

I. INTRODUCTION

Responsibility of the Highway Department

Your State Highway Department is a State agency which was created by the legislature. The Department serves the populace in many ways, but it must always function in accordance with legislative directives and limitations, and within the funds provided by the legislature for specific purposes. The main functions of the Department are:

1. The design, construction, maintenance, and operation of highways, bridges, and related sections of the street and highway system within the state.

2. The study, design, construction, and maintenance of public works involving dams, dikes and tide gates, and shore protection as authorized by the General Assembly.

3. The acquisition of land for Department projects.

4. The planning, regulation, and licensing of motor vehicle usage and operation in the State.

5. The planning and regulation of the various activities undertaken by the Department, including but not limited to traffic control, highway research, analysis and testing of materials, landscaping and highway beautification, maintenance of picnic and roadside rest areas, snow removal functions, and liaison activities with other agencies.

6. The preparation of maps for the Department.

7. The planning and implementation of mosquito control measures.

8. The planning, construction, maintenance, and operation of beach and public lands improvement projects and activities.

9. The operation of a state police force responsible for the control, regulation, and enforcement of all motor vehicle

traffic control, and for the enforcement of criminal law.

10. The collection of motor fuel taxes.

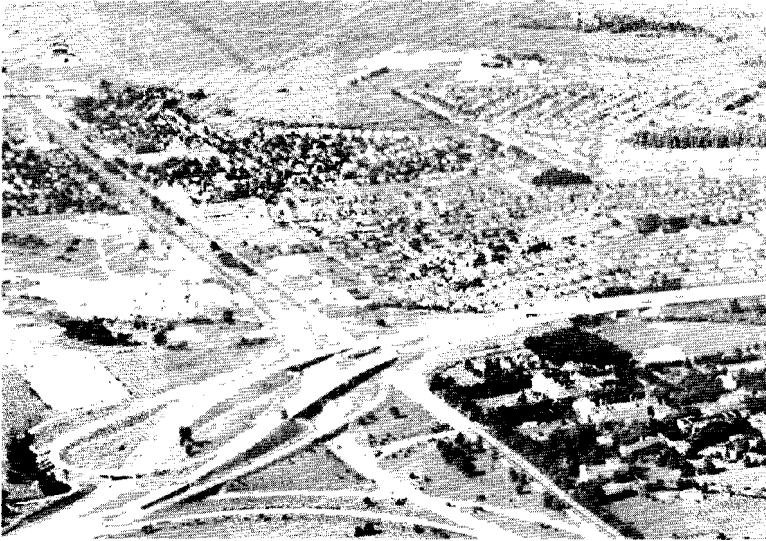
11. The maintenance of a communication division for the service of the State.

12. To cooperate with the Interstate Highway Division (Delaware Memorial Bridge) and all other state and local governmental agencies.

13. To participate actively in Civil Defense.

14. To control, regulate, and enforce such measures as are necessary in emergency conditions which may occur from time to time in the State.

To perform the functions listed above the Department is organized as shown in the chart on page 7. All sections of the Department cooperate closely to assure that the citizens of Delaware get the best possible service for their tax dollar.



Farnhurst Interchange area includes suburban residential development, manufacturing, shopping centers, airfields, and State institution.



Basin Corner area showing traffic on du Pont Highway opposite Greater Wilmington Airport.

FACTORS INFLUENCING THE OPERATION OF THE HIGHWAY DEPARTMENT

A. Traffic and Population.

Each year the Department is faced with an increasing volume of work, which is related directly to the increase in population in our State.

TABLE I

Year	Total Mileage of Streets and Highways under the jurisdiction of State Highway Department	Approximate Number of Vehicles Registered	Population (State Board of Health Statistics)
1961	4,174.42	194,822	461,089
1960	4,148.86	185,972	449,498
1959	4,125.51	178,896	436,674
1958	4,119.71	172,456	423,854
1957	4,073.70	163,648	411,033
1956	3,983.07	156,992	398,213
1955	3,957.37	146,438	285,393
1954	4,004.59	135,243	372,569
1953	3,974.24	127,199	359,731
1952	3,960.60	117,656	346,929
1951	3,925.62	111,376	334,121
1950	3,910.72	101,727	321,291
1949	3,910.02	92,129	312,927
1948	3,905.03	84,900	307,769
1947	3,899.31	78,212	302,611
1946	3,897.14	72,660	297,453

Table I covers the postwar years. The major increase in total mileage was due to the acceptance of newly-built suburban development streets. However, the network of roads existing in 1946 must be improved constantly by resurfacing, widening, or completely reconstructing them to handle adequately the heavy increase of traffic and the resulting constant pounding of pavements which were designed for less traffic. Within this period the number of vehicles using approximately the same mileage of roads as in 1946 has increased 168 percent while the population has increased 55 percent. The mileage of streets and highways in all categories now maintained by the Department is shown in Tables II and III.

TABLE II
MILEAGE OF STREETS AND HIGHWAYS
BY SURFACE TYPE BY COUNTY
DELAWARE
JULY 1, 1961

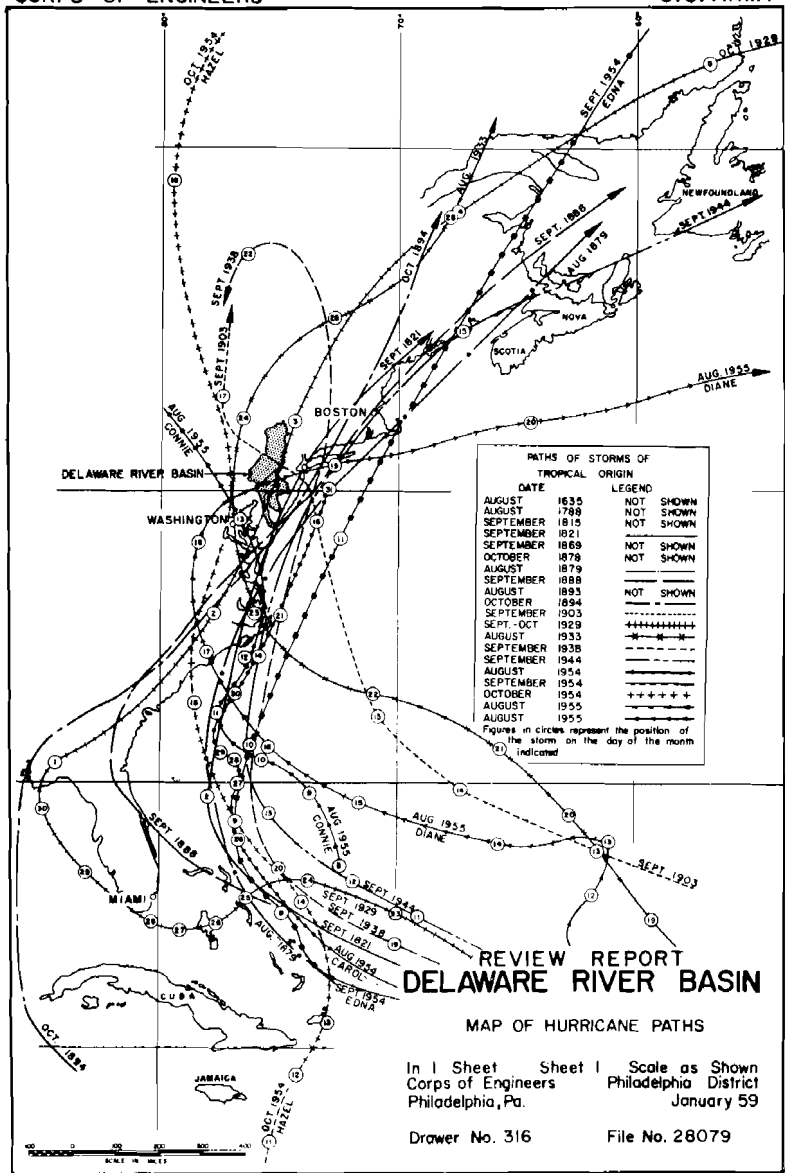
Surface Type	Kent	New Castle	Sussex	Totals
Brick .....	..	0.12	..	0.12
Concrete	119.22	119.62	117.01	355.85
Bituminous Concrete	137.27	425.83	246.95	810.05
TOTAL PAVED	256.49	545.57	363.96	1,166.02
Other Low Type Bituminous	19.97	97.08	34.85	151.90
Bituminous Surfaced Treated	456.67	419.13	937.72	1,813.52
Soil Surfaced	291.04	46.78	264.82	602.64
TOTAL SURFACED	767.68	562.99	1,237.39	2,568.06
Graded and Drained Earth	7.89	2.21	262.88	272.98
Unimproved .....	..	..	1.44	1.44
Primitive .....	..	0.41	1.07	1.48
TOTAL UNSURFACED	7.89	2.62	265.39	275.90
TOTAL NON-DIVIDED HIGHWAYS ..	1,032.06	1,111.18	1,866.74	4,009.98

DIVIDED HIGHWAYS

Concrete	36.24	33.15	26.20	95.59
Bituminous Concrete	7.74	48.00	11.57	67.31
Low Type Bituminous .....	..	0.17	..	0.17
Bituminous Surface Treated .....	..	0.38	0.99	1.37
TOTAL DIVIDED HIGHWAYS	43.98	81.70	38.76	164.44
TOTAL ALL HIGHWAYS	1,076.04	1,192.88	1,905.50	4,174.42

TABLE III
MILEAGE OF STREETS AND HIGHWAYS
BY SYSTEM CLASSIFICATION BY COUNTY

Interstate (F.A.P.) .....	..	37.91	..	37.91
Primary (F.A.P.)	130.10	140.67	224.92	495.69
Secondary (F.A.S.)	377.62	341.94	696.55	1,416.11
Tertiary*	568.32	672.36	984.03	2,224.71
TOTAL	1,076.04	1,192.88	1,905.50	4,174.42
*Includes: H.B. 256 and	12.95	313.87	5.54	332.36
S.B. 387	9.46	34.44	23.67	72.57
TOTAL	22.41	348.31	34.21	404.98



However, the Department will be faced with ever-increasing activity in all its various functions. The following population estimates for Delaware have been taken from the recent *Intrastate Water Resources Survey* (1959).

Year	Population
1965	631,000
1980	856,700
2010	1,426,400
2060	3,352,100

The above population estimates may occur earlier or later than the dates shown, but they will occur within a reasonable time. Continuous construction and reconstruction will be necessary to meet traffic demands; maintenance costs will increase; and land will be at a premium in certain localities, so right-of-way costs will increase.

B. Weather.

The unpredictable forces of Nature exercise a major influence on the operations of the Department, which attempts to meet the worse-than-average bad-weather problems.

Estimated snowfall is an example of the calculated risk type of planning the Department must make. Weather records of Delaware for the past 51 years have been projected to make a hundred-year snowfall estimate which indicates that the total annual snowfall will approach 20 inches and the following will occur:

20 years in which annual snowfalls will range from 2.0 to 12.5 inches

60 years in which annual snowfalls will range from 12.5 to 28.0 inches

20 years in which annual snowfalls will range from 28.0 to 50.0 inches

Wind is another imponderable. The U. S. Army Corps of Engineers map of hurricane paths in the Delaware River basin shows that Delaware is in the cross-roads of the high winds. Hurricanes cause much physical damage and flooding, the latter being due to obsolete or very limited storm drainage systems.

Prolonged periods of extreme cold do their worst dam-



Road 31 at Canterbury. Results of hurricane winds.



Road 224 in Sussex County, showing damage caused by prolonged cold weather.

age to old roads and those designed for low traffic volumes. The past winter was one of the worst in this respect and the spring damage to our roads is estimated at about \$2.5 million.

C. Personnel.

The construction of highways and bridges requires the employment of trained, skilled, dedicated men and women. In addition to their formal training and education, a continuous need exists to develop or take advantage of new techniques or changes in procedures.

It is unfortunate that the Department has been unable during the last several years to recruit these trained personnel in the numbers needed to keep up with its needs; however, this is but a local reflection of a general nationwide situation.

During the past year the Department conducted its own training program in the following categories :

- (1) Administration and Management. Planning, organizing, motivating, coordinating and controlling.
- (2) Materials and Tests. Asphalts, concrete, and soils.
- (3) Construction. Field administration, authority and responsibility of the inspector, planning work and keeping job records.
- (4) Maintenance. Administrative problems, organizing and planning work, relations with others, safety, and related subjects.
- (5) Roadway Design. Drainage, soils, rigid pavements, flexible pavements, traffic, and the preparation of plans.

Eighty training sessions were held and attendance was kept below 25 in order to have homogeneous grouping of the personnel and to create an informal atmosphere.

Inservice training programs were inaugurated to further the training of new graduate engineers and technical personnel. A policy was adopted of reimbursing employees for completing approved educational courses outside of the Department program, on their own time.

As of June 30, 1961, there were 1,131 employees, of whom 724 were engaged in maintenance, 390 in construction,



In-service training session.

and 17 in mosquito control. There were 53 professional engineers, and a total of 288 more employees than in 1951.

A personnel manual is now being prepared which will define all jobs and the qualifications necessary for each position.

In August 1960 a group of employees was chartered and formed the Delaware Highway Federal Credit Union. Any employee and members of his family may join. All Federal credit unions are chartered and supervised by the U. S. Department of Health, Education, and Welfare. The members enjoy the benefits of insured savings, insured loans, low rates of interest on loans, and death benefits to heirs according to the amount of shares owned by the member. The first loan was made in February 1961 and to date the credit union has made loans totaling \$6,900.

Since 1951 the state population has increased by 126,968 and the number of motor vehicles has increased by 83,446, which represents an increase of 657 motor vehicles per thousand of population increase. At the same time the number of employees of the Department increased by 3.4 per thousand vehicles. Based on this, by 1980 the motor vehicle registration should increase by 259,000 and, in turn, should

indicate the need for 900 more employees. This may be conservative since Delaware is changing from an agricultural to an industrial community. The expected impact will require additional suburban development construction and considerable widening of existing highways, with relatively high maintenance costs as the result of the added traffic volumes.

In December 1960 the Department rented an IBM 1620 Data Processing System to be used by the newly-activated Electronic Computer Section. Due to the rapid development which has occurred in the field of electronic computers obsolescence comes quickly, hence renting is standard practice among most users of the equipment. The computer is used to solve engineering problems, and if used constantly will enable the engineers and technicians to reduce the time spent on tedious and repetitious computations by as much as 85 percent. It is hoped that the use of the computer will offset the anticipated shortage of professionally trained men.

HISTORY OF CHANGES WITHIN THE STATE HIGHWAY DEPARTMENT

By 1903 the automobile had gained such prominence that the General Assembly passed the State Aid Law, the first Delaware law designed to improve the roads. This provided for joint state-county financing of new road construction; the law was repealed in 1905.

In 1911 a group of citizens led by General T. Coleman du Pont was granted permission to build a boulevard running the length of the state. General du Pont's plan was for high-speed and low-speed travelways separated by parkways, a trolley line down the center, and provision for the construction of utility lines. However, a more modest single travelway was built first as the start of the project. It was built at private expense and donated to the State as the various sections were completed.

In 1917 the Highway Department was created by the legislature to manage the state's growing road net. The first Department consisted of five members, the Governor being *ex officio* chairman. In 1921 the legislature changed the chairmanship to the Secretary of State, *ex officio*. In 1924 the chairman's position was changed again, to be filled by one of the members, elected by his colleagues, and the Secretary of State became an *ex officio* member of the body. Another change, in 1929, found the Governor back again, this time

as an *ex officio* member, instead of the Secretary of State. Beginning in 1938 the chairman was elected from the membership and there were no *ex officio* members.

In 1940 the General Assembly increased the membership from 5 to 7 by adding 2 new members. Two members represented each county and a single member represented the City of Wilmington. The Department at that time had the responsibility for the highway maintenance and construction, the State Police, the Motor Vehicle Division, and the Mosquito Control Division activities.

In 1955 the membership of the Department was restored to 5, again by legislative action.

In 1956 the Department membership was changed to 12 by the addition of 7 more members. In this arrangement 4 members represented each county.

In 1961 the Department was completely reorganized by the legislature. A new 11-man commission was selected, 4 members for New Castle County, 4 members for Sussex County, 3 members for Kent County, and the chairman is appointed at the pleasure of the Governor.

CHRONOLOGICAL HISTORY OF SOME IMPORTANT EVENTS OF THE DEPARTMENT DURING 1960-1961

July 1960 — Legislation was enacted to raise the speed limit on divided highways from 55 miles per hour to 60 miles per hour in daylight and 55 miles per hour at night.

The first steps toward the construction of another bridge, to parallel the present Delaware Memorial Bridge, between Delaware and New Jersey were taken by the Interstate Highway Division as it authorized studies in this regard.

August 1960 — A barge loaded with concrete pipe broke its towline and crashed into pilings at the north end of the Charles W. Cullen Bridge at Indian River Inlet. Although the damage was relatively light, the accident occurred during the height of the tourist season and caused many traffic jams because the bridge was limited to alternating one-way traffic as a safety measure.

September 1960 — The Traffic Section placed warning signs

on all the roads of the State, "Speeders lose privileges, 1st offense 30 days."

The Shell Oil Company brought a group of 14 foreign engineers to visit various asphaltic concrete projects in the State.

Mr. Charles D. Murphy, head of the Mosquito Control Division, announced that lack of funds caused him to discontinue aerial spraying. However, a total of 100,000 acres had been sprayed in August.

The Department was advised by its attorney that it is not responsible for drainage beyond that which affects the road or beyond that which has been altered because of the road.

Hurricane "Donna" struck this area, causing much damage.

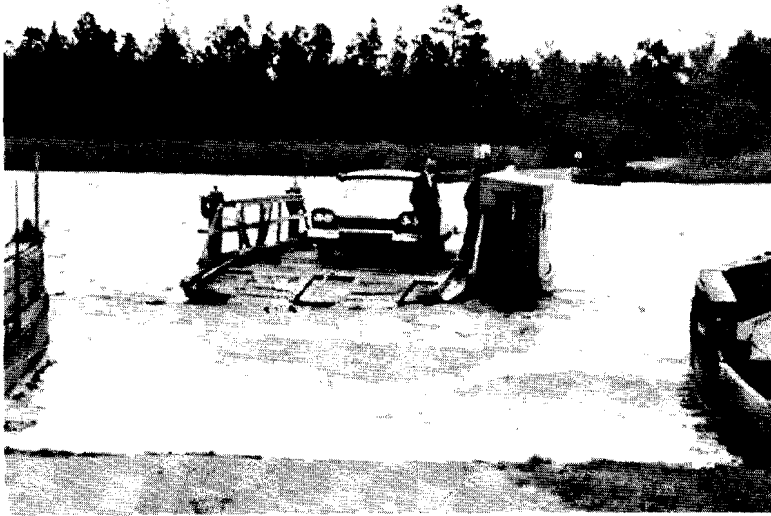
October 1960 — A recent court decision in a traffic case resulted in a Department resolution to the effect that STOP signs, directional signs, traffic lights, and school warning signs require the direct approval of the State Highway Department in each individual case.

November 1960 — A plan to build a toll road connecting the Memorial Bridge with the Maryland section of the Interstate highway was announced by the Chief Engineer. He said that under present Federal Aid plans the road could not be completed until around 1970, while a toll road could be built with bond money and be in operation by 1964.

The Chief Engineer urged that State motor fuel taxes be earmarked for use by the Department in order to relieve this agency of having to depend upon legislative action for all funds.

December 1960 — The first snowstorm of the season brought five inches on December 11 and three more inches on the 12th. Although no more snow fell during the month, the cold weather prevented much melting; by December 22 it had only reduced to five inches. Department estimates on December 15 indicated that it would cost about \$260,000 to remove the snow then on the roads.

The Planning Division made arrangements for the Department to contract for 125,000 copies of the latest tourist map for free distribution.



The old ferry at Woodland, southwest of Seaford.



The new ferry, "Virginia C," crossing the Nanticoke River at Woodland.

The Attorney General released an interim report on his investigation of the Highway Department. The main charges were: lack of project control with excessive overrun conditions; misuse of Federal Aid funds; conflict of interest activities; faulty accounting procedures; and other alleged improprieties.

January 1961 — A resolution was passed by the Department banning acceptance by any member or employee of the Department from any person or firm having business dealings with the Department of any sort of gift of any value whatsoever.

A new type of traffic control device was installed on Governor Printz Boulevard at Clifton Park Drive in New Castle County. It is actuated by infrared light instead of the usual treadle-type switch.

The Department approved a list of proposed changes in Department policies, procedures, and requirements, most of which are a direct result of the Attorney General's report.

Two more inches of snow fell on January 15; and on January 23 another 9 inches blanketed the State, especially in New Castle County.

February 1961 — On February 2 Mr. Richard A. Haber submitted his resignation as Chief Engineer, to be effective on March 1.

A professional diver inspected the pilings of the Charles W. Cullen Bridge at Indian River Inlet.

March 1961 — Road repairs for winter damage were estimated at nearly \$5 million. Over \$2 million was declared as being needed immediately so the roads could be salvaged and used before further deterioration occurred.

A bill was presented to the General Assembly to change the name of the new boat at Woodland Ferry from "Virginia C" to "Woodland Ferry." On March 17 the "Virginia C" took her inaugural trip.

Projects amounting to \$70 million were approved by the Department, and funds in the amount of \$26.6 million for the State's share were requested from the General Assembly.

The Department received \$1.3 million from the Interstate Highway Division for part of the State's share of costs

incurred in the construction of approach roads to the Delaware Memorial Bridge.

April 1961 — On April 25 legislation was enacted reorganizing the State Highway Department. The new law provides for an 11-man board, a Director of Operations, and a Controller.

On the 27th the legislature approved a \$26.6 million bond issue.

May 1961 — Contracts FAI-1(21-1), FAI-1(23), and FAI-1(24) were advertised for the construction of the Christina River Interchange, where the Interstate Route will connect south of Wilmington.

Contracts were let to repair winter damage to roads. The \$1.3 million received from the Interstate Highway Division were used for this purpose.

The 5th Annual Highway Day was celebrated in Delaware.

June 1961 — On June 7 the Department made the following appointments:

William J. Miller, Jr., Director of Operations
Ernest A. Davidson, Chief Engineer
James J. Deputy, Controller
Russell W. Whitby, Motor Vehicle Commissioner
Benjamin Ableman, Member, Delaware Interstate Highway Commission

On the 20th the ten new members of the Department were confirmed by the Senate.

On the 26th award of the Department's largest single highway project, FAI-1(21-1), (23), and (24), was made to C. J. Langenfelder and Son, Inc., of Baltimore, Maryland, at the low-bid price of \$12,977,428.99.

PUBLIC RELATIONS

The Department has a continuing, all-important responsibility of keeping the public informed of the Department's programs and progress. The State Highway Department is a large and complex state organization. Its importance is felt

all over the state. Imagine the chaotic conditions we could expect if our snowplows never did get on the road; or, if for some reason all traffic stopped, even for a single day. No mail, no food, no visiting, no living would be the result. Our Department and its functions are indeed extremely news-worthy activities.

The Public Relations Section news releases are forwarded to 4 daily papers in this state and to 4 metropolitan newspapers in nearby states. Copy is provided regularly for weekly newspapers, 10 radio stations, and 8 magazines. A total of 331 news releases were issued during the past year, in many cases with photographs. Many other news releases were issued to individual papers for local news. Other news releases appeared a number of times in trade magazines of national circulation. The photographic laboratory supplied the pictures to accompany the news releases. The photographic personnel also showed films and slides about the Department's work on dirt roads and beach protection work at the request of local civic organizations.

A complete photographic record is maintained for the Department of construction work, existing conditions, right-of-way problems, experimentation, and tests.

II. ACTIVITIES OF THE ENGINEERING SECTION PLANNING AND DESIGN DIVISION

The Planning and Design Division coordinates the activities of the Road Design Section, the Bridge Section, the Right-of-Way Section, the Planning Section, and the Utilities Section with the other sections of the Department which are concerned with any aspect of contract plan preparation.

Upon completion of the plans they are assembled with proposals, special provisions, right-of-way agreements, and other factual information which are then forwarded to the Federal Aid Section.

Road Design Section. The Road Design Section designs, reviews and approves all plans for road construction on Interstate, Primary, Secondary, and Tertiary roads. Consulting engineering firms engaged for certain projects work with the Road Design Section.

Tables III, IV, and V show various categories of projects processed through this Section.