

REPORT OF THE CHIEF ENGINEER  
DELAWARE STATE HIGHWAY  
DEPARTMENT

July 1, 1954 to July 1, 1955

---

Dover, Delaware

Chairman and Members  
Delaware State Highway Dept.  
Dover, Delaware

Gentlemen:

In accordance with the provisions of the Laws of Delaware 1953, I am pleased to present to you the Annual Report for the State Highway Department for the period July 1, 1954 to July 1, 1955.

During this period my services as Chief Engineer started on April 15, 1955. I succeeded Colonel W. A. McWilliams who retired from the Department after having served the State of Delaware in many capacities for over 30 years.

I am most grateful for the advice, counsel and cooperation of the Members of the Department. I especially wish to thank Mr. Hugh R. Sharp, Jr. for the time, energy and helpful assistance that he gave to the many difficult problems of the Department and the Chief Engineer's Office.

To all of the Division Heads and employees of the Department, I wish to express my sincere thanks and appreciation for their loyalty and the tremendous effort that they put forth to provide service to the people of the State and all those visitors traveling through. Highway construction, maintenance and operation are big business and it is only through teamwork that the job can be accomplished.

In addition to reporting on the activities of the various Divisions of the Department, there is contained herein a series of general recommendations as well as a comprehensive

list of construction projects from which future construction programs may be selected.

### General Recommendations

The Department has grown to over a sixteen million dollar a year operation in actual funds expended. In addition the Department is involved directly or indirectly in the expenditures of many more millions of dollars of public and private funds. In order to provide the proper service and perform efficiently, we must keep pace with the times and therefore a series of general recommendations have been developed for consideration. It is recommended that:

1. New combined division office and maintenance facilities be provided for New Castle County at an approximate cost of \$600,000.
2. Land be acquired in Sussex County both near Georgetown and Seaford for a future building program in this County.
3. Consideration be given to dividing Sussex County into two division offices each having jurisdiction over approximately 1,000 miles of roads.
4. All employees be provided some form of job security.
5. The Department be reorganized into a Department of Public Works with the top administrative position being a Commissioner appointed by the Governor.
6. In the future every effort be made to obtain at least part of the biennium construction funds early in the legislative session, so as not to lose the best part of the construction season during legislative years.
7. A special maintenance unit be established in New Castle County for the sole purpose of maintaining streets in Suburban Communities surrounding Wilmington.
8. A formula be devised and an additional gas tax be levied in order to provide a moderate level of State Aid to Cities and Towns for the purpose of maintaining local City and Town streets. The two basic elements of the distribution formula should be street mileage and population.
9. A new central sign shop be provided in Dover.
10. Our right of way law be strengthened to permit the pur-

chase of land for future highways and that a revolving right of way fund be set up for the purchase of said lands.

11. Additional funds be made available for mosquito control work and that more emphasis be placed upon ditching and draining marsh areas.

12. The State Lands in Sussex County between Cape Henlopen and Fenwick Island be turned over to the State Park Commission for supervision and development. These lands should never be sold.

13. The program of increasing the number of roadside rests and picnic areas be continued and expanded.

14. The experimental work in calcium chloride and rock salt to stabilize dirt roads and lay the dust be expanded to regular yearly programs.

15. Surface treatment be replaced with hot mix asphaltic concrete on secondary roads carrying intermediate volumes of traffic.

16. Every effort be made to do all possible improvement and maintenance work by the contract method.

17. "The Rules and Regulations Governing Suburban Communities" be changed to require the construction of sidewalks along all existing county or state highways.

18. The Department undertake a comprehensive study of flooding conditions along streams and their tributaries in upper suburban New Castle County and then seek special local and/or state funds to gradually correct these serious conditions.

19. A State—Local formula be developed that will care for sidewalk and drainage facilities in connection with the construction of suburban and rural schools.

## CONSTRUCTION

### General

111 contracts for various types of work throughout the State took place during the year. Some of these contracts involve work which was carried over from the preceding year, and other contracts commenced during this year but are not yet completed.



Approach to Wilmington's Walnut Street crossing of Christina River with sand drain installation in background.

The award value of the contracts for the 1954-55 year was \$7,222,432. This compares with an award value of contracts for the preceding fiscal year of \$9,112,558. The value of the construction work performed during the year was \$8,881,884. This compares with a construction value of the preceding year of \$6,165,905, and with the 1952-53 figure at \$8,914,859. The 1954-55 construction was the second largest amount in the past five (5) years.

For tabulation of projects see Table I Appendix, Page 96.

#### **New Castle County**

During the fiscal year 25 contracts were awarded in this Division. In addition, 22 were carried over from the previous year for a total of 47 active during the year. These had a total contract value of \$9,900,000.

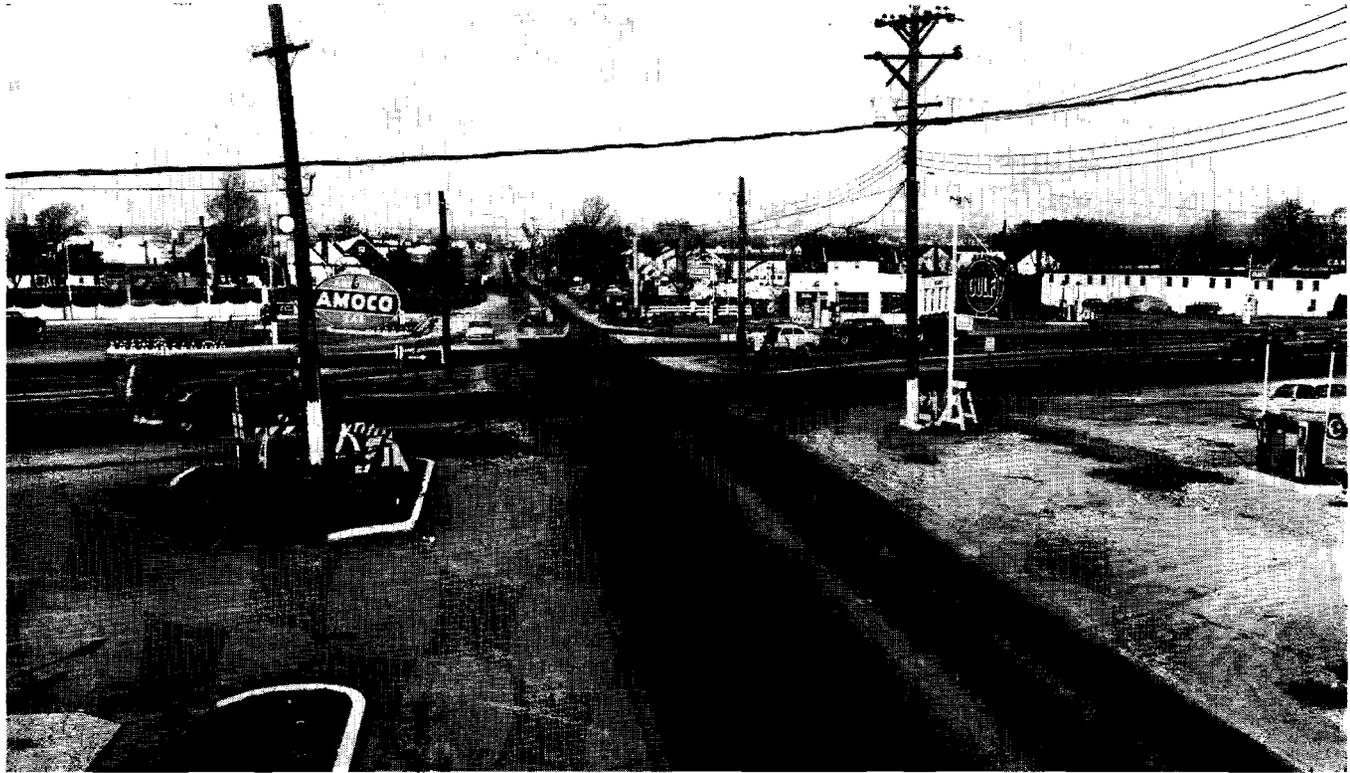
#### **Walnut Street Bridge and Approaches (Contract 1224) :**

An important part of this new entrance and approach to Wilmington from the south is the section of the overall contract concerning the marsh stabilization.

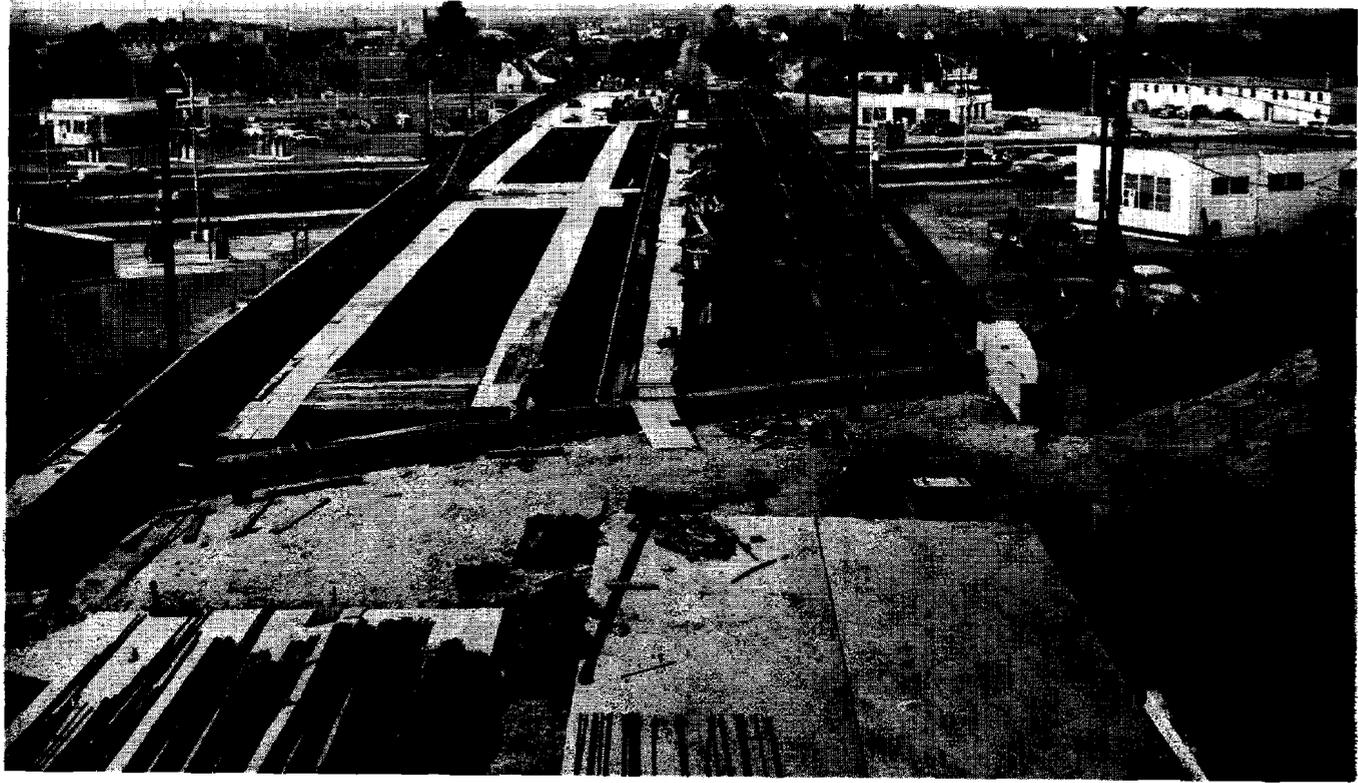
Primarily a stabilization and grading project, it provides for the stabilization of a marsh area in order to accommodate the future pavement for the project. The procedure consisted of placing over the marsh a sand blanket to be used as a working table, placing vertical sand drains or columns through the muck to firm bottom, and placing a load of earth over the sand blanket to serve as weight. The weight forces the water out of the marsh muck into the sand drains or columns, thence to the surface where it escapes through the sand blanket. In doing so it allows the muck to consolidate, settle, and obtain increased bearing strength. Settlement which would normally occur during a period of a half century is thereby achieved in a few months permitting the early placement of a permanent surface. Worthy of special note in this project was the construction of a timber structure on piling to carry the several utilities. All this structure is underground.

#### **Basin Corner Interchange (Contract 1318) :**

The largest single contract in this Division was the construction of the Basin Corner Interchange. It is an overhead bridge carrying Route 41 from Newport to New Castle across the DuPont Parkway.



Basin Corner, U.S. 13 and Del. 141, New Castle County—Before Construction.



17

**Basin Corner Interchange under construction, a \$1,040,000 project.**

Full provisions are made by a modified seven way clover leaf for traffic to move continuously from all directions without interruption on left turns. In spite of delays resulting from delivery of structural steel progress is satisfactory. The maintenance of traffic at this busy intersection has been a major problem, but has been handled with a minimum of inconvenience to the public. It has involved moving approximately 15,000 vehicles per day across the path of 50,000 vehicles while construction continued.

**Murphy-Wilson Road (Contract 1235):**

The reconstruction of Murphy-Wilson Road is typical of what may be necessary to rehabilitate many of the old secondary roads which have become primary in importance as the area becomes highly developed.

The original road has a high crowned, narrow, built up bituminous pavement requiring almost constant maintenance. The new pavement generally follows the old alignment and will consist of 4 lanes and curb from Concord Pike to Faulk Road and 2 lanes from Faulk Road to Marsh Road. Some locations on this project required the removal of 2 to 3 feet of depth of unsuitable materials before a firm foundation could be found.

**Washington Street, Wilmington (Contract 1257):**

The reconstruction of Washington Street in Wilmington is typical of urban construction. The entire old pavement was removed down to firm bottom and replaced with new concrete and bituminous surfacing. To facilitate construction and minimize the period of time the street would be under construction, two innovations were made. First, the utilities were instructed to make all their necessary changes before the project was put under contract. This permitted the paving contractor to proceed at a faster pace. Second, the contractor was required to work two 8 hour shifts. This method worked satisfactorily and is recommended for future city work when practicable.

**Heald Street, Wilmington (Contract 1299):**

The reconstruction of Heald Street is typical of the reconstruction of a main highway passing through a congested city area. All the old pavement was removed, the street widened on one side and new 9" concrete pavement placed. Again speed of construction was of prime importance since this was one of only two entrances into the south of Wilming-

ton. The contractor was permitted to detour traffic during some stages of construction and completed the project in satisfactory time.

**Fieldsboro to McDonough (Contract 1287):**

Although this project is located in New Castle County, the contract work was handled by Kent County forces. The project consisted of patching the existing pavement, widening in some instances, and resurfacing the entire pavement with hot mix.

**Maryland Line to Route 41—Warwick (Contract 1191):**

This contract which also was handled by Kent County forces, is a connecting link between the new Maryland Expressway connecting the Bay Bridge with Delaware. Work was started during the fiscal year, but will not be completed until the next fiscal year.

Other projects which were handled during the year are shown in Table I.

The field supervision of the above construction is handled by a force of about 30 engineers and inspectors. This force should be supplemented periodically by additional trained engineers in order to maintain suitable standards for future construction.

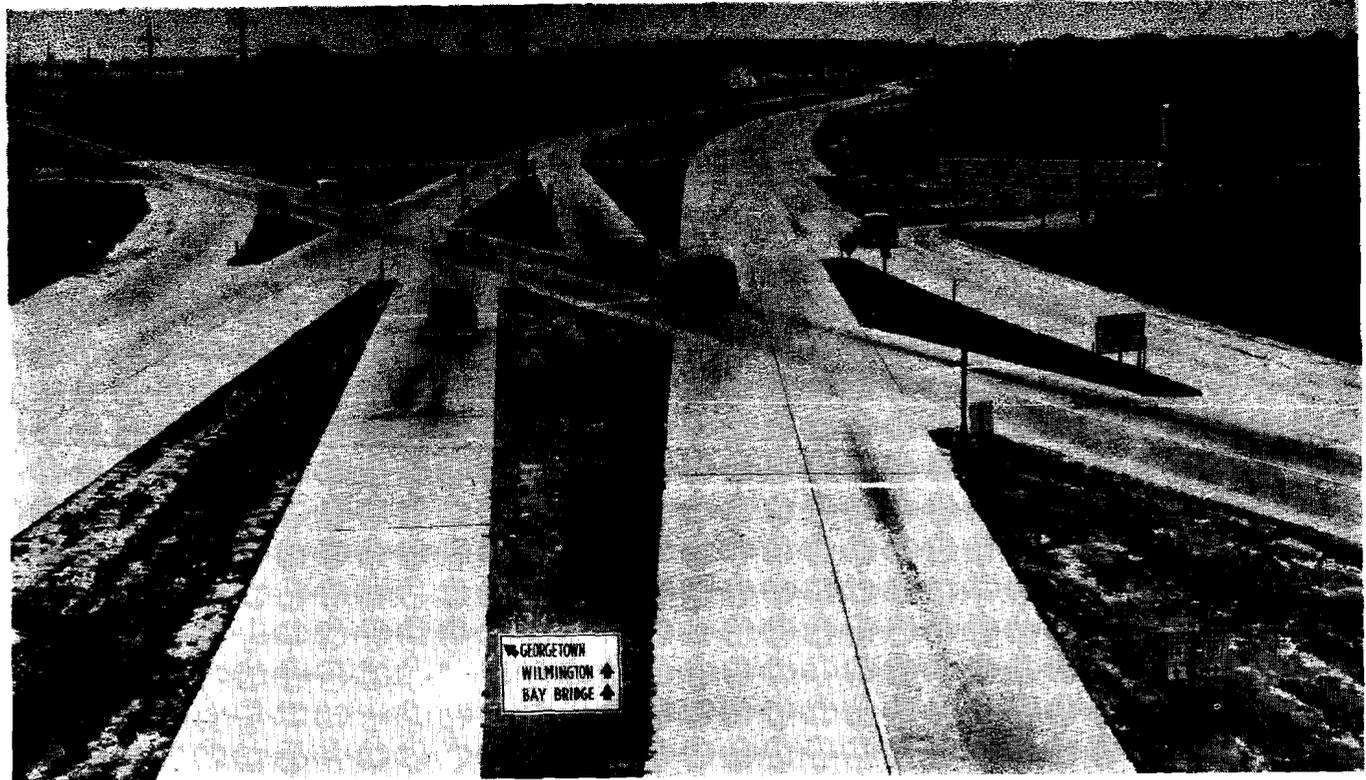
Construction would not be possible, of course, without the necessary surveys. The survey section consisting of a chief of surveys and four parties in addition to making the necessary layouts, completed approximately 420 miles of various types of surveys.

**Kent County**

During the year 16 construction projects were handled in Kent County. Details concerning some of the more important are listed below.

**Harrington to Canterbury (Contract 915):**

This construction was a carry over from the previous year. The construction of this new divided highway adds another section toward the ultimate completion of U. S. 13 as a divided highway throughout the length of the State. Excellent progress was made when the concrete was poured at an average rate of 3,145 feet per day during the month of July.



Reconstructed intersection of Delaware Routes 14 and 18, a part of the dual road project from Rehoboth to Wescoats Corners, Sussex County.

**Smyrna to Wendalls Corner (Contract 682) :**

This contract was also started in the preceding year. It consisted of the widening of the street, placing curbs, and replacing sidewalks within the Smyrna Town Limits, and surfacing the pavement with hot mix. The completed facility provides a good highway toward Woodland Beach.

**Edgehill Acres (Contract SD58) :**

This was a Suburban Development Contract performed in Kent County. It is thought that the project is a good example of what can be done under the Suburban Community Road Law.

**Sussex County**

From July 1, 1954 to June 30, 1955, the Sussex County Division had under contract 27 jobs, of which 12 were carry-overs from the previous year. Information concerning these contracts follows:

**Delmar to Laurel (Contract 1149) :**

This was the construction of the divided highway for the southerly end of U. S. 13 in the State. This construction relieves considerably traffic conditions in the towns of Delmar and Laurel, and effectively assists the through traffic moving north and south along the peninsula.

**Five Points to Rehoboth (Contract 1152) :**

The construction of this new divided highway has assisted very much in relieving conditions caused by heavy summer traffic entering and leaving Delaware's largest summer resort.

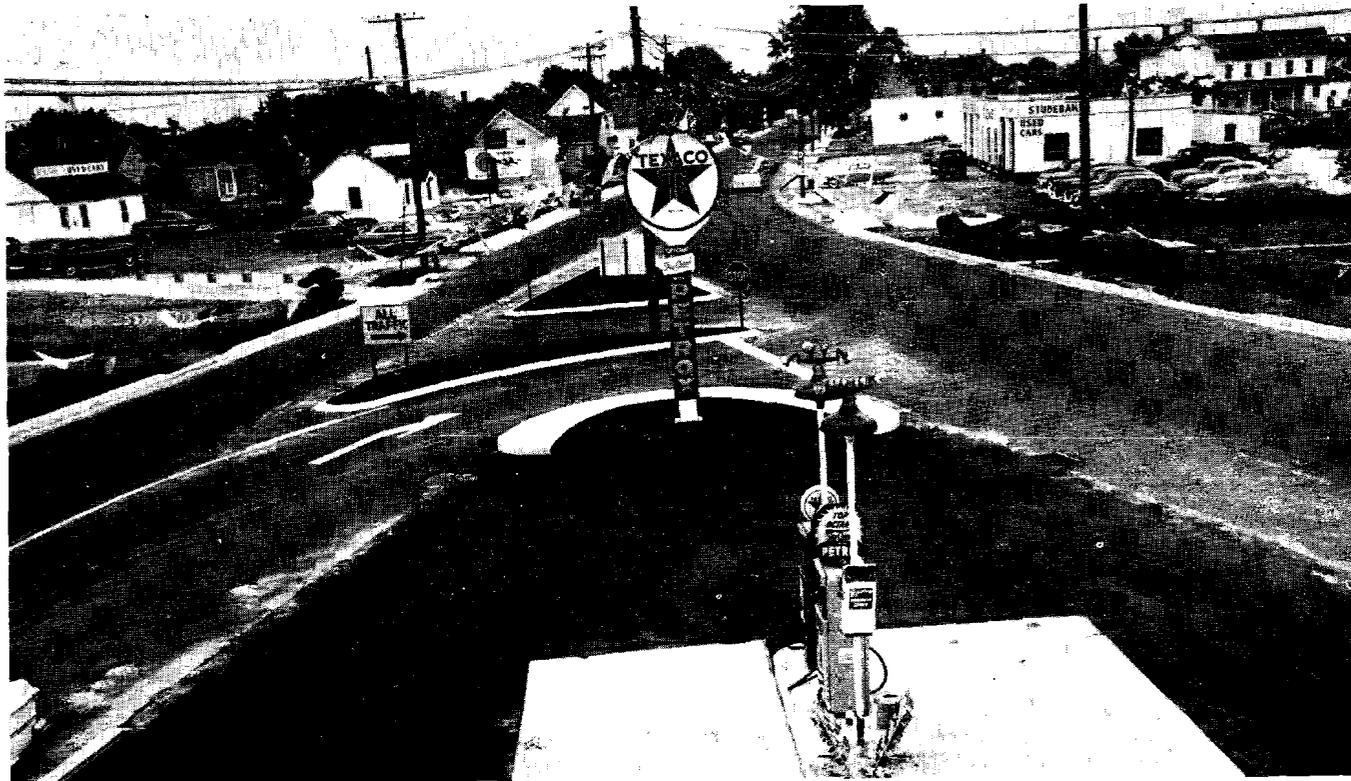
The construction of the new highway utilizes the existing alignment in some locations, but new alignment was used in the vicinity of Route 18. Channelization at the Route 18 intersection and the Rehoboth Beach entrance with traffic signal installations, in each case, were added features of this highway.

**Harbeson to Five Points (Contract 1265) :**

This widening and resurfacing project considerably assists traffic which is travelling toward the seashore resorts



Bedford Street, Georgetown, showing intersection and service station entrance conditions before reconstruction.



Bedford Street showing intersection treatment after construction.

from Maryland by way of the Bay Bridge. Many favorable comments have been offered on the smooth riding surface which now is present on this road. It is thought that this, perhaps, the best hot mix surfacing project in Sussex County.

**North and South Bedford Streets—Georgetown  
(Contract 1335):**

The construction of North and South Bedford Streets in Georgetown was delayed for several years because of the objection to the removal of trees in front of a few properties. The poor drainage conditions and the narrowness of the street had made this road difficult to maintain and unsightly to the public entering the County Seat. However, this has been corrected, and since the construction has been completed, the Department has been commended on the design and construction, both by the residents of the Town and by motorists who pass through it.

Other contract work included some bridge reconstruction, addition to the State Police Station at Georgetown, and routine construction operations. See Table I.

Also, during the year seven (7) contracts which were authorized by the Legislature were placed under construction. They included work at:

Blair's Pond Dam, Williams Pond Dam, Silver Lake Pumping Station, the dock for the Marine Laboratory at Lewes, and Bethany Beach, Lewes Beach, and Broadkill Beach Shore protection.

**Recommendations**

Previous Annual Reports of the Chief Engineer of the State Highway Department contained comprehensive listings of roads and streets in the State, from which construction programs are to be selected.

These listings have been revised to eliminate projects which have been selected and are under construction. Also the entire listing has been carefully reviewed and brought up to date to show the urgent highway needs of Delaware as of June 30, 1955.

I therefore submit to you the following listing of roads from which the future highway construction program may be selected:

**RECOMMENDED ROADS  
FOR FUTURE CONSTRUCTION  
NEW CASTLE COUNTY**

**URBAN SYSTEM**

Road Number	Location	Sufficiency Rating	Mileage	Estimated Cost
11	Union Street—Lancaster Pike to Sycamore (Wilm.)	45-74	0.28	\$ 112,000.00
50	Heal Street (Spruce Street to Christina River, Wilm.)	54	0.25	80,000.00
41 (SR 273)	West Newark Limits to Capitol Trail	55-56	1.18	378,000.00
11	Through Newark	57-74	2.06	660,000.00
217	Miller Road—Baynard Blvd. to Lea Blvd.	57	0.56	220,000.00
4A	Baynard Blvd. (Washington St. to Concord Ave.)	58	0.63	202,000.00
4	Concord Avenue, Wilmington	49	0.79	280,000.00
			Total	\$ 1,932,000.00
	<b>Special Projects</b>			
24	Walnut Street Paving		0.57	\$ 700,000.00
24	Walnut Street (Front Street to 4th Street)	65	0.20	200,000.00
			Total Special Projects	\$ 900,000.00
	<b>Building Projects</b>			
	Maintenance Building—New Castle			\$ 600,000.00
			Total Building Projects	\$ 600,000.00
			Grand Total Urban System and Projects	\$ 3,432,000.00

25

**RECOMMENDED ROADS  
FOR FUTURE CONSTRUCTION  
NEW CASTLE COUNTY**

<b>PRIMARY SYSTEM</b>				
Road Number	Location	Sufficiency Rating	Mileage	Estimated Cost
336	Maryland Avenue (Boxwood Road to Silview)	45	1.50	\$ 750,000.00
18	Christiana to Newark (Rt. 273)	53	4.60	500,000.00
237	Lancaster Pike (DuPont Road to Centre Road)	54	1.00	150,000.00
19	New Castle Avenue (Fingerboard Rd. to Chestnut St.)	57	3.58	1,000,000.00
24	Philadelphia Pike, Bellevue Road to Claymont	57	2.43	550,000.00
6	Basin Corner to New Castle	57	1.30	78,000.00
34	McDonough to State Rd. (N.B.) U.S. 13	61	11.80	800,000.00
4	Concord Pike (Talleyville to Pennsylvania Line)	63	2.00	560,000.00
34	Corbit Station to Tybout's Corner (S.B.) U.S. 13	87	2.00	200,000.00
6	Basin Rd. (U.S. 13 to Newport) Route 41	69	2.50	200,000.00
11	Capitol Trail—Dual, Limestone Road to Newark	70-78	4.24	510,000.00
50	Governor Printz—Stockdale to Wilmington City Line	73-81	5.15	385,000.00
43	Lea Boulevard to Road 24	60-74	1.52	320,000.00
			Total	43.42
				\$ 6,003,000.00
	<b>Special Projects</b>			
24	Naaman's Road Interchange (U.S. 13 to Chester Expressway)			\$ 700,000.00
24	Naaman's Road Interchange (Underpass Paving)			250,000.00
	State Road Interchange			375,000.00
			Total Special Projects	\$ 1,325,000.00
			Grand Total Primary System and Projects	43.42
				\$ 7,328,000.00

26

**RECOMMENDED ROADS  
FOR FUTURE CONSTRUCTION  
NEW CASTLE COUNTY**

**SECONDARY SYSTEM**

Road Number	Location	Sufficiency Rating	Mileage	Estimated Cost
11C	Old Capitol Trail	28-62	2.14	\$ 128,000.00
271	Centre Road (Lancaster Pike to Kennett Pike)	31	1.25	375,000.00
212	Silverside Road—Concord Pike—Phila. Pike	33-48	4.59	459,000.00
214	Shipley Road—Phila. Pike—Naaman's Road	34-63	4.98	498,000.00
232	Rockland Road—Concord Pike to Penna. Line	35-65	5.91	591,000.00
270	DuPont Road to Gap Road (Faulkland Road)	35-56	3.37	337,000.00
336	Stanton to Newport	35-37	2.00	120,000.00
259	Centre Road to 275A	37-65	3.42	342,000.00
373	Road 374 to New Castle Avenue	40	0.81	81,000.00
13	Milford Crossroads to Limestone Road	41-45	3.51	211,000.00
235	Road 225 to Road 232 (Near Montchanin)	41	0.90	54,000.00
366A	Ogletown to Road 336 S. of Stanton	41-47	2.84	284,000.00
	Kiamensi Road	42-65	2.51	251,000.00
13	Curtis Mill Rd. (Newark to Milford Crossroads)	43	2.43	210,000.00
221	Beaver Valley Road	45-59	5.00	600,000.00
336	Road 387A to Christiana	46-50	4.55	273,000.00
202	Naaman's Road to Pennsylvania Line	47	0.71	43,000.00
261	Road 242 to 247 (Ashland to Yorklyn)	48	1.72	172,000.00
441	Odessa to Mathews Corner	48-51	0.98	59,000.00
27	Dupont Road—Maryland Avenue to Elsmere	49	0.44	44,000.00
225	Montchanin Road (Barley Mill Road to 221)	49-62	5.02	502,000.00
307	Corner Ketch to Thompson Station	49	1.69	101,000.00
207	Darley Road (Naaman's Road to Philadelphia Pike)	50	2.20	270,000.00
27 & 27A	Dupont Road—N. Elsmere Limits to Kennett Pike	50-52	1.60	160,000.00
247	Road 261 to Pennsylvania Line Near Yorklyn	50-63	2.41	145,000.00
258	275A to Road 261 (Ashland to Wooddale)	50	1.42	86,000.00
337	Road 338 to Capitol Trail (Near Stanton)	50-65	0.50	30,000.00
340	Hog Swamp Road—Road 3 to Road 6 (Near Newport)	51-59	3.63	218,000.00
429	Armstrong's Corner to Odessa	51-61	3.63	218,000.00
378	Delaware City Road to 376 (New Castle to Delaware City)	52-65	5.44	327,000.00
410	Delaware City to Road 378	52-59	2.54	152,000.00
411	Delaware City to Dupont Parkway	52-62	3.49	209,000.00

27

**RECOMMENDED ROADS  
FOR FUTURE CONSTRUCTION  
NEW CASTLE COUNTY**

**SECONDARY SYSTEM**

Road Number	Location	Sufficiency Rating	Milage	Estimated Cost
448	Noxontown Road to Fieldsboro	52	2.48	\$ 149,000.00
243	Old Kennett Road	53	2.96	296,000.00
23	Marsh Road—Edgemoor Road to Philadelphia Pike	54	0.45	90,000.00
242	Road 9 to Road 261	54-65	2.60	156,000.00
338	Road 336 to 337	54	0.51	51,000.00
23	Marsh Road—Philadelphia Pike to Washington Street	55	0.48	90,000.00
449	Fleming's Landing—Mathews Corner	55-65	9.24	554,000.00
215	Weldin Road—Faulk Road to Shipley Road	56	1.36	136,000.00
218	Bellevue Road (Philadelphia Pike to Gov. Printz Blvd.)	58	0.55	174,000.00
5, 336 & 31	Route 7 (Limestone Road—U.S. 13 to Pennsylvania Line)	58	13.10	910,000.00
208	Faulk Road (Blue Ball to Naaman's Road)	58	4.00	1,200,000.00
40	Road 493 to Kent Line	58	1.55	31,000.00
221B	Road 221 to Pennsylvania Line	58	0.12	8,000.00
294	Limestone Road to Lancaster Pike	58	1.33	80,000.00
433	Summit Bridge to Maryland Line	58	3.27	66,000.00
452	Stump's Corner to Fieldsboro	58	1.73	35,000.00
267	New Bridge Road and Alapocas Drive Intersection	31-43		10,000.00
295	North Star Road 296 to Rd. 131		0.56	50,000.00
220	Edgemoor Road	34-68	0.96	224,000.00
484	Road 469 to Road 471		1.45	76,000.00
485	Road 30 to U.S. 13		1.18	30,000.00
40	Road 478 to Road 7	78	0.80	37,000.00
32	Appleton Road (Rd. 41 North for 0.5 Miles)		0.50	20,000.00
453	Road 36 to Road 462	75	1.65	42,000.00
			<b>Total</b>	<b>140.47</b>
				<b>\$12,020,000.00</b>
	<b>Bridge Construction and Repair</b>			
474	Fenimore Bridge and Approaches			\$ 150,000.00
449	Taylor's Bridge and Approaches			150,000.00
	Seventh Street Bridge, Wilmington			400,000.00
	Morrow Road Bridge over Pennsylvania Railroad			118,000.00
			<b>Total Bridge Construction and Repair</b>	<b>\$ 818,000.00</b>
			<b>Grand Total Secondary System and Bridges</b>	<b>140.47</b>
				<b>\$12,838,000.00</b>

28

**RECOMMENDED ROADS  
FOR FUTURE CONSTRUCTION  
NEW CASTLE COUNTY**

**TERTIARY SYSTEM**

29

Road Number	Location	24-Hour Traffic	Mileage	Estimated Cost
	Liberty Avenue		1.10	\$ 130,000.00
		Grand Total Tertiary System	1.10	\$ 130,000.00
		Totals by Systems:		
		Urban	6.52	\$ 3,432,000.00
		Primary	43.42	7,328,000.00
		Secondary	140.47	12,838,000.00
		Tertiary	1.10	130,000.00
	New Castle County Grand Total—All Systems and Projects	291.51		\$23,728,000.00

**RECOMMENDED ROADS  
FOR FUTURE CONSTRUCTION  
KENT COUNTY**

30

**URBAN SYSTEM**

Road Number	Location	Sufficiency Rating	Mileage	Estimated Cost
51	Lockerman Street, Dover	55	0.77	\$ 270,000.00
	Division Street, Dover, from Penna. R.R. to Maple Lane	60-64	0.67	200,000.00
Grand Total Urban System			1.44	\$ 470,000.00

**RECOMMENDED ROADS  
FOR FUTURE CONSTRUCTION  
KENT COUNTY**

**PRIMARY SYSTEM**

Road Number	Location	Sufficiency Rating	Mil. age	Estimated Cost
39	Commerce Street, Smyrna (U.S. 13 to Route 300)	50-67	1.12	\$ 276,000.00
8 (U.S. 113)	Frederica to Milford	58-71	8.58	344,000.00
6	Farmington through Harrington (Dual)	69	4.73	700,000.00
36	Harrington to Houston Road	71	3.50	250,000.00
27	Dover to Little Heaven (13A)	73	7.82	380,000.00
2	Dover to Bishop's Corner (U.S. 13, N.B.)	77	4.00	260,000.00
60	Vernon to Burtsville (Md. Line to Vernon Bridge)	78	3.76	240,000.00
1	Through Smyrna, Dual (Rd. 12 to Smyrna River)	80	1.63	254,000.00
7	Barker's Landing Bridge (Deck Repairs)			20,000.00
7	Dover Air Base Entrance			150,000.00
27 & 7	U.S. 13 Intersection Safety Improvements			150,000.00
			Total	\$ 3,024,000.00
	<b>Special Projects</b>			
7	Dover to Air Base, Dual, U.S. 13	57	3.37	\$ 2,000,000.00
		Total Special Projects	3.37	\$ 2,000,000.00
		Grand Total Primary System and Projects	38.51	\$ 5,024,000.00

**RECOMMENDED ROADS  
FOR FUTURE CONSTRUCTION  
KENT COUNTY**

**SECONDARY SYSTEM**

Road Number	Location	Sufficiency Rating	Mileage	Estimated Cost
190	Layton Avenue, Wyoming	47	0.36	\$ 15,000.00
65	Main Street, Smyrna, North to New Castle Line	49-62	1.50	90,000.00
35	Harrington to Frederica	58-62	7.35	295,000.00
45	Cheswold to Kenton	59-68	4.45	267,000.00
88	Dover—Leipsic Road (Road 7 to 334)	59	2.51	100,000.00
356 & 357	Dover Air Base to U.S. 13	59	3.49	349,000.00
53	Wyoming to Willow Grove	61	5.35	351,000.00
59	Fleming's Corner to Whiteleysburg	62	7.91	480,000.00
39	Through Clayton to Smyrna	65	1.42	120,000.00
34	Through Felton to Frederica	67	6.25	400,000.00
17	Bay Road to Little Creek	68	3.93	160,000.00
345 & 67	South Little Creek Road	73	1.30	80,000.00
57	Felton to Whiteleysburg (Rt. 12)	73	9.74	630,000.00
241	Road 240 to Road 57	75	1.12	16,000.00
137	Road 136 to Road 39		0.60	6,000.00
9	Road 82 to Road 10	70-82	3.81	33,000.00
193	Road 4 to Caesar Rodney Avenue		0.76	23,000.00
170	Road 41 to Road 171		3.37	51,000.00
170	Road 171 to Road 49		1.13	17,000.00
129	Road 39 to Road 40 (Blackiston to Delaneys)		3.11	65,000.00
243	Road 241 to Road 57		0.62	12,000.00
281	Road 58 to Road 57		2.27	42,000.00
134	Road 65 to Clayton Ice Plant		1.14	18,000.00
380	Ragtail Corner thru Anderws Lake (Road 33 to Road 12)		3.91	90,000.00
			<b>Total</b>	<b>77.40</b>
	Bridge Construction and Repair			\$ 3,710,000.00
	Lebanon Bridge (New Construction)			\$ 200,000.00
	Court Street Bridge, Dover (Replacement)			310,000.00
			<b>Total Bridge Construction and Repair</b>	<b>\$ 510,000.00</b>
	<b>Grand Total Secondary System and Bridges</b>		<b>77.40</b>	<b>\$ 4,220,000.00</b>

**RECOMMENDED ROADS  
FOR FUTURE CONSTRUCTION  
KENT COUNTY**

**TERTIARY SYSTEM**

Road Number	Location	24-Hour Traffic	Mileage	Estimated Cost
32	Cantrebury to Viola	287	0.90	\$ 70,000.00
398	Road 397 to Road 384	114	1.20	70,000.00
372	Road 7 to Road 18	133	0.58	9,000.00
349	Pickerings Beach Road	131	0.52	8,000.00
168	Road 45 to Road 167	122	0.68	12,000.00
165	Road 166 to Road 101	113	0.29	5,000.00
162	Road 161 to Road 51	134	0.38	7,000.00
198	Road 51 to Road 162	113	0.19	4,000.00
444 & 445	Road 36 to Road 444, Houston Limits to Road 444	216	1.51	32,000.00
		Grand Total Tertiary System	6.25	\$ 217,000.00
		Totals by Ssystems		
		Urban	1.44	\$ 470,000.00
		Primary	38.51	5,024,000.00
		Secondary	77.40	4,220,000.00
		Tertiary	6.25	217,000.00
		Kent County Grand Total—All Systems and Projects	123.60	\$ 9,931,000.00

33

**RECOMMENDED ROADS  
FOR FUTURE CONSTRUCTION  
SUSSEX COUNTY**

**PRIMARY SYSTEM**

Road Number	Location	Sufficiency Rating	Milrage	Estimated Cost
24	U.S. 113 to Rehoboth Road	58-75	15.11	\$ 966,000.00
26	U.S. 113 through Dagsboro to Bethany Beach	61-75	10.37	623,000.00
50	Bethany Beach to Indian River	64	4.80	560,000.00
50	Rehoboth to Indian River	66	6.89	290,000.00
18	Georgetown to Harbeson	67	6.00	210,000.00
18	Maryland Line to Atlanta	68	1.96	120,000.00
4 & 6	1 Mile from Greenwood to Farmington	70	5.53	720,000.00
24, 26 & 26A	Millsboro to Maryland Line via Gumboro	71	11.80	500,000.00
14	Five Points to Milford	71	18.00	630,000.00
18	Bridgeville to Atlanta	71	7.55	272,000.00
404	Maryland Line to Bridgeville	71-75	7.51	451,000.00
20A	Seaford to Reliance	72	4.84	340,000.00
18	Route 404A to Georgetown	73	9.66	600,000.00
4A	Market Street, Bridgeville, to U.S. 13	74	0.96	60,000.00
18A	Route 404 through Bridgeville to U.S. 13A	75	0.44	50,000.00
24	Laurel to Maryland Line—Sharptown	76	8.07	310,000.00
18	Wescoats Corner of Lewes—Rehoboth Canal	81	2.00	140,000.00
18	Georgetown to U.S. 113	70	0.30	15,000.00
			<b>Total 121.79</b>	<b>\$ 6,797,000.00</b>
	<b>Bridge Construction and Repair</b>			
14	Rehoboth Bridge Repair between Rehoboth and Fenwick Island:			\$ 20,000.00
	Replacement of Timber Bridges			300,000.00
14	Charles W. Cullen Bridge, North Approach Replacement			475,000.00
			<b>Total Bridge Construction and Repair</b>	<b>\$ 795,000.00</b>
	<b>Grand Total Primary System and Bridges</b>		<b>121.79</b>	<b>\$ 7,592,000.00</b>

34

**RECOMMENDED ROADS  
FOR FUTURE CONSTRUCTION  
SUSSEX COUNTY**

**SECONDARY SYSTEM**

Road Number	Location	Sufficiency Rating	Mileage	Estimated Cost
382	Roxana to Johnson (Road 389)	45-50	2.40	\$ 96,000.00
376	Frankford to Selbyville	52-63	4.06	244,000.00
16	East Ellendale Limits to Rehoboth Road	54-60	8.62	517,000.00
26	Shaft Ox Corner to U.S. 113	55	5.58	335,000.00
401	Road 26 in Dagsboro to U.S. 113 in Frankford	55-65	2.56	154,000.00
339	U.S. 113 South to Millsboro to Road 331	56	0.71	28,000.00
16	Kent Line through Greenwood to U.S. 13	57-70	5.70	342,000.00
22	Harbeson to Waples Pond	58	8.55	530,000.00
78	U.S. 13 in Laurel to Road 493	59	2.56	128,000.00
225	Lincoln to Milford (207 to 36)	59-65	2.86	143,000.00
549 & 549B	Road 20A to Road 553	61	3.53	66,000.00
297	Oak Orchard Road	61	1.99	100,000.00
493	Broad Creek to Bethel	62	2.43	68,000.00
70	Hearn's Cross Roads to Smith's Mill	62	3.50	129,000.00
64	Bacon Swith to Smith Mill	62	2.56	76,000.00
285	Wescoat's Corner to Road 48	62	5.82	110,000.00
360	State Route 14 to Road 357	62	1.30	25,000.00
64	Smith Mill to Whitesville	64	4.80	160,000.00
58	Through Selbyville to Road 52	65-69	0.92	40,000.00
64	Whitesville to Route 26	66	2.50	62,000.00
536	Seaford to Woodland	66	3.00	54,000.00
80	Maryland Line to Seaford—Reliance Road	66	3.96	160,000.00
204	Cedar Creek to Slaughter Beach	66	1.93	45,000.00
16	Greenwood to Ellendale	67	7.40	322,000.00
40	Bridgeville to Double Bridges	69	4.22	210,000.00
46	Brown's Church to Middleford	69	1.47	50,000.00
562	Road 18A to Road 404	69	4.00	150,000.00
589A	Road 13 to Road 589	69	0.33	7,000.00
546	Bridgeville Limits to Road 18	71	2.71	54,000.00
536	Road 78 to Railroad, West of Seaford	57-76	3.60	90,000.00

**RECOMMENDED ROADS  
FOR FUTURE CONSTRUCTION  
SUSSEX COUNTY**

**SECONDARY SYSTEM**

Road Number	Location	Sufficiency Rating	Mileage	Estimated Cost
465	Road 466 to Road 479	71	0.97	19,000.00
465	Road 479 to Road 74	71	1.00	20,000.00
462	Road 70 to Road 13	70	0.30	2,000.00
215	Road 215B to Road 212	80	0.90	18,000.00
213	Road 16 South	89	1.00	18,000.00
326	Road 20 to Road 318		0.75	15,000.00
267	Road 18 to Road 268	73-85	1.75	32,000.00
76	Delmar to Sharptown Road	71	9.84	350,000.00
20	Route 113 to Route 28	59-71	9.66	500,000.00
36	Milford to Road 208	48-71	1.19	92,000.00
22	Harbeson to Route 24	69-78	8.21	229,000.00
224	Argo Store Route 14 to Slaughter Beach	58	3.66	133,000.00
32	Route 16 to Route 404	74-77	3.49	126,000.00
207	U.S. 113 Through Lincoln	63-84	1.09	50,000.00
432	U.S. 113 through Stockley	90	1.15	54,000.00
582	Route 404 to Road 583	68	1.19	15,000.00
249	Route 18 to Milton Town Limits	72-80	4.57	116,000.00
546	Route 18 to Road 544	63	1.10	25,000.00
46	Road 28 to Road 484	71	2.32	96,000.00
544	U.S. 13 to Road 546	61	1.25	30,000.00
494	Route 24 to Road 495	68	2.50	50,000.00
365	Route 26 to Road 84	60	3.38	62,000.00
583	U.S. 13 to Road 585	61	2.26	55,000.00
277	Road 275 to Route 24	71	5.50	85,000.00
311	Road 297 to Road 312 at Riverdale		1.00	20,000.00
381	Road 384 to Road 58, Southeast of Bayard		2.07	42,000.00
227	Road 230 to Road 216		2.56	51,000.00
227	Road 216 to Route 16		1.63	32,000.00
619	Road 36 to Road 113		1.58	45,000.00
419	Road 455 to Road 26	65	4.88	75,000.00

36

**RECOMMENDED ROADS  
FOR FUTURE CONSTRUCTION  
SUSSEX COUNTY**

**SECONDARY SYSTEM**

Road Number	Location	Sufficiency Rating	Mileage	Estimated Cost
546	Bridgeville Limits to Road 18	71	2.56	50,000.00
326	Road 20 to Road 318		0.68	14,000.00
527	Road 113 to Road 524B		4.00	80,000.00
536A	Woodland Ferry		0.16	3,000.00
465A	Road 465 to Road 24		0.45	9,000.00
505	Road 24 to Road 76		1.42	20,000.00
212B	Road 16 to Road 22		0.36	3,000.00
224	Road 42 to Road 629		4.36	48,000.00
318	Road 326 to Stockley Farms		0.62	12,000.00
328	Road 326 to Road 113		0.40	6,000.00
328	Road 113 to Road 20		0.24	4,000.00
318	Road 48 South to Stockley Farms		0.76	16,000.00
211	Milford Limits to Road 225		0.14	\$ 2,000.00
402	Road 113 to Road 406		1.50	25,000.00
279	Road 24 to Road 277		1.95	40,000.00
277	Road 275 to Road 279	71	6.61	120,000.00
600	U.S. 13A to Road 591	70	1.00	20,000.00
389	Road 382 to Road 58	45	1.00	20,000.00
Grand Total Secondary System			216.53	\$ 7,444,000.00

37

**RECOMMENDED ROADS  
FOR FUTURE CONSTRUCTION  
SUSSEX COUNTY**

**TERTIARY SYSTEM**

Road Number	Location	24-Hour Traffic	Mileage	Estimated Cost
507	Maryland Line to Road 76	146	1.11	\$ 29,000.00
507	Road 76 to Road 76	104	1.93	31,000.00
507	Road 76 to Maryland Line	128	1.09	14,000.00
211	Road 225 to Road 206	135	1.59	25,000.00
211	Road 206 to Road 207	101	0.67	11,000.00
206	Road 211 to Road 207	113	1.12	16,000.00
225	Road 224 North	145	0.87	17,000.00
224	Road 225 to Road 213	102	1.45	29,000.00
222A	Road 14 to Road 38	151	0.67	12,000.00
519	Road 113 to Route 18	172	0.48	8,000.00
334A	Road 113 to Road 339	150	1.49	30,000.00
82	Road 326 to Road 113	251	0.41	6,000.00
317	Road 48 to Road 318	87	0.25	4,000.00
366	Road 84 to Road 353	125	1.48	30,000.00
353	Road 366 to Road 52	116	0.22	6,000.00
349	Route 26 to Road 347	166	1.45	26,000.00
276	Road 269 to Road 275	144	0.71	11,000.00
390	Road 389 to Road 58	141	1.01	20,000.00
	Shipley Street, Seaford (Penn. Ave. to Road 20A)		0.60	26,000.00
		<b>Grand Total Tertiary System</b>	<b>18.60</b>	<b>\$ 351,000.00</b>
		<b>Totals by Systems:</b>		
		Primary	121.79	\$ 7,592,000.00
		Secondary	216.53	7,444,000.00
		Tertiary	18.60	351,000.00
	<b>Sussex County Grand Total—All Systems and Projects</b>		<b>356.92</b>	<b>\$15,387,000.00</b>

38

## MAINTENANCE

### General

The increase in traffic volumes on all the highways in the State resulted in heavier demands for adequate maintenance than ever before. In many instances, not only is good maintenance needed to extend the life of a worn out road, but it is also an important factor in making a road safe for vehicular travel.

The importance of highways in our State was realized more than ever during the past year when Hurricane Hazel visited us. The maintenance which was necessitated by the Hurricane indicates the importance of good maintenance. Lack of maintenance, whether to assist in the aftermath of storm damage or to repair damage caused by repeated traffic, can result only in the breakdown in our transportation system.

### New Castle County

#### Primary Roads

During the year there has been \$136,232.12 worth of maintenance performed on Primary roads. With this, many shoulders were maintained, grass was cut, litter was picked up, joints were sealed, surfaces were patched, and drainage conditions maintained and improved.

#### Secondary Roads

The Secondary roads in the upper part of the County are most crucial. In upper New Castle these roads serve the function of connecting roads between metropolitan Wilmington and the suburbans surrounding it. In lower New Castle they connect smaller towns and serve the farm areas. During the year approximately 207 miles of roads were resurfaced at a cost of \$157,445.00. The overall secondary road maintenance was approximately \$230,000.00. It is generally felt that the increased traffic volumes in the upper part of the County now indicates the need for a hot mix resurfacing in many instances, rather than surface treatment used for many years.

#### Suburban Developments

Approximately 23 miles of suburban development streets were added for maintenance during the fiscal year. This brings



Many thousands of dollars are spent annually in at tempting to "Keep Delaware Highways Clean."

the total to approximately 211 miles. The increase in suburban development mileage which has already occurred indicates the serious need for a complete section within the maintenance organization to be assigned to suburban developments only.

#### **Movable Bridges**

**South Market Street Bridge** was opened 534 times during the year.

**Fleming's Landing Bridge** was opened 77 times during the year.

**Third Street Bridge** was opened 2,088 times during the year.

**Seventh Street Bridge** was opened 123 times during the year.

**Newport Bridge, Fenimore Bridge, and Sixteenth Street Bridge** (Wilmington) were opened for tests only during the year. Permission has been received from the U. S. Engineers to operate these bridges on a 24-hour notice basis.

#### **Highway Beautification**

When it is realized that an appreciable amount of the maintenance dollar goes to litter control, the recently aroused public interest is very much appreciated. The signs and dumping areas which were established seem to have assisted in the control of the problem, and the picnic areas which have been established have been commented upon favorably.

#### **Snow Removal**

All the snow fighting equipment was reconditioned and overhauled prior to cold weather. There were 10 snow alerts during the winter. Approximately \$71,800.00 were spent for snow removal, compared with \$83,000.00 for the previous year.

#### **General**

The New Castle County Division is particularly concerned with its inadequate maintenance housing and working facilities. Present facilities are poor. A recent insurance report sites the hazardous conditions under which personnel must work and operate. Equipment must of necessity remain out

of doors, with resulting rusting and deterioration. Personnel do not have suitable working areas. There is insufficient inside area for servicing equipment.

## **Kent County**

### **Primary System**

On some of the older surface treated roads a Pit Run Gravel resurfacing program was tried. While this mixed material costs more than surface treatment, it is felt that the treatment would last three to four times longer and provide a better riding surface.

Fall maintenance was changed somewhat in order to erect snow fence earlier than usual to anticipate snow removal problems. This was made somewhat difficult by large acreages of planting which was not yet harvested. However, in most instances the snow fence was erected by the 15th of October. During the winter there was an especially deep freeze with resultant deep frost conditions. A wet spring following this caused considerable damage to our bituminous treated roads. The breakup occurred at many places over the whole system. It was difficult to repair all the broken places at the same time. However, limestone screens were used for this purpose, which made a permanent base for later patches.

During the winter a check was made on all structures on the Primary System needing painting, and a crew started on the work during the year.

### **Secondary Roads**

More calcium chloride was placed for dust this year than in any previous year. It was distributed with crews equipped with spreaders and a water wagon. No calcium was placed at any location until it was properly graded and as free as possible of loose material.

Mowing was changed somewhat during the year, since the roads were mowed twice instead of once which had been the previous practice.

Experiments were made during the year by the use of rock salt. The results are being watched, and to date, have been favorable. The cost of these appears to be moderate, and while the results do not product dust free roads, approximately 75% of the dust is eliminated.



**Insect Control in Kent County, a part of the Highway Beautification program conducted throughout the State.**

The drainage ditches are in much better shape at the present time because of the new equipment which has been added. During the winter, timber bridges were checked on the Secondary System, and work has started on necessary repairs.

### **Storm Damage**

Hurricane Hazel visited Kent County on October 15, 1954. Extensive damage was caused which kept the crews busy for the next several weeks. Several of the main roads were blocked in the Camden area for several hours. The maintenance crews stayed on the job until the main roads were opened. Some of the Secondary roads were blocked for several days. All available equipment which could be used was employed or rented. In many cases the Department continued to haul not only debris left on the Right of Way, but much on private property, since the people did not have the means to haul it themselves. It is estimated that Hurricane Hazel cost Kent County \$25,000.00 for labor alone.

### **Snow Removal**

The snow removal problem was less than the previous year; however, several times crews were called out for light snows, ice, and sleet. The equipment was in good condition and the snow removal problem seemed to be under control all of the time.

### **Suburban Development**

Kent County is now entering the Suburban Community picture in addition to New Castle County. Among those which have been started on or completed during the year were Palmer Park, Capitol Green, Capitol Park, and Kent Acres.

### **Highway Beautification**

The highway beautification program was carried on in the regular manner until Hurricane Hazel, and then much of the time was spent cleaning and repairing damages resulting from the storm. This condition will continue for some time. Particular emphasis was placed on obtaining poisonous sprays and weed killers to replace the cutting of these undesirable weeds by hand.

## Sussex County

### Primary System

During the year some 148 miles of roadway shoulder work was accomplished and 72 miles of ditches sloped and cut. Shoulder areas were built up by much of this excess material in the Slaughter Beach Area.

Other general maintenance work involved clearing and shaping picnic areas, caring for the damages from wind storms in July and October, snow removal, and cleaning and controlling the dumps in the different sections of the County.

During the spring, all of our maintenance forces participated in the "Clean-Up Campaign," cleaning up dumps and removing trash from the side of the road. This was done in conjunction with the Sussex Gardners Club. It is estimated the yearly cost for clearing the roadside is \$69,500.00.

### Surface Treatment Program

A total of 108.9 miles of roads were resurfaced during the year at a cost of \$100,142.00. This compares with 48.5 miles resurfaced during the preceding year.

### Dirt Roads

The supervisors have been attempting during the past year not only to improve the condition of dirt roads, but also to make them safer. In many instances blind corners have been eased and signs moved which blocked sight distances. Some roads have been completely rebuilt; others have had excessive sand removed, and others have had slag spread to make them passable.

The drainage problem as usual in Sussex County has been a major problem during the year. The tile throughout the County along dirt roads have been completely checked, and some of them have been completely replaced.

During the year a one-day school for Dust Control and Soil Stabilization was held for the dirt road supervisors, foremen, grader operators, and scraper truck operators. The use of salt and calcium chloride was explained to them.

### Bridges

During the year a number of small wooden bridges throughout the County were repaired. All drawbridges were inspected and oiled monthly. The Indian River Inlet Bridge was cleaned and repainted during the year, as was the Walnut Street Bridge in Milford.



Typical daily scene of roadside picnic areas which are being placed on main highways throughout the State. These are found to be extremely popular to motorists.

## PLANS AND DESIGN DIVISION

### General

The function of the Plans and Design Division is to prepare plans for highway construction either by Department personnel or by assistance from Consulting Engineers. During the fiscal year 1954-55 thirty-two (32) plans were prepared by this Division. Plans for two (2) contracts were prepared by outside Engineering Organizations.

This Division has an average of twenty (20) employees, classified from Engineering Aides to Highway Engineers. The normal force is supplemented by temporary employees hired for the summer, usually college or high school students.

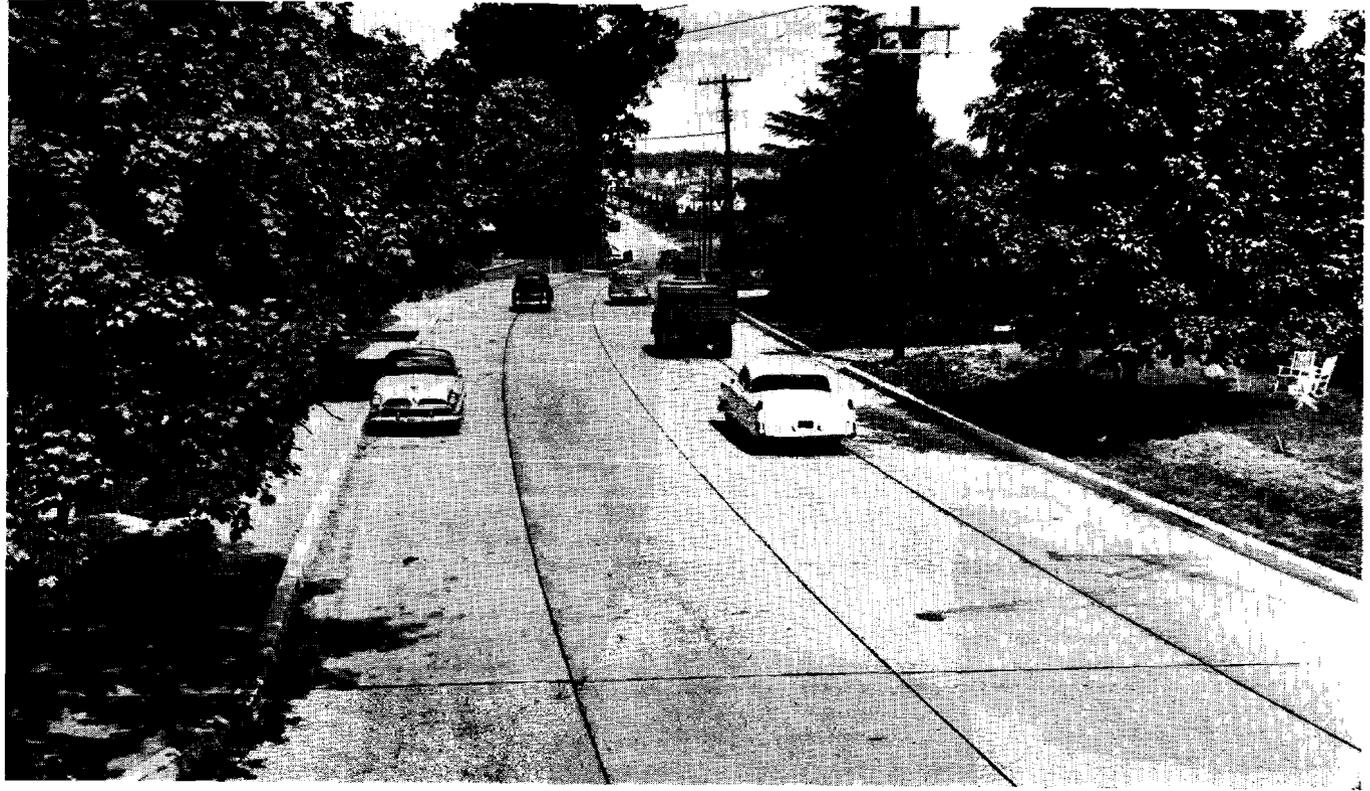
A tabulation of contracts for which plans have been prepared is as follows:

Contract	Location	Type	Miles
1235	Murphy—Wilson Rd.—Concord Pike to Marsh Road	Reinforced Concrete	2.423
1302	Delaware Avenue—Newark	Concrete Pavement	0.955
1319	High Street—Seaford	Concrete Pavement	0.984
881	Union Street—Sycamore Street to Prospect Rd.	Concrete Pavement	0.292
1191	Middletown to Warwick Spur	Concrete Pavement	1.211
1330	Church Street—Bridgeville	Macadam	0.440
1372	Burrsville Relocation	Macadam	0.650
1192	Holloway Terrace	Macadam	1.130
1335	N. & S. Bedford Street—Georgetown	Widen & Resurface	1.430
1287	Fieldsboro—McDonough—Northbound U.S. 13	Widen & Resurface	0.500
1301	Gov. Printz Blvd.—11th St.—30th St.	Widen & Resurface	1.103
1288	Minquedale to Rogers Corner	Widen & Resurface	0.895
1333	Harvey Rd.—Philadelphia Pike to Harvey Rd. Bridge	Widen & Resurface	0.764
1329	Gap Road—Route 2 to Route 48	Widen & Resurface	1.921
1388	E. Cleveland Ave Intersection—Newark	Widen & Resurface	0.081
1365	Co. Rd. 224—Cedar Creek Mill Pond—Argo Store	Rd. Grading & Surf. Treat.	1.756
1366	Co. Rd. 206 & 205—Lovetts Nursery to Cedar Neck School	Rd. Grading & Surf. Treat.	3.315
1343	Fords Corner to Pearsons Grove—Rds. 95-96-96A & 97	Rd. Grading & Surf. Treat.	4.700
1369	Gravel Hill to Road 249—Sussex	Rd. Grading & Surf. Treat.	1.528
1371	Road 370—Route 17 to Road 382	Rd. Grading & Surf. Treat.	1.347
1392	Road 213—Road 207 to Milford	Rd. Grading & Surf. Treat.	1.646
704	Tulls Crossing to Ross	Rd. Grading & Surf. Treat.	1.900
1393	Rd. 582—Rd. 404 to Rd. 583—& Rd. 583 Rd. 34 to U.S. 13	Rd. Grading & Surf. Treat.	3.073
1396	Rd. 571—Route 404 to Maryland Line	Rd. Grading & Surf. Treat.	1.794
1391	Clarksville to Millers Neck—Road 365	Rd. Grading & Surf. Treat.	4.744
1367	Delmar—Browns Church	Seeding & Mulching Slopes	16.340
1380	Barley Mill Road	Rock Excavation	0.013
1382	Muddy Branch Bridge at Squagum	Bridge Approaches	0.161
1264	Rd. 84—Twin Willows—Whitehall X Roads	Bridge Approaches	0.761
Grand Total			57.857

The salaries for operating the Drafting Room for the year from July 1, 1954, to June 30, 1955, was \$79,997.67, which included all salaries for Drafting Room personnel, blue print operation, supervision, miscellaneous expenses and the survey party working out of this Division.



Center Road, New Castle County — Under construction.



**Center Road construction completed**

It is further broken down as follows:

Engineering and Construction General .....	\$41,889.87
State Land Survey .....	1,982.64
Sub-Division Engineering .....	397.39
Contracts Engineering .....	35,727.77
<b>Total .....</b>	<b>\$79,997.67</b>

The value of plans prepared at the above cost amounted to \$3,353,630.00, and were prepared at 1.06% of the cost of the work.

In addition to the work on the above mentioned contracts, the following office work has been completed during the past fiscal year:

Detail Plotted .....	73.4 Miles
Base Line Plotted .....	82.1 Miles
Profiles Plotted .....	86.4 Miles
Plans Traced .....	66.3 Miles
Cross Sections Plotted—(Original) .....	65.8 Miles
Cross Sections Plotted—(Final) .....	71.1 Miles
Borrow Pits—(Original and Final) .....	50
Miscellaneous Drawings .....	105
Black and White Prints .....	58,547

#### Description of Major Contracts

**Contract No. 1191** — Middletown to Warwick — under active construction, will be the northbound lane of the future divided highway to connect the Delaware Memorial Bridge with the Chesapeake Bay Bridge.

The Department has obtained a 200-foot right-of-way for this contract, which will provide adequate width for a 50-foot parkway, two (2) 24-foot traffic lanes, and 10-foot shoulders. A 9-inch reinforced cement concrete pavement 24-feet in width is being constructed on this project. This section of road will also be a tie-in with the future location for a highway to connect to a high level bridge at Summit.

Construction of **Contract 1335** — North and South Bedford Street, Georgetown — consisted of widening the existing street with 6-inch cement concrete base course, placing curbs, sidewalks, channelized intersection, and resurfacing the hot-mix asphaltic concrete surface course over the new and existing pavement. A well planned drainage system has been installed on this project, which will be part of an overall storm sewer system for the Town of Georgetown.

**Contract No. 1301** — Governor Printz Boulevard, is under active construction and will be completed early this fall. Construction on this project includes widening, reconstruction of the present road, and placing hot-mix asphaltic concrete pavement. In addition, separate turning lanes were provided for at 14th Street, 26th Street and 30th Street. The turning lanes at 14th Street and 26th Street were deleted when the City was unable to procure the necessary right-of-way. Considerable time and many meetings were necessary in order to reach final agreements for the right-of-way for the construction of this contract.

Plans were completed and work is progressing rapidly on **Contract No. 1288** — Minquadale to Rogers Corner. Construction of this project included the placing of additional merging lanes, widening and resurfacing, and placing reinforced cement concrete pavement on Heald Street, hot-mix asphaltic concrete pavement, surface treated shoulders, and adequate drainage.

Upon completion of construction of this contract, traffic will move much smoother and quicker on this heavily travelled highway.

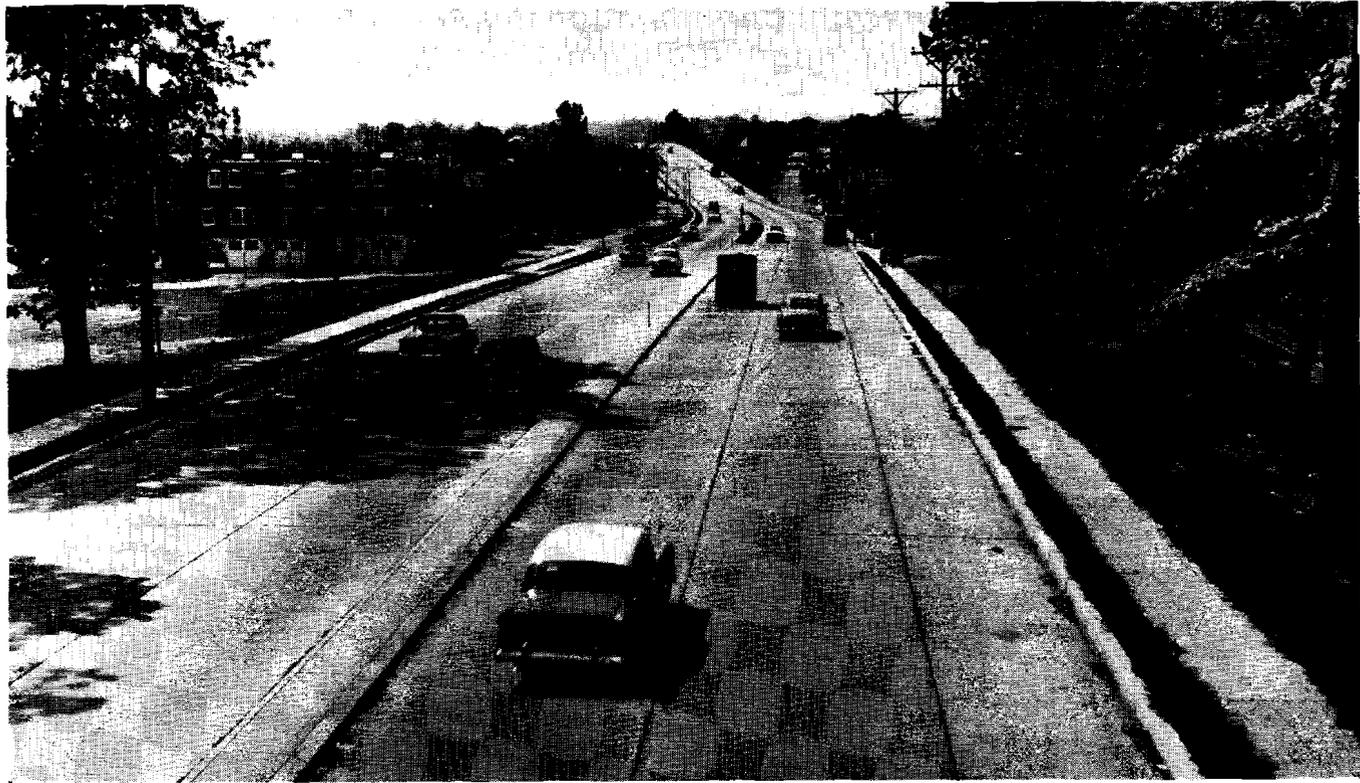
It is expected to completed construction of **Contract No. 1319** — High Street, Seaford, this fall. The improvements were the placing of an 8-inch reinforced cement concrete pavement, widening the approach to the main business section, sidewalk and curbs, resurfacing the present pavement to the dual highway with hot-mix-asphaltic concrete, and the construction of a bridge across the Nanticoke River.

Plans were completed for **Contract No. 1302** — Delaware Avenue Extension, Newark, and is under construction at this time. A 9-inch reinforced cement concrete pavement, curbs, sidewalks and an extensive drainage system are being built on new location on this contract. When completed, this construction will greatly speed the flow of traffic through the business section, and establish a one-way system in Newark, which is very heavily travelled.

Plans for **Contract No. 1329** — Gap Road, were completed and construction started for this contract. The improvement consists of widening the existing pavement, placing new cement concrete base course where necessary, and a hot-mix asphaltic concrete pavement. It is necessary to make several cuts on this project to provide the travelling public with an improved vertical sight distance.



South Union Street, Wilmington, before construction.



53

South Union Street, Wilmington, after construction.

During the past year plans were completed for ten (10) roadway grading contracts, having a total length of 25.803 miles. Construction of these contracts will cost approximately \$457,521.42 or \$17,731.33 per mile. These projects are bid on a mileage basis, thus eliminating the preliminary and final cross-section work. Sufficient information is given on the plans to enable contractors to give proper bids. By bidding in this manner, it reduces the amount of field and office work considerably, thus keeping the engineering cost to a minimum.

**Miscellaneous Work Completed By This Division**

A survey of the State Lands from Fenwick Island, north to the south gate at Fort Miles has been completed during the past year. This was a very large survey, and will prove to be very helpful to the State of Delaware. The corners have all been located and referenced. The re-establishing of the boundaries of State Lands has not been done for a number of years. As this is very valuable real estate today, it was felt that this survey was greatly needed and would offer the State the protection necessary for this land.

A survey has been completed recently of the Camp Barnes property for the State Police. All topographical features have been located and points and corners were established.

The Dickinson Mansion survey was completed during the past year. Lines and grades were established and the property was staked out for construction purposes.

Plans and construction for **Contract No. 1375** — Brandywine Springs State Park have been completed. This contract consisted of excavating, placing selected borrow and surface treatment to provide for an improved and larger parking area.

### STATUS OF CONTRACT PROJECTS AS OF JNE 30, 1955

Contract	Location	County	Status of Surveys	Status of Plans
1377	Philadelphia Pike—(Bellevue to Claymont)	New Castle	Complete	Traced
1163	Newport Pike	New Castle	90%	
1378	Christina to Newark	New Castle	80%	Traced
1350	Curtis Mill Rd.—(Newark to Milford X Rds.)	New Castle	95%	Traced
1258	New Castle Ave.—6th Street—Fingerboard	New Castle	95%	Traced
1368	Concord Pike—(Talleyville to Pa. Line)	New Castle	60%	Traced
1176	Broom Street—(Lancaster Avenue—7th Street)	New Castle	Complete	Complete
1237	Darley Road—(Naamanms Rd.—Phila. Pike)	New Castle	Complete	Traced
1238	Liberty Avenue—Minquadale	New Castle	Complete	Traced 70% Design
1336	North Star Rd.—(Rt. 72—Rt. 296—Rt. 293— Rt. 7)	New Castle	90%	Traced 70% Design
1224	Walnut Street Extension	New Castle	95%	Traced 20% Design
1398	Bellevue Road	New Castle	Complete	
1385	Veale Road	New Castle	Complete	Designed Traced
	Ferris Rd.—(Faulkland Rd.—Lancaster Pike)	New Castle	Complete	Traced No Design
1404	New Castle County Intersections	New Castle	95%	Traced No Design
1401	Miller Road	New Castle	90%	Traced No Design
916	Farmington to Harrington—(Dual)	Kent	95%	Traced 10% Design
1094	Division Street—Dover	Kent	80%	Part Traced No Design
1169	Court Street—Dover	Kent	95%	Traced 95% Design
1263	Dover—Bishops Corner—(Northbound Dual)	Kent	Complete	Traced 80% Design
872	Bay Road—Little Creek	Kent	Complete	Traced 95% Design
1324	Lockerman Street—Air Base	Kent	50%	Traced No Design
	Rising Sun—Air Base	Kent	60%	Part Traced No Design
1297	Felton—Frederica	Kent	90%	Part Traced No Design
1405	Kent County Intersections	Kent	Complete	Traced 90% Design
	Road No. 380	Kent	90%	Traced No Design
1044	Laurel to Sharptown	Sussex	Complete	Part Traced No Design
925	Greenwood—Farmington—(Dual)	Sussex	Complete	Traced 60% Design
1151	Waples Pond—Five Points	Sussex	Complete	Traced No Design
1397	Roads 389 and 390	Sussex	Complete	Complete
	Five Points—Milford—(Patch Survey)	Sussex	Complete	
	State Lands	Sussex	Complete	90% Complete
1395	Road 277—(Road 275—Road 24)	Sussex	Complete	Traced 90% Design

55

## BRIDGE DIVISION

The principal function of the Bridge Division is the design and preparation of plans, specifications, and special provisions for bridges, culverts, retaining walls, dams and spillways, shore protection structures, tidal water control structures, special drainage projects, and miscellaneous structural designs. Other duties include routine correspondence, checking of shop drawings, and inspection of projects under construction.

During the past fiscal year two (2) important bridge projects have progressed from the design and planning stage to an active construction status. These projects are:

1. Walnut Street Extension — Wilmington.
2. Basin Corner Interchange — New Castle County.

A third important project, Naaman's Road Underpass and Interchange, is still in the preliminary planning stage.

As a special arrangement the Bridge Division also has charge of the construction of all bridge work on the Walnut Street project.

Brief descriptive summaries of these projects are included elsewhere in this report.

During the year, the Bridge Division continued with the duties assigned during the previous fiscal year relative to the periodic inspection of the Delaware Memorial Bridge. The work includes the consideration and solution of maintenance, structural, and engineering problems in connection with the operation and preservation of the bridge. In the performance of this assignment, the Bridge Division works in conjunction with the consulting engineers retained to perform services for the Bridge. Maintenance work by both contract and bridge forces, performed during the report period, will be covered elsewhere in this report.

### **Contract 1224—Walnut Street Extension**

This project is located on the extension of the present Walnut Street in Wilmington, between Front Street and the north end of the existing railroad overhead bridge on South Market Street. When completed, the project will provide a new entrance into the City of Wilmington from the south.

The design and plan preparation for the project were performed under the supervision of the Bridge Division as described in the 1954 Annual Report.

The construction of the Pennsylvania Railroad Underpass and the Walnut Street Bridge over the Christina River were also placed under the supervision of the Bridge Division. The bid prices for the contracts are listed in Table I.

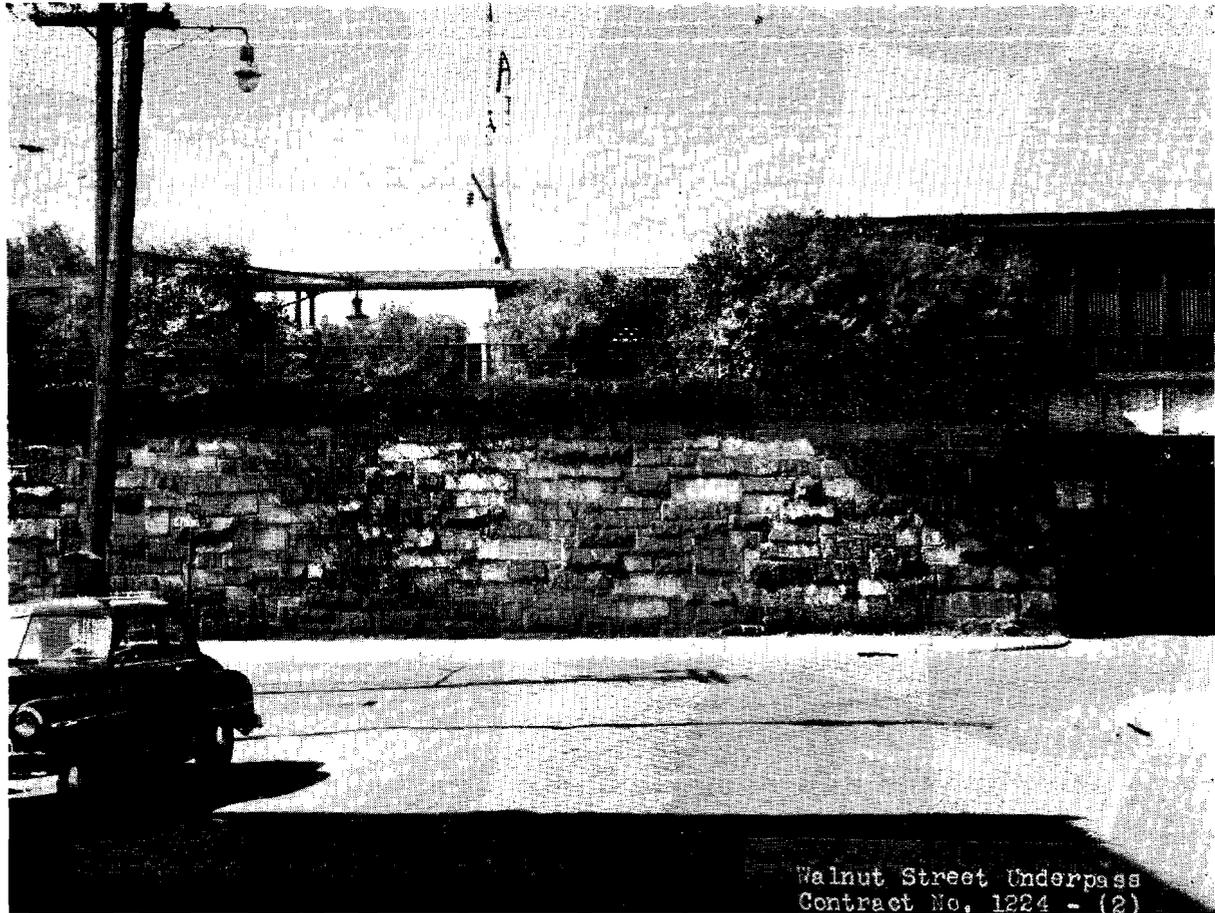
At the end of the report period, the Pennsylvania Railroad Underpass contract was 65% complete. The Walnut Street Bridge-Substructure contract was 47% complete. The structural steel was in process of being fabricated for the Walnut Street Bridge-Superstructure.

The Pennsylvania Railroad Underpass is a very complex construction project, due to the requirement of maintaining railroad traffic at all times, a matter of approximately 142 trains per day over this structure. At the end of the report period the temporary support structure had been completed, the sub-structure for the permanent bridge was completed and the contractor was preparing to construct the south portion of the permanent bridge superstructure. The superstructure units will be assembled outside the limits of the bridge, and will be rolled into permanent position at a time when this operation will cause the least inconvenience to railroad traffic.

At the end of the report period the completed work on the Walnut Street Bridge—Substructure contract consisted of the substructure for the north approach, the north bascule pier to just above high tide level, the footings for Piers 1-S and 2-S on the south approach and preparatory work for placing the steel sheet pile cofferdam for the south bascule pier.

#### **Contract 1318—Basin Corner Interchange**

This project consists of a grade separation and interchange at the intersection of the duPont Parkway (U.S. 13 & 40) and Basin Road (State Route 41)—New Castle County. The design provides for a modified cloverleaf-type interchange with three (3) traffic lanes in each direction on the duPont Parkway, bordered by a combination of service roads, acceleration and deceleration lanes, and provides four (4) traffic lanes across the bridge structure on Basin Road. The design and preparation of contract plans and specifications were under the supervision of the Bridge Division.



Walnut Street Underpass  
Contract No. 1224 - (2)

Site of Walnut Street railroad underpass, a part of the project to provide a new entrance to South Wilmington by crossing the Christina River.



The Walnut Street railroad underpass under construction.

The contract for the construction of this project was awarded September 15, 1954, with actual work starting September 27, 1954. At the end of the report period the project was 41% complete.

#### **Contract 1315—Naamans Road Underpass and Interchange**

This project provides for the construction of a new railroad underpass near Naamans Road, the widening of Philadelphia Pike to a four-lane highway, and the construction of the roads and bridges necessary to connect the Philadelphia Pike with the proposed Chester Expressway (by Commonwealth of Pennsylvania) at the Pennsylvania-Delaware State line. The design will also permit a future connection with the Governor Printz Boulevard.

It is planned that the project will be divided for construction purposes as follows:

- Phase I (A) Widening the Pennsylvania Railroad Underpass
- Phase I (B) Widening Philadelphia Pike to Four Traffic Lanes
- Phase II Connection of the Philadelphia Pike with the Chester Expressway
- Phase III Connection of the Governor Printz Boulevard with the Chester Expressway

After several conferences and considerable correspondence with officials of the Pennsylvania Railroad, agreement was reached concerning the financing and construction of Phase I (A) of the project. The cost of this phase of the work will be borne by the Railroad and the Department, with the preparation of contract plans and specifications, and the supervision of construction to be performed by the Railroad. At the end of the report period the agreement had been executed by the Department and transmitted to the Railroad for similar action on their part. Contract plans and specifications were practically complete, and it is expected that this phase of the work will be under contract at an early date.

The remaining phases of work for this project are still in the study stage and will be progressed to final plans while the railroad underpass structure is being constructed.

### **Contract 1319—High Street—Seaford**

This contract begins at the intersection of High and Market Streets and continues in an easterly direction along High Street to its intersection with Route 13.

An important part of this contract consists of the construction of a new bridge across the Nanticoke River. The Bridge Division prepared plans and special provisions for this structure, and also designed and detailed a special retaining wall to serve as protection for the large frame dwelling at the south-east corner of North and High Streets.

The Nanticoke River Bridge is a three-span structure with a total length of 134 feet, and a clear roadway width of 40 feet. Two 4-foot-9-inch sidewalks are provided for pedestrian use. The substructure consists of two (2) reinforced concrete abutments supported on cast-in-place concrete piles, and two (2) stream pile bents, each composed of eight (8) cast-in-place concrete piles, with a reinforced concrete strut at low-water elevation and a reinforced concrete pile cap.

The bridge superstructure consists of three (3) framed spans of structural steel beams with spiral shear connectors, supporting the reinforced concrete roadway and sidewalks. The parapets consists of fabricated metal railing panels supported and located between reinforced-concrete railing posts.

The contract was awarded on January 25, 1955. At the end of the report period, the existing bridge had been completely removed, the two stream piers were complete, and the footing for the west abutment was in place.

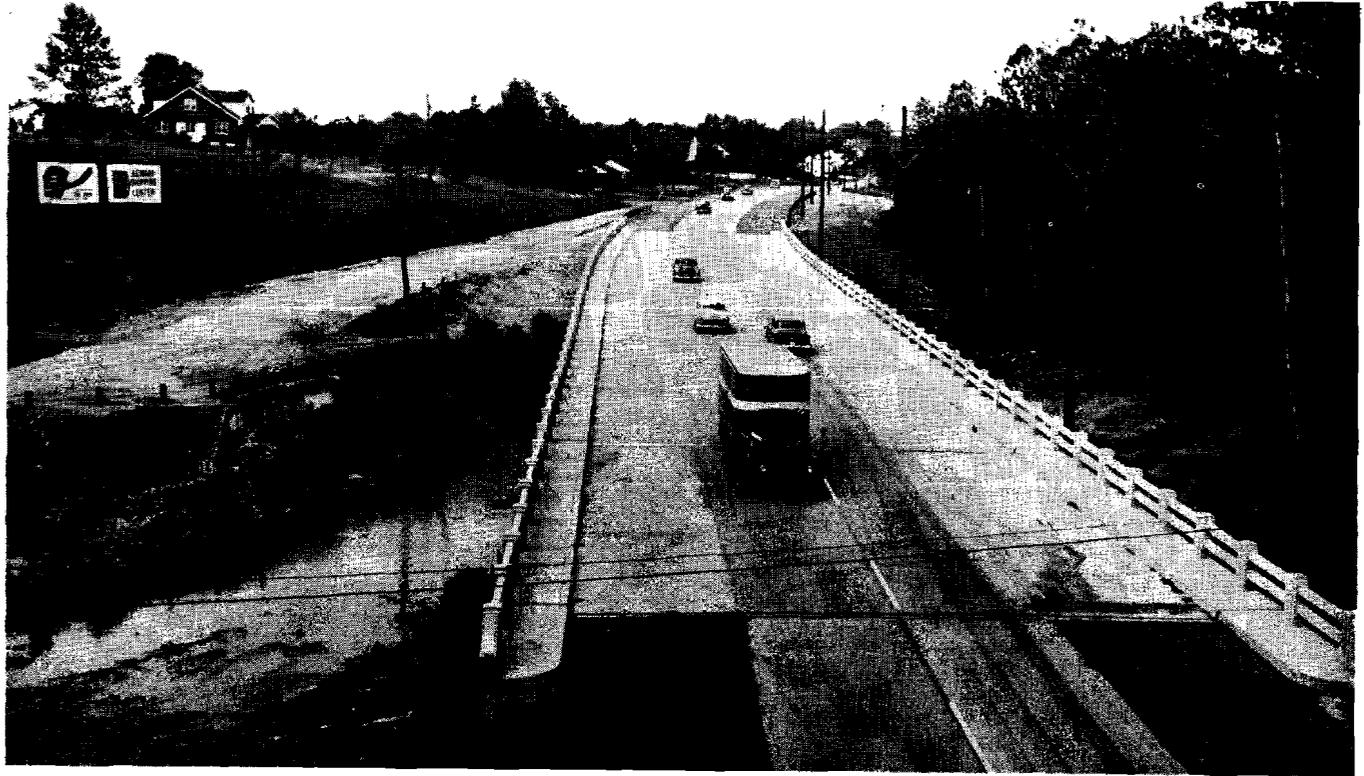
The complete bridge structure and approach roadways will provide a much needed connection between the business district of Seaford and the new dual highway east of the city.

### **Contract 1374 A—Smith's Bridge**

Smith's Bridge is located in northern New Castle County on County Road 221, and spans Brandywine Creek approximately 3/4 mile northeast of Granogue and 1/4 mile south of the Pennsylvania State Line. The bridge is a timber covered structure, with an original clear span of 130 feet, and is one of three remaining covered bridges in the State.



White Clay Creek Bridge near Newark during construction.



**White Clay Bridge after completion.**

The bridge continued in service, under a limited posting, until October 1954, when an overloaded vehicle seriously damage the structure. Temporary repairs were made and the bridge again restored to limited service. After a careful study of costs and alternate plans, it was decided to reconstruct the bridge to meet the needs of present-day traffic, insofar as possible, while at the same time preserving the exterior appearance of the bridge, as a memento of the pioneer days of American bridge construction. A complete steel beam superstructure, supported on the abutments, and on two (2) new stone-faced stream piers, will carry all traffic loads and provide support for the wooden superstructure as well.

A new wooden floor, supported by the steelwork, will retain the appearance of the original construction. Essential restoration and repairs to trusses, siding, and roof should preserve this structure for many more years in the dual function of a historic landmark and an adequate bridge structure designed to carry the greatly increased vehicular loadings of present-day traffic.

#### **Contract 1382—Muddy Branch Bridge At Squagum— Kent County**

This bridge is located on Kent County Road 86, approximately 1-3/4 miles southeast of Leipsic, Delaware.

The original bridge was a four-span creosoted timber structure, built in 1926. The new bridge will be a two-span structure with a total length of 65 feet, and a clear roadway width of 22 feet. The basic substructure will consist of three (3) pile bents, each composed of five (5) cast-in-place concrete piles and a reinforced-concrete pile cap. The bridge superstructure will consist of a reinforced-concrete roadway slab with safety curbs and creosoted timber parapets, supported on steel I-beams, previously purchased by the Department as war surplus material. Proposals were received on April 27, 1955, and the contract awarded. Actual work began on June 10, 1955.

This bridge will combine the advantages of a relatively permanent type of construction with comparatively low first and future maintenance cost; two very desirable features in and era of high construction costs.

#### **Reflooring Of Movable Bridges—Repairs To Structures**

During the past fiscal year, the Bridge Division made

significant progress in a long range program to refloor the movable bridges of the State. Plans and special provisions were completed for the reflooring of the bascule bridges at Lewes, Broadkill River, and Barker's Landing—(St. Jones River). Detail plans were also prepared for Rehoboth Bridge.

**Contract 804—Lewes Bridge**

A contract was awarded and construction completed on an entire new flooring installation for this bridge. The roadway surface now consists of 5-inch open steel floor and 3-inch I-Beam Lok armored floor slab. New creosoted timber sidewalks were also placed. Additional maintenance work included repairs to the fender system and the painting of all accessible structural steel. An extra undertaking involved protection of the south abutment footing by the placing of stone rip-rap. The bridge has now been restored to serve for many more years. One maintenance operation, the complete overhaul, repair and rewiring of the electrical system, remains to be done.

**Contract 1373—Broadkill Bridge**

A contract was awarded on February 10, 1955, for the reflooring of the bascule leaf and resurfacing of approaches as well as the painting of the entire bridge. All work was complete and accepted on June 14, 1955.

**Contract 1376—Barker's Landing Bridge Reflooring**

A complete set of plans and special provisions has been prepared for this project. No contract has as yet been awarded.

**Contract 1381—Rehoboth Bridge**

Detailed plans have been prepared for this project. No contract has as yet been awarded.

**FEDERAL AID DIVISION**

The fiscal year began with forty-four projects in active status, thirteen of which were Federal-aid and nineteen State financed. The remaining twelve active projects were being constructd through special appropriations of the General Assembly. These unfinished projects represented an estimated accounts payable, based upon contract prices, of \$6,324,429.25 the estimated Federal share of which is estimated to be \$2,180,814.94.

Balances of Federal funds which remained in the unpro-

grammed status as of June 30, 1954 totalled \$1,565,868.21. These funds by system represented \$461,283.53 Primary; \$982,709.58 Secondary; \$121,875.00 Interstate. No unobligated funds remained in the Urban system allotments.

Federal-aid funds for the fiscal year ending June 30, 1956 under the Highway Act of 1954 were made available for programming and construction on July 1, 1954. Normally allowable Federal-aid procedures were advanced six months by this action. Expenditures of the new funds, however, cannot be made until after July 1, 1955.

Twenty-one Federal-aid Projects were programmed during the year. These projects are noted by system as follows: Primary, 7; Secondary, 13; Urban, none; Interstate, 1. The projects are classified Highway Planning, 4; Construction, 13; Erosion Control, 1; Railroad Crossing Protection, 3. Total estimated value of the programmed projects was \$1,727,496.

Through the year seventy-two projects were authorized for construction or procurement. These projects were released through twenty-two advertisements. These projects are classified as follows: Federal-aid Primary, 9; Federal-aid Secondary, 8; Federal-aid Urban, 1; State Primary, 4; State Secondary, 12; Bridges, 10; Building Alterations, 8; Legislative Appropriation Projects, 1; Materials, 7; Pest Control, 2; Insecticides, 1; Fuels, 9. The total estimated value of these contracts was in amount \$7,212,807.86. This amount does not include the fuel contracts as they are based upon a discount process.

The aforementioned contract advertisement produced a total of three hundred five bids. All bids were checked by item and tabulated. Two thousand two hundred proposal forms were prepared by the Division for bidding and departmental purposes.

Through the year a total of two hundred ninety-four estimates were checked and processed. Sixty-four of these estimates were final. The aggregate of all estimates paid was \$9,290,968.67.

Reimbursements from the Federal Government totalled \$4,089,451.48 for the fiscal year. Twelve final vouchers which had been submitted during the previous fiscal year were paid. A total of fifty-four vouchers were prepared and submitted by the Division during the year. Twelve of these submissions were finals. One final voucher remains unpaid.

As the fiscal year closed there were forty-four unfinished projects, twenty-one of which were Federal-aid projects, twenty-two State projects and one project financed by special appropriation of the General Assembly.

The status of allotted Federal funds as of June 30, 1955 indicate total contractual obligations outstanding on the unfinished Federal-aid projects in amount of \$3,482,368.52; Approved Program, \$454,403.00; submitted for approval, \$544,955.50; Unprogrammed Balances, \$3,921,415.39. Included in these amounts are the funds which were made available for programming under the 1954 Act on the date of July 1, 1954.

## **TRAFFIC AND PLANNING DIVISION**

### **Road Inventory**

The several systems of the State Highway Department contain 3957.37 miles of roads and streets. This mileage is considerably less than the mileage shown in the Annual Report for 1954, due to the deletion of all suburban development streets which are not maintained by the State Highway Department. Comparison with last year's figures indicates the continued efforts of the State Highway Department to surface dirt roads. It will show a definite reduction in dirt road mileage and a corresponding increase in the mileage of bituminous surfaced-treated roads. An appreciable increase in divided highway mileage is shown, particularly in Kent and Sussex Counties. Table II, Appendix, Page 100 shows mileage of streets and highways by surface type in the three counties.

Table III, Appendix, Page 101, indicates the existing mileage of the four systems controlled by the Department. Urban mileage as listed is the extension of primary rural roads in cities with a population of 5,000 or more: Wilmington, Elsmere, Newark, New Castle, Dover and Milford.

The Primary System includes all main arterial routes through the State, except those described in the Urban System. It is identical with the Federal Aid Primary System. The Secondary System comprises the intermediate roads of the State and is the same as the Federal Aid Secondary System. All other roads in the State's highway system are classified as the Tertiary System. This system includes 185.20 miles of suburban development roads which are maintained by the Department.

Mileage changes during the year resulted from construction on new locations, transfers from one system to another and the assimilation of 22.98 miles of suburban development roads.

A complete set of road inventory books showing mileage by type, surface width and traffic volume is available from the Traffic and Planning Division.

### **Traffic**

A new permanent type automatic counter station located on U.S. Route 40 near Bear was added to the six (6) existing automatic counter stations in January of 1955. Due to the heavy traffic volumes on this route and the resulting high percentage of passing vehicles the old "electric eye" type counter was replaced with the pressure sensitive detectors in the roadway type. Numerous manual check counts have been made at this new station and the results show a highly satisfactory degree of accuracy. As an example of the heavy traffic volumes passing this new station, the machine recorded on Monday May 30, a total of 32,006 vehicles in both directions.

Of the seven automatic counter stations now in existence, four of these have been in continuous operation since 1941, which makes it possible to draw some very interesting comparisons over this extended period.

Table IV, Appendix, page 101 gives a clear picture of the tremendous traffic growth on our highways on a state wide basis for the 15 year period involved. The table indicates an increase of 117.0 percent in total traffic at the four selected stations for fiscal year 1954-55 over fiscal year 1941-42. The table also shows an increase of 8.85 percent for fiscal year 1954-55 over fiscal year 1953-54.

As reported in previous issues of this publication the regular annual traffic counting program, which includes the use of portable counters and manual classification counts at pre-determined major and minor stations, continued during fiscal year 1954-55. This program, in addition to the seven permanent automatic counter stations, enables this Division to publish monthly traffic volume bulletins on certain major highways and information annually on all roads in the state outside the limits of incorporated places.

### **Mapping**

During the month of September, 1954, 75,000 copies of the 1954-55 Official Highway Maps were received from the

printer. The bulk of these free maps were transferred to the Delaware State Development Department which has distributed most of the maps for the past several years. At the end of the fiscal year approximately 37,000 maps had been distributed.

In addition to county, state, and incorporated town maps used by the Highway Department, 1267 of those maps were sold for a total of \$421.90. This is an increase of 321 maps over the previous year.

### **Permits**

During the fiscal year ending June 30, 1955, appreciable increases were noted in the several categories of special Hauling Permits issued and total monies collected over the previous fiscal year. An increase of 30.7 percent in number and 23.6 percent in dollar value in heavy hauling permits is particularly noteworthy since this branch of the trucking industry again reflects the national trend toward larger commercial vehicles and heavier wheel loads on our highways.

Activities for the year, including a comparison with fiscal year 1953-54 and related percentages are shown in Table V (appendix, Page 102).

### **Petitions**

Within the fiscal year the Traffic and Planning Division investigated 60 petitions of which 58 were for improvements or alterations to roads, streets and bridges, construction and relocation of crossovers on divided highways, and installation of traffic signals. The remaining two petitions were in regard to traffic studies and speed zone regulations. As compared to the previous fiscal year, there has been a 30% reduction in the number of petitions received, but an increase of 40% in the number of traffic engineering investigations.

For the most part these petitions concerned rural areas and suburban developments, but there were also ten incorporated towns including Bethel, Blades, Bridgeville, Clayton, Frankford, Lewes, Middletown, Milford, Selbyville and Wyoming in which investigations were conducted.

### **Traffic Engineering Studies**

The need for traffic engineering studies to determine the most efficient methods for the movement of motorists and commodities from origin to destination is clearly indicated

by the increasing traffic volumes in all rural and urban areas throughout the State. Traffic accidents continue to present a major highway problem, but each year there are indications that satisfactory results are being attained in designing and effecting safety regulations.

The Traffic and Planning Division during the fiscal year, conducted 94 studies and investigations pertaining to traffic signalization, parking, speed zoning, road and street marking, location and types of traffic signs, and vehicular turn-movements at various intersections. Investigations included also, location of crossovers on divided highways, crosswalks and sidewalks in school zones, road and street improvement and highway lighting.

In order to determine whether the facilitation of increased traffic movement and provision of greater highway safety required alterations in signals, nine detailed studies were made of existing signalized intersections. Revised prints of these locations showing the recommended changes were prepared for the use of field engineers for addition study, and for the permanent record of all signalized intersections in the State.

In an effort to carry out the continuing phases of the highway safety program, the Traffic and Planning Division cooperated with the Governor's Highway Safety Committee and furnished factual data in regard to traffic accidents and recommended safety measures. A Highway Fatality Scoreboard on U.S. 13, north of State Police Troop No. 2, calls to attention of motorists, Delaware's fatality comparisons by years. Additional scoreboards are located at the Dover and Bridgeville State Police Troops.

During the racing season at Delaware Park and Brandywine Raceway the increased volume of traffic movement to and from the track areas presents an additional highway traffic problem. Preparations for these events are made at annual conferences with personnel of these two organizations, and immediately previous to the opening of each racing season crews from the race track cooperate with the Department in the erection of necessary traffic signs.

#### **Motor Vehicle Use Study**

The Motor Vehicle Use Study is designed to determine the character of highway travel and the extent to which State Highways and Urban Streets are used by the various population groups and to show how essential highway transportation is to our economy.

The study was initiated in 1952. The information gathered has been coded and punched on I.B.M. cards. Upon starting the analysis it was noted that the Commercial Vehicle sample was not large enough to make a true report. At the present time work is progressing on a supplemental study for Commercial Vehicles. When this is completed, an analysis will be made with a view of publishing tables showing all information collected.

The knowledge derived from the survey could be important in the solution of highway finance problems and in planning future development of the highway system. It will be used by U.S. Bureau of Public Roads in combination with similar studies of other states for a study on a national basis.

### **A Plan For Delaware Highways**

During the past fiscal year, the Traffic and Planning Division, helped considerably by the other Divisions in the Department, prepared a report for the Department entitled "A Plan For Delaware Highways."

The booklet was prepared to develop and present a highway program to the Governor and General Assembly. Among other things, the report presented detailed information concerning the growth in population, registration, and motor fuel consumption in the state.

An analysis of the existing roads compared to the needs of the state when measured against today's traffic volumes was made.

A look at the future was attempted in order to present data for future highway thinking. As a result of all the analysis, the following recommendations were presented in the report:

1. The construction of an arterial highway system connecting with the Delaware Memorial Bridge to be paid for by the revenues collected at the bridge. It is estimated that this system will cost approximately \$130,000,000.

2. A long range highway plan to be accomplished by the State Highway Department, the plan to cover a 15-year period at a total expenditure of \$198,000,000. The program is to be made possible by the use of highway-related tax imposts, including a 1 cent additional gasoline tax.

3. The naming of an administrative authority to develop and execute an arterial highway plan.

4. Biennium progress reports for future legislative sessions.

5. Legislation enabling the State Highway Department to construct limited-access highway facilities in Delaware.

6. Legislation allocating the motor vehicle fuel taxes and related imposts for highways administration, maintenance, construction, and other highway-related costs.

### **Traffic Maintenance**

The volume of traffic maintenance work handled by the Traffic and Planning Division during the past year has been considerably increased: first as a result of the purchase in 1954 of all leased traffic signal contracts, second, since the Division purchases fewer manufactured signs and makes more in our sign shop in Dover, and third, as other traffic maintenance requirements for all traffic requirements have constantly expanded.

Also, during the past two years an attempt has been made to standardize and improve methods of marking detour routes and other locations resulting from construction or maintenance projects. Some progress has been made, but there is a great need for more effort in this field. Adequate signs and markings are costly, but once a definite program has been agreed upon, every effort should be made to make sure that safety is being provided for the motorist.

During 1955, fourteen traffic signals of various types were warranted and installed. This brings the total number maintained by the Department up to 112 signals.

The total miles of highways with reflectorized painted center lines or lane lines maintained now total 805 miles. This entire mileage is also marked with no-passing zones and special pavement markings where they are required.

With respect to standard highway signs, the Department is purchasing only a few manufactured signs from outside sources. Aluminum blanks and reflective sheeting are bought in large quantities. These signs are then processed in the shop as the signs are needed. During 1955, the shop made 7,851 new signs. This is an increase in production of 791 percent over the number of signs made in 1953, and 342 per-



Typical signs produced by the sign shop of the Traffic and Planning Division.

cent over the number made in 1954. However, during these two years many signs were purchased from manufacturers. In addition, a total of 2,194 signs were refinished during the past year.

The floor space of the sign shop is but 1600 square feet, being 50 feet long and 32 feet wide. It was originally constructed in 1941 for refinishing work only. Needless to say, it has now outgrown its usefulness as a sign shop, due to this acute lack of space.

## DIVISION OF TESTS

The general policies of the Division have been followed during the past year in the practice of sampling and testing materials at their sources. This avoids delay on our projects, and materials not meeting the requirements of our Specifications are rejected at the various plants. Also, a number of research projects in the Physical and Chemical aspects of Materials were performed.

### Materials Laboratory

The Materials Laboratory performed 8,244 tests during the past year on the Sand, Water, Cement, Stone, Gravel, Slag, Asphalt, Creosote, Bituminous Hot-Mix, Piling, Lumber, Highway Posts, Reinforcing Steel, Concrete Cylinders and Beams, Motor Oil, Diesel Oil, Concrete Pipe, Concrete Cores, Air Tests, Adhesion Tests, Specific Gravity Tests and Gasoline. These tests represent materials listed in the following tabulation:

Sand .....	100,780 Tons
Cement .....	271,142 bbls.
Stone .....	318,933 Tons
Gravel .....	78,630 Tons
Slag .....	21,391 Tons
Hot-Mix .....	146,431 Tons
Asphalt .....	3,274,867 Gallons
Piling .....	8,744 Lineal Ft.
Lumber .....	85,275 Board Ft.
Posts .....	2891
Concrete Pike .....	166,139 Lineal Ft.
C. M. Concrete .....	55,577 Cubic Yds.
Truck Mix Concrete .....	2,666 Cubic Yds.
Job Mix Concrete .....	115,852 Cubic Yds.

During the past fiscal year the Soils Laboratory increased its pace to provide suitable sources of earth materials for highway construction and maintenance, as well as to insure their quality and use in conformance with good soil practices and engineering. A total of 4,400 individual analyses were required to determine the suitability of some 181 separate sources of select and common borrow. Of these, only 41 were found acceptable, pointing up the fact that the type of earth materials needed for highway work are becoming harder to find as the demand for them continues to increase.

### Soils Section

In earthwork construction, the Soils Section controlled

the quality of, and aided in the placing of some 1,050,950 cubic yards of material. This alone required 943 field tests for compaction control; 1,060 laboratory tests for quality, and 39 separate laboratory determinations of compaction characteristics of the materials involved.

As an aid in the design of highway and bridge projects of the past year, a total of 34.03 miles of highway and sub-banalignments were surveyed for soil conditions; 1,138 lineal feet or borings were made to determine foundation conditions for highway structures; and some 50 specialized investigations were conducted for drainage, pavement design, and other engineering considerations.

### **RIGHT-OF-WAY DIVISION**

Of prime importance in Right of Way procedure was the Court Ruling handed down by Superior Court, and upheld by Supreme Court making it unlawful for the Department to condemn excess lands. This ruling, if allowed to stand, will seriously hamper future negotiations and will place the Department in the position of having to justify every square inch of Right-of-way taking.

In effect this means that it will be extremely difficult to purchase right of way at the present to care for future highway needs, even though it will be far less expensive to the taxpayers in the State to do so.

While this ruling does not prohibit negotiations for excess lands, it places the Department in a position of being unable to negotiate on a "market" price level. There is no bargaining possible, for to acquire the excess lands that are desired, the "asking" price must be paid to avoid litigation. This action of the Courts could place the State in a position of being prey to unscrupulous land speculators. It is not a very healthy condition and affects all phases of Highway Development from Design through to Maintenance.

To offset this ruling, recent legislation was presented whereby Right-of-way widths would be established by law in strict conformity with present day Standards of the American Association of State Highway Officials. Should this be enacted into law, we would be safeguarded against the effects of the Court Ruling. Such a law would supersede the previous decision.

### **Metropolitan Areas**

No longer can Wilmington claim the distinction of being the only Metropolitan area of the State. Newark and a wide surrounding area, together with Dover and its environs are making their presence felt in Metropolitan make-up. This growth can be noticed in the increased land values in these areas. Speculation at the several locations are running rampant. A new high record was set during the past year when lands—outside of incorporated city limits—brought a price of \$30,000.00 per acre. One such sale was for seven acres, and another for three acres. Therefore, it stands to reason that such figures are going to reflect on future negotiation prices.

### **Drainage Legislation**

If the pending legislation with regard to establishing, maintaining, widening and deepening of drainage ditches not on our right of way is enacted into law, it will remove a load of uncertainty from the shoulders of the Department and will clarify our rights with regard to this very important function of Highway design and will enable the Right of Way Agent to better present his case before the property owner, with regard to drainage.

### **Handling of Incidentals**

In the past a large part of Right-of-way time was spent in reviewing Right-of-way conditions to determine whether or not all terms had been complied with. The present force is so small that time is just not available to make such review. . . suffice to say that it is a struggle to keep up with current work. Therefore, a policy of paying for incidentals has been adopted. This includes payments for fences, hedged, trees, sanitary and fresh water wells, repairs to buildings, etc., rather than have these jobs done. Once the payment is made, the responsibility of replacement of such incidentals rests entirely with the property owner.

### **Condemnation Laws**

One weak spot is being detected in the Condemnation Law. In order to gain immediate entry on lands, it is required that payment be posted with the courts in the total amount of the estimated damages.

The penalty imposed for "immediate entry requests" is that the State pay interest payments of six (6%) per cent

to the owner based on the final award figure, over the period of from entry date to the date of the award. One hearing now pending before the courts has been postponed several times by the property owners, who have used several excuses as reasons for postponement. It is becoming more apparent that this owner is attempting to stall the proceedings and it is thought that he is doing so in order to collect the interest on what will be his final payment. Actually he is holding off and making an investment by so doing. Action is now being taken to have the courts stop the interest payment when the delay in the hearings is the sole responsibility of the owners.

### General

Moneywise, this past year has been the biggest year ever in the life of the Department for Right-of-way acquisition. Over one million dollars have been expended for Right-of-way and land purchase. Considerable damage was inflicted on properties in the Greenwood and Harrington areas. The Basin Corner job, the Walnut Street Bridge and Approaches, and the Concord Pike all reflected high priced land purchases.

Again this year we point with pride to the record of successful negotiation established. Only one condemnation case was brought to trial after having dealt with better than eight hundred different people.

During the fiscal year, the Right-of-way Division has performed the following work:

Options Obtained .....	385
Easement Agreements Executed .....	265
Permanent Easement Agreements Executed .....	78
Slope Agreements Executed .....	16
Drainage Agreements Executed .....	46
Miscellaneous Tresspass Agreements Executed .....	21
Descriptions Written .....	368
Deeds Executed .....	268
Mortgage Releases Executed .....	90
Judgment Releases Executed .....	40
Condemnations Argued .....	1
Houses Moved .....	7
Parcels of State Land Sold .....	12
Borrows Pits Purchased .....	6
Road Vacations .....	7
Property Plats Prepared .....	43
Right of Way Expenditures Excluding Salaries .....	\$1,017,702.23

## **SUBURBAN DEVELOPMENT DIVISION**

The Suburban Development Division is responsible for performing the duties imposed on the Department by the laws of Delaware concerning the acceptance for maintenance of streets and roads that have been, or are to be, dedicated for public use, outside the corporate limits of cities or towns.

These laws relate to construction of new streets and reconstruction, improvement or additions to existing streets. The Department's duties are covered primarily in the following sections of the 1953 Revised Code of Delaware:

1. Suburban Road Laws: Title 9, Chapter 5, Section 501 to 534.
2. Bonding Laws: Title 17, Chapter 5, Section 508.
3. Highway Laws: Title 17.

### **Streets Accepted**

A total of 22.982 miles of streets was accepted into the State Highway Department's maintenance system during fiscal year 1954-1955. A tabulation by contract and development will be found in Table VI, Appendix page 103.

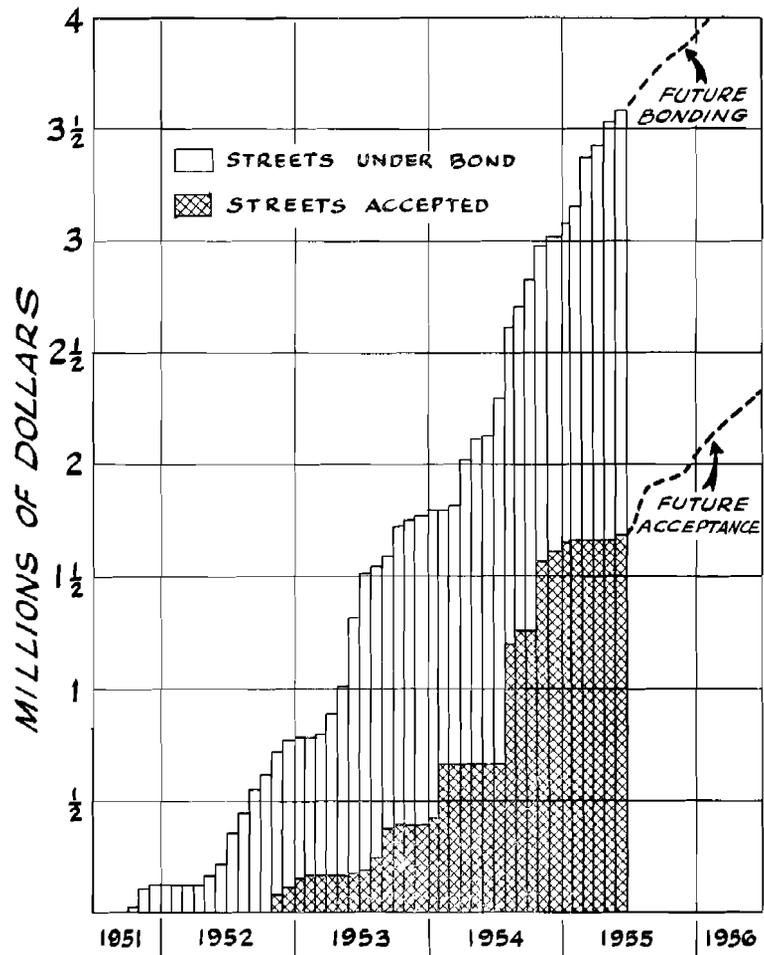
### **Suburban Road Law Projects**

During the year the Division has worked on 27 projects having a total mileage of 16.223 miles and the estimated cost being \$942,847.88. Several of the projects listed were tabulated in the 1954 report under design and are still classified as under design. Difficulties were encountered which required drainage easements and vacating of streets occurred which delayed completion of plans.

Services of consultants for surveys and design cost approximately \$22,500.00. Delay was experienced in getting the work finished due to the lack of sufficient personnel in the consultant engineers' office. See Table VII, Appendix, page 104.

### **Bonded Developments**

Under the Bonding Law any person, firm or corporation must post a performance bond with the Department in order to construct a new road or street which is to be dedicated for public use and become part of the general highway system of the State.



**VALUE OF BONDED PROJECTS**

ACCUMULATIVE RECORD FROM  
OCTOBER 1951 THROUGH JUNE 1955.

chart No. 1

Since the Bonding Law became effective in 1951 performance bonds have been posted for the following mileage:

<b>Fiscal Year</b>	<b>Mileage Bonded</b>
1951-1952	1.383
1952-1953	19.856
1953-1954	19.024
1954-1955	26.805
Total	67.068

The above tabulation indicates the amount of work to be handled by the Department is on the increase. This increase indicates an increase in the number of personnel required in the Suburban Development Division and the New Castle County Division.

Table VIII, Appendix, page 106 shows the projects for which a bond was received during the current year.

Chart No. 1, page 80, shows the accumulative record of the value of bonded projects.

#### **Growth and Acceptance of Streets in New Castle County**

Chart 2, page 82, indicates the number of miles of streets placed on record and the streets accepted by the Department.

At the end of the calendar year 1955 the total placed on record will approximate 380 miles of which the State will have accepted 200 miles.

During the past three years plans have been received for 145.9 miles of street in 101 developments having a total area of 5,415 acres, an average of .02694 miles of street per acre. The area stated being approximately 80% the size of the incorporated City of Wilmington. Chart No. 3, page 84, shows the monthly value of projects under bond and suburban road laws from June 1953 through June 1955.

The report of 1953-1954 gave an area of plans examined for the two years of 1952-1954 as being equal to 40% the size of Wilmington. Comparing the percentage this represents an increase of 100% in the work; however this figure is misleading since it does not include the review of plans previously submitted which have been revised.

New plans examined this year for proposed subdivision in all three Counties are shown in Table IX, Appendix, page 107.

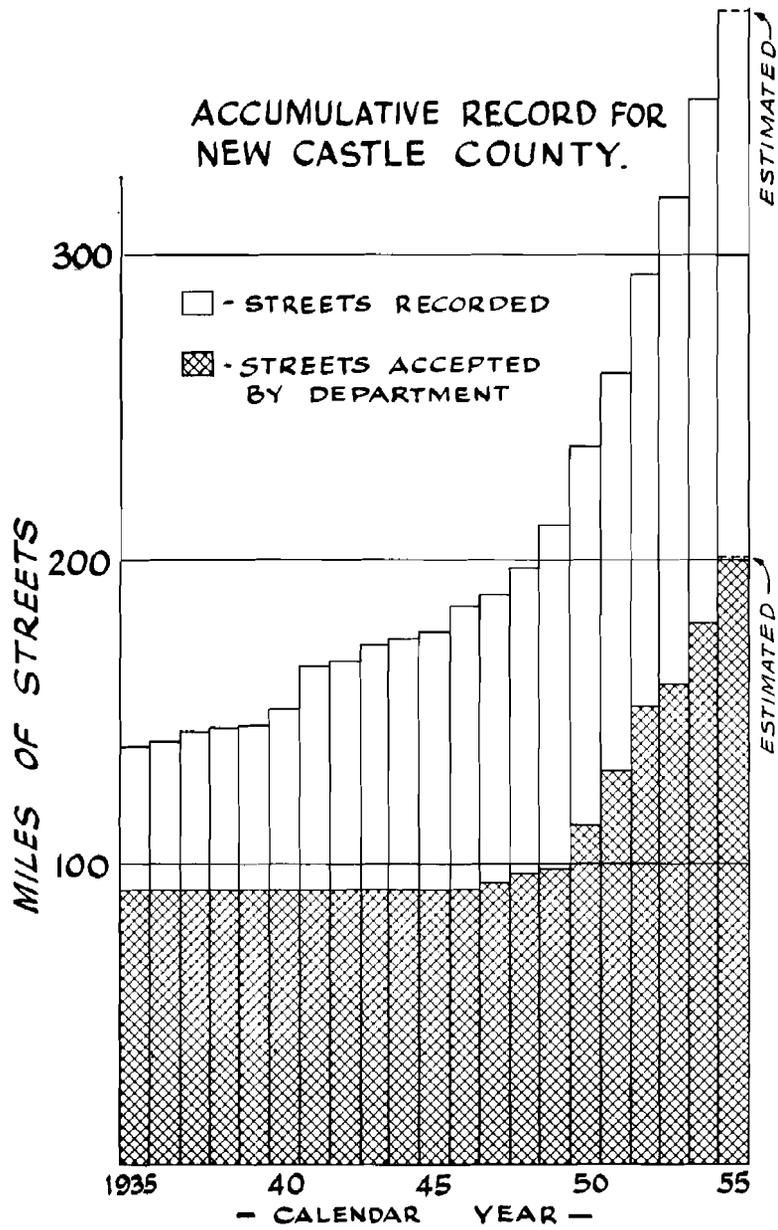


Chart No. 2

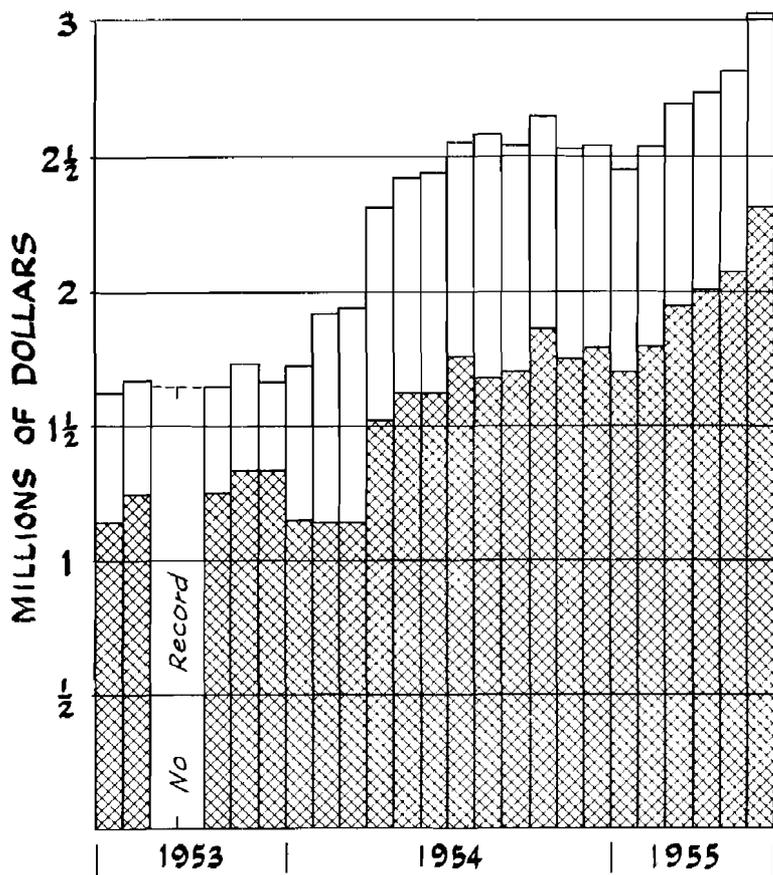
A summary of the streets handled in one form or another during the fiscal year follows:

	Miles	Value
Suburban Road Laws .....	16.22	\$ 942,847
Bonding Law .....	59.14	3,347,409
Potential .....	84.00	5,040,000
	159.36	\$9,330,256

It is interesting to note that the potential is greater than the work under design and construction.

**The Drainage Problem**

The major issue in sunburban development work is drainage. This was discussed in the previous annual report. The problem is becoming more acute in certain localities where new subdivisions are ever increasing the flow due to change in land use and the subdivisions lower down in the drainage basin are obligated to carry the total cost of handling the flow from subdivisions at higher elevations in the drainage area. The Suburban Development Division spends the majority of its effort to have correct drainage facilities constructed. This item of drainage must be correct, for, once storm drainage pipes are installed it is difficult to rectify a faulty drainage system. Legal legislation is needed to remedy certain limitations and restrictions as established by Common Law if progress is to continue in a logical manner.



MONTHLY VALUE OF PROJECTS UNDER BOND AND SUBURBAN ROAD LAWS.

(FROM JUNE 1953 THROUGH JUNE 1955)

- ▨ - BONDED PROJECTS
- - S.D. PROJECTS

Chart No.3

## MOSQUITO CONTROL DIVISION

The control activities of this fiscal period have been similar in character to those of the previous one. Emphasis has been on permanent procedures for Sussex County rather than temporary. The airspraying work was continued in Sussex County mainly to curb migration, and in the upper counties as a relief against pest mosquitoes, while research was being continued to discover the effects of fresh water impoundments on mosquito production. Over the past year no discoveries of importance have been made in relation to mosquito control, nor has the resistance problem been fully analyzed up to this time.

The annual allotment of \$96,300 with certain budgetary requirements was granted by the General Assembly for mosquito control activities for the biennium ending July 1955. In addition a supplementary fund of \$25,000 per year was provided for the purpose of aiding and assisting in the control and eradication of mosquitoes. This added allowance made it possible to extend the airspraying into Kent and New Castle Counties, as well as provide additional labor for permanent work.

The extra allotment allowed a regular spray program for most of the season for the upper counties, and this gave the populated sections more relief from mosquitoes than ever before. Mosquito prevalence in sections where no permanent work is undertaken should not be considered as neglect on the part of the department, as it is not always able to provide aerial relief at the proper instant due to the weather, lack of funds, or some other irregularity. The various communities receiving aid from the spray effort are not usually aware of the effort being exercised for their comfort, because the insects which annoy them are being eliminated at the source, generally away from the eyes of the public. We wish to repeat our statement in a former report, that since the cost of effective aerial spraying of towns and other non-mosquito producing areas is high, concentration of effort at the breeding source is essential. Such control gives relief to rural as well as urban areas, Permanent control—at the breeding source—is the only economical means of protecting the population of the state.

During the fiscal period 163,479 acres of marshland was sprayed in the three counties, which represents 86,849 acres for Sussex, 36,894 for Kent, and 39,736 for New Castle. The

number of applications to a given marsh varied depending on conditions. In other words, this figure represents duplication, because some areas received as many as eight or ten applications. These figures include work accomplished during June 1955 because it falls within the fiscal period. With almost six inches of rain and very high tides in June the spray acreage for the month alone totaled 44,400 acres. This was one of the wettest June's on record, and will probably bring higher averages for trap collections than for recent years, however, since it falls within the 1955 summer season it seems proper to discuss this more fully in the next report.

In order to spray this acreage 81,740 gallons of No. 2 fuel oil, containing 28,255 lbs. DDT, and 6,660 lbs. BHC (36%) were used. The entire spray program including supervision cost \$61,621.41, or an average of .377 per acre. About 12% of the labor assigned to the mosquito control program was used in this operation.

Contracts for aerial spraying were awarded in accordance with Department specifications. The contract for 1954 was awarded at .20 per acre and for June 1955 through September 1955 it was awarded at .174 per acre. The fuel oil award was .1097 for 1954 and .1094 for 1955.

The spray program in Sussex gave relief to Fenwick Island, Bethany Beach, inlet section, Oak Orchard, Rehoboth, Lewes, and intermediate points. The resort sections received about eight applications, which is average for a normal season. Other points sprayed were near Broadkill Beach, Primehook Beach, and Slaughter Beach. Since it was not practical to spray all the marshes there, it is doubtful if the latter places received much relief from the spray, due to the large expanse of muskrat territory that generally breeds extensively through the season.

There were few complaints about mosquito annoyance in the lower Sussex area during the season. A few came from Dewey Beach and Henlopen Acres during mid-July, as a result of thunder storms which occurred between July 3rd and 5th. The July 14th storm brought winds from both the north and south encouraging migration from outside, as well as inside the control band. This flight was brought under control through proper airspraying of the coastal sections. The amount of annoyance from this was almost negligible.

The reason for the influx of mosquitoes after "Labor

Day" was caused by hurricane "Edna." This storm occurred on September 11, leaving three and one-half inches of rain plus extreme high tides. The tides were responsible for most of the breeding. Normally after September 10 the marches are not very productive, however, due to favorable weather following the storm provided ideal conditions for heavy breeding. The warm weather persisting after they reached the adult stage caused migration that would not have normally taken place in late September. At that time a few complaints came in from the Lewes and Rehoboth sections, and as a result from these the chief engineer authorized another treatment on September 30, 1954, the latest date on record.

The spray program in Kent County gave relief to Dover, Little Creek, Pickering Beach, Kitts Hummock, Bowers Beach, Magnolia, the Dover Air Base and intermediate points. The last spraying in the Kent section was completed on August 28. The hurricanes "Carol" and "Edna" arriving on August 31 and September 11, 1954, respectively with high tides followed by rain and moderate weather caused heavy production in the salt marshes. The continuance of good weather in late September encouraged migration to Dover and other inland points. There were several complaints about mosquitoes coming from Silver Lake section at Dover around September 7, 1954. Upon advice of the chief engineer this division, accompanied by University of Delaware personnel, investigated this situation. The survey revealed that 65% of the annoyance was caused by salt marches species. The most troublesome of these were *aedes sollicitans* that normally breeds in salt marsh tidelands. It was the major pest in this case, because of its diurnal, as well as its nocturnal feeding habits.

In New Castle County the spray program gave relief to Port Penn, Delaware City, St. Georges, New Castle, South Wilmington section, Newport, the New Castle Air Base and intermediate points. The Delaware City marsh section received nine applications including the health center, who cooperated with us by fogging their grounds twice weekly through the season.

The ditch maintenance program was continued in Sussex County through the year with the work being slightly expanded as result of some aid from the special allotment. Emphasis was placed on the coastal region to eliminate trouble spots that disturbed us during the previous summer. The ma-

jority of ditch laterals east of the highway were graded to eliminate surface water to prevent ditch breeding that is common to the area. In many instances we reduced the ditch width to save hand labor as our machines could not be utilized to advantage under the conditions that existed. The Henry hydraulic backhoe, that was purchased last year was used to advantage in cleaning main ditches or doing dyke repair.

Several hundred linear feet of that type of ditch remain to be done in the sections under discussion, and we feel the investment in permanent work is justifiable. Since last July 404,234 linear feet of ditch has been dug or cleaned. This required 23,130 man hours of labor, and supervision at an average rate of 17.4 feet per man hour. The labor, including supervision, cost an average of .07 per linear foot, and represented 49% of a total of 48,389 man hours devoted to mosquito control during the fiscal year.

Construction and maintenance of structures represented about 8% of the labor charge amounting to 4,453 man hours. This involved the installation of five culverts or bridges, the construction or repair of ten outlet boxes, and repair of seven tide gates. The material and labor for the projects totaled about \$7,504.89.

About 25% of the labor expenditure was chargeable to the miscellaneous category, which included sloping of ditches 38,115 cubic feet, hand fill 7,205 cubic feet, filling by disk 100,888 cubic feet, clearing or brushing 2,797,267 square feet, and 8,060 cubic feet dyking by hand or machine. All of these items are actually chargeable to ditch maintenance.

In summarizing the research work there was an indication that resistance to DDT was again increasing in certain sections, so it was generally agreed to revert to BHC the coming season. The various studies regarding resistance will be continued next season, including search for a new compound that will replace BHC or DDT when they fail to produce results.

It is interesting to note from the trap records that "Wild Life Management" can conflict with mosquito control procedures. The program of airspraying was arranged for the Delaware City area and it proved satisfactory until the "Thousand Acre" section was flooded in late July.

The draw down of water earlier in the season exposed the

marsh surface which encouraged the germination of certain plant seeds in the interest of wild life. Near the end of July a dense growth of vegetation had occurred with "Wild Millet" dominating the outer edges of the basin. The section was partly flooded as early as July 20, then increased as water was available.

As the flooding began the "Culex" population increased rapidly because mosquito larvae were protected from the aerial sprays by the heavy vegetation. This increase was reflected in the trap records, and it was interesting to note that before flooding between May 15 and August 1 only 3,793 mosquitoes were collected in 77 days, but after flooding between August 1 and the end of September, 35,380 mosquitoes were trapped in 58 days. The annoyance factor being 24 or more indicated that 49% of the nights before August were free of annoyance, while after that date only 5% of the nights were free of annoyance. This was the largest collection in 22 years of trap operation, and totaled 39,173 mosquitoes with an average of 286 per night compared to Rehoboth's average of 8 per night.

This indicates that with wild life enthusiasm some consideration must be given as to the effects it will have upon the surrounding communities. The air-spraying program is a great aid under certain conditions, but despite nine treatments in the section under discussion it failed to produce the degree of comfort required.

This division contributed \$6,100 from its budget toward research including trap collection identification. We wish to commend the University of Delaware staff under the guidance of Dr. Stearns for the very capable, economical, and efficient manner in which the research program was conducted.

Certain trap data is tabulated below for comparison of collections taken in various parts of Delaware during the summer of 1954. The four latter ones are located within the area where drainage and spray relief are both in effect, while all of the others except the Bombay Hook section are within the band receiving aid. The Dover trap was located at the northern extremity of the spray area, and could possibly be in the path of any flights inland from the non-control section as well.

Section	Nights of Operation	Nights of Annoyance	Average Per Night	Total
Bombay Hook .....	159	124	150	23,974
East of Dover .....	122	62	140	17,118
Newport .....	124	68	55	6,760
Delaware City .....	137	111	286	39,173
Lewes .....	119	2	5	600
Rehoboth .....	127	7	8	997
Oak Orchard .....	122	0	4	465
Bethany Beach .....	116	1	3	360

### PERSONNEL

In general the personnel situation within the Department has changed very little during the past year. From the standpoint of total numbers the strength at the end of fiscal year 1955 compared favorably with the strength as reported last year. As of the end of June in this year we had a total of 865 employees, an increase of twenty-five over the 840 reported on the same date in 1954. It should be noted, however, that none of this increase is reflected in the major technical groups in the organization; namely, the professional and sub-professional categories of personnel. Practically the entire increase in strength occurred in the maintenance forces among personnel employed on a bi-weekly basis. In this category there are now 544 employees as compared to 514 reported last year. The professional and sub-professional classifications experienced very little change; currently there are 68 persons classified as professional and 123 as sub-professional whereas the 1954 report listed 67 and 151 respectively in these categories. The decrease noted above in sub-professional personnel is partially offset by an increase in the number of maintenance personnel employed on a monthly basis. In this latter category there are now 90 employees whereas at the same time last year the indicated strength was 71; this shift from sub-professional to maintenance resulted primarily from the reclassification of a number of persons whom it was felt had been carried improperly on the rolls. During the year a net gain of three employees was experienced among clerical-stenographic personnel, the total in this category increasing from 37 to 40.

Although numerically our strength has shown improvement we find that we are confronted with essentially the same problems that were noted in the last report; namely, a short-

age of technically trained personnel including young engineers and a constant turnover of personnel within our maintenance forces. Under these conditions it is exceedingly difficult to build and maintain a properly balanced and stable organization.

It is felt that the one weak link in our employment chain is the inability to offer any real degree of security to prospective employees. Otherwise our employment inducements compare favorably with those offered by other employers; with certain minor modifications our policies on vacation, sick leave, overtime, retirement etc., would be considered most adequate. However, with competition in the employment field becoming increasingly greater the inability to offer security of employment continually increases in significance in our endeavors to obtain suitable personnel. The solution to the problem lies in legislative action and until the necessary legislation providing some form of security is enacted we will continue to be handicapped in efforts to build a permanent, efficient and capable organization.

As previously mentioned it is felt that some minor modifications in our personnel policies are needed. To this end the current Personnel Policy Manual is now under study and it is anticipated that a revised edition of this publication will be presented to the Department for consideration in the near future.

### **PUBLIC WORKS**

During this fiscal year as in past fiscal years, studies were made to develop estimate costs and engineering design features for special projects in which members of the Legislature are interested. In general, these projects were designed and planned by the Bridge Division of the State Highway Department. Some of the projects which were started are as follows:

#### **Proposed Tide Gates—Blackbird Creek Near Taylor's Bridge—New Castle County**

At the request of the Chief Engineer, a comprehensive study for a proposed tide gate installation at the above location was prepared. The results of the study indicated that the project was feasible, and would prove to be beneficial to the surrounding area. The Board of Game and Fish Commissioners prepared a separate report on the project with respect to its influence on wildlife, and the creating of a fresh-water

source for irrigation, stock watering, and fire protection. The completed study, including cost data and estimates, was turned over to the Chief Engineer.

**Construction of Dam and Sluiceway  
At Horsey's Pond, Near Laurel—Sussex County**

A request was made to investigate the feasibility of the above mentioned project, and to prepare an approximate estimate of the cost involved. The report was completed, and subsequent legislation enacted, in the form of House Bill No. 165, authorizing the construction and providing funds for this project.

Also during the past fiscal year, the Bridge Division made studies and prepared detailed plans, estimates, and special provisions for the projects listed and described below. The Bridge Division performed consulting services for the Board of Game and Fish Commissioners, under a cooperative agreement similar to that in effect for Griffith's Pond Dam.

**Garrison's Pond Dam—Little Duck Creek  
Near Cheswold—Kent County**

Plans for this project consist of the construction of an earth filled dam and a reinforced-concrete and steel pipe water control structure, the repair of the existing concrete spillway, and incidental construction. The work had not been placed under contract at the close of the report period.

**Beck's Pond Dam—Near Newark—New Castle County**

Plans for this project consist of the construction of a reinforced-concrete spillway with adjacent earth embankments, off-road surface-treated parking areas, and incidental construction. The work had not been placed under contract at the close of the report period.

During the year among the contractors which were built, as authorized by the Legislature, were: Blair's Pond Dam, Williams Pond Dam, Silver Lake Pumping Station, and the access road for the Marine Laboratory at Lewes for the University of Delaware.

There were also three (3) projects for shore protection, the Bethany Beach Shore protection, the Lewes Beach Shore protection, and the Broadkill Beach Shore protection.

These were temporary measures intended to protect the beaches. However, the appropriations were inadequate for the purpose.

### **Recommendations**

1. It is recommended that if the Legislature requests the State Highway Department to continue to construct these special projects, that appropriations be made available for the necessary maintenance of the installations.

2. It is recommended that the Department be granted the power of eminent domain to obtain right of way as well as for these special projects. At the present time the Department can only condemn property for highway purposes.

3. It is recommended that a special sum be appropriated to the Department for shore protection purposes, and that it be used only with the approval of the Governor and the State Highway Department.

### **STATE LANDS**

During the past year the storms which occurred in Delaware did little damage to erode the coastline. Work continued in this area, however, and listed below are some of the projects which were accomplished.

1. Beach grass was placed on the Coin Road from the Indian River Inlet approximately 5,000 lineal feet. Dr. C. E. Phillips of the University of Delaware assisted in this work.

2. A ramp was erected over the dike at the end of that road.

3. Another recreation road and parking area was placed north of Fenwick Island near the old Coast Guard Station.

4. The Old Mule Stable Shed south of Dewey Beach was replaced by a larger one which can accommodate more people for picnicking purposes.

The popularity of the Bay is seen opposite Towers Road where many people with boats and trailers enter it. Also,

the continued popularity of camping can be seen where the dune lies between the ocean and the road.

In order to supervise these tenting areas, it is thought that additional manpower should be provided.

Respectfully Submitted,

W. B. MCKENDRICK, JR.  
*Chief Engineer*

# *APPENDIX*



**TABLE 1—ACTIVE CONSTRUCTION CONTRACTS**  
**JULY 1, 1954 TO JUNE 30, 1955**

Cont. No.	Contract	Fund	Active 7-1-54	Amount	Date	Value	County	Active At	Mileage	Date Accepted
			Remaining Value	Awarded F/Y	Awarded	Constructed F/Y		End of F/Y 6-30-55		
682	Smyrna to Wendalls Corner	FA	\$ 103,190.94	\$	5-11-54	\$ 95,483.05	K	\$	2.377	9- 1-54
704	Tulls Crossing to Ross	FA		40,548.20	6-21-55		S	40,548.20	1.899	
799	Concord Pk. (Baynard Blvd. to Murphy Rd.)	State	1,000.00		7-15-52		NC	1,000.00	2.436	11-25-53
804	Lewes Bridge Reflooring	State		17,996.00	2-10-55	14,557.50	S	3,438.50		6-14-55
855	Md. Ave. (Broom St. to Lanc. Ave.)	FA	1,000.00		9- 5-52	1,000.00	NC		0.846	1- 6-54
881	So. Union Street	State		93,226.50	1-31-55	80,139.21	NC	13,087.29	0.292	6-30-55
915	Harrington to Canterbury—dual	FA	661,177.20		9-21-53	672,258.22	K		7.587	10-22-54
1063	Line Road East of Delmar	FA	12,164.16		7-31-53	22,558.74	S		4.392	6-23-54
1149	Delmar to Georgetown—Laurel Road	FA	493,758.73		6-19-52	570,213.53	S		7.956	10-14-54
1152	Five Points to Rehoboth—dual	FA	890,929.98		2-23-54	755,104.55	S	135,825.43	5.618	5-17-55
1170	Oak Lane Drive—So. Laurel	State	10,357.14		8- 3-53	8,490.58	S		0.480	5-28-54
1175	Broom Street—Wilmington	FA	11,566.13		10-28-52	11,150.03	NC		0.677	1- 5-54
1189	Green Street—Claymont	State	1,000.00		3- 3-53	1,783.01	NC		0.700	12-24-53
1191	Warwick Connection	FA		148,748	3-10-55	27,565.20	NC	121,182.80	1.211	
1192	Holloway Terrace	State		140,244.50	8-25-54	105,465.23	NC	34,779.27	1.130	
1197	Harvey Road Bridge & Approaches	State	135,181.50		11-10-53	105,021.63	NC	30,159.87	0.407	
1208	White Clay Creek Bridge	State	347,232.36		12-11-53	312,106.10	NC	35,126.26	0.433	6-15-55
1223	Concord Pk. (Murphy Rd. to Talleyville)	State	400,209.74		9-16-53	401,003.38	NC		1.912	10-29-54
1224(2)	Walnut St. Ext. PRR Underpass	FA	663,540.21		5-25-54	370,920.71	NC	292,619.50		
1224(3)	Walnut St. Bridge—Substructure	FA		820,455.00	7-20-54	293,427.58	NC	527,027.42	0.185	
1224(4)	Walnut St. Bridge—Superstructure	FA		1,251,781.00	9-15-54		NC	1,251,781.00	0.185	
1224(5)	Walnut St. Ext. Marsh Stabilization	FA		725,098.90	9-30-54	600,249.57	NC	124,849.33	0.565	
1235	Murphy—Wilson Rd. (Concord Rd. to Marsh Rd.)	FA		383,516.30	12-15-54	105,639.18	NC	277,877.12	2.423	
1236	Lancaster Pike—Paving	FA	474,170.95		4-24-54	468,654.28	NC		3.063	12-30-54
1240	Harrington Streets	State		70,842.50	8-25-54	68,403.51	K		0.936	12-28-54
1244	Marshallton School Drive	State	15,304.82		1-11-54	15,153.52	NC		0.151	7- 1-54
1245	Georgetown to Harbeson	State	3,222.50		11-10-53	12,695.33	S		5.937	5-28-54
1247	Greenville School	State	8,667.62		11-10-53	9,410.11	NC		0.326	6- 3-54
1253	Red Clay Creek Bridge	State	52,016.00		4-30-54	59,903.39	NC			4-26-55
1254	River Road	State	30,063.48		12- 3-53	28,470.84	NC		0.204	9- 1-54

96

TABLE I—ACTIVE CONSTRUCTION CONTRACTS—(Continued)

JULY 1, 1954 TO JUNE 30, 1955

Cont. No.	Contract	Fund	Active 7-1-54		Date Awarded	Value Constructed During F/Y	County	Active At End of F/Y 6-30-55	Mileage	Date Accepted
			Remaining Value	Amount Awarded During F/Y						
1257	Washington Street .....	State		76,389.00	8-24-54	72,373.60	NC		0.424	11-23-54
1260	Basin Corner to Minquadale .....	State	16,420.66		7-15-53	25,218.73	NC		1.772	6-25-54
1261	Marrows Road .....	FA	162,959.50		5-26-54	153,052.73	NC		1.419	6- 3-55
1264	Twin Willows to Whitehall Xroads .....	State		38,359.00	5-26-55		K	38,359.00		
1265	Harbeson to Five Points .....	FA	243,033.84		2-23-54	223,166.36	S	19,867.48	6.255	11-23-54
1287	Fieldsboro to McDonough .....	FA	289,089.75		5-24-54	316,728.48	NC		5.177	12-13-54
1288	Minquadale to Rogers Cor. ....	FA		129,195.75	1-20-55	28,808.88	NC	100,386.87	0.890	
1289	Frederica Bridge .....	State	895.47		9-16-53	3,016.59	K			8-25-54
1291	Bituminous Surface Treatment K. Co. State		9,267.31		7-15-53	8,546.35	K		11.790	6-29-54
1292	Bituminous Surface Treatment S. Co. State		22,518.99		7-15-53	36,528.82	S		9.420	11-26-54
1295	Hot-Mix Asphaltic Conc. Resurfacing State		1,000.00		7-15-53	1,000.00	S			12- 7-53
1298(1)	Viola Railroad Crossing .....	State		7,867.75	7-18-55		K	7,867.75	0.181	
1299	Heald Street .....	State		78,369.00	9-28-54	72,060.14	NC		0.255	1- 5-55
1300	Center Road .....	FA	633,450.00		6-11-54	440,112.70	NC	193,337.30	2.770	
1301	Gov. Printz. Blvd. Wilm. (11th to 30th St.) .....	FA		324,805.60	4-25-54	8,002.16	NC	316,803.44	1.103	
1302	Delaware Avenue—Newark .....	FA		257,155.00	6-20-55		NC	257,155.00	0.826	
1304	Port Penn Dikes & Sluice Gates .....	LB	149,021.10		3- 4-54	117,683.93	NC	31,337.17		
1305	Blairs Pond Dam .....	LB	2,669.60		5-25-54	3,275.30	S			8-19-54
1306	Red Lion Dikes & Sluice Gates .....	LB	69,630.77		1-10-54	69,218.76	NC			9-29-54
1307	New Castle Dikes & Sluice Gates .....	LB	37,267.48		1-11-54	50,324.82	NC			12-21-54
1308	Slaughter Beach Shore Protection .....	LB	7,050.92		12- 2-53	7,096.88	S			6-28-54
1310	Delaware City Dikes .....	LB	7,950.30		2-23-54	7,794.47	NC			7- 7-54
1311	Silver Lake Pumping Station .....	LB	10,043.29		4- 1-54	10,488.97	S			12-14-54
1312	Williams Pond Dam .....	State	4,165.15		11-25-53	19,182.83	S			7-26-54
1313	Churchmans Road Extension .....	State	52,341.89		10-29-53	79,264.60	NC		0.851	8-27-54
1314	Arrow Road—Georgetown .....	State	6,974.50		1-11-54	6,403.57	S		0.505	8-26-54
1316	Chryster Plant—Ogletown Ext. ....	State	783.53		11-10-53	13,839.93	NC		0.216	8-19-54
1317	Memorial Drive .....	State	155,194.70		4-30-54	165,708.22	NC		0.963	9-29-54
1318(1)	Basin Corner Interchange .....	State	1,727.50		5-26-54	1,031.07	NC			7-10-54
1318(2)	Basin Corner Interchange .....	FA		1,039,309.00	9-15-54	309,205.50	NC	730,103.50	0.724	
1319	High Street—Seaford .....	FA		240,515.60	1-25-55	34,115.89	S	206,399.71	0.984	
1320	Co. Rd. 380 (Rd. 60 to U.S. 113) .....	FA		47,795.80	7-14-54	51,028.07	S	5,669.79	2.338	6-20-55

97

TABLE I—ACTIVE CONSTRUCTION CONTRACTS—(Continued)

JULY 1, 1954 TO JUNE 30, 1955

Cont. No.	Contract	Fund	Active 7-1-54	Amount	Date	Value	County	Active At	Mileage	Date Accepted
			Remaining Value	Awarded During F/Y	Awarded	Constructed During F/Y		End of F/Y 6-30-55		
1321A	Bethany Beach Shore Protection .....	LB	1,161.83	.....	2-23-54	8,629.83	S	.....	.....	5-25-54
1321B	Bethany Beach Shore Protection .....	LB	.....	4,437.50	5-26-55	.....	S	4,437.50	.....	.....
1322	Lewes Beach Shore Protection .....	LB	34,000.00	.....	6-22-54	35,000.00	S	.....	.....	7-15-54
1323	Broadkill Beach Shore Protection .....	LB	14,773.20	.....	2-23-54	15,424.93	S	.....	.....	9-30-54
1325	Stockdale Curve—N. C. County .....	State	54,830.25	.....	4-16-54	54,318.27	NC	.....	0.417	8-20-54
1326	Alterations Del. State Polic Sta. No. 4	LB	3,218.95	.....	4- 2-54	3,218.95	S	.....	.....	10-14-54
1327	Chapel St. RR Crossing Prtoection PRR	FA	.....	56,000.00	9-20-54	56,000.00	NC	.....	.....	1-27-55
1328	Timbre Dock—University of Delaware	State	.....	10,167.00	8- 2-54	10,182.13	S	.....	.....	11-10-54
1330	Church Street—Bridgeville .....	State	.....	50,200.00	9-13-54	34,634.34	S	15,565.66	0.440	6-16-55
1331	North Star Road .....	State	.....	83,926.30	7- 8-54	75,365.59	NC	.....	0.604	11-18-54
1333	Harvey Rd. (Phila. Pk. to	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Harvey Bridge Rd. ....	FA	.....	154,697.25	3-14-55	31,048.55	NC	123,648.70	0.764	.....
1334	Church & Spruce Street .....	State	.....	61,025.00	8- 2-54	60,887.25	NC	.....	2.246	9-29-54
1335	North & South Bedford Street .....	FA	.....	244,244.00	9- 7 54	218,224.64	S	26,019.36	1.430	5-19-55
1338	Bituminous Surface Treatment N. C. ....	State	83,020.69	.....	5-27-54	83,020.69	NC	.....	22.998	6-30-55
1339	Bituminous Surface Treatment Kent ....	State	50,537.93	.....	5-28-54	50,537.93	K	.....	14.000	6-30-55
1340	Bituminous Surface Treatment Sussex	State	69,026.04	.....	5-27-54	69,026.04	S	.....	27.228	6-30-55
1341	Hot-Mix Asphalt Patching N. C. ....	State	9,990.00	.....	6- 8-54	17,538.00	NC	.....	.....	10- 1-54
1343	Ford's Corner to Pearson's Grove .....	FA	.....	63,000.00	12-15-54	15,375.42	K	47,624.58	4.700	.....
1344	Bay View School Rd. & Cedar Grove to	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Hart's Garage .....	State	.....	41,976.50	7- 8-54	49,021.34	K	.....	5.336	11-12-54
1345	Bank Run Hot-Mix Asph. Surfacing ....	State	36,100.00	.....	6- 8-54	57,596.68	NC	.....	5.700	11- 5-54
1346	Bank Run Hot-Mix Asph. Surfacing ....	State	50,077.80	.....	6- 9-54	73,418.86	K	.....	12.800	10-21-54
1347	Bank Run Hot-Mix Asph. Surfacing ....	State	49,665.00	.....	6- 9-54	97,062.84	S	.....	8.000	11- 4-54
1351	State Street—Dover .....	State	.....	53,925.00	7- 8-54	45,662.35	K	.....	1.630	10- 8-54
1361	Governors Avenue Bridge—Greenwood	State	.....	14,030.00	10-22-54	13,808.50	S	.....	.....	4-19-55
1362	Alterations to Boiler Rm. & Heating ..	State	.....	5,340.00	8- 2-54	4,660.20	K	679.80	.....	.....
1363	Alteration to Boiler Rm. Testing Lab.	State	.....	3,890.00	8- 2-54	3,668.00	K	222.00	.....	.....
1364	Alterations to Electrical System .....	State	.....	9,884.00	8- 2-54	10,436.37	K	1,043.63	.....	.....
1364A	Metal Office Partitions .....	State	.....	3,214.00	8-13-54	3,214.00	K	.....	.....	10- 6-54
1364B	Acoustic Tile Installation .....	State	.....	555.00	8-19-54	555.00	K	.....	.....	10- 1-54
1364C	Soundproof Carpeting .....	State	.....	861.94	8-13-54	1,059.78	K	.....	.....	10- 2-54
1364D	Air-conditioning installation .....	State	.....	7,873.05	8-11-54	7,873.05	K	.....	.....	10- 8-54

TABLE I—ACTIVE CONSTRUCTION CONTRACTS—(Continued)

JULY 1, 1954 TO JUNE 30, 1955

Cont. No.	Contract	Fund	Active 7-1-54	Amount	Date	Value	County	Active at	Mileage	Date Accepted
			Remaining Value	Awarded F/Y	Awarded	Constructed During F/Y		End of F/Y 6-30-55		
1365	Co. Rd. 224 (Cedar Creek Mill to Argo Store) .....State			23,832.50	9-17-54	21,545.55	S	.....	1.759	5-13-55
1366	Co. Rds. 206 & 205 Cedar Neck School to Lovetts Nursery) .....State			43,856.75	10-25-54	35,486.18	S	8,370.57	3.315	6-16-55
1367	Delmar to Brown's Church (Seeding and Mulching) .....FA			40,642.00	10-26-54	34,902.00	S	5,740.00	16.341	6-13-55
1369	Gravel Hill to Co. Rd. 249 .....State			21,788.17	3- 7-55	3,660.88	S	18,127.29	1.528	.....
1371	Co. Rd. 370 (Rt. 17 to Rd. 382) .....State			30,276.90	4-16-55	3,672.00	S	26,604.90	1.347	.....
1372	Burrsville Relocation .....FA			67,082.00	4-15-55	9,951.30	K	57,130.70	0.650	.....
1373	Broadkill Bridge Reflooring .....State			13,627.75	2-10-55	13,960.50	S	.....	.....	6-14-55
1374	Smith's Bridge .....State			792.00	1-13-55	792.00	NC	.....	.....	3- 5-55
1374A	Smith's Bridge .....State			43,125.00	4-15-55	.....	NC	43,125.00	.....	.....
1375	Brandywine Springs State Park .....State			9,911.00	1-26-55	3,043.13	NC	6,867.87	.....	.....
1379	Alterations to Lighting System—Adm. Bldg. ....State			8,624.00	1-19-55	6,985.44	K	1,638.56	.....	.....
1380	Rock Excavation—Barley Mill Road .....State			1,500.00	1-13-55	2,824.14	NC	.....	.....	3-22-55
1382	Muddy Branch Bridge .....State			33,300.00	4-28-55	.....	K	33,300.00	.....	.....
1386	Oxford Br. Rt. 300 RR X-ing Protection PRR .....FA			4,578.16	.....	4,578.16	K	.....	.....	2-10-55
1388	E. Cleveand Ave. Intersec.—Newark State			23,288.00	4-16-55	.....	NC	23,288.00	0.081	.....
1389	Deerhurst Gutters .....State			8,448.25	5-26-55	.....	NC	8,448.25	.....	.....
1392	Rd. 207 to Milford Limits Rd. 213 .....FA			37,828.00	6- 3-55	.....	S	37,828.00	1.646	.....
1394	Bridge on Rd. 362—Bridge 278 .....State			8,467.00	5-26-55	.....	NC	8,467.00	.....	7-15-55
Totals .....			\$6,655,611.40	\$7,222,432.42		\$8,881,884.44		\$5,294,766.37		

66

**TABLE II**  
**TRAFFIC AND PLANNING DIVISION**  
**MILEAGE OF STREETS AND HIGHWAYS BY SURFACE**  
**TYPE BY COUNTY—DEL. JUNE 30, 1955**

Surface Type	Kent	New Castle	Sussex	Totals
Belgian Block .....		.40		.40
Brick .....	.68	4.27		4.95
Concrete .....	197.83	146.33	252.73	596.89
Bituminous Concrete .....	63.85	177.51	121.23	362.59
Bituminous Penetration .....	.61	313.87	51.44	365.92
<b>TOTAL PAVED .....</b>	<b>262.97</b>	<b>642.38</b>	<b>425.40</b>	<b>1,330.75</b>
Other Low Type Bituminous ....	28.95	27.26	102.33	158.54
Bituminous Surface Treated.....	230.30	171.47	386.13	787.90
Gravel or Stone .....	41.93	8.59	5.79	56.31
Soil Surfaced .....	402.81	95.93	343.95	842.69
<b>TOTAL SURFACED .....</b>	<b>703.99</b>	<b>303.25</b>	<b>838.20</b>	<b>1,845.44</b>
Graded and Drained Eearth.....	66.65	6.16	569.71	642.52
Unimproved .....	1.25	7.47	11.13	19.85
Primitive .....	1.40	.12		1.52
<b>TOTAL UNSURFACED .....</b>	<b>69.30</b>	<b>13.75</b>	<b>580.84</b>	<b>663.89</b>
<b>TOTAL TWO AND FOUR-LANE HIGHWAYS .....</b>	<b>1,036.23</b>	<b>959.38</b>	<b>1,844.44</b>	<b>3,840.08</b>
<b>DIVIDED HIGHWAYS</b>				
Concrete .....	22.20	23.90	17.14	63.24
Bituminous Concrete .....	6.47	39.27	7.24	52.98
Low Type Bituminous .....		.11		.11
Bituminous Surface Treated.....		.28	.68	.96
<b>TOTAL DIVIDED HIGHWAYS</b>	<b>28.67</b>	<b>63.56</b>	<b>25.06</b>	<b>117.29</b>
<b>TOTAL ALL TYPES.....</b>	<b>1,064.93</b>	<b>1,022.94</b>	<b>1,869.50</b>	<b>3,957.37</b>

**TABLE III**  
**TRAFFIC AND PLANNING DIVISION**  
**MILEAGE OF STREETS AND HIGHWAYS BY**  
**SYSTEM CLASSIFICATION BY COUNTY**

	Kent	New Castle	Sussex	Totals
Urban (Over 5,000 Population)	11.20	41.98	2.56	55.74
Primary .....	120.52	145.51	221.65	487.68
Secondary .....	323.30	320.97	637.86	1,282.13
Tertiary .....	609.91	514.48	1,007.43	2,131.82
<b>TOTAL .....</b>	<b>1,064.93</b>	<b>1,022.94</b>	<b>1,869.50</b>	<b>3,957.47</b>

**TABLE IV**  
**TRAFFIC AND PLANNING DIVISION**  
**TRAFFIC VOLUMES AT FOUR AUTOMATIC COUNTER**  
**STATIONS BY YEAR BY MONTH WITH**  
**RELATED PERCENTAGES**

Month	Average Daily Traffic			Percent Change	
	1941 1942	1953 1954	1954 1955	1954-55 1941-42	1954-55 1953-54
July .....	22,721	40,250	41,650	+ 83.31	+ 3.48
August .....	22,328	39,755	40,508	+ 81.42	+ 1.89
September .....	19,902	37,954	41,720	+109.63	+ 9.92
October .....	17,491	33,362	35,481	+102.85	+ 6.35
November .....	17,056	28,391	32,300	+ 89.38	+13.77
December .....	16,174	29,837	32,029	+ 98.03	+ 7.35
January .....	13,421	24,592	29,426	+119.25	+19.66
February .....	13,736	29,350	30,882	+124.83	+ 5.22
March .....	14,065	30,490	33,631	+139.11	+10.30
April .....	15,583	33,964	36,983	+137.33	+ 8.89
May .....	14,744	35,018	38,999	+164.51	+11.37
June .....	13,810	37,819	42,624	+208.65	+12.71
<b>TOTAL .....</b>	<b>201,031</b>	<b>400,782</b>	<b>436,233</b>	<b>+117.00</b>	<b>+ 8.85</b>

**TABLE V**  
**TRAFFIC AND PLANNING DIVISION**

	7-1-53 to 6-30-54		7-1-54 to 6-30-55		Percent Change	
	Number	Dollars	Number	Dollars	Number	Dollars
Heavy Hauling Permits .....	4,518	\$19,965.04	5,906	\$24,683.11	+30.7	+23.6
30-Day Piling Permits .....	276	3,347.50	293	3,662.50	+ 6.2	+ 9.4
Trip Piling Permits .....	198	482.50	179	447.50	- 9.6	- 7.3
House Moving Permits .....	354	856.00	454	1,138.60	+28.2	+33.0
Free Permits .....	412		328		-20.4	
<b>TOTAL</b> .....	<b>5,758</b>	<b>\$24,651.04</b>	<b>7,160</b>	<b>\$29,931.71</b>	<b>+24.3</b>	<b>+21.4</b>

102

**TABLE VI**  
**SUBURBAN DEVELOPMENT DIVISION**  
**MILEAGE OF SUBURBAN STREETS ACCEPTED**  
**1954-1955**

Contract	Development	Mileage
Developer	Ashbourne Hills .....	0.562
Developer	Brookside Park .....	5.773
Developer	Capitol Green .....	0.517
Developer	Castle Hills .....	0.609
Developer	Cedars Knoll .....	0.322
Developer	Chelsea Estates, Section 3 .....	1.201
Developer	Chestnut Hill Estates .....	0.984
Developer	Deerhurst .....	0.410
SD-39	DuRoss Heights .....	1.627
SD-58	Edgehill Acres .....	0.907
SD-57	Fernhook .....	0.229
Developer	Guyencourt .....	0.246
SD-55	Gwinhurst .....	0.284
SD-61	Idela .....	0.179
Developer	Kenilworth .....	0.656
SD-56	Keystone .....	0.278
Developer	Liftwood, Section A. ....	0.316
Developer	Limestone Acres .....	1.519
Developer	Lynnfield .....	1.684
SD-41	Maplewood Lane .....	0.174
Developer	Mayfield .....	0.532
Developer	North Star .....	1.311
Developer	Palmer Park .....	0.220
SD-47	Roseville Park .....	1.004
Developer	Swanwyck Gardens Extension .....	0.105
Developer	Villa Monterey .....	0.607
Developer	Westview .....	0.606
Developer	Woodcrest .....	0.120
<b>TOTAL STREETS ACCEPTED .....</b>		<b>22.982</b>

**TABLE VII**  
**SUBURBAN DEVELOPMENT DIVISION**  
**S.D. PROJECTS 1954-55**

1. S.D. Projects Finished:

Contract	Development	Mileage	Cost
SD-39	DuRoss Heights .....	1.627	\$ 48,297.00
SD-41	Maplewood Lane .....	0.174	18,642.84
SD-47	Roseville Park .....	1.004	30,756.45
SD-53	Keystone .....	0.278	17,175.14
SD-55	Gwinhurst .....	0.284	19,593.05
SD-57	Fernhook .....	0.229	16,381.54
SD-58	Edgehill Acres .....	0.907	57,522.34
SD-61	Idela .....	0.179	10,973.27
		4.682	\$219,341.63

2. S.D. Projects Under Construction:

Contract	Development	Mileage	Bid Price
SD-15C	Swanwyck .....	0.677	\$ 60,209.75
SD-60	Belle Moor Heights .....	0.293	7,286.50
SD-63	Dover Heights .....	0.371	22,010.00
		1.341	\$ 89,506.25

3. S.D. Projects Rejected By Vote Of Freeholders:

Contract	Development	Mileage	Probable Cost
SD-67	Stanton Crest .....	0.204	\$ 12,000.00

**TABLE VII**  
**SUBURBAN DEVELOPMENT DIVISION**  
**S.D. PROJECTS 1954-55—(continued)**

4. S.D. Projects being Designed:

Contract	Development	Mileage	Probable Cost
SD-59	Addicks Estates .....	1.510	\$100,000.00
SD-62	Delaire .....	0.493	31,000.00
SD-64	Collins Park, Section 2 .....	1.532	96,000.00
SD-66	Newport Heights .....	0.563	35,000.00
SD-69	Collins Park, Section 1 .....	0.871	54,000.00
SD-68	Wilmington Manor, Section D.....	0.584	31,000.00
SD-70A	Woodside Hills .....	0.228	12,000.00
SD-71	Rogers Manor .....	0.208	11,300.00
SD-72	Mayview Manor .....	0.540	29,200.00
SD-73	Elmhurst .....	0.208	11,400.00
SD-74	North Hills .....	0.270	14,900.00
SD-75	Westfield .....	0.108	5,900.00
SD-76	Concord Manor .....	0.237	13,500.00
		7.352	\$445,200.00

5. S.D. Projects Rejected, Petition Illegal.

Contract	Development	Mileage	Probable Cost
SD-65	Collins Park, Section 3 .....	2.516	\$170,000.00
SD-70	Woodside Hills .....	0.128	6,800.00
		2.644	\$176,800.00

	Projects	Miles	Probable Cost
<b>GRAND TOTAL</b>	27	16.223	\$942,847.88

Average Cost Per Mile \$58,117.97

**TABLE VIII**  
**SUBURBAN DEVELOPMENT DIVISION**  
**PROJECTS FOR WHICH BOND WAS RECEIVED**  
**1954-1955**

Subdivision	Mileage	Contract Price
Ashbourne Hills (2) .....	2.166	\$ 97,675.00
Bestfield .....	1.121	38,282.00
Briarwood .....	0.246	11,500.00
Brookside Park .....	1.697	87,775.00
Capitol Green (2) .....	0.565	35,820.00
Capitol Park .....	2.188	135,315.00
Capitol Trail Farm .....	0.397	35,000.00
Carrcroft .....	0.351	17,819.40
Carrcroft Crest .....	0.436	25,090.90
Castle Hills (2) .....	1.048	70,000.00
Chestnut Hill Estates .....	0.994	45,000.00
Cleland Heights .....	0.157	8,158.20
Dunlinden Acres .....	0.348	31,101.40
Fairfax (3) .....	3.124	195,283.50
Glendale .....	0.761	37,138.50
Graylyn Crest .....	1.061	64,464.90
Greenmeadow .....	0.487	27,796.30
Kent Acres .....	0.883	52,000.00
Klair Estates (4) .....	1.297	65,343.50
Milford Meadows .....	0.106	8,875.90
Newkirk Estates (2) .....	0.263	18,200.00
Northwest Dover Heights .....	0.417	15,222.00
Oak Lane Manor .....	0.822	37,143.60
Overview Gardens (2) .....	1.518	84,564.30
Palmer Park .....	0.220	14,320.20
Redmont .....	0.256	10,000.00
Sherwood Park .....	0.835	56,877.00
Westview (3) .....	0.497	118,686.30
Windybush .....	0.337	18,010.00
Woodland .....	1.989	156,062.00
Woodside Manor .....	0.218	12,000.00
<b>TOTALS (43) .....</b>	<b>26.805</b>	<b>\$1,630,524.90</b>

Average Cost Per Mile: \$60,567.98

**TABLE IX**  
**SUBURBAN DEVELOPMENT DIVISION**  
**PLANS EXAMINED FOR NEW SUBDIVISIONS**  
**JULY 1954 TO JUNE 1955**

Subdivision	Acreage	Mileage
Anderson Beach Lands, Rehoboth .....	93.7	3.030
Ashbourne Hills No. 2 .....	107.4	3.339
Brookmont Farms .....	117.7	1.477
Brookside Park, Section C .....	58.9	2.661
Brookside Park, Section M-2 .....	126.9	2.431
Capitol Park, Dover .....	56.4	1.998
Dunlinden Acres, Section 6 .....	11.1	0.341
Galewood .....	6.9	0.178
Garfield Park .....	37.9	1.241
Graylyn Crest .....	34.1	1.396
Green Acres .....	131.3	4.508
Guenveur Estates .....	18.5	0.385
Harmony Hills .....	115.5	2.917
Hilton .....	10.2	0.227
Jefferson Farm .....	61.1	2.519
Jones Property .....	35.2	0.767
Kenilworth .....	29.2	0.670
Kent Acres, Dover .....	30.8	0.909
Kirkwood Gardens .....	59.0	1.625
Limestone Acres No. 2 .....	107.0	1.771
Northwest Dover Heights .....	32.2	0.360
Oak Hill .....	71.9	2.689
Overview Gardens .....	241.3	3.538
Palmer Park, Camden .....	24.3	0.284
Radnor Green .....	50.9	1.767
Rockwood Hills .....	15.7	0.384
Rodney Village, Dover .....	121.2	3.436
Roeper Property .....	85.2	1.288
Rolling Hills .....	33.9	1.591
Seabreeze Development, Lewes .....	53.7	1.757
Sellers Estates .....	36.2	1.074
Sharpley .....	193.0	5.208
Shipleigh Heights .....	59.7	1.564
Stanton Village .....	86.0	1.402
Webster Farms .....	56.5	1.994
Wilmington .....	17.6	0.621
Windermere .....	46.3	1.652
Windsor Hills .....	78.4	1.492
Woodcrest .....	129.1	4.755
Woodside Manor .....	33.1	0.241
<b>TOTAL (40 Developments) .....</b>	<b>2,715.0</b>	<b>71.487</b>

