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**DIRECTOR  
OF  
OPERATIONS'  
REPORT.....**

## PLANNING

Constructing a highway is an expensive and complex effort. The highway system must serve the greatest need in an efficient manner. To insure a transportation system that meets not only present but future needs, it is necessary to determine overall goals and to develop a master transportation plan. The master plan has as its central focus the safe and economical movement of persons and goods necessary to obtain and to preserve the maximum satisfaction and benefit from planned land development. Land use and transportation are directly related and inseparable.

The New Castle County Land Use and Transportation Planning Program, and independent planning organization created in 1964 by the Highway Department and other State, County and Local agencies, was designed to meet these challenges. In the spring of 1966, the Highway Department applied this planning approach to Kent and Sussex Counties as well. It was felt that a statewide transportation plan is the only logical basis for purposeful fiscal scheduling of construction projects. The State Highway Department wanted to insure provision of maximum benefit for the capital outlay involved in highway construction.

Planning for both studies required gathering massive amounts of data during the first year of operation covering such items as population, employment, land use, capacity and travel characteristics. During the second year, the New Castle County Program placed major emphasis on tabulation and presentation of this data.

Considerable progress was made on the planning portion of the overall program with continued work on projects concerning land development analysis, mass transit analysis and the determination of overall transportation goals and planning policies. The present highway system was carefully analyzed and such items as traffic volume, speed of travel, capacity and adequacy of each highway link in the entire network were determined to serve as a basis for future highway planning.

During the next fiscal year, the Program will convert the tentative comprehensive 1985 land use plan prepared by the New Castle County Regional Planning Commission into travel demand forecasts. Several alternative highway and transit system proposals will be tested by means of computer traffic assignments, and highway plans and transit plans will be determined.



*Improved intersection design provides the safety and convenience of a right-turn lane.*

These plans will help qualify the region under terms of the 1962 Federal Highway Act and enable the program to phase into a continuing, comprehensive and cooperative planning process.

As part of the normal highway planning operation, the description, condition and use of the nearly 4300 miles of State maintained streets and roads are continually revised to reflect current conditions. A program of counting the amount and type of traffic on all State maintained roads is conducted to obtain information necessary to evaluate route locations, geometric design, pavement thickness design, intersection design, traffic control measures and project priorities.

### SAFETY

Since January 1, 1963, an inventory of all accidents occurring on State maintained roads and streets was maintained indicating the type of accident, location, surrounding roadway characteristics, and many other details. A four-year safety spot improvement program was prepared from the accident data. A sufficiency survey was made which compared existing roads with desirable standards and evaluated how well each road measured up to the standards. Recommendations of the sufficiency survey, special needs studies, plus the results of the transportation studies are the basis of future capital improvements programs.

### CAPITAL IMPROVEMENTS PROGRAM

Every year, the 6-year Capital Improvements Program is reviewed, modified and updated. Construction and right-of-way acquisition costs are checked and the sequence of project timing is reviewed. The recommended highway improvements program excluding Interstate System for Fiscal Year 1968, is \$27,895,000 in State Funds, plus \$4,250,000 available in Federal Aid matching, for a total of \$31,845,000.

A recent long range study of the total highway needs from now to 1985 showed that total needs, exclusive of the cost of completing the Interstate System, is \$628 million at 1962 construction costs or an average annual need of \$37 million per year.



*The complexities of design are revealed in the drawing.*

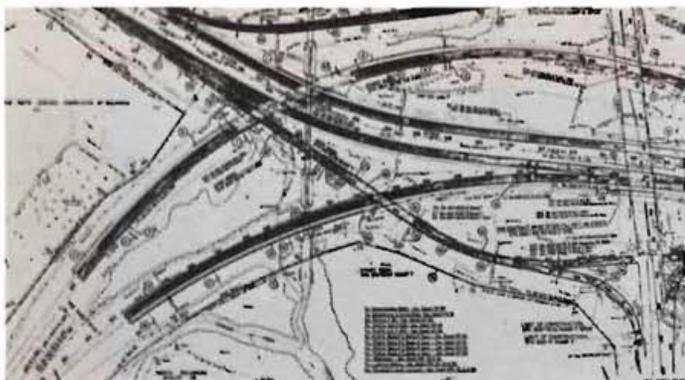
*Relocation of utilities proceeds on a highway widening project.*

*Right-of-Way negotiators discuss the acquisition of a parcel of land needed for highway expansion.*

## ROAD DESIGN

Design on 39 projects with a combined estimated construction costs of \$6.7 million was completed by the Road Design Section this year. The work ranged from small drainage studies to major highway reconstruction projects.

Responsible, too, for the acceptance of suburban streets into the State maintenance system, the Section approved plans for 17.75 miles of streets in 31 developments, and accepted 14.24 miles of completed streets into the system.



## RIGHT OF WAY

"Your property and the Right of Way," a pamphlet designed to acquaint property owners with the processes involved in acquiring private property, is credited with facilitating the work of the Right of Way Division's negotiators.

The successful acquisition of 1,399 parcels of land required for highway construction this year reflects not only the fine work of the 12 negotiators, but the cooperation of property owners who are aware of the State's fair approach to value and damages. Only 12 of the total acquisitions reached the trial stage.

## UTILITIES

Utility relocations and adjustments on road projects requires the careful advance planning of the Utility Division and its coordination not only with the various utility organizations but on an inter-departmental basis as well.

Throughout the life of a project, the Division reviews and approves all changes, prepares cost figures, processes preliminary and final estimates, and arranges for payment.

To stress the significance of the Division's responsibilities, 115 miles of mains, power lines, sewers, and conduits were adjusted or relocated during the fiscal year as work on I-95 progressed.

## MATERIALS and RESEARCH

Thousands of tests are performed each year by the Materials and Research Division to determine the most efficient and effective materials for highway use, and to maintain quality control of the materials as they are incorporated into the work.

Research is being conducted, for instance, on the use of modern synthetic rubber joint sealants to develop a long-lasting sealant which will keep these joints free from the intrusion of soil and other foreign materials.

The laboratory takes advantage of the most advance techniques and equipment to facilitate testing procedures. One example, shown left, is the nuclear moisture-density equipment which has performed 240 tests during the year accumulating experimental data which will eventually eliminate time consuming conventional testing procedures.



## CONSTRUCTION

Maintaining a state-wide quality control both on Departmental construction work and contract projects is the chief function of the Construction Division.

Division personnel assist in the review of all preliminary data and attend preconstruction meetings held with the contractor and utility representatives. From the time the "Notice to Proceed with the Work" is issued until completion of the project, division engineers review and audit all reimbursements to the contractor, coordinate contract changes, inspect work progress and act as construction consultants if help is requested. When the final field inspection is complete, a recommendation for acceptance or rejection is issued by the division.

Sixty-seven contracts were completed and accepted for a total of 161.2 miles (excluding the Turnpike Division) during the past fiscal year.

## BRIDGES

The Bridge Division's primary responsibilities are design of highway bridges (as shown under construction) sign and pedestrian bridges, culverts, retaining walls, water control structures, impoundments, and other related installations. The Division also serves as construction and maintenance advisor on these facilities. (The photo above shows a bridge design problem involving drainage control.)

Bridge Division designs were included in 24 of the projects for which bids were taken during the fiscal year including 35 new bridges and culverts, widening or repairs to 10 existing bridges, two combination bridge and dam structures, three mosquito control impoundments, and a bridge soil exploration contract.

Although a large percentage of the design work is performed by consultants, conformity to highway standards is maintained with Division personnel acting as construction and maintenance advisors on these facilities.

# MAINTENANCE and EQUIPMENT

Once a highway has been committed to public use, the type of service it performs depends largely on how well it is maintained.

The never ending job of the maintenance forces includes patching the roadway, preparing shoulders for resurfacing, spreading calcium chloride for dust control, spraying chemicals for roadside weed control (as shown), correcting drainage problems, surface treating roads, repairing bridges, removing litter from highways and beaches, and maintaining rest areas. The summer mowing program is replaced in winter with snow fence erection and maintenance as well as sanding and plowing during snow storms.

Aside from these routine tasks, maintenance personnel have the responsibility of planting and caring for trees and shrubbery along the highways and in rest areas. In Kent County this year, 100 Crown Vetch plants and 175 Seafoam roses were planted along U. S. 113 and Road 403 and 100 flowering crab apple trees on U. S. 13. Landscaping commenced on Dual Route 13 from Delmar to Road 46 in Sussex County. In New Castle, a rose garden was laid out at the picnic area south of Old Drawyers on U. S. 13.

In Sussex County, sand dune restoration continues to require maintenance division time. Since the 1962 storm, these dunes have been restored to a height of 18 feet above mean sea level through the use of a series of fences, grading operations and dikes built with earth-moving equipment.

Vegetation is planted and encouraged to further stabilize the dunes.

Another special project is the improvement of all secondary road bridges. Where practical, substandard structures are being replaced with pipe. Repair or replacement of bridge decks, railings wingwalls and guardrails has been accomplished at many locations.

Continued emphasis has been placed on safety during the year. In addition to regularly scheduled safety meetings, literature, safety displays and equipment are supplied to maintenance personnel.

*A picnic area was developed north of Dover at the intersection of Route 13 and Road 154. The wooded site was cleared of undergrowth and planted with grass seed. A pump well for fresh water was placed under an attractive shelter constructed from pine trees. An enclosed cabinet to contain information was furnished, and picnic tables, swings, see-saws, barbecue cooker, trash barrels and saniary facilities were installed.*



# TRAFFIC

## TRAFFIC ENGINEERING

The Traffic Division is basically an operational division, but there is also a direct need for strong human engineering know-how to make a functional unit out of the highway and the driver.

The operational activities provide information that can be used by the engineering staff to improve the functional aspects of highway design during any reconstruction program. The information has been used increasingly in the recent past to implement the Department's Intersection Improvement Program, and in the review of all construction projects.

## TRAFFIC SIGNALS

A new traffic — adjusted and coordinated signal control system has been put into operation on the Dover Bypass. (See below, left) A similar system has been installed at Wilmington Manor on U.S. Route 13. This system employs electronic circuits to compute and evaluate traffic information provided by sampling radar detectors placed on the major street. Based on this information, it then, selects one of the previously programmed coordinated signal settings best suited to the traffic conditions on the major highway.

## IMPROVED GUIDE SIGNING PROGRAM

In the past, the unfamiliar driver seeking a minor intersecting road along our main highways, had little information upon which to make a decision. This lack of advance warning on our modern high speed highways resulted in indecision which in turn created a serious accident hazard. A program is being initiated on all the important highways whereby all side and crossroad signs will carry the name or number of the upcoming road on an auxiliary plate below the warning sign so

as to give adequate advance warning. These signs should eliminate the undesirable lane changing and reduce the rear end collision hazard which previously has been associated with right and left turn movements at such locations. (See center, below).

## INTERSECTION CAPACITY IMPROVEMENT PROGRAM

The Traffic Division is currently investigating arterial urban routes such as the Philadelphia Pike and Maryland Avenue to pinpoint areas for accelerating traffic flow with even greater safety. Once this is determined, parking is being removed on one or both sides of the highway, and left turn storage lanes are being provided through the use of painted median areas. In locations where this already has been accomplished, the results show that the accidents and congestion have been significantly reduced. In addition, this has been provided at a reasonable cost.

## CROSSOVER IMPROVEMENT PROGRAMS

The increase in traffic over the past five years on main routes has caused a change in thinking due to the rear-end collision hazard that was developing at crossovers. In most cases, even if the crossover could store one vehicle, a back-up of waiting left turn vehicles was occurring in the high speed lane.

Since the breakthrough on the Kirkwood Highway Improvements Project which eliminated many crossovers and provided locations where a protected left turn storage lane was available for either left or U-turns as shown in photo at left, the Traffic Division is investigating such arterial routes as U.S. Route 13 and the Concord Pike to see if this concept is also applicable. Where crossovers are necessary, left turn lanes are being designed so that all concerned may reach their destination with the maximum of safety.



*Adams-Jackson Street excavation cuts swath through Wilmington.*

*Earth-moving operations going on at the huge cloverleaf just north of the Wilmington line on U.S. 202.*

*Construction on Naaman's Interchange nears completion.*



## **FREEWAYS and INTERSTATE**

With the completion of the viaduct north "Off" ramp at Maryland Avenue and south "On" ramp at Lancaster Avenue, the first direct Interstate Route connection with the City of Wilmington and uninterrupted traffic to and from the City of Baltimore became a reality.

Nearing completion is the Adams-Jackson Streets excavation, the depressed section of mainline I-95 through Wilmington.

The graceful arches of the now completed Brandywine Creek bridge leads into the northern section of I-95 generally paralleling the Baltimore and Ohio Railroad to the Pennsylvania Line.

Five major contracts were in progress on this section during the fiscal year the first, extending construction from the Brandywine Crossing to Marsh Road and includes, in addition to excavation, paving between Brandywine and Concord Pike, the 18th Street bridge and the B & O Railroad Bridge over I-95 and two northbound off ramps to serve Concord Pike.

The second, involves excavation between Marsh and Harvey Roads. Grade separation for rail and vehicular traffic along with a full interchange at Marsh Road and a partial interchange at Harvey Road is included in the third contract.

Naamans Interchange is the fourth contract active in the Brandywine to Pennsylvania line area. During the year seven highway bridges, four large box culverts, the relocation of one mile of stream, the excavation for two miles of four-lane highway and one mile of interchange ramps were substantially completed.

Toward the end of the fiscal year, the fifth contract extending a distance of 2.23 miles from the Pennsylvania line was awarded for paving the area of the entire Naamans Interchange and the construction of dual bridge over Glenrock Drive.

It is anticipated that the entire I-95 Route will be completed and in service by the close of the 1968 Construction season.

# BEAUTIFICATION

The "Federal Highway Beautification Act of 1965" has been the primary contribution to the increased emphasis on roadside development activities throughout our nation. Although there has been some significant work accomplished in the past, the above Act signed into law by President Johnson in October 1965 has provided the long needed item of specific allocations of funds for beautification purposes. As a result of this law our State received \$234,642 to expend for beautification purposes during the fiscal year ending June 30, 1966.

Our State's share of the federal beautification funds was allocated for the following projects:

Approximately \$85,000 was used to purchase four safety rest area sites, two near Delmar, one near Lewes, and another at Smyrna.

Two contracts for landscape plantings in the median of U.S. Route 13 from Delmar to approximately one mile north of Harrington are being financed with \$34,000 of the Federal funds.

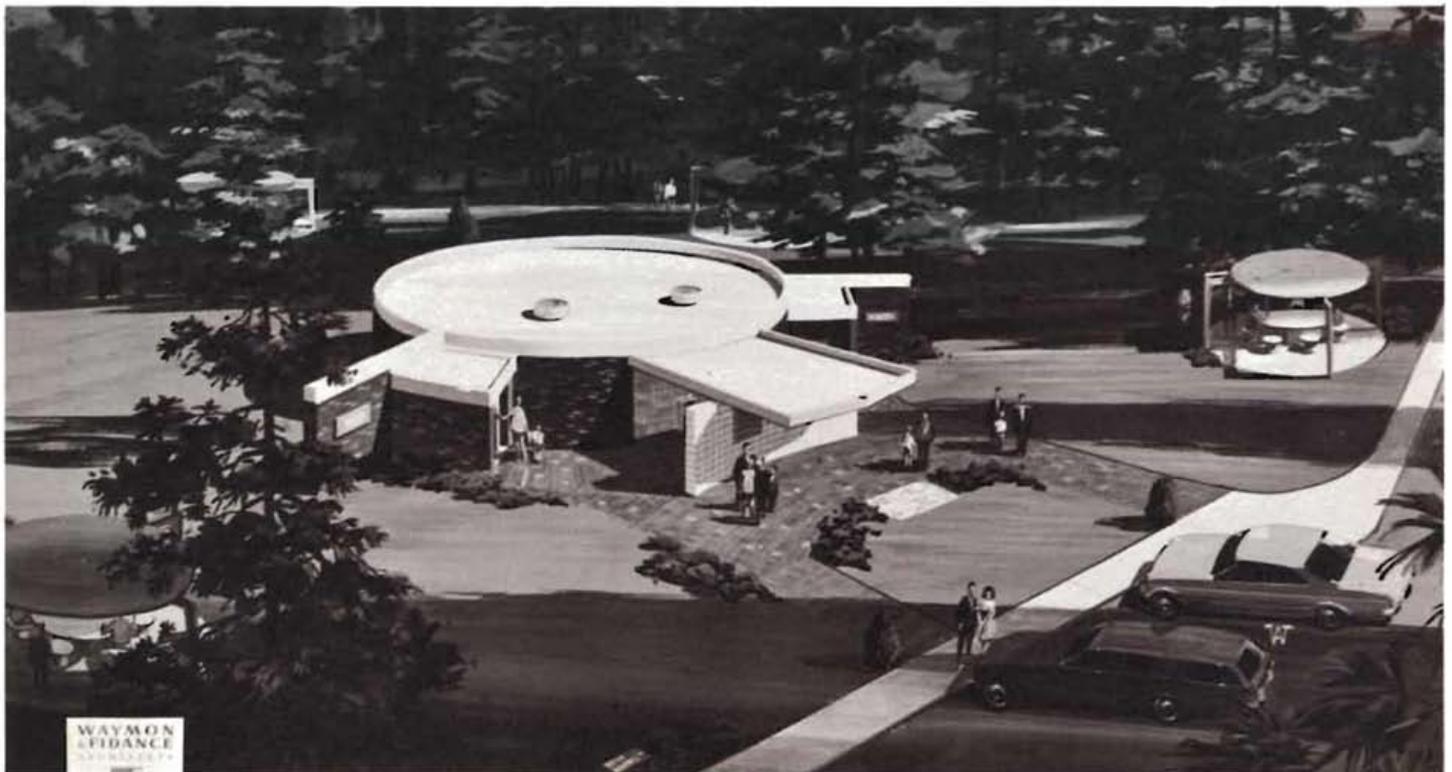
The purchase of a scenic strip of land consisting of a little greater than 10 acres located adjacent to the

southbound land of U.S. Route 113 just south of the bridge crossing the Murderkill River was accomplished for approximately \$15,000. It is hoped that more funds will be made available for the preservation of natural scenic strips of Delaware's landscape.

A safety rest area site north of Smyrna on U.S. Route 13 is being developed at a cost of approximately \$100,000. The area includes deceleration and acceleration lanes, paved parking areas curbing, selective clearing and grubbing, and seeding and mulching. Other parts of the complex are a sanitary disposal system, a rest area building, lighting, picnic tables and charcoal grills. (See below).

In addition to these specific beautification projects, the office of the staff Horticulturist is engaged in the continued development of "Plant Materials for Delaware," the listing of materials indigenous to our State including plantings suitable for problem areas.

General specifications concerning planting, seeding, mulching and maintenance of all state highway landscaping are being developed into a workbook for maintenance personnel.



# MOSQUITO CONTROL



A \$2 million permanent mosquito control program that included ditching and impounding was signed to the Engineering Division. Experienced personnel from the Mosquito Control Division were on loan to Engineering to aid in coordinating and supervising the contracts. Mosquito Control itself cleared or dug 441,000 feet of new ditches. The larger part of the ditching operation was performed in Sussex County. (Shown above).



A total of 291,000 square acres was sprayed by aircraft representing an increase of 18% over the previous year. Kent County received the largest share of these operations (60%). As in the past, helicopters only were used in New Castle County where industrial and utility installations prevent the safe use of fixed wing aircraft. Among other new equipment, fogging machines were purchased to supplement the work of the aircraft. (Shown above).

## PERSONNEL



# CONTROLLER'S REPORT



The past fiscal year has witnessed many improvements in the accounting system. One of the major efforts initiated by the Office of Controller was in the area of data processing, a function in which this office has been a pioneer within the State. All divisions of the Department were utilizing data processing in some manner. However, each division had proceeded separately and with no apparent centralization. With the advent of the third generation computers, the Controller became convinced that it would now be feasible to approach the problems of accounting, engineering, motor vehicle files and law enforcement on one computer installation.

Aware of the many problems involved, the Controller requested and received permission from the Department's finance committee early in July, 1965, to launch a feasibility study on centralization of highway data processing activities. All divisions of the Department, when contacted, expressed interest and approved this

plan in principle. At the conclusion of the preliminary study the Controller, with the concurrence of the other divisions, proposed that the Department proceed with the centralization of its data processing computer to be purchased to implement centralization. The Department granted approval to proceed with this plan on September 8, 1965.

An order was placed for an I.B.M. System 360, Model 30 computer configuration as recommended by the study group. An approximate delivery date of June, 1967, was set for the first portion of the installation with the remaining portion schedule for March, 1968. Recognizing the necessity for cooperation and technical assistance, it was recommended that each division assign a representative to serve on a technical advisory committee chaired by the Data Processing Administrator of the Controller's staff. With the formation of this committee, implementation of the centralization was instituted and is still in progress at this time.

The function of auditing, namely utility audits and internal audits, also were of prime interest during the past year. The Office of the Controller assumed responsibility for utility audits during the year and assigned an auditor to this program who was accredited by the Bureau of Public Roads. Recognizing the necessity for adherence to policy and accounting procedures, this office is in the process of determining an internal audit program for the Department.

Independence of the staff, concurrence of the Bureau of Public Roads, and staffing are several problems which must be solved in order to implement this program in Fiscal 1967.

Comparative Chart Showing Approximately 310% Increase in Dollar Volume of the Delaware State Highway Department Activities for the Years Listed

<i>Fiscal Year</i>	<i>Motor Fuel Tax (Net)</i>	<i>Motor Vehicle Division</i>	<i>Miscellaneous</i>	<i>Total Revenue</i>	<i>Total Disbursements</i>	<i>Federal Aid</i>
1955-56	6,762,179.66	3,743,623.03	277,240.30	10,783,042.99	14,619,165.92	2,486,186.12
1956-57	7,270,511.36	3,938,436.52	193,851.21	11,402,799.09	22,655,058.38	3,217,473.69
1957-58	7,855,131.83	4,207,224.78	355,224.13	12,417,580.74	30,355,218.52	4,957,382.41
1958-59	8,124,080.85	4,204,467.57	528,666.91	12,857,215.33	32,516,011.61	7,838,450.72
1959-60	8,417,059.19	4,387,121.01	660,562.71	13,464,742.91	28,533,698.89	8,230,602.78
1960-61	8,777,850.92	4,506,288.24	1,780,782.84	15,064,922.00	18,356,455.47	5,939,035.73
1961-62	10,283,014.55	4,768,093.69	625,856.40	15,676,964.64	30,203,987.08	4,699,879.00
1962-63	11,891,144.55	5,377,434.83	544,083.84	17,812,663.22	32,940,777.11	13,849,781.00
1963-64	11,792,816.01	5,596,065.86	736,180.00	18,125,061.87	33,683,418.75	12,314,211.00
1964-65	12,487,049.06	6,063,597.63	630,090.32	19,180,737.01	38,891,387.86	15,037,285.25
1965-66	14,902,522.64	8,256,907.29	848,904.53	24,008,334.46	43,664,125.09	22,072,471.93

## COMMUNICATIONS

Since the message volume on the Highway Network has increased to the point where the counties are interfering with each other, the network has been split into a county operation with New Castle and Sussex operating on the same frequency and Kent operating on a separate frequency to act as a buffer.

Obsolete equipment continues to be replaced with new equipment modified for compatibility with the new method of operation.

Three tower changes have been accomplished. The Small Boats Division has moved their operation to Fort Miles where a new tower is now in use. After an accident to the Bridgeville State Police tower, a new one was erected while structural defects caused the replacement of the Georgetown tower.

An important addition to the Civil Defense system was accomplished with the installation of an FM radio network connecting all County Emergency Operating Centers with the State Control Center at Delaware City.

Instant contact is also available with all key hospital personnel through installation of a radio paging system at the State Hospital.

