop, and also for the storage of equipment and supplies. A new garage site has been purchased at Fernwood on the Philadelphia and Reading Railroad between Trenton and Trenton Junction. A large modern repair shop will be erected at this site, and we will move our present forces and equipment from the Trenton Junction plant as soon as the Fernwood Garage building is completed.

The personnel of the Equipment Division on July 1st, 1920, was 106. On July 1st, 1921, this amounted to 210. The trucks assigned to the Construction Division number 13, and those on maintenance work number 107. In addition to this there are approximately 20 Administration cars and 54 Ford touring, survey and bus body cars.

Herewith is found a list of equipment received from the Federal Government and the disposition of the same.

In addition to the above, considerable miscellaneous equipment has been received from the Government of which the following is a small part:

- 10 Holt 45 Caterpillar Tractors
- 15 Holt 10-ton Caterpillar Tractors
- 6 Concrete Mixers
- 3 Hoisting Engines
- 1 Thew 5-ton Crane
- 13 3 H. P. Double Acting Pump Units
- 7 Steam Drills
- 6 Gas Engines—various sizes
- 4 Centrifugal Pumps
- Approximately 25 miles of rail
- 2 Carloads of Corrugated Steel
- 1 Carload 38x5 Solid Tires
- Approximately 300 Wheel-barrows
- 2,400 feet of Discharge Hose

STATE HIGHWAY COMMISSION

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FOX ROTARY SNOW BROOM.

- 3,100 Shovels
- 3 Winches
- 5 Hangers
- Several carload of equipment such as pipe, tools, vices, truck parts, etc.

In addition to the above miscellaneous equipment, we have in operation at present the following equipment purchased from State Funds:

- 6 Best Tractors
- 7 Cletrac Tractors
- 1 Koehring Paver
- 3 Foote Pavers
- 3 Koehring Mixer Loaders
- 10 Barrett Paving Mixers
- 13 Steam Rollers
- 8 Gas Rollers
- 3 Model O Thew Shovels
- 3 Gas Locomotives—24-inch gauge
- 50 24-inch Gauge Cars.

PROJECTS DIVISION.

The Projects Division was formed December 1st, 1920. The duties of this Division comprise the review of applications of Counties and Townships requesting State aid, including the examination of plans, specifications and contracts. When the contracts are approved the project is turned over to the Construction Division, which Division follows the project through until the construction is completed and the work paid for. The Projects Division also prepares the applications of the State Highway Commission to the Federal Government for Federal Aid.

It is felt that since the County and Township matters have been passing through the office in this manner that it is possible to have action taken by the State Highway Commission in a much shorter time than under the previous arrangement.

STATE AID

It is very evident that the appropriation of State Aid to Counties should be increased by the Legislature. The estimated cost of the work to be done on this plan exceeded \$4,000,000. The State's share of this work would amount to \$1,765,185.00. There is available for distribution to the 21 Counties approximately one-quarter of this amount or \$425,000, so that it is very evident that the distribution of this Fund to the 21 Counties is a very difficult task. This very seriously retards the progress of the good roads construction in New Jersey because the Counties have sufficient organization to handle more work than the State is approving because of the lack of funds.

The following is taken from Mr. Bullock's report:

MOTOR VEHICLE AID

"The writer has for some time felt that a portion, probably one-half of the State's apportionment of Motor Vehicle funds to the various Counties should be expended by the Counties and State in the reconstruction of the main County thoroughfares with some durable pavement of a hard surface type. The majority of the present roads which are surface treated macadam, have long failed to meet the requirements imposed upon them through the fast moving and heavy laden motor carriers. While all of the money spent for the maintenance of County roads could not be applied to the construction outlined above, it is thought that some of it certainly should be.

STATE HIGHWAY COMMISSION

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"It is my idea that the Counties should for themselves outline a definite policy of reconstruction and submit maps and programs of such construction for approval by this Department and make no deviations therefrom. If this were done it would not be many years before all of our main arteries of traffic would be paved with some hard type of durable surface. A great many of the roads that we are now putting maintenance on are well graded and have good alignment and with some added drainage facilities together with a hard surface would give from ten (10) to twelve (12) years service, while the present method of maintaining these roads with surface treatment can, at the best, be expected to give not more than two (2) years uninterrupted service."

TOWNSHIP AID

\$210,000 is taken from the Motor Vehicle Fund each year for distribution to the Townships of the State for State aid to townships in road construction. It is felt that Township Aid should be continued, but it is also felt that this money should not be taken from the Motor Vehicle Fund but that an appropriation of \$500,000 per year should be made by the Legislature for this purpose.

To quote again from Mr. Bullock's report:

WAR CLAIM

"The Projects Division has also looked after the matter of presenting to the War Department a claim for reimbursement for a few of the Counties of the State and the State Highway Department for road construction and maintenance performed during the period of the World War. This claim will soon be presented to the War Claim Bureau for consideration."

Pages 37, 38 and 39 contain a tabulation showing the financial status of each of the projects on which Federal Aid has been requested or approved.

The lists on Pages 40 to 42 inclusive give the names of State Aid, Motor Vehicle Aid and Township Aid Roads under construction or completed 1921.

NEW JERSEY'S APPORTIONMENT OF FUNDS UNDER FEDERAL AID ROAD ACT

Fiscal Years	Amounts Available for Fiscal Years	Remarks
1917-1918-1919	\$ 949,046.06	To be obligated by June 30, 1920.
1920	\$1,128,696.51	To be obligated by June 30, 1921.
1921	\$1,187,556.45	To be obligated by June 30, 1922.
	\$3,265,299.02	Total Federal Aid Allotment for New Jersey.

LIST OF FEDERAL AID PROJECTS, AMOUNTS CERTIFIED, PAYMENTS RECEIVED, BALANCE DUE, AND UNDER-RUNS ON CERTIFIED AMOUNTS. ALSO STATUS OF PROJECTS AS TO COMPLETION

Project	Route	Section	Federal Aid Certified	Amounts of Progress Payments Received	Balance Federal Aid Due (V)	Under-runs on Certified Amounts (@)	Status as to Completion
1	—	Sections 3, 4, 5, and 7				None	100%
		Malaga-Pennsgrove Road	\$59,212.68	\$39,334.37	¥\$19,878.31	Expected	100%
2-A	1	3—Robbinsville-Windsor	50,800.00	50,800.00	None	None	100%
2-B	1	4—Windsor-Hightstown	69,000.00	69,000.00	None	None	100%
3	13	3—3 Mile Run-New Brunswick	76,800.00	40,145.19	¥36,654.81	None Expected	100%
4	4	2—Middletown-Betsy Ross	59,714.81	59,714.81	None	None	100%
5	3	Elwood-DaCosta	65,740.95	57,918.37	None	7,822.58	100%
6	3	Egg Harbor-Elwood	100,072.28	89,804.81	None	10,267.47	100%
8	14	Wildwood Jct.-Cape May Ct. H.	33,395.28	30,924.87	None	2,470.41	100%
9	14	Rio Grande-Wildwood Junction	57,457.77	52,002.40	None	5,455.37	100%
10	9	2—West Portal-Perryville	50,047.07	12,473.31	37,573.76	None Expected	31%
11	3	DaCosta-Hammonton	81,919.87	75,841.43	None	6,078.44	100%
12	3	Absecon-Egg Harbor	197,400.00	47,320.07	150,079.93	None Expected	99%
13	6	Woodstown-Mullica Hill	144,960.00	40,817.00	104,143.00	None Expected	97%
14	13	1—Kingston-Ten Mile Run	44,348.91	44,348.91	None	None	100%
15	1	2—Menlo Park-Rahway	71,059.61	69,329.03	None	1,730.58	100%
16	9	1—West Portal-Easterly	42,740.00	12,552.62	30,187.38	None Expected	37%
17	2	2—Bordentown-Roebling	66,260.00	12,270.19	53,989.81	None Expected	83%
18	13	4—Princeton-Kingston	32,960.00	14,337.36	¥18,622.64	None Expected	100%

LIST OF FEDERAL AID PROJECTS AMOUNTS CERTIFIED, PAYMENTS RECEIVED, BALANCE DUE, AND UNDER-RUNS ON CERTIFIED AMOUNTS, ALSO STATUS OF PROJECT AS TO COMPLETION

Project	Route	Section	Federal Aid Certified	Amounts of Progress Payments Received	Balance Federal Aid Due (V)	Under-runs on Certified Amounts (@)	Status as to Completion
19	1	5—Hightstown-County Line	28,800.00	9,391.11	19,408.89	None Expected	81%
20-A&B	4	Perth Amboy-S. Amboy Bridge	1,470,798.88	None	1,470,798.88	None Expected	Con. not entered into as yet.
22	1	6—Greenwood Avenue	18,560.00	—	18,560.00	None Expected	11%
24-A	14	Cape May Court House	28,300.00	28,300.00	None	None	100%
24-B	14	Cape May Ct. House-Northerly	75,300.00	—	75,300.00	None Expected	Never Contracted for.
26	4	5—Red Bank-Eatontown	47,680.00	—	47,680.00	None Expected	0%
27	8	5—Sussex-Unionville	140,600.00	—	140,600.00	None Expected	6%
28-A	3	1—Ancora-Atco—(Paving)	51,420.00	—	51,420.00	None Expected	55%
28-B	3	2—Ancora-Atco—(Paving)	47,520.00	—	47,520.00	None Expected	6%
32-A	12	3—Phillipsburg-New Village	86,255.21	—	86,255.21	None Expected	0%
Totals			3,299,123.32	\$856,625.85	\$2,408,672.62	\$33,824.85	
Less Underruns.....			33,824.85				
			\$3,265,298.47				

(V) This figure on uncompleted jobs subject to change.

(@) Under-runs due to Project being completed for less than amounts certified due to reductions in contracts.

(%) Final voucher being prepared.

NOTE—Under-runs on certified amounts are considered obligated until expended.

STATE HIGHWAY COMMISSION

STATE AID ROADS UNDER CONSTRUCTION OR COMPLETED YEAR 1921

County	Name of Road	Type of Pavement	Length
Bergen	Bulls Ferry Road	Sheet Asphalt, Stone Block and Reinforced Concrete	0.897
Bergen	Cherry Lane (Lincoln Ave.)	Sheet Asphalt on Macadam	1.110
Bergen	Williams Avenue (Sec. 3)	Reinforced Concrete	0.588
Burlington	Hamilton Corner-Roebling	Reinforced Concrete	0.600
Camden	Clements Bridge Road	Concrete	1.170
Camden	King's Highway	Reinforced Concrete	1.000
Hudson	Passaic Avenue	Granite Block on Concrete Base	0.580
Hudson	Schuyler Avenue	Sheet Asphalt on Macadam Base	2.220
Mercer	Carter Road	Bituminous Macadam	2.030
Middlesex	Blazing Star Road	Bituminous Concrete on Concrete Base	0.741
Middlesex	West Ave., Sewaren (Sec. 1 and 2)	Bituminous Concrete on Concrete Base	2.040
Ocean	Jackson's Mills-Van Hiseville	Gravel	2.960
Passaic	Marshall Hill, Alcott & Union Valley	Bituminous Macadam	1.978
Salem	Pennsgrove-Pennsville (4th Sec.)	Concrete	1.360
Sussex	Fredon-Newton Road	Grading and Drainage	3.390
Union	Chestnut Street, Roselle Borough	Concrete	1.210
Union	Martine & Park Avenues	Reinforced Concrete	1.390
			<hr/> 25.264

MOTOR VEHICLE AID ROADS UNDER CONSTRUCTION OR COMPLETED YEAR 1921

County	Name of Road	Type of Pavement	Length
Bergen-Hudson	Belleville Turnpike	Granite Block on Concrete Base	0.490
Bergen	Wyckoff Avenue and Main St.	Bit. Macadam and Reinforced Concrete	2.030
Burlington	Burlington-Mt. Holly	Sheet Asphalt on Macadam and Concrete	7.110
Burlington	Warren Street, Beverly	Reinforced Concrete	0.515
Camden	Market Street	Bit. Concrete on Macadam Base	1.140
Camden	Wellwood Avenue	Gravel	0.610
Gloucester	Crown Point Road (Sec. 3)	Amiesite on Macadam Base	0.740
Gloucester	Westville-Glassboro (Sec. 2.)	Sheet Asphalt	2.430
Hudson	Belleville Turnpike	Bit. Concrete on Macadam	0.200
Hunterdon	Lambertville Streets	Sheet Asphalt	1.220
Middlesex	Jackson St.-South River	Bit. Concrete on Concrete Base	0.442
Salem	Pennsville-Salem, 1st Sec.	Concrete	0.975
Sussex	Main St., Newton	Reinforced Concrete	0.140
Sussex	Munson Corner, Ogdensburg	Bituminous Macadam	1.230
Union	Central Ave., Westfield (Both Sections)	Reinforced Concrete	2.422
Warren	Morris Street, Phillipsburg	Reinforced Concrete	1.170
			<hr/> 22.864

TOWNSHIP ROADS UNDER CONSTRUCTION OR COMPLETED YEAR 1921

County	Township	Name of Road	Type of Pavement	Length
Atlantic	Mullica	Elwood-Weekstown	Gravel	5.00
Bergen	Franklin	Cedar Hill Avenue	Bit. Macadam	1.00
Bergen	Franklin	Ravine Avenue	Bit. Macadam	1.00
Burlington	Chesterfield	Crosswicks-Ellisdale	Cinders	2.50
Burlington	Pemberton	Browns Mills-Pointville Road	Gravel	1.50
Burlington	Pemberton	North Pemberton Road	Macadam	3.63
Burlington	Washington	Lower Bank Road	Gravel	2.00
Camden	Berlin	Berlin-Jackson	Gravel	1.00
Camden	Berlin	Berlin-New Freedom	Gravel	0.88
Camden	Clementon	Kirkwood-Berlin	Gravel	0.75
Camden	Gloucester	Erial Road	Gravel	2.00
Camden	Winslow	Braddock Ave.	Gravel	1.50
Cape May	Lower	Shunpike Road	Gravel	0.57
Cumberland	Commercial	Mauricetown-Millville Road	Gravel	1.00
Cumberland	Deerfield	Centreton Road	Gravel	2.00
Cumberland	Deerfield	Deerfield-Seeley Road	Gravel	2.25
Cumberland	Deerfield	Husted Station, Route No. 6	Gravel	2.50
Cumberland	Deerfield	Parsonage Road and Deerfield Pike	Gravel	1.50
Cumberland	Downe	Newport Road (Sec. 2)	Gravel	1.00
Cumberland	Fairfield	Fairton-Herring Row School House	Gravel	1.50
Cumberland	Greenwich	Springtown-Salem Road	Gravel	3.75
Cumberland	Hopewell	Beebe Run Road	Gravel	4.00
Cumberland	Hopewell	Fithian's Corner-Roadstown	Gravel	1.00
Cumberland	Landis	Chestnut Avenue	Gravel	1.00
Cumberland	Stow Creek	Roadstown-Jericho	Gravel	1.10
Gloucester	East Greenwich	Paulsboro-Clarksboro	Gravel	1.32
Gloucester	Logan	Pedricktown-Centre Square	Gravel	0.75
Gloucester	Monroe	Williamstown-Glassboro	Gravel	1.00
Gloucester	Monroe	Williamstown-Sicklerville	Gravel	1.50
Hunterdon	Franklin	Croton-Quakertown	Macadam	3.23
Hunterdon	Kingwood	Baptistown-Barbertown	Macadam	2.25

Continued on next page.

TOWNSHIP ROADS UNDER CONSTRUCTION OR COMPLETED YEAR 1921—Continued

Hunterdon	Raritan	Flemington-Clover Hill	Macadam	4.00
Hunterdon	West Amwell	Old Brunswick Turnpike	Macadam	4.00
Middlesex	Piscataway	New Market Avenue	Macadam	1.00
Monmouth	Millstone	Clarksburg-Paradise Cor. Road	Gravel	2.25
Monmouth	Ocean	Deal Beach Avenue	Gravel	0.25
Monmouth	Ocean	Wickapecko Drive	Slag	1.00
Monmouth	Wall	Sixteenth Avenue	Gravel	0.50
Monmouth	Wall	Spring Lake Station-Osborne Corner	Gravel	1.00
Monmouth	Wall	Wooley Corner-New Bedford Hotel	Gravel	0.50
Morris	Mendham	Ralston-Gladstone	Macadam	2.30
Morris	Washington	Naughtright-Bartley	Macadam	3.32
Morris	Washington	Schooley's-Mt. Pleasant Grove	Macadam	2.54
Salem	Oldmans	Auburn-Penns Grove	Gravel	2.50
Somerset	Bedminster	Gladstone Pottersville Road (Sec. 2)	Macadam	0.52
Somerset	Bernards	Bernardsville-Loganville	Macadam	1.50
Somerset	Bernards	Liberty Corner-Bernardsville	Gravel	2.50
Sussex	Andover	Springdale-Greendell	Gravel	1.50
Sussex	Fredon	Andover-Greendell	Gravel	1.10
Sussex	Montague	Montague-Port Jervis Road	Gravel	6.84
Sussex	Sparta	Sparta-Woodport	Earth	3.68
Warren	Blairstown	Mt. Herman-Blairstown	Macadam	2.50
Warren	Hope	Hope-Great Meadows	Macadam	2.40
Warren	Hope	Hope-Mt. Herman	Macadam	2.00
Warren	Knowlton	Warrington-Delaware	Macadam	1.50
Warren	Lopatcong	Delaware River Road	Gravel	3.00
Warren	Mansfield	Washington-Oxford Road to Karrville	Macadam	1.50

111.68

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ENGINEER OF SPECIAL ASSIGNMENTS.

Mr. H. C. Shinn, Engineer of Special Assignments, has been engaged in various work since July 1st, 1920. Under his supervision steel garages have been erected at Dover and Hammonton. Auto truck scales have also been installed at Paterson, Newark, Camden, and Trenton. The installation of scales is also contemplated at Phillipsburg and Egg Harbor. As a result of the installation of these scales, several fines have been imposed by the Commissioner of Motor Vehicles, Mr. William L. Dill, and it has also resulted in reducing the overloading of trucks.

Statistics published in the Engineering-News Record show that New Jersey has 15.3 automobiles per mile of public rural road. It ranks second in the United States. Rhode Island is first with 23.3 cars per mile and Massachusetts is third with 14.7 cars per mile. All the other states in the Union have below 10 cars per mile of public rural road.

It is also interesting to compare the motor vehicle registration of 1914, which was 62,961, with that of 1920, which amounted to 227,737. This will give some idea of the motor traffic using the roads of New Jersey. At present it seems that the more money that is taken in by motor vehicle registrations, the worse off financially we are, that is, the present cost of motor vehicle licenses is not sufficient to repair the damage done to roads by the motor trucks and cars.

Motor vehicle receipts should be increased in order to properly maintain the roads in the State Highway System, and also to aid the Counties in maintaining county roads.

In closing I desire to express my appreciation of the whole-hearted interest and co-operation of the entire personnel of the Maintenance, Equipment, Projects Divisions and Engineer of Special Assignments.

Respectfully submitted,

EDWARD E. REED,

Assistant State Highway Engineer.

CONSTRUCTION ENGINEER'S REPORT.

To Mr. T. J. Wasser, State Highway Engineer.

Dear Sir:—

At the time of the reorganization of the State Highway Department, on December 1, 1920, the "Construction Division" was formed, to which Division is charged the design and construction of all roads and bridges on the State Highway System and the acquisition of land required for right of way. The "Construction Division" is also charged with the inspection of construction on the State Highway System performed by the Counties under the Reimbursement Plan, and the inspection of roads improved with State Aid, Township Aid and Motor Vehicle Funds.

The organization of the Construction Division, under the general charge of the Construction Engineer, is divided into six sub-divisions, namely, the Northern, Central and Southern Construction Divisions, the Bridge Division, the Right of Way Division and the State Labor Division.

The Northern Construction Division comprises the Counties of Bergen, Hudson, Sussex, Union, Essex, Passaic, Warren and Morris; the Central Construction Division comprises the Counties of Middlesex, Monmouth, Ocean, Mercer, Somerset and Hunterdon; the Southern Construction Division comprises the Counties of Burlington, Atlantic, Camden, Cape May, Cumberland, Salem and Gloucester; each of these geographic Construction Divisions being directed by a Division Construction Engineer in responsible charge of the engineering and inspection of all road construction carried on in his respective Division, either by contract or State Labor, and including the inspection of County and Township work in which the State is interested financially.

The Bridge Division is directed by a Bridge Engineer in charge of the design, construction and inspection of all bridges and structures on the entire State Highway System, and the checking of plans and inspection of bridges on roads being improved with State Aid.

The Right of Way Division is directed by a Right of Way Engineer who is charged with the survey and design of road construction, and the preparation of maps and documents for lands to be acquired by purchase for right of way purposes.

The State Labor Department, in charge of a Supervisor of State

STATE HIGHWAY COMMISSION

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STATE HIGHWAY ROUTE NO. 5—BETWEEN HACKETTSTOWN AND BUDD LAKE.
Picture showing new alignment to reduce excessive grades and dangerous curves.
Work done by State Labor Department.

Labor, handles all work performed by both free and inmate labor on State Highway construction. This Division, although directly within the State Highway Department, performs work of the same class and in the same manner as that done by contractors.

The wisdom of the inception of the above organization has been more than substantiated by the successful planning and execution of a construction program of much greater magnitude than ever before attempted, as will be evidenced by the appended list of projects either completed or under contract for completion in the year of 1921.

As first stated, the Construction Division was not organized until December, 1920, but as it is desired to record the activities of the Department during the fiscal year, this report will, therefore, include a resume of all work completed or in course of completion during the period between July 1, 1920, and June 30, 1921, and a brief description of the several projects grouped within the three geographic Construction Divisions will follow and for ready reference of location the Counties in which the work lies will be noted. (The cost of the work is tabulated in the report of the Fiscal Division.)

NORTHERN CONSTRUCTION DIVISION

UNION COUNTY

Route No. 1, Section No. 8.

Length in miles 0.9.

This section of Route No. 1 is in the City of Rahway, the pavement is of Portland Cement Concrete, twenty-nine feet wide, and a little over 0.90 of a mile long. The contract was awarded late in the Fall of 1920, paving operations started on October 18th and the pavement was completed on November 4th. A fortunate combination of weather conditions, prompt transportation and a competent contractor, equipped and ready to start work, can be given credit for what is probably a record performance in a highway construction job.

UNION COUNTY

Route No. 1, Sections No. 9, No. 10 and No. 11. Length in miles 4.6.

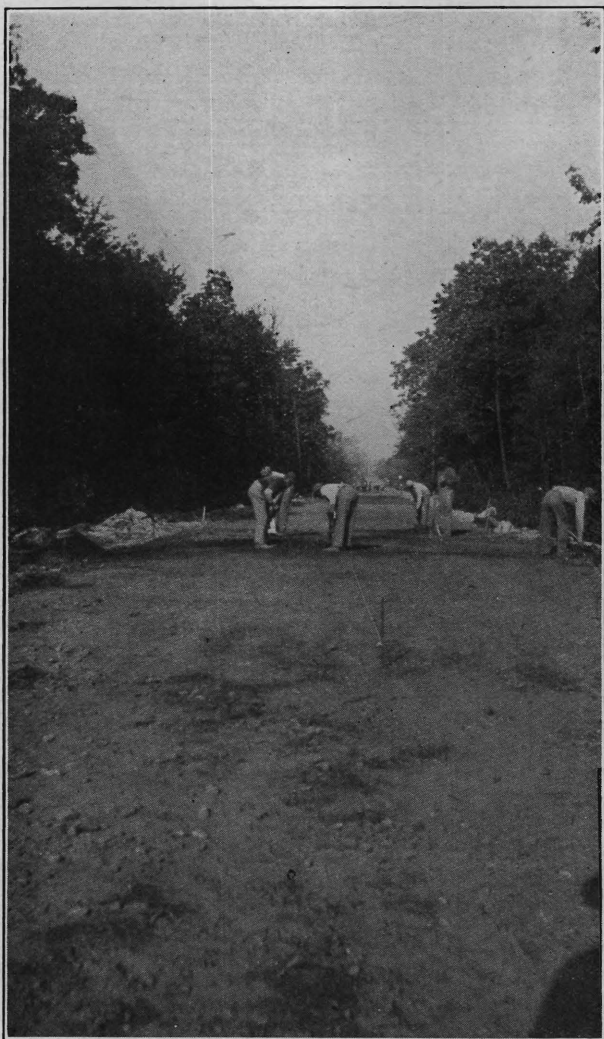
As the construction of Route No. 1, Sections No. 9, No. 10 and No. 11, extending from the center of the City of Rahway to the Elizabeth City Line, was contemplated for the season of 1921, in order to better hold the existing pavement against the possible ravages of the Winter of 1920-21, and heavy traffic, it was decided to install under-drainage throughout the three sections and in the Fall of 1920 the work was assigned to the State Labor Forces of the Department. Work on the drainage was carried on throughout the greater part of the Winter and completed, and the new construction of a bituminous concrete pavement, 29 feet in width, on these three sections will likely be completed during the year of 1921.

MORRIS COUNTY

Route No. 5, Section No. 2 and No. 2-A.

Length in miles 6.6.

These sections of State Highway extend from Hackettstown toward Netcong by way of Budd Lake. Grading and drainage work, and clearing of the new right of way, and construction of eight bridges, was started in 1920 with State Labor Forces, using inmates from the State Prison. At the close of the 1920 construction season work was practically shut down and was resumed in the Spring of 1921, using inmates from the Rahway Reformatory. The results accomplished during the past four months has demonstrated that these men are fully as efficient as free labor. Sections No. 2 and No. 2-A, as originally



STATE HIGHWAY ROUTE NO. 5—BETWEEN HACKETTSTOWN AND BUDD LAKE. Picture shows shaping up sub-grade preparatory to placing concrete pavement. Work done by State Labor Department.

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designated, are about 6.6 miles long and except for a little over a mile along the shore of Budd Lake are laid out over new right of way in order to reduce grades, curvature and distance. The twenty-foot Reinforced Portland Cement Concrete Pavement was started on May 12, 1921, and by June 30 about 1.1 miles had been completed. This pavement was laid along the lake shore and as the remainder of the section is on new alignment there will be no further interruption to traffic and 3.8 miles of concrete pavement will be completed within the 1921 season. In order to speed up the completion of these sections, the work was divided and the end nearer Hackettstown, known as Section No. 2-A, has been contracted. The greater part of this section, which is 2.8 miles long, is side hill work and it is the intention to complete the grading and place a temporary gravel surface, which will be maintained until such time as the fill has had time to settle sufficiently to warrant the construction of a permanent surface.

MORRIS COUNTY

Route No. 5, Section No. 3.

Length in miles 0.9.

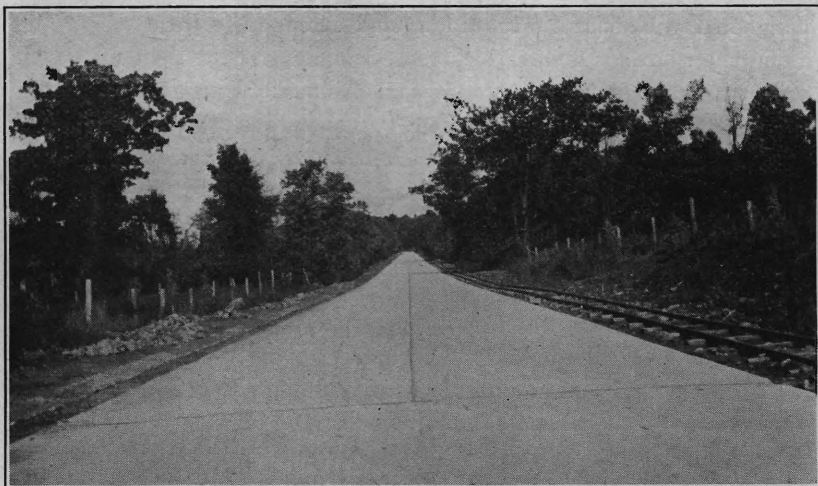
A contract for the construction of Route No. 5, Section No. 3, from King's Corner at Ledgewood to the Culvert under the canal, was awarded by Morris County, proceeding under the provisions of the Reimbursement Act. This section is about 0.9 of a mile long and closes the gap between the bituminous pavement on Route No. 5 and the concrete pavement laid this year by Morris County. The pavement is to be bituminous concrete on a Portland Cement concrete base twenty feet wide and will be completed in the Summer of 1921.

PASSAIC AND MORRIS COUNTIES

Route No. 8, Section No. 1.

Length in miles 4.33.

This section is over the Newark and Pompton Turnpike and extends from the Hamburg Turnpike, at Riverdale, to the Pompton River at Pequannock. The pavement is Portland cement concrete, eighteen feet wide. Work was started in the Spring of 1919 and the first pavement was laid on September 30th of that year. Progress was greatly impeded by transportation difficulties, due to R. R. embargoes, and by shortage of cement, so that on July 1st, 1920, less than one and one-half miles of pavement had been finished; however, the pavement was completed on November 7th, 1920.



STATE HIGHWAY ROUTE NO. 5—BETWEEN HACKETTSTOWN AND BUDD LAKE. Picture showing 20-foot wide Reinforced Portland Cement Concrete Pavement, with center Longitudinal Joint Section ready for placing shoulders and cleaning up. Work done by State Labor Department.

PASSAIC AND MORRIS COUNTIES

Route No. 8, Section No. 3.

Length in miles 1.16.

This section of Route No. 8, constructed of Portland Cement Concrete eighteen feet wide, extends from White's Paper Mill to the center of Bloomingdale, a distance of about 1.2 miles. The contract was awarded in the Spring of 1920; excavation, drainage work, concrete retaining wall and bridge construction were carried on through the Summer and work on pavement was started on September 2nd, 1920, and completed on December 8, 1920. Work on macadam shoulders, guard rail, etc., was carried on during the Winter and was completed early in 1921.

SUSSEX COUNTY

Route No. 8, Section No. 5.

Length in miles 7.03.

This section is the most northerly portion of the State Highway System in New Jersey. It runs from the New York State Line, near Unionville, into the Borough of Sussex, Sussex County, and is 7.03 miles long. The contract was awarded in May, 1921, and the excavation, drainage and considerable pavement will be completed during the year. The pavement is to be reinforced Portland Cement concrete twenty feet wide. There are also five (5) bridges being constructed under separate contracts.



STATE HIGHWAY ROUTE NO. 1—BETWEEN RAHWAY AND ELIZABETH, LINCOLN HIGHWAY. PORTLAND CEMENT CONCRETE PAVEMENT 29 FT. WIDE.
Weldon Contracting Co., Contractors.



STATE HIGHWAY ROUTE NO. 2—BETWEEN BURLINGTON AND ROEBLING. PORTLAND CEMENT CONCRETE PAVEMENT. Thompson & Glickman, Contractors.

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BERGEN COUNTY

Route No. 10, Section No. 1-A.

Length in miles 1.09.

This section, slightly over a mile in length, is the most rugged construction in the entire State Highway System. Starting at the Fort Lee Ferry in the Borough of Edgewater, opposite 130th Street, New York City, the road runs up the face of the Palisades to Arcadian Way in the Borough of Fort Lee. Work was started in the Summer of 1919 and was carried on continuously until the rock excavation and retaining walls were finished in the Summer of 1921. Because of the side hill construction and the evidence of continued settlement in the fills, it was decided to eliminate the permanent pavement which was a part of the original contract and to substitute a temporary Bituminous Macadam pavement which will accommodate traffic until it is safe to construct the more durable surface. The macadam pavement is being built and the road should be opened during the year 1921, except for a section in the Borough of Fort Lee where a new alignment is contemplated.

BERGEN COUNTY

Route No. 10, Section No. 2.

Length in miles 1.33.

This section is practically a continuation of Section No. 1-A, leading down the west side of the ridge into the Hackensack valley. This was a grading and drainage contract only; a cement concrete pavement was included in the original contract, but was eliminated as in the case of Section No. 1-A to permit the new embankments to reach a final settlement. Owing to the fact that this section is over new right of way, the delay in construction does not inconvenience traffic; no provision has been made for a temporary pavement. There are two large bridges to be built on this section, one over the tracks of the Public Service Railway Company and one over Delia Avenue.

MORRIS COUNTY

Route No. 12, Section No. 1.

Length in miles 5.44.

This section starts at the Essex-Morris County Line at the end of the bituminous pavement on Bloomfield Avenue at the Passaic River Bridge near Pine Brook and extends 5.438 miles to Parsippany at the Jersey City Water Supply Reservoir. The pavement on this section is to be bituminous concrete and granite block, 20 feet wide, on a Portland Cement concrete foundation. The contract for this work will

likely be completed in 1921. The work is generally over the old alignment except at Hook Mountain, where a new alignment is made through a heavy rock cut, thus reducing a former steep grade and sharp curvature. There are also six bridges being constructed under contracts separate from the road contract.

MORRIS COUNTY

Route No. 12, Section No. 2. Length in miles 3.3.

This is a continuation of Section No. 1 from Parsippany to the intersection with Route No. 5 at Denville. The pavement will be bituminous Concrete on a Portland Cement concrete foundation similar to that on Section No. 1. The work on Section No. 2, however, is being done under the jurisdiction of Morris County under the Reimbursement Act. An essential feature of this section is the construction of an undercrossing under the D. L. & W. tracks at Fox Hill to eliminate the present grade crossing. Work on this section has been underway since about the first of June and will be completed during 1921, except at the R. R. crossing. Three other bridges are to be constructed under separate contracts by the State.

WARREN COUNTY

Route No. 12, Sections No. 3, No. 4 and No. 5. Length in miles 12.5.

These sections extend 4.696, 4.214 and 3.615 miles, respectively, from Phillipsburg through New Village, Broadway and Washington to Port Colden. These sections are being built by Warren County under the Reimbursement Act. Contracts were awarded in the Summer of 1921 and considerable work will be done during the 1921 construction season. The pavement is to be reinforced Portland Cement concrete. There are six bridges on Section No. 3; nine on Section No. 4, and two on Section No. 5, to be built under separate contracts by the State.

CENTRAL CONSTRUCTION DIVISION

MIDDLESEX COUNTY

Route No. 1, Section No. 1-A. Length in miles 0.283.

This section begins at the intersection of Middlesex Avenue and Holly Street, Metuchen, and extends under the P. R. R. New York Division to the L. V. R. R. Bridge near the intersection of Lake Street and Amboy Avenue. The construction is of Portland Cement concrete 18 feet in width with two 3 feet bituminous macadam shoulders.

STATE HIGHWAY COMMISSION

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MIDDLESEX COUNTY

Route No. 1, Section No. 2. Length in miles 3.55.

This improvement begins at Smith Road, Menlo Park, the end of Section No. 1, and extends to Six Roads, (St. George Avenue), Rahway, and was constructed by the State Labor Division of this Department. Construction is of Portland Cement concrete, 20 feet in width, with bituminous macadam shoulders 3 feet wide, making a total paved width of 26 feet. Work was begun August 12, 1918, and completed July 30, 1920.

MERCER COUNTY

Route No. 1, Section No. 3. Length in miles 2.55.

This portion of Route No. 1 begins near Robbinsville, Mercer County, and extends to the beginning of Section No. 4, in the Village of Windsor. The construction is of Portland Cement concrete, 18 feet in width. Work was started August 19, 1919, and completed November 14, 1920.

MERCER COUNTY

Route No. 1, Section No. 5. Length in miles 1.44.

This section of Route No. 1 begins at Hightstown and extends to the Millstone River over which a new bridge was constructed. Construction is of Portland Cement concrete, 18 feet wide, with 3 feet bituminous macadam shoulders. Between Franklin Street and Rogers Avenue, the business section of Hightstown, the bituminous macadam shoulders were omitted and street paved from curb to curb, the borough authorities paying for the extra width above 20 feet. Paving on this job is finished and the work will be completed during the 1921 season. This work was started May 27, 1920.

MONMOUTH COUNTY

Route No. 4, Section No. 2. Length in miles 2.92.

This section of Route No. 4 extends from Middletown to the Betsy Ross Farm. Construction is of Portland Cement concrete, 18 feet wide, with 3 feet bituminous shoulders. A special feature of this work was changes in alignment at Middletown (eliminating two overhead R. R. Bridges) and at other points along the line eliminating several bad turns and saving considerable distance. Work was begun June 9, 1919, and completed August 30, 1920.

MIDDLESEX COUNTY

Route No. 4, Section No. 3.

Length in miles 0.824.

This improvement begins at Broadway, South Amboy, and extends over what was formerly known as the Pennsylvania Railroad Company Right of Way to Scott Avenue, the southerly approach to the Amboy Bridge. The construction is plain Portland Cement concrete, 20 feet wide, with 2 feet bituminous macadam shoulders. A special feature of this work is the large retaining wall on Main Street, north of Broadway. The change of line at this point makes a better approach to the P. R. R. under-pass. Work was started February 26, 1920, and completed September 10, 1920.

MIDDLESEX COUNTY

Route No. 4, Section No. 3-A.

Length in miles 0.58.

This section of Route No. 4 extends over Bordentown and Pine Avenues, South Amboy. Construction is of Reinforced Portland Cement Concrete, paved widths 32 to 53 feet. This improvement extends from Stevens Avenue, on Bordentown and Pine Avenues, to the City Line at the beginning of the brick road leading to Morgan (Route No. 4) and pavement extends from curb to curb, the City of South Amboy bearing expense of extra width. Work was begun May 5, 1921, and is to be completed during the Summer.

MONMOUTH COUNTY

Route No. 4, Section No. 4.

Length in miles 0.78.

This section of Route No. 4 covers Front Street, Keyport. Construction is of Reinforced Portland Cement Concrete, 22 feet to 46 feet in width. Amiesite on telford base from Washington Street across Matawan Creek meadows to end of existing bituminous concrete pavement leading to Morgan and South Amboy. A special feature of this construction is the widening of Front Street, between Broad and Beers Streets, cost of which is borne by the Borough. This relieves traffic congestion greatly. Work was begun May 13, 1921, and will be completed this Summer.

MONMOUTH COUNTY

Route No. 4, Section No. 5.

Length in miles 3.62.

This section begins at the end of the County concrete road at Monmouth Road and extends through Eatontown to the end of the asphalt

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pavement on Broad Street, Red Bank. Construction is of 3-inch sheet asphalt on 6-inch concrete base, paved width 20 to 40 feet. In Eatontown, from White's Corner to a point 180 feet north of the New Jersey Southern R. R. tracks, the pavement extends from curb to curb, the Township of Eatontown bearing the expense of extra width. Width of paving for rest of distance, 20 feet. Work was started June 24, 1921, and should be completed within the year. One bridge is to be constructed on this section.

HUNTERDON COUNTY

Route No. 9, Sections No. 1 and No. 2. Length in miles 4.17.

This improvement extends from West Portal to Perryville. Construction is of Reinforced Portland Cement concrete, 20 feet wide. The State Labor forces have done the grading and constructed ten (10) bridges and culverts. The contract for this section, therefore, included fine grading, pavement and incidental items. Work is to be started in the late Summer of 1921, and will not be completed until the Spring of 1922.

SOMERSET AND MIDDLESEX COUNTIES

Route No. 13, Section No. 1. Length in miles 3.66.

This improvement extends from Kingston to Ten Mile Run. Construction is of Portland Cement concrete, 18 feet wide, with 3 feet bituminous macadam shoulders. This was constructed by State Labor Forces and included three (3) bridges and culverts. Work was started April 29th, 1918, and completed November 3, 1920.

SOMERSET AND MIDDLESEX COUNTIES

Route No. 13, Section No. 3. Length in miles 3.84.

This improvement extends from Three Mile Run to New Brunswick. Construction is of Portland Cement Concrete, 18 feet in width, with 3 feet bituminous macadam shoulders. Construction began July 25, 1919, and was completed May 25, 1921.

MERCER COUNTY

Route No. 13, Section No. 4. Length in miles 1.76.

This improvement extends from Kingston to Princeton. Construction is of Portland Cement concrete, 18 feet wide, with 3 feet bituminous macadam shoulders. Work was begun March 25, 1920, and completed May 3, 1921.

SOMERSET COUNTY

Route No. 16, Section No. 1. Length in miles 2.39.

This improved section extends from Bernardsville to Mine Run Road. Construction is of Portland Cement concrete, 18 feet wide, earth shoulders. Work was done by Somerset County under the Reimbursement Act. Work completed May 11, 1921.

SOUTHERN CONSTRUCTION DIVISION

BURLINGTON COUNTY

Route No. 2, Section No. 1. Length in miles 5.0.

This section of Route No. 2 extends from Burlington to Roebling. Construction is of Portland Cement concrete, 18 feet wide, with 3 ft. bituminous macadam shoulders. Construction was started November 18, 1918, but was considerably delayed by war conditions, and the construction of bridges. This work was completed June 30, 1921. Three bridges are included in this improvement and are being built under separate contract.

BURLINGTON COUNTY

Route No. 2, Section No. 2. Length in miles 4.04.

This section of Route No. 2 extends from Roebling to Bordentown. Construction is of Portland Cement concrete, 18 feet wide, with 3 feet bituminous macadam shoulders. On Prince, Park and Burlington Streets, through the City of Bordentown, the concrete extends from curb to curb, the City of Bordentown agreeing to bear the cost of extra width beyond 20 feet. Work was started March 30, 1920, and will be completed during the 1921 season. This improvement includes carrying the road over the Kinkora branch of the P. R. R. and the construction of two other bridges under separate contract.

CAMDEN COUNTY

Route No. 3, Ancora-Atco Section. Length in miles 4.95.

Contract let December 10, 1920. Work finished May, 1921. This contract was for grading only, and two bridges were constructed under a separate contract. This work was done on new Right of Way.

ATLANTIC COUNTY

Route No. 3, Absecon-Egg Harbor. Length in miles 9.87.

Concrete pavement completed, 20 feet in width, with 5 feet gravel

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shoulders. Work being carried on under the jurisdiction of Atlantic County, who will be reimbursed by the State. This work to be completed during the Summer of 1921.

ATLANTIC COUNTY

Route No. 3, DaCosta-Hammonton. Length in miles 4.42.

Portland Cement Concrete, 18 feet wide, with 3 feet gravel shoulders. Contract awarded May 27, 1919, and completed October 1, 1920.

ATLANTIC COUNTY

Route No. 3, Egg Harbor-Elwood. Length in miles 5.86.

Contract awarded May 20, 1919, and completed January 1, 1921. Portland Cement Concrete, 18 feet wide with 3 feet gravel shoulders.

BURLINGTON COUNTY

Route No. 4, Mullica River Meadows. Length in miles 2.41.

Contract awarded May 26, 1921. Work is completed. Improved with gravel surface on a 5 feet high fill, which brings the road surface well above the level of the meadows and saves the road from damage caused by high water.

GLOUCESTER COUNTY

Route No. 6, Mullica Hill-Mantua Section. Length in miles 5.15.

Contract awarded April 14, 1919, and completed December 1, 1920. Portland Cement Concrete, 18 feet wide with 3 feet gravel shoulders. Two bridges were constructed under separate contract.

CAPE MAY COUNTY

Route No. 14, Cape May-Rio Grande. Length in miles 4.64.

Contract awarded November 15, 1918; completed December 2, 1920. Portland Cement Concrete, 18 feet wide, with 6 feet gravel shoulders.

CAPE MAY COUNTY

Route No. 14, Cape May Court House. Length in miles 1.41.

Contract awarded June 1, 1919; completed December 20, 1920. Portland Cement Concrete, 18 feet wide, with 3 feet gravel shoulders.

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BURLINGTON COUNTY

Route No. 4, Job's Creek Bridge.

Fill with gravel surface on new alignment, eliminating a bad curve. Work will not be opened to traffic this year, due to delay in bridge construction.

GLOUCESTER AND SALEM COUNTIES

Route No. 6, Woodstown-Mullica Hill. Length in miles 7.25.

Contract awarded May 1, 1920. Portland Cement Concrete, 18 feet wide, with 3 feet gravel shoulders. Work will be completed during the Summer of 1921. Five (5) bridges are included in this project to be built under separate contract.

CAMDEN COUNTY

Route No. 3, Ancora-Atco, Section No. 1. Length in miles 2.57.

Paving Contract awarded April 20, 1921, to be completed October 1, 1921. Reinforced Portland Cement Concrete, 20 feet wide.

CAMDEN COUNTY

Route No. 3, Ancora-Atco, Section No. 2. Length in miles 2.38.

Paving Contract awarded April 20, 1921. To be completed October, 1921. Reinforced Portland Cement Concrete, 20 feet wide.

CUMBERLAND COUNTY—REIMBURSEMENT

Route No. 6, Bridgeton-Shirley, Section No. 4. Length in miles 7.54.

Contract awarded May, 1921, to be finished December 1, 1921. Reinforced Portland Cement Concrete, 20 feet wide.

CUMBERLAND COUNTY

Route No. 6, Bridgeton-Shirley, Section 4-A. Length in miles 0.82.

Contract awarded May, 1921, to be finished December 1, 1921. Reinforced Portland Cement Concrete pavement, 20 feet wide.

CUMBERLAND COUNTY

Route No. 15, Second Street, Millville. Length in miles 0.766.

Contract awarded May, 1921, to be finished September, 1921. Reinforced Portland Cement Concrete pavement, 30 feet wide.

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ATLANTIC COUNTY—REIMBURSEMENT

Route No. 4, Absecon-Smithville. Length in miles 5.7.

Contract awarded June 8, 1921; to be completed in 1921. 20 feet wide with 2 inch Bituminous Concrete on a Portland Cement Concrete base.

In addition to the above projects, completed or now under construction, attention is called to the following projects now being planned by the Right of Way Division that will probably be contracted for and completed during the 1921 construction season:

Route No. 1, Section No. 7, Hamilton Square-Mercer County.

Length in miles 0.63.

This work is being planned for surface type reinforced Portland Cement Concrete Pavement on either side of the trolley tracks running through Hamilton Square.

Route No. 5, Section No. 4, Madison-Chatham-Morris County.

Length in miles 2.9.

The plans for this project will provide for a bituminous concrete surface laid on a Portland Cement concrete foundation on either side of the trolley tracks through the Boroughs of Madison and Chatham.

Route No. 6, Section No. 5, Shirley-Oldman's Creek, Salem County.

Length in miles 6.81.

This work is being planned for possible construction by Salem County under the reimbursement plan and is to provide for the grading, drainage and gravel surface only.

Route No. 6, Section No. 6, Oldman's Creek-Mullica Hill, Gloucester County. Length in miles 5.03.

This work is being planned for possible construction by Gloucester County under the reimbursement plan and includes grading, drainage and gravel surface.

Route No. 6, Section No. 7, Woodstown-Salem, Salem County.

Length in miles 3.98.

This work is being planned for possible reconstruction by Salem County under the reimbursement plan and the plans provide for reinforcing Portland Cement Concrete Pavement 20 feet in width.

Route No. 9, Section No. 4, Borough of Dunellen, Middlesex County.
Length in miles .478.

This section is being planned for reinforced concrete pavement between the trolley tracks and the curb through the business section of Dunellen.

Attention is also called to the activities of the Bridge Division and in addition to the bridges enumerated above as already being completed or under contract and in the course of completion the following bridges and structures have been completed or are under contract and in the course of construction:

Route No. 1, Section No. 6, Greenwood Avenue, Mercer County, M. P. 0.4.

Route No. 4, Ballanger Creek, Burlington County, M. P. 16.8.

Route No. 6, Mantua, Gloucester County, M. P., 22.4.

Route No. 6, Shirley-Oldman's Creek, Salem County, Three bridges, M. P. 14.4, 15.2 and 10.8.

Route No. 7, Manalapan, Monmouth County, two bridges, M. P. 8.1 and 8.0.

Route No. 9, Lebanon, Somerset County, M. P. 19.6.

Route No. 10, Overpeck, Bergen County, M. P. 8.0.

In addition to the above, plans have been prepared or are in course of preparation for the following structures:

Route No. 1—Bridge "D", M.P. 6.3, over P. R. R. at Robbinsville.

Route No. 2—Preliminary plans for bridge over Crosswick Creek, M.P. 24.1.

Route No. 4—Plans being prepared for Nacote Creek, M.P. 8.5; Plans completed for Job's Creek, M.P. 14.8; preliminary plans prepared for Inland Waterway, M.P. 66.6; preliminary plans for Manasquan River, Bridge at M.P. 69.4; new Raritan River Bridge—plans completed for North and South Approaches—studies made for piers and floors—preliminary designs for drawspan and fixed spans, M.P. 106.4.

Route No. 6—Plans being prepared for Pearl Street, Grade Crossing; plans being prepared for bridge M.P. 9.7—W. W. J. & S. S. R. R., at Woodstown; plans being prepared for bridge 10.7-E, Riddleton Branch, W J. & S. S. R. R.; plans being prepared for bridge 7.6, near Woodstown.

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Route No. 9—Plans completed for bridge M.P. 40.2, over Bound Brook.

Route No. 10—Plans completed for bridge M.P. 9.9, Delia Avenue; plans completed for bridge M.P. 10; trolley crossing; preliminary plans prepared for bridge, Market Street, East Paterson.

Route No. 14—Plans completed for Culverts at M.P. 37.1 and 37.2, Estellville.

Route No. 15—Plans completed for Biddle's Creek, M.P. 3.7.

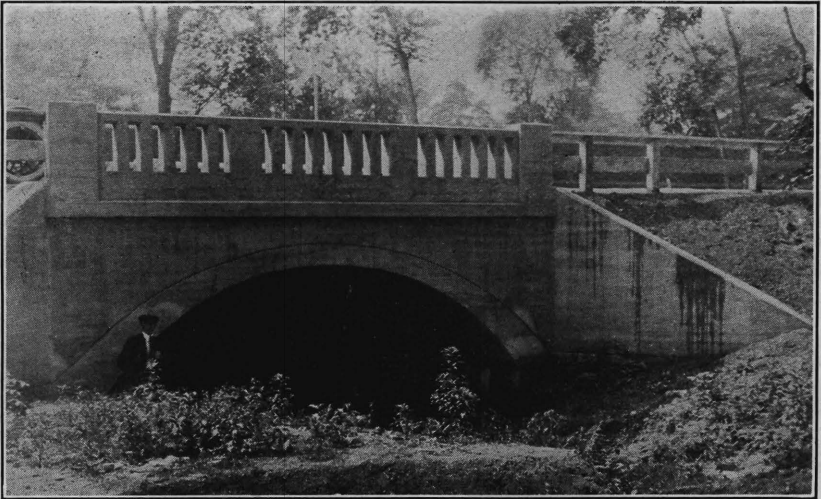
Route No. 16—Plans completed for Bedminster Bridge, M.P. 25.7.

Miscellaneous: Plans being prepared for the Fernwood Service Station at Ewing Township, Mercer County.

Respectfully submitted,

C. F. BEDWELL,

Construction Engineer.



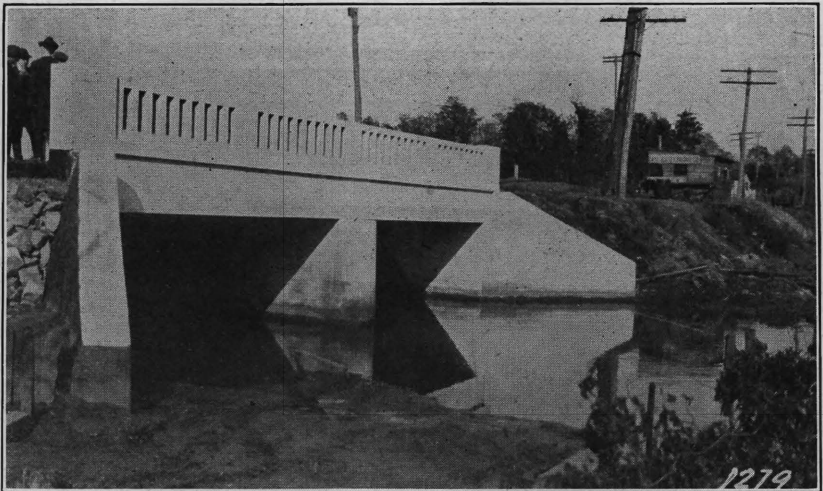
ROUTE NO. 1—BETWEEN MENLO PARK AND RAHWAY.

Bridge "M", M.P. 40.7.—Concrete Arch 21 feet span.

Contractor: State Labor.

Work started: May 26th, 1919.

Work completed: September 26th, 1919.



ROUTE NO. 2—BETWEEN BURLINGTON AND ROEBLING.

Bridge F, M.P. 19.5—Encased I-Beams, 2-20 feet span.

Contractor: H. W. Schrimpf Co.

Work started: December 31st, 1919.

Work completed: December 20th, 1920.



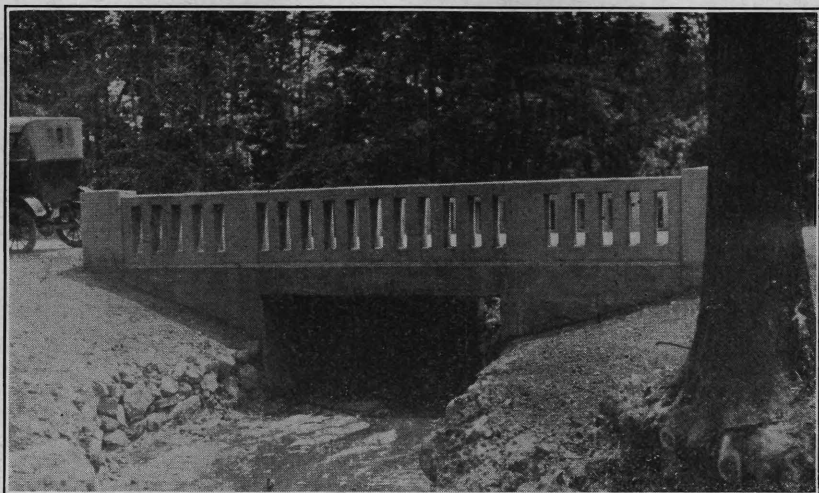
ROUTE NO. 3—ANCORA-ATCO SECTION, NEW LINE.

Bridge No. 46, M.P. 23.3—Concrete slab 13 feet span.

Contractor: Louis J. Sieling.

Work started: January 20th, 1920..

Work completed: June 6th, 1920.



ROUTE NO. 13—BETWEEN KINGSTON AND NEW BRUNSWICK.

Bridge No. 229, M.P. 14.6—Reinforced concrete slab 10 feet span.

Contractor: State Labor.

Work started: April 29th, 1919.

Work completed: July 2nd, 1920.

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SECRETARY AND CHIEF CLERK'S REPORT.

Mr. T. J. Wasser,
State Highway Engineer,
Trenton, N. J.

Dear Mr. Wasser :

I beg to submit the following report concerning the activities of the State Highway Commission and State Highway Department during the fiscal year from July 1st, 1920, to June 30th, 1921:

Meetings of the Commission: Since the organization of the present State Highway Commission at its meeting held on July 1st, 1921, there have been held a total of thirty-eight (38) regular meetings. At each of these meetings there was present a quorum which enabled the transaction of any business that came before the Commission. The average percentage of attendance for all the meetings was 92.4%. The percentage of attendance of the individual members of the Commission was as follows:

Hon. George L. Burton, Chairman, 96.8%—The one meeting at which Mr. Burton was absent was due to his being subpoenaed into court on a case in which he was interested.

Mr. George Paddock, 92.1%.

Colonel W. F. Whittemore, 94.7%—The absence of Colonel Whittemore from two meetings was due first to his attendance at the U. S. Good Roads Association as the representative of the State Highway Commission, and second to his attendance at the meeting of the Board of Freeholders of Warren County at the time of the receipt of bids on Route No. 12, Section No. 3, Phillipsburg to New Village.

Mr. Thomas E. Collins, 97.4%—The one meeting at which Mr. Collins was absent was due to serious illness in his family which made it impossible for him to leave his home.

Mr. John Ferris, 76.3%.

Mr. A. S. L. Doughty, 97.2%.

Mr. Charles F. Seabrook, 100%.

Mr. William J. Kirby during the period of his membership, 76.9%.

Hon. David Young during the period of his membership, 100%.

Bidding on State Highway Work: During the past fiscal year there have been advertised twenty-seven (27) projects on State High-

way and bridge construction and maintenance, covering work to be performed by direct State operations. On the projects advertised, there were taken out a total of 635 sets of plans. On these projects there were a total number of 214 bids submitted. Of this total there were but four (4) bids irregular or 1.87%. This percentage, as you observe, is very low and speaks very highly for the accuracy and clearness of the plans and specifications upon which the bids were based. I am informed that it is not at all unusual for the percentage of irregularities in bids to run as high as 10%. This percentage of 1.87% is, therefore, worthy of special note. I understand that the matter of mileage of contracts let, etc., will be covered by other Divisions of the Department.

Legislation: At the last session of the Legislature there were passed a number of bills of special interest to the State Highway Department. Chapter 302 of the laws of 1921 is probably of most interest inasmuch as this bill extends the one mill tax by which is provided the funds for State Highway construction. There were also passed several bills extending the State Highway system, probably the most important of which is Chapter 322 which extends State Highway Route No. 1 to connect with the proposed Hudson River vehicular tunnel at Jersey City, and State Highway Route No. 2 to connect with the proposed bridge over the Delaware River between Camden and Philadelphia. Extension of the routes is also provided for in Chapter 144 which extends Route No. 6 to the Gloucester Ferry in Gloucester and Chapter 148 which extends Route No. 6 from Salem to Bridgeton, thus forming the base of the triangle on this route.

Chapters 52 and 285 provide for the maintenance of detours necessary to be used while State Highway construction is in progress and further provide for the use of the funds of the department for such maintenance. This feature is a distinct departure from previous practice. Chapter 44 is also of vital interest to the department, it providing for a change in the manner administering contracts. By this act, there is retained only 10% on all partial payments made on account or work performed on the said State Highway contracts. This act also provides for the payment for materials delivered upon the site of the work and for the furnishing by the contractor of a guaranty bond instead of the retention of 5% for a period of one year as was heretofore in effect.

The State Aid Act was also amended by Chapter 275. One of the specific changes to the State Aid Act through this amendment is the

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allowance of 40% of the cost of bridge construction as aid to the counties instead of the 20% as heretofore, and further permitting State Aid to be applied on bridge work as a unit and not necessarily a part of a road construction project. There is submitted herewith for printing in the report as an appendix, the State Highway and State Aid laws in their amended form which are of primary interest to the department.

AUDITING AND ACCOUNTING

There is submitted herewith a complete financial statement covering the activities of the State Highway Department from July 1, 1920, to June 30th, 1921, as compiled by Mr. Marvin L. Howell, Chief Auditor and Accountant. It will be noted from statement No. 1 that the cost of administration is only 2% of the total of expenditure and the cost of survey and engineering is but 4.3% of the total expenditure. Statements Nos. 2, 3, 4 and 5 are self-explanatory. Statement No. 6 shows the amounts set aside from the State Aid and Motor Vehicle funds in accordance with the provisions of Chapter 15 of the laws of 1917 for the purpose of meeting that share of the administration and engineering expenses chargeable to these particular funds. The item of special appropriation at the bottom of statement No. 6 covers amount specifically appropriated by the Legislature as aid to Essex County.

Statements Nos. 7, 8, 9, 10, 11, 12 and 13 are self-explanatory.

Statements Nos. 14 and 17 give a detailed disposition of State Road Tax and State Highway maintenance expenditures on the various routes of the State Highway System under the various classes of expenditure shown thereon.

Statements Nos. 15 and 16 are self-explanatory.

It will be noted on statement No. 18 that the total of funds standing to the credit of the State Highway Department amounted to \$18,119,751.65 which included balances brought forward from previous years in addition to the receipts of the current year. It will be noted that against these total funds there is a liability of \$17,053,670.64, representing a cash expenditure of \$10,656,053.24 and a liability on contracts of \$6,397,617.40. This leaves a balance available as of June 30th, 1921, of \$1,066,081.01. The item of deficit on maintenance of State Highways as shown on this statement is covered by a transfer of \$500,000.00 from the general funds of the department as shown on statement No. 15.

ANNUAL REPORT

CLERICAL AND PERSONNEL

There is submitted herewith a report from Mr. Charles Fishberg, Assistant Chief Clerk, concerning the personnel of the State Highway Department. Attention is called to the high rate of turnover in the employments in the department during the past fiscal year. Attention is also directed to the report concerning the State Highway Convention and Materials Exhibit. This affair was a new departure in State Highway administration and aroused such wide-spread interest and favorable comment that it is hoped this feature will be made a permanent annual convention.

PURCHASING

There is submitted a brief resume of the activities of the Purchasing Division for the past fiscal year. You will observe that there was a total of 1,463 orders placed which covered 831,660 gallons of asphalt oils and tars, 105,776 tons of stone, gravel, sand and other road materials, 20,728 barrels of cement, 34,533 feet of pipe, and many other items incident to the operation of the department.

Respectfully submitted,

A. LEE GROVER,

Secretary and Chief Clerk.

FINANCIAL REPORT

Year 1920-21

Index to Financial Statements.

1. Statement of Department Expenditure.

State Aid Appropriation

2. Appropriation, Expenditure and Assets and Liabilities.
3. Schedule of Expenditure.

Motor Vehicle Fund

4. Receipts and Disbursements and Assets and Liabilities.
5. Schedule of Expenditure.

General Road Fund

6. Funds and Disbursements.

Special Appropriations

APPROPRIATED AND EXPENDED.

State Road Tax

7. Funds and Disbursements.
8. Assets and Liabilities.
9. Schedule of Road Contracts Liability as of June 30, 1921.
10. Schedule of Bridge Contracts Liability as of June 30, 1921.
11. Schedule of Reimbursement to County Liability as of June 30, 1921.
12. Federal Aid State Highway Construction, Balance available.
13. Schedule of Accounts Receivable as of June 30, 1921.
14. Distribution of Yearly Expenditure.

STATE HIGHWAY COMMISSION

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Maintenance of Roads & Bridges by Department

15. Funds and Disbursements, Assets and Liabilities.
16. Schedule of Contract Liability as of June 30, 1921.
17. Distribution of Yearly Expenditure.

Recapitulation

18. Recapitulation of Accounts.

Respectfully Submitted,

M. L. HOWELL,

*Chief Auditor and Accountant.**Table Number 1***Expenditure****July 1, 1920---June 30, 1921****Administration—**

General	\$155,230.16	
Laboratory	53,806.19	
	<hr/>	\$ 209,036.35

Survey and Engineering—

Roads	\$364,277.17	
Bridges	67,584.60	
	<hr/>	\$ 431,861.77

Purchase of Right of Way.....		126,184.39
Purchase of Toll Roads.....		70,000.00
Reimbursement of Counties		326,386.78
Construction of Roads by Contract.....		2,737,547.67
Construction of Bridges by Contract.....		289,869.80
Preliminaries on Bridges.....		10,950.65
Construction by State Labor.....		495,234.66
Federal Aid to Counties.....		14,479.09
State Aid to Counties.....		480,934.27
Essex County Reimbursement.....		25,000.00
Maintenance by State Highway Department.....		1,971,107.60
Maintenance by Contract.....		114,748.05
Installation of Scales for weighing trucks.....		18,475.00
To Counties and Townships		3,081,454.32
Equipment	\$327,454.70	
Less depreciation distributed above	128,569.14	
	<hr/>	198,885.56

Materials and Supplies		17,191.87
On account of other State Department and Municipalities		24,257.01
On account of previous year.....		39,482.49

Total expenditure		<hr/>	\$10,683,087.33
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Table Number 2

STATEMENT OF STATE AID APPROPRIATIONS

July 1, 1920---June 30, 1921

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Public Road Funds	Balance forward from previous year	Annual appropriation	Total amount available	Expended	Balance forward on contracts	Saved on contracts	Forward on Apportionment
Appropriation 1909-10...	\$ 1,203.63	\$ —	\$ 1,203.63	\$ —	\$ 1,203.63	\$ —	\$ —
“ 1913-14...	10,454.12	—	10,454.12	10,454.12	—	—	—
“ 1914-15...	21,145.19	—	21,145.19	144.85	20,459.00	541.34	—
“ 1915-16...	31,119.68	—	31,119.68	1,830.42	22,616.76	6,672.50	—
“ 1916-17...	86,601.08	—	86,601.08	51,321.59	20,650.07	14,629.42	—
“ 1917-18...	210,062.12	—	210,062.12	126,542.19	31,210.05	7,493.12	27,816.76
“ 1918-19...	380,322.84	—	380,322.84	143,001.73	135,511.54	6,996.72	78,812.85
“ 1919-20...	420,409.48	—	420,409.48	124,575.62	199,439.97	3,081.13	115,312.76
“ 1920-21...	—	500,000.00	—	—	—	—	—
*Less amount set aside for administration ...	—	75,000.00	425,000.00	23,063.75	197,458.54	2,141.53	213,336.18
	\$1,161,318.14	\$425,000.00	\$1,586,318.14	\$480,934.27	\$628,549.56	\$41,555.76	\$435,278.55

*Transferred to General Road Fund.

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APPROPRIATIONS

State Aid to Counties

ASSETS.				LIABILITIES	
Cash Balance Appropriation 1909-10...	\$	1,203.63		Approved contracts outstanding.....	\$ 572,534.23
“ “ “ 1914-15....		21,000.34		Approved extras on contracts.....	3,136.28
“ “ “ 1915-16....		29,289.26		Reserve for extras, engineering and inspection.....	52,879.05
“ “ “ 1916-17....		35,279.49		Apportionments, contracts not yet submitted.....	435,278.55
“ “ “ 1917-18....		66,519.93		Apportionment from, Saved on Contracts, contracts not yet submitted	10,000.00
“ “ “ 1918-19....		221,321.11		Balance available, saved on contracts.....	31,555.76
“ “ “ 1919-20....		317,833.86			
“ “ “ 1920-21....		401,936.25			
		\$1,105,383.87			\$1,105,383.87

STATE HIGHWAY COMMISSION

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Table Number 3

STATE AID

Statement of Expenditure

Name of Road	County	Amount Paid
Florence Station, State H. R. No. 2.....	Burlington	\$ 5,248.69
Moorestown-Camden Pike	"	5,287.98
New Lisbon-Four Mile.....	"	3,768.12
Clements Bridge	Camden	17,734.14
Cedar Brook	"	5,943.70
Cape May-Wildwood	Cape May	19,694.10
Bridgeton-Fairfield	Cumberland	3,883.70
Bloomfield Ave.	Essex	43,583.27
Cross Keys-Turnerville	Gloucester	43,110.52
Cooper St.—Woodbury	"	16,897.82
Glassboro-Knights Run Road.....	"	13,909.03
Paterson Turnpike	Hudson	16,777.95
Lower Valley-County Line.....	Hunterdon	5,458.85
Rosedale-Mt. Rose-Hopewell	Mercer	10,598.97
Hightstown-Princeton Junction	"	1,830.42
River Road	"	11,370.94
Freehold-Adelphia	Monmouth	8,541.45
Matawan-Freehold	"	39,073.68
Washington Street	Morris	11,753.29
Bay Head-Point Pleasant.....	Ocean	3,966.68
Lakewood-Van Hiseville Road	"	7,594.14
Long Beach Road.....	"	17,500.00
Long Beach Road.....	"	17,500.00
Long Beach Road Extension.....	"	1,748.14
Malaga-Penns Grove	Salem	16,893.14
Pedricktown-Woodstown Road	"	14,092.82
Fredon-Newton	Sussex	5,986.67
Ogdensburg-Sparta	"	15,855.52
Ross's Conrer-Sussex Road.....	"	24,045.66
Mountain Avenue-Westfield	Union	22,990.50
Stuyvesant Ave.	"	26,410.98
Hope-Bridgeville	Warren	1,720.67
Hope-Bridgeville 3rd section.....	"	19,616.03
Bridge on Hope-Bridgeville.....	"	546.70

Table Number 4

\$480,934.27

MOTOR VEHICLE FUND

July 1, 1920---June 30, 1921

Receipts

Balance forward, July 1, 1920.....	\$2,750,745.70
Receipts July 1, 1920—June 30, 1921.....	4,069,475.97
	<hr/> \$6,820,221.67

Expenditure

Paid on allotments, July 1, 1920—June 30, 1921.....	\$2,885,042.58
Appropriated to expense of M. V. Department.....	196,411.74
Allotted to Division of Maintenance.....	1,563,064.23
* Allotted to Administration	100,000.00
	<hr/> 4,744,528.55

Cash Balance Forward \$2,075,703.12

* Transferred to General Road Fund.

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Motor Vehicle Fund

ASSETS.	LIABILITIES.
Cash Balance.. \$2,075,703.12	Allotments for maintenance out-standing \$1,672,622.69
	Allotments for township aid out-standing 399,445.44
	Balance available 3,634.99
<hr/>	<hr/>
\$2,075,703.12	\$2,075,703.12

Table Number 5

MOTOR VEHICLE

Statement of Expenditure July 1, 1920---June 30, 1921

County	Amount	Totals
Atlantic	\$135,082.55	
Bergen	364,750.00	
Burlington	234,429.68	
Camden	178,670.08	
Cape May	53,180.00	
Cumberland	37,473.71	
Essex	186,250.00	
Gloucester	50,781.18	
Hudson	193,401.04	
Hunterdon	56,898.53	
Mercer	113,300.00	
Middlesex	153,205.71	
Monmouth	223,075.28	
Morris	103,000.00	
Ocean	51,500.00	
Passaic	181,954.78	
Salem	113,024.80	
Somerset	89,550.00	
Sussex	49,200.00	
Union	94,599.30	
Warren	51,200.00	
	<hr/>	\$2,714,526.64
State Highway Detours.....		42,487.45
DEPARTMENT		
Preliminary investigation bridge over Newark Bay..	600.00	
Repairs of detours Princeton-Yale game.....	1,503.10	
Browns Mills-Lakehurst	24,438.12	
Home for Feeble Minded.....	2,008.90	
Hightstown Detour	4,000.00	
	<hr/>	32,550.12
TOWNSHIP ROADS		
Year 1916	15,577.94	
" 1917	10,039.22	
" 1918	14,558.67	
" 1919	36,217.06	
" 1921	19,085.48	
	<hr/>	95,478.37
		<hr/>
		\$2,885,042.58

STATE HIGHWAY COMMISSION

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Table Number 6

GENERAL ROAD FUND

Funds

Funds set aside from State Aid Appropriation.....	\$ 75,000.00	
Funds allotted from M. V. Funds.....	100,000.00	
		<hr/> \$175,000.00

Disbursements

Administration of Appropriation and M. V. Fund...	\$ 94,681.41	
Survey and Engineering, State Aid Roads.....	32,337.93	
Survey and Engineering, M. V. Roads.....	31,764.61	
Survey and Engineering, Township Roads.....	16,216.05	
		<hr/> \$175,000.00

SPECIAL APPROPRIATION

July 1, 1920—June 30, 1921.

	Appropriation	Expended	Balance
Essex County State Aid.....	\$25,000.00	\$25,000.00	\$

Table Number 7

STATE HIGHWAY FUND

Funds

Cash Balance, July 1, 1920.....	\$4,437,215.61	
Tax Receipts year 1921.....	3,569,725.97	
Federal Aid Receipts, 7/1/20—6/30/21.....	509,371.83	
		<hr/> \$8,516,313.41

Disbursements

State Highway System	\$4,476,090.50	
Loan to Maintenance Division	500,000.00	
Equipment and Inventory of Materials and Supplies.	228,094.74	
On account of Accounts Receivable.....	24,257.01	
On account of Accounts owing from 6/30/21.....	39,482.49	
Receipts from permits to open State Highway received previous to 6/30/21 turned over to Maintenance Division	932.85	
		<hr/> \$5,268,857.59
Cash Balance		<hr/> \$3,247,455.82

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June 30, 1921

A and B. This item represents States equity in the Departments equipment and material on hand and State Highway System Constructed.

Table Number 9

SCHEDULE OF CONTRACTS

Road Construction

Liability as of June 30, 1921

Route	Name of Road	Contractor	Amount
1	Lake Ave. to Middlesex Ave., Metuchen.....	M. Irving Demarest.....	\$ 1,919.05
1	Robbinsville to Windsor.....	H. Nawn Construction Co.....	6,600.77
1	Hightstown to Millstone River.....	Thompson & Glickman.....	49,073.63
1	Leesville Ave. to Milton Ave., Rahway.....	Weldon Contracting Co.....	5,779.50
1	Elizabeth to Rahway (Drainage).....	State Labor.....	596.93
1	" " " ".....	" ".....	
1	" " " ".....	" ".....	
1	" " " ".....	" ".....	
2	Burlington-Roebling.....	Thompson & Glickman.....	20,681.00
2	Roebling-Bordentown.....	R. Sangiovanni.....	132,925.58
3	Ancora Atco.....	Klockner & Black.....	42,829.60
3	" ".....	Weldon Contracting Co.....	19,010.46
3	" ".....	William Eisenberg.....	96,830.74
3	" ".....	" ".....	117,997.39
3	DaCosta-Hammonton.....	Michael Staub.....	8,644.73
3	Egg Harbor-Elwood.....	J. M. Kelly Contracting Co.....	9,898.96
4	Broadway to Scott Ave., So. Amboy.....	Louis J. Sieling.....	3,824.63
4	Pine and Bordentown Ave., So. Amboy.....	O'Gara Construction Co.....	55,021.52
4	Keyport.....	O'Gara Construction Co.....	56,611.04
4	Eatontown-Red Bank.....	Newark Paving Co.....	211,164.13
4	Mullica River.....	Ross & Whelan.....	85,958.10
4	Fill at Jobs Creek Bridge.....	" " ".....	6,479.16
5	Hackettstown to Budd Lake.....	State Labor.....	134,963.72
6	Bridgeton-Shirley.....	Tri-State Construction Co.....	33,344.45
6	Mullica Hill-Mantua.....	J. M. Kelly Contracting Co.....	9,524.52
6	Woodstown-Mullica Hill.....	Michael Staub.....	122,498.03
8	Riverdale to Pompton River.....	Harrop and Shannon, Inc.....	8,988.16
8	Riverdale to Pompton River (Extra).....	State Labor.....	8,187.91
8	White Bridge to Bloomingdale Center.....	Phillip Jannarone.....	10,739.07
8	Sussex to Unionville.....	Kavanaugh and Van Keuren.....	470,565.05
9	West Portal to Union Township.....	State Labor.....	5,841.82
9	East of West Portal to Perryville.....	New Jersey Construction Co.....	261,799.46
9	Lenox Ave. to Elmer St., Westfield.....	John Dorer.....	614.93
10	Arcadian Way to Fort Lee Ferry.....	E. C. Humphrey Co.....	77,288.92
12	Parsippany-Pine Brook.....	Arthur A. Johnson Corp.....	490,626.19
13	Ten Mile Run to Three Mile Run.....	Utility Construction Co.....	16,801.27
13	Three Mile Run to New Brunswick.....	O. G. Julian Construction Co.....	9,979.75
13	Kingston to Princeton.....	Utility Construction Co.....	5,617.31
14	Cape May Court House.....	William Eisenberg.....	4,351.94
14	Cape May-Rio Grande.....	William P. McDonald.....	12,298.64

Total Liability on Road Construction..... \$2,615,878.06

Table Number 10

SCHEDULE OF CONTRACTS

Bridge Construction

Liability as of June 30, 1921

Route	Bridge	Bridge Contractor	Amount
1	Bridge No. 8	Selbach-Meyer Co.	\$ 1,377.44
2	Burlington-Roebling Bridge F.	H. W. Schrimpf Co.	1,595.32
2	Burlington-Roebling Bridge G.	Thompson & Glickman.	502.27
2	Burlington-Roebling Bridge H.	" " "	238.92
2	Bridge C.	East Jersey Bridge Co.	15,963.90
2	" D.	" " "	6,412.58
3	Ancora-Atco Bridge No. 46.	L. J. Sieling.	471.47
3	" " " " 174.	L. J. Sieling.	546.65
3	Hammonton-Ancora Bridge No. 46.	L. J. Sieling.	494.05
3	" " " " 172.	L. J. Sieling.	349.05
4	Ballingers Creek Culvert	Cranmer & Parker	177.25
5	Bridge Sta. 3 plus 57.2.	State Labor	3,645.95
5	Bridge Sta. 34 plus 34.	State Labor	8,801.90
5	Bridge Sta. 42 plus 2.5.	State Labor	10,812.10
5	Bridge Sta. 50 plus 61.	State Labor	10,616.26
5	Bridge Sta. 197 plus 00.	State Labor	0
5	Bridge Sta. 214 plus 00.	State Labor	6,265.60
6	Mantua-Woodbury Bridge No. 60.	H. W. Schrimpf & Co.	2,784.91
6	Mullica Hill-Mantua Bridge No. 32.	H. W. Schrimpf & Co.	346.74
6	Mullica Hill-Mantua Bridge No. 33.	H. W. Schrimpf & Co.	1,026.39
6	Mullica Hill Bridge R.	H. W. Schrimpf & Co.	657.08
6	Mullica Hill Bridge No. 35.	Empire Engineering Co.	1,271.07
6	Mullica Hill Bridge No. 69.	Empire Engineering Co.	1,065.58
6	Mullica Hill Bridge No. 70.	Empire Engineering Co.	953.45
6	Mullica Hill Bridge No. 71.	Wedow & Meyers	450.55
8	Bridge No. 20	P. Jannarone	586.00
8	Bridge W	F. W. Schwiars & Co.	10,800.00
8	Bridge W M. P. 42.7.	W. S. Konover	6,545.42
8	Bridge X M. P. 44.1.	W. S. Konover	4,343.83
8	Bridge Y	F. W. Schwiars & Co.	10,382.00
8	Bridge Z M. P. 47-1.	W. S. Konover	4,377.22
9	Bridge R. Sta. 49 plus 25.	State Labor	1,520.95
9	Bridge R 2 Sta. 50 plus 25.	State Labor	2,633.00
9	Bridge O	State Labor	1,584.39
9	Bridge O (Steel)	Selbach-Meyer Co.	549.58
9	Bridge Sta. 144 plus 30.	State Labor	0
9	Bridge Sta. 152 plus 37.	State Labor	0
9	Bridge No. 37	State Labor	2,563.51
12	Bridge M. P. 7.8.	Louis J. Sieling	1,160.00
Total Liability on Bridge Construction.			\$123,872.38

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STATE HIGHWAY COMMISSION

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*Table Number 11***Reimbursement to Counties****Liability as of June 30, 1921**

Route	Section	County	Amount
3	Absecon-Egg Harbor	Atlantic.....	\$420,000.00*
1	Nottingham Way	Mercer.....	68,483.14
9	City of Plainfield	Union.....	65,000.00
Total Liability on Reimbursement to Counties.....			<u>\$553,483.14</u>
NOTE.			

* Estimate of Cost.

Table Number 12

**FEDERAL AID
STATE HIGHWAY CONSTRUCTION**

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Route	Section	Project No.	Federal Aid Certified	Amount Paid to Date	Underrun Canceled	Amount Available
*4	Amboy Bridge	20	\$1,470,798.88	\$ 0	\$ 0	\$1,470,798.88
1	Menlo Park-Rahway	15	71,059.61	69,329.03	1,730.58	0
1	Robbinsville-Hightstown	2	119,800.00	119,800.00	0	0
1	Hightstown-Millstone River	19A	28,800.00	9,391.11	0	19,408.89
*1	Trenton City Line-Nottingham Way.....	22	18,560.00	0	0	18,560.00
2	Roebbing-Bordentown	17A	66,260.00	12,270.19	0	53,989.81
3	Absecon-Egg Harbor	12	197,400.00	47,320.07	0	150,079.93
3	Da Costa-Hammonton	11	81,919.87	75,841.43	6,078.44	0
3	Egg Harbor-Elwood	6	100,072.28	89,804.81	10,267.47	0
3	Elwood-DaCosta	5	65,740.95	57,918.37	7,822.58	0
4	Red Bank-Eatontown	26	47,680.00	0	0	47,680.00
4	Middletown-Betsy Ross Farm.....	4	59,714.81	59,714.81	0	0
6	Woodstown-Mullica Hill	13	144,960.00	40,817.00	0	104,143.00
8	Sussex-Unionville	27	140,600.00	0	0	140,600.00
9	West Portal-Union Township.....	16	42,740.00	12,552.62	0	30,187.38
9	West Portal-Perryville	10	50,047.07	12,473.31	0	37,573.76
12	Phillipsburg-New Village	32A	86,255.21	0	0	86,255.21
13	Kingston-Ten Mile Run.....	14	44,348.91	44,348.91	0	0
13	Three Mile Run-New Brunswick.....	3	76,800.00	40,145.19	0	36,654.81
13	Kingston-Princeton	18	32,960.00	14,337.36	0	18,622.64
*14	Cape May Court House-Swainton.....	24B	75,300.00	0	0	75,300.00
14	Cape May Court House.....	24A	28,300.00	28,300.00	0	0
14	Rio Grande-Wildwood Junction.....	9	57,457.77	52,002.40	5,455.37	0
14	Wildwood Junction-Cape May Court House.....	8	33,395.28	30,924.87	2,470.41	0
3	Ancora-Atco	28A&B	98,940.00	0	0	98,940.00
			\$3,239,910.64	\$817,291.48	\$33,824.85	\$2,388,794.31
* Items for which contracts have not been let.....						1,564,658.88
						\$ 784,135.43
		County	Construction			
Malaga-Pennsgrove Road		1	59,212.68	39,334.37		19,878.31

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STATE HIGHWAY COMMISSION

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*Table Number 13***Accounts Receivable as of June 30, 1921**

State House Commission (Delaware River Bridge).....	\$ 143.21
State Arsenal	1,109.64
Jamesburg Reformatory	300.00
Hauling Tags—Prison	87.00
State House Commission (Hauling Coal).....	387.50
Purchasing Department	393.05
State Prison	1,263.39
Adjutant General	598.69
Institutions and Agencies	13.99
Department of Public Instruction	136.03
Towaco, N. J.	48.80
Public Service Railway Co.	259.25
Trenton & Mercer County Traction Co.....	374.17
Jersey Central Traction Co.....	421.50
Morris Co. Traction Co.....	1,202.00
Jersey City Water Co.....	180.87
Winans Company	9.64
J. C. Doughty	34.70
State House Commission (Ford).....	292.24
Trenton Water Works	75.00
Lawrence Township	165.00
Princeton Township	472.50
O. G. Julian Company.....	222.02
L. J. Sieling Company.....	18.24
Ross & Whelan	67.21
Walter Leslie	5.00
Rahway Reformatory	102.69
City of Bordentown	11,825.35
Borough of Princeton	7,339.41
	<hr/>
	\$27,548.09
Less Credit Balance—H. Wilhelms Sons	514.00
	<hr/>
	\$27,034.09

Table Number 14

**DISTRIBUTION OF EXPENDITURE
STATE ROAD TAX**

July 1, 1920---June 30, 1921

Route	No.	1...	Survey and Engineering Roads	Purchase of Right of Way	Road Construction	Reimburse- ment to Counties	Purchase of Toll Roads	Survey and Engr. of Bridges	Bridge Preliminaries	Bridge Construction	Adminis- tration	Total
"	"	1...	\$ 34,406.60	\$ 580.05	\$ 356,899.95	\$135,575.45	\$ 0	\$ 3,016.72	\$ 0	\$54,144.75	\$10,276.45	\$ 594,899.97
"	"	2...	20,606.06	905.17	293,957.39	0	0	4,670.43	0	75,824.90	6,959.86	402,923.81
"	"	3...	19,578.30	74.00	276,212.66	0	0	268.91	0	15,331.55	5,472.03	316,789.45
"	"	4...	35,535.08	1,795.83	360,632.55	0	0	24,091.90	11,143.15	5,695.81	7,714.45	446,608.77
"	"	5...	20,058.80	10,007.20	174,662.19	90,562.42	0	1,815.48	0	35,023.70	5,837.84	337,967.63
"	"	6...	26,096.40	754.07	387,072.96	0	70,000.00	4,223.51	0	119,493.85	10,680.50	618,321.29
"	"	7...	273.21	0	0	0	0	166.45	0	0	7.70	447.36
"	"	8...	19,411.29	20,168.34	197,309.48	53,631.15	0	4,005.06	0	2,344.00	5,218.72	302,088.04
"	"	9...	17,281.10	2,817.30	92,421.23	0	0	6,150.81	0	65,548.45	3,238.02	187,456.91
"	"	10...	32,458.90	86,544.80	514,613.22	0	0	5,372.09	0	0	11,231.51	650,220.52
"	"	11...	0	0	0	0	0	0	0	0	0	0
"	"	12...	31,883.94	0	1,228.25	0	0	8,733.38	0	3,281.20	793.19	45,919.96
"	"	13...	13,762.89	1,856.16	256,490.64	0	0	63.32	0	5,130.38	4,874.16	282,177.55
"	"	14...	9,081.33	829.47	208,547.64	0	0	702.26	0	0	3,852.19	223,012.89
"	"	15...	502.49	0	0	0	0	923.73	0	0	25.07	1,451.29
"	"	16...	2,975.79	0	0	46,627.76	0	3,380.55	0	11,694.28	1,136.68	65,805.06
			\$283,912.18	\$126,184.39	\$3,120,048.16	\$326,386.78	\$70,000.00	\$67,584.60	\$11,143.15	\$393,512.87	\$77,318.37	\$4,476,090.50

Continued on page 85.

Table Number 14 (Continued)

DISTRIBUTION OF EXPENDITURE STATE ROAD TAX

July 1, 1920—June 30, 1921

Continued from page 84.

PROPERTY			
Automobiles Purchased	\$ 67,786.21		
Depreciation on Automobiles charge.....		\$ 18,433.92	
Camp Buildings	3,472.36		
Depreciation on Camp Buildings.....		9,401.22	
Fernwood Garage	21,528.16		
Dover Garage	15,044.49		
Hammonton Garage	13,963.85		
Beacon Lighthouses (Road).....	1,540.50		
Road Equipment	171,424.29		
Depreciation on Road Equipment.....		33,311.39	
Tools	9,378.90		
Depreciation on Tools		8,162.96	
Trucks	19,925.76		
Depreciation on Trucks		43,802.06	
Total Property Purchased	\$324,114.42		
Less total depreciation charged to routes.....		\$113,111.55	211,002.87
INVENTORY			
Materials, Supplies, Trucks and Automobiles, parts, etc., June 30, 1921.....	31,625.85		
Less inventory June 30, 1920.....	14,533.98		17,091.87
MISCELLANEOUS			
Accounts Receivable June 30, 1921.....	27,034.09		
Less Accounts receivable June 30, 1920.....	2,777.08		24,257.01
Account of 1920 Expenditure paid 1921.....			39,482.49
Receipts from permits 1920 turned over to Maintenance Division 1920.....			932.85
			\$4,768,857.59

*Table Number 15***DIVISION OF MAINTENANCE****Funds**

Cash Balance July 1, 1920.....	\$ 234,334.33
Allotments, year 1920-21.....	1,563,064.23
Borrowed from Road Tax.....	500,000.00
Receipts from openings on State Highway.....	4,071.27
	<hr/> \$2,301,469.83

Disbursements

* July 1, 1920—June 30, 1921.....	<hr/> \$2,137,362.06
Cash Balance	\$ 164,107.77
NOTE—*See distribution of expenditure.	

ASSETS.**LIABILITIES.**

Cash Balance	\$ 164,107.77	Contracts	
		Road Maintenance....	\$ 4,224.68
		Extraordinary repair of	
		Bridges	10,934.60
* Deficit	351,051.51	Loan from Road Tax....	500,000.00
	<hr/> \$515,159.28		<hr/> \$515,159.28

NOTE—* Deficit covered by allotment of 1921-1922 Motor Vehicle Funds.

*Table Number 16***SCHEDULE OF CONTRACTS****Liability as of June 30, 1921****Road Maintenance**

Route	Section	Contractor	Amount
No. 1	1 A	Utility Construction Co....	\$ 2,930.00
No. 4	A	C. H. Winans.....	1,294.68
Total liability on Road Maintenance.....			<hr/> \$ 4,224.68

Extraordinary Repair of Bridges

Route	Bridge	Contractor	Amount
No. 5	Drawbridge N.	L. D. Steel.....	\$ 5,655.00
No. 4	Amboy Bridge	G. Wickberg	1,704.60
No. 12	Bridge No. 145.....	Broadhurst Co.	3,575.00
Total liability on Extraordinary Repair of Bridges.....			<hr/> \$10,934.60

Table Number 17
MAINTENANCE DEPARTMENT
DISTRIBUTION OF EXPENDITURE
July 1, 1920---June 30, 1921

		Maintenance and Betterment of Roads	Repairs of Detours	Pole Painting	Snow Removat	Scales	Total
Route No.	1.....	\$ 246,726.56	\$ 6,410.43	\$ 642.47	\$15,767.37	\$ 0	\$ 269,546.83
" "	2.....	105,056.30	0	0	3,608.98	0	108,665.28
" "	3.....	31,261.56	0	96.79	1,486.08	0	32,844.43
" "	4.....	212,283.46	8,639.17	634.86	5,759.80	0	227,317.29
" "	5.....	141,618.33	0	472.70	6,833.45	0	148,924.48
" "	6.....	59,075.99	1,436.51	0	1,339.51	0	61,852.01
" "	7.....	72,590.54	0	0	8,557.79	0	81,148.33
" "	8.....	79,626.73	0	0	3,637.89	0	83,264.62
" "	9.....	213,539.86	0	81.80	9,567.25	0	223,188.91
" "	10.....	66,331.78	0	0	3,775.41	0	70,107.19
" "	11.....	0	0	0	0	0	0
" "	12.....	132,963.33	0	490.45	3,931.76	0	137,385.54
" "	13.....	60,662.07	113.56	0	3,098.62	0	63,874.25
" "	14.....	44,959.79	0	0	140.09	0	45,099.88
" "	15.....	40,328.31	0	0	4,412.51	0	44,740.82
" "	16.....	167,640.38	0	0	11,092.24	0	178,732.62
Scales		0	0	0	0	18,760.65	18,760.65
Glen Gardner Sanitorium Road.....		9,015.04	0	0	0	0	9,015.04
Woodbury Avenue		26,233.52	0	0	0	0	26,233.52
Totals		\$1,709,913.55	\$16,599.67	\$2,419.07	\$83,008.75	\$18,760.65	\$1,830,701.69

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Continued on page 88.

Table Number 17 (Continued)

**MAINTENANCE DEPARTMENT
DISTRIBUTION OF EXPENDITURE**

July 1, 1920—June 30, 1921

Continued from page 87.

	Repair of Bridges	Extra- ordinary Repair of Bridges	Operation and Maintenance of Draw Bridges	Total	Total Expenditure for Roads and Bridges	Adminis- tration	Final Total
Route No. 1.....	\$ 316.00	\$ 0	\$2,117.62	\$ 2,433.62	\$ 271,980.45	\$ 4,778.70	\$ 276,759.15
" " 2.....	1,109.21	0	2,519.07	3,628.28	112,293.56	1,973.00	114,266.56
" " 3.....	26.57	0	0	26.57	32,871.00	577.54	33,448.54
" " 4.....	12,203.57	162,784.94	41,489.24	216,477.75	443,795.04	7,797.48	451,592.52
" " 5.....	624.43	0	0	624.43	149,548.91	2,627.57	152,176.48
" " 6.....	180.40	0	0	180.40	62,032.41	1,089.91	63,122.32
" " 7.....	5,806.66	3,299.33	0	9,105.99	90,254.32	1,585.77	91,840.09
" " 8.....	3,201.45	0	0	3,201.45	86,466.07	1,519.21	87,985.28
" " 9.....	399.18	0	0	399.18	223,588.09	3,928.44	227,516.53
" " 10.....	399.76	6,200.39	7,212.07	13,812.22	83,919.41	1,474.46	85,393.87
" " 11.....	0	0	0	0	0	0	0
" " 12.....	1,138.15	0	0	1,138.15	138,523.69	2,433.86	140,957.55
" " 13.....	2,354.30	0	0	2,354.30	66,228.55	1,163.64	67,392.19
" " 14.....	368.74	2,018.85	656.41	3,044.00	48,143.88	845.89	48,989.77
" " 15.....	2,883.28	3,593.22	1,401.78	7,878.28	52,619.10	924.52	53,543.62
" " 16.....	2,299.44	0	0	2,299.44	181,032.06	3,180.75	184,212.79
Scales	0	0	0	0	18,760.65	329.62	19,090.27
Glen Gardner Sanitorium Road	0	0	0	0	9,015.04	158.39	9,173.43
Woodbury Avenue	0	0	0	0	26,233.52	460.92	26,694.44
Island Heights Seaside	0	0	684.15	684.15	684.15	12.02	696.17
Manahawken-Long Beach	0	1,777.91	689.23	2,467.14	2,467.14	43.35	2,510.49
Totals	\$33,311.14	\$179,674.64	\$56,769.57	\$269,755.35	\$2,100,457.04	\$36,905.02	\$2,137,362.06

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*Table Number 18***STATE HIGHWAY DEPARTMENT****Recapitulation of Accounts****Total Funds July 1, 1920---June 30, 1921**

State Aid, Balance forward from previous year.....	\$ 1,161,318.14
State Aid Appropriation, year 1920-21.....	500,000.00
Essex Co. Reimbursement Appropriation 1920-21.....	25,000.00
Motor vehicle fund, balance forward from previous year.....	2,750,745.70
Motor vehicle fund receipts, 7/1/20—6/30/21.....	4,069,475.97
Maintenance by State Highway Dept. balance forward from previous year	234,334.33
State Road tax, balance forward from previous year.....	4,437,215.61
State road tax receipts	3,569,725.97
Federal aid certified on State Highway Construction, balance for- ward from previous year	965,556.90
Federal aid certified year 1920-21.....	367,950.36
Federal aid certified on County roads, balance forward from previous year	34,357.40
Receipts from permits for openings in State Highway.....	4,071.27
	<hr/>
	\$18,119,751.65

Total Liability as of June 30, 1921

State Aid Appropriation (Counties)...	\$1,073,828.11
Motor Vehicle Fund (Counties).....	2,072,068.13
State Highway Construction (Con- tracts)	\$3,293,233.58
Less Amount Recoverable on Klockner & Black Contract	\$6,671.50
	<hr/>
	3,236,562.08
Maintenance by Dept. (Contract).....	15,159.28
	<hr/>
	6,397,617.60

Total Expenditure July 1, 1920---June 30, 1921

State Aid Appropriation, to Counties..	\$ 480,934.27
Essex County Reimbursement	25,000.00
Motor Vehicle Fund to Counties.....	3,081,454.32
Maintenance by State Highway Dept...	2,137,362.06
State Highway Construction.....	\$4,259,485.76
Less expenditure on account of Ac- counts Rec.	27,034.09
	<hr/>
	4,232,451.67
Federal Aid, State Highway Construc- tion	509,371.83
Federal Aid, County Construction.....	14,479.09
General Road Fund, Administration of Appropriation	175,000.00
	<hr/>
	10,656,053.24

Total Balance Available

State Aid Appropriation	\$ 31,555.76
Motor Vehicle Fund	3,634.99
Maintenance by State Highway Department Deficit.	351,051.51
State Road Tax	537,927.83
Federal Aid, State Highway Construction.....	824,135.43
Federal Aid, County Road Construction.....	19,878.31
	<hr/>
	1,066,080.81
	<hr/>
	\$18,119,751.65

PERSONNEL DIVISION REPORT

The payrolls for the year 1920-1921, summary of which is attached hereto, show an average employment throughout the year of 422. During this year there was an average employment of 15 each month, and an average layoff, resignation, etc., of 38. The turnover has been approximately $12\frac{1}{2}$ per cent., or one out of every eight employed.

The system used in the operation of the personnel records has worked out very satisfactorily during the past year, so that there was very little inconvenience caused employees in the time ensuing between the date of employment and the issuance of the first pay check.

NUMBER OF EMPLOYEES EACH PAYROLL

July 1, 1920—June 30, 1921.

	First Half	Second Half
July	595	581
August	574	550
September	519	497
October	487	450
November	444	359
December	359	345
January	340	320
February	317	314
March	316	318
April	362	398
May	404	414
June	436	437

Average monthly employment, 422.333.

A new departure in the methods pursued in acquainting the employes of the State Highway Department with advancements made in road building, was the holding of a Highway Convention, during the past winter. This was arranged at the suggestion of State Highway Engineer Thomas J. Wasser, and in connection there was held a Materials Exhibit at the Chemical Laboratory. On account of the wide interest shown, four days were set aside for this convention, February 23 to 26, 1921 (inclusive), and county road authorities and highway contractors were the invited guests.

Interesting papers were read, and discussions held. A complete program of the Convention follows:

STATE HIGHWAY COMMISSION

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PROGRAM

WEDNESDAY, FEBRUARY 23, 1921

Presiding,

GEORGE L. BURTON,

Chairman of Highway Commission.

A. M.

- 9:30 "Address of Welcome," COLONEL W. F. WHITTEMORE.
10:00 "Highway Program for 1921," T. J. WASSER, State Highway Engineer.
11:00 "What Our Engineers and Inspectors Can Do Towards Helping to Successfully Complete the 1921 Program," C. F. BEDWELL, Construction Engineer.

P. M.

- 1:30 "The Proper Spirit of a Highway Organization," CHARLES M. UPHAM, Chief *Engineer*, Delaware State Highway Department.
2:30 "Impact Tests on Pavement Surfaces," PROVOST HUBBARD, Chemical Engineer, Asphalt Association, New York City.
3:30 "Solving of County Road Problems," MR. BRAY, Mercer County; MR. BERGEN, Monmouth County.
6:30 Dinner at Hildebrecht's, 19 West State Street.

THURSDAY, FEBRUARY 24, 1921

Presiding,

E. E. REED

A. M.

- 9:30 "Methods Used in the Mining and Purification of Sand," N. PERRY EDMUNDS, Norcross & Edmunds, Sand Producers, Philadelphia, Pennsylvania.
10:30 "Conditions Imposed by Specifications That Increase the Cost of Broken Stone," F. W. SCHMIDT, Morris County Crushed Stone Company, Morristown, N. J.
11:30 "Relations Between State Highway Inspectors and County Authorities," JAMES LOGAN, Burlington County Engineer.

P. M.

- 1:30 "Causes and Preventions of Delays in Highway Construction," JOHN M. KELLY, President New Jersey State Highway Contractors' Association.
2:30 "The Proper Selection of Lumber and Timber for Highway Structures," ROBERT MCKNIGHT, Anderson Lumber Company, Passaic, New Jersey.
3:30 "Benefits Secured by Reinforcing Concrete Pavements," H. W. WHITMAN, National Steel Fabric Company, Philadelphia, Pa.
4:30 "Different Phases in the Construction of a Concrete Pavement," as shown by the "movies."

FRIDAY, FEBRUARY 25, 1921

Presiding,

COLONEL W. F. WHITTEMORE.

A. M.

- 9:00 "Proposed Methods of Approving Materials for the 1921 Program," R. B. GAGE, Chemical Engineer.
- 9.45 "The Proper Application of Liquid Bitumens," W. F. FULWEILER, U. G. I. Contracting Company, Philadelphia, Pa.
- 10:30 "The Importance of Keeping Systematic Records Relative to Materials Used and Construction Details," J. G. BRAGG, Senior Testing Engineer.
- 11:15 "Detailed Construction of Bridges," CHARLES A. MEAD, Chief Engineer, Division of Bridges and Grade Crossings, Public Utilities Commission, Newark, New Jersey.

P. M.

- 1:30 "Methods Used in Testing Highway Materials," H. S. MATTIMORE, Engineer of Tests, Pennsylvania State Highway Department.
- 2:30 "Improvements During 1920 in Portland Cement Concrete Pavement Construction," MR. L. N. WHITCRAFT, Portland Cement Association, New York.
- 3:30 Inspection and Examination of Highway Materials.

The attendance at this convention exceeded all expectations there being about 400 present on several occasions.

The social end of the convention was taken care of by the Highway Dinner, at Hildebrecht's Restaurant, Trenton, on the first night of the convention. Close to 300 members of the department were in attendance. The affair was voted a tremendous success and a great step toward establishing closer friendship between State Highway officials and employees.

Still another, and probably, the most important feature of the convention was the formation of the State Highway Association, composed entirely of employes of the Department, with the Division Heads constituted as a Governing Board. Officers were elected by popular ballot as follows: A. W. Muir, President; W. A. Johnson, J. L. Vogel, Willard Emmons, G. R. Moore, William J. McGovern, and H. D. Robbins, Vice-Presidents, and Edward W. O'Brien, as Executive Secretary. The formation of this Association will bring to its members a state of mutual understanding and the spirit of loyalty to a common purpose.

Respectfully submitted,

CHARLES FISHBERG,

Asst. Chief Clerk.

PURCHASING DIVISION REPORT.

The work of Purchasing has for the past fiscal year been done under the supervision of the Chief Clerk by a Purchase Clerk and two stenographers and the results secured have been very satisfactory. The results secured are not due entirely to the efforts of the Purchasing Division but through the hearty cooperation received from the various Divisions of the Department.

A large percentage of the materials to be used during the construction season can be estimated fairly close during the winter months preceding the season in which they will be used and when the requirements for the various jobs are known they are totalled and bids on the materials are invited. Contracts are drawn with the various successful bidders and the materials are delivered only when covered by a purchase order.

It is, however, impossible to judge exactly the quantity of materials which will be used. As in every line of endeavor there are certain unforeseen occurrences which must be given immediate attention, in road work especially, in order to prevent adverse criticism from the public in general. When it is necessary to buy materials for a job of this kind the order is given to the dealer supplying like materials under contract near the point at which the emergency materials are required. This is covered by a clause in the contract which allows a 20 per cent. increase or decrease from quantities specified in contract.

The powers of the Purchasing Division of the Highway Department are limited to include only such materials as are used in road construction. Other materials, such as office and surveying supplies and equipment, automobile and truck tires, etc., are purchased by the State Purchasing Agent. This arrangement is entirely satisfactory and could not very well be improved upon, since the two departments work entirely in harmony.

During the past fiscal year (July 1, 1920, to June 30, 1921) there has been 1,463 purchase orders placed by the Highway Department. The table below gives an idea of how the above orders were distributed as well as showing the relative quantities of materials used:

52,710 tons of stone (trap rock).....	were covered by 248 orders
20,483 tons of slag.....	" " " 58 "
26,960 tons of sand and gravel.....	" " " 30 "
5,623 tons of bituminous concrete.....	" " " 26 "

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258,150 gals. of asphalts and oils.....	“	“	“	64	“
573,510 gals. of tar.....	“	“	“	50	“
20,728 barrels of cement	“	“	“	13	“
34,533 feet of miscellaneous pipe.....	“	“	“	23	“
702 tons of coal.....	“	“	“	18	“
Miscellaneous materials (truck repair parts, lumber, etc).....	“	“	“	933	“

Respectfully Submitted,

R. W. WILDBLOOD,

Purchase Clerk.

CHEMICAL ENGINEER'S REPORT.

Mr. T. J. Wasser, State Highway Engineer.

Dear Sir:—

GENERAL

The various highway materials and pavement samples tested for the Highway Department during the past fiscal year were analyzed in the same laboratory as in previous years, which belongs to the Department of Conservation and Development. Most of the special equipment needed for these tests were purchased by the State Highway Commission, and the extra employes needed to perform this work have been carried on the pay-roll of the State Highway Commission.

THE LABORATORY ORGANIZATION

Responsibility for the proper function of the laboratory organization is centered in the Chemical Engineer, who is chief of the laboratory force and a member of the Department of Conservation and Development, and primarily responsible to that department. However, in order to facilitate the work done for the Highway Department, he had been authorized to deal directly with the State Highway Engineer and not through the head of his own department.

Tests required on such materials as Portland cement, sand, stone, gravel, brick, etc., are classified as "physical", and are made under the direction of the Senior Testing Engineer, while the tests required on such materials as asphaltic cements, oils, tars, bituminous pavements, lignin binders, etc., are classified as "chemical", and come under the jurisdiction of the Senior Testing Chemist. Both of these officials have assistants such as testing engineers and chemists, junior testing engineers and chemists and laboratory assistants.

PERSONNEL

The number of employes under the direction of the chief of the laboratory naturally depends upon the amount of work the laboratory is called upon to perform for the various State Departments with which it cooperates. During the construction season or summer months, the number of the laboratory force employed in highway work ranged from thirty to thirty-five and about one-half that number during the

winter months or non-construction season. Those temporarily employed are chiefly the material inspectors. In general, during the construction season, the laboratory force was made up as follows: Chemical Engineer, Senior Testing Engineer, Senior Testing Chemist, two testing engineers, two junior testing chemists, two laboratory assistants, three stenographers, file clerk, materials classifier and recorder, janitor and eighteen material inspectors.

The material inspectors of the Highway Department have, by order of the State Highway Engineer, been placed under the direction of the chief of the laboratory, and are regarded as part of the laboratory force. These men are not stationed in the laboratory but are located at points of production or shipment of such materials as cement, stone, gravel, sand, asphalt, etc. Their duties are to inspect and approve for use all highway materials before shipment and should be so qualified as to be able to make such preliminary tests as may be necessary to properly judge the quality of the materials being inspected. During the winter months, when very little construction work is being done, many of the construction inspectors and their assistants, who work directly under the district engineers, have been detailed to the laboratory for instructions and training in method of inspection and testing.

EQUIPMENT

The Testing Laboratory is equipped to test practically all materials used in highway construction. It occupies all the floors of a four-story building, which was designed for this particular purpose. It appears to be the general opinion of the different Government and State officials, who have inspected the laboratory, that it is one of the best designed and equipped laboratories for highway work, seen by them to date.

All of the equipment required by the Highway Inspection Force in the field is supplied by the Laboratory. This equipment usually consists of sieves, molds, thermometers, etc., which are needed for making the necessary field tests.

The principal items of equipment possessed by the Laboratory consist of: two Tinius Olsen testing machines—one of 300,000 pounds capacity and the other 20,000 pounds capacity, a ductility machine, a De Val abrasion machine, a Talbott-Jones rattler, a brick rattler, a Dorey Hardness machine, a Page cementation machine, a Page Impact machine for determining toughness, a large drying oven, a steaming

oven, four Freas electric ovens, a Freas constant temperature water thermostat, a Tyler sand shaker, three mechanical sand shakers, two Olsen briquette testing machines, a bitumen extractor for extracting bitumens from bituminous concrete pavements, a Brown pyrometer, an Emerson coal colorimeter, a water still of five gallons capacity per hour, a large copper steam bath, a lap grinder and saw for preparing stone specimens, a ball mill, six sets of brass sieves, four analytical balances, a Westphal balance, twelve cast iron cylinders, six abrasion molds, six cube molds, a soapstone curing closet, platinum crucibles and many other items of equipment.

A Calyx core drill was also purchased during the past fiscal year and becomes a part of the Laboratory equipment.

FUNCTIONS OF THE LABORATORY IN RELATION TO STATE HIGHWAY WORK

The laboratory performs several distinct kinds of services for the Highway Department. It inspects, tests and approves for use all materials used in highway construction; it tests and approves or rejects all pavements and pavement foundations constructed; it supervises and inspects the preparation of all bituminous pavements; it helps to supervise the preparation and construction of concrete pavements and foundations and maintains a constant supervision over the quality of the concrete thus produced; it investigates failures in materials and pavements and determines their causes; it carries on experiments to develop better methods of construction; it trains not only its own workers but gives considerable time during the winter months to instructing men in the other divisions.

The fundamental purpose of all the laboratory work done for the Highway Department is to secure better roads than can be built without such help. The real object of the laboratory is to assure that all materials used and pavements constructed are of the specified quality. To secure this desired end, a complete cooperation of the field and laboratory forces is necessary.

The laboratory should be equipped and its force so qualified as to be able to promptly and correctly test all samples received. The field force must also be able to correctly interpret the reports received from the laboratory and to know when approved materials are being correctly used; otherwise, errors in construction are sure to occur and the work of the laboratory is more or less wasted.

If first class work is to be secured, the use of inferior materials or methods of construction must be prevented. The methods of testing and inspecting must be such as to prevent the use of poor materials. But this is not sufficient, the work of the laboratory is not finished when the materials have been tested and approved. To secure the best results, these materials must be used in the proper manner. It is one of the functions of the laboratory to see that the approved materials are properly used. However, it is just as important to have approved materials used in the proper manner as it is to prevent the use of inferior grades of materials. Consequently, it is also one of the duties of the laboratory to see that these materials are used in the manner specified and the pavements prepared therefrom have the required composition, density, etc.

If the maximum amount of benefit is to be secured from the materials specified to be used, it is necessary that the specifications require them to be used in such a manner that the pavement produced therefrom will give the maximum amount of service. The quantity of each material thus specified to be used in preparing the different pavements is usually determined by laboratory tests previous to the preparation of the specifications. Consequently, the work of the Laboratory is not limited to testing materials or pavements to see if they comply with the requirements of the specifications, but it is also one of its functions to make sure that the specifications themselves are so prepared that first class work will be secured.

Experience has shown that unfortunately there is often quite a difference in quality between the pavement expected as defined by the specifications and the pavement which is secured. It is then the function of the laboratory to determine wherein the pavement does not comply with the requirements of the specifications and the cause or causes responsible for this departure. Experience has demonstrated that the interest of the State is protected better by preventing mistakes from happening than to correct them after the damage has been done.

OBSTACLES TO MORE PERFECT SERVICE

The chief obstacle to more successful work is inability to secure a sufficient number of trained and trustworthy assistants. Some of the force, notably the material inspectors, are not continuously employed, but are laid off during the winter months when construction work is at a minimum. Under these circumstances, it is not possible to main-

tain a trained and experienced force of men in these positions, and yet since they are stationed at points of shipment of materials, their work has to be done without direct supervision. Every effort has been made to find competent men for these places, and to instruct them properly in their duties, but the fact remains that, owing to the conditions of employment, thoroughly trained, reliable men cannot be obtained in sufficient numbers at the salaries paid. In other words, in positions where men who can be depended upon are most needed, it has been necessary to use men who, through lack of experience and training in this particular field, were not wholly reliable.

In the laboratory itself matters are on a somewhat better basis. The chief assistants are thoroughly trained and experienced men, and, while it has often been difficult to obtain other workers with the necessary experience, yet it is possible to exercise close supervision over their work. The results of all tests are carefully checked by the Senior Testing Engineer and Testing Chemist, or by the Chemical Engineer himself, so that there is assurance that the results are correct.

The instruction, which it has been possible to give the construction inspectors and their assistants during the brief period they have been detailed to the laboratory during the winter, has been far from adequate, and the result has been that many of these men are not as well qualified to supervise the construction of concrete or bituminous pavements as they should be.

Two methods can be adopted in recruiting a corps of technically trained workers. One is to select men, who have already acquired the necessary knowledge and skill in other places and, by the payment of larger salaries or offer of more congenial conditions of employment, attract them from their present positions. This method, of course, can only be followed where there already is a body of experienced men which can be drawn upon and when adequate salaries can be paid. The other method is to build up gradually a corps of workers by taking technical training in the laboratory itself. Both methods have advantages and disadvantages. Both have been tried to some extent in recruiting a force to handle the State highway work. The disadvantages of too large a dependence on the second method is that important work has to be placed in the hands of beginners. During this period, there is great chance for error, and errors in road-building are expensive. A single such mistake made by an improperly trained man, placed in a position he is not qualified to fill because no better man is available,

may easily entail a loss of \$5,000 to \$10,000 per mile in an improperly constructed pavement. Moreover, the training of an inexperienced man takes the time and energy of an older employe and by so doing reduces his efficiency so that it is expensive from almost any standpoint.

But, since it is probably necessary, in part at least, to build up an efficient force by training beginners in spite of the accompanying risk of mistakes, the loss of time by superiors in giving instruction and the general lower efficiency of the organization as a whole, common sense should dictate that reliable men once trained should be held in the department.

Experience has shown that not over fifty per cent. of the men originally employed in these positions will develop the desired ability and character. Therefore, when good men are once secured, the salaries paid and conditions of employment should be such as to retain their services. Otherwise, the department becomes only a training school from which the good men will continually graduate into employments where their pay is commensurate with their abilities and only the mediocre men will be left.

That this condition is real and not fanciful is shown by the fact that some of our best men have left to enter private employment and that several county engineers have preferred to contract with private firms for testing and inspection on state aid roads, rather than use the State inspectors, the contention being that the inspectors, detailed by private firms to the supervision of a job, are better trained and more competent than those employed by the State. It should be noted that this criticism is directed, not against the quality of the work done in the laboratory, but to the inspection in the field. The testing and inspection force of the State should be maintained at a standard as high as that of any private firm.

It is the intention of the Highway Department that only materials which comply with the specifications shall be used and that the work shall be done and the pavement completed according to the contract. The laboratory makes a serious effort to check all materials before use. Samples are also taken of the pavements constructed and their character determined. A material is seldom approved for use until its source of supply or deposit has been inspected and approved. This has been found essential for a producer is inclined to select a sample for approval from the best part of the deposit; consequently, future shipments may be of an inferior quality and the work delayed by their rejection.

After the quality of a material has once been determined, it is often possible to judge the quality of subsequent shipments by their appearance or by a few field tests. This is particularly true of such materials as sand, stone, gravel, etc. Consequently, material inspectors were placed at the source of supply or point of shipment of these materials. It has been their duty to pass upon shipments intended for use in any State or State Aid contracts. However, the character of such materials as Portland cement, asphaltic cement, asphaltic oils, tars, etc., cannot be thus judged and must be determined by laboratory tests. In the latter case, the material inspectors secure a sample from each shipment and forward it to the laboratory with the necessary data regarding the shipment. As a general rule, the tests are completed on these samples before the shipment arrives at its destination. Consequently, construction work is seldom delayed awaiting the results of the laboratory tests.

The material inspectors have in most cases been furnished with sufficient field equipment to permit them to make the tests necessary to roughly estimate the quality of the material being examined. These inspectors should be thoroughly familiar with the materials being inspected, the intended use thereof and the proper methods to follow in making the field tests. Unfortunately, men of this caliber have not always been secured and some trouble was experienced during the past year because these men were not properly qualified to perform the duties required.

During construction, samples were taken at regular intervals of both bituminous and concrete pavements. In the former case, a sample is cut from the completed pavement and forwarded to the laboratory. This sample is analyzed and its composition definitely determined. In the latter case, concrete cubes are cast at frequent intervals as the pavement is being constructed. These cubes, after being cured in the field for a definite period, are forwarded to the laboratory and their strength and general character determined. By this method of testing, a fairly definite record is secured of the manner in which the pavements are being constructed from day to day, which makes it possible to correct quickly any errors in construction or exclude from use any materials which have not given the required results.

QUANTITY OF WORK PERFORMED

The number of samples tested or number of determinations made in the laboratory do not represent the whole work done. The time spent in securing samples, in inspecting deposits in the field, in checking the work of road inspectors to determine whether the different ingredients were being used in the quantity and manner specified, is not measured by the number of determinations made in the laboratory. Since these field inspections necessitate travel to different parts of the State, more time is often consumed thereby than is spent in making the laboratory tests themselves.

The number of samples tested for the Highway Department in the laboratory during the past year is given in the following table:

Portland Cement	1690	Samples
Stone	302	"
Concrete Sand	452	"
Bituminous Sand	30	"
Concrete Gravel	186	"
Road Gravel	123	"
Concrete Cubes	567	"
Asphaltic Cements	127	"
Asphaltic Oils, Tars.....	261	"
Bituminous Pavement and Mixtures.....	231	"
Mineral Fillers	23	"
Slag	120	"
Paving Blocks	29	"
Coals	46	"
Pipes	10	"
Steel	7	"
Miscellaneous Materials	25	"

RELATIVE COST OF THE HIGHWAY TESTING WORK

The cost to the Highway Department of the laboratory testing work performed for it, as carried on the books of that department, includes some items usually charged to engineering. These are chiefly the salaries and expenses of the material inspectors who were placed under the direction of the Chief of the Laboratory. This item nearly doubles the amount charged against the laboratory.

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It is very difficult to determine the cost of inspecting and testing on each contract either as a lump sum or unit of pavement laid, for each employe is frequently engaged in sampling and testing materials for several contracts at the same time. Neither will the average cost of this work be correctly shown if figured on the unit or lump sum cost of any one given contract since the cost will vary with the quantity of work then under construction. The salaries of the permanent employes must be paid regardless of the quantity of construction work being performed.

A more satisfactory basis is a comparison of the cost of the laboratory service with the amounts spent in road construction and maintenance during a normal period. During the past fiscal year, the cost to the Highway Department of the laboratory work in all its branches was seven-tenths (0.7) of one (1) per cent. of the total money expended in road construction, bridges and maintenance.

Whether measured by actual money or by benefit secured, the cost is small. If the life of the pavements, built in any season, be increased only one year as a result of the work of the laboratory force, the saving thus effected will amount to several times the cost of laboratory service for that period. In some instances, this work has doubled the life of a pavement. The money spent in constructing, equipping and maintaining the laboratory, has been returned to the State several times in highway work done.

The work of the laboratory along another line has also resulted in considerable saving to the State.

A survey has been made of the road-building materials within the State or adjacent thereto. In many cases, suitable materials have been located close to the line of proposed new work. Unsuitable material has been eliminated. The general conditions governing the shipping facilities of approved materials have been carefully determined. These facts are at the disposal of contractors preparing to bid on any contract. As a result, lower bids have been received than when the contractors were more or less ignorant of where materials, which would pass the specifications, could be obtained. The elimination of certain grades of materials, which have been demonstrated to be of inferior quality, has resulted in a great improvement in the character of the completed work. Materials and methods of use are now so well standardized that the causes producing failures must be sought elsewhere than in the materials.

CALYX CORE DRILL TESTS

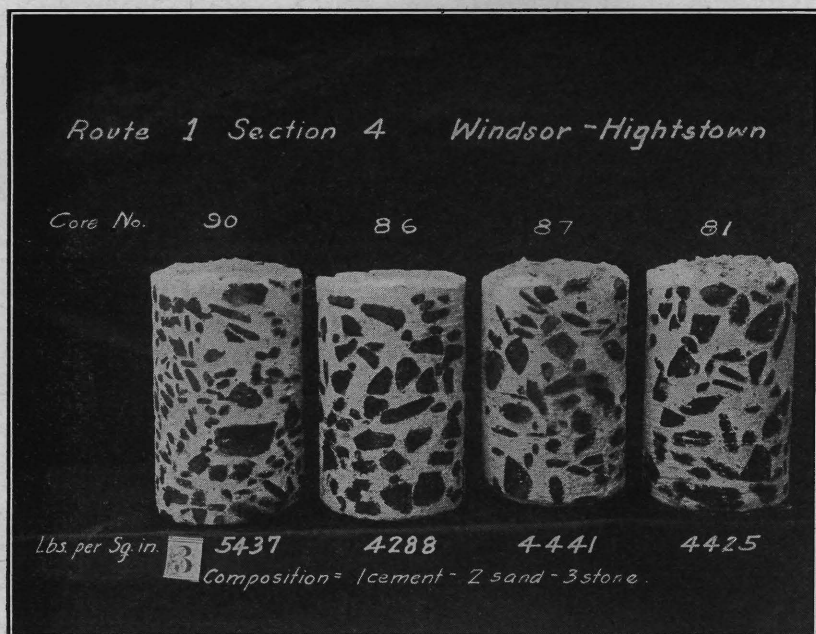
There has always been a certain amount of doubt regarding the value of the concrete cubes during the construction of concrete pavements and foundations for testing purposes. Statements have been made that these cubes represent only the batch of concrete from which they were taken; consequently, the quality of a concrete pavement or foundation cannot be judged from the limited quantity of concrete thus represented and that no concrete should be rejected on account of not having the required strength as determined by these cubes. If this is a fact, it must be admitted that each concrete pavement or foundation is composed of almost as many varieties of concrete as batches were prepared in its preparation. This we know is not the case for it is not uncommon to have at least ninety (90) per cent. or more of the concrete in some of the pavements of practically one composition.

In order to remove all doubt regarding the real character of the concrete pavements or foundations constructed, a Calyx core drill was purchased with which it is possible to easily cut cores from the different concrete pavements or foundations. From these cores the thickness of the concrete and its general character can easily be secured. In addition, the general character, stability and drainage conditions of the subgrade can be determined.

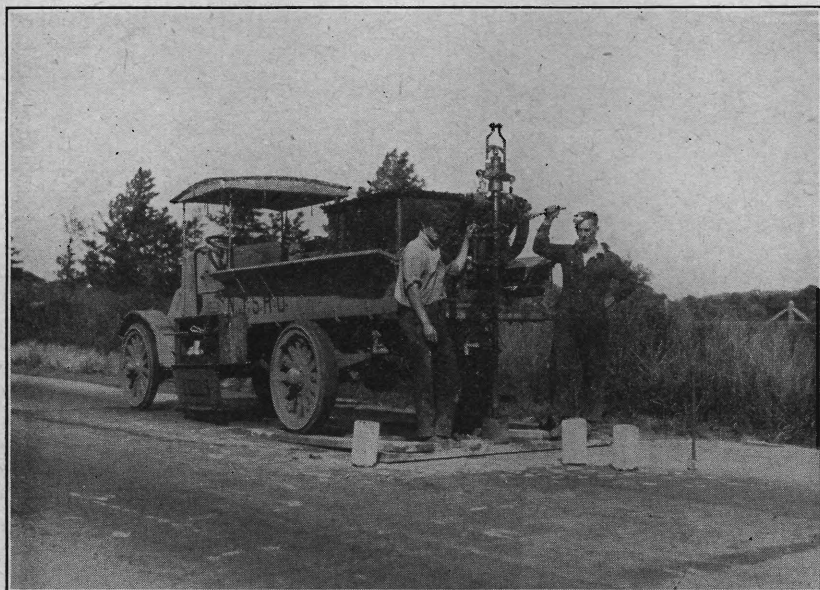
There is much difference of opinion among engineers as to proper formula to use in constructing concrete foundation, although the engineering reasons for using a particular composition are seldom given. The fact that a concrete base of a given composition has not "blown up" or been crushed into the subgrade by travel is no proof that it is the best mixture to use when first cost, strength, durability and maintenance are considered. The fact that a better type of base might add years to the life of the surface pavement is seldom taken into consideration.

In order to abolish this doubt regarding the general character of bases to use for the different purposes, the department intends to have cores taken from the different types of bases throughout the State, and their general character definitely determined.

The results secured to date with the core drill have been satisfactory as well as beneficial. In some instances, it was found that a considerable quantity of material was wasted by not having the subgrade at the proper elevation; in other cases, the concrete was found to be deficient in thickness; again, the damage that has been done con-



CORES OF PAVEMENT STATE HIGHWAY ROUTE NO. 1—BETWEEN WINDSOR AND HIGHTSTOWN.



CALYX CORE DRILL, DRILLING CORES FOR TEST PURPOSES.

crete by the subgrade material getting mixed with the concrete was not generally realized until the pavements were tested with the core drill. Further, when local defects appear in the pavements, it is possible with the drill to quickly determine the causes producing them.

The work done to date with this drill has demonstrated to the contractors that it is very risky to construct concrete pavements or foundations that are deficient in strength or not of the required thickness. The specifications define both of these points, but, in the past, it has been very difficult to check up the thickness of a concrete pavement or foundation; also, when the strength or quality of the concrete was questioned, every effort was made to condemn the methods used in determining these factors. The inability of the Department in the past to definitely determine these points regarding the concrete, naturally made it easy for unscrupulous contractors to lower the quality of their product or reduce the quantity of the concrete when their net profits could be increased thereby. With this drill, it is possible to determine the thickness of the concrete constructed and no question can be raised regarding the quality of the core secured since it was taken from the body of the concrete and is not a laboratory sample. The effects of this method of sampling and testing pavements is already shown in the improved quality of the concrete secured this season over that of previous years.

Again, with the aid of this drill, some of the irregularities in construction that have caused premature failures in the past have been determined. It has thus been found much easier to prevent their recurrence.

So far, over three hundred cores have been cut from the different concrete pavements and foundations. Each core thus secured has been numbered, photographed, its general character, density, strength, etc., determined. The data thus secured, taken in conjunction with the actual service given by the different pavements, makes it possible to easily select the character of concrete to use that will give the maximum amount of service for the money expended; consequently, the determining factor in the selection of the type of concrete to use should no longer be a matter of guess or personal prejudice.

EXPERIMENTAL WORK

If progress is to be made, in almost any enterprise it is necessary to do a certain amount of experimental work. In road construction,

this kind of work can usually be done in the laboratory on a small scale for a fractional part of the cost required to do it in the field. The results thus secured are usually sufficient to demonstrate whether the experiment has any merits or not.

In this connection, the laboratory always has under execution a certain volume of experimental work. Some of the tests extend over a period of a year or more, while others are completed in a couple of weeks. The most of this work is usually done during the non-construction season; i. e., during the winter and early spring months.

Several members of the laboratory force belong to different engineering and chemical societies, which are endeavoring to prepare standard specifications for the different materials and methods used in road construction. The laboratory is called upon to do a certain amount of experimental work to assure that the specifications being thus prepared conform with the standards adopted for use by the Highway Department.

Respectfully submitted,

R. B. GAGE,

Chemical Engineer.

APPENDIX "A"

STATE HIGHWAY COMMISSION

Rules and Regulations

"A" MEETINGS OF THE COMMISSION—

1. *Stated Meetings:*

Stated meetings of the Commission will be held regularly on the first Wednesday of each month at Trenton, New Jersey, and on such other Wednesdays as may be called.

2. *Special Meetings:*

Special meetings may be called at any time by the Chairman, on request of the State Highway Engineer, or of any two members of the Commission. In the absence or disability of the Chairman, Special Meetings may be called by any three members of the Commission.

The call for any Special Meeting must be in the hands of the Secretary three days before the date and hour specified in the call for such special meeting.

3. *Place of Meeting:*

All meetings shall be held at the State House, unless otherwise specified in the call.

4. *Order of Business for Stated Meetings:*

Reading of the minutes.

Report of the Executive Committee.

Report of the State Highway Engineer.

Report of the Special Committees.

Unfinished Business.

New Business.

All hearings are to be held at first meeting of each month.

5. *Order of Business for Special Meetings:*

Consideration of the subject named in the call.

Other Business.

"B" EXECUTIVE COMMITTEE—

The Chairman shall appoint an Executive Committee composed of three members of the Commission. The duties of the Executive Committee will be divided as follows:

1. To consider and recommend to the Commission for its action the allotment of funds: 1st, money derived from the State Road Tax; 2nd, from State Aid; 3rd, from the Motor Vehicle Fund.

2. Consider changes in alignment and grades for highway routes.

3. Approve plans and specifications prior to action by the Commission.

4. Vise all contracts and modifications that may be subsequently made in such contracts, with specific recommendations to the Chairman for action.

5. Pass upon questions that came before the Commission requiring its action in regards to type of pavement and other matters of construction and maintenance. Act upon recommendations of the State Highway Engineer in case of dispute concerning the interpretation and intent of meaning of the plans and specifications.

6. To act upon personnel appointments, salaries, and salary increases, upon recommendation of the State Highway Engineer.

7. Consider and make recommendations on any matters specifically referred to it by the State Highway Commission.

"C" GENERAL REGULATIONS FOR THE STATE HIGHWAY DEPARTMENT—

The work of the Commission will be executed by the State Highway Engineer, and will be divided into general divisions as follows:

(a) Administration.

(b) Construction.

(c) Maintenance and Equipment, Federal, County and Township, Projects.

(d) Testing Laboratory.

ADMINISTRATION.

The Administration Division will carry the forces and work of the general office, employees assigned to general or special work, the purchasing of material and equipment, and all auditing and accounting.

The office clerical and accounting forces and files will be in charge of the Chief Clerk, who will also act as Secretary to the Commission. The Chief Clerk will place orders for material and supplies on requisitions approved by the State Highway Engineer, and will approve pay-rolls, bills, and estimates.

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CONSTRUCTION

The Construction Division will be under the direction of the Engineer in charge of Construction, who will in turn report to the State Highway Engineer.

The Construction Division will embrace engineering, surveying, acquisition of Right of Way, field work and supervision of construction work, either that performed under contract or by State Labor, and inspection of State, County, and Township work.

This Division, for convenience of operation and administration, will be sub-divided as follows: A Survey and Right of Way Division, with an Engineer in charge; a Bridge Division, in charge of a Bridge Engineer; and three geographic divisions, to be known as the Northern, Central and Southern Divisions, each of which will be in charge of a Division Construction Engineer.

The Northern Division shall consist of the counties of Bergen, Hudson, Essex, Union, Sussex, Passaic, Warren and Morris.

The Central Division shall consist of the counties of Middlesex, Monmouth, Ocean, Mercer, Somerset and Hunterdon.

The Southern Division shall consist of the counties of Burlington, Atlantic, Cape May, Cumberland, Salem, Camden and Gloucester.

The Survey and Right of Way Division will extend over the entire State and will make all surveys, prepare maps and descriptions for routes, and maps, descriptions and documents for land to be acquired by purchase or otherwise.

The Survey and Right of Way Division will also prepare all construction plans.

The Bridge Division will operate under the direction of the Chief Engineer of Bridges and Grade Crossings of the Board of Public Utility Commissioners, will perform the work of inspection and preparation of plans and specifications for bridge construction or reconstruction, and will check bridge plans for State Aid and inspect the work.

The work to be performed by State Labor will be handled by the Supervisor of State Labor, his assistants and construction forces, in accordance with the agreement between the State Board of Control of Institutions and Agencies, and the State Highway Commission, for the utilization of inmate labor on State Highway construction and will come under the jurisdiction of the Construction Division.

MAINTENANCE, EQUIPMENT, FEDERAL, COUNTY AND TOWNSHIP PROJECTS.

The Maintenance, Equipment, Federal, County and Township Projects Division will be under the direction of the Assistant State Highway Engineer who will in turn report to the State Highway Engineer.

The work of this Division for convenience of operation and administration, will be divided into the following sub-divisions.

The Maintenance Division will be in charge of the Superintendent of Maintenance, to whom will report clerks, Road Supervisors, Supervisor of Bridges, all maintenance forces, and Bridge Tenders.

The Equipment Division will be in charge of the Supervisor of Equipment, to whom will report Clerks, Supervision Mechanics, Mechanical Repairmen, Motor Truck Foremen, Motor Truck Drivers, Garage Assistants. This Division shall be responsible for the conduct of the State Highway Garages.

The Federal, County, and Township Projects Division will be in charge of the Office Engineer, when the Project becomes a contract, it will be turned over to the Construction Division for execution.

The work of the Maintenance Division will be divided under the following headings, viz., *Maintenance, Betterment, and Bridge Repairs.*

Maintenance will be classed as all work upon the main pavement.

Betterment will be classed as all work outside of the main pavement, such as shoulder, drainage, fences, etc.

Bridge Repairs will cover all work on bridges done by the Maintenance Division.

The *Equipment Division* will maintain all automobiles, trucks, and other vehicles used by all departments, also all construction and maintenance equipment.

The Federal, County, and Township Projects Division will prepare and check all reports pertaining to contracts covering the projects.

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TESTING LABORATORY

The sampling, testing and approval for use of all materials of construction and maintenance will be performed by the State Highway Engineer, acting through the Chemical Engineer at the Trenton Laboratory.

Adopted by State Highway Commission, effective December 1, 1920.

APPENDIX "B"

STATE HIGHWAY SYSTEM ACT

Chapter 14, P. L. 1917

An Act to establish a State Highway System, and to provide for the improvement, betterment, reconstruction, resurfacing, maintenance, repair and regulation of the use thereof.

BE IT ENACTED by the Senate and General Assembly of the State of New Jersey:

1. The State Highway Commission shall, as soon as practicable, lay out routes for a State Highway System as follows:

ROUTES.

Route No. 1. From Elizabeth to Trenton, by way of Rahway, Metuchen, New Brunswick and Hightstown.

Route No. 2. From Trenton to Camden, by way of Bordentown, Fieldsboro, Roebling and Burlington.

Route No. 3. From Camden to Absecon, by way of Berlin and Hammonton.

Route No. 4. From a point on Route No. 1., in or near Rahway, to Absecon, by way of Perth Amboy, Keyport, Middletown, Red Bank, Long Branch, Asbury Park, Point Pleasant, Lakewood, Toms River, Tuckerton and New Gretna.

Route No. 5. From Newark to the bridge crossing the Delaware River about two miles above Delaware, by way of Morristown, Dover, Netcong, Budd's Lake, Hackettstown, Buttsville and Delaware.

Route No. 6. From Camden to beginning of Route No. 15 and Salem, by way of Woodbury, Mullica Hill, Woodstown and Pole Tavern, and from Salem to beginning of Route No. 15, by way of Quinton and Shiloh, including therein a spur extending from the property line of the Gloucester and Philadelphia Ferry Company to a point on Broadway, in the City of Gloucester, known as Pine Grove Toll Gate.

Route No. 7. From Hightstown to Asbury Park, by way of Freehold, Jerseyville and Hamilton.

Route No. 8. From Montclair to State line at Unionville, by way of Singac, Wayne, Pompton Plains, Butler, New Foundland, Stockholm, Franklin Furnace and Sussex.

Route No. 9. From Elizabeth to Phillipsburg, by way of Westfield, Plainfield, Bound Brook, Somerville, White House, Clinton, West Portal and Bloomsbury.

Route No. 10. From Paterson to Fort Lee Ferry, by way of Dundee Lake and Hackensack.

Route No. 11. From Newark to Paterson, by way of Belleville, Bloomfield, Nutley and Passaic.

Route No. 12. From Paterson to Phillipsburg, by way of Little Falls, Pine Brook, Parsippany, Denville, thence over Route No. 5 to Budd's Lake, thence to Washington and Broadway.

Route No. 13. New Brunswick to Trenton, by way of Kingston, Princeton and Lawrenceville.

Route No. 14. From Egg Harbor City to Cape May City, by way of Mays Landing, Tuckahoe and Cape May Court House.

Route No. 15. From Bridgeton to Cape May Court House, or such other point on Route No. 14 as may be determined by the State Highway Commission.

Route No. 16. From Morristown to Trenton by way of Van Dorn's Mills, Bernardsville, Far Hills, Bedminster, Pluckemin, Somerville, South Somerville, Belle Mead and Harlingen.

Said routes shall be as short and direct as practicable between the points specified, due regard being had for the other requirements of the act.

Existing highways may be made use of wherever it is convenient so to do, but the commission may lay out, open and improve new roads over acquired rights of way and may also lay out routes in continuation of, connecting with, or in addition to the routes above specified. (As amended by P. L. 1921, pp. 338. Also see supplement "A".)

2. The State Highway Commission shall from time to time cause to be prepared a road map or plan of the State showing thereon the State highways and county roads.

3. When, in its discretion, it shall see fit so to do, the State Highway Commission shall give notice in writing, which may be served by mailing to the presiding officer or clerk of the governing body in charge, that the said commission will, upon a day to be fixed in said notice, and not less than thirty days from the date thereof, give a hearing to all parties interested thereon, and shall after said hearing determine by resolution whether any routes, route or parts thereof, if any, shall be taken over as a State highway, and shall notify such governing body of such action. Upon the passage of such resolution, such routes, route, or parts thereof, shall become a State Highway, and its further improvement, maintenance and repair shall be at the expense of the State under the jurisdiction of the State Highway Department;

Provided, however, that whenever such resolution or any amendment thereof made before the work of such portion of any State highway has been begun shall contain a provision or provisions that certain or any indicated portions of any State Highway to a length thereof in any particular location not exceeding two miles is subject to change of route at any time thereafter, which change is hereby limited to five years from completion of such highway in its entirety as originally laid out, will or may, in such location or locations, be subject to change of location, then and in such case, the certain indicated portion or portions thereof shall not become permanently dedicated as a part of the route of such State highway, but the said commission shall, in such case, alter such route and lay out such new part of such route as may be indicated by resolution of such commission as might have been done in the first instance, and the vacated portion of such highway to the extent limited herein may then and in such case be either vacated (and may be taken over by the board of chosen freeholders of the county and maintained as a county road as is otherwise provided by law); *provided further, however,* that whenever the governing body, or other jurisdiction from which said highway is taken over, has rights or benefits by virtue of an understanding, agreement, award or contract with any public utility or other company, firm, individual or corporation, to repair, maintain or construct all or any part of such highway, or to deliver or execute any other source of obligation with respect thereto, the said undertaking shall remain in force, and all such contractual or agreement rights, duties and benefits shall pass to and be taken over and assumed for the State by the State Highway

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Commission. All the terms conditions and requirements of such agreements or contracts shall be fulfilled to the State by any public utility or other company, firm, individual or corporation, in the same manner as if they had been originally made between the State and said companies, firms, individual or corporations. (As amended by P. L. 1919, pp. 511. See also Supplement "A".)

4. If at the time when it is proposed to take over any highway, a contract for any work thereon, shall have been awarded but the work thereunder not completed, the further operation of this act with respect to such highway or part thereof shall be suspended until the completion of such work.

5. If when any highway is taken over by the State under this act, any county shall have improved, reconstructed or made any extraordinary repairs upon the same, or any part thereof, under a contract or contracts awarded after the first day of March, one thousand nine hundred and sixteen, the State Highway Commission shall first set aside from the funds under its control herein provided for a sufficient sum of money to reimburse such county for all money expended by it on such work, whether the moneys so expended were raised by the issue of bonds or otherwise, exclusive, however, of all moneys which may have been received by such county in the form of State aid, and expended as part of the cost of such extraordinary repairs or reconstruction: *Provided, however*, that no such repayment shall be made, by virtue of any award of contract made therefor after the date upon which this act shall take effect, unless some proceeding concerning such contract has been heretofore begun or said contract shall have been approved by the State Highway Commission, before the execution thereof. For the purpose of determining the amount of money expended by any such county as aforesaid, the county engineer shall prepare and file with the State Highway Commission a detailed certificate of the moneys so expended by such county, and shall be accepted as fixing the amount so expended by such county; *provided, however*, that such work shall be equal to that required by the provisions of this act.

in case any money thus repaid to any county was raised by sale of bonds an amount equal to the amount thus raised, shall be used to retire said county bonds or invested in such manner as may be lawful for sinking funds.

6. The State highways herein provided for shall be paved with granite, asphalt or wood blocks, bricks, concrete, bituminous concrete, sheet asphalt or other pavement having a hard surface and of a durable character. But nothing in this act shall be held to prevent the State Highway Commission from maintaining roads heretofore improved with other materials with their present or similar surfaces pending their paving with materials complying with this act. In all cases the width of the pavement shall be at least eighteen feet and the total width of the roadway shall be at least thirty feet, except at bridges, culverts, or grade crossings, where the width of the roadway shall be of such width or widths as the State Highway Commission may deem necessary and determine. All sharp turns and angles and railroad grade crossings shall be eliminated wherever practicable. (As amended by P. L. 1919, pp. 512.)

7. The State Highway Commission shall take charge of all work on State Highways and maintain the same in good order. All work of improvement, betterment, reconstruction, or resurfacing shall be done in accordance with plans and specifications prepared by the State Highway Department. All work of maintenance, repair and extraordinary repair shall be done at the expense of the State and may be done either as an independent contractor or employer or through contracts made in the name of the State of New Jersey.

8. For any road in the State Highway System prior to its taking over as a State Highway, as provided by this act, no consent, grant or franchise for the laying in or upon it of any railroad or street railway crossings, gas pipes, water pipes, electric conduits or other piping, telegraph, telephone, electric light or power poles shall be given except under such restrictions, regulations and conditions as are or shall be approved and officially made known by the State Highway Commission to the body with authority to issue such privilege. No issue of such consent, grant or franchise by any public body shall operate as a waiver of liability in favor of the person, firm, company or corporation laying or erecting such works in or upon such highway or any portion thereof.

9. No State Highway shall extend into any municipality, other than township, of a population exceeding sixteen thousand in number, as determined by the most recent census. With such municipality, the streets or roads of which will form proper connections of State highways, the State Highway Commission shall enter into contract for work which shall place such streets or roads in a condition which will be in keeping with the nature of the State highways approaching and leaving such municipality; *provided, however*, that all bridges and approaches thereto, containing a draw and not less than six hundred feet in length, forming a part of any of the routes as described in section one of the act to which this act is an amendment, and extending over any navigable waterway, or any part thereof, which forms the dividing line or part thereof between two municipalities in this State, which bridge, bridges and approaches shall have been in existence for at least ten years previous to the passage of this act, shall upon the State Highway Commission heretofore or hereafter taking over according to section three of the act to which this act is an amendment, the whole or any part of the route or routes of which said bridge, bridges and approaches form a connecting or continuing part to said State Highway systems; said bridge, bridges and approaches or any part thereof shall be and become a part of said State Highway system, and the State Highway Department shall thereupon immediately take over the improvement, betterment, reconstruction, resurfacing, maintenance, repair, and regulation of the uses thereof. (As amended by P. L. 1920, pp. 554.)

10. In the construction, repair and maintenance of highways, forming a part of the State Highway System, the said commission shall possess and exercise, in addition to those conferred by this act, all those rights and powers, not incompatible with its functions nor prohibited by law, which are now exercised by overseers of roads and boards of chosen freeholders in road construction, repair and maintenance.

11. It shall be lawful for the State Highway Commission to enter into written agreement with any board of chosen freeholders or other public body, or any person or corporation for co-operation in any work, and to assume any portion of that cost. Such board or public body may raise their proportionate share of such cost in accordance with the provisions of any law providing for road improvement or maintenance. Upon approval by the said commission of the certificate of the inspector and engineer in charge of the work that the same has been satisfactorily completed in whole or in part, according to contract, drawings and specifications, the disbursing officer of said board or body shall pay its share of the whole or partial cost to the State Treasurer to the credit of the State Road Fund.

12. The State Highway Commission may enter into a contract with any person, company, firm or corporation, public or private, for the acquisition of

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any necessary lands, or easements for gravel pits or other natural deposits of road materials, advantageously located to the State highways, and may take title in the name of the State.

13. All work of construction or building of unimproved roads and of extensive repairs to improved roads taken over as State highways shall be by contract or by labor of inmates of State institutions.

14. The State Highway Commission shall advertise for bids on the work and materials covered by the plans and specifications, and may divide the same into two or more contracts, but all bids for the whole or as subdivided shall be submitted at the one time. Such advertisement shall be by public notice published for at least three weeks before the contract may be awarded, at least once a week in each of two newspapers printed in the county or counties where such roads are located, and in one other newspaper in Trenton, and may be inserted in one or more American engineering periodicals. The advertisements shall give a brief description of work and materials required, specify where plans and specifications can be seen, or had, the hour, the date, and place where sealed proposals will be received and publicly opened and read, and such other pertinent information the commission may include.

15. The commission may reject any or all bids not in accord with the advertisement or specifications, or for other irregularity, or may reject any or all bids if the price for work or materials is excessively above the estimated cost or for any other cause. The State Highway Engineer shall prepare a list of the bids, including any rejected and the cause therefor, and the commission by resolution shall award the contract to the lowest responsible bidder.

16. A certified check equal to at least ten per centum of the bid, *provided*, the same shall in no case exceed twenty thousand dollars (\$20,000); *and provided, further*, that in case the bid be less than five thousand dollars (\$5,000) the check shall be five hundred dollars (\$500) and must accompany the bid and be drawn to the order of the State Treasurer, and shall be held as security that, if awarded the contract, the bidder will deliver the same within ten days from the ratification of the award, properly signed and secured by a satisfactory bond; *provided, further*, that it shall be the duty of the State Highway Commission to make the award of the contract or contracts or to reject the same within the period of one month from the date the bids are received, and that all proposal checks which may be delivered with any bid or bids, excepting the two lowest responsible bids, shall be returned within three days thereafter.

In case of the bidder's failure to provide a satisfactory bond as aforesaid, said check shall be forfeited to the State as liquidated damages, and shall be applied and become a part of the State Road Fund. The Commission may require in addition to said certified check such additional evidence of the ability of the contractor to perform the work required by the contract, as it may deem necessary and advisable. (As amended by P. L. 1921, pp. 73.)

17. Contracts may provide for partial payments at least once each month or from time to time as the work progresses on work of construction or maintenance, amounting to ninety per centum of the value of the materials in place and of the work done.

Contracts may also provide for partial payments at least once in each month or from time to time as the work progresses on all materials placed along or upon the site which are suitable for the use and execution of the contract, but such partial payments shall be eighty per centum of the value of such material; *provided*, the contractor furnishes releases of liens for all material furnished at the time each estimate of work is submitted for payment.

Where, however, the contract provides that a portion of the work may be deferred with the approval of the State Highway Commission, the sum withheld from the contractor may not be less than twenty-five (25) per centum of the value of said work.

That whenever any contractor has completed his contract for work to be done under this act no per centum of the contract price shall be retained, but the contractor shall enter into a bond in a sum amounting to five per centum of the contract price with any surety company authorized to do business in the State of New Jersey and which has the approval of the Attorney-General, to the State Highway Commission, which bond shall remain in full force and effect for the period of one year, and shall provide that the contractor can be held responsible for poor workmanship done or poor materials furnished under such contract, but he shall not be responsible for acts or causes which are beyond or outside of his control. (As amended by P. L. 1921, pp. 73.)

18. At the end of each fiscal year the State Highway Commission shall make to the State Comptroller a full financial report showing the available unexpended balances in the several accounts, also all outstanding liabilities, under contracts or other financial obligations to counties, municipalities, person, firm or corporation.

19. Wherever in this act the following words are used, they shall be held to have the meanings hereinafter given:

DEPARTMENT: The State Highway Department, acting through the action of the State Highway Commission, or such officials as may be by the Commission designated.

COMMISSION: The State Highway Commission.

ENGINEER: The State Highway Engineer, or the Assistant State Highway Engineer, when designated.

HIGHWAY: Any public right of way, whether opened or improved or not, including all existing factors of improvements.

STATE HIGHWAY SYSTEM: All highways included in the routes set forth in this act, or others added thereto, including all bridges, culverts, such necessary gutters, guard rails, along the route thereof.

ROADS: Highways other than streets, boulevards and parkways.

STATE ROADS: Roads taken over by the State and maintained by the State.

COUNTY ROADS: Roads taken over, controlled or maintained by the county.

STREETS: A highway in a thickly settled district where, in a distance of one thousand three hundred and twenty feet on the center line of the highway, there are twenty (20) or more houses within one hundred feet of said center line; or any highway which the governing body in charge thereof and the commission may declare a street; also all highways within incorporated municipalities of over twelve thousand population by the last census; the word "street" shall be deemed to include boulevards, parkways, speedways, being highways maintained mainly for purposes of scenic beauty or pleasure, or of which the public use is restricted.

ROUTES: A highway or set of highways including roads, streets, boulevards, parkways, bridges and culverts needed to provide direct communication between designated points.

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GOVERNING BODY: The mayor and council, town council, village trustees, commission or committee of any municipality, including townships. And the board of chosen freeholders of any county.

TAKE OVER: The action by the department in assuming the control and maintenance of any part or parts of the State Highway System.

AUTHORITY: Any governing body or public official charged with the care of any highway.

IMPROVEMENT: The original work on a road or right of way which converts the same into a road which shall, with reasonable repairs thereto, at all seasons of the year, be firm, smooth and convenient for travel. Improvement shall consist of location, grading, surface, and sub-surface drainage provisions, including curbs, gutters and catch basins, foundations, shoulders and slopes, wearing surface, bridges, culverts, retaining walls, intersections, private entrances, guard rails, shade trees, illumination, guide posts and signs, ornamentation and monumenting. All of those component factors need not be included in an original improvement.

BETTERMENT: Construction, subsequent to the original improvement, of any one or more of the component factors properly belonging to the original improvement, which may have been omitted in the original improvement of a road, or which adds to the value thereof after improvement.

RECONSTRUCTION: Rebuilding with same or different material of an existing improved road, involving alterations or renewal of practically all the component factors of which the original improvement consisted.

RESURFACING: Work done on an improved road involving a new or partially new pavement, with or without change in grade or alignment.

MAINTENANCE: Continuous work required to hold an improved road against deterioration due to wear and tear and thus to preserve the general character of the original improvement without alteration in any of its component factors.

REPAIRS Limited or minor replacements in one or more of the component factors of the original improvement of a road which may be required by reason of storm or other happening in order that there may be restored a condition requiring only maintenance to preserve the general character of the original improvement of a road.

EXTRAORDINARY REPAIRS: Extensive or entire replacement, with the same or a different kind of material, of one or more of the component factors of the original improvement of a road, which may become necessary because of wear, disintegration or other failure.

JURISDICTION: The civil division of the State, over the roads of which any authority may have charge.

WORK: The acquisition of land for any purpose connected with highways by lease, gift, purchase, demise, or condemnation, for temporary or permanent use; the laying out, opening, construction, improvement, repair and maintenance of highways; the building, repair and operation of bridges; the building of culverts, walls and drainage, the planting of trees, the protection of slopes, the placing and repair of road signs and monuments, the opening, maintenance and restoration of detours, the elimination of grade crossings, the lighting of highways, the removal of obstructions to traffic and to the view, surveying and preparation of drawings and papers, the counting of traffic, the letting of con-

tracts, purchase of equipment, materials and supplies, hiring of labor and all other things and services necessary or convenient for the performance of the duties imposed by this act.

20. In case any clause, proviso or section of this act shall be attacked in any court of competent jurisdiction and shall be declared to be invalid or unconstitutional, the clause, proviso or section so declared to be invalid or unconstitutional shall be excised from this act, but the remainder of the act shall stand.

21. All acts or parts of acts inconsistent herewith are repealed, and this act shall take effect immediately.

Approved March 13, 1917.

SUPPLEMENT A

Chapter 322, P. L. 1921

A Supplement to an act entitled "An Act to establish a State Highway System, and to provide for the improvement, betterment, reconstruction, resurfacing, maintenance, repair and regulation of the use thereof," approved March thirteenth, one thousand nine hundred and seventeen.

BE IT ENACTED by the Senate and General Assembly of the State of New Jersey:

1. Route No. 1 of the State Highway System as described and designated in section one of the act to which this act is a supplement shall begin at the entrance of the vehicular tunnel under the Hudson River in Jersey City county of Hudson, proposed to be constructed by the States of New Jersey and New York, instead of the point of beginning as described in section one of the act to which this act is a supplement, and shall run from thence through the city of Jersey City and the county of Hudson, to, through and beyond the city of Newark in the county of Essex, to and through the city of Elizabeth in the county of Union, to the point of beginning of said route No. 1 as described or designated in the act to which this act is a supplement, and from thence shall continue as described in said act.

2. Route No. 2 of the State Highway System, as described or designated in section one of the act to which this act is a supplement, shall be extended from the terminal point of said route at the city line of the city of Camden in the county of Camden, through the said city of Camden to the approach or entrance of the bridge proposed to be constructed over the Delaware river by the State of New Jersey and Pennsylvania.

3. Wherever any State highway shall run through a city having a population of seventy-five thousand or more, over streets or roads formerly under the jurisdiction of said city, such city shall retain in all such streets or roads all its former jurisdiction and rights as to the construction and regulation of the use of all water, sewer, gas and other sub-soil conduits and structures.

4. This act shall take effect immediately.

Approved April 12, 1921.

STATE HIGHWAY DEPARTMENT ACT

Chapter 15, P. L. 1917

An Act to establish a State Highway Department and to define its powers and duties; vesting therein all the powers and duties now devolved by law

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upon the Commissioner of Public Roads, and the existing State Highway Commission and Highway Commission.

BE IT ENACTED by the Senate and General Assembly of the State of New Jersey:

1. A State Highway Department is hereby established and the same shall be governed by a board to be known as the State Highway Commission, which shall consist of eight members, two of whom shall be qualified and competent engineers, and all of whom shall be residents of the State. The Governor shall, in addition thereto, be ex-officio a member of the commission.

The members of the State Highway Commission shall be appointed by the Governor, by and with the advice and consent of the Senate, for the following terms, to take office on the date of the appointment: Two for one year, two for two years, two for three years, and two for four years. Annually thereafter two members shall be appointed for a term of four years. The Governor shall have the power to summarily remove any or all members of the commission. Vacancies shall be filled for the unexpired terms.

Each member of the commission shall receive an annual compensation of four thousand dollars (\$4,000). It shall be paid in the same manner as other State salaries are now paid, and in addition thereto they shall be entitled to receive their necessary expenses. (As amended by P. L. 1921, pp. 924.)

2. Said commission shall organize each year by the selection of a chairman, and the appointment of a secretary, who shall be an employee of the department. The board shall hold not less than twelve stated meetings each year, and all stated meetings and the minutes thereof shall be open to the public.

3. The board shall elect a person who shall be known as the State Highway Engineer, who shall be a qualified and competent engineer, who has had actual experience in road and bridge construction and maintenance. He shall hold office for the term of five years, and shall devote his entire time and attention to the duties of his office. His salary shall be fixed by the board, and he shall also receive reimbursement for his necessary expenses, to be paid out of the treasury of the State. He shall furnish a bond to the State in the sum of ten thousand dollars, conditioned for the faithful performance of his duties.

The board shall elect an Assistant State Highway Engineer, whose qualifications shall be the same as those prescribed for the State Highway Engineer. His salary shall be fixed by the board, and he shall also receive reimbursement for his necessary expenses. He shall hold office for the term of five years. He shall furnish a bond to the State in the sum of five thousand dollars conditioned for the faithful performance of his duties. The board shall have the power to summarily remove the State Highway Engineer or the Assistant State Highway Engineer, for cause after hearing.

4. The board shall provide for the proper auditing of all accounts and moneys received or expended, and of labor performed or materials used in road work, and for the collection and tabulation of such statistics as may be proper or necessary for the use of the department in carrying out the provision of any law or laws.

5. All other appointees and employees shall be appointed and employed by the board as and when necessary, and their compensation and duties shall be fixed by said commission, subject always to the appropriations provided therefor. All such appointments and employments, excepting that of the State Highway Engineer and Assistant State Highway Engineer shall be within the

civil service of the State. The State Highway Commission may by resolution delegate to the State Highway Engineer or the Assistant State Highway Engineer the authority to engage any employee, and to fix the wages and duties thereof, subject at all times to the approval of said State Highway Commission.

6. No member of the State Highway Commission shall, during the time for which he shall have been appointed, be elected or appointed by said commission to any office except that of chairman.

7. The State Highway Department shall be furnished with suitable accommodations in the State House, and elsewhere in the State as may be necessary, the same to be properly equipped for the transaction of its business.

8. The State Highway Department shall succeed to and exercise all the powers and perform all the duties now exercised or performed by or conferred and charged upon the State Commissioner of Public Roads or upon the existing State Highway Commission or the Highway Commission by virtue of any existing law or laws, and shall have full control and direction of all projects and work on State highways.

9. All unexpended balances of appropriation heretofore made for roads shall be transferred to the commission, but without any of the restrictions or conditions imposed thereon, excepting rights heretofore vested in any governing body by any State aid contract or certificate of allotment, as to which the commission shall discharge the duties and responsibilities now imposed on the State Commissioner of Roads. All property now held by the State Commissioner of Public Roads shall likewise be transferred to the commission.

10. The work of the department shall be performed under the State Highway Commission, which shall have all power necessary therefore, without recital in detail. All action shall be determined by the State Highway Commission by the vote of a majority thereof. In case of a tie in any vote the Governor shall be requested to cast the deciding vote. The signature of the chairman of the State Highway Commission, or in his absence or disability the signature of a person designated by the commission, to any order, regulation, contract, bill or other paper or document required to be signed on behalf of the State Highway Department, shall be sufficient evidence of the authority therefor and authenticity thereof.

11. The State Highway Commission shall formulate and adopt such rules and regulations and prescribe duties for the conduct of the business, work and general administration of the State Highway Department, its officers and employees. The commission may purchase such material and equipment as shall be necessary for the competent, efficient and economical administration of the State Highway Department.

12. In addition to, and not in limitation of, its general powers, the State Highway Commission shall have power:

a. To determine and adopt rules, regulation and specifications and to enter into contract covering all matters and things incident to the acquisition, construction, reconstruction, maintenance and repair of State highways.

b. To execute and perform as an independent contractor or through contracts made in the name of the State of New Jersey, all manner of work incident to the maintenance and repair of State highways.

c. To establish and maintain as an independent contractor or employer a patrol repair system for the proper and efficient maintenance and repair of State highways.

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d. To employ and discharge, subject to the provisions of the Civil Service Act, all foreman and laborers, prescribe their qualifications and furnish all equipment, tools and material necessary for such patrol repair system.

e. To widen, straighten and regrade any State Highway and to acquire any lands or rights therein by gift, devise, purchase, or by condemnation, according to the procedure as contained in an act entitled "An Act to regulate the ascertainment and payment of compensation for property condemned or taken for public use" (Revision of 1900), approved March twentieth one thousand nine hundred, and vacate any State highway or any part thereof. The State Highway Commission shall have the right and power to enter upon and take property in advance of making compensation therefor in any case where it cannot acquire land or other property by agreement with the owner, whether by reason of disagreement as to the price, or the legal incapacity or absence of the owner, or his inability to convey valid title, or by reason of any other cause. In any such case, upon the said Highway Commission exercising this right and entering upon and taking land in advance of making compensation therefor, it shall present a petition, and proceedings shall be had to fix the compensation to be paid to the owner, as provided in the said act entitled "An Act to regulate the ascertainment and payment of compensation for property condemned or taken for public use" (Revision of 1900), approved March twentieth, one thousand nine hundred. To do and perform whatever may be necessary or desirable to effectuate the object and purposes of this act. To do and perform all acts now required by law to be done and performed by the State Commissioner of Public Roads, the State Highway Commission or the Highway Commission. These powers are to be liberally construed. (As amended by P. L. 1919, pp. 523. See also supplement A.)

13. The funds provided to meet lawful expenditures appertaining to roads, as required under this act or any other law, shall constitute a State road fund. It shall include the appropriations made therefor by the Legislature, the receipts from motor vehicle licenses, and from fines for violations of chapter 113, Laws of 1906, its amendments and supplements, as therein provided, and from any State tax levied for that purpose; from Federal aid and other contribution, sales of condemned property, fines, penalties or damages for violation of any law providing for the protection of roads. An amount equal to the State road tax shall be expended for the extension and construction of State highways. The remainder of State funds may be expended for State aid to counties and municipalities, as provided by law, in the improvement of roads, in maintenance and repair of improved roads and in the building and repair of bridges and culverts; and in acquisition of toll roads and bridges; for the maintenance and administration of the State Department of Public Roads, the salaries or wages of its lawful officers, clerical, office help and employees, and traveling expenses of such, actually and necessarily incurred while in discharge of their official duties, and such other reasonable and proper expenses itemized and reported to the department, incurred while actually on the business of the State, as the State Highway Commission shall direct and approve; *provided, however*, that no funds shall be expended for State aid to counties or other municipalities unless the roads constructed therewith shall conform to such standards as shall be prescribed by the State Highway Department, and the said County or other municipality shall have entered into an agreement or contract with the State through the said department agreeing that such road or roads shall be kept in repair or condition by patrol or such other methods of repair as shall be adopted by said department. (See supplement B).

14. The term of office of the State Commissioner of Public Roads, of the members of the State Highway Commission and of the members of the Highway Commission shall terminate at the expiration of thirty days from the date this act takes effect.

15. In case any clause, proviso or section of this act shall be attacked in any court of competent jurisdiction and shall be declared to be invalid or unconstitutional, the clause, proviso or section so declared to be invalid or unconstitutional shall be excised from this act, but the remainder of the act shall stand.

16. All acts or parts of acts inconsistent herewith are repealed, and this act shall take effect immediately.

Approved March 13, 1917.

SUPPLEMENT A

Chapter 145, P. L. 1921

A Supplement to an act entitled "An Act to establish a State Highway Department and to define its powers and duties; vesting therein all the powers and duties now devolved by law upon the Commissioner of Public Roads, and the existing State Highway Commission and Highway Commission," approved March thirteenth, one thousand nine hundred and seventeen.

BE IT ENACTED by the Senate and General Assembly of the State of New Jersey:

1. Whenever the commission created by the act to which this act is a supplement shall have acquired by purchase or condemnation lands for highway purposes, and subsequently, by reason of the relocating of any highway, it shall be determined by such commission that lands heretofore acquired are no longer needed for highway purposes, such commission is hereby authorized and empowered to dispose, by sale, of lands so as aforesaid acquired.

2. Before any sale, as contemplated by this act, is held, notice of intention to dispose of lands, so acquired by purchase or condemnation, shall be given by the State Highway Commission to the abutting property owner or owners; thereafter the commission may dispose of lands, so acquired, at either public or private sale, and the State Highway Commission is hereby authorized to make a deed therefor in the name of the State of New Jersey to the purchaser of such lands.

3. This act shall take effect immediately.

Approved April 5, 1921.

SUPPLEMENT B

Chapter 281, P. L. 1921

A Supplement to an act entitled "An Act to establish a State Highway Department and to define its powers and duties; vesting therein all the powers and duties now devolved by law upon the Commissioner of Public Roads, and the existing State Highway Commission and Highway Commission," approved March thirteenth, one thousand nine hundred and seventeen.

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BE IT ENACTED by the Senate and General Assembly of the State of New Jersey:

1. All expenditures from the State Road Fund for the purposes of State aid to the counties or other municipalities for the improvement, maintenance, or repair of highways or for the building, maintenance or repair of bridges shall be in accordance with annual work programs prepared by the governing bodies of said counties or other municipalities and filed with and approved by the State Highway Commission, said work programs shall be submitted on blanks prepared by the State Highway Commission and shall differentiate between State Aid for Highway Construction, State Aid for Highway Maintenance, State Aid for Bridge Construction and State Aid for Bridge Maintenance.

The State Highway Commission may fix a date on or before which said counties or municipalities shall file said annual work program; provided, that, in case of emergencies which were not anticipated, amendments to said work program may at any time be filed and approved. Prior to approving of the same and extending State aid to the projects set forth therein the State Highway Commission may hold hearings with the Governing bodies of the counties or municipalities concerned with a view to recommending such additions to, removals from or changes in said work program as will best enable said counties and municipalities to develop the highways under their jurisdiction in co-operation and co-ordination with the State Highway System and with each other. The State Highway Commission shall have power to deny the extension of State aid to such projects which in its judgment do not comply with this requirement.

2. All acts and parts of acts inconsistent herewith be and the same are hereby repealed.

3. This act shall take effect January first, one thousand nine hundred and twenty-two.

Approved April 12, 1921.

HIGHWAY CONSTRUCTION FUND TAX ACT

Chapter 302, P. L. 1921

An Act to provide for the taxation of real and personal property in this State for the construction of public roads.

BE IT ENACTED by the Senate and General Assembly of the State of New Jersey:

1. There shall be annually, beginning with the calendar year one thousand nine hundred and twenty-two, levied, assessed and collected in each of the municipalities of the several counties of this State, a tax of one mill on each dollar of the value of all real and personal property in every such municipality upon which municipal taxes are or shall be levied, assessed and collected in the same manner and at the same time as other taxes upon real and personal property are now levied, assessed and collected. It shall be the duty of the collector or other officer having the custody of the collected taxes, on or before the fifteenth day of December in each year, out of the first money collected, to pay to the county treasurer of the county such State tax required to be levied, assessed and collected in his taxing district, and the county treasurer or other officer having the custody of the collected taxes, shall pay the said State tax, which he shall so receive from the taxing districts, to the Treasurer of the

State on or before the twentieth day of December following and the said State Treasurer shall place and keep the same in a separate and distinct fund to be known as the "Highway Construction Fund."

2 This act shall take effect immediately.

Approved April 12, 1921.

PAY ROLL FUND ACT

Chapter 261, P. L. 1921

An Act providing for the establishment and maintenance of a fund subject to the disbursement of the New Jersey State Highway Commission for the payment of salaries and wages of its officers and employees.

BE IT ENACTED by the Senate and General Assembly of the State of New Jersey:

1. The State Highway Commission is authorized to establish and maintain a fund for the payment of the salaries and wages of its officers and employees out of the State Road Fund in the following manner:

The State Highway Commission immediately after the taking effect of this act is authorized to certify to the Comptroller of the Treasury the amount of salaries and wages paid on the certification of the designated approval officer of the State Highway Commission to its officers and employees for the month next preceding such date of certification, and the Comptroller of the Treasury upon verifying same, shall issue his warrant for such amount to the State Treasurer who shall pay the same forthwith to such custodian of the fund as the commission shall designate as hereinafter provided.

2. The State Highway Commission shall designate one of its employees to act as custodian of the fund hereby established. The custodian shall furnish a surety bond conditioned for the satisfactory maintenance and disbursement of the fund in a sum at least double the amount of the fund as first established.

The custodian shall make no expenditure from said fund for salaries and wages of the officers and employees of the said commission except on proper certifications and approval of the Civil Service Commission.

3. The commission is authorized and directed to pay out of the said fund salaries and wages of its officers and employees at least bi-monthly, as other State officers and employees are paid by the State Treasurer.

4. The fund so established shall be replenished and maintained by payments made by the State Treasurer to the said custodian, on the warrant of the Comptroller, which payments shall in amount equal the sum disbursed immediately previous to the date of said warrant of the Comptroller of the Treasury. The sum to be paid shall be established by a certification bearing approval of the Civil Service Commission and of the approval officer designated by the State Highway Commission.

5. The Comptroller of the Treasury is further authorized to require from the said State Highway Commission or said custodian or other approval officer, or any or all of them, such further satisfactory proof as to the proper disbursement of said fund and its maintenance as he may in his judgment require, and he is hereby authorized to withhold said warrant for the replenishing of said fund until such proof is forthcoming, provided, however, that in such event the salaries and wages of the officers and employees of the State Highway Commission shall be paid by the State Treasurer upon warrant of the Comptroller

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of the Treasury after approval of the Civil Service Commission as heretofore in effect, until such time as the cause for withholding of said warrant shall have been removed.

6. This act shall take effect immediately.

Approved April 8, 1921.

COUNTY REIMBURSEMENT ACT

Chapter 183, P. L. 1918

An Act to authorize the counties of this State to construct, improve and complete the whole or any part of any State highway within any such county now or hereafter laid out by the State Highway Commission, and to issue and sell the bonds or other obligations of the county to provide funds for such purposes.

BE IT ENACTED by the Senate and General Assembly of the State of New Jersey:

1. The board of chosen freeholders of any county in this State in which a State highway shall have been or may hereafter be laid out by the State Highway Commission may, with the consent of the State Highway Commission, construct and improve the whole or any part of said highway within such county. Such construction and improvement shall be in accordance with plans and specifications submitted by such board of chosen freeholders and approved by the State Highway Commission, and shall be conducted by such board of chosen freeholders at all times subject to the inspection of said State Highway Commission. Any contract for the construction and improvement of any highway made by any county under this act shall not be effective until approved by the State Highway Commission both as to character and cost of work and materials, and shall provide that no payment shall be made thereunder to any contractor except on the certificate of the county engineer, countersigned by the State Highway Engineer, certifying that the work for which payment is claimed has been done in all respects in accordance with the contract and with the plans and specifications.

2. The board of chosen freeholders of any county may provide and raise moneys to be expended for the construction and improvement of highways, as provided by section one of this act, by issuing notes or bonds under the provisions of an act entitled "An Act to authorize and regulate the issuance of bonds and other obligations and the incurring of indebtedness by county, city, borough, village, town, township or any municipality governed by an improvement commission," approved March twenty-second, one thousand nine hundred and sixteen, and amendments thereof and supplements thereto, excepting, however, a deduction shall be made in the annual or supplemental debt statement called for in section twelve of said act for bonds issued under this act equal to one-half per centum of the average of the valuations of the three next preceding years, as called for in section twelve of said act. The obligations issued under the authority of this act and renewals thereof shall be made under the provisions and limitations of section thirteen of said act. If the State Highway Commission shall not take over such highway or highways in the manner as prescribed in section three of this act before six years after the authorization of appropriation for such construction and improvement as called for in the above referred act, the county shall refund the indebtedness incurred under

the authority of this act by the issuance of bonds, which bonds shall be issued under the provisions of said act, but in no case shall the last maturity of the bonds so issued be longer than the period set forth in section four of said act, counting from the time of the authorization of the appropriation for such construction and improvement, but after their issue such bonds shall cease to be deducted in the annual or supplemental debt statement under section twelve of said act.

3. Whenever the State Highway Commission shall have approved any contract made in accordance with section one of this act and the payments thereunder, it shall within six years after the date of such approval, if funds be on hand available for such purpose, take over any highway constructed by any county under said contract in accordance with the terms of this act and pay to said county the actual cost of the construction thereof, without interest. When any such sum is paid to any county, the sum so paid, or such part thereof as may be necessary, shall be used for the purpose of retiring any bonds or other obligations issued for the purpose of raising funds for the construction of such road. No road constructed by any county under this act shall be taken over and paid for by the State Highway Commission unless the State Highway Engineer shall certify to such Commission that such road has been constructed in all respects in accordance with the plans and specifications approved by said commission.

4. This act shall take effect immediately.

Approved March 4, 1918.

SUPPLEMENT

Chapter 317, P. L. 1920

A Supplement to an act entitled "An Act to authorize the counties of this State to construct, improve and complete the whole or any part of any State highway within any such county now or hereafter laid out by the State Highway Commission, and to issue and sell bonds or other obligations of the county to provide funds for such purposes," approved March fourth, one thousand nine hundred and eighteen.

BE IT ENACTED by the Senate and General Assembly of the State of New Jersey:

1. Whenever a road laid out as a State highway shall have been taken over by the State Highway Commission but not paved, the board of chosen freeholders of the county in which such road is located may, by resolution, request the permission of the State Highway Commission to pave said road, and if the State Highway Commission concurs in such resolution the county may provide for the work and pay for the same in accordance with the act to which this act is a supplement and in the same manner as is outlined for the improvement by counties of sections of the State highways that have not been taken over by the State Highway Commission. Counties proceeding under this act shall finance such improvement in the manner outlined in the act to which this act is a supplement. The State Highway Commission may, by resolution, designate a year in which said county shall be reimbursed for such work.

2. This act shall take effect immediately.

Approved April 21, 1920.

MUNICIPAL REIMBURSEMENT ACT

Chapter 246, P. L. 1921

An Act to authorize cities, boroughs, towns, townships and villages of this State to construct, improve and complete any part of any State highway system within such cities, boroughs, towns, townships and villages of this State, now or hereafter laid out, or taken over by the State Highway Commission, and to issue and sell bonds or other obligations of any such cities, boroughs, towns, townships and villages to provide funds for such purposes.

BE IT ENACTED by the Senate and General Assembly of the State of New Jersey:

1. The governing body of any city, borough, town, township or village of this State in which a State highway shall have been or may hereafter be laid out or taken over by the State Highway Commission may, with the consent of the State Highway Commission, construct and improve any part of said highway within such city, borough, town, township or village. Such construction and improvement shall be in accordance with plans and specifications submitted by such council and approved by the State Highway Commission, and shall be conducted by such council at all times subject to the inspection of said State Highway Commission. Any contract for the construction or improvement of any highway made by any city, borough, town, township or village under this act shall not be effective until approved by the State Highway Commission both as to character and cost of work and materials, and shall provide that no payment shall be made thereunder to any contractor except on the certificate of the city, borough, town, township or village engineer, countersigned by the State Highway Engineer, certifying that the work for which payment is claimed has been done in all respects in accordance with the contract and with the plans and specifications.

2. The council of any city, borough, town, township or village may provide and raise moneys to be expended for the construction and improvement of highways, as provided by section one of this act, by issuing notes or bonds under the provisions of an act entitled "An Act to authorize and regulate the issuance of bonds and other obligations and the incurring of indebtedness by county, city, borough, village, town, township or any municipality governed by an improvement commission," approved March twenty-second, one thousand nine hundred and sixteen, and amendments thereof and supplements thereto, excepting, however, a deduction shall be made in the annual or supplemental debt statement called for in section twelve of said act for bonds issued under this act equal to one-half of one per centum of the average of the valuations of the three next preceding years, as called for in section twelve of said act. The obligations issued under the authority of this act and renewals thereof shall be made under the provisions and limitations of section thirteen of said act. If the State Highway Commission shall not take over such highway or highways in the manner as prescribed in section three of this act before six years after the authorization of appropriation for such construction and improvement as called for in the above referred to act, the city, borough, town, township or village shall refund the indebtedness incurred under the authority of this act by the issuance of bonds, which bonds shall be issued under the provisions of said act, but in no case shall the last maturity of the bonds so issued be longer than the period set forth in section four of said act, counting from the

time of authorization of the appropriation for such construction and improvement, but after their issue such bonds shall cease to be deducted in the annual or supplemental debt statement under section twelve of said act.

3. Whenever the State Highway Commission shall have approved any contract made in accordance with section one of this act and the payments thereunder, it shall within six years after the date of such approval, if funds be on hand available for such purpose, take over any highway constructed by any borough under said contract in accordance with the terms of this act and pay to said city, borough, town, township or village the actual cost of the construction thereof, without interest. When any such sum is paid to any city, borough, town, township or village, the sum so paid, or such part thereof as may be necessary, shall be used for the purpose of retiring any bonds or other obligations issued for the purpose of raising funds for the construction of such road. No road constructed by any city, borough, town, township or village under this act shall be taken over and paid for by the State Highway Commission unless the State Highway Engineer shall certify to such commission that such road has been constructed in all respects in accordance with the plans and specifications approved by said commission.

4. The State Highway Commission may, by resolution, designate the year in which said city, borough, town, township or village shall be reimbursed for such work.

5. This act shall take effect immediately.

Approved April 8, 1921.

TOLL ROAD ACT

Chapter 350, P. L. 1920

An Act to acquire by gift, devise, grant, purchase or condemnation, the toll roads and toll bridges situated entirely within this State, and providing for the cost thereof.

WHEREAS, It appears from the report of the Commission to Investigate Toll Roads and Bridges, appointed by authority of Joint Resolution No. 2, of the Legislature of the State of New Jersey, approved March fifteenth, one thousand nine hundred and sixteen, that the only toll roads and toll bridges situated wholly within this State are those named in this act; and

WHEREAS, In the public interest it is deemed expedient to abolish such toll roads and toll bridges and to make such roads and bridges free;

BE IT ENACTED by the Senate and General Assembly of the State of New Jersey:

1. The State Highway Commission, or any other body by whatsoever name known, which may hereafter succeed to the general powers and duties of said State Highway Commission, is hereby invested with full power and authority to acquire for the State, by gift, devise, grant, purchase or condemnation, according to the procedure contained in an act entitled "An act to regulate the ascertainment and payment of compensation for property condemned or taken for public use (Revision of 1900)," approved March twentieth, one thousand nine hundred, for public use, the following toll roads and toll bridges:

TOLL ROADS.

1. Gloucester turnpike, extending from Red Bank avenue, in the city of Woodbury, a distance of twenty-one thousand nine hundred and forty feet, to

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King Street, in the City of Gloucester City, Camden County, owned by Gloucester Turnpike Company.

2. Marlboro and Quinton turnpike, six and one quarter miles long, owned by the Marlboro and Quinton Bridge Turnpike Company.

3. Bridgeton and Millville turnpike, extending from Bridgeton, New Jersey, to Millville, New Jersey, a distance of ten miles, owned by Bridgeton and Millville Turnpike Company.

TOLL BRIDGES.

1. Ocean City automobile bridge, extending from Somers Point, New Jersey, to Ocean City, New Jersey, owned by Ocean City Automobile Bridge Company, Inc.

2. Long Beach Automobile bridge, extending from Manahawkin, New Jersey, across Manahawkin bay to the island of Long Beach (on which island are located the towns of Barnegat City, High Point, Harvey Cedars, Surf City and Beach Haven), a distance of approximately two miles, owned by Long Beach Turnpike Company.

3. Toms River and seaside Heights automobile bridge, extending from foot of Washington street, in Dover township, on the western shore of Barnegat bay, across said bay, a distance of approximately two miles, to Hamilton Avenue, Seaside Heights, Ocean County, New Jersey, owned by the Island Heights and Seaside Park Bridge Company.

The said toll roads and Toll bridges, when acquired by the State, shall become a part of the State Highway System, and shall be under the supervision and control of the State Highway Commission, or such other body as may succeed said State Highway Commission, as hereinbefore mentioned, and shall be maintained by the State out of funds appropriated, raised or collected for the use of the State Highway Commission, or such other body, as aforesaid, in the repair and maintenance of roads and bridges.

2. So much of the moneys appropriated to the State Highway Commission for the State Road Fund as is necessary shall be used by said State Highway Commission in carrying out the provisions of this act.

3. This act shall take effect immediately.

Passed May 5, 1920.

TOLL ROAD ACT

Chapter 306, P. L. 1921

An Act concerning the State Highway Commission of this State.

BE IT ENACTED by the Senate and General Assembly of the State of New Jersey:

1. The State Highway Commission, or its successor, shall have in addition to the power and authority conferred upon it by an act of the Legislature of the State of New Jersey, entitled, "An act to acquire by gift, devise, grant, purchase or condemnation, the toll roads and toll bridges situated entirely within this State, and providing for the cost thereof," approved May fifth, one thousand nine hundred and twenty, power and authority to enter into agreements and terms with the owner or owners of the toll roads and toll bridges, being such toll roads and toll bridges as are enumerated in said act. And like

power and authority is hereby given to enter into agreements and terms with the owner or owners of and security or securities on or held against any such toll road or toll bridge.

2. This act shall take effect immediately.

Approved April 12, 1921.

RIPARIAN LANDS ACT

Chapter 283, P. L. 1920

A Supplement to an act entitled "An Act creating a department to be known as the Board of Commerce and Navigation, and vesting therein all the powers and duties now devolved by law, upon the Board of Riparian Commissioners, the Department of Inland Waterways, the Inspector of power vessels, and the New Jersey Harbor Commission," approved April eighth, one thousand nine hundred and fifteen.

BE IT ENACTED by the Senate and General Assembly of the State of New Jersey:

1. Whenever the State Highway Commission or the board of chosen freeholders of any county shall, in the planning or construction of any road or highway, deem it necessary to cross or pass over any land now or formerly under the tidewaters of this State, by means of a bridge, to secure the continuity of such road or highway, the Board of Commerce and Navigation of this State, upon application thereto by the said State Highway Commission or the said board of chosen freeholders, as the case may be, shall grant so much of the lands now or formerly under the tidewaters of this State as shall be necessary for the construction and maintenance of any such bridge. Such grant, for the purposes aforesaid, shall be made without payment of rental or other charge, and upon such lands ceasing to be used for the purpose so granted shall revert and vest in the said Board of Commerce and Navigation, or its successors.

2. This act shall take effect immediately.

Passed April 21, 1920.

DETOUR ACT

Chapter 52, P. L. 1921

An act relating to the use, maintenance and repair of detour roads and providing for the cost thereof.

BE IT ENACTED by the Senate and General Assembly of the State of New Jersey:

1. Whenever any road shall be closed temporarily by any public authority, it shall be the duty of such public authority which shall have control of such road, or shall so close such road, to provide a detour road for the use of the public.

2. The detour road so selected shall be the shortest practicable route from and to the road temporarily closed, and said public authority selecting such detour road shall have full and complete jurisdiction over the same, except as hereinafter provided, so long as it shall be used as a detour road.

3. The detour road shall be put in proper condition for the use of, and shall be maintained in proper condition for the use of, the public who will use such detour road during the period of its use as a detour road.

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4. Said public authority shall erect and maintain proper signs to guide the public to, from and along such detour from and to the points of departure from and re-entry upon the closed road.

5. At the termination of the period of use of such detour road as such, said public authority shall place such detour road in as good condition as when jurisdiction was assumed by said public authority.

6. The cost of repairing and maintaining detour roads as required by section one of this act shall be borne by the public authority so required to maintain and repair the same, and shall be a part of the cost of the construction, repair or reconstruction making necessary the use of any road or highway as a detour.

7. Whenever in the opinion of the governing body of any municipality having original jurisdiction over any road or highway selected as a detour road any public authority shall fail or neglect to comply with the provisions of section one of this act with respect to any road or highway within its original jurisdiction it shall report such violation to the State Highway Engineer, who shall investigate such alleged violation and, if he finds a violation, issue an order to the agency, body or unit hereby charged with the maintenance and repair of such detour road directing it to make repairs to or maintain such detour in the manner and within the time indicated in said order.

8. The term "Public authority" as used in this act shall include the State Highway Commission, the board of chosen freeholders of any county, and the governing body of any municipality.

9. This act shall take effect immediately.

Approved March 17, 1921.

DETOUR ACT

Chapter 285, P. L. 1921

AN ACT CONCERNING ROADS

BE IT ENACTED by the Senate and General Assembly of the State of New Jersey:

1. Whenever any road is being constructed, reconstructed or undergoing extraordinary repairs under authority and direction of the board of chosen freeholders of any county, or the State Highway Commission of this State, or by them jointly, and by reason of said construction, reconstruction or extraordinary repairs, said road is closed to or rendered unfit for public travel, it shall be lawful for the board of chosen freeholders or the State Highway Commission under whose authority or supervision said construction, reconstruction or extraordinary repairs are being made, to provide a detour or detours over any other road or roads in the county where the work is being done, in case the work is being done by the board of chosen freeholders, and over any other road or roads in this State in case the work is being done by the State Highway Commission.

2. In providing detour or detours, the board of chosen freeholders or the State Highway Commission shall have power and authority to expend money on roads used as a detour or detours so as to place them in fit condition for public travel, provided they first obtain consent from the governing body having control and supervision of the road or roads used for a detour or detours, to make such repairs.

3. From and after the passage of this act, whenever any road is to be constructed, reconstructed or have extraordinary repairs made thereto that will necessitate the providing of a detour or detours over other roads it shall be lawful for the board of chosen freeholders or the State Highway Commission to pass a resolution setting forth the fact that a detour or detours is or are necessary, naming the road or roads to be used as a detour or detours during the period of construction, reconstruction or extraordinary repairs, and also setting forth the amount of money necessary to put said detour or detours in proper condition for travel and to maintain the same during the period said detour or detours is or are rendered necessary by reason of said improvement; and the cost of repairing and maintaining said detour or detours during the period aforesaid may be included in and considered as a part of the cost of construction, reconstruction or extraordinary repairs, and bonds or other obligations may be issued for the payment of the same in the same manner as bonds or other obligations are issued for the construction, reconstruction or the making of extraordinary repairs, and may be included in the same issue and as a part thereof.

4. That the repair of roads used as a detour or detours and their maintenance during the period aforesaid may be included in the original contract for construction, reconstruction or extraordinary repairs, or may be let by separate contract, or the roads so used may be repaired and maintained the same as State and county roads are now repaired and maintained, as the body authorizing the work may elect.

5. That the State Highway Commission may contribute to any county of this State for the purpose aforesaid, any money that may come into its hands to be used for construction, reconstruction or extraordinary repairs, and may certify and set forth in writing to the board of chosen freeholders or any county the amount of money it will give for the purpose of providing and maintaining detours as aforesaid, and the manner and method in which said sum so contributed shall be used, and may formulate such rules and regulations for the expenditure of the money aforesaid as it may deem necessary, and any money so contributed as aforesaid shall be used only for the purpose for which it is contributed, and expended under the authority and direction of the board of chosen freeholders of the county to which the contribution is made.

6. This act shall take effect immediately.

Approved April 12, 1921.

STATE AID ACT

Chapter 395, P. L. 1912

An Act to provide for the construction, permanent improvement and maintenance of public roads in this State (Revision of 1912, (As amended by P. L. 1916, pp. 11.)

BE IT ENACTED by the Senate and General Assembly of the State of New Jersey:

1. The board of chosen freeholders of any county in this State may, at any time, by resolution, direct that any public road or section of road, except a city street located within said county, being at least thirty-three feet in width and at least one mile in length, or, being less than one mile in length, is an extension

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of or connection with some permanently improved or paved road or street, be constructed or improved by the construction of a macadamized road, or a telford or other stone road, or a road constructed of gravel, oyster shells, or other similar materials, with or without plastic binder, in such manner that the same, of whatever materials constructed, shall, with reasonable repairs thereto, at all seasons of the year, be firm, smooth and convenient for travel. When more roads are applied for than can be constructed in any one year, the board of chosen freeholders and State Commissioner of Public Roads shall have power and authority to select from the roads petitioned for the ones first to be constructed, having first regard to the most important roads and the distribution of the benefits of this act to all parts of the county. The board of chosen freeholders may, before approval of any road, require as a condition of said approval that the township or townships or other municipalities through which said road runs shall pay not less than ten per centum of the cost of said improvement, said payment to be applied to the county's share of the cost of said improvement, of said roads constructed under this act. That any public road in this section shall be construed to include any road that may have been laid out, dedicated, or the right of way acquired, so that the same may be built, notwithstanding the same never has been built or used by the public or any bridges or culverts erected thereon. (As amended by P. L. 1921, pp. 806.)

2. The said board, after passage of the resolution, shall cause a survey of said road so to be improved to be made, and plans, cross-sections and specifications of the work to be done on the same to be prepared. The survey shall indicate the width and length of said road, and shall also show how much of said road may be improved by deviation from the then existing lines, but no survey shall be commenced until the written consent of the State Commissioner of Public Roads shall have been first obtained. When the said plans, cross-sections and specifications shall have been prepared, they shall be submitted to the board of chosen freeholders for its approval or rejection. If such board shall approve the same they shall then be submitted to the State Commissioner of Public Roads for his approval or rejection, whose duty it shall be, before approving of said plans, cross-sections and specifications, to ascertain, by personal inspection or otherwise, the natural character of the soil upon which such road is proposed to be constructed, and any and all other facts that he may deem important. If, after examination of the plans, cross-sections and specifications he approves their scope and detail, and by an inspection of the road, as aforesaid, he shall be satisfied as to the advisability of the improvement of the road as contemplated, and that the State's share of the cost of the construction of said road, together with its share of the cost of the construction of all other roads or sections of roads in this State, under plans and specifications previously approved by him, will not in any one year exceed the sum of five hundred thousand dollars, or such sum as shall in each year be appropriated for that purpose, then he shall approve in writing thereon said plans, cross-sections and specifications, otherwise he shall reject the same.

3. Within thirty days after approval of the plans, cross-sections and specifications by the State Commissioner of Public Roads, it shall be the duty of the board of chosen freeholders to advertise for bids for said work in two of the public papers printed in said county, and they may also advertise in one engineering journal published in the city of New York, for three weeks successively, at least once in each week. The first publication of which advertisement

shall be at least seventeen days before the date fixed therein for the receipt of bids. This advertisement shall state the place where bidders may examine said plans, cross-sections and specifications, and the time and place where bids for said work will be received by the board of chosen freeholders, or a committee of said board. Each bidder must accompany his bid with a certified check, payable to the county treasurer equal to at least ten per centum of the bid; *provided*, the same shall in no case exceed twenty thousand dollars; *and provided, further*, that in case the bid be less than five thousand dollars, the check shall be five hundred dollars, as a guarantee that if said work be awarded to him he will enter into a contract with said board for the same. This contract must be executed, together with a bond of the successful bidder, in the penal sum of at least the estimated cost of said work, with two or more sureties, freeholders of the county, or a surety or trust company created by this State, or a surety or trust company of another State, authorized to transact business within this State, to be approved by the director of the board of chosen freeholders and the finance committee thereof, conditioned for the faithful performance of said work in strict conformity with the plans, cross-sections, and specifications for the same, within thirty days from the awarding of the contract. *Provided, further*, that it shall be the duty of the board of chosen freeholders to make the award of the contract or contracts, or to reject the same, within the period of one month from the date the bids are received, and that all proposal checks which may be delivered with any bid or bids, excepting the two lowest responsible bids, shall be returned within three days thereafter. The contract and bond, before any work is done thereunder, must be exhibited to the State Commissioner of Public Roads for his approval, in writing, thereon, and the said commissioner is hereby authorized, whenever, in his judgment, the best interests of the county require him so to do, to reject the same, in which case he shall write upon said contract the word "rejected" and append thereto his signature and official title of office, and said contract and the bond required to accompany the same shall, from the time of such rejection, be absolutely null and void, but such rejection shall in nowise operate to prevent the said board from readvertising for bids and proceeding thenceforth under the provisions of this act; *provided*, such action is taken within four months after such rejection, otherwise said approval shall be null and void. The time and manner of payment for work done under any contract awarded under this act shall be set forth in said contract; *provided, however*, that whenever any contractor has completed his contract for work to be done under this act, no percentage of contract price shall be retained but the contractor shall enter into a bond in a sum amounting to five per centum of the contract price, with any surety company authorized to do business in the State of New Jersey and which has the approval of the Attorney-General, to the board of chosen freeholders, which bond shall remain in full force and effect for the period of one year and shall provide that the contractor can be held responsible for poor workmanship done or poor material furnished under such contract, but he shall not be responsible for acts or causes which are beyond or outside of his control. (As amended by P. L. 1921, pp. 806.)

4. The road improvement contemplated under this act shall include the construction of the road and its intersections with other public roads, the restoration or construction, as herein provided, of proper and adequate entrances to properties, the building of any essential walls in cuts or for slopes, bridges, culverts, and all necessary facilities for drainage in improvement aforesaid, also the planting of shade trees, such works as may be necessary to preserve

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existing shade trees and such treatment of adjacent forest lands as may be needed to make the road and its borders an effective firebreak.

Bridge and culvert building may be included in the road contract, or separately contracted for and advertised in the engineering journal as hereinbefore specified. Every such separate contract must be approved by the commissioner. All advertisements shall be made as required by this act and bids received shall give separately the price of each bridge or culvert when the same are included in the road contract.

For the purpose of estimating the State's share of the cost of the work under this act, said cost shall include that of supervision and engineering.

The board of chosen freeholders may, after the execution and approval by the State Commissioner of Public Roads of a contract or contracts for improvement under this act, make without public advertisement, supplemental contracts for additional work found to be necessary as a part of such improvement; *provided*, such contracts shall not cover any additional mileage or length of road, nor alter the general character of the improvement; *and provided, further*, that before any such contracts shall become binding, and before any work shall be done thereunder, they shall be submitted to and approved by the State Commissioner of Public Roads in the same manner as hereinbefore provided in case of contracts let after public advertisement.

The State's share of or contribution to the cost of any improvement under this act shall be forty per centum of the total estimated cost thereof, except when otherwise provided in this act or when the same is left to the discretion of the State Commissioner of Public Roads. (As amended by P. L. 1921, pp. 806.)

5. A true copy of the specifications, bid, contract, bond, justification of surety and summary of all bids received (including any rejected and the cause therefor), certified to be such by the director of the board of chosen freeholders, shall, immediately after the awarding of any contract, be furnished by the board of chosen freeholders to the State Commissioner of Public Roads, to be filed and remain of record in the office of said commissioner.

6. The State Commissioner of Public Roads is empowered to employ as need arises, a staff of qualified road inspectors, certified as such by the Civil Service Commission, at salaries to be determined by the State Highway Commission, and such proper itemized and reported expenses as said commission may allow. Such staff may be removed in accordance with the provisions of the Civil Service law, or assigned to any work appertaining to roads which the commissioner may elect. If, in the judgment of the Commissioner of Public Roads, temporary or seasonal inspectors are required, they may be appointed by the said commissioner at a salary to be fixed by the State Highway Commission. Said inspectors shall be appointed subject to the provisions of the Civil Service law of this State, from among those certified by the Civil Service Commission. The said inspectors may be graded according to the character of the work to be performed by them and compensated accordingly. In addition to their duties as road inspector, such persons may be sent to points within or without the State of New Jersey, for the inspection and supervision of road and bridge materials in course of production or manufacture for use in said state. All inspectors shall be paid from the State appropriated share of the cost of the road, and credit for these payments shall be allowed the State in fixing its share of such cost. (As amended by P. L. 1921, pp. 806.)

7. Where any contract provides for partial payments based upon the

amount of work done, it shall be the duty of the State Highway Engineer or his authorized agent, in conjunction with the county engineer, as each payment becomes due, to present to the board of chosen freeholders a certificate, signed by said State and county officials, in which certificate shall be stated, as near as can be, the amount of work done, for which payment is to be made, and that the same has been done, in all respects, in strict conformity with the contracts, plans and specifications. When the work done under any contract shall have been fully completed, the State Highway Engineer and county engineer shall have prepared a detailed and itemized statement, in quadruplicate, of the cost of the improvement, one copy whereof shall be filed with the board of chosen freeholders, one with the clerk of the county and two with the State Commissioner of Public Roads.

Contracts may provide for partial payments at least once each month or from time to time, as the work progresses, on work of construction or maintenance, but not in excess of ninety per centum of the value of materials in place and of the work done.

Contracts may also provide for partial payments at least once in each month, or from time to time, as the work progresses, on all materials placed upon the site which are suitable for the use and execution of the contract, but such partial payments shall not be in excess of eighty per centum of the value of such materials, providing the contractor furnishes releases of liens for all material furnished at the time each estimate of work is submitted for payment. (As amended by P. L. 1921, pp. 806.)

8. The State's share of the cost of all roads constructed under this act, not exceeding in any one year the sum of five hundred thousand dollars, shall be paid out of the State treasury, out of any moneys not otherwise appropriated, if the same be first appropriated in the annual appropriation act. The Governor and State Commissioner of Public Roads shall certify from time to time to the State Comptroller the amount to be paid to any county, township, town, borough, village or other municipality for such year, and the State Comptroller shall draw his warrant on the State Treasurer in favor of the county collector or collector of the township, town, borough, village or municipality, as the case may be for the amount so certified, and the State Treasurer shall thereupon pay the same.

When any contract provides for partial payments based upon the amount of work done, the intent of this act is that partial payments to any county, township or municipality shall be certified as aforesaid, provided the amount so certified is not in excess of the State's proportional share of that paid on account of the contract or contracts for work done by said county, township or municipality as provided in section seven of this act.

9. On or before the time fixed by law for the closing and final adoption of the annual tax budget of the county, the board of chosen freeholders of such county shall appropriate either in the annual tax budget or separately the county's share or portion of the estimated cost and expense of all work contracted for under the provisions of this act since the day fixed by law for the closing and final adoption of the annual tax budget of the county in the year next preceding which shall be the total cost of such work less the amount certified to be paid by the State.

The sum or sums so fixed and appropriated shall be certified to the county board of taxation and shall be included in the assessment of county taxes and shall be assessed, collected and paid over to the county in the same manner and

at the same time that other county taxes are assessed, collected and paid over; if a deficiency shall exist in consequence of the cost and expense exceeding the estimate, or in consequence of the receipt of a lesser sum from the State as its share of said total cost and expense than shall have been estimated or fixed, the board of chosen freeholders shall have authority to borrow, on temporary loans, such deficiency, and shall include the amount of the same with accrued interest in its next annual budget and the same shall be assessed, collected and paid over as other taxes are assessed, collected and paid over, or the same may be raised by an issue of bonds either separately or in conjunction with an issue to meet and pay the cost and expense of improving any other road under this act, and in the same manner as herein provided for issuing bonds of the county.

If, for any reason, there is a surplus, the same shall be retained and used in the improvement of other roads under this act or in repairs to roads improved under this act.

10. The board of chosen freeholders may, instead of certifying to the county board of taxation the county's share of the cost of any work done under this act, as required by the ninth section of this act, by resolution, adopted by a vote of at least two-thirds of all its members, issue bonds of the county for its proper share of the cost of said work which shall be an amount not exceeding the total cost of such work, less the amount certified to be paid by the State.

11. From and after the date of the approval by the State Commissioner of Public Roads of any contract under this act for the improvement of any road, such road shall forever thereafter be a county road. Any road improved under the provisions of any previous act entitled "An act to provide for the permanent improvement of public roads in this State," any road accepted by any board of chosen freeholders under chapter one hundred and fourteen of the laws of one thousand nine hundred and four, and any road acquired under chapter one hundred and twenty-one, laws of one thousand nine hundred and ten, shall forever thereafter be a county road, and the duty of keeping the same in repair shall devolve exclusively upon the board of chosen freeholders and the county supervisor, as hereinafter mentioned, and all other powers and duties respecting such roads shall be imposed upon and vested in the said board of chosen freeholders, to the exclusion of all township, town, borough, village or other municipal officers. No power conferred on any of said governing bodies shall in any way divest the board of chosen freeholders of their right to construct across or under the sidewalks the necessary culverts or other provisions for the maintenance of such county roads. If any such road shall become out of repair and shall not be repaired within sixty days after notice in writing so to do, given by the State Commissioner of Public Roads to the board of chosen freeholders, or to its director, the said Commissioner of Public Roads shall certify to such neglect or refusal to the State Comptroller, who shall withhold payment to such county of any moneys already apportioned, or that may thereafter be apportioned, to such county by the State, and no payment shall be made to said county until the State Commissioner of Public Roads shall certify to the State Comptroller that said road has been placed in a good state of repair.

12. After the first county road shall have been constructed under this act in any county, it shall be the duty of the board of chosen freeholders to appoint some suitable person as county supervisor of roads, and a qualified civil engineer as county engineer, and each of whom, before assuming the

duties of his office, shall make and subscribe an oath or affirmation that he will faithfully perform all the duties of his office to the best of his ability and understanding. Such supervisor and engineer shall hold office for five years and until his successor is appointed and qualified. He shall give bond to the board of chosen freeholders in the penal sum of one thousand dollars, conditioned for the faithful performance of the duties of his office, with such surety or sureties as the board shall approve. The said engineer shall receive such compensation for his services as the said board shall determine, and said supervisor shall receive a salary and allowance for expenses, both fixed by said board, but said compensation or salary is not to be reduced during the said engineer's or supervisor's term of office.

The said engineer or supervisor may be dismissed at any time by the governing body after a proper hearing upon proof sustaining to the satisfaction of said body charges preferred by the said body or the State Commissioner of Public Roads, for incompetency, neglect, disability or other cause. In the event of such dismissal, the said board shall immediately appoint a new engineer or supervisor to hold for the full term of five years from the date of appointment. The said board of chosen freeholders shall appropriate all moneys necessary to keep any and all roads constructed under this act in good repair and free from obstruction, and if the board shall have no money which may be lawfully used for such purposes, it shall have the power to borrow the same on credit of the county, until the next annual taxes shall have been levied and collected. The cost of all repairs and removal of obstructions shall be paid by the county treasurer, upon the order of the board of chosen freeholders, and all bills for repairs and removal of obstructions shall be verified by affidavit and shall be certified to be correct by the county supervisor of roads. (As amended by P. L. 1921, pp. 806.)

13. Whenever it is deemed necessary and advisable by the board of chosen freeholders of any county to acquire lands for the purpose of laying out, widening, changing the location of or straightening any road improved or to be improved under this act all cost and expense of obtaining and acquiring such land by whatsoever method the same may be acquired may be paid out of any moneys applicable for road improvement purposes, or, if there be no money on hand for such purpose, said board may borrow the necessary sum or sums on temporary loans, upon the credit of the county, until the next annual taxes shall be levied and collected or such sums as may be necessary may be raised by an issue of bonds, either separately or in connection with and as part of any other bond issue under the provisions of this act. The said board of chosen freeholders is hereby authorized to agree with the owner or owners of any lands required for the foregoing purposes, as to the compensation to be paid by said board for a conveyance of said land or lands, and in case said board cannot agree with the owner or owners of any land for the acquisition of the same for the foregoing purposes said board shall have the power to acquire said lands by condemnation, in the manner prescribed by law, and the said board is also authorized to vacate any part of any public highway that may be rendered unnecessary for public travel by the widening, straightening, altering or changing of location thereof.

14. If all the owners of property abutting on any road or highway, in any county, which has not been improved or is not undergoing improvement, desire said road, or any section thereof, to be improved, and shall certify, in writing, to the board of chosen freeholders, that they are willing to bear

the entire expense of such improvement, the county engineer, or other competent engineer, shall prepare plans, cross-sections and specifications for the work to be done on such road, or any section thereof, so to be improved, and shall submit the same to the owners and if satisfactory to such owners, they are hereby authorized to enter into contract for such work, said contract to be first submitted to the board of chosen freeholders for its approval. Upon the completion of the work to the satisfaction of the county engineer, and the board of freeholders, and upon the submission to said board of proper receipts showing full payment for all work done, the said board of chosen freeholders may, by resolution, declare the said road, or any portion thereof, be thereafter a county road. The location of any portion of said road may be changed, if deemed desirable, upon acquiring the consent, in writing, of the owner or owners of land abutting on such portion of road so to be changed, and upon acquiring, without expense to the county, the land necessary for such change. The county engineer shall be paid a legitimate fee for supervising said work, to be paid by said owners. (As amended by P. L. 1921, pp. 806.)

15. The board of chosen freeholders shall have full power to lay out, open, construct and improve, when such contemplated work is shown on the approved plans and cross-sections, all necessary approaches to any properties along the line of such road which may have been destroyed or damaged by any alteration in the existing grade, whether within or without the line of such road, and all costs and expenses incurred therefor shall be paid by the said board of chosen freeholders in the same way and manner as other work done under this act is paid for.

16. Whenever any public road is sought to be improved under the provisions of the fourteenth section of this act, upon which road any lands or real estate owned by the State of New Jersey may front or border, the board of managers, or other body having the control and management of said lands and real estate, are hereby authorized to consent to the improvement of said road and to enter into contract for the same in the manner directed by said section, and to pay for said improvement out of any moneys appropriated to said board of managers or other governing body.

17. Whenever it shall be deemed necessary by the State Commissioner of Public Roads to close a road or section thereof which is being constructed, improved or repaired under this act, in order to permit a proper completion of such work, he shall execute a certificate and file the same with the clerk of the board of chosen freeholders of the county in which such road is situated. Such certificate shall state the necessity for closing such road and describe the portion thereof to be closed; not more than one mile of any road shall be closed at any one time. The board of chosen freeholders shall thereupon close the same to public travel by erecting suitable obstruction and posting conspicuous notice to the effect that the road is closed.

18. It shall be lawful for the boards of chosen freeholders of two or more counties to agree, by resolution passed separately in each board, to improve, under the provisions of this act, a road, in whole or in part, which is on the dividing line or runs into or through such counties.

In such case they shall make all necessary surveys and prepare proper plans, cross-sections and specifications, which, on approval by resolution passed separately by each board, shall be certified to the State Commissioner of Public Roads for action thereon. If approved by said commissioner, each board is authorized to appoint members thereof to serve as a joint committee

to advertise for and receive bids, as specified in this act, for said improvement. The bids shall be opened and read in public meeting and thereafter the members of the joint committee shall report the amount of the bids with recommendations to their respective boards. The contract shall be awarded, by resolution of each board voting separately, to the lowest responsible bidder, and shall be approved or rejected, as provided in this act, by the State Commissioner of Public Roads. As nearly as may be possible, all proceedings concerning the improvement under this section, shall conform to those prescribed in this act.

The contract awarded shall specify the proportion which each county shall bear of the cost of the improvement exclusive of the State's share, and each county shall be liable for that amount alone.

Of the share of the cost of the improvement paid by the State, each county shall receive such proportionate part as it bears to the cost of the improvement to the counties and in the manner as specified for payment to a county for road improvement within its own territory; *provided, however*, that if, in the judgment of any of the boards, parties to said agreement, the burden of the cost of improvement aforesaid is too great to incorporate in the annual tax levy for any one year in that county, then such board, by a resolution adopted by a vote of at least two-thirds of its members, may raise the sum necessary for the payment of its share of the cost by an issue and sale of bonds.

19. The provisions of this act shall extend to townships, towns, boroughs, villages, or any municipality or municipalities, except cities, and no road shall be built within any city under this act. The common council or other governing body, the assessor or assessors, the mayor or other chief executive officer, the clerk and collector, or other financial officer, respectively, of any township, town, borough, village or other municipality, shall have the power and shall perform all the duties as are in this act cast upon the board of chosen freeholders, the county board of taxation, the director of the board of chosen freeholders, the county clerk and county treasurer, respectively. Any of said municipalities may raise, by taxation, funds with which to pay for the cost of the construction of any road or roads, or may issue bonds for the payment of the same, in the same manner, as nearly as may be, as the board of chosen freeholders may do under this act, it being the expressed intention of this section to confer upon townships, towns, boroughs, villages or other municipalities, full power to improve any road, or section of road, under the provisions of this act, all proceedings conforming, as nearly as may be practicable, to the provisions of this act. Any such road, or section of road, so constructed by any township, town, borough, village or other municipality, other than by the county, shall be exclusively under the jurisdiction and control of such township, town, borough, village, or other municipality, and shall be repaired and maintained by such municipality. (As amended by P. L. 1921, pp. 806.)

20. Whenever any road, or section of road, constructed by the board of chosen freeholders, shall lie within the corporate limits of any city, said road shall be exclusively under the jurisdiction and control of such city, and shall be repaired and maintained by the same; *provided, however*, that this provision shall not extend to roads now maintained under the act entitled "A supplement to an act entitled 'An act to authorize the board of chosen freeholders of any of the several counties in this State to lay out, open, construct, improve and maintain a public road therein,'" approved _____ seventh,

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one thousand eight hundred and eighty-eight, approved March twenty-fourth, one thousand eight hundred and ninety-eight.

21. A resolution passed by the township committee of any township, or the governing body of any other municipality through which said road runs, to pay at least ten per centum of the cost of said improvement provided for in the first section of this act, shall be binding upon such township, or such other municipality, as the case may be. (As amended by P. L. 1921, pp. 806.)

22. Whenever any township or other municipality shall have undertaken to pay ten per centum of the cost of any improvement under the provisions of this act, either by resolution of the township committee or other governing body, or otherwise; and if in the opinion of any such township committee or other governing body, to be determined by resolution of such township committee or other governing body, it would be to burdensome on the taxpayers of such township or other municipality to place in the tax levy for any fiscal year the portion of the expense of said improvement to be borne by it, then it shall be lawful for such township committee or other governing body to issue a bond or bonds for the amount undertaken to be paid as afore-said by such township or other municipality.

23. Whenever any public road has been or shall hereafter be improved under the provisions of this act and in the course of improving such road the grade of the roadbed shall have been or shall be changed so that it shall not conform to the grade of the remaining portion of the road, including the sidewalks, it shall be lawful for the municipal authorities of each municipality through which such road passes to cause the remaining portion of such road within the limits of their several municipalities to be graded and formed so as to conform in grade to that established for the roadways constructed under the provisions of this act and to cause such work to be done under the same proceedings and in the same manner as may be provided by law in their several municipalities for the grading of the streets of such municipalities.

The proper municipal authorities of any municipality through which any such road may run shall have full power and authority to make any municipal improvement upon or within any such road within the limits of their several municipalities which may be authorized by law to be made in any of the other public streets or roads of such municipalities; *provided, however*, no such improvement shall be made by such municipal authorities which may in any way interfere with or impair the roadway improved under the provisions of this act without the approval and consent of the board of chosen freeholders of the county within which such road may be located.

The cost and expense of any of the public improvements authorized by this section shall, so far as the same can be, be assessed upon the lands and real estate specially benefited by the improvement in proportion to the benefit received; and no lot or parcel of land shall be assessed more than it is so specially benefited, and such assessment shall be made in the same manner and under the same procedure as is directed by law for the making of other assessments for street improvements within every such municipality.

Nothing in this act contained shall be construed in any way to impose upon any such municipality therein referred to any part of the cost of the maintenance and repair of the roadway of any road improved under the provisions of this act.

24. Whenever the owners of fifty-one per centum of the frontage of property abutting any road proposed to be improved under this act by any

board of chosen freeholders shall petition the governing body in which their lands and the said road or section of road shall lie, praying that said road or section of road be improved and paved for its entire width, from gutter to gutter, and agreeing to pay the entire added cost due to said increased width of impovement and pavement, it shall be lawful for said governing body, by and with the consent of the State Commissioner of Public Roads, to enter into a contract with the said board of chosen freeholders to pay such additional cost, which contract shall fix and prescribe the times and manner of payment by said municipality to said board of chosen freeholders of such added cost.

Such cost and expense so contracted to be paid by the municipality shall be assessed and collected by said municipality upon and from the lands abutting upon said road or section of road so improved in the same manner as other assessments for benefits for improvements are authorized to be assessed and collected in such municipality.

If the improvement contemplated is being undertaken by municipal instead of county authority such extended improvement shall be authorized by the petition herein provided for, the consent of the municipal authorities of such municipality and the consent of the State Commissioner of Public Roads and the said additional cost shall be assessed and collected as herein provided.

25. All bonds authorized to be issued by this act by the board of chosen freeholders, or any municipality, shall be known as "Road Improvement Bonds."

Such bonds shall be of such denomination, bear such rate of interest, not exceeding five (5%) per centum per annum, and be payable at such places and such times, not exceeding thirty years from their date, except bonds issued to provide funds for extraordinary repairs or reconstruction which shall be payable in not exceeding five years from their date, and be in such form as the board of chosen freeholders or governing body of any municipality issuing such bonds shall by resolution determine.

Said bonds shall be signed by the director and clerk of the board of chosen freeholders of the county, sealed with the seal of such board and countersigned by the county treasurer of the county, and in the case of a municipality other than a county shall be signed by the mayor, or chief executive officer, or the chairman or presiding officer of the governing body thereof and by the clerk thereof and sealed with the seal of said municipality, and countersigned by the chief financial officer thereof. The said bond may be either coupon or registered, or coupon bonds with the privilege of registration as to principal only and of conversion into bonds registered as to both principal and interest and the faith and credit of the county or municipality issuing them shall be pledged for their payment. Such bonds shall recite that they are issued pursuant to the authority of this act and of the resolution authorizing the issuance thereof, which shall be conclusive evidence of their validity, and of the regularity of their issuance.

There shall be raised by taxation annually after the issuance of any such bonds, a sum sufficient to meet and pay the interest thereon, as the same accrues, and a sum to be paid into a sinking fund which will, together with the accumulations thereof, provide a fund sufficient to meet and pay the principal of said bonds at maturity; *provided, however*, that if such bonds be so issued that they are payable in annual installments substantially equal in amount, the first of which installments shall be payable in two years from the date of such bonds and the last installment to be payable within thirty

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years from such date, the board or body authorizing such bonds in lieu of providing for a sinking fund to meet the principal of said bonds, shall cause to be raised by taxation in each year in which an installment of principal shall be payable an amount sufficient to meet said installment, in addition to the annual tax during the life of the bonds to provide for the payment of the interest accruing thereon. (As amended by P. L. 1921, pp. 806.)

26. In order to enable the Commissioner of Public Roads to execute the provisions of section thirty-seven of an act of the Legislature of this State entitled "An act defining motor vehicles and providing for the registration of the same and the licensing of the drivers thereof; fixing rules regulating the use and speed of motor vehicles; fixing the amount of license and registration fees; prescribing and regulating process and the service thereof and proceedings for the violation of the provisions of the act and penalties for said violations," approved April twelfth, one thousand nine hundred and six, said commissioner is hereby authorized to issue to the public body charged with the maintenance of any improved roads, his certificate setting forth the amount set aside by him for the repairs of such road from moneys under his control available for road repairs. On receipt of suitable certificate from the proper officer that said road has been repaired, said commissioner is authorized to approve said certificate for payment, and its amount shall then be paid as provided by section eight of this act; or said commissioner may advertise for sealed proposals for the repair of any such road and award a contract to the lowest responsible bidder, reserving to himself, however, the right to reject any and all bids.

27. Whenever any improved public road in this State is in need of extraordinary repairs or reconstruction, the public body charged with its care shall prepare specifications and any plans and cross-sections necessary to explain and describe the repairs contemplated and forward the same to the State Commissioner of Public Roads. The said commissioner is authorized, in his discretion, to approve of said specifications, plans and cross-sections, and to certify what amount of State moneys he will set aside for the repair of such roads. On his approval and issue of certificate as this act provides, said public body shall advertise for bids and otherwise proceed as this act directs.

If such public body shall not have sufficient funds wherewith to pay its share of the cost of such repairs, then it shall be lawful for said public body to issue bonds in a sum not exceeding the sum to be advanced by the State Road Commissioner for and towards such repairs as stated in his certificate, to defray and pay its share of the costs.

The State Highway Commission may, in its discretion, approve and permit the use of not more than fifty per centum of the motor vehicle fund allotment made by the State to the counties each year to be used toward the payment of interest on such bonds, and for the retirement of such bonds, except that the State Highway Commission shall not permit the use of the State motor vehicle funds for such purposes in an amount which, if subtracted from the total allotment by the State to the county would, in the opinion of the State Highway Commission, leave an insufficient amount for the proper repair and maintenance of the other existing county roads; *provided, further*, that the provisions of this amendment shall not apply to any work or contracts performed or entered into by any county in this State prior to the date of the

passage of this act. (As amended by P. L. 1919, pp. 27.) (See also P. L. 1921, Chapter 164.)

28. It shall be lawful for boards of chosen freeholders, or other governing body charged with the construction, maintenance and repair of roads to acquire lands for gravel pits, stone quarries, or other natural deposits of road building materials advantageously located for use in their jurisdiction and to pay for the same from funds available for the construction, maintenance and repair of roads.

29. When a road plan involving the treatment of trees or forests is to be made the State Commissioner of Public Roads shall notify the State Board of Forest Park Reservation Commissioners, which shall cause to be prepared such plans and specifications as shall be necessary for the completion of said treatment, the cost of which shall be taken as part of the cost of the road. In all that relates to the choice, planting, or care of trees, the decision of the Forest Park Reservation Commission shall be final. In all that affects the location of trees, or their influence upon the road, the decision of the State Commissioner of Public Roads shall be final. If the State Commissioner of Public Roads and a local governing body having authority in respect to roadside trees shall be unable to agree regarding the removal or treatment of any tree standing within the line of any road to be improved, according to this act, the two interests shall submit the case to the Forest Park Reservation Commission, and its decision shall be final and binding upon all parties.

30. In case, for any reason, any section or sections of this act shall be questioned in any court and shall be held to be invalid or unconstitutional, no other section or sections or part hereof shall be affected thereby

31. All acts and parts of acts inconsistent with the provisions of this act be and the same are hereby repealed; *provided*, that this repealer shall not revive any act heretofore repealed, nor shall any proceeding for the improvement of any public road entered into before the passage of this act abate, but such proceedings shall continue as prescribed in the act under which the improvement was commenced or may be proceeded with under the provisions of this act.

32. This act shall take effect immediately.

Approved April 15, 1912.

SUPPLEMENT A

Roads to State Institutions Act

Chapter 28, P. L. 1916

An Act to amend an act entitled, "A supplement to an act entitled 'An act to provide for the permanent improvement and maintenance of public roads in this State (Revision of 1912), approved April fifteenth, nineteen hundred and twelve,'" which supplement was approved April first, nineteen hundred and thirteen.

BE IT ENACTED by the Senate and General Assembly of the State of New Jersey:

1. Section one of the act to which this is an amendment be and the same is hereby amended to read as follows:

1. The Commissioner of Public Roads is hereby authorized to improve and keep in repair any road, or section of road, leading up to any institution or to any part or reservation maintained wholly by the State of New Jersey,

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and cause plans and specifications for such improvements to be made. If the said commissioner shall decide that said road, or section of road, shall be improved, the same shall be improved in all respects in accordance with the provisions of the act to which this act is a supplement, and the payment of the cost of said improvement and the repair of said road after said improvement shall be paid out of any appropriation made for the improvement and maintenance of roads authorized to be improved or maintained under the act to which this act is a supplement, or for the repair of said roads, out of any moneys derived by the Commissioner of Public Roads pursuant to any law of the State, which said payments shall be made out of the treasury of this State, on the warrant of the Comptroller, on bills duly approved by said Commissioner of Public Roads.

Nothing in this act nor in the act to which this is a supplement shall be held to prevent the improvement or maintenance by the said commissioner of any street in any city when said street leads up to any such institution, park or reservation.

2. This act shall take effect immediately.

Approved March 8, 1916.

SUPPLEMENT B**Chapter 305, P. L. 1913**

A Supplement to the act entitled "An act to provide for the permanent improvement and maintenance of public roads in this State (Revision of 1912)," approved April fifteenth, nineteen hundred and twelve.

BE IT ENACTED by the Senate and General Assembly of the State of New Jersey:

1. The estimated amount of all contracts for road improvements awarded in any one year by the board of chosen freeholders, together with the estimated cost of repairs of roads already constructed, shall not exceed (in excess of the amount which any county may raise in any one year) the sum of one hundred thousand dollars, exclusive of the State appropriation for road purposes apportioned to any county, except when the county's share of the cost of the improvement or repair of any road is to be paid for out of the proceeds of a legally authorized bond issue, for the purpose, by any such board of chosen freeholders.

2. This act shall take effect immediately.

Approved April 9, 1913.

SUPPLEMENT C**Chapter 79, P. L. 1914**

A Supplement to an act entitled "An act to provide for the permanent improvement and maintenance of public roads in this State (Revision of 1912)," approved April fifteenth, one thousand nine hundred and twelve.

BE IT ENACTED by the Senate and General Assembly of the State of New Jersey:

1. Whenever any county road or section thereof shall lie within the corporate limits of any borough, said borough may improve said road or sec-

tion thereof in the same manner, as nearly as may be, as such road could be improved by said board of chosen freeholders under the provisions of the act to which this is a supplement; and the cost of such improvement shall in the first instance be paid by said borough, but said State and county shall when said road is completed reimburse and pay to said borough such proportionate part of the cost thereof as they would have respectively paid if said road had been improved by the county under said act, in which cost there shall be included any interest charges incurred by said borough on temporary loans as hereinafter provided, and said road when improved shall be and remain a county road.

2. Said board of chosen freeholders and said borough may issue bonds to meet the cost of said improvement in the same manner and to the same extent that bonds could have been issued if said improvement had been made by the board of chosen freeholders of said county, and said borough may borrow on temporary loans such sums as may be necessary to pay the moneys due under the contract for said improvement until such time as the proportionate shares of the cost thereof shall be received by said borough from the State and county respectively.

3. Before any improvement is undertaken by any borough by virtue of the provisions of this supplement, it shall be necessary to obtain the consent and approval of the State Commissioner of Public Roads and of the board of chosen freeholders of the county in which said borough may lie; and it shall be lawful for said board of chosen freeholders to agree with said borough as to the time and manner of the payment to said borough of its proportionate share of the cost of said improvement.

4. All acts and parts of acts inconsistent with this act are hereby repealed, and this act shall take effect immediately.

Approved March 30, 1914.

SUPPLEMENT D

Chapter 248, P. L. 1915

A Supplement to an act entitled "An act to provide for the permanent improvement and maintenance of public roads in this State (Revision of 1912)," approved April fifteenth, one thousand nine hundred and twelve.

BE IT ENACTED by the Senate and General Assembly of the State of New Jersey:

1. The board or body having charge of the finances of any municipality or public body of this State, which municipality or public body, with the approval of the State Commissioner of Public Roads, has heretofore made and entered into, or shall hereafter make and enter into, any contract for the improvement of any public road, pursuant to the provisions of the act to which this is a supplement, shall have power and is hereby authorized as and when each installment or payment on account of the contract price of such improvement falls due, and a proper certificate therefor is presented to such municipality or public body in accordance with section seven of said act, to borrow money on temporary loan in anticipation of the payment to such municipality or public body of and to an amount not exceeding the State's share of such installment or payment on account of the contract price of such road so falling

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due, and the proceeds of such temporary loan shall be applied and paid on account of such installment or payment on account of the contract price.

2. Such temporary loans shall be repaid upon payment to said municipality or public body of the sums in anticipation of payment of which said loans were made.

3. This act shall take effect immediately.

Approved April 8, 1915.

SUPPLEMENT E

Chapter 258, P. L. 1915

A Supplement to an act entitled "An act to provide for the permanent improvement and maintenance of public roads in this State Revision of nineteen hundred and twelve)," approved April fifteenth, nineteen hundred and twelve.

BE IT ENACTED by the Senate and General Assembly of the State of New Jersey:

1. Whenever the State Commissioner of Public Roads shall issue to any municipality or public body charged with the maintenance of any improved roads his certificate, setting forth the amount set aside by him for the repair of any such road, from moneys under his control available for road repairs in accordance with section twenty-six of the act to which this is a supplement, it shall and may be lawful for the board or body having charge and control of the finances of said municipality or public body, and said board or body is hereby authorized, to borrow money on temporary loan to an amount not to exceed the amount named in such certificate in anticipation of the payment of the amount named in such certificate to said municipality or public body in accordance with the provisions of the act to which this is a supplement, and to apply the proceeds of said loan to the payment of the cost of the repairs of such road. Such temporary loan shall be repaid upon payment to said municipality or public body of the sum in anticipation of payment of which said loan was made.

2. This act shall take effect immediately.

Approved April 8, 1915.

Chapter 164, P. L. 1921

A Supplement to an act entitled "An act to authorize and regulate the issuance of bonds and other obligations and the incurring of indebtedness, by county, city, borough, village, town, township, or any municipality governed by an improvement commission," approved March twenty-second, one thousand nine hundred and sixteen.

BE IT ENACTED by the Senate and General Assembly of the State of New Jersey:

1. Any bonds heretofore or hereafter issued by any county, for the payment or retirement of which part of the county's allotment of the motor vehicle fund may be permitted to be applied by the State Highway Commission, shall be deducted in any annual or supplemental debt statement filed

pursuant to the act to which this is a supplement; provided, that bonds heretofore issued shall be deducted only if and to the extent that the portion of said allotment authorized to be so applied in the fiscal year next preceding the filing of such statement would be sufficient, if applied annually, to pay the interest and retire the principal of said bonds within ten years from their issuance; *further provided*, that such bonds hereafter issued shall be deducted when issued and in the future years thereafter if and to the extent that the portion of every said allotment so permitted to be so applied in the fiscal year of their issuance would be sufficient, if applied annually, to pay the interest and retire the principal of all such bonds whether heretofore or hereafter issued within ten years from their issuance; further provided, that the total amount of bonds so deducted shall not at any one time exceed one per centum of the average assessed valuation of the taxable real property of said county as ascertained in said statement.

2. It shall be lawful for any county to make and file at any time during any year a revision of its last annual debt statement as of the thirty-first of December of the preceding year, in order to make the deduction authorized by section one hereof or to correct any error or omission therein.

3. This act shall take effect immediately.

Approved April 7, 1921.

TOWNSHIP AID ACT

Chapter 217, P. L. 1916

An Act to provide for the proper construction, grading and drainage of the unimproved township roads of the State and to provide State aid therefor.

BE IT ENACTED by the Senate and General Assembly of the State of New Jersey:

1. There shall be set aside annually on the first day of July or as soon thereafter as available from the net receipts of the motor vehicle fund the sum of two hundred and ten thousand dollars which shall be used to meet the State's share of the cost of the work hereinafter prescribed. Payments from this fund shall be made in the same way as other payments from the motor vehicle fund. The State Highway Commission shall reserve each year a sum of ten thousand dollars to meet the State's share in each county until the first day of January. Any amount thus reserved that has not been applied for on said date shall be distributed among other applicants, in the discretion of said State Highway Commission, for the work contemplated by this act. (As amended by P. L. 1920, pp. 101).

2. Any township committee may on its own motion apply to the said Commissioner for aid under this act. Such application may be passed by resolution of said township committee at any meeting. It shall set forth the road or roads on which it is proposed that the work shall be done and the beginning and ending points of such work, and the amount of money the said committee may be authorized to spend on the work, including any contributions thereto.

3. The State Commissioner of Public Roads shall decide which applications in any county will best serve the interests of the township, county and State. He shall notify the township committee of his approval of such applications and shall thereupon enter with them into a written agreement for the

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necessary planning and surveying and for the doing of the actual work and for the inspection thereof. Said work may be performed, in whole or in part, by the labor of prisoners, by contract, either with or without advertisement, but advertisement shall in every case be made upon the demand of said Commissioner.

4. The work contemplated under this act will include, in addition to constructing said road, the survey and preparation of plans, profiles and cross-sections, the grading and drainage of the road and the construction of the necessary culverts and bridges whose construction and maintenance is by law now imposed upon the township authorities.

5. The share of the cost of the work to be assumed by the State shall not exceed seventy-five per centum of the cost of the actual work. In addition the State shall pay the cost of the survey and preparation of plans. Said work of survey and planning shall in all cases be done by the said commissioner and shall be paid out of said fund. (As amended by P. L. 1920, pp. 101.)

6. Township committees are hereby authorized to raise funds necessary for the work contemplated in this act, by including the same in the tax levy or by temporary loans, the amount of which said temporary loans and the interest thereon until time of payment shall be included in the tax levy of the next year following that in which the indebtedness is incurred. Any township committee is hereby authorized to accept contributions from any person or corporation, toward meeting its share of the cost of this work. The financial officer of the township is hereby directed to receive such contributions and to properly credit the same.

7. Any township committee may acquire any land necessary for straightening or relocation of any road on which work is to be done under this act by gift, grant, demise, by purchase or by the exercise of eminent domain, in the manner now provided by law. All roads on which work may be done under this act shall have a right of way not less than thirty-three feet wide.

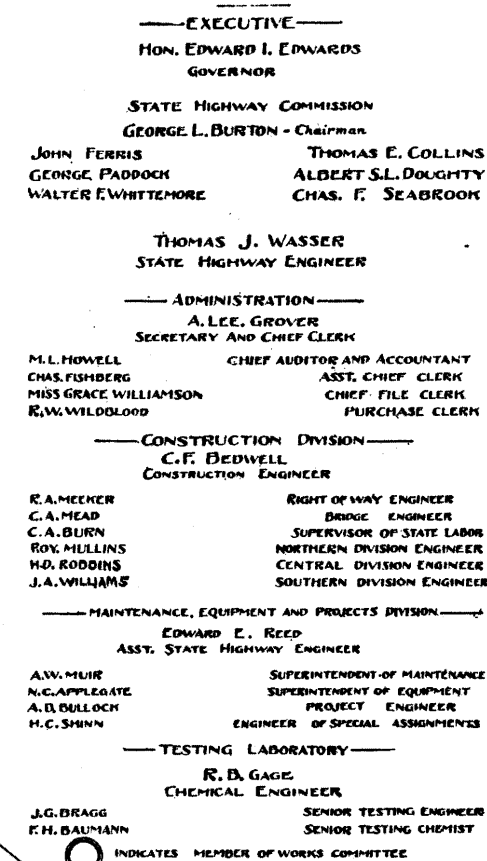
8. It shall be the duty of any township committee, accepting State aid under this act, to appropriate not less than one hundred dollars per mile annually, to maintain the roads on which State aid has been received in a condition satisfactory to the State Highway Commission. The State Highway Commission may agree in any year to assume a share, not exceeding three-fourths of the cost of said maintenance, and to pay the same out of the receipts of the motor vehicle fund. (As amended by P. L. 1920, pp. 101.)

9. The State Commissioner of Public Roads is hereby authorized to employ such assistants, either temporary or permanent, as may be necessary for the discharge of the duties imposed upon him by this act.

10. All acts and parts of acts inconsistent with this act are hereby repealed, but this repealer shall not work to revive any statute or part thereof heretofore repealed.

11. This act shall take effect immediately.

Approved March 20, 1916.



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