

The year of the bridges. Fiscal Year 1967-68 saw the opening of the Brandywine crossing of I-95, a new link with New Jersey, a renewed effort to inventory all bridges in Delaware as to age, condition, maintenance needs and evolutionary replacement needs. A noteworthy accomplishment of the Department's Bridge Division.

Engineering

FROM THE DIRECTOR OF OPERATIONS

I would like to briefly refer to some of the more significant events of the year and to make recommendations for consideration.

The many facets which effect the Department's operations have probably been subjected to more changes in the last five years than in all of the Department's previous history. The more significant among these are the many additional federal controls which highway departments have been subjected to by federal regulations. The time-honored partnership of the federal aid highway program which provided the Nation with 'the greatest highway system in the world has been all but lost in the ever-increasing usurpation of control by the federal government. While the changing requirements may have been well intended, the delays, the restrictions, and the time-consuming implementation procedures have materially slowed the federal aid construction program and effectively removed it from a state-federal partnership undertaking. Administrative cutbacks and the withholding of apportioned federal funds have made it impossible to adhere to an orderly schedule.

Apart from these frustrations, the Department was able to undertake the following which were among its major activities:

1. Interstate 95 completion - opened to traffic in its entirety.
2. Spot Safety Improvement Program - designed to improve locations of high accident incident.
3. Route 41 and 141 - Newport to Concord Pike - planning developed to stage that majority of route is now under design.
4. Railroad Crossing Protection Program - installing protective devices at many previously unprotected crossings.

5. Adopted new federal safety standards to be incorporated in design and construction.
6. Initiated a bridge inspection program to determine safety and adequacy of all highway structures.
7. Undertook replacement program for small unsafe or inadequate bridges.
8. Adjusted personnel classification system to comply with State Merit System.
9. Initiated "Project Control System" to better schedule various activities preliminary to project advertising and availability of funds.
10. Executed initial edge-of-lane paint striping program within limits of funds made available by Legislature.
11. Undertook a Statewide traffic sign review to determine status of compliance with National standards.
12. Executed contract with federal highway administrator for billboard control adjacent to highways.
13. Constructed State's first roadside rest with full facilities.
14. Initiated roadside junkyard control program subsequent to passage of State Legislation.
15. Executed Equal Opportunity Agreement with federal highway administrator.

RECOMMENDATIONS

I would recommend the following for the Department's consideration for better operation of the Department and better service to the State's motorists:

1. Encourage continuing and strengthening of the full implementation of the State Merit System.
2. Provide a continuing priority for the construction of routes 41 and 141 in New Castle County.
3. Continue programs to provide safety improvements at locations of high traffic incidents.
4. Sponsor legislation for billboard control in order to meet federal standards and to provide better appearing roadsides.
5. Sponsor legislation to meet federal requirements on Relocation Assistance.
6. Sponsor legislation to require greater financial participation by railroads in railroad crossing protection.
7. Provide greater emphasis on the recruitment of professional personnel.
8. Encourage legislation to provide fringe benefits for employees, hospitalization, insurance, etc.
9. Strengthen and further develop the project control function.
10. Strengthen right-of-way acquisition capabilities.
11. Advocate Capital Improvement Program to provide revolving right-of-way fund and less restrictions on funding limits on individual projects.

The Staff of the Department has been most appreciative of the support and encouragement provided it during this past year.

YOUR HIGHWAY ENGINEERING DOLLAR



Revenues



Expenditures

Roadside Development

The fiscal year 1967-68 saw a great deal of emphasis placed on roadside development and highway beautification as a result of both the State's interest in this area of responsibility as well as that of the Federal Government expressed in the "Highway Beautification Act of 1965."

The primary responsibility of this section began with the coordination of all agencies and divisions concerned with planning, construction, maintenance and administration of the State's highways to insure that the plant material is preserved, enhanced and displayed in a manner contributing to the realization of an economical, safe, well engineered, and aesthetically pleasing highway.

Recent agreements with the Federal Highway Administration covering roadside development controls in the area of junkyards and outdoor advertising have greatly increased the activities and responsibilities of the Roadside Development Section of the Delaware State Highway Department.

The Department is now fully involved in establishing a junkyard control program. Conducting a survey, informing affected property owners, and issuing licenses were the initial phases of this activity. House Bill No. 206, signed into law by the Governor on March 4, 1968, charged the Department with the responsibility to control the establishment, operation and maintenance of junkyards within 1,000 feet of most roads of

the highway system. The Roadside Development Section is responsible for fulfilling the Department's program of junkyard control.

The Department and the Federal Highway Administration entered into agreement for the control of outdoor advertising adjacent to Delaware's federal-aid interstate and primary highways on May 1, 1968. This agreement, to be followed by appropriate legislation, is designed to establish controls over the locations and manner in which outdoor advertising may be displayed. During this fiscal year, 2,505 permits were issued for outdoor advertising signs which represent, primarily, renewals with fewer new signs added this year than in past years.

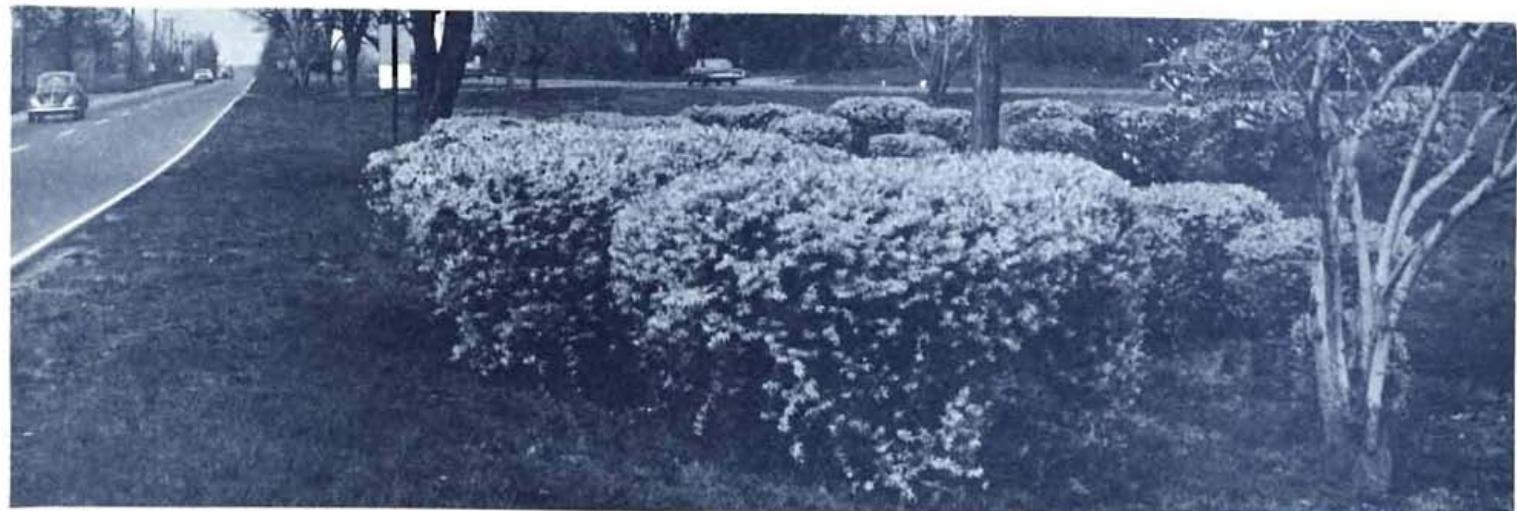
The addition of plant material to the roadsides with specific functions, such as, screening headlight glare, providing a crash barrier, delineating change of direction, screening unsightly views, acting as a dirt or noise abatement screen, and yielding scenic enhancement, coupled with the vast program of roadside maintenance, are indicating an expanding responsibility for roadside development as it finds its place in the over-all highway operations.

Through the coordination of the Roadside Development Section, various civic, garden and social clubs and organizations have participated in projects providing plantings adjacent to Delaware Highways. One of the more significant gestures of concern for highway beautification was expressed with the donation of 1,000 Bald Cypress seedlings that were planted in the vicinity of the Christina Interchange.

Due to these steadily increasing responsibilities of the Roadside Development Section, it became necessary during this past fiscal year to add personnel. For instance, a landscape technician, whose primary activities are the rendering of technical assistance on landscaping projects and assisting with maintenance functions related to plant material (trees, shrubs, grass, weed control, pruning, etc.), was employed in September, 1967. The establishment of this position has greatly aided the efficiency of the operations.

The two landscape planting contracts extending from Delmar, northerly on U.S. Route 13, to Harrington have both been completed and accepted by the Department. The landscaping of U.S. 113 (dual) from south of Milford to the Murderkill River Bridge was completed during December, 1967. Landscape plantings in the massive Christina Interchange (linking Interstate Routes 95, 295, and 495) are 50% complete and scheduled for completion by December 15, 1968. This is the largest single landscaping contract to date. There are over 29,000 trees and shrubs involved in this job bid at nearly \$180,000. The Smyrna Safety Rest Area should be completed during the fall of 1968. Design is underway for the landscaping of I-95 from Maryland Avenue in Wilmington to the Pennsylvania State Line, with work expected to be undertaken in 1969. It is hoped that construction can begin during the spring of 1969 for the area within the City Limits to include portions of Delaware Avenue. A separate contract is being prepared for street tree planting on Adams and Jackson Streets, Wilmington. This project should be completed by spring of 1969.

Roadside Development contributes to highway beautification as well as motoring safety such as these shrub planted in the median of U.S. 13 to act as a shield against headlight glare between oncoming vehicles.



Planning

The Bureau of Highway Planning acts as the guiding element in Delaware's roadbuilding process. While primarily a research and fact-finding function, it has been charged with the responsibility of formulating the recommended plans, schedules and controls for the Department in developing Delaware's highway transportation system.

To fulfill its primary responsibility, the following major planning activities are in continuous operation:

- (1) A comprehensive transportation planning process for both rural and urban areas considering present and anticipated community and area land development plans.
- (2) A study of the present physical and service adequacy of the highways, along with a forecast of future deficiencies.
- (3) A study of the long-range highway needs and the cost of providing an adequate highway system.
- (4) The Development of a 6-Year Capital Improvements Program, and in turn, the recommendation of a 1-Year Improvement Program for which funding is received.
- (5) The initial development of an effective scheduling and monitoring system to be utilized to trace project's progress from their initial conception to their construction.
- (6) The location studies of new routes and major upgrading of present considering such items as traffic demand, local impact, construction costs, engineering features and other pertinent factors.

To successfully carry out the planning functions of the Department, this office was expanded into the following sections:

- (1) Planning Support
- (2) Project Scheduling and Control
- (3) Planning Survey
- (4) Transportation Planning Studies
- (5) Advance Planning
- (6) Computer

The preparation of new Incorporated City and Town Maps was nearing completion at the end of the fiscal year. These maps are prepared at scales of 1" = 1000', 1" = 800', 1" = 400', depending on the area to be covered.

It is planned during the comming year to bind all 52 maps in folders, distribute them to the various offices in the Highway Department, the Bureau of Public Roads and place them on sale to the general public. These maps have proven to be very popular.

A Delaware Official Highway Map with a new look was prepared and sent to the printer. For the second year, the pictorial side of the map was prepared by the Delaware State Development Department. A total of 100,000 of these maps were printed and distributed by the State Highway Department and the State Development Department.

During the year, the Central Files Office was transferred to the Bureau of Highway Planning. Personnel of the Central Files Office have been primarily engaged in the screening and preparing older contract documents for microfilming. After microfilming, which is being accomplished by the State Archives, each image is checked for legibility and then placed in aperture cards for permanent storage and future reference.

Plans for extending this service are being considered. A feature used by a number of States is the method of microfilming current contract plans and using the microfilm in conjunction with special equipment to enlarge the image to any scale desired for reproduction. Construction plans are being reproduced one-half size of the plans now being produced in Delaware. Tests are underway to determine the feasibility of this application in Delaware.

A project has been developed in connection with the Bridge Design Section for rating all bridges. Both Kent and New Castle Counties have been completed.

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.

Manual vehicle classification counts were made at 36 intersections throughout the State to determine the proportion of types of vehicles on various types of roads. All of this collected data about the amount, type, size, and weight of traffic is used to locate, design, and operate the State Highway System.

A monthly summary of the results from permanent counter stations is printed and distributed. Annually, a summary of the results of the traffic counting program and a report of the truck weight survey is printed and available for interested persons.

An inventory of all accidents occurring on State roads is maintained presenting the type of accident, location, surrounding roadway characteristics, and many other details for each accident. A four-year safety spot improvement program, prepared in the previous year, is now underway. Most of the 1966 or 1967 safety spot improvement projects have been completed with a few under construction or design. In addition, a number of other safety spot improvement projects were added in 1966 and 1967.

During the past year, the "Existing Dover By-Pass Safety Improvement Study" was completed. The suggested improvements in this study were mainly based upon the type of accidents, location, surrounding roadway cultures, and other pertinent data.

"Delaware Accident Summary 1963-1965" has been prepared. This summary presents the exact location of accidents, number of accidents, number of accidents involving personal injuries, number of fatal accidents, and number of accidents per million vehicle miles of travel in all three counties of Delaware.

A sufficiency survey of the tertiary Highway system was prepared which compares the existing roads with desirable standards and evaluate how well each road measures up.

The results of Highway Planning are implemented by the formulation of construction programs. 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 or project timing is reviewed. A report including the recommended 6-year program is printed and distributed.

Under Highway Statistics, the Road Life Study determines the cost of operating the Highway Plant. From highway construction records the average life of various pavement types is determined.

An annual Fiscal Study of the Municipalities and Counties is made to report the receipts and expenditures of funds that relate to the construction, maintenance and administration of roads, streets, alleys, and other public ways; traffic police; debt service, status of bonds and other financial obligations related to the highway user; and the use of any surplus road and street funds for non-highway purposes.

There are 19 major comprehensive annual Statistical Tables prepared for the Federal Government, giving such information as Motor Fuel Consumption, State Highway Income, and State Motor Vehicle Registrations.

The New Castle County Land Use and Transportation Planning Program has been completed and is now in its continuing phase. Two years work has been applied to the initial Kent and Sussex Study; therefore, one more year may be anticipated before completion. Upon termination of the initial stage of the Kent and Sussex Study, it is intended to merge the two studies into one statewide transportation plan.

The guidelines for the development of the Project Scheduling and Control section as presented in a Management Study Report, were studied in detail and became the basis upon which our efforts were directed toward the initiation of an integrated highway management system.

During the past fiscal year ten engineering fee proposals were reviewed by the Advance Planning Section which resulted in engineering agreements being written and processed. Two route studies were performed and completed. Other projects in various stages of study are:

Project	County
12th Street, Wilmington	New Castle
Marsh Road	New Castle
Delaware 14, Rehoboth By-Pass	Sussex
East-West Connector, Dover	Kent



Planning of Delaware's highways must take into consideration the special requirements placed on pavements and bridges by longer and heavier than average vehicles which must utilize them.

Additional efforts were expended in determining an alternate corridor for a freeway between Limestone Road and Concord Pike in New Castle County; also, numerous exhibits, sketches and prints were prepared for informational purposes.

To assist in route location studies, new aerial photography was obtained by the Advance Planning Section. Areas covered by aerial photography in Fiscal 1968 were Harmony Road, Delaware Route 9 and the Dover area.



Road design must take into consideration property damage to the Department's new neighbors along the proposed routes which is the consideration of the Right-of-way and Road Design conferences held during various stages of development.



Road Design must make certain that the compromise between safety and space availability does not lean too far toward available space and fall short of minimum safety standards.

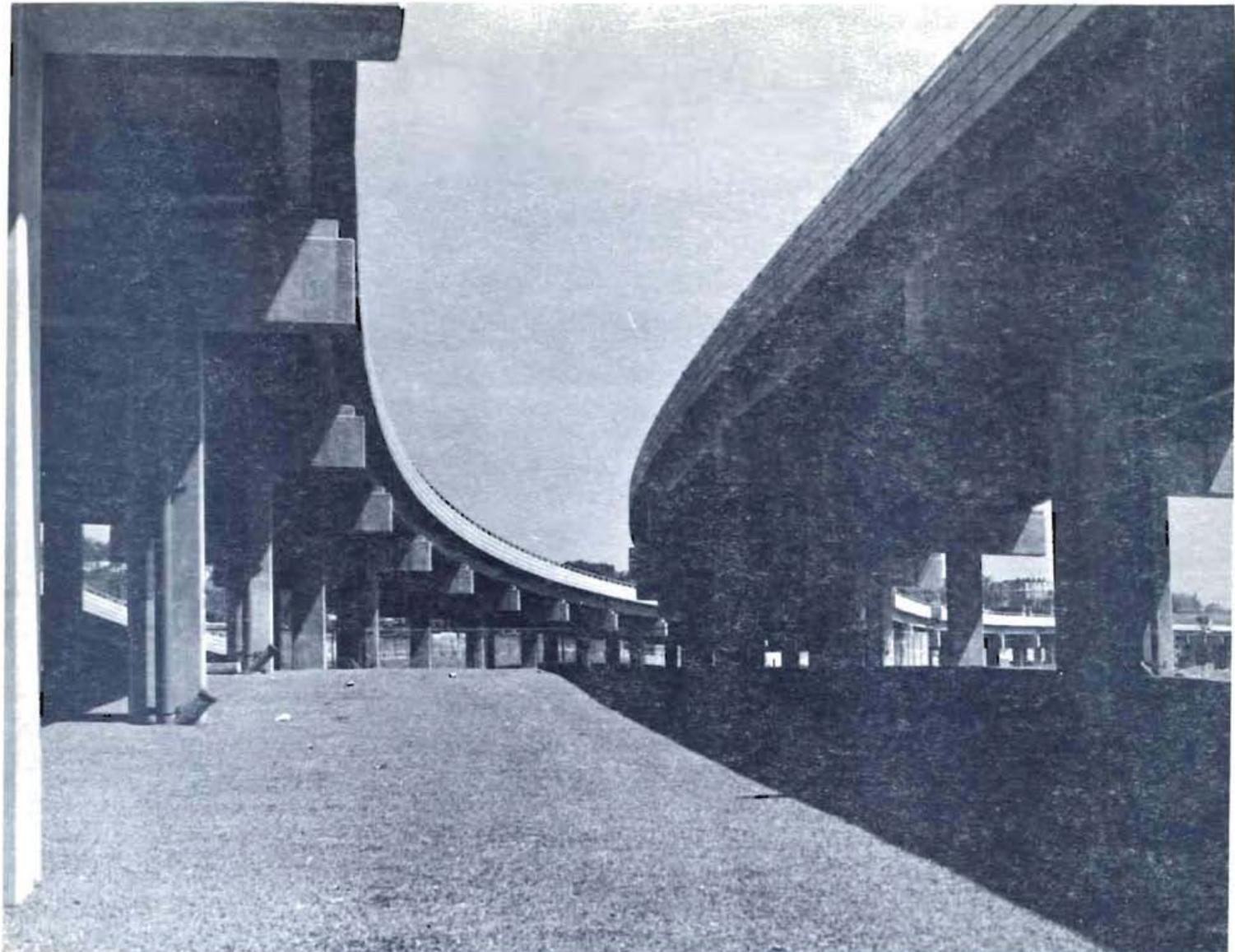
Road Design

Road Design has been actively engaged in the design of 38 projects ranging in complexity from simple sidewalk projects to the design of urban highways in densely populated areas. Of these 38 projects, 16 were advertised for construction while the design of 8 additional projects was essentially completed. The combined estimated value of these 38 projects was \$10,422,118.89.

Due to the emphasis placed on safety during the past year, the Department

through its Design Section has been actively engaged in the review and revision of its highway design criteria. Some of the revisions that were a direct result of this review were as follows: 1) A complete revision of the standards for placement of guard rail including a burial of the exposed rail ends, so that impalement of a vehicle on these exposed ends is no longer a serious factor. 2) The typical rural highway section

has been revised to ensure that there are no obstructions within 30 feet from the edge of the nearest travel lane to prevent serious injury to occupants of an out-of-control vehicle. 3) New methods of protecting exposed pipe culvert ends were initiated. In addition to these items, the Drainage Design Criteria of the Department were revised to keep pace with the latest practices being used by State Highway Departments throughout the nation.



Interstate 95 through Wilmington sweeps the motorist over the usual downtown congestion of traffic lights and conflicting movements on a series of bridge structures accented by graceful lines of steel and concrete.

Bridge Division

The record-producing rainfall of August 6 and 7 provided an unexpected workload for the Bridge Division. Many roads, bridges, culverts and dams throughout the State were damaged or destroyed. The general area between Sandtown and Frederica in Kent County was particularly hard hit. Design of eight separate emergency replacement and repair contracts were prepared in record time. In addition, the Bridge Division personnel made uncounted field inspections at a seemingly endless number of locations to make on-the-spot decisions regarding repairs undertaken by Department Maintenance personnel.

Design work underway during the year included bridges, culverts, sign structures, retaining walls, water control structures, and mosquito control impoundments.

Structural designs prepared by the Bridge Division were included in 29 of the projects the Bridge Division accepted bids for during the year. The dollar value of this work was \$1,733,387. This amounted to 73 percent of all structural work contracted by the Department. Plans for the remaining 27 percent of structural work undertaken were prepared by consultants employed by the Department. This work was reviewed and approved by the Bridge Division. During the year consultants were actively engaged in structural design on the following major projects: Route I-495, Milford By-Pass, and Delaware Route 141.

Bridges are usually included in the larger contracts prepared by other divisions of the Department. However, this year many small bridge replacement contracts, which included roadway approaches, were prepared entirely by the Bridge Division. For the first

time the Capital Improvements Program contained funds specifically designated for small bridge replacements. Needs seem to be always greater than available funds, but it is felt that a start has been made to a continuing program.

Inspection and investigation of existing bridges is an often overlooked responsibility of the Bridge Division. Investigations for several major structures were undertaken following the collapse of the Ohio River Bridge at Point Pleasant, West Virginia. The most important of these structures was the Augustine Cut-Off Bridge in Wilmington. The preliminary findings of this investigation resulted in placing an eight-ton load limit on the bridge. A complete painting and inspection contract was scheduled to complete the investigation. Two smaller bridges were removed from service and several others were posted as a result of additional studies.

The bridge inventory program, which started in 1966, continued during the year. The inventory of all Kent and New Castle County bridges was completed and work was well underway in Sussex County. The field work of the inventory involves locating and classifying the bridges. The many variables of each bridge, such as safe load, alignment, and condition are then rated in order to assign a "sufficiency rating" to each location. In this way, attempts to place more impersonal priorities on future bridge replacement projects can be made.

A specific listing of bridge contracts handled by the Bridge Division will be found in the Statistical Abstract Addendum to this report.

Specifications

The Specifications Section prepared special provisions for 50 contracts. The work covered highway and bridge construction, drainage, repairs, demolition and maintenance. Seventy percent of the contracts were prepared entirely by this section. The remaining 30 percent were in participation with consultants, as well as our Traffic, Bridge, Right-of-Way and Construction Sections.

Federal - Aid

The Federal-Aid Section is the office of liaison between the Delaware State Highway Department and the Federal Bureau of Public Roads. As Federal funds are apportioned and made available, a program of projects approved by the Highway Department is submitted to the Bureau for review, approval and authorization to proceed. The Federal-aid Section prepares the program and records approval action by the Bureau for the work which has been authorized. As work progresses, requests for additional authorization or modifications to work already authorized are submitted by the Federal-aid Section to the Bureau.

Payment for work in which Federal funds are participating is made first from State funds and requires the submission of reimbursement vouchers to the Bureau for their share of the project costs. All reimbursements vouchers are prepared by the Federal-aid Section, signed by the Controller and submitted to the Bureau for audit and engineering review and payment.

During the past fiscal year a total of 85 vouchers claiming \$18,766,974.28 were submitted to the Bureau for payment.

Review

The Review Section was formed in August 1967 to coordinate design contracts awarded to consulting firms engaged by the Department.

The following designs are now under contract:

Route	Length	Estimated Construction Cost (Only)
I - 495	11.4 Miles	\$55,000,000
Route 141 (Partial)	6.3 Miles	28,000,000
Primary System	34.4 Miles	13,400,000
TOTALS	52.1 Miles	\$96,400,000

Office Management

The office Manager handles contract administration from the time of obtaining permission to advertise to the execution of the contract. Included in this administration is obtaining permission to advertise from the Department, advertising of contracts, preparing request for Department action on awards, writing of award letters, checking contract documents for execution, and liaison with the department's attorney for

matters concerning contract documents and various agreements.

The public advertisement required by State law for the purchase of materials, equipment, supplies and performance of

Six projects handled by the Review Section were advertised for bids during the fiscal year. Total bids for these projects amounted to \$3,103,000.

work is prepared and mailed to a list of prospective bidders and other interested parties and also submitted to the Controller's office for publication in newspapers. Then bid proposals, consisting of the specifications and all the other papers necessary to provide a valid contract, are assembled and made available to prospective bidders. Before issuing documents for bidding, the applicants' qualifications are checked for type and volume of work permitted.

Representatives of this section attend public bid openings for all contracts, verify the accuracy of all submissions, and prepare and distribute tabulations.

Below is a summary of the contracts advertised this fiscal year:

CONTRACTS ADVERTISED AND LET

NUMBER	TYPE	No. Of	Contract Amount
	Construction		
	Federal Participating	22	\$ 5,398,464.75
	Toll Road	4	44,977.15
	100% State	63	6,234,453.46
	Mosquito Control	1	19,412.50
	Total Construction	90	\$11,697,307.86
	Materials & Supplies	87	\$ 1,491,302.41
	Equipment	20	287,593.01
	Mosquito Control Spraying	4	113,200.00
	Total	111	\$13,589,403.28

No. Proposals Prepared -	10,493
No. Proposals Sold -	1,671
Total Receipts -	\$6,425.80

Freeways

The Freeways Division has continued to exert major effort toward the completion of I-95 from the South Wilmington Viaduct north to the Pennsylvania State Line, a distance of approximately eight and one quarter miles. Additional contracts awarded for this section of freeway were a \$476,111 highway signing contract, and a \$79,481.55 guardrail contract for the depressed roadway between Adams and Jackson Streets in Wilmington. A total of eleven I-95 contracts with a composite value of 25 million dollars were active and in various stages of completion. Remaining contacts for this route include \$300,000 for highway lighting and landscaping.

Additional Interstate roadway opened to traffic during the 1967-68 fiscal year included total ramp mileage of 1.32 miles.

It is anticipated that I-95 northbound will be opened to Route 202 by mid-August of 1968, and the entire I-95 freeway opened to the Pennsylvania State Line by November.

Active construction was also inaugurated on I-495, the east bypass around Wilmington from the Christina Interchange to the Naamans Road Interchange, during the past year. In addition to three demolition contracts totaling \$13,500, two construction contracts were awarded with a net value of \$1,546,580.66. These contracts included the construction of a critical box culvert under the four main lines of the Penn-Central Railroad at Holly Oak Creek, and the westerly relocation of a 1.28 mile section of Governor Printz Boulevard to provide sufficient width for the forthcoming I-495 roadway. Additional construction contracts are anticipated during the coming year as the I-495 construction program gains momentum.

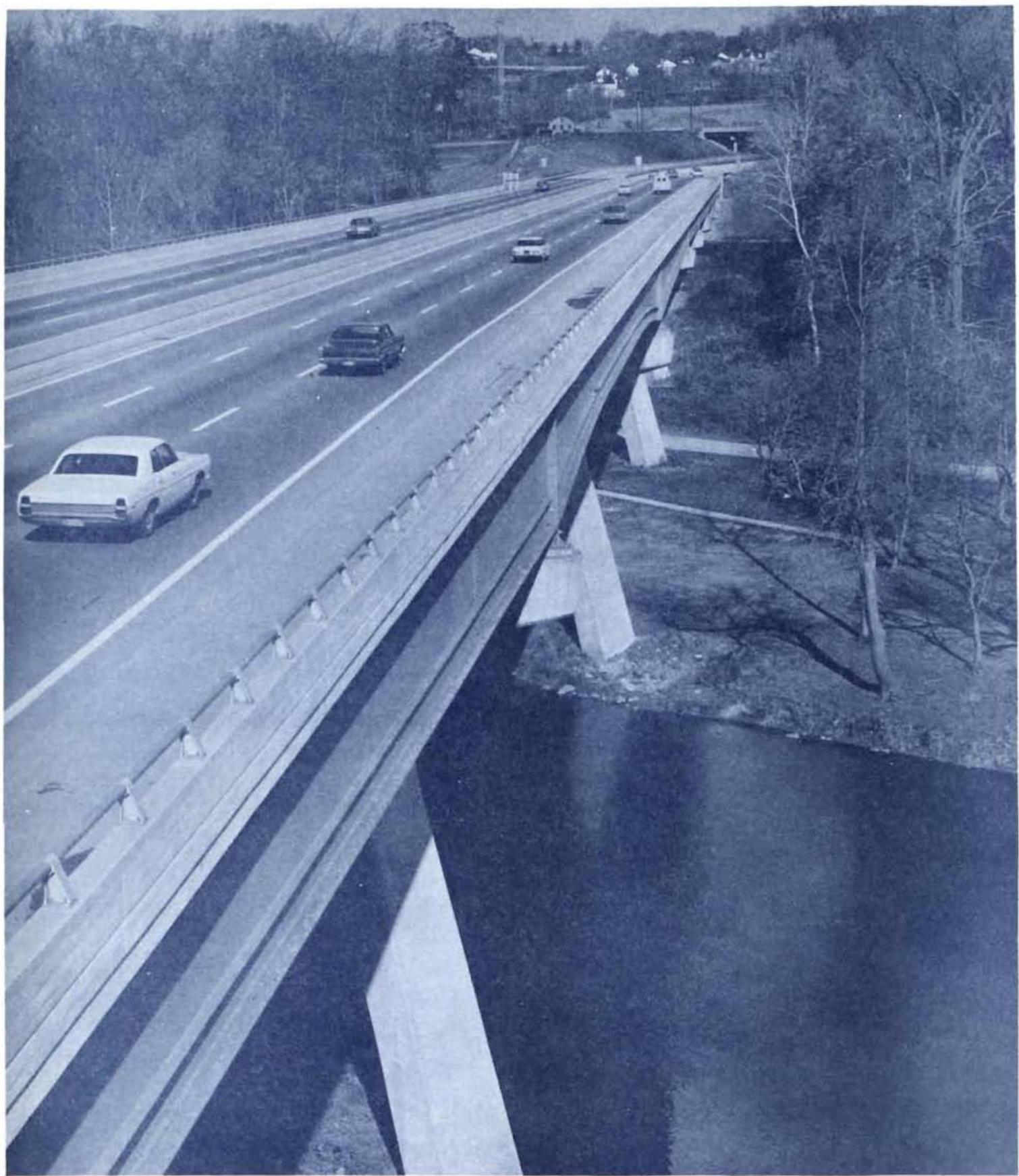
Supplementing Interstate construction, the Freeways Division was also assigned the supervision of reconstruction of the \$828,000 Delaware Avenue Project in Wilmington.

During the past year, the Freeways Division operated with an average of fifty-five permanent employees of which thirteen were graduate engineers or persons with a recognized professional standing. This force was supplemented during the busy construction season with eleven summer employees, most of whom were college engineering students.

Total value of active contracts was 32.3 million dollars of which 28.2 million dollars has been paid for completed or partially completed work, and an additional 1.18 million dollars is being withheld as a retainage.

This beautiful Brandywine crossing of I-95 represents a new entrance to the City of Wilmington of which all of Delaware can be proud.

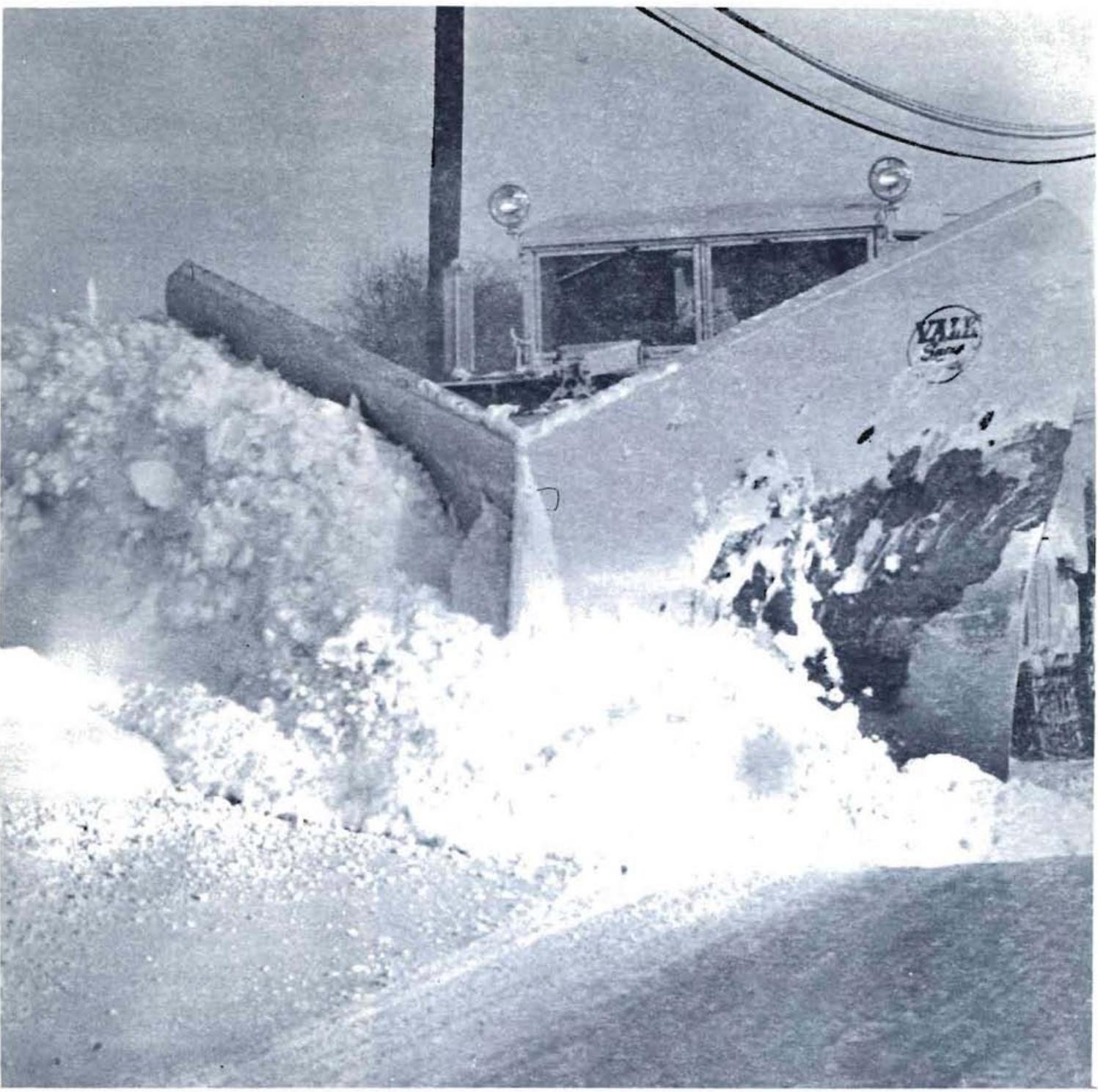




Looking North along the Brandywine River Bridge on the newly completed Interstate Route 95.

The Department, in order to insure that all snow removal equipment is ready and in good working order, prior to the seasons first snow storm holds an annual inspection with awards given the area with the best record.





Maintenance and Equipment

The Maintenance and Equipment Section purchased \$614,440 worth of new equipment and approximately \$29,580 was expended for government surplus equipment. The purchase of government surplus equipment has greatly facilitated the Department's ability to stay ahead of equipment needs. The department usually purchases this equipment for five to ten percent of its original price; and with minor renovation, it is restored to full capacity operation.

The Department's hot mix and concrete patching program expended \$1,294,000 during 1967-68's resurfacing projects.

Snow removal cost the state \$343,676.04 during this fiscal year.

The Maintenance and Equipment Section purchased and distributed six emergency rescue breathing kits throughout the state, and anticipates the replacement purchase of safety helmets, first aid kits, fire extinguishers, reflector flare sets and traffic guide cones soon. The total cost of safety equipment for this fiscal year was \$5,051.

Snow removal represents one of the Highway Departments major problems. We live in a temperate climate in Delaware and don't have enough snow for the citizenry to learn to cope with; therefore, the demand for bare pavement is great.

Traffic Division

The Traffic Division's review of entrance-exit facilities has resulted in increased recommendations for channelized entrances and exits and the construction of acceleration and deceleration lanes. These facilities minimize the motorist's hesitation in deciding where to turn or park until he is well off the roadway. Traffic is less congested and the rear-end collision potential is reduced.

Every effort has been made to upgrade traffic control devices in order to comply with the Manual on Uniform Traffic Control Devices. In order to determine progress toward proper uniformity, a cooperative field review was scheduled in various sections of the State. Four basic things were analyzed in reference to each traffic control device--design, placement, maintenance and uniformity.

The placement of each device was observed to assure that it was safely located and within the vision of the motorist to command his attention.

Maintenance of all traffic control devices has to be kept at a high level to insure legibility. In order to command respect every device must be clean, legible, properly mounted and in good working condition.

Uniformity of traffic control devices simplifies the task of the road user because it aids in instant recognition and understanding. Upon completion of this study it was concluded that most of the state's traffic control devices are uniform and adequate; however, there appeared a need on some rural roads to upgrade signs and markings and provide proper markings at railroad crossings.

The Traffic Division, in cooperation with other divisions and the Bureau of Public Roads, has undertaken a project to insure safe practice in lighting and signing of I-95. All sign supports to be installed under this contract will either be protected by guardrailing or of a breakaway design. It is hoped that such safety devices will make substantial contribution toward the reduction in severity of accidents involving collisions with fixed roadside obstacles.

Several pieces of equipment have been put into operation, including a small metal cutting saw, a 35-ton press, and a sign-straightening machine in the sign shop.



This alphabetic spaghetti will spend its days as a easily understood guide sign once completed by the Department's sign shop. Traffic controls and guide signs must employ all of the ingenuity of science and psychology to adequately protect a cross section of individual humans with various reaction times and emotional responses.

The 35-ton press is used to cut six inch radius corners for all metal which is used on green guide signs throughout the state. In the past these corners were left on the signs.

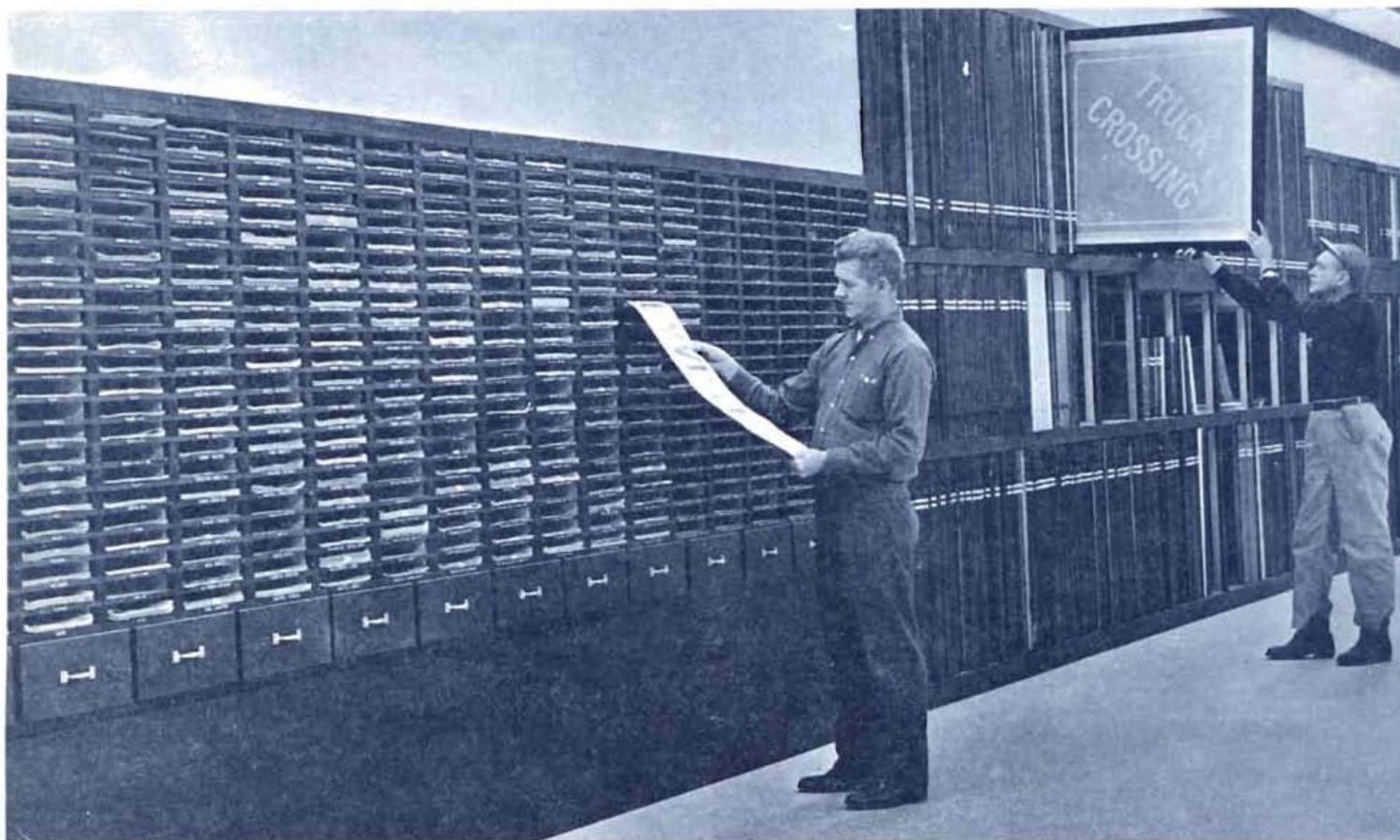
Of major importance was the sign-straightening machine. Through a series of metal rollers it is now possible to straighten the damaged metal enough to enable the aluminum blank to be used again. This means that all new metal previously cut for this purpose can be used for new signs.

The Sign Shop has been supplying necessary signs to any town, municipality, or other state agency who requests them. In this way, it is felt that any signing which is done by the respective towns will conform with all signs on our highways.

During the past year, a total of 16,938 signs of various types and sizes were fabricated and delivered.

During the fiscal year, the Traffic Division collected a total of \$31,193.46. In 198 separate accidents \$10,301.34 worth of damage was done to signs and signals. We collected \$20,892.12 for signs, signals, and services to other governmental agencies.

The Sign Shop of the Traffic Division manufactures all traffic control signing used through out the State including those used within incorporated communities. All standard signs are silkscreened on relectorized aluminum from massive file maintained in Dover.



Construction

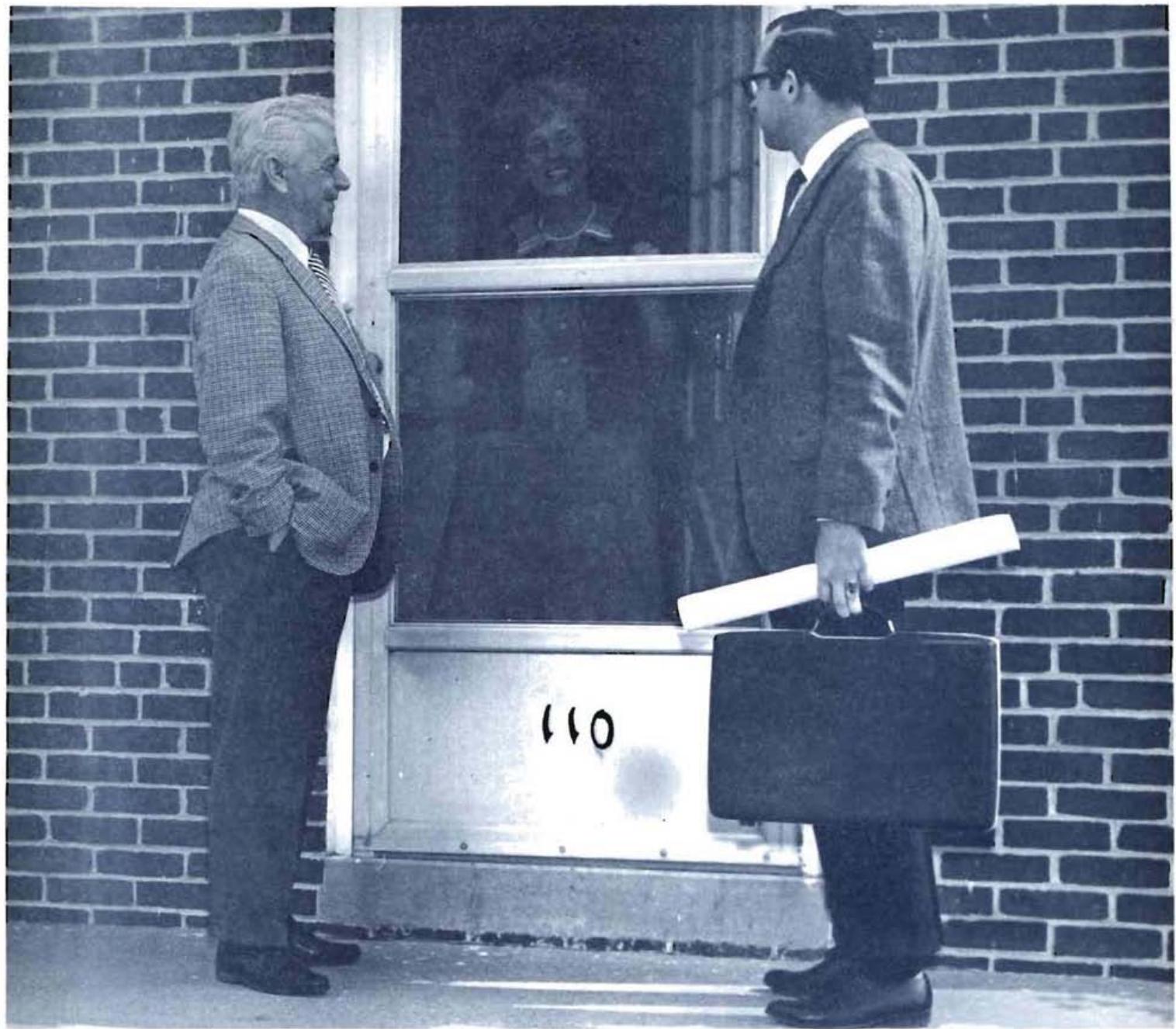
The Construction Division made a detailed study of procedures, reproduction methods and costs involved in the Department's processing of contractor estimate payments. This resulted in a new format for estimates and substantial savings to the Department.

The Construction Division has managed to successfully handle increasing loads of paper work through increased office help, improved internal efficiency and decreased field review.

In June, 1968, the Construction Manual was completed and issued to all construction related personnel.

Modern highway construction requires massive machinery and manual dexterity on the part of manpower which reflects millions of dollars poured into the State's economy through hundreds of highway contractors.





Right - of - Way

Specialized talents are required to handle the number of transactions which are successfully processed by the Right of Way Division in a one-year period. These talents must be developed in actual practice and in the Right of Way training programs, because every poss effort is made to maintain equitable balance between fair treatment of the property owners and protection of the state.

The twelve week training program for all personnel, which stressed all phases of right-of-way technique, proved beneficial. Its success was readily noted in the acquisiton of the 990 parcels of land acquired during the year at a total expenditure of \$4,823,775.

The Department's business dealings with its new highway neighbors must represent the highest degree of fair play because the Right-of-way Division negotiates for private property spending public money with an equal responsibility to all.

Utilities

The Utility Division coordinated the relocation of 141.5 miles of utility facilities. Negotiations were carried on with railroad companies for the upgrading of 27 grade crossings. During the year \$675,646 was paid to utility companies for adjustments and relocations to their facilities on Federal Aid Projects.



Mosquito Control Division

The Mosquito Control Division, relative to the permanent control work, has most of its men and equipment employed on the completion of projects undertaken through the Capital Improvement Fund Program, financed by a two million dollar appropriation from the Divestiture Fund.

The actual ditching achieved from the Division's regular appropriation amounted to 133,400 lineal feet of cleaning and ditching, which is a small amount of footage compared to years in the past. In addition, considerable time and energy was spent on the new impoundments which took the form of reinforcing dikes and making improvements on the pumping stations. However, contributions were made to the overall permanent program in the form of small ditching projects which were furnished by the two million fund.

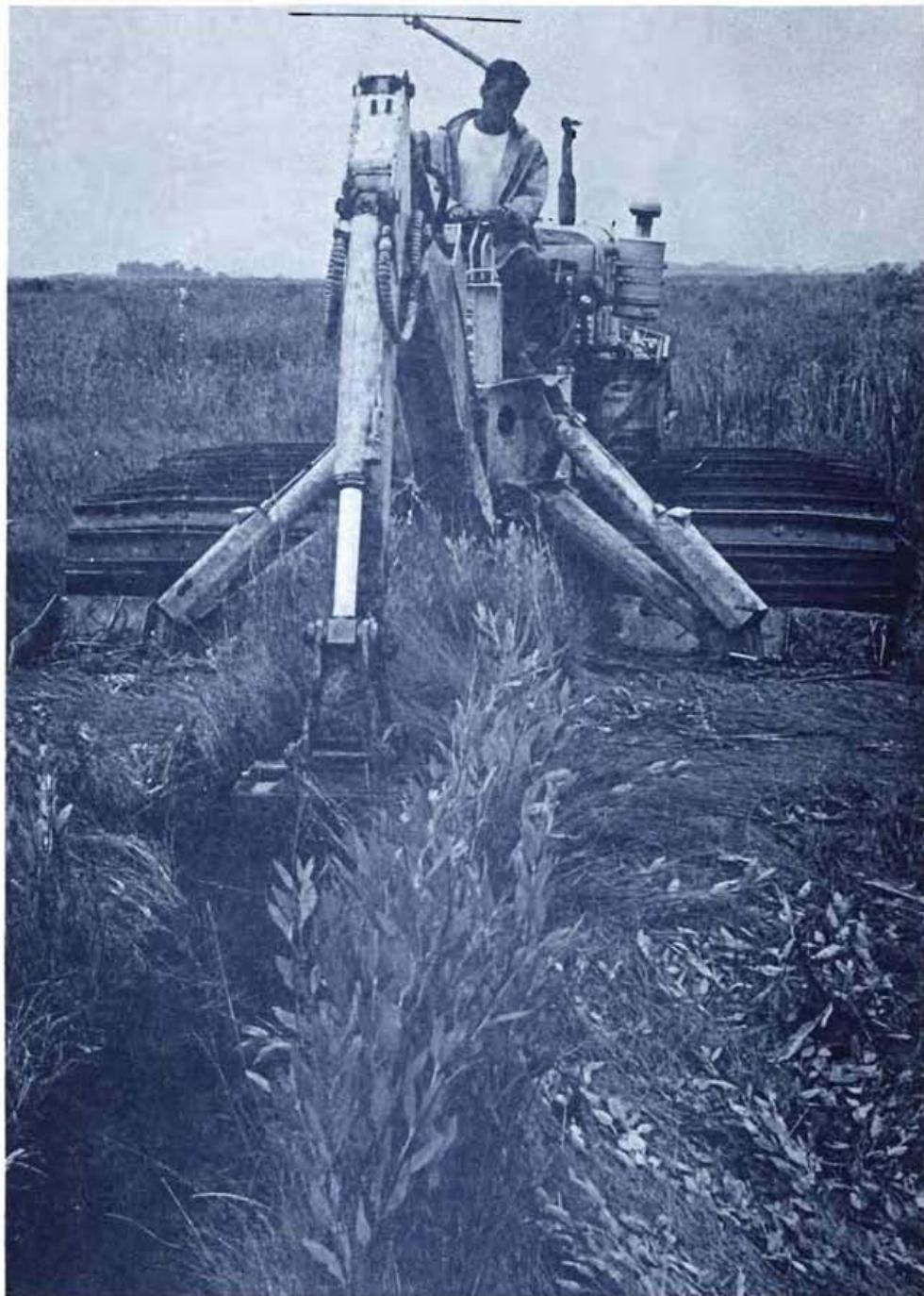
The fiscal year 1968 showed an increase in the acres of air spraying due to the extra amount of rainfall during August of 1967 and June of 1968, plus the extra high tides during the first of June 1968. A total of 239,000 acres was sprayed both as a larvicide and an adulticide. This was accomplished by fixed-wing aircraft and helicopter.

A new larvicide, Abate 4E liquid, was expended and proved to be very effective. This insecticide was used in the 1967 season. In the 1968 season Abate Granular was introduced and was used in areas with heavy foliage where the Abate liquid would not penetrate.

In addition to the air spraying it was necessary to disperse 1113 gallons of Baytex and 2547 pounds of Abate Granular, as well as 200 gallons of Abate liquid. This material was used in isolated and inaccessible breeding areas throughout the three counties. The majority of this work, however, was done in New Castle County.

The Thermo Aerosol fogging machines of the Division were again used to compliment aerial operations against adult mosquitoes. These machines were employed for a total of 66 hours in the three Counties, dispersing 1,13 gallons of solution containing 1.25 percent Dibrom.

The most significant item during the fiscal year was a new building at Bear, Delaware. The New Castle building had been sorely



Aside from spraying operations, the Mosquito Control Division must maintain millions of linear feet of ditching to control flooding and drainage of the salt marshes. This special wide track Cat is designed for this specific operation.

needed for a long time. Also, an addition was made during the year in the field of Capital improvements. A new four-wheel drive pickup on a trade-in basis was purchased for New Castle.

There is considerable reduction in the mosquito population according to our mosquito traps which are located in towns throughout the State.

The Division encountered a financial impasse at the height of the spraying season in August of 1967. The only way that aircraft were once more made available was

through the diversion of certain funds within the Mosquito Control budget that were previously earmarked for other purposes and through the transfer of monies from the budget of the Engineering Division of the Highway Department. Fortunately, this was accomplished expeditiously, and the planes were again airborne. Furthermore, the Legislature enacted House Bill no. 233, which made available \$100,000 from the two million dollar Permanent Control Program Divestiture Fund for the purpose of getting an early start on larvicing and spraying this spring.

As the use of radio through the country increased so has interference to all radio systems. The Division Offices of the Highway Department were equipped with tone systems to reduce this undesirable noise. It was found that phone lines to control radio transmitters were giving trouble when most needed. A new and modern Micro-Wave Control System was installed in New Castle Division and Delaware Turnpike control points. This system has proved to be very reliable as of this date.

Civil Defense has seen many changes this year; new base stations on all counties and change in antennas, which have improved their state coverage. At the State Emergency Operating Center a new control was built and installed, at a saving of several thousand dollars over a commercially built unit.

An emergency control point was added to the Civil Defense at the Governors Office. By using this unit, the Governor can talk over the Civil Defense system to Delaware City control and then to all units in one of

COMMUNICATIONS DIVISION

Communications is the backbone of all the following systems: the State Police, Fire agencies. The growth of our services to other Network, Civil Defense Network, and State departments has been greatly increased with Highway Network, as well as talking through service covering the following: Water and Air several commercial radio stations to all Resources, Delaware Turnpike, Delaware citizens of Delaware, all of this from his National Guard Emergency Command, chair in the State House.

University of Delaware, State Park

Commission, State Fire School, Agriculture As the demand on this division has Department, State Highway Department, increased, so has its needs for facilities. Two Controller's Office, Claymont Fire new shops are under construction and Company, and Governor's Office.

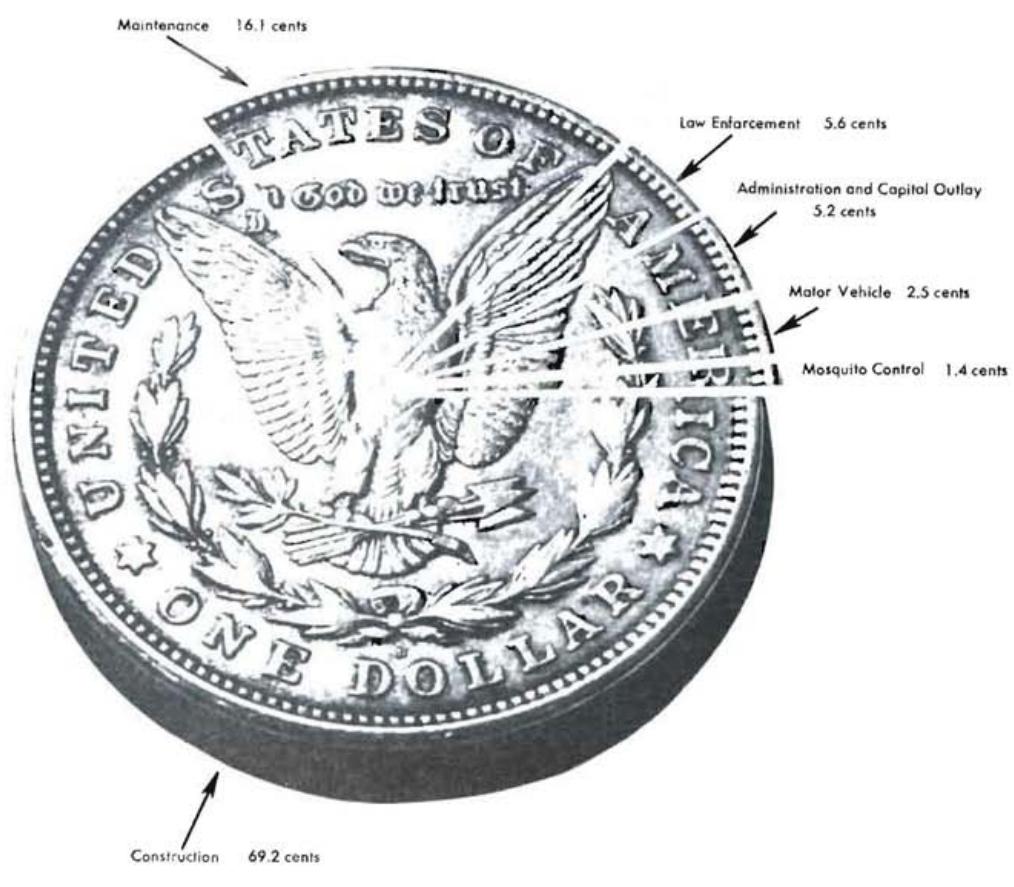
Complete new systems (base and mobile) were planned and installed for the Delaware Turnpike, Water and Air Resources Commission, the University of Delaware and State Park Commission. Emergency control centers were installed for the State Police and Delaware Guard. Engineering studies were made for the State Highway need for additional engineers to provide all Department System. New equipment was of the required services. These men are hard installed in mobile and base stations. to find and harder to hire, but with the help Harrington Yard base was found to be very weak in several areas. A new type antenna Commission, we hope to overcome this corrected this defect.

future it is planned to provide an emergency control station in this new office. Civil disorder, student unrest, and hurricane watch are three of the things which our Governor can control from this central location.

The most important thing facing us is the Department System. New equipment was of the required services. These men are hard installed in mobile and base stations. to find and harder to hire, but with the help Harrington Yard base was found to be very weak in several areas. A new type antenna Commission, we hope to overcome this corrected this deficiency.

YOUR HIGHWAY DOLLAR

COMPTROLLER'S STATEMENT



Expenditures