

## PLANNING & REVIEW

An example of the planning process utilized by today's pathfinder is the work of the Study Staff of the Planning and Review Section. During the past year, this group helped to provide New Castle County metropolitan area with a sound transportation plan.

The major work emphasis was on gathering the massive amount of data required for future analysis. This information was needed to describe and understand the location and movements of people and goods within and through the Delaware area. It will help predict probable shifts in the distribution of population as well as industries and commercial centers which may cause major changes in future traffic patterns.

The plan required ten major field surveys and a number of minor ones. The Home Interview Survey, for example, gathered information from nearly 7,000 households concerning population, economic and travel characteristics. The Roadside Survey interviewed over 75,000 operators of motor vehicles and determined the origin, destination and purpose of these vehicular trips. The Truck/Taxi Survey interviewed 2,000 operators of commercial vehicles in New Castle County.

Other surveys completed during the year include a Traffic Counting Program, a Travel-Time Survey, a Capacity Study and a Transit Survey. These surveys were designed to obtain information about transportation facilities, their speeds, the ability of these facilities to carry traffic both now and in the future. All the information obtained in these surveys was punched into over 300,000 IBM data cards for future data processing.

Prior to the design of an actual project, traffic information is collected and analyzed. The amount, type and weight of traffic that will use the road during design life is esti-

mated. Studies are made of traffic conditions in special areas to help make decisions affecting the planning and routing of the road.

The preliminary plan for a new project is prepared on the basis of study results and alignment surveys. The Highway Department may offer public hearings on the proposed route to give the people in the area, where property will be affected, the opportunity to study the proposal and offer comments.

See Table I  
Projects Advertised for Construction

See Table II  
Maps Available for Distribution

See Table III  
Mileage of Streets and Highways

*Master Map of highways in  
New Castle County.*



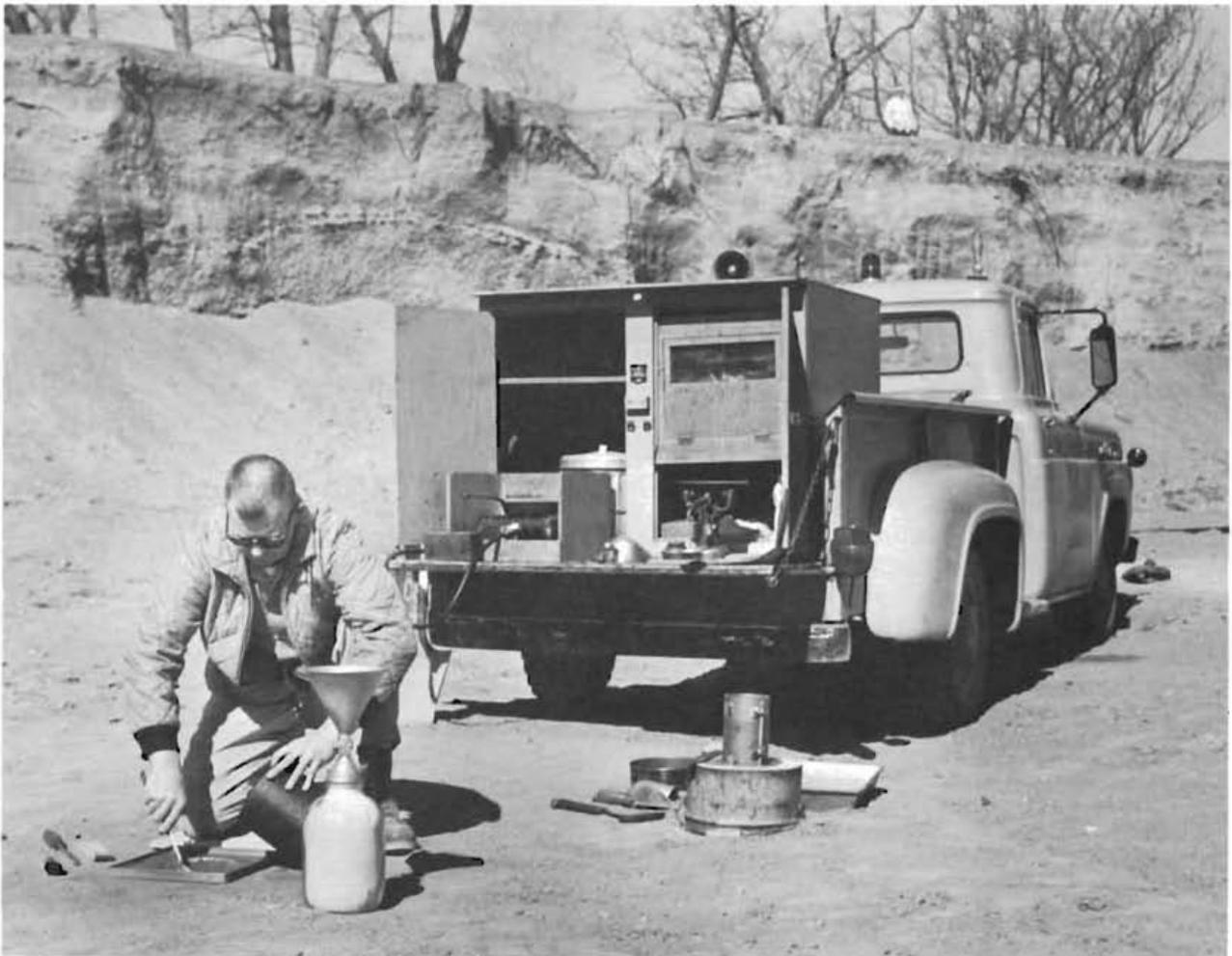
## MATERIALS & RESEARCH

Investigation of original soil and foundation conditions is the responsibility of the M. & R. Section, and tests are conducted along the proposed route before final designs are completed.

In addition, the Section inspects and tests the quality of materials for highway construction and highway maintenance.

This year, for instance, studies were conducted on the effect of entrained air in the strength of concrete during freeze-thaw cycles and chemical ice removal procedures. Data is also being collected by the use of Nuclear Moisture Density equipment on density and moisture content of soil embankment materials and density of asphaltic concrete pavement.

This year saw the completion of a materials manual prescribing standard specifications and outlining procedures for sampling and testing materials—a Delaware State Highway first.



*Before construction can begin, original soil and foundation conditions must be investigated.*

## ROAD DESIGN

Months, even years, of detailed work by engineering experts go into the creation of a new road or bridge. Thousands of individual items developed in the preliminary traffic countings, field inspections, surveys and studies must be considered.

The Road Design Section was responsible for the primary design of 34 projects during this fiscal year varying from small drainage projects to major highway construction for a total bid cost of 6.3 million dollars.

In addition to its function in design, the section is responsible for the acceptance of suburban streets into the State maintenance system. Plans and bonds covering 22.185 miles of streets in 38 developments, at an estimated cost of \$1,864,781 were approved during the year along with the acceptance of 17.35 miles of completed suburban streets.

See Table IV  
Projects Designed and Advertised



*The design of a new road or bridge takes months of detailed work by engineering experts.*

## RIGHT-OF-WAY

As soon as detailed designs are completed, the Right-of-Way Section begins the often complicated land acquisition process and is charged with protecting the rights of the landowner as well as the State. Appraisals are made on the basis of market value in comparison with comparable properties, with the original appraisal thoroughly reviewed by a review appraiser. If agreement cannot be reached within a suitable period of time, the State must then initiate condemnation proceedings.

This Section was also engaged this year in acquiring lands required for the approach to the Lewes-Cape May Ferry and for the second Delaware Memorial Bridge. Both projects used many man hours not directly related to Department projects.

As a result of training programs instituted in 1964, the appraisals prepared by the staff for the first time outnumbered those prepared by realtors on a fee basis.

Total expenditures were \$3,642,711 with the following matters processed: Option Contracts 792; Lateral Easements 148; Slope Easements 92; Corner Cut Easements 55; Temporary Easements 9; Ditch Agreements 105; Rights of Trespass 203; Borrow Pits 1; Staff Appraisals 332; Fee Appraisals 248; Deeds 379; Releases 184; Condemnations Processed 61; Condemnations Settled By Negotiation 24; Condemnations (Court Trial) 3; Road Closures 4; Descriptions 488; and Plats 270.

*Right-of-Way seminar, part of the training program for staff appraisers.*





*Twin bridges under construction as part of the Frederica By-Pass.*



*Aerial view of dual bridges crossing Murderkill River east of Frederica.*

*Frederica By-Pass nears completion. Part of the 2.02 miles of dual highway under construction can be seen in the upper right.*



## CONSTRUCTION

Delaware's highways constitute an outstanding example of American free enterprise system in action. Although highways are public property administered by the State Highway Department, they are built by private contractors through competitive bidding. Forty-seven such contracts totaling 85.05 miles were completed this year for payments totaling \$22,907,689.19.

The primary responsibility of the Construction Section is to achieve quality control in construction practice. Representatives are on hand for preconstruction meetings with the contractor and the utility company. Prior to the issuance of the official "Notice to Proceed With the Work," this group assists in the review of all preliminary data. Frequent unscheduled field trips are made to all construction projects to insure that work is proceeding properly. The Construction Section reviews and audits all reimbursement estimates to the contractor and checks for conformity and accuracy in all phases of projects including highways, bridges, retaining walls, drainage structures, buildings, beach facilities, mosquito control work and beach erosion restoration.

See Table V  
Contracts Completed and Accepted

## UTILITIES

The complexities of modern-day pathfinding include the relocation of such utilities as gas, water, telephone, sewer and electric services as well as an occasional railroad line.

Utility operations were increased this year because of the Interstate Highway Construction program. Seventeen utility agreements were prepared by the Section. During this period, forty-six estimates for adjustments and relocations to utility facilities on interstate projects were processed and submitted to the Federal-Aid Section of which forty-four have been approved by the Bureau of Public Roads for a total of \$1,712,816.

To expedite utility adjustments prior to road construction activities, a select material contract for the furnishing of back-fill material for utility trenches was implemented in New Castle County. First used on the Second Street project in Wilmington, the select material contract allowed utility organizations to begin adjustments several weeks ahead of starting construction. On a typically heavily populated urban street, each block represents approximately 150 utility service lines to be adjusted indicating the need for this type of advance planning.

In order to better prepare the contractor on proposed utility adjustments, special conferences are set up prior to preconstruction meetings. Field coordinating meetings are also held as needed on the job site with utility company personnel and Department representatives to coordinate movements of both utility and construction operations.

Another function of the section is the processing of franchise applications submitted by utility organizations to install facilities in state-controlled right-of-way. Six hundred and five applications were received and approved involving water mains, sewers, telephone buried cables, gas main, telephone and electric pole lines.

A new phase in utility cooperation was the coordination of various state agencies, Diamond State Telephone Company, and the Utility Section to complete the Educational Television System in conjunction with road construction throughout the State.



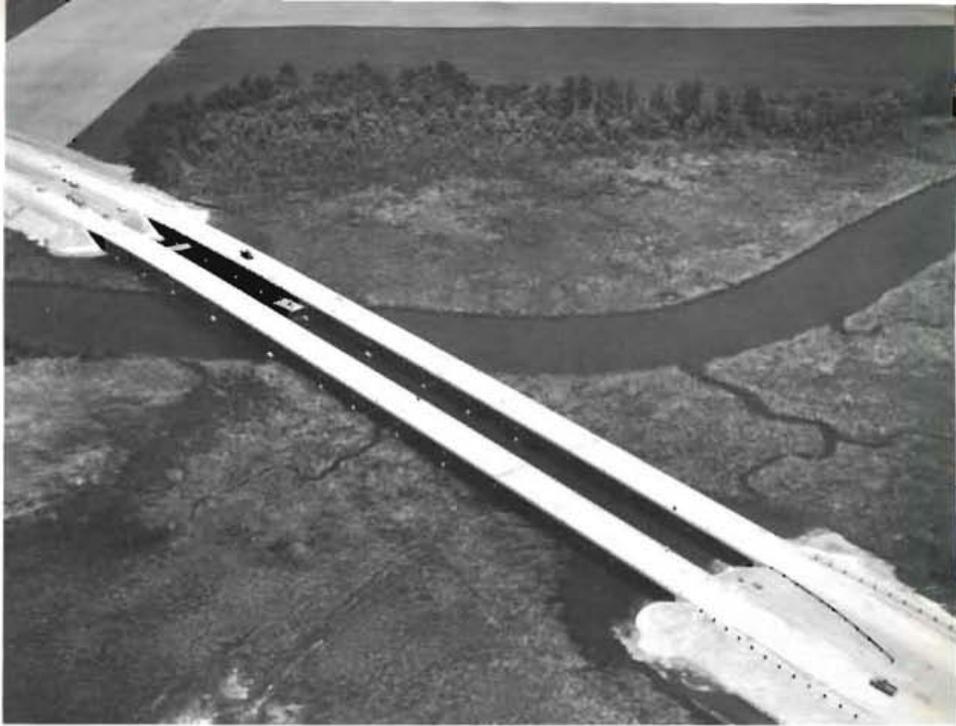
*Looking South from Naaman's Road.*



*Approach road to ferry at Lewes under construction.*



*Traffic begins to roll on the completed Frederica By-Pass.*



## BRIDGES

The image of a bridge that comes most readily to mind is a structure across a waterway. However, as in the case of all sections, the title is an oversimplification of the responsibilities. This section serves not only as the designer and construction advisor for highway bridges, but for sign and pedestrian bridges, culverts, retaining walls, impoundments, water control structures, dams and other protective structures. In addition, the Section serves as maintenance advisor to each of the county divisions.

To insure uniformity and conformity to highway standards, the Section is responsible for design even when handled by a consultant. However, an increase in staff this year to a total of seven designers along with plans to add two additional staff members next year, will result

in increasing number of design jobs handled internally.

For the fiscal year, the Bridge Section participated in advertising non-interstate structures including eight bridges and culverts totaling 1,100 feet in length, 14 bridge widenings, one millpond dam, one retaining wall and three bridge repair jobs totaling \$1,343,732. During the same period, the Bridge Section participated in advertising interstate structures including 14 bridges and nine culverts for a total length of 3,165.54 feet, retaining walls and a bridge deck at a construction cost of \$5,709,763.43. In addition, the signing of a major interchange was advertised at a contract cost of \$296,586.

See Table VI  
Construction Projects Advertised

*Water control structures are a Bridge Section responsibility. Engineers check work progress along Milford By-Pass.*



*Construction of a culvert on FAI and FAII between Wilmington and Claymont.*



*The graceful Brandywine Creek Bridge on Interstate I-95 located in Wilmington's Brandywine Park.*



*The dual Indian River Bridge on Route 14 nearing completion.*

