

Report of Chief Engineer
of the
State Highway Department
January 1, 1941 to June 30, 1942

Dover, Delaware
July 1, 1942

To the Chairman and Members of the
State Highway Department
Dover, Delaware

Sirs:

I am submitting herewith the twenty-fifth annual report of the activities of the State Highway Department together with certain recommendations and suggestions.

This report will cover a period of eighteen months beginning January 1, 1941 and ending June 30, 1942. Future reports will then coincide with the fiscal year period instead of the calendar year as has been the case in the past.

Twenty-five years ago, on May 10, 1917, the Delaware State Highway Department held its first meeting at Dover and began plans for the construction of a system of State Highways. This marked the beginning of the "Motor Car Age" in Delaware.

It would seem proper in making this report to review and briefly summarize the accomplishments and work of the Department for this twenty-five year period. It is perhaps particularly appropriate since the year 1941 quite possibly marks the end of an era of highway progress, which surpassed in scope and magnitude any other constructive development in the nation's history.

In looking back over these twenty-five years there are certain dates which stand out as highway landmarks. The years between 1917 and 1926 were the years of the Good Roads Movement; of bond issues, the beginning of Federal Aid, when the highways expanded to help industry and aid agriculture, by bringing the farm closer to the market.

The goals during these years were mileage and revenues. With an increasing mileage of improved highways came a rapidly increasing number of motor cars and trucks, and mounting revenues which warranted larger bond issues. The total revenue of the Department for the year 1917 was less than \$84,000, for 1918 it was \$232,000 and not until 1923, the first year of the gas tax did it exceed \$500,000; however, three years later it had jumped to \$1,212,000. During this period the State issued \$9,780,000 and the Counties \$6,725,000 of State Highway and State Aid Highway Bonds, all of which was expended on the State Highway system, and 588 miles of modern highways were built.

These expenditures provided an excellent investment for not only did business, agriculture, and the general public profit by the improvements in transportation, but the revenues obtained mounted rapidly until by the year 1930, they had increased to nearly two and a quarter millions of dollars annually.

During this period all the main highways were paved and the State Highway Police Force was organized.

These results were obtained by following definite and continuous policies laid down by the original members of the Department under the leadership of General T. Coleman duPont and Governor John G. Townsend, Jr.

The second period covers the years 1926 to 1935. The consolidation and improvement of the primary system and the development of a secondary system of low cost highways characterized this period. Existing roads were widened to meet the demands of increasing traffic and higher speeds, while the need of secondary roads was recognized. Under

the aggressive leadership of Governor C. Douglass Buck and Chairman Francis V. duPont, the dual highway from Wilmington to Dover was launched and completed. This innovation which at the time of completion was the longest of its type in the world has been widely copied and is now a standard throughout the nation for multiple lane highways.

This was a period of large Federal grants and increasing revenues which led to the assuming by the State in 1927 of the interest payments on the County Highway Bonds and the adoption of the "pay as you go" policy in 1932.

An active construction program continued through these years until at the beginning of the year 1935 the State Highway System totalled 1239 miles which included 46 miles of dual highway, also in addition 158 miles of main highways had been widened and 29 miles of sidewalks laid in urban sections.

During this period highway bonds totalling \$10,125,000 were retired and the outstanding State Highway Bonds reduced from \$13,030,000 to \$2,905,000.

In 1929 the Department became custodian of the Public Lands of the State, while the final period 1935 to 1942, which completes the twenty-five year life of the Department is marked by the enlarging of its activities.

On July 1, 1935, as directed by the General Assembly the Department took over all highways formerly maintained by the Counties approximately 2600 miles in all. To offset this added maintenance cost an additional cent of gas tax was levied increasing the tax to four cents per gallon, at the same time the payment of both interest and retirement of County highway bonds was made an obligation of the Department, which resulted in freeing real estate entirely from highway taxation and substantially reducing the property owners taxes.

Beginning with the year 1935, the Department through the Secretary's Office has collected the Motor Fuel Taxes, audited the sales records of the oil companies and checked and approved the refunds to non-highway users, while the General Assembly of 1939 placed upon the State Highway Department the responsibility of carrying on the work formerly administered by the Mosquito Control Commission. At the same session the Motor Vehicle Department was transferred from the Office of the Secretary of State to the State Highway Department, thus bringing all the functions of highway building, maintenance, and policing; the registration and licensing of motor vehicles and operators, and the collection of registration fees and motor fuel taxes under the State Highway Department.

The first years of this period 1935 to 1942 were busy ones, the dual highway system was extended, many miles of narrow roadways were widened and a progressive improvement of the 2200 miles of dirt roads was carried on. This dirt road improvement has been continued to date and has shown that largely by the use of local materials all-year roads can be developed which are serviceable and satisfactory to the farmer, the mail carrier and the school bus operator. Over 300 miles of these stabilized highways have been treated with a bituminous covering and over 250 new bridges and 87,000 linear feet of concrete drainage pipe have been installed, as a part of the secondary highway program.

Notable new highways constructed during this period were the Governor Printz Highway in New Castle County and the Ocean Highway from Rehoboth to the Maryland line at Fenwick's Island. There was also an increasing emphasis on highway construction within the towns and cities. The increasing dependence on highway transportation by the public had brought the demand for new and improved services and facilities, such as roadside improvement, traffic service, snow removal, railroad grade crossing

protection and elimination, and the whole field of highway safety. Delaware has kept abreast and taken an active part in these developments.

Of increasing importance has been the reconstruction and resurfacing of the older pavements and highways which had assumed a constantly greater place in the activities of the Department until interrupted by the War effort.

BUILDING PROGRAM

As a climax to a quarter of a century of highway progress, the Department in 1941 entered upon a building program now about completed for housing the Department.

This program consisted of the construction of an Administration building located on the State House grounds at Dover, modern motor vehicle buildings with testing lanes located at Wilmington, Dover and Georgetown, and a central garage and division office buildings at Dover.

This building program long contemplated is nearing completion with the exception of the garage and repair shop building planned for State Road in New Castle County, the construction of which it was found necessary to postpone until the end of the War.

ADMINISTRATION BUILDING

The Administration Building now nearly completed is located south of the Legislative Hall in Dover and is constructed of colonial brick in architectural harmony with the Legislative Hall and the Hall of Records. It is a fine addition to the group of State buildings contemplated in the master plan for the Capitol grounds. On its occupancy, for the first time the highway department will have all of its divisions adequately housed under one roof.

The first floor will be occupied by the Motor Vehicle Division, the second floor by the Administrative and general offices of the Department, while the third floor contains the drafting room for the planning and designing forces of the Bridge and Road divisions.



NEW STATE HIGHWAY ADMINISTRATION BUILDING ON RIGHT BUILT IN 1942, STATE HIGHWAY TESTING LABORATORY ON LEFT

INSPECTION LANES

Modern inspection lanes and office buildings are centrally located in the County seats and enable the Motor Vehicle Division to carry out their inspection and licensing operations with precision and efficiency.

The new central garage and machine shop in Dover has been designed having in mind the possibility that during the war period it may be necessary to make all mechanical repairs in the Department's shops, due to the difficulty and long delays in the securing of parts and materials. Complete facilities are provided for rebuilding, repairing and painting of motor vehicles and highway machinery. All highway signs are repaired and painted here as well. The buildings are brick, of modern design, with ample grounds provided for storage and expansion.

DIVISION OF PLANS AND SURVEYS

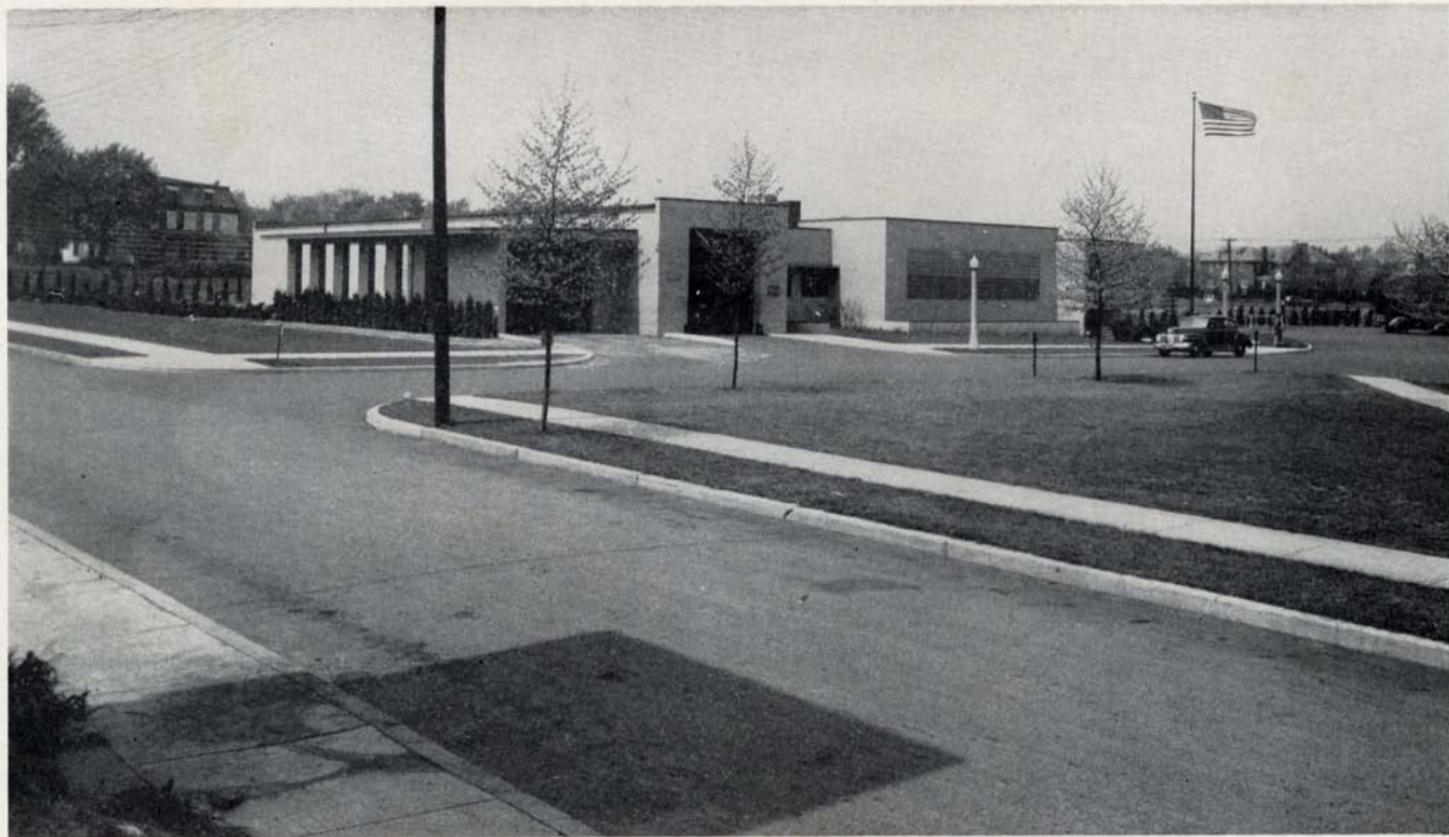
Prior to the construction of the projects embraced within this period the division prepared detailed plans and estimates from the field surveys.

Completed surveys from the field are as follows:

127.4 Miles Base Line	
133.5 Miles Topography	
74.9 Miles Cross Sections	(Prelim.)
68.4 Miles Cross Sections	(final)
21 Borrow Pits	(Prelim. & Final)

Completed plans for the period are as follows:

141.7 Miles Base line plotted	
139.4 Miles Topography plotted	
60.1 Miles Profile plotted	
95.0 Miles Index Plans plotted & traced	
126.8 Miles Plans traced	
49.3 Miles Cross Sections	(Prelim.)
61.3 Miles Cross Sections	(Final)
35.0 Miles Grade	



MOTOR VEHICLE BUILDING, WILMINGTON

67.8 Miles End Areas	(Prelim.)
61.3 Miles End Areas	(Final)
23 Borrow Pits	(Prelim. & Final)

In addition to the above there were 55 property drawings and miscellaneous charts prepared for this and other state departments.

DIVISION OF ESTIMATES AND FEDERAL AID

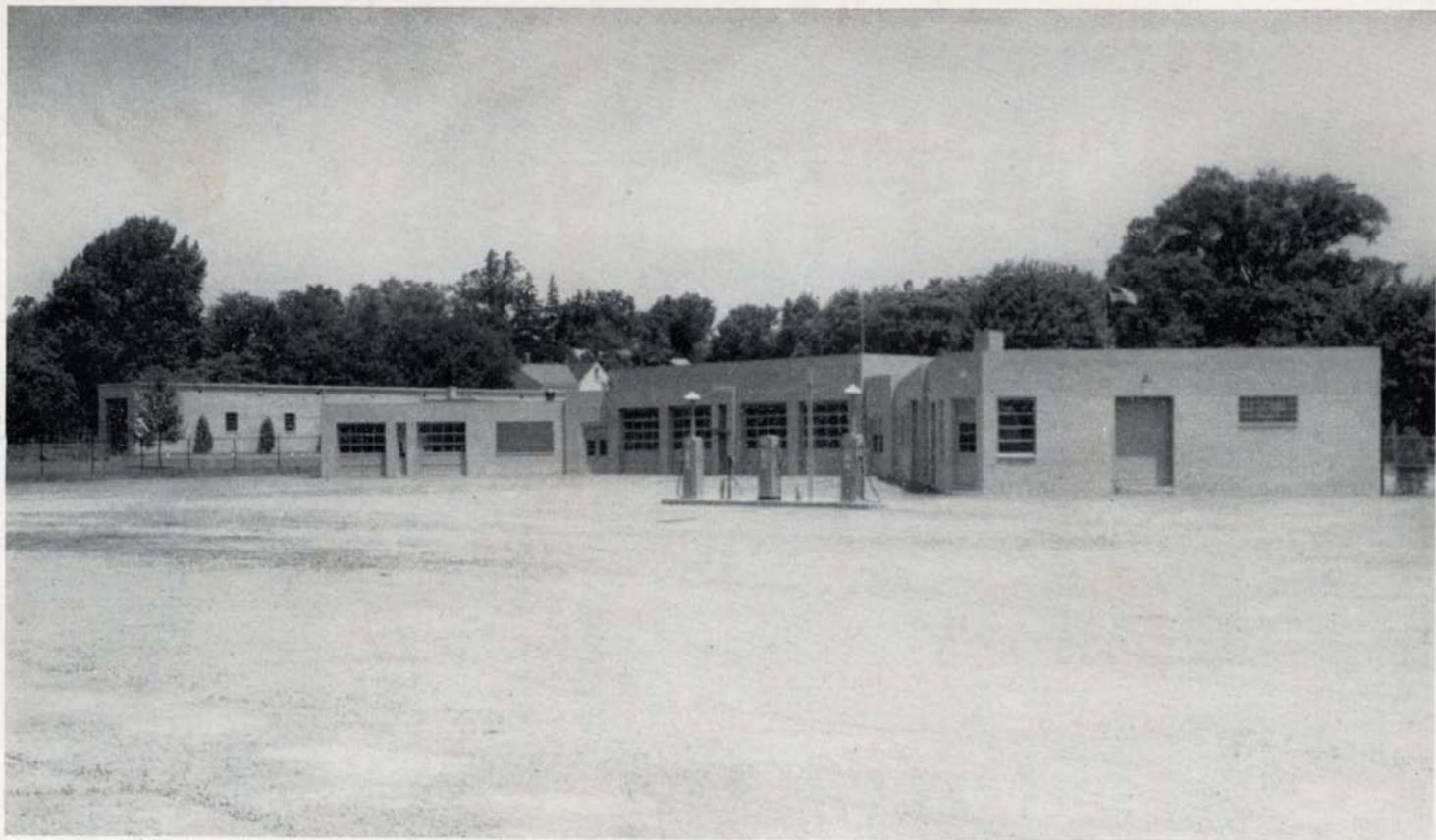
The division issued sixteen advertisements for bids involving forty-five separate contracts. The classification of the projects is: Roadway, 20; bridges, 3; surface treatment and maintenance materials, 11; fuel and lubricants, 3; mechanical equipment, 4; buildings, 4. One flashing light grade crossing installation was authorized and completed.

The Public Roads Administration participated in the construction of twenty of the projects placed under contract during the period. The participation of the Administration required detailed programs, maps, plans, estimates, and other accompanying statistical documents to be prepared for these federal aid projects and submitted for approval prior to advertisement.

There were 875 proposal forms prepared by the division for bidding purposes and departmental requirements. A total of 178 bids were received by the Department on the advertised projects. Each bid was checked by items and tabulated.

Two hundred thirty-six periodical estimates were computed, checked, and recorded on active projects throughout the period.

Weekly transcripts of labor are required to be filed with the Public Roads Administration on all Federal projects. These weekly submissions were checked, recorded, and forwarded to the proper bureau.



REAR VIEW OF STATE HIGHWAY GARAGE ON SOUTH STATE ST., DOVER, DEL., WITH TESTING LANE ON FAR LEFT

The division submitted 104 vouchers to the Public Roads Administration for reimbursement. Reimbursement was received on 70 of the vouchers submitted during the period, and upon 14 vouchers which had been submitted during the years 1939 and 1940.

DIVISION OF TESTS

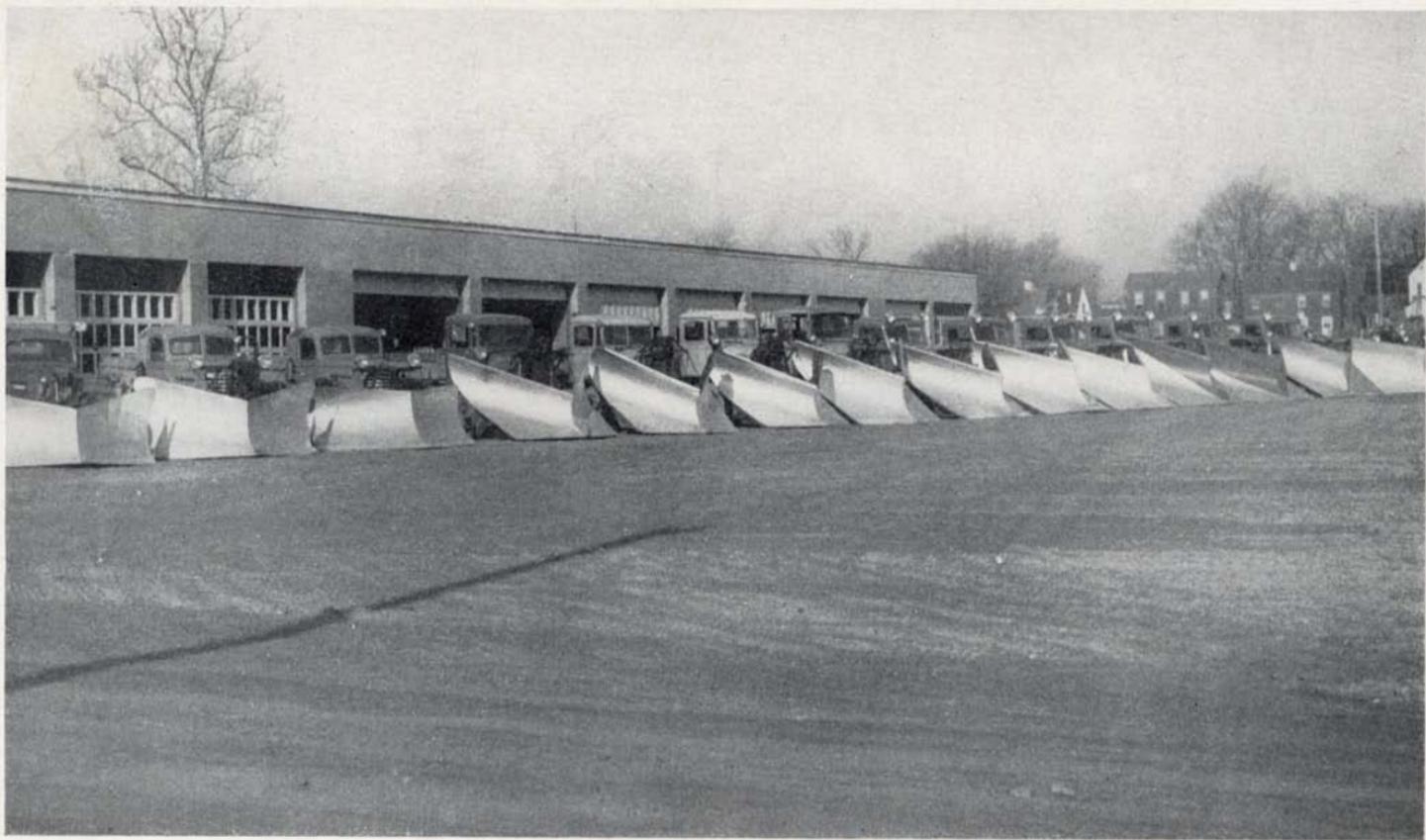
The outstanding achievement of the Division of Tests during this period was the revision of the Standard Specifications and their printing, circulation, and approval by the Public Roads Administration.

More than two years was spent in the assembling of data and construction methods and the placing of this information in Specification form. After these changes had been made it was then necessary to review the proposed draft with representatives of the Public Roads Administration and our own personnel.

The review necessitated many changes and the complete specifications were rewritten because of these reviews three or four times. Of note in these Specifications is the change in the size and style of the Specification Book. The old large style and size were abandoned in favor of the small pocket style cloth bound book which should prove very acceptable in the field. The new book is exceptionally convenient to carry at all times while actually working on projects.

The copies were completely finished late in April and were placed in circulation at that time. The Public Roads Administration was supplied with the necessary copies and approval was asked on the New Specifications. On August 14th, 1941 these Specifications were approved by the Administration subject to several minor points in difference.

Possibly the most important item is one not of accomplishment but one which has been general throughout our entire State Highway Department. During the period cov-



SNOW EQUIPMENT—STATE HIGHWAY GARAGE, DOVER

ered by this report we have lost the services of eight members of the Division of Tests. The loss of these men has necessitated a complete revision in Laboratory Supervision.

The Division of Tests has pursued the usual policy of sampling, testing and approving all materials entering into construction and maintenance at their source wherever possible.

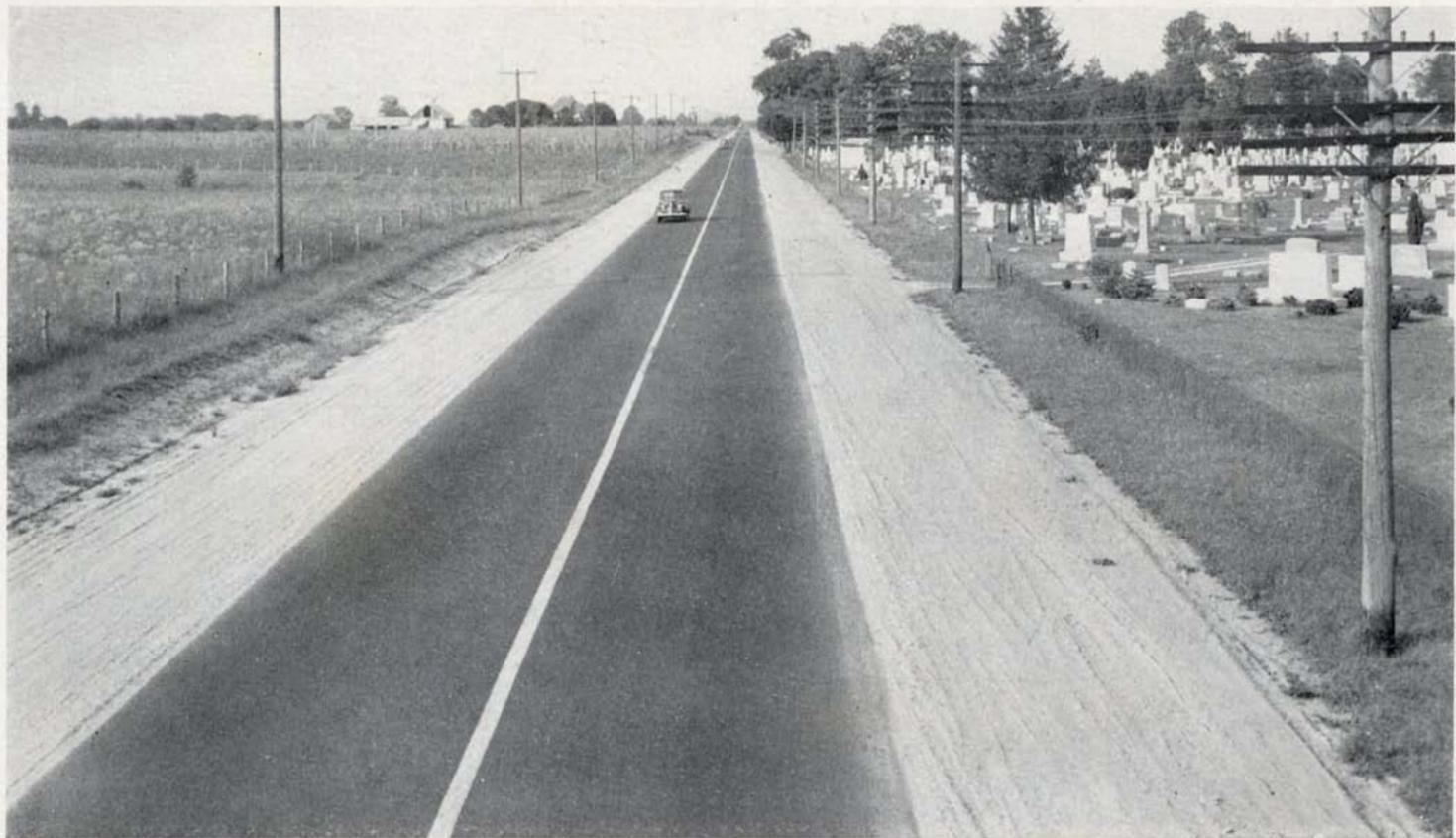
MATERIALS LABORATORY

In general, there were no changes in the manner of sampling, testing and judging materials proposed for construction; however, there was a decrease of total samples. This decrease was mainly due to the fact that our total yardage of cement concrete was much less than in previous years.

To balance this decrease in samples the Laboratory was operating with a limited personnel and also inspecting Bituminous Concrete. The addition of the Bituminous Concrete alone, with a reduced organization, more than made up for the work not done for concrete.

The following tabulation will show the material represented by the testing of samples either in the Materials Laboratory or directly under its supervision.

Coarse Aggregate (Stone)	92,922 tons
Coarse Aggregate (Gravel)	11,740 tons
Fine Aggregate (Sand)	64,392 tons
Cement	225,762 barrels
Central Mixed Concrete	14,557 cu. yds.
Concrete Pipe (All sizes)	35,025 lin. ft.
Creosote Timber Piling	12,166 lin. ft.
Creosote Timber and Lumber	199,514 Bd. Ft.
Creosote Guard Rail Posts	1,055
Asphalt	2,178,089 gallons
Amiesite (Top and bottom)	24,731 tons
Sheet Asphalt (Top and binder)	760 tons
Concrete cores removed	669



U. S. 113 AT BARRATT'S CHAPEL LOOKING NORTH

Concrete Cylinders broken	1,151
Slag	39,726 tons
Creosote Oil	87,000 gallons
Oil (Motor Oil)	12,000 gallons
Naptha (For Amiesite)	30,000 gallons
Steel (Structural and reinforcing)	1,476,803 lbs.
Tar (Surface treatment)	26,943 gallons
Foundation Piling	23,355 lin. ft.

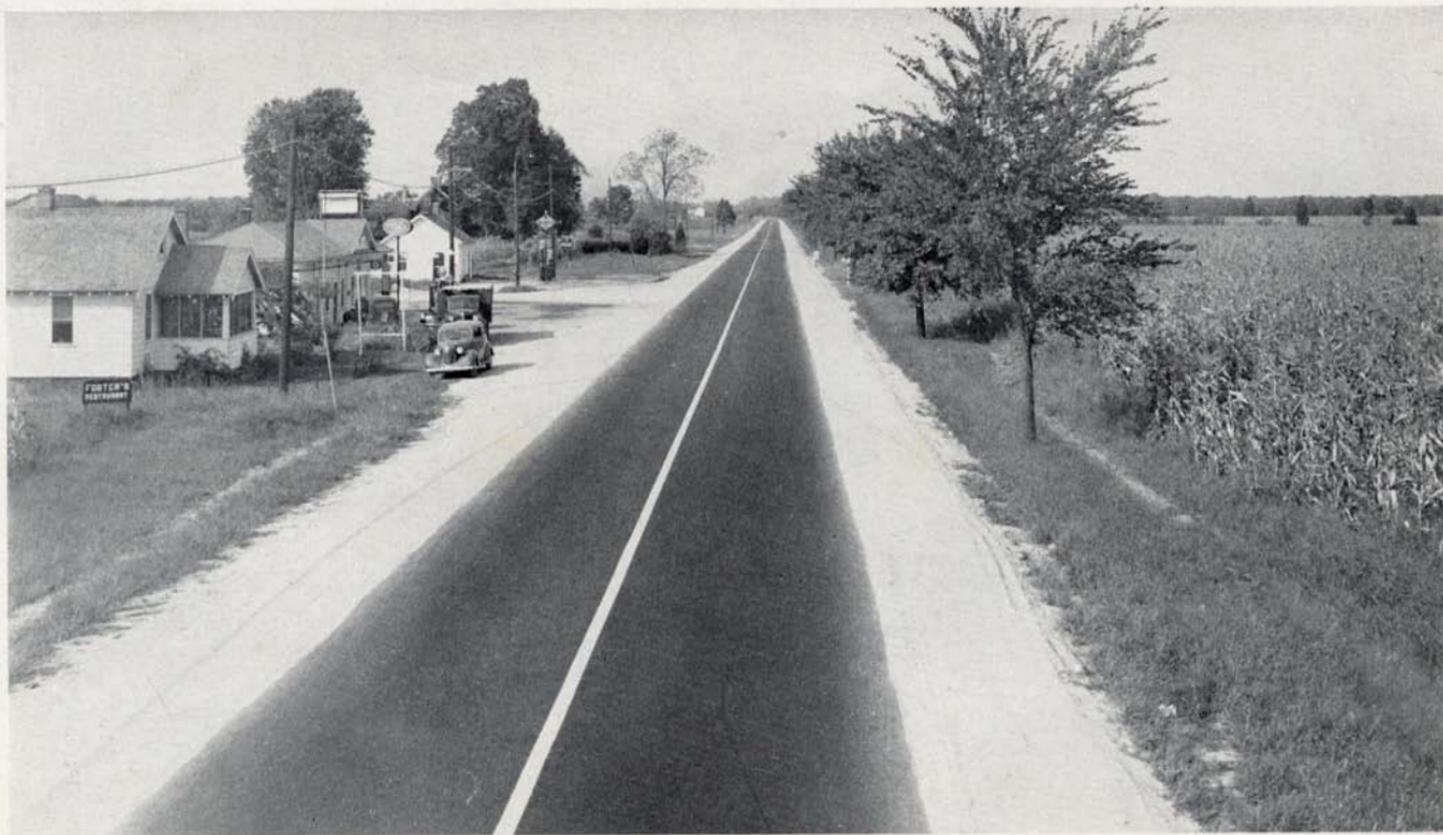
NOTE:—Of the eleven hundred fifty-one (1151) concrete cylinders tested, six hundred fifty-four (654) are for outside Commercial Laboratories who were charged for this service.

Work has been continued on the investigation of concrete pavement subgrades which was mentioned in the report of the work performed last year.

During this period work was started on a new investigation. The purpose of which was to determine, if possible, the relation between the different types of subgrade soils and the transverse cracking intervals found in old concrete pavements under varying traffic conditions. Crack surveys of thirty-one (31) separate sections of pavements selected to cover all parts of the State have been made to date, this work requiring one hundred three (103) field trips representing two hundred one (201) man-days of work. This work was done by members of the Division of Tests but not by the personnel of the Soils Laboratory. To date, twenty-eight (28) sections have been drilled and three hundred two (302) samples obtained have been tested. This work will be continued during the coming year. This investigation serves a dual purpose in that the results obtained apply equally well to the concrete pavement subgrade investigation.

CONSTRUCTION

During the past eighteen months, the Department held sixteen (16) lettings, receiving bids on twenty road contracts, three major bridge contracts, ten state-wide surface maintenance contracts, one bituminous material maintenance contract, one Administration Building contract, two



U. S. 13 AT FARMINGTON, DEL., LOOKING NORTH

Motor Vehicle Testing Lane Building contracts, one Central Repair Shop contract, three motor truck contracts, one motor grader contract, and two state-wide gasoline requirement contracts.

Proposals were received from 202 bidders on the above forty-four contracts, an average of approximately five bidders per contract. The total contract low bids for the above projects excepting the contract for gasoline requirements amounted to \$2,071,240.10.

The classification of the 1941-42 contracts and monies expended for each is as follows:

20 Roadway Projects	\$1,007,123.25
3 Major Bridge Projects	260,437.85
4 Building Projects	318,612.00
4 Motor Truck and Grader Contracts.....	97,481.00
11 Road Maintenance Contracts	387,586.00
	<hr/>
	\$2,071,240.10

* This total does not include the gasoline and grease requirement contracts.

The mileage and types of roadway contracts advertised during the year were as follows:

- 0.206 miles of 34 to 53 Ft. Sheet Asphalt on Concrete Base (New)
- 2.153 miles of 22-Ft. Cement Concrete Pavement (New)
- 0.714 miles of 20-Ft. Cement Concrete Pavement (New)
- 7.994 miles of 23-Ft. Bituminous Concrete on Present Concrete Base (Reconstruction)
- 4.588 miles of 24-Ft. Bituminous Concrete on Present Concrete Base (Reconstruction)
- 10.497 miles of 20-Ft. Bituminous Concrete on Present Macadam Base (Reconstruction)
- 27.718 miles of 4-Ft. Concrete Addition to Present Concrete Road (Widening)
- 11.889 miles of 18-Ft. Traffic Slag (New)



DAGSBORO TO duPONT ROAD

In addition to the above there were carried into the 1941 construction from the previous year:-

- Contract 679 N. Wyoming Elimination .284 miles of traffic slag
- Contract 690 Tulls Crossing Elimination
- Contract 737 Dewey Beach Bridge
- Contract 281-A Lake Como Bridge

All these contracts were completed with the exception of the following contracts which were carried into the 1942 construction year:-

- Contract 787 Administration Building (Dover)
- Contract 786 Central Repair Shop (Dover)
- Contract 700 Heald Street Overhead (Wilmington)
- Contract 699 High Street Bridge (Seaford)
- Contract 737 Dewey Beach Bridge (Rehoboth)

Road construction during the year 1941 was primarily in the widening and reconstruction of concrete and penetration macadam roads which has reached the limit of maintenance expenditures and which had served the public for nearly twenty years. These pavements were salvaged by patching and widening the existing roadways and the entire pavement surface covered with a wearing course of bituminous concrete.

These reconstructed pavements have not been in service long enough to determine whether this type of reconstruction will become standard practice or not.

In the reconstruction of these pavements attention is paid to traffic safety by increasing the width of the road surfaces, reducing curvature and super elevating curves.

A notable roadway improvement in New Castle County was the completion of the last stretch of the Concord Pike from Talleyville to the Pennsylvania State Line by the building of a new 22-foot cement concrete road with modern

construction features, replacing the high crowned old macadam road which was dangerous to traffic especially during bad weather conditions.

Another improvement was the reconstruction of the Kennett Pike from Barley Mill Road to the Pennsylvania State Line. This twenty-four-foot concrete road nearly twenty-two years old was resurfaced with bituminous concrete and Dead Man's curve just north of Centerville was eliminated by a reduction in grades and curvatures. This reconstructed highway extending from Wilmington to the Pennsylvania State line is an excellent example of reconstruction which will serve traffic for years to come, rebuilt with an economical saving in construction costs due to the salvaging of the old concrete pavement.

Another example of this type of economical reconstruction was the rebuilding of the south bound lane of the duPont Road between St. Georges and Wrangle Hill.

East Front Street in Wilmington was rebuilt and widened from Market to Walnut Street. This short stretch was rough and was used heavily by passenger and truck traffic. Its improvement has helped to relieve congestion in the vicinity of the Pennsylvania Railroad Station.

The building of the Heald Street Overhead has eliminated the hazardous railroad crossing at this point and has added to the safety of the Governor Printz Boulevard, which by-passes the City of Wilmington.

Road work in Kent County was confined mostly to widening of existing concrete roads by the addition of concrete widening strips. These roads built years ago 15 to 16 feet in width have been widened to twenty feet. The reconstruction of short selected stretches of old concrete roads between Frederica-Little Heaven and Farmington to Harrington by patching and widening the existing concrete roadways and then resurfacing with a bituminous concrete

surface are continuations of the Department's policy to determine if this type of construction is the answer to salvaging older pavements.

In Sussex County the same procedure of road work was followed as in Kent County, the widening of the existing concrete roads and the widening and reconstruction of old 14-foot penetration macadam roads such as the Selbyville to Clarksville Road and the Milford to Shawnee Road.

Construction for the year 1942 has been drastically curtailed due to the war effort and has been brought practically to a standstill. Although plans were prepared for a normal program, the use of critical materials was so restricted that an active program of construction will have to be postponed until after the war.

For the period January 1st to July 1st, 1942, the Department contracted for no new construction except maintenance materials for a state-wide surface treatment, this in turn was curtailed due to road oil for this type of work being on the critical list. The outlook for road and bridge construction is not bright and all this work will have to be postponed for the duration, except essential access road construction to war plants.

Attached is a tabulation giving location, type, length, type of roadway, bridge, building and miscellaneous construction advertised and awarded for the year 1941 and the six months period January 1st to July 1st, 1942.

DELAWARE STATE HWY. MILEAGE
JUNE 30, 1942

TYPE	NEW CASTLE	KENT	SUSSEX	TOTALS
CONCRETE HIGHWAYS				
(DUAL) DIVIDED HIGHWAYS (4-7 LANE)	50.27	10.53		60.80
TWO LANE HIGHWAYS	117.02	218.28	295.12	630.42
NINE FOOT & TEN FOOT LANES	24.90	56.87	49.65	131.42
BRICK & CONCRETE HIGHWAYS				
BRICK & CONCRETE (4 LANES)	6.39			6.39
BRICK	0.40			0.40
MACADAM HIGHWAYS				
BITUMINOUS MACADAM	374.87	21.19	7.19	403.25
COUNTY - 10 FOOT			40.05	40.05
BITUMINOUS CONCRETE				
STONE BASE	6.40		16.50	22.90
CONCRETE BASE	30.15	4.8		34.95
ASPHALT				
SAND ASPHALT			28.93	28.93
STABILIZED				
SOIL CEMENT		2.90		2.90
BITUMINOUS STABILIZED		4.87		4.87
SLAG, CINDERS, GRAVEL				
SURFACE TREATED	96.88	100.12	255.49	452.49
TOTAL DUSTLESS OR BETTER	707.28	419.56	692.93	1819.77
TRAFFIC BOUND	9.70	115.89	74.84	200.43
DIRT, GRAVEL, & CINDERS				
DIRT	18.82	161.96	803.07	983.85
GRAVEL, CINDERS	258.70	380.15	296.31	935.16
TOTALS	994.50	1077.56	1867.15	3,939.21

NEW CASTLE COUNTY
MILEAGE AND TYPES ADVERTISED AND AWARDED
1941

ROADWAY CONTRACTS

Cont. No.	Location	34-53-foot Sheet Asphalt	24-foot Bit. Concrete	23-foot Bit. Concrete	24-foot Plain Concrete	22-foot Plain Concrete
702	E. Front St. (Wilmington).....	0.206				
766	Concord Pike (Talleyville to Pa. Line).....					2.126
715	Kennett Pike (Barley Mill Rd. to Pa. Line)...		4.368		0.22	
762	Md. Line-Glasgow (South Bound Lane).....			2.159		
675	St. Georges-Wrangle Hill (South Bound Lane).			1.101		
		0.206	4.368	3.260	0.22	2.126

BRIDGES, BUILDINGS AND MAINTENANCE CONTRACTS

700	Heald Street Overhead (Wilmington)
788	Motor Vehicle Building Testing Lane (Wilmington)
790	Motor Vehicle Building Driveways (Wilmington)
775	Stone Chips for State Wide Surface Treatment (Maintenance)
776	Stone Chips for State Wide Surface Treatment (Maintenance)
780	Bituminous Concrete for New Castle County (Maintenance)
773	Bituminous Oil for State Wide Maintenance (New Castle and Kent Counties)

JANUARY 1, 1942 - JULY 1, 1942

808	Bituminous Oil—New Castle and Kent Counties—State Wide Maintenance Surface Treatment
810	Stone Chips for New Castle County—State Wide Maintenance for Surface Treatment

KENT COUNTY
MILEAGE AND TYPES ADVERTISED AND AWARDED
1941

ROADWAY CONTRACTS

Cont. No.	Location	23-foot Bit. Concrete	20-foot Plain Concrete	4-foot Concrete Widening
759	Farmington-Harrington	2.62		
732	Frederica-Little Heaven	2.472		
281-B	Lake Como Approaches		0.027	
686	Md. Line-Kenton			4.566
723	Dover-Little Creek			3.547
652	Everett's Corner-Pearson's Corner			6.675
		5.092	0.027	14.788

BUILDINGS, ROAD AND EQUIPMENT MAINTENANCE CONTRACTS

789	Administration Building (Dover)
786	Central Repair Shop (Dover)
782	Motor Trucks
781	Motor Graders
779	Gasoline Requirements
785	Motor Trucks
784	Motor Trucks
776	Stone Chips—Kent County
789	Motor Vehicle Building Testing Lane

JANUARY 1, 1942 - JULY 1, 1942

811	Stone and Slag Chips for Surface Treatment—Kent County (Maintenance)
818	Gasoline and Grease Requirements

SUSSEX COUNTY
MILEAGE AND TYPES ADVERTISED AND AWARDED
1941

ROADWAY CONTRACTS

Cont. No.	Location	22-foot Bit. Concrete	20-foot Plain Concrete	4-foot Concrete Widening	18-foot Traffic Slag
767	Atlanta-Greens Pond			5.163	
710	Selbyville-Clarksville	8.266			
698	Reliance-Seaford			5.192	
413	Oakley-Shawnee				6.921
709	Blades-Concord		0.71	2.579	
754	Lovett's Nursery-Jeffersons X Roads				4.968
713	Shawnee-Milford	2.231			
		10.497	0.71	12.934	11.889

BUILDING AND MAINTENANCE CONTRACTS

774	Bituminous Oil Sussex County Surface Treatment
777	Stone and Slag Chips Surface Treatment
789	Motor Vehicle Building Testing Lane

JANUARY 1, 1942 - JULY 1, 1942

809	Bituminous Oil Sussex County Surface Treatment
812	Stone Chips Sussex County Surface Treatment

TABULATION OF CONTRACTS AWARDED FROM JANUARY 1, 1941 TO JUNE 30, 1942

Cont. No.	Location	Estimated Cost	Date of Award	Contractor	Length In Miles	Type of Roadway
759	Farmington to Harrington	\$ 47,925.20	4/10/41	George & Lynch, Wilmington, Del.	2.262	Conc. Wid. & Bit. Conc. Resurf.
732	Frederica-Little Heaven	45,028.00	4/10/41	Amiesite Construction Co., Mt. Vernon, N. Y.	2.472	Widening & Reconstruction
702	East Front St.—Wilmington	29,558.50	4/10/41	Oliver Paving & Const. Co., Wilmington, Del.	0.206	Conc. Base Sheet Asphalt Surf.
281B	Lake Como Bridge Approaches	3,944.00	4/11/41	Gooden & Clark, Dover, Del.	0.027	Concrete
767	Atlanta-Green's Pond	75,958.50	6/4/41	Waller Paving Co., Salisbury, Md.	5.163	Concrete
766	Concord Pike (Talleyville-Pa. Line)	121,533.05	6/5/41	E. E. Downing, Wilmington, Del.	2.126	Concrete
686	Maryland Line-Kenton	49,873.30	6/4/41	James Julian, Wilmington, Del.	4.566	Reinforcing Concrete
723	Dover to Little Creek	29,183.75	6/4/41	James Julian, Wilmington, Del.	3.547	Concrete Widening
715	Kennett Pike	82,062.00	6/5/41	Alex. Petrillo, Wilmington, Del.	4.588	Conc. Wid. Bit. Conc. Surf.
710	Selbyville to Clarksville	141,253.60	6/10/41	M. J. McDermott, Georgetown, Del.	8.266	Mac. Wid. Bit. Asp. Surf.
698	Reliance to Seaford	56,245.70	6/4/41	Old Line Construction, Chestertown, Md.	5.192	Concrete Widening
762	Maryland Line-Glasgow	41,779.75	6/9/41	Alex. Petrillo, Wilmington, Del.	2.159	Conc. Wid. Bit. Conc. Resurf.
652	Everetts Corner-Pearson Corner	72,476.75	6/10/41	Phillips Bros., Salisbury, Md.	6.675	Concrete Widening
413	Oakley to Shawnee	38,941.25	6/16/41	W. Roach & Sons, Georgetown, Del.	6.921	Slag
709	Blades to Concord	60,112.70	6/11/41	W. Roach & Sons, Georgetown, Del.	3.289	Conc. Wid. & Reconstruction
754	Lovett's Nursery-Jefferson X Rds.	39,408.95	6/27/41	Short & Walls, Middletown, Del.	4.968	Slag
713	Shawnee to Milford	30,686.60	6/17/41	M. J. McDermott, Georgetown, Del.	2.231	Slag Wid. & Bit. Surf.
675	St. Georges-Wrangle Hill	28,844.15	8/10/41	Wilson Construction Co., State Rd., Del.	1.101	Conc. Wid. & Reconstruction
790	Motor Vehicle Bldg., (Streets and Drives)	12,307.50	8/29/41	James Julian, Wilmington, Del.		Conc. Base Bit. Conc. Surf.
750	Stanton Bridge	42,944.00	6/9/41	J. A. Bader & Co., Wilmington, Del.		
700	Heald Street Overhead Bridge	137,774.85	6/23/41	J. A. Bader & Co., Wilmington, Del.		
699	High Street Overhead Bridge	79,719.00	8/29/41	J. A. Bader & Co., Wilmington, Del.		
786	Repair Shop, Dover	110,000.00	6/28/41	Chas. H. Schwertner, Phila., Pa.		
787	Administration Building, Dover	157,200.00	6/28/41	J. A. Bader & Co., Wilmington, Del.		
788	Motor Vehicle Dept. Bldg., Dover	25,708.00	6/28/41	D. M. Fontana & Sons, Wilmington, Del.		
777	Sussex County Chips Surf. Tr.	11,660.00	6/6/41	J. R. Hitchens, Inc., Seaford, Del.		
777	Sussex County Chips Surf. Tr.	14,616.00	6/6/41	The Arundel Corp., Baltimore, Md.		
777	Sussex County Chips Surf. Tr.	17,340.00	6/6/41	J. E. Baker Co., York, Pa.		
780	Bituminous Conc. for Maint.	11,375.00	6/17/41	Delaware Asphalt Co., Wilmington, Del.		
776	Kent County Chips Surf. Tr.	9,337.50	6/6/41	J. T. Dyer Quarry Co., Birdsboro, Pa.		
776	Kent County Chips Surf. Tr.	8,215.00	6/6/41	The Arundel Corp., Baltimore, Md.		
775	New Castle Stone Chips Surf. Tr.	8,775.00	6/9/41	Warner Company, Wilmington, Del.		
775	New Castle Stone Chips Surf. Tr.	9,000.00	6/9/41	Wilson Construction Co., Wilmington, Del.		
774	Sussex County Surf. Tr.	47,371.00	6/9/41	Hatteras Oil Company, Baltimore, Md.		
773	New Castle and Kent Co. Surf. Tr.	37,782.50	6/9/41	Hatteras Oil Co., Baltimore, Md.		
782	Motor Trucks (4-Wheel Drive type)	22,948.00	6/24/41	Four Wheel Drive Auto Co., Baltimore, Md.		
781	Motor Graders	18,321.00	6/28/41	McClung-Logan Equipment Co., Baltimore, Md.		
789	Motor Vehicle Dept. Bldg. (Georgetown, Del.)	25,706.00	6/28/41	D. M. Fontana & Sons, Wilmington, Del.		
781	Motor Graders	3,990.00	6/28/41	King-Burrous Corp., Philadelphia, Pa.		

TABULATION OF CONTRACTS AWARDED FROM JANUARY 1, 1941 TO JUNE 30, 1942—(Con.)

Cont. No.	Location	Estimated Cost	Date of Award	Contractor	Length In Miles	Type of Roadway
779	Gasoline Requirements		6/23/41	Diamond Ice & Coal Co., Wilmington, Del.		
785	Motor Trucks	35,682.00	6/28/41	White Motor Co., Philadelphia, Pa.		
784	Motor Trucks	5,300.00	6/28/41	Sterling Auto Sales, Wilmington, Del.		
785	Motor Trucks	11,240.00	6/28/41	Russell A. Clark, Wilmington, Del.		
	1941 Total	<u>\$1,859,126.10</u>				
808	New Castle and Kent Co. Surf. Tr.	61,103.00	5/12/42	J. R. Hitchens, Inc., Seaford, Del.		
809	Sussex County Surf. Tr.	71,702.50	5/11/42	J. R. Hitchens, Inc., Seaford, Del.		
810	New Castle Stone Chips	11,562.50	5/11/42	Warner Co., Wilmington, Del.		
811	Kent County Stone Chips	11,206.00	5/11/42	J. T. Dyer Co., Birdsboro, Pa.		
811	Kent County Stone Chips	9,471.00	5/11/42	Philadelphia Slag Co., Swedeland, Pa.		
811	Kent County Stone Chips	6,450.00	5/11/42	General Crushed Stone Co., Philadelphia, Pa.		
812	Sussex County Stone Chips	40,619.00	5/11/42	J. E. Baker Co., York, Pa.		
818	Gasoline Requirements		6/24/42	Diamond Ice & Coal Co., Wilmington, Del.		
	1942 Total	<u>\$212,144.00</u>				
	TOTAL	<u>\$2,071,240.00</u>				



OVERHEAD BRIDGE—TULL'S CROSSING

BRIDGE DIVISION

Several important structures were completed during the past eighteen months and one is still incomplete.

The Tull's Crossing overpass at Seaford was opened for traffic on September 2, 1941, it was fully described in the 1940 Report. The contract price was \$74,214.00.

Another important improvement in the Town of Seaford was the replacement of the old narrow timber bridge over the Pennsylvania Railroad at High Street with a reinforced concrete bridge having a total length of one hundred and ten feet. The grades were greatly improved and the bridge provided with a roadway forty-two feet in width and two sidewalks each five feet wide. The contract price was \$79,719.00. The completion of this project gives Seaford two modern structures over the Delaware Railroad within the town limits, which will adequately serve present needs.

There was also completed during the period the Heald Street Bridge over the Shellpot Cutoff in South Wilmington. This is a reinforced concrete structure fifty-four feet in width provided with two sidewalks and four eleven-foot roadways separated by a center dividing strip two feet in width. The completion of this overpass eliminates one more of the dangerous grade crossings on the south side of the City of Wilmington. The contract price was \$137,800.00.

The three above described projects were financed 100% by the Federal Government under the Grade Crossing Elimination Program, except for right-of-way costs and damages which were shared equally by the State and the Pennsylvania Railroad.

A reinforced concrete tied arch of one hundred and twenty feet span was also completed crossing the White Clay Creek at Stanton, to replace a narrow antiquated steel truss bridge at this point. This was the first bridge of this type to be constructed in Delaware. The contract price was \$43,000.

Plans have been completed and approved for a structure and approaches to eliminate the crossing of the many tracks of the Baltimore and Ohio and Reading Railroads at Elsmere Junction and connecting with the dual highway at Elsmere. The declaration of War and the shortage of steel made it necessary to postpone this much needed improvement until the post-war period.

Studies were also made and preliminary plans drawn for the extension of the Governor Printz Boulevard to a connection with the Ridge Road at the Pennsylvania State Line, this project also has been delayed for the duration.

Other structures for which plans have been completed and approved but the construction of which has been delayed owing to war conditions are the Curtis Paper Mill Bridge at Newark and the Leipsic River Bridge at Leipsic.

A detailed survey and study has been made of all the bridges of the State with respect to their present condition and a program of progressive repairs outlined in the order of their importance.

MAINTENANCE PRIMARY SYSTEM

The maintenance work during the period has been largely routine restricted somewhat by the scarcity of labor and materials. Especial effort has been made to get all highway and maintenance equipment in as good condition as possible in view of the possible greater shortage which may develop during the War years.

Particular attention was given to a thorough overhauling of all equipment and the purchase of new trucks and machinery where justified.

The complete outfitting of the Dover machine shop will enable the making of complete repairs and necessary parts.

The total cost of maintenance of the primary system for the eighteen months period has been \$993,996.42 for \$314.62 per mile per twelve months, this includes the cost of new plant and equipment.

\$445.11



WHITE CLAY CREEK LOOKING NORTH TOWARDS STANTON

MAINTENANCE SECONDARY SYSTEM

The secondary system of 2,682 miles was carefully maintained throughout the period, owing to the increased costs of labor and materials of approximately thirty (30) percent as well as the high standard of maintenance on the secondary system the progressive improvement of these roads which has continued since July 1935 has been slackened and further extensive improvement will have to be curtailed for the duration of the War. The drastic reduction in the supply of available asphalt will seriously affect the condition of the black-top roads if long continued.

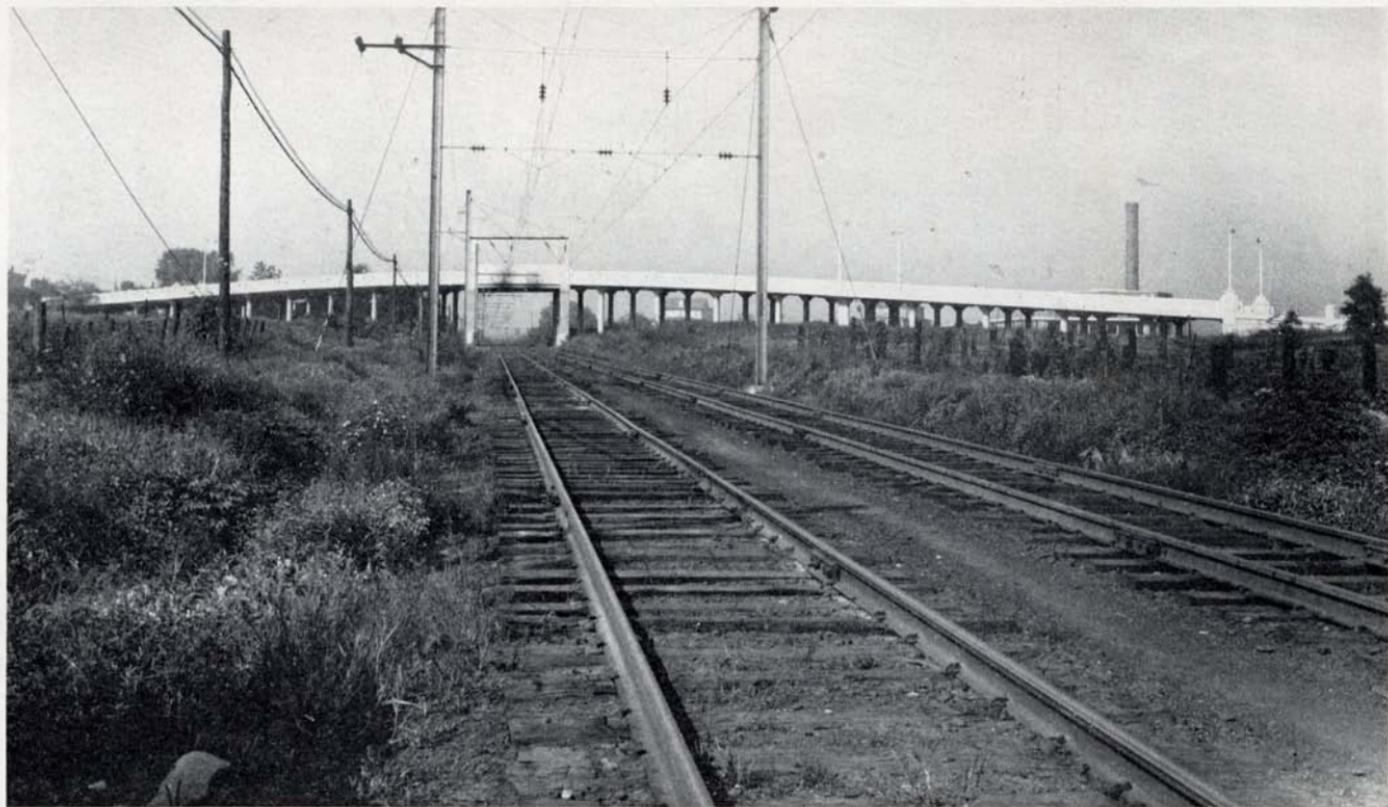
The total cost of this work for the eighteen months covered by this report has been \$592,515.64 or \$147.27 per mile for twelve months including the cost of new equipment. 2682 mi
167.21

In addition during the period under secondary construction five creosoted timber bridges have been built, 49 miles of road graded and surfaced with gravel or stabilized earth, 5,812 lineal feet of concrete pipe have been placed, and 50.5 miles have been given an initial bituminous surface.

FUTURE WORK

Quoting from the Annual Report for the year, 1940, "Notwithstanding the careful maintenance and considerable expenditures each year in patching the highways of the State System, a substantial mileage of the older main routes have reached a stage where repairs are not sufficient, but a general reconstruction is necessary. Many of these pavements are now 18 to 25 years old and if they are not promptly reconstructed before their condition becomes too serious, their value as a base will be lost and complete rebuilding will be necessary at a greatly increased cost.

This work was begun in 1937, examples of which are: New Castle to Newport, in 1938 a concrete resurfacing contract between Camden and Woodside; in the same year,



HEALD STREET, WILMINGTON, OVERHEAD BRIDGE

Tybout's Corner to Wrangle Hill on the Coleman duPont Road was repaired; in 1940 the southbound dual highway from Odessa to Smyrna was widened and reconstructed.

I cannot too strongly emphasize the necessity of a greatly enlarged program of this reconstruction work before these roads get beyond repair.

I am attaching a list of roads which should be so treated within the next four years, with an estimate of the cost of reconstruction.

RESURFACING

Kennett Pike	5 miles		
Newark-Md. Line	3 "		
State Road-Md. Line	13 "		
Tybout's Corner-Wilmington	8 "		
H & H to Tybout's Cor. via Middletown	17 "		
Odessa-Wrangle Hill	9 "		
Naaman's Creek Rd.	6 "		
Smyrna-Dover	10 "		
Dover-Delmar	50 "		
Dover-Milford	19 "		
Milford-Selbyville	30 "		
<hr/>			
Required in next 4 years	170 "	At \$20,000	\$3,400,000

WIDENING

Since 1926 the work of widening inadequate pavements has been carried on, yet many miles are still far below modern standards.

The following highways vary from 14 to 16 feet in width and should be widened as rapidly as funds are available as they are too narrow for present-day traffic:

Brandywine Sanatorium-Gap	2 miles	At \$10,000	\$ 20,000
Selbyville-Clarksville	11 "	10,000	110,000
Greenwood-Milford	11 "	10,000	110,000
Atlanta-Seaford	8 "	10,000	80,000
Blades-Hardscrapple	14 "	10,000	140,000
Md. Line-Greenwood-Rehoboth Rd.	20 "	10,000	200,000
Kenton-Md. Line Via Hartly	8 "	10,000	80,000

Bowers Beach Road	3 "	10,000	30,000
Clayton-Md. Line	7 "	10,000	70,000
Little Creek-Devils Hill	4 "	20,000	80,000
<hr/>			
Needed for present-day traffic	8 ¹ / ₂ miles		\$920,000

NEW CONSTRUCTION

Distributed throughout the State there are various bottlenecks and unsatisfactory stretches of highway which should be improved or eliminated during the next few years, and some building projects which will be needed in the near future to care for the needs of the Department. A list of such projects is attached.

Concord Pike	2 miles		\$ 90,000
Lancaster Pike	3 "		150,000
Elsmere-Wilmington	1 "		200,000
Limestone-Newark	7 "		700,000
Ogleton	1 ¹ / ₂ "		60,000
Ogleton Underpass			80,000
Claymont-Pennsylvania Line	2 "		1,000,000
Dual Highway South of Dover	5 ⁰ / ₁₀ "	At \$60,000	3,300,000
State Highway Bldg., Dover			140,000
Motor Vehicle Office and Testing Lane, Dover			60,000
Motor Vehicle Office and Testing Lane, Georgetown			60,000
<hr/>			
For present and future consideration.....	Total		\$5,840,000

In addition, the State Highway Department has assumed certain obligations as to construction and maintenance on approximately 13 miles of connecting streets in the City of Wilmington. A considerable part of this mileage is in poor condition and will require reconstruction in the near future at a cost of approximately \$75,000 per mile.

add
Owing to the shadow of war in 1941 and the restrictions thrown around construction in 1942 due to the war effort, few of the projects listed above have been undertaken; however, other roads than those listed are now needing reconstruction and improvement and if the necessary re-

pairs and reconstruction are long delayed a considerable increase in mileage in all of these classes will accumulate, making large post-war programs essential.

A recent Associated Press dispatch called attention to the fact that the truck traffic on the Pennsylvania Turnpike finished two years ago had doubled, now averaging nearly 1,000 trucks per day and added "in spite of this terrific pounding the highway is showing no signs of failure." Delaware's highways are receiving similar punishment yet many of these roads are over 20 years old and are carrying a traffic of over 3,000 trucks per day or three times the count on the Pennsylvania Turnpike.

Some of these pavements are showing signs of distress and extensive repair and in some cases complete rebuilding will be necessary at the close of hostilities.

I recommend that plans be prepared and held in readiness for construction work as soon as materials and funds are available.

HIGHWAY PLANNING SURVEY

The Delaware State-wide Highway Planning Survey was initiated in October of 1940, under legislation, which permitted expenditures of Federal highway funds not to exceed 1½% of Federal Aid appropriations when matched by State funds, for scientific investigation and fact finding studies relating directly to highway problems. The 1940 program specified only a collection of facts relating to the physical and traffic characteristics of all highways in the State. However, in December 1941, the State Highway Department authorized the Planning Survey to expand their field of operation to include a study of the financial aspects of highways and streets in the State. The several studies undertaken are being conducted in cooperation with the Public Roads Administration of the Federal Works Agency.

PURPOSE OF SURVEY

The specific objectives of the Highway Planning Survey are to determine the present status of the highways, streets, and highway structures; to evaluate the service rendered by the numerous parts; to prepare the way for the selection of that part of the road mileage, which by reason of its relative importance and absolute utility, merits inclusion in future improvement programs; to assemble the facts necessary for an estimate of the ultimate cost of construction and maintaining the economically necessary improvement—all to the end that an integrated highway improvement program may be established within the State's financial ability to construct and maintain. The studies now underway or programmed will supply complete information toward these objectives.

ORGANIZATION

The Survey is divided into three separate Bureaus: Inventory, Traffic, and Financial. Starting with five regular and four borrowed employees in October of 1940, the personnel was increased to a maximum of twenty-one employees as the work gained momentum, and again reduced as the status of phases of work permitted. At present and for the past several months the total personnel numbers eleven employees. It appears that this is a minimum of employees necessary to complete the present analysis and to perform the continuing functions of the Survey.

ACCOMPLISHMENTS

Road Inventory—It is essential in planning future improvements to have a detailed knowledge of the present physical conditions of the highways; hence, a complete road inventory, embracing approximately 3,917 miles, was made showing the length, width, type of surface, condition, and other pertinent facts relative to the highways in the State. Houses, industries, schools, churches, and other cultural features indicating the origin and destination of traffic were recorded. All these items are being recorded on a

series of State and County maps which will be published and made available to the Highway Department, State and Federal Agencies, and the general public. Two maps in the Kent County series are at present available and have met with favorable comment. The pertinent facts relating to the road inventory are in the last stages of analysis and will be listed in a series of tabulations for the administrative use of the State Highway Department.

Traffic—The necessity for improvement, the economical type and width of surface to be used, and the order of priority cannot be equitably determined without a knowledge of the volume and characteristics of traffic passing over the highways. To provide this information, a State-wide traffic survey was conducted during 1941, with certain minor phases of the work extending into the early months of 1942.

During this period 7,763 twenty-four hour machine traffic counts were made at 720 intersections spread throughout the State. Seven automatic traffic recorders kept and are continuing to keep continuous counts along primary highways. These counters determine the daily, weekly and the monthly variations in traffic, as well as provide factual data for the development of traffic trends. At thirty-six control intersections, 856 eight hour manual classification counts were made on a predetermined schedule to provide data on the character as well as volume of traffic.

During the same period, 15,088 commercial vehicles were stopped, weighed, measured, and each driver was interrogated to obtain information relative to operation, commodities carried and other pertinent data. This information was obtained at fifteen carefully selected stations on the primary highways.

All phases of the traffic studies are in the final stages of analysis and will be made available in map, tabular, and report form in 1943.

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Road Use and Motor Vehicle Allocation—A knowledge of the geographic distribution of motor vehicles, the travel habits of motor vehicle owners, the relative use of the different highway systems and the fees and taxes paid by motor vehicle owners is necessary to the establishment of an equitable allocation of funds to the several highway systems, as well as essential to the preparation of impartial tax laws which will prevent the subsidization of one motor vehicle user group by another.

To determine facts which will permit a factual analysis of these problems, there was initiated during the spring of 1942, with the cooperation of the State Board of Education, a Road Use and Motor Vehicle Allocation Survey. The field work is essentially complete, and the analysis of the data obtained will proceed as rapidly as personnel permits, in order to make the information available at an early date.

Fiscal Study—The Fiscal Study is primarily directed toward a determination and analysis of highway income and expenditures of all units of government within the State, the extent of which highway users provide funds for highway activities and the amounts which are derived from other sources. Preparations are being made to assemble this information, using the calendar year 1941 as the basic year.

Other Related Studies—Two other important studies, Road Life and Accident, have been reprogrammed for consideration at a later date, probably 1943. The Road Life Study is directed to a determination of the probable average life and rates of retirement for each type of surface in order that definite data will be available to forecast the future necessary reconstruction. The Accident Study involves detailed analysis of traffic accidents as they relate to physical characteristics of the highway, as well as specific locational studies which will permit factual recommendations that will reduce to a minimum hazardous conditions.

Statistical Data—The Public Roads Administration receives from each State monthly and annual reports on motor vehicle registration, gasoline consumption, motor users imposts, and improvements and additions to the highway system, as well as many special reports. In addition to these reports, the Highway Planning Survey prepares a number of charts and tabulations for other Divisions and Bureaus of the Highway Department and supplies upon request a large variety of statistical information.

DUAL HIGHWAY

The 1940 Annual Report set forth preferred construction projects; one of which was, "The construction of a dual highway from Dover south to the Maryland Line, by the route which the traffic surveys and studies now being made by the State-wide Highway Planning Survey shall determine most important and desirable."

Recently the Highway Department approved the preparation of plans for dual highways from Dover to Delmar, and from Little Heaven to Milford. This decision was predicated on preliminary traffic figures furnished by the Planning Survey. To further support this decision there is listed the following comparative traffic figures which were collected in the field during the calendar year 1941.

COMPARATIVE TRAFFIC

Dover to Delmar

U. S. No. 13

Section of Highway	24-hour average Daily Traffic
Dover to Camden	4339
Camden to Felton	3476
Felton to Harrington	2992
Harrington to Greenwood	3284
Greenwood to Bridgeville	3055
Bridgeville to Seaford	2914
Seaford to Laurel	3930
Laurel to Delmar	3450

Dover to Selbyville
U. S. No. 113

Section of Highway	24-hour average Daily Traffic
Dover to Little Heaven	1529
Little Heaven to Milford	3365
Milford to Millsboro	1709
Millsboro to Dagsboro	2749
Dagsboro to Frankford	2198
Frankford to Md. Line	2464

The tabulation indicates that although short sections of the highway, U. S. 113 from Milford to Selbyville carry considerable travel, in general the travel does not compare in volume with U. S. No. 13 from Dover to Delmar.

The 1940 Annual Report recommended a study of highway speeds in order to establish on a factual basis a reasonable yet safe speed law. During December of 1940 and January of 1941, speed data was collected on 5,382 passenger vehicles and 1,028 trucks at twenty-six locations throughout the State. After an extensive analysis of the data, speed legislation which recommended absolute speeds of 50 miles per hour on two lane highways, 55 miles per hour on dual highways, 25 miles per hour in business districts, 35 miles per hour in residential districts, and provisions for speed zoning, was prepared and adopted by the legislature. This enactment became a law in May, 1941. Under this law trucks with a maximum gross weight of less than 8,000 pounds are allowed passenger car speeds. Trucks over this weight are restricted to 20 miles per hour in business districts, 25 miles per hour in residential districts, and 40 miles per hour under other conditions.

After one year of observation, it has been determined that several of the component parts of the law do not truly conform to actual field conditions. It is, therefore, recommended that the following amendment be submitted to the 1943 session of Legislature. It is obvious at present that the law itself and the amendment will be for post War use.

1. The speed limit in business and residential districts be set at 25 miles per hour; hence, all business and residential districts will be 25 miles per hour unless otherwise zoned and posted.

Some forty-eight miles of highway were speed zoned during 1941 with the thought of preparing and analyzing accident data on a "before" and "after" basis to determine the results. The war interfered with this program before sufficient accident experience could be obtained; however, from the limited amount available, it appears that although the number of accidents was not materially reduced, the severity of the accidents dropped considerably.

Numerous sign, marking, parking, and miscellaneous studies were conducted, with corrective measures being applied. The remainder of the Traffic Engineering efforts were directed toward the collection of accident and traffic data to be used in the development of a post War safety program.

RIGHT OF WAY DIVISION

During the period covered by this report the Right of Way Division has obtained 491 Options, 424 Deeds have been executed, 132 Releases secured and 893 property descriptions prepared. Four properties were acquired by Condemnation. Twenty-five buildings were moved from the right of way and three others were demolished.

Legislation enacted by the last General Assembly enables the Department to sell, without special legislative action, portions of right of way not required for construction purposes. Following the approval of this Act, the Department sold the unused portions of ten properties acquired for the St. Georges Bridge for the sum of \$13,542.33.

The Department prepared and there was submitted to the Congress by Representative Traynor a Bill to reimburse the State Highway Department, for the cost of securing



DITCH JUST COMPLETED BY SPUR PLOW—MOSQUITO CONTROL DIVISION

the right of way of the St. Georges Bridge, amounting to \$170,889.47. While there appears to be no reason why the State of Delaware should bear this unusual expense no action was taken on this claim by the Congress.

The total cost of work done and property acquired by this Division for the eighteen months was \$221,548.31.

MOSQUITO CONTROL DIVISION

The work of mosquito control has continued through the period insofar as funds, equipment and man power were available.

A heavy turn-over in personnel and the impossibility of securing experienced men added to the difficulties previously experienced. It may be frankly admitted that the problem of keeping properly cleaned the more than eight million feet of mosquito control ditch in Sussex County alone, together with the necessary inspection and spray work, the maintenance of equipment, tide gates and bridges necessary to the satisfactory carrying on of the work is impossible under present conditions.

During 1941 the inspection forces located 7,115 breeding places, totalling 50,828,000 square feet in area, the prompt spraying of which at the critical time is essential to proper control. Under unfavorable weather conditions to efficiently cover these large areas with available equipment and personnel is almost hopeless.

I would estimate that with the return of peace that an appropriation of \$100,000 per annum will be necessary to adequately control the mosquito pest of the State, in lieu of the current appropriations of \$33,250.00.

The mosquito control engineer and his assistants deserve a great deal of credit for the strenuous fight they have waged during the past two seasons under very discouraging and difficult conditions.



**DRAINAGE DITCH AND GATE—GORDON LAKE NORTH OF REHOBOTH
MOSQUITO CONTROL DIVISION**



TRACTOR AND POWER SPRAYER—MOSQUITO CONTROL DIVISION

During the period special cooperative projects have been carried on with the W. P. A., the State Board of Health and the State Agricultural Experiment Station, to control malaria carrying species in the vicinity of Fort duPont, Saulsbury and Miles.

A survey was made of the problem of mosquito control in the vicinity of the Dover Airport and it was estimated that \$50,000 would be required to produce results in this area.

Assisting in all of this work, the State Agricultural Experimental Station has conducted the scientific and research work and has rendered most valuable service.

PUBLIC LANDS

Following the construction of the Ocean Highway from Rehoboth to Fenwick's Island a considerable number of small cottages were built without legal rights on Public Lands. Beginning in 1941, the Department took steps to remove these encroachments.

A section of the beach at Fenwick's Island was subdivided and lots were offered for sale, first to those having cottages on State Land, and later to others. Eighty-eight (88) lots were sold, the total amount received from these sales was \$16,298.00.

In this way the Department has cleared the Public Lands of squatters, and almost without exception, received ready cooperation from the cottage owners.

Plans and specifications have been prepared for an adequate Concession Building for the accommodation of fishermen and tourists at the Indian River Inlet. Owing to the restrictions affecting travel and building material, these plans will be held in abeyance for the duration of the War.

SUBURBAN STREETS

Modern transportation has made possible a great development of the suburban areas, and while such developments are highly desirable some of the results are far from satisfactory especially since this movement has been accompanied by or has sometimes been motivated by a desire to escape taxation. Taxes are a necessary accompaniment of life in an incorporated community, where paved sidewalks and streets, sanitary and storm sewers, street lighting and water supply, garbage collection and snow removal, police service and fire protection are provided at least in part from the community treasury supported by local taxation.

It will come as a surprise to many people that there are communities in Delaware with a population nearly as large as the City of Dover having no local community government. I believe it is unnecessary to add that such a condition does not encourage or assist in an orderly and progressive development nor does it promote community pride and spirit. I believe it will also be generally acknowledged that it is hardly equitable to the tax payers of the State and especially motorists living in incorporated towns and cities, to contribute funds for the construction of roads, streets and other utilities in unincorporated districts, while at the same time they are paying through direct taxes and assessments for similar improvements in their own communities.

The real estate developer has often painted the suburban picture in too glowing colors and sometimes assured the unsuspecting that the State Highway Department would furnish at least some of the most essential of these services. Moving to the country in spring or summer the suburbanite is frequently shocked on the approach of winter to realize that there are no sidewalks by which his children can reach the neighboring school, that the streets are muddy, rough and unlighted and that no storm water drainage is provided, while other subdivisions may divert additional water to these streets or dam back the water flooding cellars or roadways.

To meet this situation, the Department on May 21, 1942, adopted Rules and Regulations requiring the construction of streets, sidewalks and storm water drainage structures meeting certain requirements, before streets will be accepted by the State for maintenance. Developments are divided into three classes in accordance with the average value of the properties and specifications and standards are established for each.

The New Castle County Planning Commission cooperated in the drawing up of these regulations and gave them their official approval. It is believed that these regulations will serve as a protection and benefit to both the home owner and the reputable real estate developer.

I would suggest that appropriate legislation be presented for consideration by the General Assembly confirming these regulations and clarifying the existing situation. This would place the whole problem on a sound basis, which would be equitable to all our citizens and not impose a burden on the State.

MERIT AND RETIREMENT SYSTEMS

All states adjacent to Delaware have a Civil Service or Merit System by which their employees have a certain amount of security and permanence of employment, afforded them by law. Likewise these states have a retirement or pension program for all state employees.

In view of this fact and the fact that under existing Federal laws a large percent of our population, except State and Municipal employees have some form of retirement pension and unemployment insurance, I recommend that the Department make a study of such systems and present its findings to the General Assembly for its consideration, otherwise the State will lose many of the more energetic and intelligent of its employees and the State services will decline in morale and efficiency.

FEDERAL AID

There were on June 30, 1942, unobligated Federal Funds amounting to \$1,874,498.03 with an additional amount of \$414,299.67 which has been allocated to projects but is not available at present owing to Wartime restrictions.

It is reasonable to expect that these funds will be available at the conclusion of the War and will have to be matched by State funds.

What other funds may be available for a Post War Public Works program is highly speculative as are the conditions under which they will be apportioned; however, the program of the Department for preparing plans for possible construction and reconstruction of highways, and having them in readiness for such a period is unquestionably most desirable as well as the program of right of way acquisition which the Department has adopted.

STATE POLICE

A complete report of the activities of the State Police including tabulations of accidents and arrests will be submitted at the end of the calendar year.

In closing I wish to express my appreciation of the advice and counsel I have received from the Chairman and the courtesies and consideration shown me by the Members of the Department.

To my associates I desire to extend my thanks for their willing and valuable cooperation.

Respectfully submitted,

W. W. MACK
Chief Engineer