# FOURTH ANNUAL REPORT

Fiscal Year 1970

DEPARTMENT OF TRANSPORTATION

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**U.S. DEPARTMENT OF TRANSPORTATION**

**Washington, D.C.**

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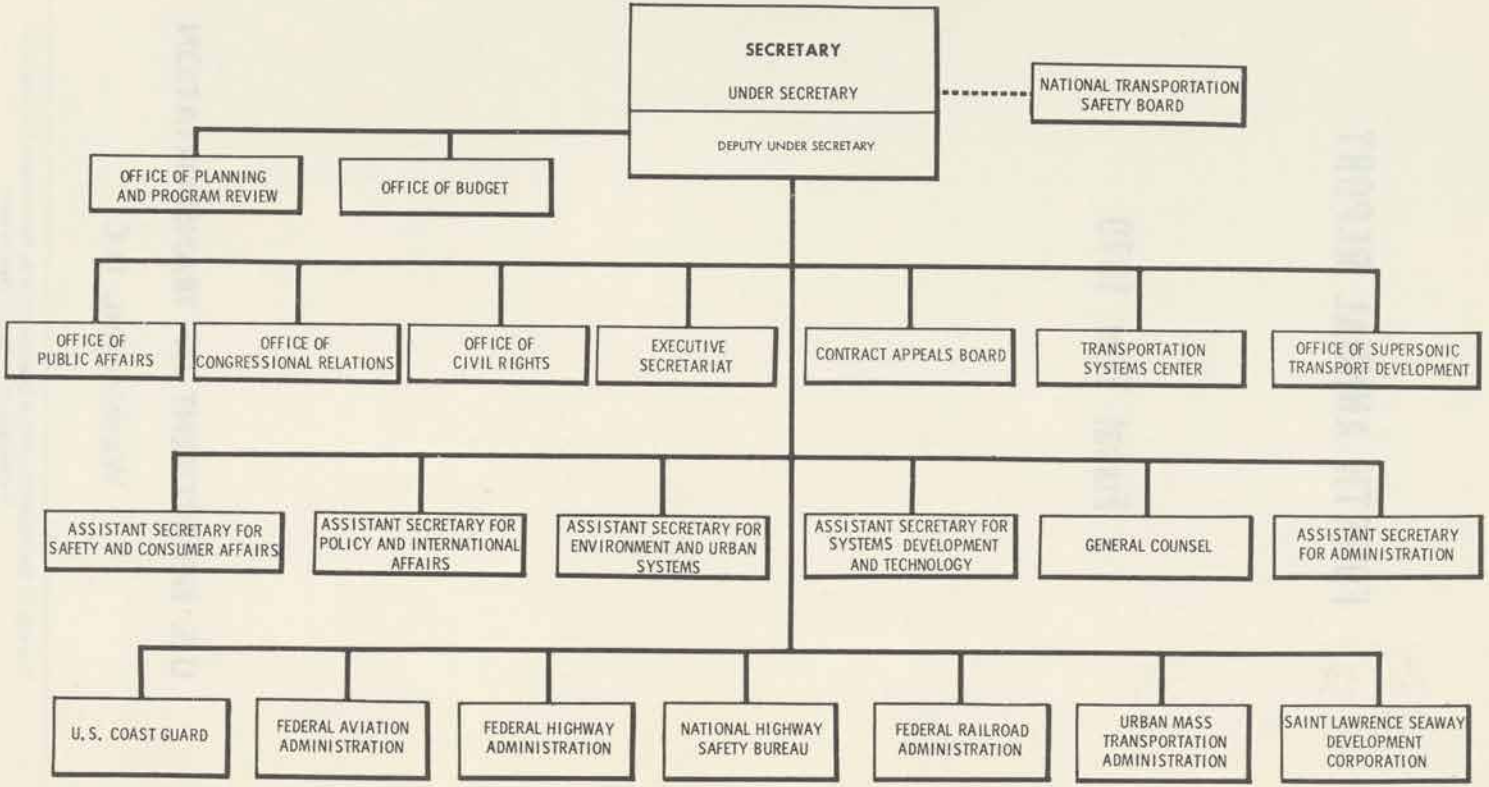
# DEPARTMENT OF TRANSPORTATION



THE SECRETARY OF TRANSPORTATION
WASHINGTON, D.C. 20590

The President
The White House
Washington, D. C. 20501

Dear Mr. President:

In compliance with Section 11 of the Department of Transportation Act, I submit herewith the fourth annual report of the Department of Transportation. The Report deals with the Department's achievements during Fiscal Year 1970.

Sincerely,

John A. Volpe

Enclosure

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# CHAPTER I

# INTRODUCTION

The DOT is concerned with the development of forms of transportation that will provide the citizen and consumer the greatest possible measure of safety, economy, and convenience. But at the same time the Department zealously guards certain higher interests of all citizens, including the physical environment, which it must help protect from many varieties of assault, and the civil and human rights of all citizens, which it must promote.

The Department accomplished these purposes in many ways, making quiet but certain progress on dozens—perhaps hundreds—of projects simultaneously. Perhaps most striking and significant was the progress made during the year as a result of passage of needed legislation providing new authority or funds for improvements in air, land, and water transportation of people and goods. The Department placed great emphasis on promotion of public transportation, especially urban mass transportation—so long neglected in the United States. Concurrently it improved the highway program; it produced innovative programs of research and development; it stressed international cooperation, and international trade. But in conformity with the ideal of "full national commitment" to environmental quality, the Department encouraged expansion of transportation facilities and services, but refused to take or authorize action that would threaten natural values now so much in peril from both public and private action.

Although its major effort is to help achieve a rational, balanced, integrated transportation system for the nation, the Department utilized its prestige and influence to promote civil rights, guaranteeing equal employment opportunity on projects funded with public funds, assuring replacement housing in fair housing quarters for those displaced by its construction efforts, and enforcing anti-discrimination regulations, both within the Department and on its numerous sponsored projects.

Efforts to improve the safety of all forms of transportation consumed a major portion of the efforts of all of the Department's administrations as well as those of the National Transportation Safety Board. One evidence of the success of such efforts was the decline in the number of people killed in highway accidents during the year. During the fiscal year the Secretary also decided to separate safety functions relating to drivers operating vehicles on the highways from the safety considerations relating to highway construction. To emphasize his concern and to assure continuous high-level attention to prevention of traffic deaths, the Secretary created as a seventh

operating administration the National Highway Safety Bureau, removing its functions from the Federal Highway Administration.

In a further administrative shift to accomplish related purposes the Secretary authorized the use of one of the Department's Assistant Secretary appointments for an Assistant Secretary for Safety and Consumer Affairs.

In addition to conducting previously authorized safety programs, the Department placed major emphasis on pipeline safety programs by developing new administrative structures in the Secretary's office; it brought nearly to a conclusion its massive study of compensation for those injured in auto accidents; and let contracts for the development of an experimental safety vehicle.

The Department continued its efforts to improve national transportation planning, particularly with its National Transportation Needs Study, emphasizing transportation aspects of urban planning, and also the need to increase utilization of rail and high-speed ground transportation.

Organizational changes were made as required to improve the Department's capabilities or further the Secretary's effort to achieve genuine control of the several elements of the Department. Such consolidations of Department-wide resources as concentrating the Public Affairs and Congressional Relations personnel under the Office of the Secretary contribute to the latter objective, as do the centralization of internal audit personnel and those concerned with civil rights.

The Department's portion of the President's effort to facilitate local and State participation in Federal grant programs, particularly the appointment of Secretarial Representatives in each of the 10 standard regions established by the President, has encouraged urban systems planning and regional facilities planning under a total transportation concept that is essential if transportation is to serve appropriate social purposes.

During FY 1970 the Department of Transportation achieved a highly desirable consolidation of its headquarters elements in two buildings in Southwest Washington—Federal Office Building 10A and the Nassif building, the former belonging to the Government, and the latter a leased facility. In addition to the Federal Aviation Administration which it has housed for some years, FOB–10A will provide space for the National Transportation Safety Board, St. Lawrence Seaway Development Corporation, and the Offices of Hazardous Materials and Pipeline Safety.

It is believed that housing the Department in new and functional buildings will help establish the public image of the Department as one dedicated to innovation, efficiency, and progress in transportation. Already the new proximity among its elements has made internal coordination of program objectives and plans vastly easier and has stimulated practical cooperation among the elements to a high degree.

## CHAPTER II

## EMPHASIS ON SAFETY

Since a major reason for the establishment of the DOT was that a Department could concentrate attention on problems of safety in all modes of transportation, all of the administrations have been since the beginning of the Department clearly oriented toward safety programs. Indeed, such operating administrations as the U.S. Coast Guard, the Federal Aviation Administration, and the Federal Railroad Administration, not to mention the National Transportation Safety Bureau and the Highway Safety Bureau, pursue safety regulation as their most important function.

However, although safety of travellers was a primary reason for its establishment, responsibility for the safety functions of the Department was not originally assigned to a single office. Each administration has had as part of its function the promotion of safety in its own mode, but no office had responsibility for leadership in developing safety standards and guidelines applicable to all modes. Similarly, the development of safe, efficient, low-cost, and convenient transportation was not the exclusive responsibility of any one of the administrations or Assistant Secretaries, but was a responsibility common to all of them. Because he decided that these two related functions—promotion of safety and satisfaction of the citizen who travels—deserved the attention of a high-level member of his staff, Secretary Volpe authorized the activation of the office of the Asistant Secretary for Safety and Consumer Affairs. Research and planning for that position were undertaken during FY 1970, though the implementation of the plan would not occur until FY 1971.

There follows a set of discussions of the Department's safety-related activities, subdivided according to mode of transportation.

### HIGHWAY AND MOTOR CARRIER SAFETY

Safety Improvement Activities on Federal-Aid Highways. Improved highway safety is a major objective and responsibility of the Federal Highway Administration (FHWA). The highway fatality rate has shown a steady decline from 17 per 100 million vehicle-miles in 1925 to about 5.5 in 1958 and has held reasonably steady since then. This fact reflects in large part the safety-oriented improvements to highways and traffic operations accomplished by the States under the Federal-aid program. It is estimated that about one-fourth of all highway program expenditures are devoted to projects or roadway elements which increase highway safety.

Safety in Highway Design. The FHWA's efforts to "build in" greater safety and operational efficiency in the design of new highways involves considering the roadway itself, the physical roadside, structural elements on and alongside the roadway, and all related elements of the highway. Considerable attention has been devoted to developing design standards and practices to improve safety.

Significant progress occurred during the fiscal year. Revised national standards for uniform traffic control devices neared completion. Changes in practices and procedures for installing traffic signs included increased use of symbols and diagrammatic guide signs, which have been installed in six States. Twelve other States have indicated interest in using this signing format. The present diagrammatic signs are being evaluated by the States involved.

In highway lighting also, additional progress was achieved in the design, application, and performance of high-mast lighting systems which use lights mounted 100 feet or more above the roadway. These systems provide improved uniformity in lighting, and are becoming increasingly popular.

Significant new findings on the nature of highway accidents further demonstrated the dangers inherent in fixed objects along the roadside, including many types of guardrail, and substantiate the desirability of clear roadsides wherever feasible. Where guardrail is essential to protect against greater hazards, new structural designs and installation practices have been adopted to assure that they will function safely.

Under an accelerated R & D and implementation program, a variety of energy-absorptive highway barriers were developed and are being installed at selected critical locations on primary routes. These barriers are effective in saving lives and minimizing property damage in vehicular impacts at speeds over 60 m.p.h.

Safety Improvement Program. The Safety Improvement Program is a continuing effort to identify and correct potential safety hazards on all Federal-aid highway systems. During FY 1970, the States initiated a systematic program for analyzing potential methods for accident reduction benefits for all proposed safety improvements projects, in order that the limited pool of Federal-aid and State funds could be concentrated on the most hazardous locations. Approximately 680 projects were approved at a total cost of about $136 million.

Motor Carrier Safety. The FHWA's Bureau of Motor Carrier Safety is responsible for developing, establishing, administering and enforcing rules and regulations governing the safety of operation of interstate commercial vehicles. During the year, a number of changes designed to strengthen the Bureau of Motor Carrier Safety's (BMCS) role were completed; these included:

- Appointment of a full time Director and Deputy Director to fill vacancies created by the retirement of the former incumbents.

- Delegation of rulemaking authority to the Director, BMCS.
- Addition of some 20 field staff members, including nine regional hazardous materials specialists.
- Opening of seven additional duty locations in the field to provide better coverage.
- Establishment of a system of formal interpretations of the regulations.

***Regulations.*** During FY 1970, a number of significant revisions to the FHWA's Motor Carrier Safety Regulations were completed or initiated; these include:

- Adoption of a complete revision of driver qualifications, updating existing standards and requiring more thorough physical examinations, background investigations, and, for the first time, criteria for disqualifying a driver from operating a vehicle in interstate commerce. Changes were dictated by present-day pressures and technological advances in equipment and highway engineering.
- Adoption of more stringent regulations prohibiting the use and possession of amphetamines, or pep pills, and the use and possession of intoxicating beverages. The intolerable toll of human lives and suffering has shown the need for more stringent regulations in an effort to reduce the number of drivers under the influence of alcoholic beverages, amphetamines, and dangerous drugs who are in control of heavy commercial vehicles on the Nation's highways.
- Proposed rulemaking which would decrease allowable stopping distances for commercial vehicles and require the installation of emergency braking systems on all new commercial vehicles.
- Proposed rulemaking which would impose much more stringent requirements for the safe loading of trucks and buses.
- Proposal to ban the use of carbon tetrachloride and other vaporizing liquid fire extinguishers, increasing the capacity of required extinguishers, and updating the requirements for fuses.
- Issuance of Notice of Proposed Rulemaking designed to reduce the severity and number of fires involving large commercial motor vehicles by strengthening the requirements dealing with fuel systems, whether for gasoline, diesel, or liquefied petroleum gas.
- Issuance of an amendment to the Motor Carrier Safety Regulations requiring that seat belts be installed in commercial vehicles and making it mandatory that they be worn by drivers of the vehicles.
- Issuance, in response to a petition from a manufacturer of an "under-tongue coupling device", of a Notice of Proposed Rulemaking and an amendment to the Regulations allowing the optional use of devices other than safety chains or cables which would provide equal levels of safety.

- A decision, taken in collaboration with the National Highway Safety Bureau (NHSB), to issue concurrent notices of proposed rulemaking for bus windows and emergency warning devices.
- An investigation of the possibility of issuing rulemaking concerned with the control of commercial vehicle noise level and exhaust emissions.

***Compliance.*** A vigorous motor carrier safety compliance program has been pursued through educational efforts, public releases, safety meetings and enforcement cases. Highlights of this effort included:

- *Enforcement*—Investigations for enforcement purposes were conducted in 470 instances during the fiscal year, and reports were submitted to the FHWA's legal staff for appropriate handling. FHWA initiated the use of the penalty provisions in 49 U.S.C. 322 (h) (Civil Forfeiture) on a regular basis in those instances in which the provisions would apply. The program began slowly and continued to grow during the year as experience was gained, and the advantages of this procedure (compared to criminal action) were fully realized. During the year, 40 civil forfeiture claims based on violations of the Motor Carrier Safety Regulations were settled for $117,475. The largest settlement was in the amount of $10,500.
- *Fitness Reports*—The number of reports on the safety compliance records of motor carriers made to the Interstate Commerce Commission (ICC) about application filed with that agency increased sharply from a FY 1969 total of 7,042 to a FY 1970 total of 8,263. Additionally, 116 reports were submitted to the Department of Defense (DOD) relative to carriers desiring to be on DOD lists of carriers approved to haul military explosives and related items.
- *Accident Investigation*—FHWA released reports of 12 in-depth investigations of motor carrier accidents, and for the first time, released to the public a composite report summarizing the findings of all in-depth investigations of accidents during the preceding calendar year. The BMCS field staff made full investigations of 242 separate accidents and preliminary investigations of 642 accidents. Accidents were selected on the basis of casualties, property damage, or other significant factors. In addition to being published, the investigators' reports were referred to the National Transportation Safety Board (NTSB) in connection with accidents in which the Board had expressed an interest.
- *Safety Meetings*—More than 1,200 safety meetings were conducted by or participated in by members of the field staff. These meetings were held to instruct drivers and mechanics on the proper application and interpretation of the Motor Carrier Safety Regulations.

***Inspection.*** The inspection program continued during the year with the following results:

- Some 43,242 vehicles engaged in interstate commerce were inspected by the field staff. Of this number, some 10,413 were ordered "out of

service" because of defects which constituted a danger to the public. The vehicles selected for inspection were those that appeared to be the least well maintained.

- Over 4,300 carrier terminal inspections were conducted. These inspections included examination of carrier records, operating practices, dispatching procedures, and inspection and maintenance systems, as well as a determination of the carriers' knowledge of the FHWA Motor Carrier Safety Regulations and the DOT Hazardous Materials Regulations as they apply to movements by highway.
- Numerous checks on shippers and distributors of hazardous materials were conducted to assist these firms in complying with the very technical requirements of packaging and documenting shipments tendered in interstate or foreign commerce.

***Planning.*** A number of innovative planning projects were initiated to assist the development of future programs. Among these, the more significant were:

- A nationwide commercial motor vehicle sampling was planned; the sampling technique was designed to yield an unbiased composite of the compliance posture of the interstate motor carrier industry.
- A research requirements review was undertaken in order to synthesize basic research needs.
- Special studies concerning driver ejections and seat belt use were performed.
- A study of training needs for BMCS accident investigators was conducted and the results were incorporated in a Departmental study.
- In cooperation with other interested elements of the Department and the NTSB, an interagency agreement on multi-modal response to major accidents was developed for initial review.

Safety Programs for all Highways in the U.S. The FHWA Office of Driving Environment Programs has as its primary function the fostering and development of highway safety programs, directed toward the driving environment and its impact on the roadway user. It had 363 safety projects in progress during FY 1970 for which federal funds in the amount of $11,116,000 have been committed. The following breakdown shows the distribution of these projects and their funding.

| Standard Area | Number of Projects | Federal Funds Involved |
|---|---|---|
| Identification & surveillance of accident locations | 123 | $ 5,968,511 |
| Highway design, construction and maintenance | 35 | 408,976 |
| Traffic control devices | 143 | 4,154,651 |
| Pedestrians | 62 | 583,946 |
| Totals | 363 | $11,116,084 |



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Typical of the projects funded by this program are: (1) Five States have developed a capability for in-depth investigation of selected accidents; (2) seven States are conducting statewide skid inventory programs to identify slippery pavements, including roads and streets not on the Federal-aid system; (3) forty-four small cities and counties have inaugurated programs for the detection and correction of high accident locations; and (4) more than thirty-three separate jurisdictions have taken advantage of funds available to train their employees in basic traffic engineering techniques which promote safer highway operation.

Research and training activities sponsored by this office and managed by the National Highway Safety Institute of the National Highway Safety Bureau (NHSB), were directed toward the following areas of critical need:

1. Increasing the number of highway and traffic engineers who have been trained to incorporate in highway design factors which tend to reduce the severity and frequency of collisions involving the roadway and its appurtenances. The Institute of Traffic Engineers will develop and manage a series of workshops over a 2-year period which will train approximately 300 engineers now working in highway design.
2. A major research effort in graphic techniques to improve or develop systems for providing better guidance to motorists. This effort appears to be on the verge of identifying the means of greatly improving effectiveness of guide signs.
3. Research to develop techniques for determining optimum speed limits compatible with roadside environment, traffic stream characteristics, roadway geometrics and conditions, law enforcement, and other significant factors.
4. A multi-phase research to conduct on-site investigations of pedestrian accidents in 12 major cities across the Nation. These in-depth investigations should identify a hierarchy of factors contributing to the accidents. Analysis of these previously unavailable data will permit the development and application of countermeasures aimed at the reduction of pedestrian injuries and fatalities. Pedestrians comprise nearly 20 percent of the total motor vehicle fatalities.

## TRAFFIC SAFETY

THE PROBLEM. Even though fatalities on the nation's highways declined slightly in comparison with FY 1969, the total in FY 1970 was 55,850 deaths. A disproportionate number (41 percent) of those killed were youths under 25 years old. While the numbers of drivers, vehicles, and vehicle miles rise each year, and the problem is further complicated by immoderate consumption of alcohol, the NHSB is beginning to have some success in restricting the number of fatalities.

ORGANIZATION. As noted earlier, the NHBS is responsible for the national traffic safety effort. In March 1970, the Secretary shifted the Bureau from

the FHWA to the Office of the Secretary and gave it the status of a separate operating administration reporting directly to him in recognition of the priority and visibility required to do the job. The Bureau organization has been strengthened and simplified.

More than organizational improvement is required to reduce substantially human and material traffic losses. Clear and feasible goals are being established and priorities set in order to concentrate resources in those programs which will effect the greatest saving.

LEGISLATION. During the reporting period, Congress amended the National Traffic and Motor Vehicle Act (PL 91–265) in three significant ways: (1) To require tire manufacturers to furnish notification of safety related defects to the first purchaser; (2) to require the Secretary to submit a report to Congress by January 1, 1971, on the extent, cause, and means of prevention of agricultural tractor accidents on both public roads and farms; and (3) to amend the definition of "equipment" in the law so as to permit establishment of standards for such items as motorcycle helmets. Specific authorization for compliance test facilities was refused; in lieu of the authorization, a procedure was established whereby funds can be appropriated after the Commerce and Public Works Committees of both the House and the Senate approve a prospectus of the proposed facility.

The Administration has submitted several proposals for modification of the Highway Safety Act of which the most important are: (1) To provide a sound financial base by funding highway safety Federal assistance for the States (sec. 402) from the Highway Trust Fund; (2) to establish the Federal Highway Safety Administration, an operating administration to replace the National Highway Safety Bureau; and (3) to increase funds for research and development, including significant funding for the high-priority program to control the use of alcohol as it relates to highway safety; that is, to prevent the problem drinker from driving.

GOALS. The establishment of a clear and feasible goal for the reduction of traffic losses during the 1970's was undertaken upon the initiative of the National Motor Vehicle Safety Advisory Council in cooperation with the National Highway Safety Advisory Committee. It proposed a reduction of 50 percent in the death rate per 100 million vehicle-miles and sought the cooperation of the Governors. Their consensus was that such a goal was unrealistic in light of financial and manpower restrictions. A one-third reduction was agreed upon. Considering an anticipated increase of 17.3 percent in drivers, 23.6 percent in vehicles, a 30.1 percent increase in miles driven, the projection of traffic deaths is 51,000 fatalities per year by 1980. Projection of the pre-1966 rate would result in 116,000 fatalities annually by the year 1980. This reduction has now become national policy. (See table 25).

PRIORITIES. Development of priorities emphasized these programs: Alcohol countermeasures, crash survivability, and the experimental safety vehicle.

Research has proven that alcohol is involved in at least 50 percent of all highway fatalities; the single major cause of crashes is the abusive use of alcohol by the problem drinker. That the problem can be controlled is shown by the experience of Sweden where alcohol is involved in only 10 percent of auto fatalities, and Britain where fatalities and injuries have been reduced 33 percent during the heavy drinking hours. The Secretary recommended to the President a program to control the drinking driver which would: (1) Identify problem drinker drivers; (2) enable courts and licensing agencies to make appropriate decisions concerning them; and (3) take action to insure that they do not drive and drink at the same time. This program focuses on research and development to produce systems capable of preventing the heavy drinker from driving; a national public information campaign; development of specially trained enforcement personnel; and increased emphasis on alcohol in the Federal assistance program. However, the heart of the effort is the Alcohol Safety Action Program (ASAP), which will undertake operational projects in communities in every State and implement and evaluate remedial measures. The first nine were announced by the Secretary in June 1970.

No matter how successful the various programs may be, crashes will continue to occur. Deaths and injuries can be minimized when the crash forces are managed so that they do not exceed the limits of human tolerance. Seat belts and shoulder harnesses do a good job when they are used, but their use is so infrequent that a way must be found to protect the passenger without his cooperation. By notice in the Federal Register in July 1969, the Bureau requested comments on involuntary restraint systems, including inflatable ones—the so-called air bag—and proposed 1973 as the mandatory installation date; work is going forward on modification of vehicle structures so as to protect passengers in frontal crashes at speeds over 60 m.ph.

The third priority program is the experimental safety vehicle, an attempt to incorporate safety design in vehicles on a system basis without sacrificing public acceptance. Late in the fiscal year the Secretary announced the award of three contracts. Under contract, three prototype vehicles are to be delivered in 18 months for testing. The cars are to be five-passenger, four-door sedans weighing approximately 4,000 pounds and with a wheel base of 116–124 inches. Occupant protection is of prime importance in the designs: substantial improvements in braking, visibility, pedestrian protection, and interior design for safety are required.

New Studies and Programs. Largely as the result of experience with demonstration projects, the Bureau has requested funding to conduct operational programs several years in duration. Sufficient funds would be concentrated on a particular mix of highway safety standards and remedial measures to yield data upon which an ordered set of priority programs could be based. This project is called Safety through Concentrated Operational Program Effort (SCOPE); initial programs will include, among others: Driver licensing, emergency medical services, and selective enforcement.

Last year the President suggested that NATO utilize its organization and skills to respond to some of the problems of industrialized society. A committee was established called Committee on the Challenges of a Modern Society to consider initially three projects: (1) Road safety; (2) air pollution; and (3) disaster relief. The Department is taking the lead in the pilot study on road safety and the United States is conducting the other two with Turkey and Italy, respectively. This is an effort of limited duration and cost from which the U.S. may gain significantly. The Bureau has issued contracts for construction of experimental safety vehicles in the 4,000 pound class as a priority project and the European countries will undertake similar programs with vehicles in the 2,000 pound category. Exchange of data on other aspects of highway safety may prove mutually beneficial and result in saving lives, time, and finances.

The Departments of Transportation and Defense have announced their cooperation in a project called Military Assistance for Safety in Traffic (MAST). Helicopters and medical skills developed by the military services will augment local emergency medical services within range of military establishments. The first demonstration project is underway at Fort Sam Houston, Texas. Other projects are expected to be inaugurated in Washington and Colorado.

In view of the heavy cost to the young people of the country of traffic deaths and injuries, a new program called Youth Order United Toward Highway Safety (YOUTHS), has been launched to inform and arouse them to action.

The study on extent, causes and means of prevention of agricultural tractor accidents called for by the recent amendment to the National Traffic and Motor Vehicle Safety Act is well underway.

Motor Vehicle Programs. The Bureau has published a plan for motor vehicle safety programs,[1] developed as a guide for Bureau and Department staff in promulgating motor vehicle safety performance standards under P.L. 89–563, and released to the public to assist the many constituencies of vehicle safety programs. It should be of assistance to the automotive industry in its planning and useful in overcoming the leadtime and cost problems facing this industry in safety-related tooling and hardware changes.

In all, the Bureau has issued 30 motor vehicle safety standards; new ones include four on seat belts and one each on glazing materials and mounting, door latches, fuel tanks, and steering columns. In addition 60 amendments to previously issued standards were promulgated. Six completed regulations included three on consumer information, one on customs regulations, one on certification, and one on re-grooved tires. At the end of the reporting period work was progressing on 82 new standards, 67 amendments and

[1] *Program Plan for Motor Vehicle Safety Standard*, available through the Clearinghouse for Federal Scientific and Technical Information, Springfield, Virginia 22151, Price $3.00.

13 regulations. The latest book of standards was published in September, 1969.[2]

Under the basic legislation, manufacturers are required to furnish purchasers and the Department with notification of safety related defects, and public notification has impelled the recall for inspection and correction of such vehicles. Since the institution of the program, manufacturers have announed 589 recall campaigns involving 14,578,849 vehicles of which 133 campaigns involved 1,401,985 foreign vehicles.

The Bureau is responsible for investigating possible violations of the standards. This work is done through 12 independent testing laboratories. Forty-two vehicles have been tested for performance requirements as have 3,452 pieces of equipment; investigations have been initiated of 132 potential violations of import regulations. The results of compliance testing are released regularly.

Two studies basic to the work of vehicle-in-use safety were completed during the period covered by this report. One was to establish the safety status of the 1964–1968 pessenger car population, and the other project was to establish the effect on performance of the degradation of various braking system components. Both projects will be used to support current and future research relating vehicle defects to crashes and to provide a basis for inspection criteria.

There were two noteworthy developments in the field of vehicle handling. The first is a hybrid computer simulator which can accurately simulate vehicle responses to driver inputs, and determine the effect upon handling of such conditions as tire underinflation, vehicle overload, etc. The other is an electrohydraulic control device which makes it possible to measure or observe objectively differences in vehicles responses to identical inputs and eliminates variability present when test drivers are used.

The National Traffic and Motor Vehicle Safety Act of 1966 directs the Secretary to consult with the National Motor Vehicle Safety Advisory Council on motor vehicle standards promulgated under the Act. Major recommendations of the Council during the year were: (1) Early implementation of passive restraint rule-making; (2) setting a long-range goal of reducing the highway fatality rate by one-third by 1980; and, (3) establishing highway safety program priorities in alcohol countermeasures, crash survivability, and public support and education. Other recommendations included: Improvement of the consumer safety information program, greater emphasis on development of used vehicle safety standards, policies for compliance testing, for early release of compliance test results, for early availability and field testing of passive restraint systems by the auto industry, State, and Federal governments. State Senator Edward J. Speno of New York is Chairman of the 22-member Council.

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[2] *Federal Motor Vehicle Standards and Regulations* available from the U.S. Government Printing Office, Washington, D.C. 20402; annual subscription ($8.00) includes supplements.

TRAFFIC SAFETY PROGRAMS. One of the provisions of the Highway Safety Act of 1966 was that each of the States should develop a 5 year comprehensive program for implementing the highway safety standards which met with Secretarial approval by December 31, 1969. The standards establish the highest practicable level of safety so that the States' programs constitute a plan for excellence. After review and negotiation with each of the States, the plans were approved before the statutory deadline. None of them was found to be without major weaknesses. The process of developing and reviewing the plans was beneficial in itself as the States thereby brought their highway safety activity into systematic focus, and the Department gained much knowledge of the strengths and weaknesses in the States' programs.

Heretofore, each highway safety project was reviewed individually by the Bureau prior to allocation of Federal funds. In all, some 2,600 projects have been so reviewed. The Secretary has approved a new concept which shifts much of the administrative control back to the States and communities. Each State is to prepare an annual work plan for highway safety progress which, when approved, will constitute obligation of Federal funds subject to statutory or administrative limitations.

State legislative activity stimulated by the Highway Safety Act and subsequent programs is most impressive. During FY 1969 about 360 laws were enacted which had a direct bearing on one or more of the 16 standards, and another 150 were passed which were safety related. Since the first standards were issued in 1967, it is estimated that over 2,000 laws have been enacted in the States to implement the standards or to bring State laws into closer conformance.

Some of the legislation enacted during the current reporting period includes: "implied consent" for blood alcohol level, enacted in two States; motorcycle safety legislation, nine States; driver licensing and driver education upgraded in 20 States; medical advisory board (assist driver licensing), one State; improved medical services, two States; improved inspection laws, seven States.

The National Highway Safety Advisory Committee met twice during the year under the chairmanship of the Under Secretary. It made recommendations on the highway safety program priorities and goals, alcohol and driving, and used vehicle safety. Interim recommendations were made concerning school bus safety and accident investigation; final recommendations will be made by the end of 1970.

RESEARCH AND DEVELOPMENT. The research and development effort of the National Highway Safety Bureau is focused to a considerable extent on two priority areas: experimental safety vehicles and passive restraint-crashworthiness.

Accident investigation is considered the corner stone to understanding both human and mechanical aspects of traffic crashes. There are 15 especially trained medical-engineering teams working at research centers in

the United States under contract to the Bureau. These teams conduct "on-the-scene," detailed investigations of selected (usually serious) collisions. Over 400 case studies have contained more than 2,000 findings and recommendations. These form the basis for development work in the preparation of standards or amendments to safety standards. Thus far, 28 motor vehicle safety standards, or prospective standards, have been influenced directly or indirectly by them.

In addition, Cornell Aeronautical Laboratory is performing a tri-level accident investigation study. The first level is a study of accident rate versus exposure data (numbers of cars, miles driven, etc.) in a geographic area. The second step will combine police data with selected injury or causative information collected by scientific investigators. The third step will be a sub-set of the second in which investigations will be conducted in detail by the multidisciplinary team to provide statistical significance to accident and injury findings and to validate the relevancy of data collected in the earlier phases of the study.

The Bureau will be investigating the feasibility and possible subsequent development of two devices to aid the courts and police in their dealings with drivers under the influence of alcohol. One such device would prevent the car from starting if the driver has an excessive level of alcohol in his body. The other instrument would be a remote sensor of alcohol to detect alcohol in the air in front of the driver's face. This remote sensor will aid law enforcement officers because it does not require the driver's cooperation and would not involve a search within the normal legal definition of this term.

Surveys of the need for manpower trained in the various aspects of traffic safety indicate an estimated requirement for 500,000 additional personnel by 1978 to implement the Highway Safety Program standards, plus an earlier projection of 30,000 to meet State needs. More than 1,000 highway safety program managers and accident investigation personnel have been trained directly with Federal funds, while Sec. 402 matching funds have assisted in the training of some 50,000 by the States and communities. The development of training courses will assure a trained highway safety labor force of 1.3 million by the year 1978.

The National Driver Register is a Federal-State cooperative driver license records exchange service. It provides State licensing officials with a single source to disclose records which problem drivers have established in other States. At the end of FY 1970, the Register contained more than 2.5 million records, and was growing at the rate of 3,000 accessions a day. More than 60,000 reports and searches are processed in each 24-hours. Presently, 19 States and the District of Columbia check all original and renewal applications against the files. Twenty-three other States check the register on all original applications, while the remander submit searches on a "suspicious" case basis.

Data on the efficacy of the safety standards is not always easy to obtain or clear in its implication. However, those States which have had changes in their laws with respect to motorcycle safety have furnished a clear picture of the effectiveness of these laws. In Michigan, the year the helmet law was in effect, motorcycle deaths declined 17 percent and the year following its repeal they rose 42 percent. A similar experience was evident in Illinois. Repeal of the helmet law was followed by an increase of 42 percent in motorcycle deaths.

PERSISTENT PROBLEMS. Like all complex programs, the national highway and motor vehicle safety effort has unresolved problems:

- Lack of research and testing facilities, including compliance test facilities.
- The need for long-term highway safety funding in order that the States may make and carry out their plans in an orderly manner.

Passage of the Department's proposal for funding of the Federal portion of the State highway safety programs and of highway safety research and development from the Highway Trust Fund would alleviate a portion of these persistent problems.

## AVIATION SAFETY

Events of FY 1970 brought two problems of aviation safety into special prominence: aircraft piracy and midair collision.

AIRCRAFT PIRACY. This problem's manifestation in FY 1970 was marked by the following:

- An encouraging drop in the number of incidents involving U.S.-registered airplanes, from the previous year's 42 to 26.
- An almost equal rise in the number of incidents involving foreign-registered airplanes, from 24 to 39. (A table of statistics on worldwide highjacking incidents for both calendar and fiscal years from 1930 through June 30, 1970, is appended.) (See table No. 1.)
- A break in the diversion-to-Cuba pattern, with one hijacked aircraft of U.S. registry landing during the year at each of the following hijacker-chosen places: Damascus, Syria; Rome, Italy; Beirut, Lebanon; Washington, D.C.; and Cairo, Egypt. (The only previous exception to the hijacked-to-Cuba pattern involving U.S. aircraft was an incident in August 1965 in which a plane was compelled to return to Honolulu shortly after taking off from there.)
- The first transatlantic diversion of a U.S.-registered airplane. (The airplane mentioned above as diverted to Rome was hijacked on a Los Angeles-to-San Francisco flight on October 31, 1969.)
- The first incidents connected with the Middle East situation. (The flights mentioned above as diverted to Damascus and Cairo were hi-

jacked by Arab guerrillas—the former having been a Los Angeles-to-Tel Aviv flight seized over the Adriatic Sea on August 29, 1969, and the latter, a Beirut-to-Rome flight of June 22, 1970. The flight mentioned above as diverted to Beirut was en route from Paris to Rome on January 8, 1970, when hijacked by a French national in sympathy with the Arab guerrillas.)

- The first death in a domestic U.S. hijacking incident. (The copilot on a flight from Newark to Boston on March 17, 1970, was fatally shot but managed to wound the hijacker severely with the latter's own pistol; the captain, though wounded in both arms, landed the plane safely at Boston.)
- A unique incident involving Washington, D.C.'s Dulles International Airport. (A hijacker professing grievances against the Federal Government seized a Phoenix-to-Washington flight on June 4, 1970 (on the Phoenix-to-Saint Louis leg), and had the plane land at Dulles to pick up a large sum of money waiting in sacks on the runway in response to his earlier radioed demand. After having the plane take off and fly northward for some time toward an unspecified destination, he ordered it back to Dulles to get the rest of the $100 million he had demanded, since the amount picked up was about $100,000. Sacks stuffed with newspapers were placed on the runway this second time, and, after the plane landed, the hijacker was overpowered by the crew and a Federal Bureau of Investigation agent; the pilot and the hijacker were wounded in the scuffle.)

Thus, though the drop in the number of incidents involving U.S.-registered aircraft in FY 1970 was encouraging, some of the incidents that did occur—particularly the diversions to Middle East destinations—were of a new and ominous character.

Antihijacking developments during FY 1970 were highlighted by the following:

- Selective use by some airlines of an antihijacking detection system developed by FAA the previous year and tested at various airports beginning in the spring of 1969. One trunk airline began such use of the system in October 1969, two others by January, and on June 15 the Secretary of Transportation announced that a fourth trunk airline would soon join the first three. The system screens passengers by means of a "profile" of behavioral traits common to hijackers of the past used in conjunction with a weapon-detecting device. Though the system is not claimed to be foolproof, at year's end (June 30, 1970) there had been no hijacking incident on any flight to which it had been applied.
- A growing number of arrests and trials of hijackers of U.S. aircraft. A statement on May 6, 1970, by the Federal Aviation Administrator gave the following statistics on this subject: 45 arrests since the hijack-

ing of the first U.S. aircraft in 1961, including 14 returnees from Cuba (all through some other country); 18 convictions on various charges, with sentences ranging from an indefinite term in a correctional school for certain juveniles to 20 years for four adults; three findings of mental incompetence to stand trial and three acquittals, one on grounds of temporary insanity; 21 cases pending.

- Announcement by the Secretary (June 15, 1970) that FAA's Task Force on the Deterrence of Air Piracy, which had been created in February 1969, would be replaced by a permanent organizational component staffed with full-time specialists to deal, not only with aircraft piracy, but also with sabotage and all the other problems embraced in a comprehensive approach to air transportation security.
- Announcement by Cuba (September 1969) of a new law that apparently would allow return of aircraft hijackers—except those regarded as political refugees—to the countries from which they had fled if those countries would reciprocate in the case of persons fleeing Cuba.
- Going into effect of the Tokyo Convention on Offenses and Certain Other Acts Committed on Board Aircraft. U.S. ratification took place September 5, 1969, completing the 12 ratifications required to bring the convention into effect among its signatories (90 days later, or on December 4, 1969). Though ineffectual against hijackings to nonsignatory countries, the convention is a forward step in its clarifying of jurisdiction over crimes aboard aircraft anywhere in the world; it affords one useful framework within which an international or diplomatic solution to aircraft piracy may be pursued.
- An extraordinary session of the International Civil Aviation Organization's Assembly at Montreal, June 16–30, 1970, to consider possible measures by member states to combat aircraft piracy and other criminal acts endangering civil air transport. The Federal Aviation Administrator attended as vice chairman of the U.S. delegation.

MIDAIR-COLLISION HAZARD. Official concern with this problem was notably manifested in the first month of FY 1970 by the following two events:

- Issuance (July 15, 1969) by FAA of a study of near misses reported to the agency during 1968 in a cooperative program involving the aviation community, under which, to encourage reporting of incidents, pilots and other airmen were guaranteed immunity from penalties that might otherwise have been applicable under the Federal Aviation Regulations. (This program is still in progress.) This study found that most of the reported near-miss incidents of 1968 judged to be hazardous had occurred in congested airspace near large airports having air traffic control service, and resulted from a mixture of controlled traffic with traffic under visual flight rules (VFR).

- Release (July 31, 1969) by the National Transportation Safety Board of a study of the midair collisions of 1968. The Board found, in contrast to FAA's finding regarding near misses, that the majority of the 38 actual collisions (none involved an air carrier aircraft) had taken place in uncongested airspace at or near airports without air traffic control service.

The event, however, that focused unusual attention on this problem in FY 1970 was a midair collision of September 9, 1969, near Indianapolis, Ind. This event attracted attention because—

- An air carrier aircraft was involved—a relatively rare occurrence.
- The number of people killed—38—was larger than for any other midair collision in the 1960's except one (the collision of two airliners over Staten Island, N.Y., in December 1960, brought death to a total of 134 persons—128 in the planes and six on the ground).

Efforts by the Department of Transportation to eliminate or minimize the midair-collision hazard were highlighted during FY 1970 by the following:

- A major new FAA safety rule, establishing the concept of terminal control areas. The rule was proposed to the aviation community in September 1969, re-proposed in revised form in March 1970, and adopted in May, with an effective date of June 25, 1970.

  The new rule calls for the terminal control area to consist of controlled airspace located around at least one primary airport and extending upward from the surface, or higher, to a specified altitude, within which all aircraft are subject to special operating rules and pilot and equipment requirements (see below). By June 30, 1970, this concept had been implemented at only one location—Atlanta—but planning called for implementation at 23 other locations. The implementing at Atlanta was by a separate rule effective the same date as the rule establishing the concept; because of the varying conditions at the selected locations, a separate rule will implement the terminal control area at each of them, adapting it to local features and needs.

  At the fiscal year's end, the 24 locations that had been selected (they are subject to review and possible change) consisted of sites for 10 Group I and 14 Group II terminal control areas. Besides Atlanta, the Group I locations include Boston, Dallas, John F. Kennedy International Airport (New York), La Guardia Airport (New York), Los Angeles, Miami, O'Hare International Airport (Chicago), San Francisco, and Washington, D.C.

  The Group II locations include Cincinnati, Cleveland, Denver, Detroit, Houston, Kansas City, Las Vegas, Minneapolis, Newark, New Orleans, Philadelphia, Pittsburgh, Seattle, and St. Louis.

Operating rules for the Group I terminal control areas—more demanding than for Group II because the locations are busier—are the following: (1) Air traffic control clearance is required for all operations, both instrument flight rules (IFR) and visual flight rules (VFR); (2) an operable receiver for VOR or TACAN (these are standard air navigation aids) signals and an operable two-way radio are required; (3) unless otherwise authorized by air traffic control, large turbine-engine-powered airplanes must remain above the floor of the terminal control area; (4) the speed limit beneath the floor of the terminal control area is 200 knots (230 m.p.h.); (5) a transponder is required for all operations except those of helicopters and IFR operations to and from satellite airports; (6) no solo student pilot operations are allowed. All traffic in Group I terminal control areas is to be separated by air traffic control.

For Group II terminal control areas, the operating rules are the same as for Group I except that solo student pilot operations are not prohibited and the transponder requirement is relaxed to permit VFR operations, in addition to helicopter operations and IFR operations to and from satellite airports, to take place without transponders. Because of this relaxed transponder requirement, air traffic control, though separating all large turbine-engine-powered aircraft from all other aircraft operating in Group II terminal control areas, will provide only normal IFR or VFR radar service to other traffic in such control areas.

- Participation in flight testing—completed during the year—of a promising collision-avoidance system developed in previous years by a private contractor for the Air Transport Association (an organization of airlines). (See explanatory remarks in second item immediately following.) Earliest possible operational use of the system was considered at least 2 years away.
- Further simulation of interaction between the collision-avoidance system and the air traffic control system, testing their compatibility.
- Award of a $279,032 contract for a study of pilot warning instrument systems. (A pilot warning instrument system, much simpler and therefore less costly than a collision-avoidance system, so as to be affordable by private pilots, enhances a pilot's ability to detect other aircraft in flight, but the pilot must determine as well as take any necessary evasive action. The collision-avoidance system, designed mainly for airline aircraft, not only detects other aircraft posing a collision threat but also indicates the maneuver the pilot should perform to end the threat.)
- Proposal (June 1970, based on responses to a notice of proposed rulemaking the previous February) of a new safety rule (1) permitting the use of aviation white as well as the already-permitted aviation red for anticollision lights on aircraft, (2) requiring those powered air-

craft not already required to be equipped with anticollision lights (i.e., certain small aircraft) to be so equipped within 1 year for night flying, and (2) prescribing a higher intensity for anticollision lights required on aircraft to be type certificated in the future.

CERTIFICATION ACTIVITIES. Certification of aircraft, airmen and other aviation components is an essential element of FAA's safety-regulating responsibility. The principal developments of FY 1970 in FAA's certification activities included:

- Issuance of the type and production certificates for the Boeing 747 airplane on December 30, 1969. This airplane entered airline service on January 21, 1970. (See table 2, appendix p. 124 for comprehensive list of new aircraft models certificated in fiscal year 1970.)
- Issuance of the type certificate for the Pratt & Whitney turbofan aircraft engine model JT9D–3A, which is used on the Boeing 747 airplane. (See table 3 for statistics on certification of airmen, aircraft, and aircraft components.)
- Upgrading of type-certification standards for large transport aircraft (those over 12,500 pounds) for which type certification is applied for after May 8, 1970. The new airworthiness standards represent several years of Government-industry study and development. They relate to four major certification areas: flight requirements, airframe, powerplant, and systems and equipment.
- Amendment of airworthiness standards for small airplanes (12,500 pounds or under), giving FAA a better basis for certificating the emerging larger, faster, and more sophisticated light planes entering service in ever-increasing numbers.
- Issuance of the first supplemental type certificate for installation and operation of area navigation equipment in general aviation aircraft. (Area navigation, because it permits a straight-line course between flight origin and destination, is a means of reducing congestion on the regular airways, which make straight lines only from one air navigation facility to the next.)
- Upgrading of certification requirements for the former aviation mechanic schools, which were renamed "aviation maintenance technician schools." The changes, which included new curriculum requirements for both certification and operation, were designed to reflect technological advancements of the aviation industry. Based on a notice of proposed rulemaking published in February 1969, they became effective on May 3, 1970.
- Continuation of work developing supersonic transport certification standards, with a goal of issuing a notice of proposed rulemaking in January 1971. FAA is conducting developmental work in close association with the National Aeronautics and Space Administration, including airworthiness authorities at NASA's Ames Research Center,

Moffett Field, Calif., using that center's sophisticated flight simulator for advanced aircraft, and with Franco-British industry.

- Holding of an FAA-Government-industry conference (April 1970) in a step toward updating tentative airworthiness standards for transport category vertical/short takeoff and landing (V/STOL) aircraft previously developed for industry guidance pending adoption of formal requirements.
- Preparations to certificate for safety all airports serving air carriers certificated by the Civil Aeronautics Board, in accordance with an amendment to the Federal Aviation Act of 1958 contained in the Airport and Airway Development Act of 1970.

Safety Rules and Regulations. Highlight changes during the year in the Federal Aviation Regulations already covered above include:

- Establishment of the terminal control area concept (under "Midair Collisions").
- Upgrading of type-certification standards for large transport aircraft ("Certification Activities").
- Amendment of airworthiness standards for small airplanes ("Certification Activities").
- Upgrading of certification requirements for the former aviation mechanic schools and renaming them ("Certification Activities").

Additional highlight changes during FY 1970 involved:

- Air taxi operators of large aircraft (over 12,500 pounds). The change, issued September 8, 1969, and effective November 15, 1969, made applicable to these operators the stricter operational requirements applying to the supplemental air carriers.
- Small airplanes (12,500 pounds and under) capable of carrying more than 10 occupants. The change, issued June 12, 1970, to become effective July 19, 1970, upgraded airworthiness standards to be met by these aircraft to be eligible for air taxi operations.
- Cockpit voice recorders in helicopters. This amendment, issued May 4, 1970, to become effective July 8, 1970, allows 1 year from the effective date for compliance, after which no certificate holder may operate a large transport helicopter unless an approved cockpit voice recorder is installed and operated as prescribed while the helicopter is in use.

Aircraft Operations and Maintenance. The following two items were highlights in this area during FY 1970:

- FAA's fifth annual maintenance symposium was held at the Aeronautical Center, Oklahoma City, December 9–11, 1969, with the theme "Advances in Aviation Maintenance Technology" and with the Federal Aviation Administrator as the featured speaker. The 730 attendees (a

record) included 62 representing 29 foreign interests. Five technical sessions were moderated by outstanding industry personalities; there were 19 technical presentations.

- The general aviation accident-prevention program (Projects 85) successfully completed its 2-year tryout period in two FAA regions, and, at year's end, plans called for expanding it to FAA's other regions (except the Europe, Africa, and Middle East Region). Under the program, an accident-prevention specialist is stationed in each general aviation district office to focus and lead efforts of the aviation community to reduce the number of general aviation accidents.

RESEARCH AND DEVELOPMENT. Efforts continued during the year to reduce or eliminate a broad range of aviation hazards, to find better solutions to safety-related problems of flight, and to learn more about man-machine relationships in problems of aviation safety. Highlights are as follows:

- *Airport hazards.* Efforts continued notably on runway-traction problems and airport firefighting materials and methods.
- *Aircraft crashworthiness.* Work continued on gelled fuels, crash-resistant fuel tanks, and improvement of aircraft cabin interior materials—all to reduce postcrash fire hazards. For general aviation aircraft, an air-bag system to help pilots survive accidents without injury was found to have good potential, and tests of shoulder-harness installations found them feasible and practical.
- *Emergency evacuation of jumbo jets.* An emergency-evacuation simulator accommodating airline passengers in numbers significantly related to jumbo-jet capacity was placed in operation during fiscal year 1970 by the Civil Aeromedical Institute at FAA's Aeronautical Center, Oklahoma City—a timely move in view of the entry of the first jumbo jet into commercial operation in January 1970. Adjustability of pitch, roll, and elevation on this simulator enables safety personnel to assess effectiveness of escape equipment, ditching equipment, and escape procedures in their constant search for improvements. Studies will be conducted under both day and night conditions.
- *In-flight hazards.* (1) Aircraft wake turbulence: A problem requiring a quick answer was addressed in February 1970: whether the separation standard requiring following aircraft to stay at least 10 miles behind either of the two types of jumbo jets then in operation (Boeing 747 and Lockheed C–5A) should be retained or could be relaxed. (The standard was based on theoretical calculations and early data.) The conclusion—after FAA, the Boeing Company, the National Aeronautics and Space Administration, and the U.S. Air Force had carried out a cooperative program that examined effects of wing-tip vortexes generated not only by the jumbo jets but also by other types of jet aircraft, including four-, three-, and two-engine types—was that the space between jumbo jets and following aircraft could be safely reduced

to 5 miles, a spacing applying also to the wake of various other large jet aircraft. Further tests being conducted in this area will refine these results and determine more precise criteria of this kind for general aviation aircraft. (2) Other turbulence: (a) Though over 1,000 hours of in-flight data had been recorded by year's end by the "unusual events recording systems" installed on three civil jet transports to obtain data permitting analysis of pilot and aircraft response to encounters with severe turbulence, no unusual events had been recorded. This may indicate that current flight procedures are acceptable. The engineering-quality data accumulated in this way will be useful in other FAA programs. (b) Efforts to establish a universal turbulence intensity system—*i.e.*, a standard system for determining and reporting turbulence intensity—were underway during the year. (3) Work continued to seek better ways to control in-flight engine fires—notably on a technique for using liquid nitrogen. (4) For work on antihijacking measures, see separate heading above on "Aircraft Piracy." (5) Efforts to develop an effective as well as economically feasible method to counter aircraft sabotage continued.

- *Flight-characteristics criteria.* (1) Two projects with variable-stability airplanes—one a joint FAA-NASA-U.S. Navy operation with a Navion airplane, the other a joint FAA-U.S. Air Force operation with an Air Force trainer—were nearing completion at year's end and expected to be completed during calendar year 1970. The FAA-NASA-Navy project will provide stability and control data useful to designers of small general aviation airplanes in defining optimum flight characteristics and to regulatory authorities as criteria for airworthiness standards. (2) Lateral maneuverability criteria for deflected jet and deflected slipstream short takeoff and landing (STOL) transports were investigated by an FAA contractor using moving-base-simulator facilities at NASA's Ames Research Center, Moffett Field, Calif., in the first phase of an investigation of flight characteristics criteria for these aircraft.
- *Human factors.* Work continued on developing an objective flight test for the private-pilot certificate. The flight test for the private-pilot certificate was scheduled to be field tested during FY 1971 and FY 1972, with tests for the other ratings to be similarly field tested after being developed. All the tests are developed from identification and analysis of tasks and critical skill requirements as reflected in survey samples of the population within the existing certificate-rating class.

SAFETY RECORD FOR THE YEAR. Tables of statistics issued by the National Transportation Safety Board, included in the appendix, compare the accident and fatality rates of the principal segments of U.S. civil aviation during calendar year 1969 with similar rates for the preceding years as far back as 1959. Though rates for 1969 appear relatively low, the trend of the figures over a period of several years is more significant than the fluctuation between adjacent years. (See tables 4, 5, 6).



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## MARITIME SAFETY

MERCHANT MARINE SAFETY PROGRAM.[1] The chief function of the Coast Guard's Merchant Marine Safety Program is an effective preventive safety program designed to minimize the number of deaths and injuries and the amount of property damage resulting from accidents in marine transportation.

Since Congress passed the first law providing for "inspectors" of steamboats in 1838, the role of marine safety has been expanded to include the frequent inspection of numerous other classes of vessels, the licensing and certification of their officers and crews, and the investigation of marine casualties and accidents.

The enforcement of the maritime safety laws and Federal regulations has been vested in the Coast Guard, and personnel are located throughout the United States and its territories as well as in various major seaports of Europe and Asia in order to insure compliance with the law and assist the merchant mariner in whatever way possible.

Marine safety laws apply not only to U.S. flag vessels, but also to foreign vessels plying to and from U.S. ports. The Coast Guard insures that foreign freighters and tankers carry hazardous materials only under strict safety conditions and that passenger vessels comply with all applicable international safety regulations before they are permitted to carry U.S. citizens from American ports.

Modernization and Revision of Merchant Marine Officers' License Examination. In 1969, the Coast Guard contracted for an extensive study of the requirements and examination procedures used for the licensing of officers of the U.S. Merchant Marine; the Educational Testing Service, Princeton, N.J., conducted this study. Following the study recommendation, plans were made to update the license examinations and revise licensing procedures.

LICENSING. An entirely new concept of the Coast Guard licensing program is expected to be in use by mid-1972. This system calls for the development of new test specifications to determine an appropriate scope of examination subjects for officers in the modern merchant marine. Testing centers will be established to standardize evaluation, testing, and grading.

COMMERCIAL VESSEL CASUALTIES. During FY 1970, the Coast Guard investigated 2,342 casualties to personnel on commercial vessels which did not result from a vessel casualty. Also investigated were 2,582 vessel casualties, some of which also resulted in injury or death to personnel. A total of 41 lives were lost as a result of these casualties.

NEW TRAFFIC REGULATIONS. To aid masters, pilots, and operators in obeying anti-collision rules and to reduce the danger inherent in the con-

[1] See table 10 for summary of Merchant Marine Safety Activities.

verging of two or more vessels, proposed legislation requiring bridge-to-bridge radiotelephone capability has been introduced in Congress.

In a continuing effort to relieve congested areas, additional traffic separation schemes were established at the approaches to Chesapeake Bay and off Smith Point, Virginia, in Chesapeake Bay. These schemes are systems of sea lanes which separate traffic in much the same manner as dual highways separate vehicle traffic.

An international conference to revise the International Regulations for Preventing Collisions at Sea has been called for 1972. Working with the Rules of the Road Coordinating Panel of the Merchant Marine Council, the Coast Guard is preparing a U.S. position for this conference.

International Load Line Convention (1966). The regulations implementing the 1966 International Load Line Convention have been published and are in force. Legislation covering the changes from the 1929 Foreign Load Line Act, as amended, has been prepared and is being considered by Congressional Committees.

Shipboard Fire & Safety Testing Facility. The Coast Guard Shipboard Fire and Safety Testing Facility was dedicated at Mobile, Ala. in August, 1969. A series of fire detection tests in the machinery space of the M/V *Rhode Island*, a retired tanker, was conducted under Coast Guard supervision in May 1970. An additional series of detection tests is planned for August 1970 followed by a series of extinguishing tests.

Hazardous Materials. The volume and variety of hazardous materials transported in tankers, barges, container ships, and cargo ships have increased rapidly; chemical production has doubled and barge shipments have increased fivefold during the past 10 years. Major new regulations for barges carrying bulk chemicals became effective on 1 June. The development of corresponding regulations for tankers, container ships, and "roll on-roll off" ships is proceeding at an accelerated pace. A new concept of hazard evaluation is being used for bulk transportation, utilizing the results of work by the Coast Guard's National Academy of Sciences Advisory Committee on Hazardous Materials and studies by the Bureau of Mines under contract. Currently the pending large scale importation of liquefied natural gas (LNG), by tankers carrying this uniquely hazardous material at $-258°$ F. is causing special concern. Preliminary theoretical and experimental studies of liquefied natural gas and chlorine were completed in the past year and will be extended to provide a better understanding of the disaster potential of massive spills of these and other types of hazardous materials. Pollution prevention is an important element in new hazardous materials regulations and hazard evaluation studies.

The foreign vessel Letter of Compliance program continued as a major activity. Under this program, foreign tankers considered to present an unusual risk to U.S. ports by reason of their design, operation, or cargoes carried are required to obtain a Letter of Compliance based on plan review

and vessel inspection. The number of foreign vessels processed has at least doubled every year for the past 5 years and now totals 220.

Boating Safety. The Federal Boat Safety Act of 1969 was introduced in the House of Representatives on 2 December 1969 (H.R. 15041), and in the Senate on 3 December 1969 (S. 3199). This bill is an outgrowth of a proposal introduced in the 90th Congress, which was modified by the Coast Guard working cooperatively with the staff of the House Merchant Marine and Fisheries Committee, the boating industry, and the States.

The House Merchant Marine and Fisheries Committee held hearings on the proposed Federal Boat Safety Act during May and June 1970 at Staten Island, Long Island, Boston, and Seattle.

By the end of FY 1970, 41 law enforcement agreements had been signed with various state jurisdictions. Progress in signing these agreements has been hindered by conflicting requirements in state boating laws.

Forty-seven states, the Virgin Islands and Puerto Rico, have numbering systems in accordance with the Federal Boating Act of 1958. There were 4,864,074 craft numbered as of 31 December 1969. There are an estimated 8.6 million boats in the U.S.

On 1 July 1969, enforcement reporting requirements were changed in an effort to collect more meaningful and useful information, improve reporting procedures among the various units, and eliminate requirements for unneeded data.

Coast Guard Boating Safety Patrol efforts during the past fiscal year again placed primary emphasis on curtailing unsafe boating practices, such as excessive speed, overloading, improper loading, operating in swimming areas, operating in posted dangerous waters, and erratic operations. Emphasis on detecting and deterring these unsafe practices will be continued during FY 1970.

During FY 1970, shore and floating units of the Coast Guard Boating Safety Teams spent 67,774 man hours in educating the boating public and disseminating safety information. Coast Guard displays at boat shows were visited by 1,815,146 persons, 220,954 people attended lectures and other speaking engagements given by the Coast Guard, and 37,706 persons saw boating safety films.

During calendar year 1969, 5,239 vessels were reported as being involved in 4,067 accidents which resulted in 1,350 fatalities and 1,004 personal injuries and property damage in the amount of $6,371,900. As compared to calendar year 1968, fatalities increased 0.6 percent; injuries decreased 21.8 percent; and the dollar value of property damage decreased 3.9 percent.

During FY 1970, the Coast Guard coordinated and monitored boating standards activity cooperatively with national and international standards organizations. In its international standards activity Coast Guard observers attended a meeting of the International Council of Marine Industry Association in Sweden, and safe powering trials in Canada sponsored jointly by

the Boating Industry Association of the U.S. and the Allied Boating Association of Canada. Through membership at several levels in the American Boat and Yacht Council, the Coast Guard has kept track of U.S. voluntary standards activities.[1]

## RAILROAD SAFETY

INTRODUCTION. The number of train accidents in 1969 increased 6.4 percent over the previous year.[2] The major factor in this increase was the 8.6 percent rise in "derailments" caused mainly by failure of equipment and defective track. The number of "collisions" increased by 4.8 percent from 1968, while other train accidents decreased by 5.0 percent. The number of casualties resulting from all reportable accidents decreased by 4.9 percent.

TRAIN ACCIDENTS. Table No. 12 lists the number of train accidents, the number of such train accidents which involved casualties, and the number of casualties involved in reportable accidents of all types (train-train service-nontrain) as reported by all common carriers by rail, during the 3-year period 1967–1969. In 1969, 8,543 train accidents were reported, an increase of 515 accidents or 6.4 percent over those reported in 1968, and an increase of 1,249 or 17.1 percent over those in 1967.

RAIL-HIGHWAY GRADE CROSSING ACCIDENTS. During 1969, 3,774 grade crossing accidents were reported, a decrease of 42 accidents or 1.1 percent compared with the previous year.[3] A total of 1,490 deaths and 3,669 injuries resulted from these accidents, representing a decrease of 3.6 percent in deaths and a decrease of 2.8 percent in injuries compared with 1968. (See tables 13 and 14).

Collisions at grade crossings involving trains and motor vehicles during 1969 totaled 3,572 and resulted in 1,381 deaths and 3,578 injuries—a decrease of 31 accidents, 67 deaths, and 87 injuries compared to 1968. Included in the total number of accidents involving motor vehicles were 61 derailments and 243 miscellaneous train accidents accounting for 135 deaths and 157 injuries. Also included in the total casualties at rail-highway grade crossings were one injury to a passenger, as well as six fatalities and 121 injuries to employees on duty.

Information concerning these accidents is summarized in Table No. 15.

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[1] See Table 11 for U.S. Coast Guard Financial Statement for FY 1970.

[2] As in previous years, the Federal Railroad Administration had no safety jurisdiction during FY 1969–1970 over the construction and maintenance of track, roadbed and structures, the running gear of rail cars, or the number of qualifications of train crew members.

[3] In addition, there were 18 nontrain grade crossing accidents during 1969 which resulted in two fatalities and 22 injuries.

LOCOMOTIVE SAFETY. The Locomotive Branch investigated 101 accidents during FY 1970. Failure of locomotive equipment contributed to 66 of these accidents and resulted in 72 injuries. There were no fatalities (see Tables 16 and 17). Predominant causes of these accidents were defective insulation, short circuits or electric flash; unsafe cab floors, steps and passageways; defective cab windows and doors; defective cab seats; energized electric parts.

The Locomotive Branch inspected 95,004 locomotives, a decrease of 9,277 from the number of units inspected in the previous fiscal year (see Table No. 18). Of the total units inspected, 11,988 or 12.6 percent were reported as defective. The percentage of defective locomotives remained the same as it was last year.

EQUIPMENT AND OPERATIONS. The percentage of defective equipment in use increased from 7.7 to 8.8 percent during the year, a matter of grave concern. The operation of trains which had not been given proper train brake tests increased from 21.3 percent observed in FY 1969 to the high level of 22.2 percent in FY 1970.

INSPECTION ACTIVITIES. Tables 19 and 20 show the number of freight cars, passenger-train cars, and locomotive inspected; the number found with defective safety appliances; the percentage defective, and data for comparison with the preceding year.

Of the 883,164 freight cars inspected, 84,268 or 9.6 percent had defective safety appliances, as did 8.1 percent of passenger cars and 2.5 percent of locomotives inspected.

INVESTIGATIONS OF COMPLAINTS—SAFETY APPLIANCES. During the year, 223 complaints were investigated, compared with 189 for the preceding year. Of the total, 75 involved power brakes, 95 safety appliances, 20 both power brakes and safety appliances, and 33 miscellaneous matters. In 125 of these investigations evidence of violation of the law was obtained and prosecution on 1,306 counts was instituted. In many other instances, investigation resulted in the correction of unsatisfactory conditions.

SPECIALIZED EQUIPMENT. In response to shipper demands for specialized equipment, the development of new equipment by the railroad industry is continuing at an increasing pace. The technical staff of the Equipment and Operations Branch reviews drawings submitted by carriers and builders and inspects prototype cars to make certain that they meet requirements and to anticipate any potential hazards which might exist in new and untried designs.

In order to achieve uniformity of application, the technical staff keeps fully informed of carrier and car builder activities. Needed advance information was provided by continuing the established practice of working closely with interested parties in conferences, studying submitted drawings and prints, and making physical inspection at the carriers' and car builders' shops and plants.

Interest in high-capacity cars continued. Car builders developed large-capacity tank cars with span bolsters; 16-axle, one million pound flat cars; special airplane parts cars; and controlled-environment cars for fresh fruit and vegetables. In addition, a totally new concept in transporting small automobiles by rail was introduced with the development of a large volume box car designated the Vert-A-Pac.

The unit-train concept likewise developed further. Specialized equipment was designed to haul train loads of commodities to single consignees on a cyclic basis. Each of the new car designs required development of an appropriate safety appliance installation to provide uniformity of application so far as possible.

During the past year, 161 special inspections of new equipment were made by field inspectors and members of the Washington staff.

HOURS OF SERVICE ACT. During the year, hours of service reports were filed by 92 railroads reporting 5,881 instances of all classes of excess service. The reports covered 5,007 instances of excess service by operators, train dispatchers and other employees subject to the 9-hour and 13-hour provisions of the law. A breakdown of this total is shown in Table 21. The reports also covered 874 cases of excess service performed by train and engine employees subject to the 16-hour provision of the law. (Tables 22 and 23.)

MEDALS OF HONOR ACT. Under the Medals of Honor Act of February 23, 1905, as amended (49 U.S.C. 1201–1203), applications are considered for award of life-saving medals to persons, who by extreme daring risk their own lives in saving or endeavoring to save lives in any wreck, disaster, or grave accident, or preventing or endeavoring to prevent such a wreck upon any railroad within the United States or involving any motor vehicle on the public highways. At the beginning of the year there were no pending applications involving railroads and only one was received during the fiscal year.

SIGNAL AND TRAIN CONTROL EQUIPMENT. During the year, 164 applications for approval of proposed modifications of block signal systems, interlocking, automatic train stop, train control, and cab signal systems were filed by the carriers. At the beginning of the year, action was pending on 66 applications previously filed. Of the total, 194 applications were acted upon during the year and action was pending on 36 at the close of the year.

Fifty-one applications were filed requesting relief from the Federal Railroad Administration's requirements of the Rules, Standards, and Instructions. At the beginning of the year action was pending on 13 such applications. Of this total 53 were acted upon and action was pending on 11 at the close of the year. No public hearings were held on applications for relief from the Rules, Standards, and Instructions.

During the year 58 complaints were received regarding alleged violations of the Rules, Standards, and Instructions. At the beginning of the

year action was pending on 11 complaints previously filed. During the year investigations were completed on 54 and action was pending on 15 at the end of the year.

Also during the year, 12 cases (96 counts) involving violations of Signal Inspection Law (49 U.S.C. 26) were forwarded to the Chief Counsel for consideration compared with six cases (45 counts) during the previous year.

Table 24 shows, for a 5-year period, the number of applications for approval of modifications of block signal systems and interlockings as well as applications for relief from or modifications of the Rules, Standards, and Instructions prescribed by order of the Federal Railroad Administration, and the number of inspections and the devices inspected during the year.

These signal inspection activities resulted in bringing to the attention of railroad managements a number of unsatisfactory maintenance conditions requiring necessary corrective action. Meetings were also held with carrier officials and manufacturers to discuss the need for advance signal systems which would improve safety of train operations.

HAZARDOUS MATERIALS. The Department is authorized to develop and administer regulations for the safe packaging, marking, and transportation of explosives and other dangerous commodities in interstate commerce. (Title 18, Chapter 39 U.S.C. Sections 831–835 provide the basis for the Hazardous Materials Regulations which are found in the Code of Federal Regulations, Title 49, Parts 170–195.) The Federal Railroad Administration promotes and assists in the enforcement of these regulations insofar as they relate to shipments by railroad and liquid pipeline. The regulations apply to shippers as well as to carriers.

The Bureau of Railroad Safety conducts routine and special investigations relating to hazardous materials in transit and in storage, and takes appropriate corrective action when the regulations are not observed. Close liaison is maintained with the other modes of transportation through the several operating administrations within the Department, and the Hazardous Materials Regulations Board.

Safety inspectors of this Bureau made 1,022 inspections of the movement of hazardous materials by railroad. The improper documentation of hazardous shipments at point of origin continued to be the principal deficiency noted. In many cases the inspectors were able to take corrective action with carrier personnel to avoid a recurrence. Other areas of concern were the improper placarding of freight and tank cars, and the location of such cars in trains.

A total of 1,061 Special Permits (including renewals and assignments), which allow the movement of commodities not specifically covered by the regulations, were approved for railroad transportation. Copies of the permits were distributed to the field staff of the Bureau for guidance and informational purposes in enforcement and inspection work.

Complaints and allegations of unsafe handling of hazardous materials while in transit were cited in 20 letters received from State and local officials, Congress, labor unions, and the public. The allegations were referred to the appropriate Regional Directors for investigation, report of findings, and corrective action with the carriers involved to prevent recurrence. During the year, 16 such instances were found to have sufficient basis for possible prosecution in the courts, and were therefore forwarded to the Chief Counsel for appropriate action.

Numerous inquiries were received from the public, educational institutions, and law firms relative to the applicability of the hazardous materials regulations.

Comprehensive regulations for the transportation of liquids by pipeline were promulgated by the Administrator during the year. They cover Accident Reporting, Design Requirements, Construction, Operation, and Maintenance of liquid pipelines engaged in interstate commerce. The regulations have been published as Part 195 of Code of Federal Regulations Title 49, and became effective on April 1, 1970. In total, 380 Pipeline Carrier Accident Reports (DOT Form 7000–1) were filed with the Administrator during the fiscal year. A review and analysis of the reports revealed 29 instances in which oil spills resulting from pipeline ruptures or breaks injected pollution into streams, creeks, stock ponds, and irrigation ditches.

A petition was received requesting a review of plans for a pipeline relocation in the Louisiana delta area. This was in accordance with the above mentioned pipeline regulations relating to construction. The proposal was examined in coordination with the Office of Pipeline Safety and was found to be in compliance with the regulations, and no exceptions were taken to the project.

On approximately five or six occasions annually, the National Transportation Safety Board preempts accident investigation originated by the FRA. On those occasions, some FRA field inspectors are assigned to the investigation and lend the NTSB fullest cooperation possible, performing most of the on-the-scene investigation work required on behalf of the NTSB.

The Accident Investigations Branch conducted 117 investigations in FY 70 and issued 11 public reports.

Engineering Safety. The Engineering Branch is a new addition to the Bureau of Railroad Safety's (BRS) total effort in promoting railroad safety. Its function is to provide technical staff support for BRS Headquarters and the eight field Regions. This support consists of determining technical causal factors of reported railroad accidents and recommending corrective action, establishing criteria for new railroad operational components which affect safe and efficient performance, making technical studies and time study evaluations of BRS workload, participating in FRA Task Forces, and keeping current on technological advances in the rail industry.

Work has commenced on the following projects:

- Analyze the design and operation of hazardous materials tank cars; e.g., venting requirements, sizing of safety valves, construction of shielding, metallurgy of tank steels, fire insulation, and interlocking couplings.
- Evaluate design and functional operation of rail equipment components such as cast steel wheels.

Several serious accidents occurred during the year involving tank cars loaded with liquefied petroleum gas and other hazardous substances. As a result, the advisability of requiring tight-lock couplers on tank cars was considered, and steps were taken to develop a suitable proposal for amendment to the regulations.

The Hazardous Materials Branch continued its close cooperation with the Bureau of Explosives of the Association of American Railroads, the Transportation Division of the American Petroleum Institute, the Compressed Gas Association, and the Manufacturing Chemists' Association. Hazardous materials specialists from the Washington office particpiated in several on-the-spot investigations of railroad accidents that had serious implications because of the presence of hazardous lading. The investigations were carried out in conjunction with the accident investigation team and various field inspectors of the Bureau of Railroad Safety.

Accident Investigations. The Accident Investigations Branch is responsible for handling investigations of railroad accidents. It selects those accidents to be investigated; arranges for the assignment of investigators; reviews and analyzes field reports of accident investigations; recommends FRA courses of action for prevention of accidents, and prepares accident investigation reports for printing and release to the public. In case of a very serious accident, a "go team" from the Washington office is dispatched to the scene via government airplane (under arrangement with the FAA) to investigate the accident in conjunction with field personnel.

## CHAPTER III

# EMPHASIS ON ENVIRONMENTAL FACTORS

### THE REQUIREMENTS

One of the most striking developments during the brief history of the DOT is the growth of popular concern for protection and enhancement of the general environment. Secretary Volpe has actively campaigned for enhanced public interest and participation in environmental studies and programs. The Department responded to the general concern by establishing in 1969 an Assistant Secretary for Environment and Urban Systems (TEU). That office is charged with the Department's assignments under the National Environmental Policy Act of 1969, the President's Executive Order of March 5, 1969, section 4(f) of the DOT Act, several sections of the Airport and Airway Development Act of 1970, and directives from the Executive Office of the President.

Those enactments provide legal underpinning for a great variety of Department programs. Briefly stated, the Office of the Assistant Secretary for Environment and Urban Affairs provides a bridge between transportation-related objectives and fundamental social, economic, and environmental goals, all of which are legally responsibilities of the Secretary.

In addition, during the year the President delegated to the Secretary of Transportation a number of responsibilities under the provisions of the Federal Water Pollution Control Act and the Water Quality Improvement Act of 1970. These include: (1) Collaboration with the Secretary of the Interior in the determination of those quantities of oil, the discharge of which will be harmful to the health and welfare of citizens of the United States, (2) rigorous inspection of vessels carrying cargoes of oil and their equipment for preventing or minimizing oil spills, (3) the administration of the revolving fund established by the Act, and (4) management of the clean-up of oil spills, the removal of discharged hazardous substances, and related tasks. Proposals were prepared to delegate most of the functions acquired to the Coast Guard.

Within the Department, the Office of Assistant Secretary for Environment and Urban Systems is a focal point for policy and program development, for coordination, and for education relating to environmental and urban transportation matters. The office seeks to encourage metropolitan areas to develop their own governmental institutional mechanisms for planning balanced transportation systems, for responding to a broad range of transportation needs within the communities, for facilitating the development of

integrated transportation systems, and for responding sensitively to the broad public and private concern for the preservation and enhancement of the quality of environment.

## RESPONSE OF THE OFFICE OF THE SECRETARY

AUTOMOTIVE POLLUTION SUBCOMMITTEE REPORT. The Secretary coordinated preparation of the Cabinet Committee on Environment Subcommittee Report on Automotive Pollution, presented its conclusions to the President and Cabinet and developed a proposal for a Federal program to develop low-polluting, nonconventional power systems which could be mass produced if refinements to the internal combustion engine fail to reduce emission pollutants to acceptable levels.

The President directed the Council on Environmental Quality to coordinate such a program. The Department of Health, Education, and Welfare was designated to conduct research and development of advanced automotive systems, with consultation and assistance from the Department of Transportation. Responsibility for the mass production phase was assigned to the Department of Transportation. Studies have been initiated of the social, economic, and manpower impacts which might occur if unconventional vehicles replace the internal combustion vehicle.

HAZARDOUS MATERIAL SUBCOMMITTEE REPORT. The Secretary was chairman of the Cabinet Committee on Environment Subcommittee for a Study of the Handling and Transportation of Toxic and Other Hazardous Materials, that coordinated an interagency report and made recommendations which were submitted to the White House and the Council on Environmental Quality.

DADE COUNTY JETPORT. The Department of Transportation worked closely with the Department of the Interior in bringing about a Federal-State pact to assure consideration of all feasible environmental protection measures in the search for and the selection of an alternate site for the Everglades Jetport, upon which further construction has been suspended.

RESEARCH ON ENVIRONMENTAL AND URBAN PROBLEMS. Research into environmental and intermodal urban transportation planning considerations received considerable attention during FY 1970. Through 10 separate projects, having a total value of nearly $800,000, a series of manuals, films, technical processes, and suggested revisions to DOT policies and procedures will be developed. These projects are designed to:

1. *Establish* an intermodal urban transportation planning process which is reflective of local goals and objectives and which promulgates transportation programs which enhance the quality of life;
2. *Promulgate* policies and procedures which are responsive to Congressional intent under the Environmental Policy Act of 1969 and the various pieces of legislation under which the Department operates;

3. *Develop* a Departmental capability to assist States and local communities in resolving conflicts between transportation needs and environmental resources; and
4. *Develop* a system of technical processes by which transportation plans and projects can be assessed for their impact upon the quality of life as well as upon transportation problems.

Research into the urban transportation planning process in stressing the interdisciplinary approach to this process; the involvement of public officials and citizens in the process; the consideration of social, environmental, and aesthetic factors in the process; as well as the development of intermodal planning techniques.

DOT's current policies and procedures are being assessed in light of the Environmental Policy Act of 1969 and in light of new funding programs for airports, airways, and public transportation.

The FY 1970 research effort was designed to help establish future directions for DOT relations with States and local communities and for utilizing the Department's resources, both to help solve the Nation's transportation problems and to facilitate solutions to other pressing problems, including the enhancement of the quality of life.

Section 134 Study. Section 134 of the 1962 Highway Act called for "a continuous coordinated comprehensive transportation planning process" for those metropolitan areas with more than 50,000 population. The Office of Assistant Secretary for Environment and Urban Systems' study or evaluation is aimed at rationalizing all DOT planning assistance programs in urban areas, and involves all elements of the Department. It is the first attempt to rationalize Federal planning assistance programs for transportation, a step which may eventually lead to institutions which enable local governments to establish intermodal urban transportation systems.

The study is based on responses to questionnaires sent to 40 Mayors, 25 Councils of Government, 50 State highway departments, 250 urban planning agencies, and other groups. Ideally, the study will enable the Department to devise the best possible urban transportation planning process, and may make it possible to meld existing highway planning policy and procedures with the planning assistance programs of the FAA and the UMTA. A possible result could be the establishment of metropolitan development agencies with planning and programming authority for all modes of transportation in urban areas. The study will be completed during FY 1971.

Secretary's Replacement Housing Policy. The Office of Assistant Secretary for Environment and Urban Systems was assigned responsibility for the development of procedures to implement the replacement housing policy which the Secretary announced in February, 1970. This policy requires that transportation projects be halted if adequate relocation housing is not available to persons displaced by the projects. The policy requires

that if the housing does not exist it must be built. The Department of Housing and Urban Development is joined by DOT in that effort; most replacements at the present time result from highway construction and the replacement housing policy has been effectively applied in a number of instances throughout the Nation.

URBAN CORRIDOR DEMONSTRATION PROGRAM. The Office of Assistant Secretary for Environment and Urban Systems was assigned responsibility for coordinating the activities of the Urban Mass Transportation and the Federal Highway Administrations in establishing the Urban Corrridor Demonstration Project. Applications were received from 38 metropolitan areas and, after evaluation, the Secretary designated 11 cities as recipients of planning grants.

During FY 1971 these 11 metropolitan areas will plan their projects which are designed to relieve traffic congestion from the central city business districts to outlying suburbs. Funds for the implementation of these plans will be provided through appropriations and the ongoing programs of the two Administrations.

SUPPORT FOR OTHER URBAN ORIENTED PROGRAMS (MODEL CITIES PROGRAM). The Office of Assistant Secretary for Environment and Urban Systems was assigned responsibility for participation on the Subcommittee on Model Cities of the "President's Domestic Council." Through the device of an intra-agency Model Cities Committee, the support of the Department of Transportation to the Model Cities program was accomplished.

The Urban Mass Transportation Administration earmarked $8.5 million for Model Cities purposes and the Federal Highway Administration assigned a priority to those Model Cities programs which involved highway construction or traffic engineering programs.

CEQ AND DOMESTIC COUNCIL. These important Councils which serve as advisors to the President and coordinate programs relating to environmental quality and broad domestic issues have been the focus for much of the Office of Assistant Secretary for Environment and Urban Systems' activity during the past years. CEQ's Ocean Dumping Task Force, Hazardous Materials Task Force and others have examined specific problem areas which relate to both transportation and the environment. The Domestic Council has concerned itself with new towns and with other long- and short-range programs designed to have an impact on urban areas served by the Office of Assistant Secretary for Environment and Urban Systems' activities.

EDUCATION AND PROMOTIONAL EFFORTS. During FY 1971 TEU continued its effots to promote, to explain, and to educate the public as to the Department of Transportation's activities on environmental matters and on matters relating to the development of true urban transportation systems. These educational and promotional efforts were undertaken with the support of other elements of the Department and include the publication of various

public informational materials relating to the Office of Assistant Secretary for Environment and Urban Systems and its works within the Department, numerous public speaking engagements on the part of the Assistant Secretary and the Deputy Assistant Secretary, the publication of numerous articles and news stories relating to the office and its work, and responses to thousands of public letters on environmental and urban matters. In addition, the office reviewed legislation relating to the environment and transportation's impact on the environment. The Office of Assistant Secretary for Environment and Urban Systems distributed thousands of pieces of public information material and information kits to students and others as part of the celebration of "Earth Day."

## MODAL RESPONSES

### Highways

***Social and Environmental Enhancement Activities.*** The impact of highways on people and the environment is a factor which the FHWA considers at every stage of the project development process, from system planning through design, route location, and right-of-way acquisition, to construction and maintenance activities. In fact, the highway official now attaches as much importance to noise, pollution, compatibility of land uses, ecological factors, and many other environmental considerations as he does to drainage, topography, cuts and fills, traffic accommodation, and the other engineering elements of location and design.

***Interdisciplinary Teams.*** With increasing national concern for the social, economic, and environmental effects of new highways has come the recognition that the work of highway design professionals can be enhanced by collaboration with professionals from the social and applied sciences. FHWA has provided the services of an interdisciplinary environmental unit, staffed in FY 1970, to field offices and State highway departments for technical assistance and guidance.

Because State highway department officials have seen the need for this type of team involvement in highway location and design, many State highway departments have begun to develop their own interdisciplinary analysis capability. A report describing the historical usage of the team approach and its contemporary application to highway projects, especially in urban areas, was widely distributed during FY 1970.

***Joint Development and Multiple Use.*** To further encourage the application of the joint development concept, a report titled "Highway Joint Development and Multiple Use" was prepared and distributed to Federal, State and local officials concerned with the planning and coordination of transportation facilities. This report itemized over 700 projects and their current status. The illustrations show the wide range of applicability of joint development to various transportation modes, urban and rural situations, and differing land use activities. Many presentations were made to public and private groups to explain the benefits and opportunities that can

accrue through joint development. Feasibility studies were initiated or continued in such cities as Hartford, Connecticut; Omaha, Nebraska; Seattle, Washington; and Baton Rouge, Louisiana to identify early in the highway location and design process the community development goals and objectives that could be accommodated in conjunction with highway development.

***Environmental Impact of Proposed Projects.*** During FY 1970 FHWA was involved in the development of new policies and procedures for implementing section 4(f) of the Department of Transportation Act. That section restricts the taking of land for highway purposes from public parks, recreational areas, waterfowl and wildlife refuges, and historical sites. The past year has seen a continued and increased awareness on the part of both the FHWA and the State highway departments of the effect of highways on these lands, and cooperative work with local, State, and Federal authorities on highway projects affecting section 4(f) lands has resulted in significant measures being taken to minimize adverse effects on these facilities. In several cases, as a result of land exchanges, the amount of available resource land has actually been increased.

Pursuant to the Environmental Policy Act and interim guidelines issued by the Council on Environmental Quality, FHWA is similarly coordinating with the Assistant Secretary for Environment and Urban Systems the development of operating procedures to give adequate consideration to environmental factors in the highway development process. FHWA is also preparing guidelines for environmental factors to be considered by State highway departments and an Environmental Fact Book containing all relevant statutes, regulations, and other information or assistance to Federal and State officials and the general public.

***Public Participation in the Highway Process.*** Alternative means of providing for and encouraging timely and constructive citizen participation in highway planning and design were investigated. Creative techniques were designed to encourage consultation among the official, quasi-public, business, and local interests at all stages of the highway development process. The successful experiments of California and Michigan with community organization approaches to highway planning and similar efforts in other States were studied for wider application.

The public hearing is an essential step in highway project planning and a vital step in a public relations program. During 1970, emphasis was given to identifying ways by which the public hearing process could be improved. To encourage participation by the involved public, States were urged to review hearing organization procedures, to avoid public inconvenience, and to enhance the value of the hearing as a true public forum. A manual is being prepared to give States guidance in the conduct of such hearings.

URBAN AREAS

***Environmental Improvement—Bus.*** Under an UMTA contract four city transit buses were equipped with Environmental Improvement Program (EIP) kits to reduce noise and exhaust emissions and a program of test and evaluation was undertaken. In addition, under project INT–MTD–20 five more buses will be similarly equipped in FY 1971. These buses are currently in transit service in Washington, D.C. and in San Francisco; they will be periodically tested for emission and operational suitability. Preliminary results indicate a significant reduction in smoke, odor, and other pollutants when compared to standard buses. If successful, the kits could be installed rapidly on large numbers of buses presently in service throughout the country.

During FY 1971 contracts were let to three different steam engine manufacturers to furnish and install steam engine propulsion systems in existing bus bodies (UMTA project CAL–MTD–13). Preliminary designs for these engines will be completed and some of the engine components constructed and tested during FY 1971. During FY 1972, demonstrations of these buses are planned. They should generate substantially less noise and air pollution than standard buses.

A grant was also made to develop a catalytic muffler for reduction of pollutants from bus diesel engines. This novel device uses a molten salt sprayed into the exhaust stream as the catalyst. Substantial reduction in pollutants should result, particularly oxides of nitrogen.

***Environmental Improvement—Rail Rapid Transit.*** The Institute for Rapid Transit was awarded a grant for Phase I of a 3-year project to develop a *Handbook of Environmental Criteria for Underground Systems.*

The objective of this project is the development of a designer's handbook containing detailed information on environmental criteria, analysis, and control for subway rapid transit systems. As the current state-of-the-art in these areas is inadequate, an extensive research program must precede the handbook. This research will include theoretical and experimental model studies which will provide a basic understanding of, and an analytical approach to, the family of problems associated with moving vehicles and heat generation and distribution, in the confined spaces characteristic of subway rapid transit systems. Other research will be required in the areas of environmental criteria, environmental control systems, and the maintenance associated with these systems.

AVIATION

***Aircraft-Engine Noise Abatement.*** On December 1, 1969, FAA adopted a rule establishing allowable engine-noise levels as part of the criteria for aircraft type certification. This was the first rule issued under Public Law 90–411, which empowers the Federal Aviation Administrator to pre-

scribe rules and regulations for the control and abatement of aircraft-engine noise and sonic boom. In announcing the rule, Secretary Volpe characterized it as "the important first step in reversing the escalation of aircraft noise. . . "

The rule applies to the following two classes of aircraft for which an application for a type certificate was made after January 1, 1967: (1) All subsonic aircraft in the transport category, and (2) all subsonic turbojets regardless of category. Piston-powered aircraft not in the transport class are not affected by the rule; nor are aircraft already in service.

In general, the level of engine noise is a function of engine size; the larger the engine, the greater the noise. Accordingly, the allowable noise levels prescribed by the rule vary with aircraft size and type, ranging from as low as 93 effective perceived noise decibels (EPNdB) to as high as 108. Moreover, different noise limits are prescribed for different aircraft operations. The allowable noise limits on approach range between 102 and 108 EPNdB; during takeoff, between 93 and 108 EPNdB. Sideline noise—i.e., noise along the runway or taxiway during idling or taxiing—is limited to a range between 102 and 108 EPNdB. The largest aircraft in service today generate between 110 and 120 EPNdB. Hence, new transports such as the Lockheed 1011 and the DC–10 will be between 10 and 12 EPNdB quieter than the noisiest transports in service today. This means that, in time, the new regulation will have cut the noise around airports in half. (A decibel is a unit of relative acoustic power; a reduction of 10 EPNdB in the noise level of a jet engine is roughly equivalent to a 50 percent reduction in noise annoyance.)

In two other FY 1970 developments in aircraft-engine noise abatement, FAA—

1. Established a 26-member Government-industry task force to assist it in defining noise certification criteria for short takeoff and landing (STOL) transport aircraft.
2. Awarded a $107,762 contract to an aircraft-parts manufacturer to study the economics of retrofitting transport aircraft currently in service with acoustically treated nacelles. The contractor will also develop retrofit standards.

***Sonic Boom.*** In another action under Public Law 90–411, FAA issued a notice of proposed rulemaking banning flights by civil aircraft in the United States at speeds that would produce a sonic boom capable of reaching the ground. (Such flights, however, would be permitted in designated flight-test areas.) This action had been entirely expected. "President Nixon and I have stated on numerous occasions," Secretary Volpe said in announcing the proposed regulatory action, "that it is our unequivocal position that no commercial supersonic aircraft will be allowed to fly over populated areas at boom producing speeds."

The agency also continued to sponsor sonic boom research looking to the reduction of sonic boom intensities and ground effects. Some of the more important studies begun during the reporting period were concerned with:

- The interaction of sonic booms with topography and atmospheric turbulence.
- Sonic boom measurement techniques.
- Sonic boom suppression through the use of lifting surfaces, engine and exhaust jets, laser beams, and electromagnetic techniques.
- The effect of pressure waves (including sonic booms) on glass structures.
- The effect of unusual noise (including sonic booms) on special population groups.

***Aircraft Air Pollution.*** The airplane is not a heavy polluter of the air; air carrier aircraft are responsible for approximately 1 percent of the total pollutants dumped into the air each year. In areas neighboring airports, however, the concentration of pollution attributable to aircraft-engine emissions can be substantially higher. Thus, aircraft-created pollution is of concern to the Federal Aviation Administrator, who is charged by the Federal Aviation Act with regulating the flight of aircraft "for the protection of persons and property on the ground."

The more important developments in control of aircraft air pollution during FY 1970 included:

- Reaching an agreement with 31 airlines on the retrofit of JT8D engines with smoke-reducing combustors. These devices reduce the level of visible pollutants emitted by jet engines, but have no effect on invisible pollutants. Under the retrofit plan, which was agreed to voluntarily by the airlines, combustors will be installed on some 3,000 engines on Boeing 737's, Boeing 727's, and DC–9's by late 1972. The Department of Health, Education, and Welfare participated in negotiating the agreement.
- Letting a contract for the establishment of design criteria for the control and reduction of nitrogen oxides (invisible pollutants) emitted from jet aircraft engines.
- Issuing an advance notice of proposed rulemaking soliciting comments from the aviation community and the public at large on the establishment of aircraft-engine emission standards.

***Airports and the Environment.*** The airplane poses its greatest threat to the environment at the airport and its vicinity. It is here that aircraft-engine noise is loudest; it is also here that the greatest concentration of air pollutants emitted by aircraft engines is found.

With the passage of the Airport and Airway Development Act of 1970, environmental considerations bearing on airport expansion or site selection

have been elevated to the same level of importance as long-standing engineering considerations. Briefly, the act directs that—

- In preparing the national airport system plan (NASP), the Secretary of Transportation shall consult with local, State, and Federal agencies to insure the conservation of national resources and the preservation of environmental quality.
- The Aviation Advisory Commission established by the act shall recommend uses for land surrounding airports that are compatible with NASP.
- No project involving the location of a new airport, the construction of a new runway, or the extension of an existing runway may be approved by the Secretary unless the sponsoring agency has held public hearings for considering, among other things, the environmental effects of the project on the surrounding community.
- No airport project may be approved if the Secretary, after consulting with the Secretaries of Interior and Health, Education, and Welfare, determines that such project will have an adverse effect on "fish and wildlife, natural, scenic, and recreation assets, water and air quality," and other natural resources. The Secretary may approve such a project, however, if he certifies in writing that no feasible and prudent alternative exists to the proposed project and that all possible steps have been taken to minimize adverse effects on the environment.

Important FY 1970 actions taken by the Secretary of Transportation and/or the Federal Aviation Administrator to preserve the environmental quality around airports or the quality of the environment in general included:

- Reaching an agreement with the Secretary of Interior, the State of Florida, and the Dade County Port Authority to seek a site outside the proposed 39-square-mile area in the ecotone between Big Cyprus Swamp and Everglades National Park for the development of a Miami jetport. Building a jetport in this ecotone was judged to be a potential threat to the ecology of the Everglades. The parties also agreed that the small facility already constructed in the ecotone would be operated under strict safeguards as a one-runway training airport until a new training facility is constructed at a still-to-be-determined south Florida jetport site.
- Denying the use of Federal funds for additional runways at John F. Kennedy International Airport pending the results of an environmental study by the National Academy of Sciences. In announcing the decision, Secretary Volpe stressed that any action to improve the major airports in the New York City area must not have the effect of increasing air pollution, the community noise level, or otherwise causing harm to the area's ecology. "The airports of New York, as well as

those across the country," he said, "must be compatible neighbors to the areas they serve."

- Letting four grants (in collaboration with the Department of Housing and Urban Development) for the study of aircraft noise at John F. Kennedy International, O'Hare International, Bradley International (Hartford, Conn.), and Cape Kennedy Regional Airports. The studies are principally concerned with (1) Defining existing noise exposure problems, (2) identifying and evaluating activities affecting those problems, (3) identifying land uses compatible with airports, and (4) estimating the cost of various noise-abating approaches.
- Awarding a contract for a research study to determine whether auxiliary launch systems can be used effectively during takeoff to lessen aircraft noise in the vicinity of airports.

### Water Commerce

Paralleling FAA efforts to control air pollution are the Coast Guard programs to prevent or clean up water pollution. In recent times, of course, the most common type of pollution has resulted from spilling or leaking of oil from ships, oil wells, or other sources, though there is also danger from transporting corrosive, explosive, and toxic materials, particularly when ships carrying them are in harbors. The Coast Guard is charged to prevent, control, and abate marine pollution. It maintains air borne patrols over most of the likely areas for oil spills and oversees the efforts of commercial companies to clean up oil which they spill. For major spills the Coast Guard also provides an on-scene commander to coordinate all efforts to control or dissipate the spills; spills at Sewaren, New Jersey; Tampa, Florida; and off New Orleans, Louisiana were cleaned up under such supervision last year.

Although the current authority for the activity of the Coast Guard in preventing pollution is the Water Quality Improvement Act of 1970, the Coast Guard has for many years considered such work a major responsibility. Under such legislation as the Tanker Act and other laws, the Coast Guard was able to prevent or control almost all pollution arising from vessel construction or cargo containment. Thus the Merchant Marine Safety Program which governs design, construction, manning, and operation of vessels can be credited with the lack of major pollution incidents involving U.S. flag vessels.

Emphasis will now be given also to prevention of minor spills which may arise from leakage from a single skin vessel or from human errors in cargo handling. The Coast Guard is now studying potential problems that may arise from the transportation of oil from the Arctic in tankers. It is also charged with overseeing the design and construction of maritime sewage disposal equipment; that work is coordinated with the Federal Water Quality Administration.

The Coast Guard assumed responsibility for development of Coastal Regional Oil and Hazardous Materials Pollution Contingency Plans. A new national contingency plan was announced on June 1, 1970, and with it a series of regional contingency plans.

The Coast Guard has also included within its research and development program new types of equipment to contain and remove oil spills, including air borne pumps, storage systems, and containment booms, sinking agents, sorbents, and bacteriological degradation agents.

### Railroads

The Federal Railroad Administration's planning and development work during FY 1970 took full account of environmental considerations and it was these considerations in part that stimulated FRA's research and development work, especially on the linear induction motor (LIM) for high-speed systems. The Urban Mass Transportation Administration collaborated in developing the LIM. It is hoped that the LIM may not produce noise, vibration, or contribute to air pollution.

The country's first LIM, designed and built for the Department, was unveiled in December 1969, and has been undergoing low-speed testing since that time at the manufacturer's facility. This particular test vehicle—for speeds in the 150 m.p.h. range—will be further tested at the new test center beginning in 1971.

Also during the last year, a contract was awarded for the design of a high-powered LIM for a 300 m.p.h. tracked air cushion vehicle (TACV) and other vehicles in that speed range.

The relationship of existing rail facilities to the environment was an additional subject of concern. As urban areas grow and expand, there is need to evaluate the impact on them of the variety and amount of railroad facilities, such as stations, shops, yards, and rights-of-way. There is believed to be a potential for enormous public benefits from the removal of rail facilities in congested areas and the release of that land for redevelopment or make improved transportation use of the right-of-way.

At the request of local officials in East St. Louis, Illinois, and Greenwood, S.C., FRA provided assistance in their track and rail relocation plans. Once completed, the relocation project in Greenwood would eliminate 35 grade crossings, two pedestrian crossings, and free the city of train crossings on downtown city streets for the first time in its history.

In East St. Louis, there are 36 railroad yards including 17 on the waterfront and in the city center area. The Terminal Railroad Association of St. Louis, which operates four of the yards, has plans to consolidate them into one. If the other 13 railroads participated in the project, the entire riverfront would be cleared of railroad yards. Other potential benefits would include a 50 percent reduction in terminal delays and improved freight service reliability activities. The consolidation would also provide

the public increased employment opportunities, improved physical environment, and more revenue-producing facilities.

FRA joined FHWA in an engineering feasibility study of a rail-highway transportation corridor to serve the needs of north and northwestern Alaska. It was thought that such a corridor might help to develop the natural resources in that area in a balanced manner, thereby benefiting the entire State; the corridor would provide many natural resources to the Nation with reasonable transportation costs. Other considerations that led to the study were:

- Increased employment opportunities for Alaska natives, with the expectation that availability of low-cost transportation would foster the development of new industry and related businesses.
- Reduced costs of transporting necessities to interior citizens.

The contract prescribes that the study will give appropriate emphasis to ecological and environmental considerations. To assure that these needs will be met, FRA and FHWA officers have contracted with qualified scientists to furnish informed advice from many disciplines; e.g., fish and wildlife biology, forestry, game management, plant ecology, soil sciences, and others.

# CHAPTER IV
# CIVIL RIGHTS

## OFFICE OF THE SECRETARY

The Department of Transportation is particularly proud of its position of leadership among government agencies in promoting civil rights for minority groups. From the outset of the Nixon Administration, Secretary Volpe has insisted that all possible actions be taken to improve the record of the Department in utilizing the talents of minority people. Unprecedented emphasis was placed upon employing Alaskan natives, and citizens of Spanish-American origin as well as black citizens. Furthermore, the Secretary issued orders that no DOT-sponsored construction was to proceed until replacement housing had been guaranteed for people who would be displaced from their homes by the construction. Finally, on June 18, 1970, Secretary Volpe published the DOT regulations for the implementation of the President's civil rights program that are considered to be the most stringent among the agencies of the government. The Secretary also established new regulations governing review of discrimination complaints, making the Office of the Secretary responsible to review all such complaints within the Department, to make certain that no part of the Department evaded the regulations.

During the year the Secretary implemented numerous programs to carry out the equal opportunity principles that he so strongly supported. For example, he has instituted a semi-annual conference of DOT executives during which each has to review his own program for equal opportunity, and all can discuss techniques for realizing the equal opportunity goal. In another context, the Department has required that the operating administrations set aside specific amounts of funds for contracts with minority business firms. The Department has assumed responsibility to assure compliance with Equal Opportunity regulations by the Washington Metropolitan Area Transportation Authority which is constructing the subway system for the District of Columbia. The Department's authority and responsibility for equal opportunity have now been extended to other Federally-sponsored construction projects in the Washington area.

The Department has established a Youth Opportunity Committee to help with the training and employment of disadvantaged young people; many of those young people are, of course, members of minority groups. Similarly the Department has made large grants to predominantly black colleges for research in transportation-related problems with the double purpose of

utilizing the talent available in the faculty and student bodies of the schools, and, at the same time, of training additional minority members in transportation-related skills so that they may become prospective candidates for employment either with the DOT or with the transportation industry.

Within the Department, 17 minority-group employees have now been appointed to Executive Level or supergrade positions, whereas there were no minority-group members in such positions in 1968.

## COAST GUARD

In May of 1969 the Equal Opportunity Division was elevated to Office status. The Office Chief is the principal staff advisor to the Commandant on civil rights and equal opportunity matters.

Through the performance of in-depth reviews and evaluations of implementation of policies, programs, standards, and procedures, the Office of Civil Rights assures full and affirmative implementation of civil rights and equal opportunity and treatment precepts of: (1) Coast Guard military and civilian personnel; (2) contractors, subcontractors, suppliers, and labor unions; (3) recipients of Coast Guard sponsored Federal assistance; and (4) Coast Guard programs and activities affecting housing and urban development. The Office Chief also conducts liaison with the Departmental Office of Civil Rights, Office of the Secretary, and coordinates the development of civil rights and equal opportunity reports prescribed by OST.

The Coast Guard has recently been given contract compliance responsibility for all private industry dealing with shipbuilding and repair and in water transportation located in States that do not border the oceans or Gulf of Mexico.

## FEDERAL AVIATION ADMINISTRATION

FAA accomplishments in the area of civil rights and equal employment opportunity (EEO) during the first full year of operation of the Office of Civil Rights included:

- Raising the number of FAA minority group employees from 2,465 (or 5.4 percent of the FAA work force) at the end of FY 1969, to 2,929 (or 5.9 percent of the FAA work force) at the end of FY 1970. Of the 7,542 new employees hired during the reporting period, 803 (or 10.6 percent) were members of minorities. (Above figures exclude FAA employees in Hawaii and Puerto Rico.) This rise in minority group employment is largely attributable to the efforts of 18 equal employment opportunity recruiters (appointed during FY 1969), and to the placement of advertisements for air traffic recruits in *Ebony* and *Jet* magazines.
- Inaugurating under revised Civil Service Commission regulations an equal employment opportunity counseling program. The purpose of this program is to establish an open, informal, and sympathetic channel

through which employees may discuss their problems and have them resolved.

- Inaugurating the "150 program" for the training of some 300 disadvantaged persons a year as air traffic controllers or electronic technicians. Trainees spend their first 6 training months at the GS–4 level ($5,853 per year); those successfully completing the first 6 months of training are promoted to GS–5 ($6,548) and given training leading to journeyman status.
- Participating in and displaying exhibits at national conferences sponsored by such groups as the National Association for the Advancement of Colored People, the National Urban League, the National Technical Association, the Negro Airmen International, and others as a means of facilitating minority group employment within FAA and the air transportation industry.
- Being designated by the U.S. Department of Labor as the agency responsible for the compliance of the air transportation industry with the EEO provisions of Executive Order 11246. During the fiscal year, the agency made 140 separate reviews of contractor compliance with Federal EEO regulations.
- Awarding contracts worth $1.6 million to businesses owned by members of minority groups. In addition, airport sponsors receiving funds from the Federal-aid airport program awarded minority group firms contracts worth $3.6 million.
- Issuing to agency managers and other employees an EEO action plan incorporating specific goals for the recruitment, promotion, and training of women and members of minorities.
- Requiring under a new regulation that Federal approval be withheld from an airport development project until people subject to displacement by that project have been provided with replacement housing.

## FEDERAL HIGHWAY ADMINISTRATION

After one year of operation, the FHWA Civil Rights Program has been concerned with such major "on-going" programs as: comprehensive contract compliance review activities, statewide affirmative action programs, internal and external training programs, youth opportunity program, and an effective in-house program.

Accomplishments during this fiscal year include: (1) Established a 1-year training program for Civil Rights Officers (the first of its kind in the Federal Government); (2) conducted some 914 contract compliance reviews and some 10,935 inspections relating to contract compliance; (3) approved 43 acceptable affirmative action programs to implement assurances of compliance required by the Federal-Aid Highway Act of 1968 and signed by the States sponsoring the programs; and (4) increased the number of Civil Rights Specialists from 17 to 35.

In addition, new programs and responsibilities include: (1) The nationwide Federal-State program to train 10,000 workers in the highway construction industry, at least 5,000 of whom are expected to be minority or disadvantaged workers; (2) the establishment of FHWA's Women's Program in accordance with Executive Order 11478 and Civil Service Commission Regulations to assure equal employment opportunity for women employees and applicants; (3) the development of assurances and affirmative action programs to implement Title VI of the Civil Rights Act of 1964; (4) the participation in special contract compliance reviews in cooperation with the Department of Labor's Office of Contract Compliance; and (5) the participation in the Department's program for expanding opportunities of minority contractors and consultants.

## FEDERAL RAILROAD ADMINISTRATION

An Office of Civil Rights was established with a counterpart office in the headquarters of the Alaska Railroad, in accordance with Department policy. The information system was refined to better advise the Administrator and the Department of progress made in civil rights. A management council on civil rights was established so that those directly responsible for hiring and for program implementation could devote a specific period to evaluating equal opportunity progress and devising means to assure further progress. An action plan setting specific goals and timetables was also completed.

Specific evidence of progress included: the employment of a minority employee at the supergrade level; the hiring of minority employees for railroad safety inspection positions; the appointment of a minority employee to the Transportation Intern Program.

In the Alaska Railroad, emphasis has been on increasing employment of minorities, including Alaskan natives. The railroad requires the services of locomotive engineers, conductors, heavy duty equipment mechanics, electricians, car service personnel, and skilled craftsmen. During the last year, more than half of those in apprentice programs for skilled crafts were members of minority groups, including: Aleuts, Eskimos, Indians, Spanish-surnamed, and Negroes.

In addition, the railroad has increased the number of minorities being trained for railroad operating positions, such as brakemen and firemen. It has reached out to manpower development centers and to remote villages to tap these sources of new employees.

# CHAPTER V

# TRANSPORTATION PLANNING AND COORDINATION

## NEW APPROACHES TO TRANSPORTATION PROBLEMS

NATIONAL TRANSPORTATION POLICY STATEMENT. Soon after the new Administration took office, the President asked Secretary Volpe to make a searching re-examination of the fundamental policies which guide the national transportation system. The President also asked that a comprehensive statement of national transportation policy be developed which would assure not only an economical and efficient national transportation system, but one acceptable in terms of environmental and social considerations.

Much of the work for this expansive and notable effort was completed this year. The policy statement will be prepared for the Secretary and the President next year. It will summarize in specific terms the long-term national transportation needs and goals, and set forth present and prospective policies regarding environment, safety, technology, investment (public and private), manpower and management, and suggest regulations to ensure these objectives.

IMPROVEMENTS IN TRANSPORTATION PLANNING AND COORDINATION—SYSTEMATIC ANALYSIS AND PLANNING. The Assistant Secretary for Policy and International Affairs has assumed a primary leadership role for the Secretary in developing the Department's capability for improving and changing the entire approach to domestic and international transportation problems and needs. New policies must ensure a "systems approach" to specific transportation conditions and needs. Progress has been made on the concept of *integrated multi-modal transportation* in cooperation with city and regional planners, ecologists, the transportation industry, and in the Department's negotiations and cooperative research efforts with foreign countries.

The traditional approach which focused on a single transportation mode for a restricted geographical area is now viewed as a "bad patch job." The Assistant Secretary's office, in all its analysis, planning, policy review, and development efforts, concerns itself with major population corridors and regions. Transportation policies must now also consider the best use of land, air, and waterways, and the long-range effects of such use; must ensure public service, welfare, and safety; and must protect natural environmental balances. An additional and vitally important objective of planning is economic expansion.

With the use of computerized analytical techniques and tools, a coordinated, long-term multi-modal planning process is now underway. The process includes direct State-regional-local-industry involvement in the analysis and input required to identify and evaluate long-range national transportation needs and alternatives. This coordinated effort produced an analytical structure for planning which interrelates information on the national economy and on the transportation industry, and aids in the evaluation of alternative multi-modal systems.

While full budget support was not provided last year for the establishment of a Transportation Information Program, progress was achieved in the gathering of basic data on the total transportation industry which is essential to effective and timely systems analysis by the Department.

During 1970 the Department began work on the 1972 National Transportation Needs Study. This study will bring together the Department's various mode-oriented planning efforts with an overall assessment of transportation capital needs and alternative Federal investment programs in which all modes are considered. This study will rely heavily on the inputs from state and urban area planning groups as well as from private industry and other government agencies besides DOT.

Computerized models were developed to analyze air transportation systems; to calculate the impact of pricing, service, and system changes on road and rail freight traffic, and on passenger traffic by various modes; to analyze the interface problems between intercity and urban transportation.

Of special importance was the development of a methodology for long-range intermodal planning that is now being used in the first nationwide multi-modal, long-range planning study in the 1972 Transportation Plan.

## THE NORTHEAST CORRIDOR TRANSPORTATION PROJECT

The Northeast Corridor Transportation Project was transferred, toward the end of FY 1970, from the FRA to the Office of the Assistant Secretary for Policy and International Affairs. Work is underway to extend the analysis and evaluation of alternative investment policies concerning Northeast Corridor intercity passenger transportation. Support also is being provided to other Departmental efforts, including the Civil Aviation Research and Development Policy Study.

The Northeast Corridor Transportation Project model system approach represents a significant step forward in multi-modal transportation investment evaluation. A model structure capable of depicting the interactions of the major elements of a transportation system has now been applied to a set of real-world problems in a highly industrialized region.

In addition to the applications and results presented in the Northeast Corridor Transportation Project Report released in May 1970, the model system already is being used to provide guidance to Department of Transportation policy planning and decision-making in a number of related areas. For example, Northeast Corridor models have supported work on: (1)

Future utilization of STOL and VTOL aircraft; (2) initial planning for Tracked Air Cushion Vehicle demonstration; (3) identification of high-speed ground transportation research and development priorities; and (4) the rail passenger network problem. In these applications, the model/simulation system has demonstrated a capability for projecting patronage, as well as demographic effects of major transportation system changes, at levels of detail and precision useful for planners.

Work is now being focused to strengthen utilization of the Corridor models and data base within the Department to aid in policy determinations. Evaluation methodology will be improved to integrate more fully external costs and benefits over the life-cycle of the systems. Application of the models is being extended and now includes important support of the Civil Aviation R&D Policy Study; the models can also offer major opportunities to improve transportation investment decision-making and the planning and management for implementation of those decisions.

Through the Northeast Corridor Project, the Department has taken a step forward in its attempts to resolve a number of the complex problems involved in allocating transportation resources.

Also during FY 1970, the Northeast Corridor Transportation Project released the "Northeast Corridor Transportation Report" and its attachments. This report provides detailed information on project methodology, descriptions of alternative systems, and various analysis techniques. The demand for the report was notably high and the requests were widespread, resulting in the dissemination of the information extensively both domestically and internationally.

The report, containing the results of the first full exercise of the overall model system, and the analysis and methodology behind it, constitutes a pioneering effort in transportation analysis—a system with extremely broad application, dealing with all modes of intercity passenger transportation, with the interactions between these modes, and with the impact that alternative transportation systems could have on the general welfare of the Corridor.

## SIGNIFICANT LEGISLATIVE AND POLICY ACTIONS

As transportation plays its increasingly important role in the Nation's economy, the need increases to review standing or proposed legislation and policies. The staff of the Assistant Secretary for Policy and International Affairs was directly involved as analysts and advisors in passage of considerable legislation including the Airport and Airway Development Act of 1970 and its companion revenue Act, and in the excellent progress of the Public Transportation Assistance Act, the National Rail Passenger Corporation legislation, the Seaman's Act of 1969, and a Vessel Documentation Bill.

The Department appeared as a party of record in some 50 economic regulatory proceedings, primarily before the ICC, CAB, and FMC. These provided important opportunities to promote a policy of broad public inter-

est and flexibility for future regulations which would be responsive to economic and technological change and include consumer protection.

A number of special studies were undertaken in support of the Department's involvement in legislative and regulatory activities. These included analysis of:

- Domestic air fare rate structures.
- The economic and management aspects of rail freight car service regulation.
- Freight loss and damage.

These efforts made significant contributions to regulatory criteria for cost and rate determinations in air, motor, and rail transportation.

## SPECIAL POLICY/PROGRAM INITIATIVES AND ECONOMIC STUDIES

A great many transportation issues attract considerable public and political interest. Factors in the economy are not always the prime reason for this interest. Indeed, the growing problems and dangers of traffic congestion, environmental pollution, ecological destruction, and the diminishing returns in public service and safety, all appear to be growing more important in the public's view and expectations of the Department's efforts.

In order to be responsive to this public interest, several staff specialists are organized to accomplish short-to-medium term analyses of key issues. Recommendations for new or revised policies and programs reach the Secretary and the President for their consideration regularly.

A few of the special issues examined this year were:

- Problems of rail passenger service and the feasibility of alternative service policies.
- The development of national land use policies.
- Auto pollution control measures.
- Regional and rural development programs and policy.
- Operation of the three Washington-area airports.
- Feasibility of a single transportation trust fund.
- Operation of the St. Lawrence Seaway.

The 2-year research for the Automobile Insurance and Compensation Study (authorized by Congress in 1968) was completed and initial reports published this year. The final report and recommendations to the President and Congress are expected in 1971.

## HIGHWAY PLANNING

STATEWIDE HIGHWAY PLANNING. For about 35 years the Bureau of Public Roads (now a major part of FHWA) and the States have conducted a continuing series of highway planning surveys designed to furnish informa-

tion needed by highway administrators during later phases of highway project development. During 1970 efforts were made to improve the efficiency and utility of the highway planning process.

Estimates of travel by highway system for the year were prepared by the State highway departments and summarized by FHWA. Motor vehicle travel in the Nation in 1969 was 1,071 billion vehicle miles, an increase of 5.4 percent over the 1,016 billion traveled in 1968. Average traffic on completed Interstate facilities increased by about 18 percent during the year.

The State highway departments operated more than 800 truck weigh stations last year. Trend data on truck weights and information on ton-miles of freight are developed from data obtained at these stations. The analysis of the truck weight data is being done by computer, which will permit more extensive use of truck weight data by FHWA and the States. A pilot test for obtaining commodity movement data by mail was conducted in three States.

Other accomplishments include: (1) A pilot project to produce a series of orthophoto maps was completed. This process combines the best features of an aerial photograph with the advantage of true scale planimetric maps. (2) A manual which describes an efficient method for estimating annual average daily traffic on sections of highway throughout a State was revised and reissued in 1970. This revision places more emphasis on procedures to be used in large urban areas in conjuction with the continuing cooperative urban transportation planning studies. (3) During the year a badly needed sampling procedure for estimating vehicle miles of travel on low-volume roads and streets was developed and is now being tested. (4) Analysis of speed trend data showed that the average speed for all free-moving vehicles increased to 60 m.p.h., an increase of 1 m.p.h. over the previous year. (5) Significant progress was made by several States in developing and implementing coordinated highway planning data systems.

National Highway Planning. In recognition of the need to begin planning post-Interstate highway programs, the Congress has called for a continuing series of biennial reports on the future highway needs of the Nation to be prepared by the Secretary of Transportation. The first of these reports was submitted in 1968. The second report, which was submitted in FY 1970, broadly examined major long-range and near-term issues and presented early findings of a functional clasification of the 1968 national highway network, as called for in the 1968 Federal-Aid Highway Act. A supplemental classification report in more detail was prepared for transmittal to Congress.

During FY 1970, field work for a more comprehensive national functional classification and need study was started. The information gathered by this study will form an integral part of the 1972 National Highway Needs Report to the Congress. The field work required by this study will be completed in FY 1971.



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## URBAN TRANSPORTATION PLANNING

The 1962 Federal-Aid Highway Act established the basic requirement for a comprehensive continuing urban transportation planning process in all areas of 50,000 or more population. A continuing transportation planning process must be responsive to the needs of the local area and to changes occurring in the area, requiring current valid data on land use, travel, and transportation facilities. All planning efforts that are presently in the continuing phase, or about to enter into this phase, are directed toward developing work plans to delineate the organization, financing, and tasks required for this on-going program. Over 100 of these operations plans have been approved by FHWA.

The FHWA, through the Bureau of Public Roads, provided technical assistance to the more than 200 urban transportation-land use planning groups throughout the country. Special effort has been concentrated on areas with a need to update their technical procedures. More attention has also been paid to improving planning in small urban areas without major cost increases. A staff study was initiated to develop an inexpensive computer technique to evaluate highway needs and policies in urban areas. Improvements in land use planning techniques are also being sought.

Additional valuable data to support the continuing urban transportation planning process will be available from the 1970 census. The Bureau of the Census has cooperated with FHWA to provide special summaries of 1970 data to the urban planning groups and State highway departments. Other census data being used in the urban planning process include the metropolitan map series being developed by the Census Bureau and various State and local agencies and geographic base files which represent urban geography as patterns of boundaries and areas.

## RAILROAD PLANNING

A key support office to the Administrator of the Federal Railroad Administration, the Office of Policy and Planning, provides advice on policy development, legislative recommendations, establishment of intermediate and long-range goals, critical evaluation of operational achievements in relation to goals, establishment and adjustment of programs, financial and economic implications of various levels of railroad safety and service, and long-range costs and financial resources. It also coordinates railroad transportation policy and plans with related Department of Transportation and other agency transportation programs, as well as advising the Administrator on public policies and programs relating to or having an impact on rail transportation.

During FY 1970, the Office of Policy and Planning was a major contributor to the following program achievements:

- Creation of the Railroad Safety Task Force in June 1969 to examine the increases in the railroad accident rate and propose appropriate

legislative remedies to the Secretary. The key elements of the Task Force's report were incorporated into the Railroad Safety and Hazardous Materials Control Bills of 1970.

- Development of a 5-year plan of action including research, identification projects, and program administration for reduction of grade crossing accidents.
- Development of a 5-year research plan for study and improvement of railroad safety through analysis of train derailments resulting from track, roadbed and equipment systems; train collisions attributed to human factors and train control problems, and inadequacies in the existing accident information system.
- Formation of a joint Research Committee of the AAR and Railway Progress Institute to develop tank car design criteria.
- Completion of an improved grade crossing protection program for the Washington-New York segments of the Northeast Corridor.
- Initiation of an Alaskan route survey to determine the engineering feasibility of a proposed extension of the existing transportation system.
- A major research effort to determine costs of freight car shortages to grain, lumber, and plywood industries.
- Identification of the major elements of a program to improve freight car supply.
- Provision for 5-year rapid amortization in the 1969 Tax Reform Act as an incentive to stimulate freight car purchases.
- Analysis of the railroad service reliability problem which resulted in the formation of an AAR committee to evaluate service performance.
- A major position paper outlining railroad potential and needs, and recommended Department of Transportation action to correct government policy imbalance with regard to the railroads.
- Analysis of the national impact of railroad strikes.

## AVIATION SYSTEM PLANNING

In April 1970, some 1,200 conferees from the aviation industry and other interested groups attended the second of FAA's projected series of annual National Aviation System Planning Review Conferences. In the interest of better public service, these conferences provide an open forum in which top Federal aviation officials may be exposed to expert knowledge, opinion, and proposals from the private sector of the aviation community as part of the Federal planning and decision-making cycle. The major portion of the 1970 conference—a week-long affair—was devoted to seminars dealing with 16 of the principal issues facing the agency. Views expressed at the conference will be considered by FAA in formulating the FY 1971 version of the 10-year National Aviation System Plan (covering calendar years 1972–1981), a document providing long-range planning guidance to the agency's staff.

# CHAPTER VI

# INTERNATIONAL AND FACILITATION PROGRAMS

## INTERNATIONAL POLICY AND PROGRAM LEADERSHIP

The importance of the Department of Transportation in providing strong initiative and leadership is clearly evident in its international activities and involvements. The Office of the Assistant Secretary for Policy and International Affairs provided such leadership for a major interagency effort which developed a new statement of U.S. international air transportation policy. This statement was signed by the President in June 1970 and will provide substantive and consistent guidelines for all U.S. agencies in dealing with international aviation problems.

The office has been involved with increasing frequency in CAB investigations concerning international air service and route award cases; in bilateral air transport negotiations; and with the International Civil Aviation Organization concerning the economic aspects of user charge principles, systems planning of new type aircraft, and the policy aspects of aircraft noise limitations.

In international maritime matters, this office was actively involved in development of U.S. policies regarding bilateral maritime agreements on cargo allocation in Latin American trade; developed the Department's position on maritime oil spill liability; and served as primary negotiator on Great Lakes pilotage rates.

The office negotiated several important agreements with foreign countries for cooperative transportation research, which will combine talents and funds, take advantage of advanced technology wherever possible, and avoid duplicative research efforts. Included in these agreements were projects such as:

- Airport guidance and control, fog dispersal, and driver behavior (France).
- Road construction, pavement material, and transportation demand analysis (Germany).
- Urban transportation (England).
- V/STOL development, and urban goods movement (Canada).
- High-speed ground transportation (Japan).

An international conference on tunneling technology was held with experts from 20 countries attending. Recommendations were developed for stimulating new technology and focusing reseearch efforts.

This office continues to be a central point of contact for other agencies, foreign governments and industry, for technical inquiry regarding transportation research or feasibility for the less developed countries. In this regard, the office serves as chief adviser to the Agency for International Development in providing technical transportation assistance to developing countries.

## TRANSPORTATION FACILITATION

All transportation activities create paperwork, with the transport of cargo generating literally tons of it. Therefore, the development and international adoption of a through bill of lading stands out as a truly important accomplishment. It will reduce existing documentation for worldwide surface cargo movements by 25 percent, with an estimated annual saving of shippers of half a billion dollars.

Other similarly productive facilitation areas studies the past year concerned:

- The standardization of commodity descriptions and codes throughout government and industry.
- The interchange and pooling of cargo containers.
- Passenger baggage handling and ticketing systems.

An extensive education program was initiated with the transportation industry at large (beginning with exporters) on newly developing systems and procedures. This program is a "must" if the many new improvements and innovations now being developed are to be generally employed throughout the transportation industry.

## COAST GUARD INTERNATIONAL ACTIVITIES

Activities during FY 1970 included coordinating U.S. efforts through chairmanship of the Safety of Life at Sea Committee of the State Department's Shipping Coordination Committee and the U.S. National Committee for Prevention of Pollution of the Seas by Oil. These efforts culminated in adopted by the Intergovernmental Maritime Consultative Organization of substantial amendments to the Convention on Prevention of Pollution of the Seas by Oil, 1954, and to the Convention on Safety of Life at Sea, 1960. These amendments have been forwarded to the Senate for advice and consent as to ratification.

Agreement in principle was reached with the Government of the Republic of the Philippines to begin negotiations on Philippine operation of LORAN-A stations located in the Philippine Islands. This is an important step toward internationalizing the worldwide LORAN-A system.

Coast Guard foreign assistance missions to Liberia and Iran were terminated during FY 1970 by the final withdrawal of all remaining personnel.

This action completes the planned withdrawal from foreign assistance programs under sponsorship of the Military Assistance Program.

Supervision over preparation of the next International Lifeboat Conference to be held in New York in the Spring of 1971, coordination of U.S. participation in the International Association of Lighthouse Authority Conference in Stockholm, June 1970, and coordination of Coast Guard involvement in the Intergovernmental Maritime Consultative Organization, the Intergovernmental Oceanographic Commission, and the International Civil Aviation Organization were some of the activities undertaken by headquarters.

On-going programs include preparations for International Conferences on: (a) Container Safety, 1971; (b) Revision of the Rules for Prevention of Collision, 1972; (c) Marine Pollution, 1973; (d) World Administration Conference for Space Telecommunications; (e) Environmental Pollution; (f) Law of the Sea; and (g) Seabeds.

TRAINING FOR FOREIGN NATIONALS. Visitors from foreign countries were extended the use of Coast Guard facilities for training in such areas as aids to navigation, LORAN, search and rescue, merchant marine safety, officer candidate school, port security, and law enforcement and general orientation in the operation of a marine regulatory agency.

Representatives of 30 foreign countries participated in the training offered by the Coast Guard. The Military Assistance Program sponsored 111 visitors. The Agency for International Development sponsored 26 visitors, and 16 visitors participated in the LORAN program.

INTERNATIONAL ICE PATROL. The Coast Guard commenced the 56th season of International Ice Patrol Service in the North Atlantic Ocean on 12 March, 1970. The International Ice Patrol was begun for the purpose of protecting North Atlantic shipping from the iceberg hazard encountered annually during the spring and early summer. The patrol utilizes C–130 aircraft and a Coast Guard oceanographic vessel to observe and study the iceberg conditions. Predictions are made concerning the iceberg danger and recommendations are made as to the best action to be taken by shipping to avoid such a danger. The 1970 season is notable in that reasonably heavy concentrations of icebergs persisted until late June.

ICEBREAKING. The Coast Guard operates the national icebreaker program with seven polar and two domestic icebreakers. The design of a new icebreaker to replace the overage "*Wind*" class has proceeded on schedule toward a FY 1971 construction contract. Features of the new design include variable pitch propellers, gas turbine power for maximum icebreaking capability, and new hull forms. The major accomplishment in the Arctic was the test of the converted tanker *Manhattan*. Three icebreaker deployments to the western Arctic and two to the eastern Arctic carried out missions of national interest in Arctic re-supply, defense programs, sea ice research, and marine science research.

## INTERNATIONAL AVIATION ACTIVITIES

PARTICIPATION IN INTERNATIONAL ORGANIZATIONS AND MEETINGS. During the reporting period, FAA representatives contributed to 21 International Civil Aviation Organization (ICAO) conferences either by attending as members of U.S. delegations or by helping develop the U.S. position on various technical, legal, and economic problems, or both. Among the more notable conferences attended by FAA representatives were:

- Seventeenth (Extraordinary) Session of the ICAO Assembly, in June 1970, in Montreal, dealing with the problem of criminal acts aboard aircraft (See "Aviation Safety" section.)
- ICAO Special Meeting on Aircraft Noise, in November–December 1969, in Montreal. The meeting reached agreement on a proposed standard for aircraft noise certification for future subsonic jet aircraft.
- ICAO 5th North Atlantic Regional Air Navigation meeting, in April 1970, in Montreal, dealing with the requirements of the North Atlantic region for facilities and services over the next 5 years.
- Fifth Session of the ICAO Statistic Division, in May–June 1970, in Montreal, dealing with airport traffic reporting, airport financial statistics, and statistics of noncommercial air transports.

FOREIGN ASSISTANCE AND TRAINING. FAA continued to provide technical assistance in aviation to foreign countries and their nationals under the State Department's Agency for International Development (AID), the Defense Department's military assistance program, and other sponsorships. During the reporting period, FAA had approximately $8 million available from all sources for foreign assistance operations.

At year's end, FAA was operating nine technical assistance groups with a total staff of 79 employees (down from 15 groups and 94 employees at the end of FY 1969). Five of these groups were sponsored by AID, three by DOD, and one by the Central American Air Navigation Services Corporation.

In addition to staffing these resident groups, FAA dispatched 37 technicians on short-term assignments to 24 countries. In one case FAA sent both equipment and technical personnel to Nigeria to establish air traffic communications at three airports supporting the relief operations that followed the conclusion of the Biafran rebellion. In another case, three FAA specialists were assigned to a World Bank team studying the feasibility of a development program for the international airport at Kabul, Afghanistan.

In the training area, FAA trained 200 foreign nationals from 42 countries in various aviation skills. AID sponsored 109 of these trainees; ICAO, 45; and individual countries, 46.

INTERNATIONAL HIGHWAY ACTIVITIES. Needed regrading and paving work continued on sections of the Inter-American Highway in Costa Rica and Guatemala. The work in Guatemala was completed through "El

Tapon" with the exception of paving of a 10-kilometer section in the center of the gap. Hard winds and rains hit the area early in the year, and major slides and slipouts resulted. In Costa Rica, work continued on the 200-mile section from Cartago to the Panama border.

Work in the Darien region of Panama and the Choco region of Colombia was continued in cooperation with the highway departments of Panama and Colombia. The FHWA, through the Bureau of Public Roads, furnished technical assistance and engineering supervision of this project for the Organization of American States. This project when complete will close the last remaining gap in a highway route stretching over the Western Hemisphere from north to south.

The FHWA continued to provide technical assistance, advice, and consultation to foreign countries in cooperation with the Department of State, the Export-Import Bank, the Development Loan Fund, and the International Bank for Reconstruction and Development (World Bank). Emphasis was given during the year to advisory services for establishing competent highway organizations and training nationals to staff these organizations.

Major improvement programs were staffed by the BPR personnel in seven countries. The programs in five countries—Laos, Dominican Republic, Peru, Brazil, and Bolivia—were sponsored by AID, and those in Kuwait and Argentina were country financed through a revolving fund account set up with the FHWA. In addition to these major programs, procurement and/or short-term advisory services were provided for the Philippines, Ethiopia, and Chad.

# CHAPTER VII

# IMPROVEMENTS IN TRANSPORTATION FACILITIES

## AIRPORT AND AIRWAY DEVELOPMENT

NEW LEGISLATION. On May 21, 1970, President Nixon signed into effect Public Law 91–258, of which title I is the Airport and Airway Development Act of 1970, and title II is the Airport and Airway Revenue Act of 1970. It was landmark legislation: in the words of Secretary of Transportation John H. Volpe, "one of the greatest pieces of transportation legislation ever passed by Congress."

Public Law 91–258 was the legislative response to the problems posed by civil aviation's extraordinary growth during the 1960's. Between FY 1960 and FY 1969, the number of aircraft handled by FAA's air route traffic control centers (ARTCC's) increased by 110.6 percent, and the number of aircraft operations at FAA's airport traffic control towers (ATCT's) increased by 112 percent. Federal airport and airway development programs, inadequately funded, failed to keep pace with this growth in activity. The result was severe strain on the air traffic control system. This strain was particularly acute within the Golden Triangle, the high-density air traffic area bounded by New York, Chicago, and Washington, D.C. It was the buildup of congestion in this area that precipitated the monumental air traffic jam of the summer of 1968. Since then, congestion has continued to be a serious problem, reducing the efficiency, though not the safety, of the system. Schedule delays have cost the air carriers millions of dollars annually, not to mention the cost to their passengers, over and above inconvenience and discomfort.

The answer to these problems is airport and airway modernization and expansion. For these purposes the new legislation assures a fund of about $11 billion over the next 10 years. By establishing an Airport and Airway Trust Fund modeled on the Highway Trust Fund, it frees airport and airway development from having to compete for General Treasury funds, the basic reason for the funding uncertainties and inadequacies of the past. Into the trust fund will go new revenues from aviation user taxes levied by the Airport and Airway Revenue Act, in addition to unexpended funds from appropriations under the Federal Airport Act, which is repealed as of June 30, 1970; Congress is authorized to appropriate further sums to the fund if they are required to meet the authorized expenditures, which include all expenditures for airport and airway development and operations, maintenance, and support services.

Revenues will be raised by the following levies on aviation users: (1) An 8-percent tax on domestic passenger fares; (2) a $3 surcharge on passenger tickets for international flights originating in the U.S.; (3) a tax of 7 cents a gallon on both gasoline and jet fuel used by aircraft in noncommercial aviation; (4) a 5-percent tax on airfreight waybills; (5) an annual registration fee of $25 on all civil aircraft, plus (a) in the case of piston-powered aircraft weighing more than 2,500 pounds, 2 cents a pound for each pound of maximum certificated takeoff weight, or (b) in the case of turbine-powered aircraft, 3.5 cents a pound for each pound of maximum certificated takeoff weight.

The principal advantages of the user-charge/trust-fund approach to revenue raising and funding are that it (1) provides a predictable and increasing source of income, more commensurate with the need; (2) permits more effective and longer range planning; (3) assures that the tax revenues generated by aviation will not be diverted to nonaviation uses.

Airports and Federal Aid. Major weaknesses of the Federal-aid airport program (FAAP)—which, with repeal of the Federal Airport Act, expired at the end of this fiscal year so far as new aid commitments are concerned—were the inadequacy of the resources provided under it and the nature of the formula for distributing those resources. In recent years preceding the one being reported on, the annual authorization for airport development under the Federal Airport Act totaled only $75 million, and, of this total, the distribution of $66.5 million was fixed by a formula apportioning 75 percent of it by population and area among the States: half in the ratio of each State's population to the total population of all the States, and half in the ratio of each State's area to the total area of all the Sates. Though he remaining 25 percent of the $66.5 million, plus any State's apportionment under the population-area formula if unclaimed for 2 fiscal years, went into a discretionary fund with certain other funds, this discretionary fund was to small for the program's resources to be brought to bear with full effectiveness on critical, high-priority areas.

By contrast, the new airport and airway act increases the total annual authorization by nearly four times for each of the next 5 fiscal years—to $280 million—and it provides a distribution formula improved in the light of experience under the Federal Airport Act.

Of the annual $280 million total just mentioned, $250 million in matching funds is to be distributed in the following manner among airports serving air carriers certificated by the Civil Aeronautics Board (CAB) and airports serving general aviation primarily to relieve congestion at airports serving other segments of aviation.

- One-third as follows: (1) 97 percent of this third among the several States, one-half in the ratio of each State's population to the total U.S. population, and one-half in the ratio of each State's area to the total area of all the States; (2) 3 percent of this third among Hawaii, Puerto

Rico, Guam, and the Virgin Islands, the first two places receiving 35-percent shares each, and the last two, 15-percent shares each.

- One-third among airports serving CAB-certificated air carriers in the ratio of each such airport's passenger enplanements to the total number of passengers enplaned at all such airports.
- One-third at the discretion of the Secretary.

The remaining $30 million of the annual $280 million total is to be apportioned by the Secretary of Transportation as follows for developing in the several States and in Puerto Rico, Guam, and the Virgin Islands airports serving segments of aviation other than CAB-certificated air carriers:

- Seventy-three and one-half percent among the several States, one-half of this in the ratio of each State's population to the total population of all the States, and one-half in the ratio of each State's area to the total area of all the States.
- One and one-half percent for Hawaii, Puerto Rico, Guam, and the Virgin Islands in shares of 35 percent, 35 percent, 15 percent, and 15 percent, respectively.
- Twenty-five percent at the discretion of the Secretary.

In its provisions concerning planning, the new legislation reflects not only certain lessons of experience but also the emergence of certain new planning factors among those important enough for explicit mention. Experience under the old legislation with the National Airport Plan (NAP), which had to cover a period of 5 years and be revised annually, led to the requirement in the new law for a National Airport System Plan (NASP) to cover at least 10 years and to be revised only as necessary; the first NASP must be published within 2 years of the new law's enactment—*i.e.*, by May 21, 1972. Notable among factors explicitly mentioned for the Secretary's consideration in preparing the NASP, but not explicitly mentioned in relation to the NAP, are (1) The relationship of each airport to the local transportation system, to forecasted technological developments in aeronautics, and to developments forecasted in other modes of intercity transportation, and (2) factors affecting the quality of the natural environment.

The provision for planning grants also marks a significant difference between the new legislation and the old. The new law authorizes the Secretary to make grants of funds to planning agencies for airport system planning, and to public agencies for airport master planning, authorizing at the same time a total of $75 million for such grants. Limitations on these grants are (1) They may not exceed $15 million in any one fiscal year, (2) no grant may exceed two-thirds of the project's cost, and (3) no more than 7.5 percent of funds available for grants in any fiscal year may go to projects within a single State, Puerto Rico, the Virgin Islands, or Guam.

One final word about the airport and airway act as it concerns airport development. Before this legislation, the airport was considered primarily a local problem, for which the Federal Government, as part of its broad mission to foster civil aviation, had assumed a partial and not necessarily lasting responsibility. Public Law 91–258 sees the airport not as a local matter of secondary Federal concern, but as an integral part of a national airport-airway system. As Secretary Volpe expressed the idea, "We must view the airway and the airport as two important parts of a single system. They are inseparable and must be treated together."

In other developments, Congress appropriated $80 million in FAAP funds for FY 1970—$30 million in August 1968 and $50 million in December 1969. Because of the lateness of the December appropriation, the entire $50 million was placed in reserve pending the enactment of the Airport and Airway Development Act; hence, FAA's 1970 airport-aid program was the smallest in more than a decade. All told, FAA entered into 256 grant agreements and obligated a total of $50.4 million (net) in FAAP funds during the reporting period. (FAAP funds carried over from previous years account for the difference between the August 1968 appropriation and obligations.)

National Airspace System Modernization. No less than airport development, airway modernization will reap the benefits of the increased funding authorized by the Airport and Airway Development Act. From FY 1960 through FY 1969, appropriations for airway F & E (facilities and equipment) averaged $93 million a year; the Airport and Airway Development Act authorizes "not less than" $250 million a year for the next 5 fiscal years for acquiring, establishing, and improving air navigation facilities. This substantial increase in F & E authorizations is important help for FAA's effort to automate the air traffic control subsystem of the National Airspace Systems—an effort characterized by FAA Administrator John H. Shaffer as "the Federal Aviation Administration's No. 1 priority."

The more notable FY 1970 developments in the en route automation program, NAS En Route Stage A, included:

- Installing NAS En Route Stage A computers at three ARTCC's, bringing the total number of ARTCC's equipped with such computers to 13. Over the next 2 fiscal years, seven more centers are scheduled to receive this equipment, which will give them a flight data processing capability.
- Delivering computer update equipment to four ARTCC's. Among these, the Washington center became the first to put this equipment into operation.
- Increasing the running time of the automated data processing equipment at the Jacksonville ARTCC from 5 to 16 hours daily.
- Completing the shakedown testing of the radar surveillance and tracking functions of the NAS En Route Stage A (Model 1a) system in-

stalled at NAFEC. This activity is in support of the NAS En Route Stage A prototype system (Model 1b) installed at the Jacksonville ARTCC.

- Completing contractual action for the necessary equipment to implement the first phase of the en route automation program (flight-data processing) at 20 ARTCC's. In addition, contracts were awarded for high-speed, high-capacity IBM 9020D computers and display channel processors—the major equipment required to implement the final phase of NAS En Route Stage A at high-density ARTCC's.
- Linking together of the Denver and Los Angeles ARTCC computers, in March 1970, which established for the first time a capability in air traffic control for coast-to-coast automated flight data processing.
- Initiating a major construction program to provide the needed space at 20 ARTCC's in the contiguous United States to accommodate NAS En Route Stage A equipment.

Among the more notable FY 1970 developments in three terminal automation programs were:

- Awarding a $500,000 contract for improving the tracking, ATC coverage, and computing capabilities of Automated Radar Terminal System (ARTS) III, FAA's automated terminal system for high-density airports. At year's end, 10 ARTS III's were expected to be delivered in FY 1971. The first ARTS III for an operational site is scheduled for delivery to Chicago's O'Hare International Airport in December 1970.
- Completing a 6-month field evaluation of an ARTS II functional prototype at the Knoxville, Tenn., terminal area. A modular programable system, ARTS II is designed for both medium- and low-density terminal control facilities.
- Completing the test and evaluation of AN/TPX–42 (direct altitude and identity readout) previously designated DAIR, an automated beacon decoding system for military and low-density civil terminal facilities. The U.S. Air Force contracted for 304 production models of AN/TPX–42; FAA exercised an option to procure 56 systems over a 5-year period.

Other Air Traffic Control Developments. In addition to converting to an automated air traffic control system, FAA is increasing the capacity and improving the capability of the existing ATC system by (1) Adding to existing facilities and equipment; (2) making discrete changes in existing equipment; (3) establishing entirely new facilities; and (4) developing entirely new pieces of equipment. Some of the more significant developments in this area during FY 1970 concerned (see table 7):

- *Facilities and F & E funding.* Both the number of facilities and the level of F & E funding during the reporting period increased over the FY 1969 totals. (See tables 7 and 9.)

- *Uninterruptible power systems.* The agency ordered two such systems, for delivery in FY 1971, as part of its continuing program to provide key ATC facilities with continuous, uninterruptible power. One system is for the New York common IFR room; the other is for the weather message switching center in Kansas City, Mo. These systems will accept commercial or auxiliary power or, in the absence of both, power from their own batteries and deliver it to a facility's critical systems in stable alternating current.
- *Dual-input beacon transponder.* The antenna of a beacon transponder is normally mounted on the bottom of an aircraft. Hence, during a climbout turn or certain other maneuvers, the aircraft often shadows the beacon signals, causing an interruption in air-to-ground beacon transmission. In seeking a solution to the problem, FAA tested a dual-input beacon transponder, which has an antenna mounted both on the top and on the bottom of an aircraft, and found it to perform better than a single-antenna transponder.
- *International aeronautical telecommunications switching center.* This high-speed, fully automated message switching facility, the key element in the North Atlantic and Caribbean Aeronautical Fixed Telecommunications Network, a world-wide communications system operated by members of ICAO, was commissioned in June 1970. Directly connected by 86 communications channels to three U.S. networks and to more than 100 locations in 17 countries, the center speeds the flow and improves the accuracy of international aeronautical information by eliminating all other intermediate relay points. For example, before the new center went into operation, a message from Lima, Peru, to Lisbon, Portugal, would have been relayed by three intermediate stations; today that same message goes from Lima to Kansas City to Lisbon.
- Alaskan North Slope. Though the expected large increase in air traffic activity between the North Slope and Alaska's interior did not materialize because the proposed 800-mile oil pipeline from the Slope to Valdez, Alaska failed to meet Department of Interior standards, FAA continued to improve facilities and services in this oil-rich Arctic region. FAA established a flight service station at the Deadhorse, Alaska, airport, a strategically located facility that was transferred to the State of Alaska by the Standard Oil Company of California during this reporting period. This airport and its environs afford excellent sites for further deployment of navaids and air-ground communication equipment. Finally, the flight service station at Barrow, a community adjacent to the oil fields, was converted from a temporary to a permanent facility, and its hours of operation were increased.

## AIRSPACE MANAGEMENT

Record levels of air traffic activity were registered during the reporting period; but for a variety of reasons—a general slowdown in the economy,

a 17-day air traffic controller "sickout," schedule restrictions at five major airports—the FY 1970 air traffic growth rate was considerably below the average annual growth rate of the preceding 10 fiscal years. FAA's airport traffic control towers handled 56,181,465 takeoffs and landings, exceeding the FY 1969 total of 55,890,476 by 0.5 percent; FAA's air route traffic control centers handled 21,606,369 aircraft flying under instrument flight rules, exceeding the FY 1969 total of 20,562,235 by 5 percent.

Despite the decline in growth rate of air traffic, congestion remained a problem in high-density traffic areas during FY 1970. As previously noted, the ultimate solution to this problem lies with the long-range development programs contemplated by the Airport and Airway Development Act; but until such programs take hold, FAA must make do with the resources it has at hand. This means managing the available airspace in the United States as efficiently as possible. What follows is a discussion of four of the more important airspace management actions taken during the fiscal year. A fifth action—the instituting of terminal control areas—deals primarily with safety rather than efficiency and is discussed elsewhere.

CENTRALIZED FLOW CONTROL. One of the more persistent problems plaguing air traffic in recent years has been the tendency of isolated instances of congestion to disrupt the flow of aircraft throughout the entire ATC system. On April 27, 1970, FAA took a significant step in dealing with this problem by establishing as a permanent part of the ATC system the Central Flow Control Facility, in Washington, D.C.

Prior to the establishment of this facility, the sole responsibility for flow control (*i.e.*, controlling the flow of traffic by restricting the number of aircraft moving from one ARTCC to another) in the contiguous United States rested with each of 21 such centers. The shortcoming of this procedure was that each center made flow-control decisions from the limited perspective of its own control area; no center had enough information to make a judgment based on the overall condition of the ATC system. Without such information, centers had a tendency to be overdefensive. For example, when a buildup in traffic forced one center to institute procedural restrictions limiting the number of incoming aircraft from an adjacent center, the adjacent center, fearing an impending traffic buildup in its own area, would institute restrictions against yet another center. With each center in turn acting defensively, the entire ATC system was eventually operating under restrictive flow-control procedures—procedures that indiscriminately affected all IFR aircraft, whether close to or remote from the situation triggering the initial restriction. And all this happened when the capacity of the overall system was usually adequate, given proper load dispersal, to handle the traffic creating the original cluster of congestion.

The Central Flow Control Facility, by collecting and correlating system-wide air traffic and meteorological data, heads off such situations before they develop. Linked by teletypewriter and telephone to all 21 centers in the contiguous United States, the facility detects potential trouble spots and

suggests solutions—such as flow-control restrictions or aircraft rerouting—to the centers. The centers may accept or reject the central facility's recommendations (the final authority to issue flow control restrictions still rests with them); but whatever decision they make is based on much broader information than before.

The facility demonstrated its worth during a 3-month test period beginning in January 1970. During this period, it succeeded in: (1) Reducing the length of delays on transcontinental routes by as much as 40 minutes; (2) virtually eliminating en route delays to long-distance traffic moving into John F. Kennedy International Airport; and (3) alleviating congestion in the Chicago area caused by the movement of eastbound coast-to-coast traffic. Finally, the facility proved invaluable in monitoring and rerouting traffic during the 17-day controllers' strike (see page 110 below).

Area Navigation. On October 1, 1969, in another effort to reduce airway congestion, FAA established 16 area navigation routes between 11 U.S. cities. The new routes, established on an interim basis pending formal rulemaking, are the first of their kind in the United States; they are also the first of many similar routes being developed by FAA as part of a nationwide area navigation route system. Perhaps more than any other step taken by FAA during this reporting period, the establishment of these routes foretokens the shape of the airways of the future.

The potential of area navigation in reducing airway congestion lies in the fact that, unlike the air navigation system in general use today, it permits the establishment of new flight paths without deploying ground-based navigation aids along each path. This is possible because aircraft with area navigation avionics equipment need not fly a track to or from a navaid. They merely follow a preselected arbitrary, or "phantom," track displayed on special airborne equipment. Hence, a far greater number of flight paths are possible in this way.

In another action, FAA established the first series of area navigation instrument approach procedures in the United States at six terminal areas—Longview, Tex., Kirksville, Mo., and Fullerton, Palm Springs, Lancaster, and Torrance, Calif. The new procedures permit pilots of aircraft equipped with airborne area navigation equipment to make straight-in instrument approaches to runways without the use of runway-oriented electronic approach aids. This eliminates the need for time-consuming procedure turns and circling maneuvers required of pilots making conventional IFR approaches.

At year's end, FAA was also collecting data to determine the feasibility of using area navigation equipment to reduce the width of routes required by STOL (short takeoff and landing) aircraft in terminal areas.

In addition to the foregoing, FAA issued:

- A notice of proposed rulemaking allowing for the designation of both low and high area navigation routes.

- An advisory circular setting standards of approval for airborne area navigation equipment.
- A handbook prescribing approval criteria for area navigation routes.

SCHEDULE RESTRICTIONS. During the reporting period, FAA extended for another 10 months—from January 1 to October 25, 1970—the life of a rule establishing hourly quotas for IFR operations at five high-density airports. The rule limits the number and type of IFR operations between the hours of 6 a.m. and midnight at John F. Kennedy International, La Guardia, Newark, O'Hare International, and Washington National Airports. FAA had adopted this measure in June 1969 to prevent a recurrence of the massive air traffic tieup that nearly paralyzed operations at high-density airports during the 1968 summer tourist season.

Two major considerations prompted FAA to keep the rule in force. First, the flight quota system had been conspicuously successful in reducing the incidence of recordable schedule delays. Delays during the first half of FY 1970 at the five airports covered by the rule dropped 46.5 percent below the level recorded during the first half of FY 1969. Reducing congestion at these five key points reduced congestion elsewhere. "If an airport fills up on the ground and in its holding patterns, bottlenecks begin to ripple through the system and before long we have a nationwide slowdown," FAA Administrator John H. Shaffer pointed out. "By reversing this effect—by unblocking key airports—the congestion trend is likewise reversed." The flight quota system had done just that; it had reversed the congestion trend.

The other consideration prompting FAA to retain the rule was the fact that the capacity of these five airports had not expanded sufficiently to eliminate the need for landing and takeoff limitations.

NEW YORK METROPLEX. Just prior to year's end, FAA took another step to facilitate the flow of traffic in high-density areas by introducing major changes in the New York Metropolitan Area's air traffic patterns and procedures. Known as New York Metroplex, the new procedures are expected to reduce traffic congestion in an around New York airports, thereby speeding up the movement of aircraft along the major north-south routes of the Golden Triangle. "The significance of this development should not be underestimated," noted FAA Administrator John H. Shaffer. Since the Golden Triangle is often the key to delays in other parts of the country, "reducing congestion in this area," the Administrator continued, "should produce beneficial effects throughout the system."

Under Metroplex, primary holding patterns, or arrival fixes, for area airports were moved farther out from the center of the city. This enabled FAA to add five new en route corridors, with the following results: (1) The number of departure routes increased significantly; (2) traffic distribution improved; (3) bottlenecks were reduced; and (4) crisscrossing of incoming and outgoing flight corridors was minimized. The introduction of the new

procedures was made possible by the presence of the New York common IFR room (commissioned in FY 1969), which gives the New York area a greater and more flexible traffic handling capability than the older, unintegrated terminal control system.

## HIGHWAY PROGRAM PROGRESS

INTERSTATE. Progress toward completion of the 42,500-mile Interstate System continues to be satisfactory. As of June 30, 1970, a total of 30,027 miles, or about 71 percent, of the total System mileage was open to traffic. Another 12 percent was under construction, and design or right-of-way acquisition was underway on 14 percent. Only 3 percent of the entire System had not advanced beyond preliminary status. During FY 1970, an additional 1,808 miles of Interstate were opened to traffic.

As originally predicted, the Interstate System will comprise the most popular by far of the Nation's highways. Although Interstate routes make up only slightly more than 1 percent of all roads and streets, they will carry more than 20 percent of all traffic.

Interstate highways are popular because they provide unequaled benefits to users in terms of increased efficiency of travel, improved safety, and greater driver comfort. For every 5 miles of Interstate opened to traffic, a life is saved each year. It is believed that the complete System will account for a reduction of more than 8,000 traffic fatalities annually. Total user benefits will greatly exceed the cost of the System, even if reductions in automobile travel time are considered to be of no economic value.

The fifth in a series of congressionally directed estimates of the cost of completing the Interstate System was compiled and transmitted to the Congress. This report will serve as the basis for apportioning Interstate funds for FY 1972, 1973 and 1974. The revised total cost to complete the 42,500-mile System by the mid-1970's is $69.87 billion, including $62.50 billion in Federal funds.

FEDERAL-AID PRIMARY, SECONDARY, AND URBAN. The Federal-aid primary and secondary systems and their urban extensions are also extremely important elements of the Nation's surface transportation network. These systems, exclusive of the Interstate, represent about 23 percent of the total road and street mileage in the country, but carry about 48 percent of all the traffic.

During FY 1970, approximately $1,162 million was obligated under the primary, secondary, and urban programs. About 7,536 miles of improved routes on these systems resulted from projects completed during the year.

TOPICS. FY 1970 was the first full year for which Congress authorized a specific class of funds, in the amount of $200 million, to fund the TOPICS program. TOPICS, an acronym for Traffic Operations Program to Increase Capacity and Safety, was originated by the Bureau of Public Roads in 1967 on a demonstration basis. The program is designed to improve

traffic flow on existing urban streets, thus increasing travel efficiency and safety while avoiding the costs and disruption of providing new urban highway facilities.

By the end of the year, some 412 urban jurisdictions were formally engaged in TOPICS activity. Much of the effort to date in this new program has involved areawide planning and preliminary program and project development. Actual construction projects were underway in 18 States, and the total cost of projects approved was about $72 million. It is anticipated that nearly all States will have construction projects underway by the end of FY 1971.

Forest Highways. The forest highway system, located in 39 States and Puerto Rico, is about 25,800 miles in length. The FHWA's Bureau of Public Roads generally supervises forest highway design and construction, most of which is centered in the 13 western States. During the year, 201 miles of forest highways were completed, and total obligations were $28 million. New project activity was sharply curtailed during FY 1970 because of the national economic situation.

Public Lands Highways. Public lands highway funds are authorized by the Congress to finance improvements on main highways through unappropriated or unreserved public lands, nontaxable Indian lands, or other Federal reservations. Projects estimated to cost over $81 million were proposed by the States for the $16 million of public lands funds authorized for FY 1970. Allocations were made for 19 projects in 18 States. However, new project activity in this program was sharply curtailed for economic reasons.

Defense Access Roads. During FY 1970, the Departments of the Army, Navy, and Air Force transferred a total of $18 million of defense access roads funds to the Bureau of Public Roads. These funds are being expended for the improvement of access roads to existing defense installations and the construction of additional access roads to new installations. The most extensive projects financed with these funds were the construction of 59 miles of road at a cost of $7.5 million to serve Safeguard installations in Montana and North Dakota, and the reconditioning of 336 miles of gravel roads in Colorado, Nebraska, and Wyoming at a cost of $950,000 to serve existing Minuteman installations.

Other Federal Highway Programs. In addition, the Bureau of Public Roads surveys, designs, and supervises construction for some Forest Development Roads for the Department of Agriculture; Park Roads, Parkways, Indian Roads, and Bureau of Land Management access roads for the Department of the Interior; and miscellaneous access roads for other Government agencies.

Considering all Federal highway programs supervised the Bureau of Public Roads during FY 1970, work was completed on 108 projects with a

total length of 483 miles and involving Federal funds totaling $50.2 million. Also, 61 new projects were awarded for construction on 199 miles for the total amount of $26.5 million. At the close of the year, 81 projects were under contract with an obligation of $60.0 million for construction of 341 miles. Additional work on 445 miles, estimated to cost $60.2 million was either in the "programed," "plans-approved," or "advertised" stage.

RIGHT-OF-WAY REVOLVING FUND. FY 1970 was the first year of operation of a revolving fund established by the Congress in 1968 for the advance acquisition of rights-of-way by the States. This procedure is designed to facilitate orderly project planning, to reduce potential inflationary pressures on the cost of rights-of-way, and to aid in relocating individual property owners. The advance acquisition of rights-of-way has been complicated by relocation and environmental requirements which must be considered before any acquisition may be permitted. The FHWA is still in the process of integrating these requirements into procedures for the advance acquisition rights-of-way. As of June 30, 1970, a total of 16 States had been allocated $31 million from the revolving fund. This represents full utilization of funds released by the Bureau of the Budget within the $200 million authorized through FY 1970.

EMERGENCY RELIEF. Federal highway legislation provides for a continuing authorization of funds to assist the States in rebuilding highways and bridges on the Federal-aid systems and to assist other branches of Government in such work on other federally financed highways following catastrophic damage. Natural disasters were unusually numerous and severe during FY 1970. An example was Hurricane Camille, which caused unprecedented destruction along the gulf coast and in Virginia. During 1970, more than $100 million was allotted for repair or reconstruction of damaged highways and bridges in 15 States.

Disasters in 20 States also resulted in considerable damage to roads and streets not eligible for assistance under the Federal-Aid Highway Act. BPR field engineers provided technical support to the Office of Emergency Preparedness in surveying damages requiring some $38 million in expenditures under the Major Disaster Act. Approximately 17,000 manhours were expended on this effort.

HIGHWAY RELOCATION ASSISTANCE. Perhaps the most significant feature of the Federal-Aid Highway Act of 1968 was the provision of a highway relocation assistance program of a scope and magnitude unprecedented among public works programs. This congressional mandate indicated growing concern for the welfare of individuals, families, and businesses required to relocate because of federally assisted highway program activity. There has been complete support for this program from all Federal and State highway officials.

The States have made good progress in complying with the provisions of the 1968 Act. July 1, 1970, was the statutory deadline for State com-

pliance with the relocation assistance provisions of the 1968 Act. As of that date, all States but one were able to comply with the Federal provisions. This State is expected to achieve compliance by January 1, 1971.

HIGHWAY BEAUTIFICATION. A major restudy of the highway beautification program was completed during the year and transmitted to the Congress. Major recommendations of the report included proposals for completing the billboard removal program in about 6 years; eliminating the 660-foot and 1,000-foot control zones for outdoor advertising signs and junkyards and substituting the limit of visibility; changing the penalty to 1 percent for the first year of noncompliance, increasing by 1 percent for each year of noncompliance up to a maximum of 10 percent; and funding the program out of the Highway Trust Fund.

HIGHWAY DESIGN. Work continued on a revision of "A Policy on Arterial Highways in Urban Areas," to be published by the American Association of State Highway Officials (AASHO), which is presently scheduled for completion during 1971. Other cooperative efforts between FHWA and AASHO in the development of geometric design standards included a proposal to increase the stopping sight distance values used in design, a new AASHO publication on design guides for local rural roads, and a review of current design practices on ramp widths.

Other important undertakings included the collection and dissemination of information on skid-resistant surfaces, the continuing evaluation of existing pavement structures and their rehabilitation, continued experimentation with different film emulsions for photogrammetric surveys, and the development of new aerial analytical triangulation surveying techniques.

Several training courses and seminars on highway site planning, highway design, and pavement design, with State engineers participating, were held at various locations during the year.

CONSTRUCTION CONTRACTS AND PRICES. The Federal-aid highway construction program is accomplished through competitive bidding for contracts awarded by the various State highway departments. During FY 1970, an average of 4.6 bids were submitted per contract in the Federal-aid primary and Interstate programs.

During the year, 4,688 Federal-aid highway construction contracts with a total value of $4.7 billion were awarded, of which 1,697 were on the Interstate System, 1,356 were on the Federal-aid primary system (exclusive of Interstate), and 1,635 were on the Federal-aid secondary system. Contracts for urban work are included in these figures. The average size contract during the year was approximately $995,000 and 79 percent of the contracts were for less than $1 million.

Contract prices on Federal-aid primary highway construction, including Interstate, increased at an annual rate of about 6.0 percent from the end of FY 1966 to the end of FY 1970. The composite indexes of contract

prices (1957–1959 calendar year average=100) for the four quarters of FY 1970 were 136.3, 138.7, 137.2, and 142.4, respectively. The composite index for the fourth quarter of FY 1969 was 130.3. During the period from 1958 through 1969, the average index of contract prices for urban construction was 11.2 percent above that for rural and urban work combined and the average for rural was 6.4 percent below the combination.

The costs of labor and materials during the fiscal year amounted to 26 percent and 46 percent, respectively, of the Federal-aid primary highway construction cost (excluding costs of right-of-way and engineering). The remaining 28 percent was for equipment expenses (excluding operators' wages), overhead, and profit.

Average hourly earnings of labor on Federal-aid primary highway construction increased 8.3 percent during FY 1970, but as a result of improving productivity in highway construction, the cost of labor increased only 7.8 percent. The cost of highway construction materials increased 4.4 percent during this period and equipment expenses rose 4.5 percent. The weighted composite increase of Federal-aid highway construction labor, materials, and equipment costs during FY 1970 was 5.5 percent.

Bridge Design and Construction. A program to review in depth the structural design procedures in each State was initiated in FY 1970. This review will concentrate on expanding usage of economical standard bridge plans, computer-assisted bridge design, and early acceptance of improved structural materials and processes.

The Federal-Aid Highway Act of 1968 provided for the establishment of national bridge inspection standards and development of a training program for bridge inspectors. Since the enactment of this provision, FHWA has been cooperating with the AASHO and the Consulting Engineers Council in the development of a national bridge inspection standard. This proposed national bridge inspection standard will soon be published in the Federal Register.

A program to train Federal and State bridge inspectors is being prepared by FHWA in cooperation with AASHO. Regional training symposia will begin in August 1970 and will be completed by early 1971. Each State highway department will then conduct training courses for State and local bridge inspectors on a continuing basis.

Hydraulics. Adequate hydraulic design in highway work has been stressed with special emphasis on safety and the prevention, control, and abatement of water pollution resulting from highway construction projects. A computer program for computing bridge backwater was prepared, based on revised publications.

Seminars on highway drainage were conducted in cooperation with State highway departments to train engineers in the principles of good drainage design.

## URBAN MASS TRANSPORTATION IMPROVEMENTS

One of the most crucial transportation problems in the United States is that the cities often do not have operative systems adequate to the job of moving large numbers of people within their boundaries, whether the trips are undertaken for vocational or recreational purposes, or for shopping or medical care. The disparity between needs and resources has been made even more acute by the expenditure since 1956 of $16 billion of Federal funds on highway systems in the urban areas with the resulting automobile traffic concentrations in the cities. Only one-half billion dollars of Federal funds has been expended on the public transit systems of the cities in the same period. The Department has approached that problem in many ways, but perhaps most significantly by proposing as an amendment to the UMTA Assistance Act of 1964 a large-scale program of grants-in-aid to rejuvenate public transportation facilities, supported by an advance commitment of $10 billion over a period of 12 years, but limited specifically to $3.1 billion over the first 5 years. At the end of the fiscal year the proposed legislation had not been adopted but Congressional action had proceeded far enough to afford some assurance that the program would be adopted in some form.

Continuing programs authorized previously, the Department, through the Urban Mass Transportation Administration, awarded about $133 million in capital grants and almost $8 million in grants for technical studies.

Capital grants went to 25 cities in 18 States while the technical studies grants went to 46 cities in 28 States.

The cumulative total of Federal funds committed to mass transit capital grants since the inception of the program through FY 1970 is now $680,646,355, involving 147 projects in 32 States, the District of Columbia, and Puerto Rico. These grants are classified by mode of transportation as follows:

| | | |
|---|---|---|
| Rail (31 projects) | $513,100,420 | 76% |
| Bus (113 projects) | 151,612,419 | 22% |
| Ferryboat and other (3 projects) | 15,933,355 | 2% |
| | $680,646,355 | 100% |

Grants approved in FY 1970 will assist in the purchase of 1,511 new buses and 309 new rail cars.

CAPITAL GRANTS. Among the larger, more significant grants for the year were the following:

- A commitment of $28 million to the Southeastern Pennsylvania Transportation Authority for the purchase of 144 new electric multiple-unit commuter cars for use in railroad suburban service in the Philadelphia area. 130 cars are scheduled to operate on the Penn Central, where they will replace cars that were built early in the 20th century and have long since reached the end of their normal useful lives, and 14

are to go to the Reading Company, which is in need of additional equipment to handle its larger peak loads as rail commuter service in the Philadelphia area continues in a growth cycle.

- Other grants for railroad commuter cars during the year were to the Metropolitan Transportation Authority in New York ($20 million for 120 Long Island railroad cars) to the State of New Jersey for 45 additional units to supplement the 35 purchased previously and in use on the New York Trenton suburban service of the Penn Central. These grants will enable the railroads to replace antiquated, uncomfortable, expensive-to-maintain fleets with now rolling stock.
- Several grants were approved for the purchase of large bus fleets during the year. The largest single such funding was to the Metropolitan Transit Authority in Baltimore, which is purchasing 370 new vehicles to replace some very old equipment. The Municipal Railway of San Francisco (260 new buses), the Southern California Rapid Transit District (200 new buses), the Metropolitan Dade County Transit Authority (100 new buses), and the Twin Cities Area Metropolitan Transit Commission (93 new buses) were other grantees receiving funds to purchase major new bus fleets.
- On the other hand, several small cities were assisted with Federal funds in the purchase of small, but vitally needed, new bus fleets. Among these were Santa Cruz, California (5 buses); Ann Arbor, Michigan (16 buses); and Sumter, South Carolina (4 buses).
- The trend toward public ownership and operation of transit systems continues in the nation, and during FY 1970 UMTA capital grant funds were used by a number of communities to assist in buying out private companies. These included the large systems in Baltimore and the Twin Cities, medium-sized companies in Wilmington, Duluth, Trenton, Portland, Oregon and Salt Lake City, and the small Santa Cruz, California system.

One of the more unusual projects on which funding began in FY 1970 was the Port Authority of Allegheny County's "Early Action Program" for rapid transit. This program involves the new technology of the transit expressway in which small, rubber-tired cars basically on aerial structure provide very frequent service at all times, the use of exclusive bus right-of-way known as "PATways," and rehabilitation of several important surface rail lines.

During FY 1970 several major transit improvements funded with UMTA assistance were placed in public service. Most important were the two major rapid transit extensions in Chicago—the Dan Ryan and Kennedy services. The former began operation on September 29, 1969, and the latter on February 1, 1970. Both have generated traffic levels considerably higher than estimated, and enhance the value of Chicago Transit Authority's comprehensive system enormously.

In all, the Department made 1335 new grants and amended 54 others for a total of $160 billion during the year.

University Research and Training Programs. During FY 70 the second round of Grants for University Research and Training in Urban Transportation was awarded. Twenty-one grants were made, including those to eight schools not previously participating. At the close of the fiscal year, 26 schools were actively doing research and training work for the Urban Mass Transportation Administration with over 200 students participating in and receiving support via the program. Thirteen percent of the students in the previous academic year were from minority groups, but it is anticipated that this figure will jump to 20–25 percent under the FY 70 grants. Three Black schools were included in the group of grantees this year. Almost two dozen research reports sponsored under University Research and Training funds have been distributed to the Federal Clearinghouse, and more are in the process of being printed.

In the area of Managerial Training of managerial, professional, and technical personnel employed by Urban Mass Transportation oriented organizations, eight people participated in several different courses conducted by a number of universities. The attendees received support from UMTA in the amount of 75 percent of their costs or $12,000, whichever is less. So far in FY 70, four Fellows are attending 1-year programs under this program, and another 30 have received grants enabling them to attend short courses.

Demonstration Programs. Another channel of assistance to cities during the year was the urban corridor demonstration program with which two elements of the Department, the FHWA and the UMTA with the cooperation of the Assistant Secretary for Environment and Urban Systems sought ways of handling peak load transportation congestion in major transit corridors—usually to and from large employment centers, often the central business districts of major cities. Funds were alocated from both elements—FHWA and UMTA—for both FY 1970 and FY 1971. Eleven cities received a total of $2 million in FY 1970 for their planning operations while the FY 1971 funds will be allocated for both planning and program support.

Transit Service Development Evaluation. During FY 70 UMTA initiated two tests of reverse commutation. The Southeastern Michigan Transportation Authority received a $315,00 grant to develop seven transit routes between inner city Detroit and suburban automobile manufacturing plants. The Twin-Cities Area Metropolitan Transit Commission received a $224,000 grant to develop transit routes from the downtowns of both Minneapolis ad St. Paul to Metropolitan Airport industries. The Stanford Research Institute was awarded a contract to evaluate new transit services and recommend new approaches to transit service for the poor. Included

in the contract is an evaluation of the Detroit and Minneapolis/St. Paul Projects.

TACV Los Angeles Urban Project. In January 1970, Secretary Volpe initiated a review of alternative projects that could demonstrate new urban transportation technologies. One area that appeared particularly promising was the Tracked Air Cushion Vehicle (TACV). This technology was determined to be suitable for project application because of advances made in the research and development of a high-speed TACV system (300 m.p.h.) by FRA's Office of High Speed Ground Transportation. A lower speed version suitable for an urban installation had been demonstrated in France, and United States licensees of this system had proposed construction of an operating system.

In March 1970, Secretary Volpe determined that an urban TACV system should be included among the new transportation projects. A field of 111 potential project sites was considered; nine were selected for more thorough evaluation. From this evaluation and from a study of the feasibility of using the San Diego Freeway between the Los Angeles International Airport and the San Fernando Valley, this site was recommended for the urban TACV project. Selection of this location was announced in June 1970 with an amendment to the technical study grants to provide for preliminary engineering design and a marketing and economic feasibility analysis of the project.

While the TACV system will provide high-speed service (up to 150 m.p.h.) between San Fernando Valley and the airport, it will not deliver passengers and baggage to and from the airline loading gates. To complete the trip, an Intra-Airport Transit System has been included as a part of the total project. This system will move passengers and baggage between the TACV terminal, remote parking lots, and the airline loading areas.

The TACV system will extend 16.4 miles primarily along the median of the San Diego Freeway. Stations will be provided near the Sepulveda Dam, at Wilshire Boulevard, and in a parking area south of the Los Angeles International Aiport. Vehicles will travel on a grade-separated dual guideway at speeds up to 150 m.p.h. Vehicle capacities may vary from 60 to 100 passengers. The system is planned for a peak capacity of 2,400 passengers per hour. Propulsion will be provided by linear induction motors with fully automatic controls.

The Intra-Airport Transit System will operate initially on 4 miles of grade-separated guideways. From 25 to 30 small vehicles will serve six passenger stations in the central air terminal loop, the TACV terminal, and four stations in the parking lot. Vehicle capacities may vary from two to 30 passengers; the system capacity is planned for 5,000 passengers per hour.

Operational tests of the systems are planned to begin in October 1972. Revenue operations are expected to start in July 1973. At the end of the first full year of operations, 4 million passengers are anticipated. By 1977,

with extension of the system to Van Norman Lakes, patronage is expected to increase to more than 9 million passengers per year.

## THE ALASKA RAILROAD

The Alaska Railroad operates 483 miles of single mainline track from Seward and Whittier, both ice-free ports, to the interior of central Alaska through Anchorage to Fairbanks. Freight service is maintained over the entire line. Passenger service is operated from Whittier to Portage and Anchorage, and Anchorage to Fairbanks.

The Alaska Railroad is under a mandate from Congress to operate within its revenues. The Railroad has not required an appropriation from Congress for operating expenses since 1939, nor for capital improvements, with the exception of the rebuilding as a result of the 1964 earthquake, since FY 1956.

The operating gain for FY 1970 amounted to $211,636.78 and $50,762.20 gain from prior year adjustment. This was offset by extraordinary retirement of rail and ties from the Jonesville branch and other costs of $421,300.60 resulting in a net loss of ($158,901.60) after depreciation charges of $2,550,408.89. Total revenues for the fiscal year amounted to $18,929,730.59.

During FY 1970 the Railroad handled 1,404,423 tons of revenue freight for a total of 268,951,000 ton-miles, an increase of 4.8 percent and 18.4 percent over FY 1969, respectively. During the same period 79,965 revenue passengers were transported for a total of 12,508,174 passenger-miles.

The Railroad again was cited for its outstanding achievements in safety when the Transportation Branch was awarded the National Safety Council's Award of Honor for its safety performance in 1969.

## THE SAINT LAWRENCE SEAWAY

Although the Saint Lawrence Seaway Development Corportation is one of the Department's seven operating administrations, it reports independently to Congress and this report does not duplicate the Seaway's report of its operations during each calendar year.

# CHAPTER VIII

# RESEARCH AND VEHICLE DEVELOPMENT

## OFFICE OF THE SECRETARY

The Assistant Secretary for Systems Development and Technology provides the Secretary with advice on all matters of research; his office plans, monitors, and coordinates the programs of research and development throughout the Department, in accordance with the obligations of the Secretary under the DOT Act. In addition, certain technical programs of special concern to the Secretary, such as the Federal Transportation Noise Abatement Program, are assigned to that office.

Major programs and achievements of OST in Systems Development and Technology during the past year included:

- Conducting a comprehensive study in conjunction with NASA to develop a national policy for civil aviation research and development. This study considers the past roles of the Federal Government and the private sector and the changing technical, political, and socio-economic conditions which may influence these areas over the next two decades. It is intended that this study will lead to a coherent plan for Federal and private sector involvement in civil aviation which will assure continued U.S. leadership in this area. Completion of this 15-month in-depth study is scheduled before the end of FY 1971.
- Conducting the Department's transportation noise abatement program including the expansion of interest in reducing the noises generated by surface transportation systems. The First Federal Aircraft Noise Abatement Plan was published; it outlines the Federal and industry research and development efforts in noise abatement and sonic boom. This office participated in the development of the new Part 36 of the Federal Aviation Regulations requiring noise certification of new transport category aircraft.
- Initiating and Air Traffic Capacity Program to automate fully and increase the capacity of major urban airports and airways. Emphasis is placed on the feasibility of major innovations for fourth generation systems as well as on improving multi-modal access to airports. This program is complementary to and coordinated with the FAA program that funds and implements the third generation air traffic control system.
- Providing leadership and the chairman of the U.S. Study Group, of the International Radio Consultative Committee, concerned with the

aeronautical and maritime satellites in the support of the U.S. positions at meetings of the International Radio Consultative Committee and the Inter-Governmental Maritime Consultative Organization, the U.S. Radio Technical Commission for Aeronautics, the U.S. Radio Technical Commissions for Marine Services, the International Radio Maritime Committee, and the U.S. Interagency Group on International Aviation. The "National Plan for Navigation" was issued by DOT as the official government source of navigational policy and plans.

The Department took an active part in the Organization for Economic Cooperation and Development Advisory Conference on Tunneling, by participating in the work of the U.S. delegation and developing the U.S. position. The Conference recommended specific actions for governments to take to promote the more widespread application of tunneling technology to the solution of existing urban problems.

After the inauguration in February of the Federal program to develop an unconventionally powered, virtually pollution-free automobile by 1975, the Council on Environmental Quality assigned to the Department of Transportation the responsibility for examining the implementation of the mass production phase of the program and the attendant effects upon the economy.

To facilitate the regulation of hazardous materials transportation, the Assistant Secretary for Systems Development and Technology developed a detailed program for adopting the United Nations' labeling system. This is a first effort toward harmonization and unification of codes to foster the free movement of goods on a worldwide basis. In order to provide the necessary data bank on accident causative factors, a centralized uniform accident reporting system was developed for all modes of transport. Actions were also taken to prohibit the transportation of certain poisons with feed and foodstuffs; to take into consideration a standard format for health hazards; to control the re-use of steel drums; and to initiate a technically standardized research program to generate data to serve as the basis for the development of a uniform, flexible, and comprehensive regulatory program for all modes of transportation.

The Department of Transportation issued requirements for reporting gas pipeline systems failures, and arranged for computer analysis of the reports. In addition, the Department issued a series of notices of proposed rulemaking which lead to the promulgation of the Federal Minimum Gas Pipeline Safety Standards in August 1970. At the close of the fiscal year more than 600 comments were received and were being evaluated and discussed with the Technical Pipeline Safety Standards Committee. Plans were announced for a series of regional meetings in the fall of 1970 to discuss Federal-State relations under this program and to explain the new standards to the industry. A sample leak survey of 20 municipally-owned gas distribution systems was initiated; completion of the survey is expected in October 1970.

## HIGHWAY-RELATED RESEARCH

SOCIAL AND ENVIRONMENTAL RESEARCH. Much of FHWA's 1970 research effort concerned the relationships between highways and people. The Bureau of the Census, acting for FHWA, collected data for a Nationwide Personal Transportation Survey of motor vehicle ownership and use, and use of other modes for personal transportation. The data will be available in FY 1971.

Motorists using Interstate and other limited-access highways often report difficulty in obtaining goods and sevices as they travel. In FY 1970, FHWA engaged a research firm to study and evaluate freeway motorists' needs for goods and services.

A study of how highway improvements influence neighborhood change was completed in 1970 and will soon be published. A related contract study, begun in 1970, will measure the effects of a planned urban highway on residents and businesses in a corridor from the time of advance notice to the final route selection. Other FY 1970 studies will analyze community participation in urban highway location controversies, and determine whether transportation-related values and goals of communities can be identified through analysis of statements and arguments at public hearings.

FHWA also emphasized research on the relationship between the social and physical environment and highway transportation. In recent years the Bureau of Public Roads has cooperated with three States in studies of the social and economic effects of highway noise. During FY 1970, a larger study of alternative solutions to the urban highway noise problem was started. Effects of highway-generated air pollution will also be studied under a project undertaken in FY 1970. In addition, a contract was let to study the overall relationship between highway transportation and the physical environment.

RESEARCH ON SAFETY AND MOTORIST AIDS. The continuing program to reduce the severity of single-vehicle accidents has produced improved versions of the oil drum, hydraulic, and other systems for impact protection at exit ramps and bridge piers, and a fragmenting-tube, energy-dissipating bridge rail system. The first two types, already installed by a number of States, have actually reduced potentially fatal accidents to minor accidents involving only slight injuries at speeds of up to 70 m.p.h. A simulation model developed for this program was validated for several barrier types, and is providing guidance in avoiding unworkable systems and reducing the number of full-scale crash tests needed.

The Bureau of Public Roads installed and is testing a new system to detect and report stranded motorists. It is called "FLASH" for "Flash Lights and Send Help." Cooperating passing motorists report stranded vehicles by flashing their headlights at roadside detectors which sense the lights and signal the highway patrol. The cooperating motorist need not stop or even



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slow down. The system is potentially more economical than such surveillance systems as television, manned patrol, or even roadside telephone or call boxes.

RESEARCH ON TRAFFIC AND HIGHWAY ENGINEERING. A prototype computerized system to help motorists to merge with expressway traffic by controlling entering traffic was installed in Massachusetts. Two types of advanced-type signal lights displays to the entering motorist are being tested. A major research project to improve urban street traffic flow was begun in 1970 in Washington, D.C., with a contract to install and test a computerized control system that would be responsive to actual traffic conditions. The Urban Mass Transportation Administration is cooperating with FHWA, since the project is also designed to improve movement of buses on urban streets.

Research on life expectancy of bridges was expanded. Contracts will shortly initiate studies of fracture toughness of bridge building steels and methods for detecting small flaws such as were significant in the 1967 callapse of the Point Pleasant Bridge. A 3-year coordinated research effort, supported by 20 cooperating States and four university research teams, will refine persent design methods for horizontally curved bridges, improve design procedures, and aid in fabrication and erection of such structures.

Research on maintenance management techniques has produced improved methods which are now being implemented by some 20 States and 10 cities and counties, resulting in savings of up to 10 to 15 percent in highway maintenance costs without a reduction in service. Significant advances have occurred in the past year because statistical methods of quality assurance in highway construction were adopted. At least seven States have used this concept in construction contracts; most have made studies of its benefits.

Engineering economics research in 1970 included Bureau of Public Roads staff studies of truck characteristics and usage for various highway systems; number and magnitude of vehicle speed changes under different traffic operating conditions; relative economy of constructing full-width shoulders on bridges under different conditions; and studies of costs arising from traffic accidents. Related contract studies included investigations of value of travel time for occupants of passenger cars and of economic feasibility of tunnels for utility pipes and wires along highway rights-of-way.

RESEARCH ON NEW TECHNOLOGY. Studies on new technology for highways produced several significant developments during FY 1970. (1) Early investigations of polymer-impregnated and irradiated concrete indicated that such materials have good potential for use in more durable bridge decks, breakaway light polies, and safety crash barriers. A 2-year study cosponsored with the Atomic Energy Commission developed a nuclear procedure and prototype portable instrument to measure the cement content of fresh concrete within 2 to 3 minutes. (2) Study of remote sensing systems, such as color and infrared aerial photography for detecting terrain and

soil conditions showed that computerized methods of interpreting such data have great potential for highway applications. (3) In another application of computers, a simulation model was developed under contract to test traffic capacity of alternate highway designs before building through mountainous terrain and thus avoid costly rebuilding. (4) Computers were applied also to generate, from engineering data, successive perspective views of a proposed highway. These views can be projected as a motion picture of the highway before construction. Thus designers can simulate driving the road, and can detect and correct faults before construction.

*Research and Vehicle Development—General.* In June of 1970, the Applied Physics Laboratory completed an UMTA contract with the production of the first critical technical evaluation of 10 representative examples of the "new systems" of transportation being proposed for public urban service. These systems use nonconventional guideways, propulsion systems, vehicles, and the like. The Applied Physics Laboratory report represents a successful attempt to get beneath the representations of the proponents of such systems to the basic issues of technological feasibility; it sets in perspective the promise and problems that "new systems" offer, and suggests the time and R&D effort that must be brought to bear before the promise can be realized.

## RESEARCH RELATED TO WATER TRANSPORTATION

During FY 1970, the primary emphasis of Coast Guard Research and Development was on environmental protection. An air-deliverable oil pumping and storage system, which would make possible the unloading of oil from a stricken tanker before an actual spill could occur, was successfully developed and tested. The second phase of this program deals with the physical containment of an oil slick occurring either when the source is not a ship or when the pumping and storage system does not effect full removal. Several overflights were made in the areas of actual spills to obtain data on the signature pattern of oil in water. This information will be used to develop airborne sensors capable of detecting and measuring oil spills.

In the Arctic, Coast Guard efforts were designed to provide understanding of sea ice since this presents a barrier to marine transportation there. Field tests have demonstrated the capability of side-looking airborne radar for sensing ice extent and features, and the feasibility of air-dropped ice-penetrating devices (penetrometers) capable of transmitting ice thickness measurements to an aircraft.

The experimental Harbor Advisory Radar station in San Francisco began operations designed to determine the potential of such an installation in the control of harbor traffic movement and to identify the requirements of an operational radar traffic control station.

National Data Buoy Development Project. The National Data Buoy Development Project has been designated for inclusion in the new

National Oceanic and Atmospheric Administration within the Department of Commerce. An agreement for use by the Project of the Mississippi Test Facility has been concluded between the National Aeronautics and Space Administration and Department of Transportation (U.S. Coast Guard). Transfer of the Project to the Mississippi Test Facility is expected within this fiscal year.

In February, the first Experimental Environmental Reporting Buoy (XERB–1) was deployed off the East Coast, 125 miles southeast of Norfolk. Deployed under National Data Buoy Development Project auspices, the buoy contributes to the Environmental Science Services Administration East Coast Storm Operations Plan designed to help warn coastal areas of severe weather. Synoptic data, consisting of hourly atmospheric and oceanic observations, are transmitted in near real time every 6 hours to civil and military agencies for use in environmental analysis and prediction. The buoy has provided the Project with valuable research, development, test and evaluation and operational experience. During summer refit of the buoy provision is being made for accommodation of pollution sensors. Operation is currently programmed through FY 1971.

Ocean Stations. The Coast Guard continued its operation of four ocean stations in the North Atlantic and two in the North Pacific. These ocean station vessels provided meteorological, navigational, communications, and rescue services for air and marine commerce and collected a variety of scientific data.

In addition, weather station HOTEL was established 20 miles east of Cape Hatteras to meet a high priority requirement for East Coast storm forecasting. This station is being manned by the cutter *Gresham* during the period 1 August to 30 March to cover both hurricane and snowstorm seasons.

Oceanography. At the end of FY 1970, the Coast Guard had more than 40 vessels capable of significant levels of oceanographic and marine science activity. During the year, these vessels were engaged in a diversity of both Coast Guard and cooperative programs. On all six ocean stations, oceanographic observations were made routinely. Standard sections in both the Atlantic and Pacific Oceans were occupied on a seasonal basis. Among the cooperative projects in which the Coast Guard took part were: (1) International Weddell Sea Oceanographic Expedition II; (2) Water mass studies in conjunction with the International Commission for Northwest Atlantic Fisheries; (3) BOMEX (Barbados Oceanographic and Meteorological Experiment); (4) West Greenland Glacier Survey; (5) North Pacific Buoy Study; (6) Polar Profile '70; (7) Cobb Seamount (Project SEAUSE), and (8) Project TEKTITE.

Work continues to improve the operational prototype of the first of a planned Coastal Oceanographic Research Data System which will collect

hydrographic data automatically from offshore light structures and large navigational sea buoys respectively.

ELECTRONICS ENGINEERING. Contracts were awarded for construction of Transportable Communications Central (TCC) with the first unit scheduled for delivery in the first quarter of FY 1971. TCC will provide rapid on-scene communications capability for natural disasters and search-and-rescue incidents. It will be transportable by air (fixed wing and helicopter) and by highway.

The prototype model of the AN/SPS–57 Radar, designed to be the service standard small boat radar, is presently undergoing field tests. Most difficulties have been resolved and production will be authorized shortly.

An evaluation is underway to determine the value and applicability of the Loran Omega Course and Track Equipment (LOCATE) System in lieu of air search radar for upper wind observations. Initial tests indicate greater accuracy and range using LOCATE. This system is also being studied for search and rescue applications and shows great promise.

Field testing of the prototype model of the AN/FPN–53 Loran-A Timer was begun at Cape Hatteras Loran Station in June 1970. The new timer will replace 20-year old equipment at 47 U.S. operated stations and improve system accuracy in accordance with the DOT National Plan for Navigation. Initial tests show great promise for accuracy improvement by reduction of synchronization tolerances from $\pm 0.5$ microsecond.

A program was initiated to procure aircraft transponders compatible with new FAA requirements for automatic altitude reporting. This will provide a much safer environment for all Coast Guard aircraft.

Three Air Transportable Loran-C System (ATLS) Stations were completed during this year. This completes the project of four ATLS stations, one of which is operating in the Southeast Asia Chain.

## HIGH-SPEED GROUND TRANSPORTATION

The most notable achievements in high-speed ground transportation were the construction of the linear induction motor (LIM) test vehicle unveiled in December of 1969, and the selection of a high-speed test site in Pueblo, Colorado.

In March 1970, the Department also awarded a contract to design a 300 m.p.h. tracked air cushion research vehicle (TACRV), including the engineering design and technological studies for the test vehicle and the guideway on which it will operate.

In a related development, a grant was awarded to provide the Nation's first passenger-carrying TACV system by mid-1973. Designed to serve the Los Angeles International Airport, the demonstration program will provide early operational experience with a TACV having a speed of up to 150 m.p.h. for which technology is already available. UMTA is the program manager for this project while the engineering responsibility has been delegated to FRA.

The TACV is essentially a vehicle which travels on a thin cushion of air over a U-shaped concrete guideway. It holds promise of speeds up to 300 m.p.h. with increased passenger comfort and safety. Air is compressed and forced through tubes along the body of the vehicle. This compressed air is then pushed out from the bottom of the vehicle, forming the air cushions that lift the vehicle from the guideway. Another set of air cushions holds the car on the guideway by directing high-pressure air against the sides of the recessed center track or the sides of the guideway. Substitution of the air cushion for steel wheels will foster economy in guideway construction and maintenance.

The research vehicle mentioned above will be used to study aerodynamic and dynamic stability, ride quality, power requirements, and external and internal noise control over a range of speeds.

As a propulsion device for the TACV research vehicle as well as the demonstration vehicle, the Department plans to use the LIM. During FY 1970 a contract was awarded for the design of a high-powered LIM to propel the 300 m.p.h. TACRV.

Providing thrust by the use of electromagnetic interaction between the motor and an aluminum rail centered in the guideway, the LIM offers the key advantages of reduced air pollution and noise. The country's first 2,500-hp. LIM, designed and built for the Department, has been undergoing tests since last December at the manufacturer's facility and will be shipped to the High-Speed Ground Test Center in early 1971.

The Test Center situated near Pueblo in southeast Colorado on a 45-square-mile site, will enable the Department to test all types of equipment and vehicles in a variety of weather and terrain conditions. Tentative plans call for the construction of two or three 20-mile test ovals and later a 20-mile straight-away.

Because surface vehicles may be incapable of reaching the high speeds needed for future transportation because of the power required to overcome aerodynamic drag, the Department has been exploring the technology of vehicles traveling in an evacuated tube which seems to be the most feasible method of attaining such speeds. If the tube is a tunnel, power requirements can be further reduced by slanting the tunnel down from one station and up to the next, using gravity for both acceleration and braking.

This and other methods of propulsion for overcoming the drag problem are under study by universities, research institutes, and corporations under contract with the Department. Studies and research also continued in the fields of gas dynamics, high-speed wheel-rail interaction and tunneling.

The Office of High-Speed Ground Transportation tunneling research, which leads the field in this country, has been the object of particular attention, since tunneling technology and costs have thus far prohibited subsurface construction on a large scale. Studies to date indicate that, if the cost of tunneling can be reduced, tube vehicle systems can be made more competi-

tive with other modal forms and, at the same time, will offer the advantages of increased safety, high speed, all weather operation and environment. A systems study of soft-ground tunneling for the Office of High-Speed Ground Transportation was nearing completion at the end of FY 1970.

Besides testing more advanced forms of transportation at the test site, a wheel-rail dynamics research laboratory will be built there to find out more about the physical phenomena involved in rolling support and wheel-rail contact. The lab will also provide the capability of simulating accidents on operating railroads.

A valuable help to the wheel-rail laboratory equipment design and to its later programming and operation is the data gathered by the four DOT test cars. The flexibility, availability, and data gathering capabilities of the cars are gaining recognition and are of great value as a basic research tool.

The cars, which have been used to validate computer models of car suspensions and pantograph action, are in regular service to survey demonstration track geometry and measure track irregularities in several wheel-rail interaction investigations, including the experimental track structures being installed on the Santa Fe Railroad.

Short test sections, based on designs of both the Office of High-Speed Ground Transportation contractors and private industry, have been built into a heavily traveled section of the Santa Fe Railroad and subjected to high-tonnage use. Instrumentation has been installed on each of these sections and in a conventionally designed control section to monitor performance. Analysis of the measurements when combined with inspection and expense records for installation and maintenance are giving indications of the best designs.

In the area of unconventional research—besides the TACV, LIM and tube systems—a program is being conducted in cooperation with the FHWA on automobile-related systems. These include automobile transporters—the autotrain, and small vehicles to carry single automobiles (pallet system); hybrid air cushion/wheeled buses capable of operating on guideways as well as roads; and automated highways. Special emphasis has been placed on the development of control system concepts which may be used in either pallet systems or automated highways.

Research efforts continued into support projects such as obstacle detection and communication systems, electric power collection and conditioning, guideway development and magnetic suspension. The latter is one of the projects to be undertaken at the new DOT Transportation Systems Center in Cambridge, Massachusetts.

## CHAPTER IX

## URBAN SYSTEMS PLANNING

A major emphasis in the debates preceding the enactment of the DOT Act reflected the conviction on the part of many that cooperation and accommodation among modes of transportation was essential if the country were ever to achieve a balanced transportation system. It seemed evident that having the agencies responsible for promotion of several modes of transportation reporting to one Cabinet official would facilitate such inter-modal cooperation. Instances of such cooperation that benefit the public greatly are beginning to appear. Thus moving of people within cities is a problem of concern at least to the Department of Housing and Urban Development (HUD), the Federal Highway Administration (FHWA), the Urban Mass Transportation Administration (UMTA), the Federal Railroad Administration (FRA), and perhaps others.

### BUS TRAFFIC SYSTEMS INNOVATIONS

Utilizing resources of the DOT, three basic approaches to bus traffic innovations will be demonstrated in FY 1971 and FY 1972. One of the approaches is to provide reserved lanes for buses or buses and carpools on existing multi-lane freeways. A second approach is to provide exclusive bus roadways mostly through the use of existing right-of-ways in the medians of freeways and on abandoned railroad right-of-ways. A third approach is to meter the use of freeways to maintain the free flow of traffic and to provide priority entry for buses. Included in all of these approaches will be preferential treatment for bus circulation in major activity centers such as central business districts and suburban parking for bus patrons.

The first approach, the reserved lane, will be implemented in FY 1971 in Seattle, Washington. Three-quarters of a mile of one of the reversible lanes of Interstate Highway 5 leading to the central business district will be reserved for buses only. A feasibility study of a reserved lane for buses and carpools was started in Cleveland, Ohio during FY 1970 and will be completed in the fall of FY 1971. It will considerably increase the number of locations where lanes of existing multi-lane freeways can be reserved for bus operations, if carpools are also allowed to use the reserved lane.

The second approach, using an exclusive bus roadway, was partially implemented in FY 1970 on the Shirley Highway in Northern Virginia. A longer exclusive bus roadway will become available in the spring of 1971.

Another location for this approach is currently in the final planning stage in Southern California.

The third approach—metering freeways and giving buses priority entry—is currently being planned in Minneapolis, Los Angles, and Dallas as part of the Urban Corridor Porgram. Eleven cities were selected for this program at the close of FY 1970. The metered freeway approach should prove feasible to implement in at least one of these cities by FY 1972.

These approaches for increasing the people moving capacity of urban highways and streets requires the close coordination of UMTA, local transit operating agencies, and the many organizations responsibile for building and operating roadway facilities, especially the FHWA. FHWA and its field organization have moved aggressively and innovatively in this area. All the projects just described are being jointly promoted—the bus service improvements by UMTA, and the roadway improvements by FHWA.

## COORDINATION WITH OTHER GOVERNMENT AGENCIES

UMTA joined with the Model Cities Administration of HUD last year to provide transportation technical assistance to local Model Cities Agencies. This project assists the local agencies in research and designing of the transportation component of comprehensive neighborhood plans.

UMTA, HUD, and HEW sponsored an Interdisciplinary Workshop on "Transportation and the Aging" during FY 1970. The workshop is producing new ideas on improving transportation for older persons using resources of the three sponsoring agencies. UMTA and HEW initiated a study by Northwestern University of the effect of reducing transit fares for the elderly. This research effort will provide a manual to assess the impact of a reduced fare plan on the revenues and operating costs of transit systems.

UMTA granted $500,000 to the National League of Cities – U.S. Conference of Mayors to evaluate the impact of public transportation on summer youth employment. The Department of Labor and HUD each contributed $500,000 toward this project. The research is designed to assist the President's Committee on Youth Opportunity in developing future youth employment programs.

## APPROACHES TO URBAN SYSTEM DESIGN

UMTA's Demonstration Programs are concerned with identifying transportation innovations and improvements which potentially have nationwide application. Previous transportation demonstration projects have in many cases been "successful" in the sense that they illustrated particular innovations or improvements that could be carried out in a particular community which were beneficial to that community in some generally agreed-upon sense. However, few of these were of a scientific form such that extensions of the concept employed in one city could be validly applied to another

city. But it is precisely in such extensions to other cities that the greatest pay-off should accrue from UMTA's demonstration projects.

In order to improve upon this deficiency, UMTA, continually responsible for a large number of individual transportation demonstration projects, is investigating the potential application of carefully designed experimental concepts which have been successfully used in educational, psychological, and other social settings to its Demonstration Program. At the end of FY 1970, planning and work statement preparation had been accomplished for initial application of this concept to several Urban Corridor bus demonstration projects. Plans for other near-term application include the Seattle "Blue Streak" and Shirley Highway Bus-on-Reserved-Lane demonstration projects.

## FURTHER IMPROVEMENTS OF URBAN TRANSPORTATION SYSTEMS

Planning effort for the further improvement of urban transportation systems included UMTA's New Systems Program. Set up in FY 1970 to provide alternatives to existing technologies, this program seeks to develop and demonstrate an array of advanced, unconventional systems—

(1) An automated intra-airport circulation system at the Dallas/Ft. Worth International Airport will be demonstrated in FY 1971. During FY 1970 UMTA funded studies which showed that on the national level, airports represented an early and very large market for new systems. The development of the Dallas/ Ft. Worth International Airport project provided an opportunity for demonstration under which system requirements and specifications will be established, prototypes of two competing systems will be built, and 1,500 feet of one system will be built in the airport.

(2) An automated, urban capsule system will be constructed and demonstrated in Morgantown, West Virginia under a project announced by Secretary Volpe in September 1970. Preliminary requirements and site preparation were accomplished under a FY 1970 demonstration grant to the University of West Virginia in that city. Alternative technologies were also studied. FY 1971 will see a substantial and important investment in a new system facility based on this significant FY 1970 work.

Reports were published during FY 1970 which document programs for the improvement of downtown mobility in five cities—Atlanta, Dallas, Denver, Pittsburgh, and Seattle. The cities are taking action recommended by these reports. Based on experience in the Center City Program, an incremental and evolutionary planning process was devised and other national and local recommendations are made in half a dozen additional "Guideline" reports. The Program stimulated a major article in the February 1970 issue of *Nation's Cities* reporting on the institutional barriers to urban transportation improvement.

# CHAPTER X

# MILITARY ACTIVITY AND READINESS

## COAST GUARD

One element of the Department—the Coast Guard—is basically a military organization, having both national defense and law enforcement responsibilities. Other elements of the Department also cooperate extensively with elements of the Department of Defense, particularly in time of war, but also routinely in peace time, *e.g.*, FAA air traffic control service is provided to military aircraft as well as to civilian counterpart craft.

OPERATIONS IN VIETNAM. For some years both the Coast Guard and FAA have had an active involvement in the Vietnam war. In accordance with President Nixon's intention to withdraw Americans from Vietnam and encourage the Vietnamese to assume responsibility for their own defense, part of the Coast Guard's equipment there has been turned over to the South Vietnamese Government and most of the Coast Guard personnel have been withdrawn. [Squadron One was disestablished on 15 August 1970, marking the succesful transfer to the Vietnamese Navy of the 24 patrol boats which had still been manned by the Coast Guard at the beginning of FY 1970.]

In conjunction with the Vietnamization program, the number of high-endurance cutters assigned to Southeast Asia has been reduced to four, two of which will be transferred to the Vietnamese Navy during FY 1971.

"Market Time" surveillance activities continued with more than 134,000 vessels being detected. Of these, 46,000 were boarded and searched. High-endurance cutters and patrol boats fired nearly 1,700 gunfire support missions, accounting for an estimated 474 enemy troops killed or wounded and damaging or destroying over 2,900 structures and 900 junks.

The buoy tender *Blackhaw* continued her short in-country deployment to service aids to navigation. The Port Security and Waterways detail supervised the unloading of 1.7 million tons of ammunition from nearly 500 ships. Additionally, a Coast Guard Aids to Navigation detail, Merchant Marine detail, and a Marine Police Advisor functioned in South Vietnam.

MILITARY READINESS. As part of the Coast Guard operational readiness program, 25 ships participated in naval refresher training during the past fiscal year. The Coast Guard is evaluating its potential capabilities in specialized warfare areas of Inshore Undersea Warfare and Counter-insurgency. Extensive anti-submarine warfare modernization is planned to commence in FY 1971 reflecting the significant changes made to the Coast Guard's anti-submarine warfare program.

## FAA AND NATIONAL DEFENSE

EMERGENCY-READINESS ACTIVITIES. FAA is entrusted with all airspace management functions supporting military as well as civil aviation. FAA is also responsible for the defense readiness of civil aviation, and for its own readiness as an agency for defense emergencies.

The more important defense-related developments during FY 1970 involved:

- Signing a memorandum of understanding with the Civil Air Patrol setting forth the relationship between Civil Air Patrol wings and State and Regional Defense Airlift (SARDA) organizations. According to the agreement, the Civil Air Patrol will function as an arm of SARDA during a national emergency.
- Bringing to the final stages of completion an emergency planning bulletin setting forth an air carrier dispersal plan that would insure the survival of the majority of the U.S. air carrier fleet during nuclear attack. The plan calls for the dispersal of air carriers to designated "safe haven" airports. At year's end, a list of safe haven airports was being refined by the Office of Emergency Preparedness.
- Revising and publishing the FAA Headquarters defense readiness plan.
- Bringing to the coordination stage a revised version of FAA's handbook for emergency resource management.
- Bringing to an advanced stage of planning a far-reaching training exercise (nicknamed SARDAX) designed to test the capability of general aviation to support State, regional, and national defense airlift requirements.
- Signing an agreement with the Civil Aeronautics Board calling for the Board to co-locate at the FAA emergency relocation site in the event of a general war.
- Issuing by the President of Executive Order 11490 ("Assigning Emergency Preparedness Functions to Federal Departments and Agencies") on October 28, 1969. The new order consolidates and updates the contents of some 23 Executive orders (now revoked) dealing with emergency preparedness. At year's end, a DOT order was drafted making appropriate delegation of the Secretary's responsibilities under EO 11490 to heads of DOT modal administrations.

AVIATION WAR RISK INSURANCE. In addition to the foregoing, FAA continued to administer an aviation war risk insurance program under the Federal Aviation Act of 1958 (as amended) and a delegation of authority from the Secretary of Transportation under the Department of Transportation Act of 1966. Under this program, FAA:

- Maintains a standby insurance binder plan that would make aviation war risk insurance available upon the outbreak of war to both U.S.

civil aircraft and foreign-flag civil aircraft engaged in operations deemed to be in the interest of national defense or the national economy. At year's end, 58 aircraft were covered under this plan by premium insurance binders representing a maximum contingent liability of $3,911,901,000.

- Provides aviation war risk insurance without premium to U.S. air carrier aircraft that are either under contract to the Defense Department or committed to the Defense Department in the event of emergency. At year's end, 447 aircraft in this category were covered by no-premium policies representing a maximum contingent liability of $52,584,991,649.25.
- Provides aviation war risk insurance without premium to U.S. air carrier aircraft under contract to the State Department. At year's end, 82 aircraft in this category were covered by non-premium policies representing a maximum contingent liability of $19,496,055,000.

All but eight of the aircraft covered by premium binders and State Department no-premium binders were also covered by Defense Department no-premium binders. Hence, addition of the foregoing figures will not give true totals. The insurance in force at the end of the reporting period totaled $49,184,030,649, and the program's actual total contingent liability at year's end was $53,095,931,649.

The program's FY 1970 revenues were $9,400.00; net adjusted administrative expenses, $17,552.08. At the beginning of the year, retained earnings stood at $36,329.28; at year's end, at $28,177.20.

A strong probability existed at year's end that aircraft falling into yet another category would be covered by aviation war risk insurance. Entry of the Boeing 747 into airline service posed a new insurance problem for U.S. air carriers. Because of the high cost of the aircraft (some $24 million), commercial insurers would insure only about 60 percent of its value. In June 1970, Secretary Volpe approved an OST staff recommendation that aviation war risk insurance be made available to cover the commerically uninsurable portion of each Boeing 747 flying an international route. By year's end, however, no insurance of this kind had been issued.

## HIGHWAYS AND NATIONAL DEFENSE

During FY 1970, Emergency Highway Traffic Regulation conferences were held in seven of the nine FHWA regions. At these, approximately 450 key State and FHWA personnel were trained in emergency highway traffic regulation. It is expected that these people will conduct similar training at the State and local levels. National Defense Executive Reserve Conferences were held in all nine regions. Approximately 75 members of the Bureau of Public Roads unit of the National Defense Executive Reserve were given current information on emergency preparedness procedures and postattack operations.

Other activities included periodic exercise in communications capability at the FHWA headquarters emergency operating facility, the development of specific emergency operational assignments by regional and division offices, the undating of detailed action plans for preattack and postattack conditions, and numerous field visits to regional and division offices and State highway departments to evaluate and assist in the development of national emergency preparedness programs.

# CHAPTER XI

# ORGANIZATIONAL AND ADMINISTRATIVE DEVELOPMENTS

## CHANGES IN THE OFFICE OF THE SECRETARY

An important reason for the formation of the Department of Transportation from elements of several government agencies was to give the Secretary responsibility for almost all of the transportation-related functions of the Government. A method employed to improve the capability of the Secretary to control his department and also to save manpower and money, once the Department was in operation, was to transfer groups of employees who performed similar functions from the several administrations to the Office of the Secretary, sometimes reducing the total number of employees performing the function, or improving their output. During the year a number of such consolidations were approved by the Secretary to centralize the functions of congressional liaison, investigation of discrimination complaints, public affairs, and internal audit. While the total number of employees transferred to OST was about 200, about 121 of them were internal auditors.

NATIONAL HIGHWAY SAFETY BUREAU. A highly important change in the structure of the Secretary's Office was the shift of the National Highway Safety Bureau from the FHWA and its establishment as a seventh operating administration reporting independently to the Secretary. The purpose of that action was to separate man/vehicle safety functions from the highway design and construction and environmental functions still performed by the FHWA. The Secretary wished also to emphasize his direct concern with prevention of the great number of automobile accident fatalities each year.

Agreement was reached concerning the allocation to both the Bureau and the FHWA of support positions and appropriate functional statements have been prepared to reflect the new operating arrangements. The National Highway Safety Bureau is organized functionally with Associate Directors for: Planning and Programming, Motor Vehicle Programs, Research and Development, Traffic Safety Programs and Administration.

OFFICE OF SUPERSONIC TRANSPORT. The Secretary decided late in 1969 that he would transfer the function of developing a supersonic aircraft from FAA to his own office in an effort to avoid the criticism that one element of the Department—the FAA—was charged with the development of a supersonic aircraft, and would also have the task of certificating the craft for commercial use when it was completed. By removing the development effort from FAA the Secretary avoided the possibility of that conflict of



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interest. The shift transferred 177 authorized positions and about 90 incumbents.

Office of Logistics and Procurement Management. An Office of Logistics and Procurement Management was created under the Assistant Secretary for Administration, combining functional elements already within the Department. Creation of this office was intended to give all elements of the Department better service at lower cost, and to elevate the administrative status of those important functions.

Northeast Corridor Project. The Northeast Corridor Project that had come into the Department as an element of the FRA was transferred to the Office of the Assistant Secretary for Policy and International Affairs because its assigned functions were multi-modal and policy formulation in character and did not fit within the more limited mission of the FRA.

Assistant Secretary For Safety and Consumer Affairs. Two independent lines of development within the Department convinced the Secretary that he should create an Assistant Secretary post for safety and consumer affairs. First, two task forces appointed to study the functions of pipeline safety and transportation of hazardous materials independently recommended in their reports that the functions be assigned to an Assistant Secretary for Safety, or for Safety and Consumer Affairs. Second, though Congress in authorizing the creation of the Department emphasized that one of its chief concerns should be the safety of all travellers, supervision of the safety functions of the Department had not been assigned to any one officer. Each operating administration had responsibility to promote safety in its own mode, but none had responsibility to develop general safety standards and guidelines for all modes. Similarly, the development of safe, efficient, low-cost and convenient transportation was not the exclusive responsibility of any one of the administrations.

The Secretary decided that the two related functions of the safety and satisfaction of the citizen who travels or ships goods deserved the attention of a high level official of his Department; he therefore ordered the activation of the position of Assistant Secretary for Safety and Consumer Affairs. Research and planning for that post were undertaken during FY 1970; implementation of the plan will be completed during FY 1971. The existing offices of Pipeline Safety and of Hazardous Materials will become elements of the new Assistant Secretary's jurisdiction, as will newly created offices of Safety Program Coordination and Consumer Affairs.

Transportation Systems Center. A most important addition to the Department's resources in the Transportation Systems Center in Cambridge, Mass., acquired by transfer from NASA to DOT. When budgetary limitations made it necessary for NASA to declare the still unfinished research center surplus to its needs, Secretary Volpe petitioned the President to transfer the installation to the Department, observing that the Department

urgently needed its own research capability, and that it would be less costly in time and money to assume the management of an already operating center than to build a comparable facility. The center's location near a major academic and industrial complex would be an added advantage. When the President approved the proposed transfer, he concurred with Secretary Volpe's suggestion that the center would facilitate the Department's effort to conduct research premised on the belief that all transportation modes should be integrated in one operating system. Initially the center under DOT direction will devote its research to such problems as more complete and reliable automation of the air traffic control system, collision avoidance systems for aircraft, reliable automatic landing systems for aircraft, air pollution sensors, systems analysis for urban transit systems, and an ocean data buoy system to gather weather and oceanographic information.

Intensive negotiations were conducted with NASA and its research center personnel in Cambridge to effect the most advantageous transition. About 425 people who had been employed by NASA at the Center were re-employed by the Department to staff DOT research projects, and numerous items of equipment were transferred from NASA to the Department at the transition. By the end of FY 1971 it is planned that the work force will total 625.

## ADMINISTRATIVE PROGRAMS—OST

DOT Contributions To Federal Assistance Review. The Department of Transportation began decentralizing control of its programs even before President Nixon issued instructions in early 1969 to all government agencies to delegate authority to field officials to the maximum extent feasible, in order to provide services effectively to local recipients of federal aid. During the year following that instruction, the Department analyzed its field structures and programs, and concluded that several of its operating administrations could conform to the 10 regions established by the President. Programs were initiated to alter DOT field structures to the President's pattern; the effort was limited only by lack of sufficient trained personnel and funds.

DOT in the Regional Councils. Because the representation of the Department in the field consisted only of officials having technical functions, sometimes organized loosely into field coordination groups, and the activities of those technical officials were directed by their parent administrations, the Secretary decided to appoint a representative to each of the Regional Councils of which the Department had recently become a member, thanks to the action of the Urban Affairs Council. The Secretarial Representative on each Council does not manage programs of his own, but functions as coordinator, communicator, planner, and expediter, while the substantive programs are managed by representatives of the Department's Administrators. As the Secretary's spokesman in the field, he communicates with the

Secretary and Administrators directly without having to deal through any intermediary or group. One permanent representative has been appointed—former Governor Norman Erbe to the Seattle Regional Council; nine other interim representatives have been delegated to act in the remaining Councils until permanent representatives have been selected.

GRANT MANAGEMENT. Another aspect of the Federal Assistance Review Program is simplifying the management of grants. Following the President's instruction, the Department made careful studies of its 11 grant-making programs with the purpose of decentralizing the grant-making authority and simplifying the application proces. The Department will increaingly rely upon State and local officials both for justifying grants and for administering those grants that are made. Illustrations of such assistance grants are: money to States for construction of highways and for highway safety programs; money to cities for purchase of buses and rail transit facilities, for construction of airports and other transportation-related uses. The Department believes that decentralizing of all of this grant-making will produce important savings for the recipients in time and money, and will afford greater satisfaction to the intended beneficiaries of the programs.

As the Federal Assistance Review began, control of most of the programs of the FAA and FHWA was already well decentralized. It is now anticipated, however, that for these grant programs work loads will be substantially increased under new legislation authorizing larger amounts to be expended for such grants. In addition large amounts have been authorized for grants in Mass Transportation Assistance and other similar programs.

The intensive review of programs that stimulated these changes also disclosed other areas that require careful investigation, including procedures for paying final vouchers for highway construction, interagency coordination, and simplification of the regulations concerning grants.

THE AUDIT FUNCTION. In the Department internal auditing is conducted to provide responsible officials with impartial evaluations of the effectiveness and efficiency with which financial, operational, and support activities are being performed. When the Office of the Secretary was organized, provision was made for an Office of Audit that included a small number of professional auditors; each administration, on the other hand, required the services of larger numbers of professionals.

As part of the effort to consolidate the several elements that became parts of the new DOT, studies were undertaken of functions common to several of the administrations and the OST. In the case of auditors, it was found that many specialists were concerned with audit of activities within the Department, but were responsible for preparing reports only to the administrators of their parent elements. The Secretary decided, when the facts had been assembled, that the internal audit function should be incorporated within the Office of the Assistant Secretary for Administration,

in order that the Office of the Secretary might have the advantage of the audit instrument in controlling the Department. Provisions for the official transfer are included in the appropriation request for FY 1971.

The extent and usefulness of audits are illustrated by the following data: for FY 1969, 2,906 audits were performed of the affairs of OST and the elements of the Department, not all of them by DOT personnel. Of those, 97 audits dealt with the Department's internal business while 2,509 were concerned with the contractors' and grantees' performance of functions for which they were responsible. The summary of the FY 1969 internal audits noted rather wide-spread deficiencies in financial and resource management, functional supervision, and program direction. Audits of the Department's contracts and grants disclosed questioned costs of $184.4 million of a total of over $7 billion expended. Costs were questioned for inadequate supporting justifications, ineligible costs under terms of the contractual instruments, and unreasonable claims of various types.

WORKING CAPITAL FUND. Plans to provide services to both the Administrations and the Office of the Secretary, particularly the elements located in the Nassif Building, proceeded well. Under the Working Capital Fund, such services as still photography, duplicating and copying, travel and imprest fund, and library services are provided to all users by one source, with sizable economies resulting. Additional services now under consideration for consolidation include mail and messenger services, preparation of visual aids, selected office services, and management of warehouse facilities.

## ADMINISTRATIVE DEVELOPMENTS—FEDERAL AVIATION ADMINISTRATION*

ORGANIZATION. The reporting period saw a number of changes in the organizational structure of the FAA Headquarters. The more important of these changes were:

- Transferring (April 1970) the Office of Supersonic Transport Development from FAA to the Office of the Secretary of Transportation.
- Establishing (May 1970) the Office of the Associate Administrator for Engineering and Development to replace the abolished Office of the Associate Administrator for Development. The new Associate Administrator was given executive direction over the National Airspace System Program Office, the Systems Research and Development Service, and the National Aviation Facilities Experimental Center.
- Abolishing the Aircraft Development Service and assigning its responsibilities to the Systems Research and Development Service (May 1970).
- Assigning the responsibility for the terminal automation program and the ARTCC building modernization program to the National Airspace System Program Office.

* For financial data on the Federal Aviation Administration, see tables 8 and 9.

- Establishing (January 1970) the Facility Installation Service under the Associate Administrator for Operations. This service assumed the management of FAA's facilities establishment program from the Logistics Service; it also assumed from the Systems Research and Development Service the responsibility for preparing procurement specifications for production equipment and for prescribing technical instructions and standards for its installation.
- Realigning the functions of the Logistics Service (January and May 1970). Logistics, while relinquishing some of its responsibilities to the National Airspace System Program Office and the Facility Installation Service (see above), retained its responsibility over materiel purchasing; at the same time, it was given the responsibilities in property management previously exercised by the Office of Management Systems and moved from the jurisdiction of the Associate Administrator for Development to the jurisdiction of the Associate Administrator for Administration.
- Renaming the Office of the Associate Administrator for Personnel and Training the Office of the Associate Administrator for Manpower.

In addition to implementing the foregoing organizational changes in its headquarters, FAA:

- Realigned its regional-office/area-office structure by consolidating, within the contiguous United States, regional and area offices located in the same city. Area offices in New York, Atlanta, Kansas City, Fort Worth, and Los Angeles were eliminated, the functions and resources in each case being transferred to the regional headquarters office located in the same city.
- Planned the realignment of the agency's organizational structure in the field to conform generally with the President's concept of standard Federal regions in the contiguous United States.

PERSONNEL ADMINISTRATION. FAA's number one priority in the area of personnel administration continued to be the bolstering of the air traffic controller work force. At year's end, the number of ATC specialists stood at 23,752, an increase of 12.4 percent over the 21,127 on board at the end of FY 1969. At the same time, the proportion of such specialists in the total work force rose from 43 percent at the end of FY 1969 to 46.1 percent at the end of FY 1970. Even more indicative of the agency's concentration on controllers was the net employment gain registered by this occupational category. Between June 30, 1969, and June 30, 1970, the total FAA work force registered a net increase of 2,371 employees (rising from 49,106, to 51,477); during the same period, the controller work force registered a net increase of 2,625.

Two categories of ATC specialists—terminal and en route controllers—were the subject of a special DOT study during the reporting period. In

August 1969, Secretary Volpe appointed a seven-man committee of experts chaired by John J. Corson, a professional consultant, to inquire into the controller career field. In January 1970, the committee submitted to the Secretary a lengthy report containing, among others, the following recommendations:

- Reduce the overtime work now being required of controllers in high-density areas.
- Reduce the consecutive hours spent by controllers in operational positions to 2, and the total hours per day in such positions to 6.
- Lengthen the interval between shift rotations.
- Detail qualified journeyman controllers to high-density facilities with critical manpower shortages.
- Develop a more mobile controller work force so that the needs of the system, rather than the preferences of controllers, will control assignment.
- Develop incentives that will attract the most talented controllers to the most difficult positions.
- Pay special rates for employment in facilities located in high-cost-of-living areas.
- Accelerate and improve training of developmental controllers.
- Seek legislation providing for the early retirement of controllers who have attained a certain age and cannot be retrained or reassigned to less arduous duty. Example: Retirement at age 50 after 20 years of ATC service with 50 percent of high-three average salary.
- Designate a single official immediately responsible to the FAA Administrator to handle all relationships with employee organizations at the national level.

FAA singled out a number of committee recommendations for immediate action, including detailing journeyman controllers to facilities with critical manpower shortages and providing developmental controllers with "upgrade" training. In addition, the agency established an Office of Labor Relations under the Associate Administrator for Manpower. As for the rest of the recommendations, FAA established nine so-called action groups to consider them and develop programs for their implementation. At year's end, it was expected that FAA would propose legislation on controller retirement.

In a related development, a task force appointed by the Administrator prior to the formation of the Corson Committee had developed by year's end a new and more accurate method of projecting air traffic controller staffing requirements—a need recognized by the Corson report.

In the area of controller health, a new program assigning a medical staff to each of the 20 ARTCC's in the contiguous United States had placed such staffs, by year's end, in the centers at Chicago and Denver. This program

will result in better medical care for the controller population; in particular, it will make possible much closer monitoring of controllers for initial symptoms of job-related stress.

Stress of this kind was an alleged factor during the reporting period in what was perhaps the most serious crisis ever to develop within the ranks of the air traffic controller work force. Between March 25 and April 10, 1970, some 3,000 journeyman en route controllers (only a sprinkling of terminal controllers were involved) belonging to the Professional Air Traffic Controllers Organization (PATCO) went on strike, some staying off the job a day or two, others for the entire 17-day period. Disruption of airline schedules resulted, marked by flight cancellations, delays, rescheduling, and rerouting.

The reasons for the strike (or sick-out, as it was popularly called) were various and complex. The reason most frequently repeated by PATCO officials was that many controllers were fatigued and were therefore "medically entitled to a period of respite for the preservation of their own health." But whatever its underlying causes, the episode itself was viewed by the Department of Transportation as a strike against the U.S. Government, and hence illegal. The Government obtained temporary restraining orders against PATCO; when PATCO failed to comply with these orders, a show-cause order was obtained against PATCO officers. During the hearing on the show-cause order, PATCO agreed to call off the strike.

## COAST GUARD MANAGEMENT IMPROVEMENT

Financial Management. During FY 1970, a Coast Guard management committee continued a comprehensive review of Coast Guard financial and workload management policies, procedures, and practices, to further the adoption of responsibility-centered, cost-based operating budgets for Coast Guard operating units and programs. A single common allotment within the Coast Guard's Operating Expense appropriation was established for use, effective 1 July 1970, to fund the ordinary normal and continuing "operating and maintenance" costs of each operating unit. District Commanders were asked to develop operating costs targets under the specified common allotment for each Coast Guard unit for comparison with actual costs incurred.

To provide an effective means of handling the increasing volume and complexity of Coast Guard financial management information and to update its accounting precedures to 1970 standards, a project to develop a completely revised accounting system was begun. The system will attempt to combine up-to-date accounting concepts and data processing techniques to utilize fully the potential of a new, more powerful computer being installed in the coming year. The new system is expected to increase accounting efficiency and promote more effective decision making.

LOGISTICS AND SUPPLY. Continued emphasis was directed toward achieving cost reductions and improved effectiveness in the procurement and inventory management functions of the Coast Guard. Efforts to decentralize re-order control responsibilities to stocking units of Coast Guard Supply Fund inventories were continued. At the present time, approximately 99 percent of the Operating and Maintenance Stores items carried in the Supply Fund are under decentralized re-order control. Excess materiel for Coast Guard use valued at $612,240 was obtained from the General Services Administration and the Department of Defense.

# CHAPTER XII

# CHALLENGES OF THE FUTURE

## RAIL PASSENGER LEGISLATION

The Department recognizes that of all known modes of transportation of passengers in large numbers, rail transportation offers the greatest potential. This is true simply because a train carries a large number of people with minimum use of space and equipment. Though ideally DOT might thus well elect to promote rail transport, the carriers have been systematically phasing out their passenger carrying programs because passenger traffic is unprofitable. DOT proposed as a practical way of preserving and extending railroad passenger service a quasi-public corporation to guarantee rail passenger transportation through 1974. The legislation provides that funding would come both from the railroads and from the Department. The Secretary would be authorized to guarantee loans to the railroads and the Rail Passenger Corporation. Passenger service would be provided by the Corporation which would contract with the railroads for services provided, including operating crews, equipment, and trackage rights. The Corporation is expected to emphasize innovations in ticket selling, reservations, and other forms of service.

## RAIL SAFETY LEGISLATION

The legislation proposed by the Department would enable the Secretary to prescribe and enforce rules, regulations, and performance standards for rail equipment, personnel, and operating procedures. Detailed inspections of railroads and their operations would be made by the States, with the work funded by the DOT. The proposed legislation would give the Secretary authority with respect to rail safety comparable to his authority and responsibility in the promotion of safety in other modes of transportation.

## URBAN TRANSPORTATION SYSTEMS

During 1970, a number of significant actions were taken by FHWA to improve all modes of urban transportation. A joint FHWA-UMTA program to demonstrate the value of joint highway-transit improvements in selected urban corridors was initiated. Planning contracts totaling nearly $2 million have been awarded to 11 cities. Much of the anticipated implementation work will probably be financed with regular ABC or TOPICS funds.

The 1968 Highway Act authorized a program of demonstration park-and-ride projects outside the central business districts of urban areas of 50,000 or more population. The first project was approved and is now about 30 percent complete. This project, in Woodbridge, New Jersey, will serve Newark and New York via the Pennsylvania Central Railroad and will provide service to Philadelphia and Washington, D.C., via the high-speed Metroliner.

A feasibility study of bus rapid transit on I–95 south of Washington, D.C., was completed. As a result, buses now have exclusive use of a 4.5-mile section of reversible lanes during the morning peak period. A temporary bus roadway from the end of the reversible lanes to the Potomac River is under construction. Buses now experience a 30 percent increase in riders as a result of a 15-minute time savings. A 30-minute time savings is expected upon completion of the temporary bus roadway.

A bus rapid transit study being conducted in Milwaukee, Wisconsin, has identified ways to significantly improve the local bus transit system, including plans for a bus roadway, a central distribution system, fringe parking, and bus terminal facilities. This 2-year study is being jointly funded by UMTA and the County of Milwaukee and is about 70 percent complete.

Urban Mass Transportation Assistance Act. The Department proposes to establish a long-term Federal obligation to assist urban areas to rationalize their own transportation systems, to acquire buses or other transportation hardware, or to make other major transportation investments that they would not otherwise be able to afford. The proposal is that a $10 billion program be authorized for grants for those purposes over 12-year period, with a $3.1 billion program to be authorized immediately. Adequate funds for planning and acquisition of suitable equipment and systems will enable cities to approach their massive transportation problems with some hope of being able to surmount them.

## BOATING SAFETY LEGISLATION

A rather serious but unspectacular waste of lives in the United States results from the numerous boating accidents each year. Both unsafe equipment and inadequately trained operators may be blamed for the problems; this proposed legislation would permit the Coast Guard to establish and enforce safety rules in both the manufacture of equipment and the operation of recreational boats. State safety programs would be encouraged and financed by grants-in-aid.

## TRADE SIMPLIFICATION LEGISLATION

International trade of great value to the United States is inhibited by a whole set of regulatory and commercial practices that have grown up over a long period of time. For example, one of the prohibitions is against the issuance of joint rates by two or more carriers of merchandise. Removal

of such barriers, and positive programs to simplify shipping documentation and remove other inhibiting factors should greatly simplify and facilitate international trade.

## PORT SAFETY LEGISLATION

This draft legislation extends the authority of the Coast Guard to regulate vessel traffic in inland waters, territorial seas, and port areas, and to regulate the handling and storage of dangerous cargoes, and to control water pollution.

## CHAPTER XIII

## CONCLUSION

At the end of its third full year of operation the Department of Transportation is proud of its achievements and dedicated to continuing improvements in transportation facilities and services offered to the public. Since practically all transportation facilities in the United States are privately owned and operated, the Department's innovations and improvements are achieved largely by offering subsidies, by imposing regulations, or by establishing demonstration programs; they cannot be accomplished by coercion.

The Department's efforts to improve safety in all forms of transportation have been noteworthy as have been its efforts to safeguard and enhance the natural environment in all transportation construction and operation. Soon new types and forms of transportation will emerge from the Department's research and development programs; probably the first entirely new form of transportation to become operational will be the tracked air cushion vehicle.

But the Department will continue to encourage improvements in old forms of transportation that are now available and the systems which employ the available forms. Perhaps most significant will be the development of a systems approach to transportation, a Department program just beginning to show results. That effort promises for the future a series of rational, economical transportation options that will contribute positively to the lives of most Americans. Through the Department's international programs, perhaps other countries will benefit as well from mutually profitable interchanges of knowledge.

All travellers will benefit from the improved facilities as will all who engage in commerce; all citizens may benefit from more economical transportation forms. Enhanced safety resulting from airways improvements, increased convenience resulting from urban mass transit development, the benefits of newly designed vehicles and systems—all will follow from the Department's efforts. And, as before, the Department's facilities and personnel will stand ready for service in national emergencies.

Great progress has been made, but the Department is not complacent; it knows the demand for transportation is almost overwhelming and increasing constantly; capacity must be doubled by the year 2000. The Department is responding to the challenge.

# APPENDIX

Department of Transportation

Annual Report Fiscal Year 1970

421-957 O - 71 - 9

## NOTES TO THE FINANCIAL STATEMENTS

1. Title 23, United States Code, Sections 125/320 allows payment for disaster assistance and construction of roadways over Federal Dams prior to appropriation. The unappropriated expenditures for Emergency Relief and Roadways over Dams are $65,729,517.

2. The fixed assets are stated at cost. Depreciation is taken on Equipment Depot fixed assets. Office furniture and equipment are utilized for administrative operations and are replaced as needed. Office furniture and equipment are not depreciated.

3. The Congress grants contracting authority to Federal Highway Administraion and National Highway Safety Bureau in advance of actual appropriations in order to permit them and the States to plan highway construction and State and Community Highway Safety Programs. This authority is apportioned to the States and the aforementioned Agencies record the obligations as the States are permitted to proceed. Funds are appropriated by the Congress annually to cover estimated needs for liquidating the obligations maturing within the current fiscal year.

4. The available balance of contracting authority shown in the Statements of Operations includes both obligated and unobligated balances of contracting authority plus unliquidated obligations for administration and research.

5 Cash returned to Treasury is derived from liquidations of prior year obligations in a lesser amount than originally obligated. The cash returned by National Highway Safety Bureau was from administration, $464,713 with a decrease of $464,790 in obligational authority. Landscape and Scenic Enhancement program under Federal Highway Administration returned $871,727 and program and obligational authority were decreased by that amount; restoration of administration increased program and obligational authority $3,060.

TABLE 1.—Worldwide hijacking incidents, 1930–1970.

Fiscal Year (FY) ending June 30.

Calendar Year (CY) ending December 31[1].

| 1930–1960 [2] | 61 | | 62 | | 63 | | 64 | | 65 | | 66 | | 67 | | 68 | | 69 | | 70 [1] | | Totals | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FY | CY | FY | CY | FY | CY | FY | CY | FY | CY | FY | CY | FY | CY | FY | CY | FY | CY | FY | CY | FY | CY |
| Incidents | 8 | 10 | 12 | 3 | 0 | 2 | 3 | 2 | 2 | 5 | 6 | 5 | 6 | 6 | 12 | 35 | 66 | 87 | 85 | 38 | 200 | 193 |
| U.S.-registered aircraft | 1 | 5 | 5 | 1 | 0 | 1 | 2 | 1 | 0 | 4 | 4 | 0 | 0 | 1 | 6 | 22 | 42 | 40 | 26 | 11 | 86 | 86 |
| Air carrier aircraft | 1 | 5 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 4 | 0 | 0 | 0 | 4 | 17 | 38 | 40 | 25 | 10 | 76 | 76 |
| Successful | 1 | 3 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 3 | 13 | 31 | 33 | 19 | 7 | 57 | 57 |
| Unsuccessful | 0 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3 | 0 | 0 | 0 | 1 | 4 | 7 | 7 | 6 | 3 | 19 | 19 |
| Gen. aviation aircraft | 0 | 0 | 1 | 1 | 0 | 1 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 5 | 4 | 0 | 1 | 1 | 10 | 10 |
| Successful | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 5 | 4 | 0 | 1 | 1 | 9 | 9 |
| Unsuccessful | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| Cuba diversions | 1 | 4 | 4 | 1 | 0 | 1 | 2 | 1 | 0 | 2 | 2 | 0 | 0 | 1 | 5 | 20 | 41 | 37 | 17 | 5 | 72 | 72 |
| Successful | 1 | 3 | 3 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 5 | 18 | 35 | 31 | 15 | 5 | 60 | 60 |
| Unsuccessful | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 0 | 2 | 6 | 6 | 2 | 0 | 12 | 12 |
| Foreign-registered acft | 7 | 5 | 7 | 2 | 0 | 1 | 1 | 1 | 2 | 1 | 2 | 5 | 6 | 5 | 6 | 13 | 24 | 47 | 59 | 27 | 114 | 107 |
| Air carrier aircraft | 7 | 4 | 6 | 2 | 0 | 1 | 1 | 1 | 2 | 1 | 2 | 5 | 5 | 4 | 5 | 12 | 24 | 46 | 55 | 24 | 107 | 100 |
| Successful | 4 | 3 | 3 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 2 | 4 | 4 | 5 | 11 | 21 | 36 | 39 | 16 | 77 | 73 |
| Unsuccessful | 3 | 1 | 3 | 2 | 0 | 0 | 0 | 1 | 2 | 1 | 2 | 3 | 1 | 0 | 0 | 1 | 3 | 10 | 16 | 8 | 30 | 27 |
| Gen. aviation aircraft | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 4 | 3 | 7 | 7 |
| Successful | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 4 | 3 | 6 | 6 |
| Unsuccessful | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| Cuba diversions | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 6 | 9 | 18 | 34 | 36 | 15 | 60 | 60 |
| Successful | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 6 | 8 | 15 | 26 | 28 | 13 | 49 | 49 |
| Unsuccessful | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 8 | 8 | 2 | 11 | 11 |

TABLE 1.—Worldwide hijacking incidents, 1930–1970—Continued.

Fiscal Year (FY) ending June 30.

Calendar Year (CY) ending December 31[1].

| 1930–1960 [2] | 61 | | 62 | | 63 | | 64 | | 65 | | 66 | | 67 | | 68 | | 69 | | 70 [1] | | Totals | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FY | CY | FY | CY | FY | CY | FY | CY | FY | CY | FY | CY | FY | CY | FY | CY | FY | CY | FY | CY | FY | CY |
| Number of foreign countries with aircraft involved in hijacking incidents | 3 | 4 | 6 | 2 | 0 | 1 | 1 | 1 | 1 | 1 | 2 | 3 | 6 | 4 | 3 | 7 | 10 | 18 | 29 | 20 | — | — |

[1] Calendar year figures for 1970 are shown only through June 30.

[2] There were 26 incidents during fiscal years 1930–60, and 33 during calendar years 1930–60; these totals are not included in the totals (200 and 193) shown in the table. All these incidents of 1930–60 involved foreign-registered aircraft except for a Pan American-Grace Airways aircraft successfully hijacked in Peru in 1930. Thus, the incidents involving foreign-registered aircraft during fiscal years 1930–60 numbered 25 (21 successful and 4 unsuccessful), and during calendar years 1930–60 numbered 32 (25 successful and 7 unsuccessful). Aircraft of 11 foreign countries were involved in the incidents of fiscal years 1930–60, and of 13 countries in the incidents of calendar years 1930–60.

TABLE 2.—Aircraft models certificated, fiscal year 1970.

| Category | Make | Model | Make | Model |
|---|---|---|---|---|
| BUSINESS and GENERAL (Except Helicopters) | Aero Commander | 402A | Cessna | 402B |
| | Beagle | B.121 Series 3 | | 414 |
| | Beech | B19, M19A | | 421B |
| | | C23 | Consolidated | Lake LA–4–200 |
| | | A24, A24R | Helio | HST—550A |
| | | F33, F33A, F33C | McKinnon | G–21E |
| | | V35B | | –21G |
| | | A36 | Mitsubishi | MU–2B–30 |
| | | E55, E55A | Murrayair | MA–1 |
| | | A56TC | Piper | PA–31P |
| | | 58 | | –39 |
| | | A60 | Reims Aviation S.A. | Cessna F150K |
| | | 100 | | FA150K |
| | Bellanca | 17–30A | | FR172G |
| | | –31A | | F337E |
| | | –31ATC | | FT337E |
| | Burns | BA–42 | Swearingen | SA–226TC |
| | Cessna | 150L, A150L | Thurston | TSC–1A Teal |
| | | R172G (USAF T–41D), 172L | Windecker | AC–7 |
| | | 177B | | |
| | | 182N | | |
| | | 188A, A188A | | |
| | | P206E, TP206E, U206E, TU206E | | |
| | | 210K, T210K | | |
| | | 310Q, T310Q | | |
| | | 337E, T337E | | |
| | | 401B | | |

TABLE 2.—Aircraft models certificated, fiscal year 1970—Continued.

| Category | Make | Model | Make | Model |
|---|---|---|---|---|
| TRANSPORT | Boeing | 727–17 | Lockheed | 382F |
| | | –77C | Nihon | YS–11A–500 |
| | | –1AO | | –600 |
| | | –225 | North American | NA–265–70 |
| | | –227 | | |
| | | –247 | | |
| | | –254 | | |
| | | –2B6 | | |
| | | –2B7 | | |
| | | 737–2B2 | | |
| | | 747–121 | | |
| | | –122 | | |
| | | –123 | | |
| | | –124 | | |
| | | –128 | | |
| | | –130 | | |
| | | –131 | | |
| | | –136 | | |
| | | –143 | | |
| | | –146 | | |
| | | –151 | | |
| | British Aircraft | BAC One-Eleven 200 | | |
| | | 201/Z/AC | | |
| | Dassault/Sud | Fan Jet Falcon Series C | | |
| | | Series E | | |
| | | Series F | | |
| | Fokker | F. 27 Mark 500 | | |
| | Gates Learjet | 24C, 24D | | |
| | | 25A | | |

TABLE 2.—Aircraft models certificated, fiscal year 1970—Continued.

| Category | Make | Model | Make | Model |
|---|---|---|---|---|
| AIRSHIP | Goodyear | GZ–20 | | |
| BALLOON | Raven | S–40A | | |
| GLIDER | Flug-und Fahrzeugwerke AG | Diamant 16.5 | Schweizer | SGS–1–31 |
| GYROPLANE | Avian | 2/180 | McCulloch | J–2 |
| HELICOPTER | Hughes | 269C | Sikorsky | S-64E |

TABLE 3.—Federal Aviation Administration certification statistics.

[*Airman certificates held in 1968 and 1969 (as of December 31)*]

| *Category* | *Dec. 31, 1969* | *Dec. 31, 1968* | *Percent change* |
|---|---|---|---|
| Total pilots | 720,028 | 691,695 | 4.1 |
| Key categories: | | | |
| Student pilots | 203,520 | 209,406 | −2.8 |
| Private pilots | 299,491 | 281,728 | 6.3 |
| Commercial pilots | 176,585 | 164,458 | 7.4 |
| Airline transport pilots | 31,442 | 28,607 | 9.9 |
| Total nonpilot airmen | 269,775 | 250,151 | 7.8 |
| Key categories: | | | |
| Mechanics | 170,716 | 158,211 | 7.9 |
| Control tower operators | 19,851 | 18,610 | 6.7 |

(*Certification of aircraft and aircraft components, fiscal years 1969 and 1970*)

| | *Fiscal year 1970* | *Fiscal year 1969* |
|---|---|---|
| New aircraft models certificated | 101* | 125 |
| New aircraft engine models certificated | 34 | 54 |
| New propeller models certificated | 10 | 35 |
| Original airworthiness certificates, export certificates, and related approvals issued | 14,000 (approx.) | 18,000 (approx.) |

*For list of models, see table 2.

TABLE 4.—Accidents, fatalities, rates—U.S. general aviation.

| Calendar year | Accidents | | Fatalities | Aircraft hours flown (000) [1] | Aircraft miles flown (000) [1] | Accident rates | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Per 100.000 aircraft hours flown | | Per million aircraft miles flown | |
| | Total | Fatal | | | | Total | Fatal | Total | Fatal |
| 1959 | 4,576 | 450 | 823 | 12,903 | 1,716,019 | 35.3 | 3.49 | 2.66 | 0.262 |
| 1960 | 4,793 | 429 | 787 | 13,121 | 1,768,704 | 36.5 | 3.27 | 2.71 | 0.243 |
| 1961 | 4,625 | 426 | 761 | 13,602 | 1,857,946 | 34.0 | 3.13 | 2.49 | 0.229 |
| 1962 | 4,810 | 430 | 857 | 14,500 | 1,964,586 | 33.4 | 2.97 | 2.46 | 0.219 |
| 1963 | 4,690 | 482 | 893 | 15,106 | 2,048,574 | 31.0 | 3.19 | 2.29 | 0.235 |
| 1964 | 5,069 | 526 | 1,083 | 15,738 | 2,180,818 | 32.2 | 3.34 | 2.32 | 0.241 |
| 1965 | 5,196 | 538 | 1,029 | 16,733 | 2,562,380 | 31.1 | 3.22 | 2.03 | 0.210 |
| 1966 | 5,712 | 573 | 1,149 | 21,023 | 3,336,138 | 27.2 | 2.73 | 1.71 | 0.172 |
| 1967 | 6,115 | 603 | 1,228 | 22,153 | 3,439,964 | 27.6 | 2.72 | 1.78 | 0.175 |
| 1968 [3] | [2] 4,968 | 692 | 1,399 | 24,053 | 3,700,864 | 20.6 | 2.86 | 1.34 | 0.187 |
| 1969 (Prelim.) | 4,931 | 651 | 1,388 | 25,351 | 3,926,461 | 19.5 | 2.57 | 1.26 | 0.166 |

[1] Source: FAA.

[2] Commencing January 1, 1968, the definition of "substantial damage" was changed; therefore, fewer accidents were reported. Care should be used in comparing with similar data for prior year.

[3] Three suicide/sabotage accidents are included in all computations except rates.

Source: National Transportation Safety Board

TABLE 5.—Accidents, fatalities, fatality rates—U.S. certificated route air carriers: scheduled domestic and international passenger service.

| Calendar year | Accidents | | Fatalities | | | | Passengers carried | Passenger-miles flown | Passenger fatality rate per 100 million passenger-miles flown |
|---|---|---|---|---|---|---|---|---|---|
| | Total | Fatal | Passg. | Crew | Other | Total | | | |
| 1959 | 67 | 10 | 268 | 42 | 0 | 310 | 56,002,094 | 37,765,609,000 | 0.710 |
| 1960 | 67 | [1] 12 | 336 | 42 | 11 | 389 | 57,886,566 | 40,484,908,000 | 0.758 |
| 1961 | 58 | 5 | 124 | 11 | 1 | 136 | 58,411,977 | 41,701,560,000 | 0.298 |
| 1962 | 43 | 5 | 158 | 25 | 0 | 183 | 62,548,399 | 45,853,343,000 | 0.264 |
| 1963 | 49 | 5 | 121 | 24 | 0 | 145 | 71,437,828 | 52,703,333,000 | 0.230 |
| 1964 | 53 | 9 | 200 | 26 | 1 | 227 | 81,762,273 | 61,022,488,000 | 0.261 |
| 1965 | 63 | 7 | 226 | 27 | 0 | 253 | 94,662,314 | 71,796,399,000 | 0.315 |
| 1966 | 53 | 4 | 59 | 13 | 0 | 72 | 109,390,556 | 83,142,197,000 | 0.071 |
| 1967 | 51 | 8 | 226 | 24 | 5 | 255 | 132,088,038 | 103,381,996,000 | 0.219 |
| 1968 | 53 | [1] 13 | 305 | 34 | 6 | 345 | 150,162,701 | 119,612,578,000 | 0.255 |
| 1969 (Prelim.) | 49 | 8 | 132 | 17 | 3 | 152 | 160,500,000 | 131,200,000,000 | 0.101 |

[1] Includes two midair collisions, nonfatal to air carrier occupants.

NOTE: Passenger deaths occurring in sabotage accidents are included in the passenger fatality column, but excluded in the computation of passenger fatality rates: 29 in 1960; 37 in 1962; 41 in 1964.

Source: National Transportation Safety Board

TABLE 6.—Accidents, accident rates, and fatalities—U.S. supplemental air carriers (all operations).

| Calendar year | Number of accidents | | Fatalities | | | | Aircraft—miles flown | Accident rate per million aircraft-miles flown | |
|---|---|---|---|---|---|---|---|---|---|
| | Total | Fatal | Passg. | Crew | Others | Total | | Total accidents | Fatal accidents |
| 1959 | 8 | 1 | 1 | 2 | 0 | 3 | 42,817,000 | 0.186 | 0.023 |
| 1960 | 8 | [1] 4 | 93 | 11 | 2 | 106 | 52,324,000 | 0.152 | 0.057 |
| 1961 | 6 | 3 | 151 | 11 | 0 | 162 | 47,983,000 | 0.125 | 0.062 |
| 1962 | 7 | 1 | 0 | 3 | 0 | 3 | 53,270,000 | 0.131 | 0.019 |
| 1963 | 11 | 3 | 1 | 4 | 0 | 5 | [2] 50,692,000 | 0.217 | 0.059 |
| 1964 | 9 | 1 | 2 | 2 | 0 | 4 | [2] 50,838,000 | 0.177 | 0.020 |
| 1965 | 10 | 1 | 0 | 5 | 0 | 5 | [2] 62,651,000 | 0.160 | 0.016 |
| 1966 | 6 | 2 | 78 | 7 | 1 | 86 | [2] 84,911,000 | 0.071 | 0.024 |
| 1967 | 4 | 1 | 0 | 3 | 0 | 3 | [2] 96,071,000 | 0.042 | 0.010 |
| 1968 | 9 | 1 | 1 | 0 | 0 | 1 | [2] 113,540,000 | 0.079 | 0.009 |
| 1969 (Prelim.) | 2 | 0 | 0 | 0 | 0 | 0 | [2] 116,600,000 | 0.017 | 0.000 |

[1] Includes one midair collision, nonfatal to air carrier occupants, excluded in fatal accident rates.
[2] Nonrevenue-miles not reported.
Source: National Transportation Safety Board

TABLE 7.—Number of major air navigation facilities in civil-military common system at end of fiscal years 1969 and 1970. [1]

| Major Facility | Number | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | June 30, 1970 | | | | June 30, 1969 | | | |
| | FAA | Military | Non-Fed | Total | FAA | Military | Non-Fed | Total |
| Air route traffic control center (ARTCC) [2] | 27 | | | 27 | 27 | | | 27 |
| Air route surveillance radar (ARSR) | 68 | 22 | | 90 | 53 | 37 | | 90 |
| Remote communications air/ground site (RCAG) | 379 | | | 379 | 378 | | | 378 |
| VOR/VORTAC (all combinations) | 888 | 32 | 31 | 951 | 888 | 35 | 28 | 951 |
| Airport traffic control tower (ATCT) | 286 | 8 | 27 | 321 | 273 | 10 | 21 | 304 |
| Combined station/tower (CS/T) | 48 | | | 48 | 51 | | | 51 |
| Airport surveillance radar (ASR) | 88 | 37 | | 125 | 86 | 36 | | 122 |
| Military radar approach control facility (RAPCON or RATCC) | 31 | | | 31 | 31 | | | 31 |
| Precision approach radar (PAR) | 13 | 14 | | 27 | 16 | 12 | | 28 |
| Instrument landing system (ILS) [3] | 298 | 1 | 3 | 302 | 282 | | 2 | 284 |
| Approach light system with sequence flashing (ALS/SFL) | 282 | 7 | 1 | 290 | 274 | 4 | 1 | 279 |
| Flight service station (FSS) | 335 | | | 335 | 334 | | | 334 |
| International flight service station (IFSS) | 9 | | | 9 | 10 | | | 10 |

[1] Source: FAA Air Traffic Service Fact Book.

[2] Both fiscal 1969 and 1970 figures include two center/radar approach control facilities (CERAP's).

[3] Figures include partial ILS's.

TABLE 8.—Federal Aviation Administration statement of financial condition. (In thousands of dollars)

| Assets | June 30 1970 | June 30 1969 |
|---|---|---|
| Cash: | | |
| Funds in U.S. Treasury | $ 741,867 | $ 644,538 |
| Trust, deposit, and general funds | 26,133 | 25,686 |
| Allocations from other agencies | 3,080 | 3,524 |
| | $ 771,080 | $ 673,748 |
| Accounts receivable: | | |
| Federal agencies | $ 5,311 | $ 11,819 |
| Other | 6,543 | 4,452 |
| | 11,854 | 16,271 |
| Inventories: | | |
| Operating materiel and facilities equipment | $ 94,557 | $ 92,828 |
| Other inventories | 16,598 | 19,517 |
| | 111,155 | 112,345 |
| Fixed assets (net): | | |
| Real property | $ 517,409 | $ 485,682 |
| Equipment in-use | 698,284 | 621,247 |
| | $1,215,693 | $1,106,929 |
| Work-in-process | 222,542 | 234,451 |
| | 1,438,235 | 1,341,380 |
| Other: | | |
| Investment in supersonic transport | $ 601,268 | |
| Intangible assets | 1,017 | |
| Deferred charges | 6 | |
| | 602,291 | |
| Total assets | $2,934,615 | $2,143,744 |

| Liabilities and equity | June 30 1970 | June 30 1969 |
|---|---|---|
| Liabilities: | | |
| Accounts payable & accrued liabilities | $ 95,661 | $ 110,872 |
| Advances from other agencies | 6,432 | 6,635 |
| Funds held for others | 26,141 | 25,699 |
| Annual leave—employees | 67,754 | 55,133 |
| Assets on loan to agency | 8,928 | 18,000 |
| Deferred credits | 49,985 | 2,249 |
| Lease-purchase contracts | 5,293 | |
| Total liabilities | $ 260,194 | $ 218,588 |
| Equity: | | |
| Invested capital, 1 July | $1,925,156 | $1,987,772 |
| Change in invested capital | 749,265 | (62,616) |
| Invested capital, 30 June | 2,674,421 | 1,925,156 |

(Included in "Invested capital, 30 June" are following unexpended appropriations:

| | FY 1970 | FY 1969 |
|---|---|---|
| Unapportioned | $201,960,000 | $158,490,000 |
| Unallotted | 12,647,000 | 47,774,000 |
| Unobligated | 33,503,000 | 24,276,000 |
| Unliquidated | 522,006,000 | 439,324,000 |
| | $770,116,000 | $669,864,000) |
| Total liabilities and equity | $2,934,615 | $2,143,744 |

NOTE: The above statement includes financial data for the National Capital airports. It excludes the following contingent liabilities: (1) $53,096,000,000 in insurance in force and commitments to insure under the aviation war risk insurance program; (2) $95,545,000 payable to supersonic transport development program contractors in the event the SST program is terminated at the Government's convenience; (3) $502,311,000 in unadjudicated claims; (4) $54,789,000 in long-term contract commitments.

Although management responsibility for the Office of Supersonic Transport Development was transferred during fiscal year 1970 from FAA to the Office of the Secretary, the accounting records for the SST program are still maintained by FAA. This statement therefore includes (under "Other assets") the total investment in the SST program. Included in this total-investment figure is accrued interest in the amount of $49,626,000, recorded as a deferred credit spending recovery of the Government's investment through royalties on sales of production aircraft, engines, and parts.

The "Intangible assets" figure of $1,017,000 under "Other assets" represents the unamortized research and development costs of building the prototype mobile lounge at Dulles International Airport and the cost of a study of the feasibility of expanding the terminal building at Washington National Airport.

Inventories at FAA's centralized depot at Oklahoma City have been valued at standard prices; inventories at other locations have been valued at cost.

TABLE 9.—Federal Aviation Administration statement of financial resources by appropriation.
(In millions of dollars)

| | Fiscal year 1970 | | | Fiscal year 1969 | | |
|---|---|---|---|---|---|---|
| | Carryover of unobligated appropriations | Appropriations | Unobligated balance | Carryover of unobligated appropriations | Appropriations | Unobligated balance |
| Research & development | $ 0.6 | $ 41.3 | $ | $ 9.1 | 27.0 | $ 0.6 |
| Operations | | [1] 845.4 | [2] 1.3 | | [1] 705.0 | [2] 1.9 |
| Facilities & equipment | 103.6 | 224.0 | 167.0 | 99.1 | 120.0 | 103.6 |
| Operation & maintenance National Capital airports | | 10.2 | | | 9.1 | [2] 0.2 |
| Construction, National Capital airports | 5.7 | 1.9 | 6.4 | 6.3 | 0.7 | 5.7 |
| Grants-in-aid airports | 21.6 | 80.0 | 51.1 | 55.0 | 70.0 | 21.6 |
| Civil supersonic aircraft | 99.0 | 85.0 | 23.5 | 222.9 | [3] (30.1) | 99.0 |
| Total | $230.5 | $1,287.8 | [4] $249.3 | $392.4 | $901.7 | [4] $232.6 |
| Percent of available funds unobligated at 30 June | | | 16.4% | | | 18.0% |

[1] Excludes appropriation transfers to other agencies ($200,000, fiscal year 1970; $400,000, fiscal year 1969).
[2] Returned to Treasury Department (hence not available for carryover).
[3] Includes transfer of $100,000 to Office of the Secretary of Transportation.
[4] Excludes aviation war risk insurance retained earnings of $28,000 for fiscal year 1970 and $37,000 for fiscal year 1969.

TABLE 10.—Summary of merchant marine safety activities.

| Material Safety Activities | FY 1968 | FY 1969 | FY 1970 |
|---|---|---|---|
| Vessels certificated | 9,353 | 9,360 | 9,341 |
| Vessels issued original certificates | 580 | 764 | 337 |

Inspected Vessels

| Type | FY 1968 | FY 1969 | FY 1970 |
|---|---|---|---|
| Cargo and miscellaneous* | 2,192 | 2,170 | 2,104 |
| Tank ships* | 401 | 395 | 378 |
| Tank barges | 2,889 | 2,987 | 3,024 |
| Passenger (over 100 gross tons)* | 200 | 160 | 153 |
| Small passenger | 3,671 | 3,648 | 3,682 |
| Total | 9,353 | 9,360 | 9,341 |

*Vessels in these categories over 1,000 gross tons, exclusive of Great Lakes and Public vessels were 1,104 in 1968, 1,581 in 1969, and 1,391 in 1970.

| Marine personnel activities | FY 1969 | FY 1970 |
|---|---|---|
| Licenses issued | 18,111 | 18,451 |
| Merchant mariners' documents issued | 25,805 | 23,026 |
| Seamen discharged from voyage articles | 529,781 | 527,953 |
| Personnel investigations completed | 36,850 | 17,527 |
| Security checks for employment | 28,085 | 23,910 |

TABLE 11.—U.S. Coast Guard—financial statement

| | *Funds* [1] *available* | *Net total obligations* | *Unobligated balances* [2] |
|---|---|---|---|
| Appropriated Funds: | | | |
| Operating expenses | $415,846,111 | $415,846,111 | $ —0— |
| Reserve training | 27,350,152 | 27,350,152 | —0— |
| Retired pay | 58,701,360 | 58,701,360 | —0— |
| Acquisition, construction, and improvements | 97,590,672 | 65,797,958 | 31,792,714 |
| Research, Development, Test, and evaluation | 14,632,382 | 10,062,915 | 4,569,467 |
| Total Appropriated Funds | $614,120,677 | $577,758,496 | $ 36,362,181 |
| Reimbursements: | | | |
| Operating expenses | $ 9,253,547 | $ 9,033,491 | $ 220,056 |
| Acquisition, construction, and improvements | 4,203,388 | 1,332,047 | 2,871,341 |
| Research, development, test, and evaluation | 60,000 | 40,000 | 20,000 |
| Total reimbursements | $ 13,516,935 | $ 10,405,538 | $ 3,111,397 |
| Trust Fund: | | | |
| U.S. Coast Guard gift fund | 73,583 | 47,272 | 26,311 |
| Grand Total | $627,711,195 | 588,211,306 | 39,499,889 |

[1] Funds available include unobligated balances brought forward from prior year appropriations as follows:

| | |
|---|---|
| Acquisition, construction, and improvements: | |
| Appropriated funds | $29,890,672 |
| Reimbursements | 4,114,928 |
| Research, development, test, and evaluation | 132,382 |
| U.S. Coast Guard gift fund | 42,395 |

[2] Unobligated balance of $220,056 under "operating expense" appropriation represents accounts receivable for costs of repairs or replacement of Coast Guard property damaged by private parties, proper for credit to fiscal year appropriation current at time collections are realized, as authorized in 14 U.S.C. 642.

Unobligated balance of $34,664,055 under "acquisition, construction, and improvements" appropriation remains available for obligation in fiscal year 1971. These funds are programmed for obligation in fiscal yer 1971 for the following purposes:

| | *Coast Guard Projects* | *Dept. of Defense Projects* |
|---|---|---|
| For projects deferred in Fiscal Year 1970 to be subsequently accomplished | $17,011,000 | $1,612,000 |
| For completion of projects started in Fiscal Year 1970 and prior years | 14,781,714 | 1,259,341 |
| Total | $31,792,714 | $2,871,341 |

Unobligated balance of $4,589,467 under "research, development, test, and evaluation" appropriation remains available for obligation in Fiscal Year 1971.

| | *Total expenditures* | *Direct expenditures* | *Reimbursable expenditures* |
|---|---|---|---|
| Expenditures Incurred: | | | |
| Operating expenses | $420,565,156 | $411,451,577 | $ 9,113,579 |
| Reserve training | 27,067,954 | 27,067,954 | ---------- |
| Retired pay | 58,701,360 | 58,701,360 | ---------- |
| Acquisition, construction, and improvements | 88,546,672 | 81,068,776 | 7,477,896 |
| Research, development, test, and evaluation | 6,919,352 | 6,819,352 | 100,000 |
| Sub-Total | $601,800,494 | $585,109,019 | $ 16,691,475 |
| Trust Fund: | | | |
| U.S. Coast Guard gift fund | 47,664 | 47,664 | ---------- |
| Grand Total | $601,848,158 | $585,156,683 | $ 16,691,475 |

TABLE 12.—Railroad accidents and resulting casualties, years ended December 31, 1967, 1968, and 1969.

| | 1967 | 1968 | 1969 |
|---|---|---|---|
| Number of train accidents: | | | |
| Collisions | 1,522 | 1,727 | 1,810 |
| Derailments | 4,960 | 5,487 | 5,960 |
| Other | 812 | 814 | 773 |
| Total train accidents | 7,294 | 8,028 | 8,543 |
| Number of train accidents with casualties | 478 | 435 | 489 |
| Trespassers killed | 646 | 628 | 627 |
| Trespassers injured | 696 | 663 | 674 |
| Passengers killed in train accidents | 4 | 2 | 5 |
| Passengers injured in train accidents | 126 | 683 | 291 |
| Passengers killed in train-service accidents | 8 | 9 | 1 |
| Passengers injured in train-service accidents | 928 | 646 | 571 |
| Employees on duty killed | 166 | 146 | 178 |
| Employees on duty injured | 17,529 | 17,600 | 16,758 |
| All other persons killed | 1,659 | 1,574 | 1,488 |
| All other persons injured | 5,244 | 5,016 | 5,062 |
| Total number of persons killed | 2,483 | 2,359 | 2,299 |
| Total number of persons injured | 24,523 | 24,608 | 23,356 |
| Highway grade crossing accidents [2] | 3,955 | 3,835 | 3,792 |
| Persons killed | 1,633 | 1,547 | 1,492 |
| Persons injured | 3,847 | 3,807 | 3,691 |

[2] Included in totals.

TABLE 13.—Enforcement activities—Accident Reports Act.

| Activities | FY 1969 | FY 1970 |
|---|---|---|
| Number of regular inspections | 332 | 235 |
| Accident and casualty cases investigated | 34,542 | 29,577 |
| Infractions disclosed by regular inspection | 37 | 74 |
| Number of complaints investigated | 8 | 15 |
| Infractions disclosed by complaints investigated | 1 | 6 |
| Violation cases transmitted for prosecution [1] | 10 | 15 |

[1] Includes cases pending at close of preceding fiscal year.

TABLE 14.—Serious accidents investigated under the Accident Reports Act (45 U.S.C. 38–43), fiscal years 1966–70.

| Fiscal Year | Number of accidents investigated | | | | Persons | |
|---|---|---|---|---|---|---|
| | Collisions | Derailments | Other | Total | Killed | Injured |
| 1966 | 44 | 16 | ---- | 60 | 75 | 639 |
| 1967 | 34 | 20 | ---- | 54 | 35 | 534 |
| 1968 | 23 | 22 | ---- | 45 | 25 | 428 |
| 1969 | 35 | 22 | ---- | 57 | 34 | 874 |
| 1970 | 60 | 55 | 2 | 117 | 67 | 621 |

TABLE 15.—Accidents at highway grade crossings, years ended December 31, 1967, 1968, and 1969.

| Accidents and casualties | 1967 | | | 1968 | | | 1969 | | |
|---|---|---|---|---|---|---|---|---|---|
| | Number of accidents | Number of persons | | Number of accidents | Number of persons | | Number of accidents | Number of persons | |
| | | Killed | Injured | | Killed | Injured | | Killed | Injured |
| Total rail-highway grade crossing accidents and resulting casualties [1] | 3,932 | 1,632 | 3,812 | 3,816 | 1,546 | 3,774 | 3,774 | 1,490 | 3,669 |
| Accidents at highway grade crossings involving motor vehicles | 3,773 | 1,520 | 3,726 | 3,603 | 1,448 | 3,665 | 3,572 | 1,381 | 3,578 |
| Derailments of trains at highway grade crossings involving motor vehicles [1] | 64 | 28 | 63 | 53 | 20 | 49 | 61 | 28 | 49 |
| Miscellaneous other train accidents as a result of collision between trains and motor vehicles [2] | 266 | 105 | 116 | 228 | 101 | 135 | 243 | 107 | 108 |
| Railroad casualties: [2] | | | | | | | | | |
| Passengers | -------- | -------- | 24 | -------- | 1 | 26 | -------- | -------- | 1 |
| Employees on duty | -------- | 3 | 83 | -------- | 4 | 123 | -------- | 6 | 121 |
| Total | -------- | 3 | 107 | -------- | 5 | 149 | -------- | 6 | 122 |

[1] Excludes nontrain.
[2] Included in totals.
Source: Highway Grade Bulletin

TABLE 16.—Accidents and casualties caused by failure of some part or appurtenance of steam locomotives, locomotive units other that si am, and multiple-operated electric locomotive units, fiscal years 1965–69.

| Accidents and casualties | FY 1965 | FY 1966 | FY 1967 | FY 1968 | FY 1.39 | FY 1970 |
|---|---|---|---|---|---|---|
| Number of accidents | 87 | 65 | 121 | 128 | 78 | 66 |
| Percent increase or decrease from previous year | *14.5 | 25.3 | *86.0 | *5.8 | −39.1 | - 15.4 |
| Number of persons killed | 0 | 0 | 0 | 0 | 0 | 0 |
| Percent increase or decrease from previous year | 100 | 0 | 0 | 0 | 0 | 0 |
| Number of persons injured | 93 | 68 | 140 | 141 | 109 | 72 |
| Percent increase or decrease from previous year | 3.1 | 26.9 | *105.9 | *0.7 | −22.7 | −33.9 |

* Increase

TABLE 17.—Accidents and casualties resulting from failure of steam locomotives, tenders, locomotives other than steam, multiple-operated electric locomotive units, and their appurtenances, fiscal year 1970.

| Part or appurtenance which caused accident | Accidents | Killed | Injured |
|---|---|---|---|
| Air compressors | 0 | 0 | 0 |
| Air reservoirs, fittings, safety and check valves | 0 | 0 | 0 |
| Air hose coupling, train line [1] | 0 | 0 | 0 |
| Boiler: | | | |
| Explosions | 0 | 0 | 0 |
| Fuel explosion in firebox | 0 | 0 | 0 |
| Draft equipment—adjustment | 0 | 0 | 0 |
| Steam valves, piping and blowers [1] | 0 | 0 | 0 |
| Brakes and brake rigging [1] | 1 | 0 | 1 |
| Cabs: | | | |
| Doors and windows [1] | 10 | 0 | 10 |
| Seats [2] | 8 | 0 | 8 |
| Control equipment—mechanical, electrical, pneumatic, or electro-pneumatic [1] | 1 | 0 | 5 |
| Couplers, draft and drawgear | 0 | 0 | 0 |
| Electrical equipment: | | | |
| Armature journals and bearings | 0 | 0 | 0 |
| Energized electrical parts [2] | 5 | 0 | 5 |
| Insulation, short circuits, or electrical flashes [1] | 15 | 0 | 16 |
| Pantographs, trolleys or third rail shoes | 0 | 0 | 0 |
| Fans and shutters | 0 | 0 | 0 |
| Fires due to liquid fuel or debris [1] | 0 | 0 | 0 |
| Floors, steps, and passageways [1] | 11 | 0 | 11 |
| Handholds | 0 | 0 | 0 |
| Internal combustion engines and turbines: | | | |
| Crankcase or air-box explosions [1] | 1 | 0 | 2 |
| Exhaust and cooling systems [2] | 5 | 0 | 5 |
| Fuel injectors and connections | 0 | 0 | 0 |
| Unguarded moving parts [2] | 2 | 0 | 2 |
| Miscellaneous [2] | 7 | 0 | 7 |
| Total [1] | 66 | 0 | 72 |

[1] Decrease [2] Increase

TABLE 18.—Reports and inspections—steam locomotives, locomotive units other than steam, and multiple-operated electric locomotive units, fiscal years 1965–70.

| | FY 1965 | FY 1966 | FY 1967 | FY 1968 | FY 1969 | FY 1970 |
|---|---|---|---|---|---|---|
| Number of locomotives for which reports were filed | 34,072 | 34,048 | 33,916 | 33,475 | 33,158 | 33,043 |
| Number inspected | 76,044 | 95,840 | 107,932 | 103,703 | 104,281 | [1] 95,004 |
| Number found defective | 9,391 | 11,447 | 13,243 | 13,017 | 13,117 | [1] 11,988 |
| Percent of inspected found defective | 12.3 | 11.9 | 12.3 | 12.6 | 12.6 | [1] 12.6 |
| Number ordered out of service | 646 | 666 | 768 | 755 | 700 | [1] 672 |
| Number of defects found | 31,596 | 36,556 | 42,609 | 44,918 | 46,439 | [1] 44,616 |

[1] Based on estimated totals for the final quarter of the fiscal year.

TABLE 19.—Number of freight cars, passenger train cars, and locomotives inspected: and the number found with defective safety appliances each year for the past 10 years.

| Fiscal Year | Inspected [1] | Defective [2] | Percentage defective |
|---|---|---|---|
| 1961 | 1,670,968 | 80,828 | 4.84 |
| 1962 | 1,562,067 | 86,121 | 5.51 |
| 1963 | 1,405,624 | 83,221 | 5.92 |
| 1964 | 1,506,729 | 96,099 | 6.37 |
| 1965 | 1,495,890 | 102,707 | 6.87 |
| 1966 | 1,646,299 | 111,096 | 6.74 |
| 1967 | 1,673,738 | 113,642 | 6.78 |
| 1968 | 1,307,863 | 92,579 | 7.10 |
| 1969 | 1,224,483 | 94,205 | 7.69 |
| 1970 | 998,837 | 88,110 | 8.82 |

[1] These figures include locomotives which were inspected for defective safety appliances during the year by inspectors of the Locomotive Branch.
[2] These figures include defective locomotives which are also included in Table 18.

TABLE 20.—Inspections of safety appliances for fiscal years 1966 thru 1970.

| | FY 1966 | FY 1967 | FY 1968 | FY 1969 | FY 1970 |
|---|---|---|---|---|---|
| Freight cars inspected | 1,500,855 | 1,520,162 | 1,176,166 | 1,094,149 | 883,164 |
| Percent defective | 7.1 | 7.2 | 7.5 | 8.3 | 9.6 |
| Passenger train cars inspected | 32,400 | 29,304 | 16,377 | 12,738 | 10,855 |
| Percent defective | 7.2 | 6.9 | 7.4 | 7.2 | 8.1 |
| Locomotives inspected [1] | 113,144 | 124,272 | 115,320 | 117,596 | 104,818 |
| Percent defective | 1.5 | 2.1 | 2.4 | 2.5 | 2.5 |
| Number of defects per 1,000 units inspected | 79.72 | 78.37 | 81.01 | 89.16 | 90.93 |

[1] These figures include locomotives which were inspected for defective safety appliances during the year by inspectors of the Locomotive Branch.

TABLE 21.—The classes of offices, and the cause of instances in which operators, train dispatchers, or other employees who by the use of the telephone or telegraph handled orders affecting the movement of trains remained on duty longer than the statutory periods, as indicated by the carrier's monthly reports for fiscal years 1966–70.

| Classes of Offices | FY 1966 | FY 1967 | FY 1968 | FY 1969 | FY 1970 |
|---|---|---|---|---|---|
| At continuously operated offices | 2,062 | 3,616 | 3,020 | 4,083 | 4,978 |
| At offices operated only during the daytime | 58 | 31 | 10 | 40 | 29 |
| Total | 2,120 | 3,647 | 3,030 | 4,123 | 5,007 |
| Causes | | | | | |
| Train accidents | 56 | 126 | 78 | 89 | 89 |
| Weather conditions, floods, fire, landslides | 314 | 642 | 112 | 358 | 278 |
| Delayed trains, and held to handle train orders | 55 | 26 | 6 | 20 | 91 |
| Misunderstanding of instructions or arrangements | 56 | 103 | 132 | 85 | 105 |
| Station or clerical work | 4 | 3 | 11 | 1 | 3 |
| Sickness, death, or personal injury | 1,054 | 1,948 | 1,764 | 2,535 | 2,900 |
| Relief operator arrived late | 85 | 112 | 158 | 261 | 450 |
| Labor shortage | 168 | 600 | 716 | 710 | 1,044 |
| Miscellaneous | 328 | 87 | 53 | 64 | 47 |
| Total | 2,120 | 3,647 | 3,030 | 4,123 | 5,007 |

TABLE 22.—The cause of excess service involving train and engine employees subject to the 16-hour provision of the law, for fiscal years 1966 thru 1970.

| Cause | FY 1966 | FY 1967 | FY 1968 | FY 1969 | FY 1970 |
|---|---|---|---|---|---|
| On duty longer than 16 consecutive hours | | | | | |
| Collisions and derailments | 144 | 117 | 134 | 139 | 140 |
| Weather conditions, track defects, floods, obstructions | 557 | 251 | 108 | 278 | 312 |
| Congestion of traffic | 70 | 26 | 29 | 40 | 74 |
| Mechanical defects, engines and cars | 78 | 100 | 56 | 41 | 79 |
| Wrecking and relief service | 49 | 33 | 25 | 53 | 90 |
| Miscellaneous | 581 | 48 | 83 | 59 | 69 |
| Others | | | | | |
| On duty longer than 16 hours in the aggregate in a 24-hour period | 146 | 102 | 115 | 136 | 94 |
| Returned to duty without required 10 hours off duty | 15 | 4 | 2 | 14 | 0 |
| Returned to duty without required 8 hours off duty | 1 | 0 | 1 | 1 | 16 |
| Total | 1,641 | 681 | 553 | 761 | 874 |

NOTE: During the year, 448 counts involving violations of the Hours of Service Law (45 U.S.C. 61–64) were forwarded to the Chief Counsel for consideration.

TABLE 23.—Instances of excess service performed by railroad employees covered by the Hours of Service Act for the Fiscal Year 1970.

| Name of railroad | Train dispatchers, operators, and levermen | Train and engine service employees | | Total |
|---|---|---|---|---|
| | On duty more than 9 or 13 hours | On duty more than 16 hours | Returned to duty without required time off duty | |
| Akron, Canton & Youngstown | 5 | 0 | 0 | 5 |
| Alabama, Tennessee & Northern | 8 | 5 | 0 | 13 |
| Atchison, Topeka & Santa Fe | 130 | 9 | 0 | 139 |
| Atlanta Joint Terminal | 9 | 0 | 0 | 9 |
| Atlanta & West Point Co | 9 | 0 | 0 | 9 |
| Atlanta Terminal Co | 5 | 0 | 0 | 5 |
| Baltimore & Ohio | 185 | 145 | 0 | 330 |
| Belfast & Moosehead Lake | 0 | 18 | 0 | 18 |
| Belt Railway Co. of Chicago | 8 | 0 | 0 | 8 |
| Bessemer & Lake Erie | 0 | 1 | 0 | 1 |
| Boston & Maine | 30 | 8 | 0 | 38 |
| Boston Terminal | 25 | 0 | 0 | 25 |
| Buffalo Creek | 6 | 0 | 0 | 6 |
| Burlington Northern | 149 | 4 | 0 | 153 |
| Butte, Anaconda & Pacific | 1 | 0 | 0 | 1 |
| Canadian Pacific | 0 | 5 | 0 | 5 |
| Central Railroad of New Jersey | 169 | 17 | 0 | 186 |
| Central Vermont Railway | 4 | 0 | 0 | 4 |
| Chesapeake & Ohio | 44 | 5 | 0 | 49 |
| Cheswick & Harmar | 0 | 8 | 0 | 8 |
| Chicago & Eastern Illinois | 53 | 0 | 0 | 53 |
| Chicago & Illinois Midland | 6 | 0 | 0 | 6 |
| Chicago & North Western | 91 | 1 | 0 | 92 |
| Chicago & Western Indiana | 63 | 0 | 0 | 63 |
| Chicago, Milwaukee/St. Paul & Pacific | 116 | 6 | 0 | 122 |
| Chicago, Rock Island & Pacific | 59 | 44 | 0 | 103 |
| Chicago Union Station | 7 | 0 | 0 | 7 |
| Chicago West Pullman & Southern | 0 | 4 | 0 | 4 |
| Clinchfield | 2 | 20 | 0 | 22 |
| Columbus & Greenville | 0 | 4 | 0 | 4 |
| Cuyahoga Valley | 0 | 1 | 0 | 1 |
| Davenport, Rock Island and North Western | 3 | 0 | 0 | 3 |
| Dayton Union | 2 | 0 | 0 | 2 |
| Delaware & Hudson | 32 | 46 | 0 | 78 |
| Denver & Rio Grande Western | 5 | 0 | 0 | 5 |
| Detroit, Toledo & Ironton | 41 | 0 | 0 | 41 |
| Detroit & Toledo Shore Line | 0 | 4 | 0 | 4 |
| Duluth, Missabe & Iron Range | 4 | 0 | 0 | 4 |
| Duluth, Winnipeg & Pacific | 2 | 0 | 0 | 2 |
| Elgin, Joliet & Eastern | 68 | 0 | 0 | 68 |
| Erie Lackawanna | 54 | 10 | 0 | 64 |
| Fairport, Painsville & Eastern | 0 | 1 | 0 | 1 |
| Fort Worth & Denver | 2 | 5 | 0 | 7 |
| Georgia Railroad | 4 | 0 | 0 | 4 |
| Grand Trunk Western | 106 | 17 | 0 | 123 |

TABLE 23.—Instances of excess service performed by railroad employees covered by the Hours of Service Act for the Fiscal Year 1970—Continued.

| Name of railroad | Train dispatchers, operators, and levermen | Train and engine service employees | | Total |
|---|---|---|---|---|
| | On duty more than 9 or 13 hours | On duty more than 16 hours | Returned to duty without required time off duty | |
| Gulf, Mobile & Ohio | 41 | 7 | 5 | 53 |
| Houston Belt & Terminal | 44 | 0 | 0 | 44 |
| Illinois Central | 193 | 0 | 0 | 193 |
| Illinois Terminal | 0 | 1 | 0 | 1 |
| Indianapolis Union | 0 | 1 | 0 | 1 |
| Kansas City Southern | 18 | 0 | 0 | 18 |
| Kentucky & Indiana Terminal | 1 | 0 | 0 | 1 |
| Lehigh Valley | 58 | 5 | 0 | 63 |
| Long Island | 2 | 3 | 0 | 5 |
| Los Angeles Union Passenger Terminal | 9 | 0 | 0 | 9 |
| Louisville & Nashville | 27 | 1 | 0 | 28 |
| Maine Central | 0 | 10 | 0 | 10 |
| Manufacturers | 0 | 1 | 0 | 1 |
| Missouri Kansas Texas | 13 | 8 | 0 | 21 |
| Missouri Pacific | 52 | 41 | 0 | 93 |
| Monon | 1 | 0 | 0 | 1 |
| Monongahela | 0 | 10 | 0 | 10 |
| New Orleans Union Passenger Terminal | 11 | 0 | 0 | 11 |
| New York & Long Branch | 12 | 0 | 0 | 2 |
| Norfolk & Western | 400 | 22 | 0 | 422 |
| Norfolk Southern | 2 | 4 | 0 | 6 |
| Northwestern Pacific | 1 | 6 | 0 | 7 |
| Pacific & Arctic Ry Navigation | 2 | 24 | 0 | 26 |
| Penn Central Transportation Co | 1,689 | 223 | 0 | 1,912 |
| Pittsburgh & Lake Erie | 10 | 0 | 0 | 10 |
| Port Authority Trans Hudson | 534 | 0 | 0 | 534 |
| Portland Terminal (Maine) | 11 | 0 | 0 | 11 |
| Portland Terminal (Oregon) | 14 | 0 | 0 | 14 |
| Reading Company | 22 | 3 | 0 | 25 |
| Richmond, Fredericksburgh & Potomac | 22 | 0 | 0 | 22 |
| River Terminal | 2 | 0 | 0 | 2 |
| St. Louis San Francisco | 25 | 22 | 1 | 48 |
| St. Louis Southwestern | 0 | 6 | 8 | 14 |
| St. Paul Union Depot | 7 | 0 | 0 | 7 |
| Seaboard Coast Line | 1 | 19 | 0 | 20 |
| Soo Line Railroad | 18 | 6 | 0 | 24 |
| South Buffalo | 0 | 6 | 0 | 6 |
| Southern Pacific | 80 | 8 | 2 | 90 |
| Southern | 20 | 6 | 0 | 26 |
| Staten Island Rapid Transit | 16 | 8 | 0 | 24 |
| Texas & Pacific | 75 | 16 | 0 | 91 |
| Toledo, Peoria & Western | 21 | 0 | 0 | 21 |
| Toledo Terminal | 13 | 0 | 0 | 13 |
| Union Depot | 17 | 0 | 0 | 17 |
| Union Pacific | 10 | 1 | 0 | 11 |
| Union Ry Co. of Pittsburgh | 0 | 2 | 0 | 2 |
| Wichita Union Terminal | 6 | 0 | 0 | 6 |

TABLE 24.—Applications; block signal.

| Period | Number | Pending at beginning of year | Acted upon | Pending at close of year |
|---|---|---|---|---|
| Year 1966 | 213 | 72 | 202 | 83 |
| Year 1967 | 172 | 83 | 222 | 33 |
| Year 1968 | 197 | 33 | 162 | 68 |
| Year 1969 | 183 | 68 | 185 | 66 |
| Year 1970 | 164 | 66 | 194 | 36 |
| **Rules, Standards, and Instructions** | | | | |
| Year 1966 | 59 | 4 | 52 | 11 |
| Year 1967 | 53 | 11 | 59 | 5 |
| Year 1968 | 43 | 5 | 36 | 12 |
| Year 1969 | 48 | 12 | 47 | 13 |
| Year 1970 | 51 | 13 | 53 | 11 |

During the year inspections were made as follows:

| | Number of inspections | Signals | Switches | Other appliances | Devices on locomotives | Record of tests |
|---|---|---|---|---|---|---|
| Automatic block signal | 726 | 6,629 | 5,381 | 1,482 | ---------- | 17,913 |
| Interlockings | 1,456 | 9,390 | 5,764 | 8,624 | ---------- | 25,048 |
| Traffic control | 1,152 | 9,029 | 5,902 | 7,843 | ---------- | 38,128 |
| Automatic train stop | 992 | ---------- | ---------- | 3,583 | 8,052 | 14,710 |
| Automatic train control | 180 | ---------- | ---------- | 299 | 1,723 | 4,452 |
| Automatic cab signal | 411 | ---------- | ---------- | 680 | 1,865 | 7,428 |
| Total | 4,917 | 25,048 | 17,047 | 22,511 | 11,640 | 107,659 |

TABLE 25.—Motor vehicle deaths: number and percent change, 1961–1970.

| Year | Deaths | Annual percent change | Average annual percent change | Deaths per 100 million vehicle miles |
|---|---|---|---|---|
| 1961 | 38,091 | −0.1 | | 5.16 |
| 1962 | 40,804 | 7.1 | | 5.32 |
| 1963 | 43,564 | 6.8 | | 5.41 |
| 1964 | 47,700 | 9.5 | 6.8 | 5.63 |
| 1965 | 49,163 | 3.1 | | 5.54 |
| 1966 | 53,041 | 7.9 | | 5.70 |
| 1967 | 52,924 | −0.2 | | 5.50 |
| 1968* | 55,200 | 4.3 | 1.2 | 5.43 |
| 1969** | 56,400 | 2.2 | | 5.32 |
| 1970*** | 55,300 | −1.95 | | 4.93 |

* PRELIMINARY
** ESTIMATED
*** PROJECTED
SOURCE: Deaths: 1961–1967, National Center for Health Statistics, Department of Health, Education, and Welfare.
1968–1969, National Safety Council.
Vehicle Mileage: Bureau of Public Roads.

TABLE 26.—Federal Highway Administration summary statement of operations July 1969 through June 1970.

APPROPRIATIONS

| *For Contracting Authority* | | *For Working Capital* | |
|---|---|---|---|
| New | $ 5,647,369,096 | New | $ 4,519,587,453 |
| From last year | 10,850,860,601 | From last year | 86,364,096 |
| Reimbursable earnings | 12,155,891 | Reimbursable collections | 15,696,705 |
| Available | $16,510,385,588 | Available | $ 4,621,648,254 |

OPERATING EXPENSES

| | *Payments* | *Change in Accruals* |
|---|---|---|
| Bureau of Public Roads | $4,458,783,829 | $− 81,947,388 |
| Bureau of Motor Carrier Safety | 2,392,465 | + 90,473 |
| Total | $4,461,176,294 | $− 81,856,915 |
| Decrease in Accruals | − 81,856,915 | |
| | $4,379,319,379 | |

| DEDUCT | | DEDUCT | |
|---|---|---|---|
| Accrued expenses | $ 4,379,319,379 | Payments | $ 4,461,176,294 |
| Lapsing program authority | 1,277,080 | Increase-advance | 3,781,641 |
| Unobligated balance of administration | 3,436 | Decrease-unpaid propect leave | + 191,689 |
| | | Disbursements in transit | + 121,041 |
| | | Proceeds-sale of property | + 43,177 |
| | | Unobligated cash returned to Treasury | 875,162 |
| Used | $ 4,380,599,895 | Used | $ 4,465,477,190 |

AVAILABLE BALANCES AT JUNE 30, 1970

| | | | |
|---|---|---|---|
| Contracting authority | $12,129,785,693 | In Treasury | $ 156,171,064 |

TABLE 27.—Federal Highway Administration summary balance sheet at June 30, 1970.

| | | | |
|---|---|---|---|
| **ASSETS** | | | |
| Current assets: | | | |
| Funds in U.S. Treasury | $2,678,459,173 | | |
| Less unappropriated receipts | −2,522,288,111 | | |
| Available fund balance with Treasury | | | $ 156,171,062 |
| Accounts receivable: | | | |
| Repayments to fund | 3,799,383 | | |
| Emergency relief [1] | 65,729,517 | | |
| Advances to travelers | 385,059 | | |
| Other advances | 7,873,421 | | |
| Materials and supplies | 91,989 | | |
| | | | $ 77,879,369 |
| Fixed assets: [2] | | | |
| Office furniture and equipment | $ 5,742,470 | | |
| Equipment—depreciable | 6,136,225 | | |
| Less allowance for depreciation | −3,605,356 | | |
| Equipment work-in-process | 12,657 | | |
| Land | 1,030,662 | | |
| Buildings and structures | 17,564,421 | | |
| | | | $ 26,881,079 |
| Contracting authority [3] | | | 12,559,848,932 |
| Total assets | | | $12,820,780,442 |
| **LIABILITIES AND U.S. GOVERNMENT INVESTMENTS** | | | |
| Current liabilities: | | | |
| Disbursements in transit | $ 186,232 | | |
| Accounts payable and accrued liabilities for States, completed work | 651,271,957 | | |
| Accrued liabilities—other | 12,563,491 | | |
| | | | $ 664,021,680 |
| Accrued annual leave of employees | | | 7,022,633 |
| U.S. Government investments: | | | |
| Unobligated contracting authority—Bureau of Public Roads | $ 5,179,445,175 | | |
| Undelivered orders and contracts— | | | |
| Bureau of Public Roads | $ 6,950,315,190 | | |
| Bureau of Motor Carrier Safety | 25,327 | 6,950,340,517 | |
| Invested capital— | | | |
| Bureau of Public Roads | 20,115,075 | | |
| Bureau of Motor Carrier Safety | −117,951 | 19,997,124 | 12,149,782,816 |
| Retained earnings | | | −46,687 |
| Total liabilities and U.S. Government investments | | | $12,820,780,442 |

TABLE 28.—Federal Highway Administration, Office of the Administrator—Salaries and Expenses statement of operations July 1969 through June 1970.

APPROPRIATIONS

| *For obligational authority* | | *For working capital* | |
|---|---|---|---|
| New and available | $ 15,758,795 | New and available | $ 15,698,152 |

OPERATING EXPENSES

| | *Payments* | *Change in Accruals* |
|---|---|---|
| Salaries and expenses | $ 15,277,381 | —0— |

| DEDUCT | | DEDUCT | |
|---|---|---|---|
| Accrued expenses | $ 15,277,381 | Payments | $ 15,277,381 |
| Reduction of general fund authority | 740 | Disbursements in transit | + 994 |
| Reduction of transfer authority | 60,643 | Increase in advances | 46,121 |
| | | Reduction of funds | 740 |
| | | Net increase in receivables | 374,904 |
| Used | $ 15,338,764 | Used | $ 15,698,152 |

AVAILABLE BALANCES AT JUNE 30, 1970

| | | | |
|---|---|---|---|
| Contracting authority [1] | $ 420,031 | In Treasury | —0— |

TABLE 29.—Federal Highway Administration, Office of the Administrator—Salaries and Expenses—balance sheet June 30, 1970.

ASSETS

| | | |
|---|---|---|
| Current assets: | | |
| Accounts receivable— | | |
| Advances to travelers | $ 46,121 | |
| Other advances | 3,579,672 | |
| | | $ 3,625,793 |
| Fexed assets: [2] | | |
| Office furniture and equipment | | 48,416 |
| Total assets | | $ 3,674,209 |

LIABILITIES AND U.S. GOVERNMENT INVESTMENTS

| | | |
|---|---|---|
| Current liabilities: | | |
| Disbursements in transit | $ 994 | |
| Accounts payable and other accrued liabilities | 3,204,768 | |
| | | $ 3,205,762 |
| Accrued annual leave of employees | | 1,532,233 |
| U.S. Government investments: | | |
| Undelivered orders and contracts | | 420,031 |
| Invested capital | | −1,483,817 |
| Total liabilities and U.S. Government investments | | $ 3,674,209 |

TABLE 30.—Federal Highway Administration, Office of the Administrator—Salaries and Expenses U.S. Government investment July 1969 through June 1970.

| | | |
|---|---|---|
| U.S. Government investment at July 1, 1969 | | —0— |
| Increases: | | |
| Contracting authority | $ 15,698,152 | |
| Increase in fixed assets | 48,416 | |
| Total increases | | $ 15,746,568 |
| Decreases: | | |
| Salaries and expenses | $ 15,277,381 | |
| Leave reserve earned—not used | 1,532,234 | |
| Reduction of funds | 740 | |
| Total decreases | | 16,810,355 |
| U.S. Government investment at June 30, 1970 | | $ −1,063,787 |

ANALYSIS OF U.S. GOVERNMENT INVESTMENT

| | |
|---|---|
| Invested capital | $ −1,483,817 |
| Obligated· | |
| Undelivered orders and contracts | 420,030 |
| U.S. Government investment at June 30, 1970 | $ −1,063,787 |

TABLE 31.—Federal Highway Administration, Office of the Administrator—Salaries and expenses statement of application of funds July 1969 through June 1970.

| | | |
|---|---|---|
| Funds provided by: | | |
| Appropriation | $ 1,832,282 | |
| Reimbursable income | 13,865,870 | |
| Reduction of appropriated funds | −740 | |
| Total funds provided | | $ 15,697,412 |
| Funds applied to: | | |
| Salaries and expenses | $ 15,277,381 | |
| Total funds applied | | 15,277,381 |
| Increase in working capital | | $ 420,031 |

TABLE 32.—Federal Highway Administration, Office of The Administrator—Salaries and Expenses change in working capital. (accounted for as follows)

| | *June 30, 1970* | *July 1, 1969* | *Increase* | *Decrease* |
|---|---|---|---|---|
| Current assets: | | | | |
| Advances to travelers | $ 46,121 | | $ 46,121 | |
| Other receivables | 3,579,672 | | 3,579,672 | |
| | | | $ 3,625,793 | |
| Current liabilities: | | | | |
| Disbursements in transit | $ 994 | | | $ 994 |
| Accounts payable and accrued liabilities | 3,204,768 | | | 3,204,768 |
| | | | | $ 3,205,762 |
| Sub-totals | | | $ 3,625,793 | $ 3,205,762 |
| Increase in working capital | | | | 420,031 |
| Totals | | | $ 3,625,793 | $ 3,625,793 |

TABLE 33.—Federal Highway Administration, Bureau of Public Roads
Summary statement of operations July 1969 through June 1970.

## APPROPRIATIONS

| *For Contracting Authority* | | *For Working Capital* | |
|---|---|---|---|
| New | $ 5,644,858,795 | New | $ 4,517,077,152 |
| From last year | 10,850,859,200 | From last years | 86,265,008 |
| Reimbursable earnings | 12,155,891 | Re mbursable collection | 15,696,705 |
| Available | $16,507,873,886 | Available | $ 4,619,038,865 |

## OPERATING EXPENSES

| | *Payments* | *Changes in Accruals* |
|---|---|---|
| Primary | $ 466,254,212 | $ +1,375,701 |
| Secondary | 290,137,301 | +2,351,566 |
| Urban | 247,948,715 | +4,134,144 |
| Highway planning research | 83,176,614 | −4,926,114 |
| Interstate | 3,172,528,571 | −92,389,879 |
| Public lands | 9,237,077 | −100,615 |
| Forest highways | 23,959,314 | −1,720,507 |
| Outdoor advertising | 1,857,958 | −116,571 |
| Junkyards | 543,276 | −166,861 |
| Landscaping and scenic enhancement | 10,412,190 | −2,059,678 |
| Emergency relief | 47,660,313 | +9,663,802 |
| Roadway over dams | 74,991 | −36,932 |
| Pentagon road network | 1,216 | 0 |
| Administration and research | 87,716,385 | +2,925,281 |
| Purchase of fixed assets | 598,440 | 0 |
| Reimbursable | 12,318,871 | −713,852 |
| Miscellaneous funds | 4,358,385 | −166,873 |
| Totals | $4,458,783,829 | $−81,947,388 |
| Decrease in accruals | −81,947,388 | |
| | $4,376,836,411 | |

| DEDUCT | | DEDUCT | |
|---|---|---|---|
| Accrued expenses | $ 4,376,836,441 | Payment | $ 4,458,783,829 |
| Lapsing program authority | 1,277,080 | Increases-advances | 3,782,079 |
| | | Increase-unpaid project levae | +191,689 |
| | | In transit | +120,996 |
| | | Proceeds-sale of property | +43,177 |
| | | Unobligated cash returned ot Treasury | 871,726 |
| Used | $ 4,378,113,521 | Used | $ 4,463,081,772 |

## AVAILABLE BALANCES AT JUNE 30, 1970

| | | | |
|---|---|---|---|
| Contracting authority [1] | $12,129,760,365 | In Treasury | $ 155,957,093 |

TABLE 34.—Federal Highway Administration, Bureau of Public Roads summary balance sheet at June 30, 1970.

## ASSETS

| | | | |
|---|---|---|---|
| Current assets: | | | |
| Funds in U.S. Treasury | $ 2,678,245,202 | | |
| Less unappropriated receipts | −2,522,288,111 | | |
| Available fund balance with Treasury | | | $ 155,957,091 |
| Accounts Receivable— | | | |
| Repayments to fund | $ 3,799,383 | | |
| Emergency relief [5] | 65,729,517 | | |
| Advances to travelers | 373,735 | | |
| Other advances | 7.873,231 | | |
| Materials and supplies | 91,989 | | |
| | | | 77,867,855 |
| Fixed assets: [2] | | | |
| Office furniture and equipment | $ 5,636,698 | | |
| Equipment—depreciable | 6,136,225 | | |
| Less allowance for depreciation | −3,605,356 | | |
| Equipment work-in-process | 12,657 | | |
| Land | 1,030,662 | | |
| Buildings and structures | 17,564,421 | | |
| | | | 26,775,307 |
| Contracting authority [3] | | | $12,559,848,932 |
| Total assets | | | $12,820,449,185 |

## LIABILITIES AND U.S. GOVERNMENT INVESTMENTS

| | | | |
|---|---|---|---|
| Current liabilities: | | | |
| Disbursements in transit | $ 186,160 | | |
| Accounts payable and accrued liabilities for States' completed work | 651,271,957 | | |
| Accrued liabilities—other | 12,363,405 | | |
| | | | $ 663,821,522 |
| Accrued annual leave of employees | | | 6,798,910 |
| U.S. Government investments: | | | |
| Unobligated contract authority— | | | |
| Federal-aid | $ 4,812,059,312 | | |
| Forest highways | 65,847,773 | | |
| Public lands | 39,636,558 | | |
| Highway beautification | 16,811,558 | | |
| Emergency relief and other | 236,243,328 | | |
| Miscellaneous funds | 8,846,646 | | |
| | | $ 5,179,445,175 | |
| Undelivered Orders and Contracts— | | | |
| Federal-aid | $ 6,809,280,662 | | |
| Forest highways | 18,291,214 | | |
| Public lands | 8,401,109 | | |
| Highway beautification | 37,624,406 | | |
| Emergency relief and other | 63,029,760 | | |
| Miscellaneous funds | 13,688,039 | | |
| | | $ 6,950,315,190 | |
| Invested capital | | 20,115,075 | |
| Retained earnings | | −46,687 | |
| | | | $12,149,828,753 |
| Total liabilities and U.S. Government investments | | | $12,820,449,185 |



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TABLE 35.—Federal Highway Administration Bureau of Public Roads highway trust fund—statement of operations; July 1969 through June 1970.

## APPROPRIATIONS

| *For Contracting Authority* | | *For Working Capital* | |
|---|---|---|---|
| New | $ 5,575,000,000 | New | $ 4,459,279,000 |
| From last year | 10,646,527,397 | From last year | 8,296,494 |
| Reimbursable earnings | 7,776,974 | Reimbursable collection | 11,317,406 |
| Available | $16,229,304,371 | Available | $ 4,478,892,900 |

## OPERATING EXPENSES

| | *Payments* | *Changes in Accruals* |
|---|---|---|
| Federal-aid: | | |
| Primary | $ 466,254,212 | $ +1,375,701 |
| Secondary | 290,137,301 | +2,351,566 |
| Urban | 247,948,715 | +4,134,144 |
| H.P.R. | 83,176,614 | −4,926,114 |
| Interstate | 3,172,528,571 | −92,389,879 |
| Administration | 69,779,461 | +2,906,966 |
| Purchase of fixed assets | 598,440 | 0 |
| | $4,330,423,314 | $ −86,547,616 |
| Emergency relief | 47,660,313 | +9,663,802 |
| Roadways over dams | 74,991 | −36,932 |
| Pentagon road network | 1,216 | 0 |
| Reimbursables | 7,939,954 | −713,852 |
| Totals | $4,386,099,788 | $ −77,634,598 |
| Decrease in accruals | −77,634,598 | |
| | $4,308,465,190 | |

| DEDUCT | | DEDUCT | |
|---|---|---|---|
| Accrued | $ 4,308,465,190 | Payments | $ 4,386,099,788 |
| Lapsing authority | | Increase-advances | 391,669 |
| Emergency relief | 646,151 | Advances right-of-way revolving fund | 3,078,856 |
| Used | $ 4,309,111,341 | Used | $ 4,389,570,313 |

## AVAILABLE BALANCES AT JUNE 30, 1970

| | | | |
|---|---|---|---|
| Contracting authority [1] | $11,920,193,030 | In Treasury | $ 89,322,587 |

TABLE 36.—Federal Highway Administration, Bureau of Public Roads highway trust fund—balance sheet at June 30, 1970.

| | | | |
|---|---|---|---|
| **ASSETS** | | | |
| Current assets: | | | |
| Funds in U.S. Treasury | $ 2,611,610,698 | | |
| Less unappropriated receipts | −2,522,288,111 | | |
| Available fund balance with Treasury | | | $ 89,322,587 |
| Accounts Receivable— | | | |
| Repayments receivable to fund | $ 3,530,626 | | |
| Emergency relief [1] | 65,729,517 | | |
| Advances to travelers | 321,326 | | |
| Other advances | 3,911,824 | | |
| | | | 73,493,293 |
| Fixed assets: [2] | | | |
| Office furniture and equipment | $ 5,542,912 | | |
| Land | 211,701 | | |
| Buildings and structures | 2,718,616 | | |
| | | | 8,473,229 |
| Contracting authority unfunded [3] | | | 12,704,598,932 |
| Total assets | | | $12,578,888,041 |
| **LIABILITIES AND U.S. GOVERNMENT INVESTMENT** | | | |
| Current liabilities: | | | |
| Disbursements in transit | | | $ 70,241 |
| Accounts payable and accrued liabilities for States' completed work | | | 641,390,747 |
| Accrued liabilities—other | | | 8,760,793 |
| | | | $ 650,221,781 |
| Accrued annual leave of employees | | | 5,061,397 |
| U.S. Government investment: | | | |
| Unobligated contracting authority— | | | |
| Federal-aid | $ 4,812,059,312 | | |
| Emergency relief and other | 236,243,328 | | |
| | | $ 5,048,302,640 | |
| Undelivered orders and contracts— | | | |
| Federal-aid | $ 6,808,860,631 | | |
| Emergency relief and other | 63,029,760 | | |
| | | 6,871,890,391 | |
| Invested capital | | 3,411,832 | |
| | | | 11,923,604,863 |
| Total liabilities and U.S. Government investment | | | $12,578,888,041 |

TABLE 37.—Federal Highway Administration, Bureau of Public Roads highway trust fund—U.S. Government investment; July 1969 through June 1970.

| | | |
|---|---|---|
| U.S. Government investment at July 1, 1969 | | $10,648,736,790 |
| Increases: | | |
| Contracting authority | $ 5,575,000,000 | |
| Reimbursable work | 7,776,974 | |
| | | 5,582,776,974 |
| Total increases | | $16,231,513,764 |
| Decreases: | | |
| Expenses | $ 4,307,866,750 | |
| Property dispositions | 3,612 | |
| Lapsing contract authority | 646,151 | |
| Leave Earned but not used* | −607,612 | |
| *(Decreased in 1970) | | |
| Total decreases | | 4,307,908,901 |
| U.S. Government investment at June 30, 1970 | | $11,923,604,863 |

ANALYSIS OF U.S. GOVERNMENT INVESTMENT

| | | |
|---|---|---|
| Invested capital | | $ 3,411,832 |
| Obligated: | | |
| Federal-aid | $ 6,805,781,775 | |
| Emergency relief | 62,980,793 | |
| Roadways over dams | 0 | |
| Pentagon road network | 48,966 | |
| ROW revolving fund | 3,078,856 | |
| | | $ 6,871,890,390 |
| Unobligated: | | |
| Federal-aid | $ 242,519,165 | |
| Emergency relief | 45,896,162 | |
| Roadways over dams | 908,088 | |
| Pentagon road network | 206,408 | |
| ROW revolving fund | 0 | |
| | | $ 289,529,823 |
| Reserved—not available | | 4,758,772,818 |
| U.S. Government investment at June 30, 1970 | | $11,923,604,863 |

TABLE 38.—Federal Highway Administration, Bureau of Public Roads highway trust fund—statement of application of funds; July 1969 through June 1970.

| | | |
|---|---|---|
| Funds provided by: | | |
| Appropriation | $ 4,459,279,000 | |
| Repayments to appropriation | 7,776,974 | |
| | | $ 4,467,055,974 |
| Funds applied to: | | |
| Federal-aid | $ 3,171,189,031 | |
| Administration and research | 72,686,427 | |
| Bridges over dams | 38,059 | |
| Pentagon road network | 1,216 | |
| Emergency relief | 57,324,115 | |
| Reimbursable work | 7,226,102 | |
| Total funds applied | | 4,308,464,950 |
| Increase in working capital | | $ 158,591,024 |

TABLE 39.—Federal Highway Administration, Bureau of Public Roads highway trust fund—change in working capital.
(accounted for as follows)

| | *June 30, 1970* | *July 1, 1969* | *Increase* | *Decrease* |
|---|---|---|---|---|
| Current assets: | | | | |
| Funds with U.S. Treasury | $ 89,322,587 | $ 8,296,494 | $ 81,026,093 | |
| Accounts receivable— | | | | |
| Repayments to fund | 3,530,626 | 7,856,326 | | $ 4,325,700 |
| Advances to travelers | 321,326 | 343,817 | | 22,491 |
| Other advances | 3,911,824 | 418,808 | 3,493,016 | |
| | | | $ 84,519,019 | $ 4,348,191 |
| Current liabilities: | | | | |
| Disbursement in transit | $ 70,151 | $ 17,920 | | $ 52,231 |
| Accounts payable and accrued liability for States' completed work | 641,390,748 | 723,303,166 | $ 81,912,418 | |
| Other accrued liabilities | 8,760,793 | 5,320,712 | | 3,440,081 |
| | | | $ 81,912,418 | $ 3,492,312 |
| Sub-totals | | | $166,431,527 | $ 7,840,503 |
| Increase in working capital | | | | 158,591,024 |
| Totals | | | $166,431,527 | $166,431,527 |

TABLE 40.—Federal Highway Administration miscellaneous funds summary statement of operations—July 1969 through June 1970.

## APPROPRIATIONS

| *For contracting authority* | | *For working capital* | |
|---|---|---|---|
| New | $ 4,000,000 | New | $ 4,000,000 |
| From last year | 22,413,843 | From last year | 23,231,735 |
| Available | $26,413,843 | Available | $ 27,231,735 |

## OPERATING EXPENSES

| | *Payments* | *Change in Accruals* |
|---|---|---|
| Inter-American highway | $ 3,927,244 | $ −225,738 |
| Consolidated working fund | 683 | |
| Maintenance of roads—Alaska | 231,786 | |
| Advances from State cooperating agencies | 18,550 | +862 |
| Chamizal memorial highway | 153,737 | |
| Alaskan assistance | 26,385 | +58,003 |
| Totals | $ 4,358,385 | $ 166,873 |
| Decrease in accruals | −166,873 | |
| | $4,191,512 | |

| DEDUCT | | DEDUCT | |
|---|---|---|---|
| Accrued expenses | $ 4,191,512 | Payments | $ 4,358,385 |
| Restoration—Maintenance Alaskan roads | +231,786 | Restoration—maintenance Alaskan roads | +231,786 |
| Advances from State Cooperating agencies | +72,455 | Advances from State cooperating agencies | +28,168 |
| Reimbursement—Alaskan assistance | +7,403 | Allocations to other agencies—Chamizal | 125,262 |
| Refund—Inter-American highway | +710 | Refund—Inter-American highway | +710 |
| | | Disbursements in transit | +114,414 |
| | | Increase in advances | 250 |
| | | Increase in payables | 5,248 |
| Used | $ 3,879,158 | Used | $ 4,114,067 |

## AVAILABLE BALANCES AT JUNE 30, 1970

| | | | |
|---|---|---|---|
| Contracting authority [1] | $ 22,534,685 | In Treasury | $ 23,117,668 |

TABLE 41.—Federal Highway Administration miscellaneous funds summary balance sheet at June 30, 1970.

| | | |
|---|---|---|
| **ASSETS** | | |
| Current assets: | | |
| Funds in U.S. Treasury | | $ 23,117,668 |
| Advances to travelers | 325 | |
| Accounts receivable—other | $ 381,692 | |
| | | 382,017 |
| Fixed assets: [2] | | |
| Office furniture and equipment | $ 40,908 | |
| Equipment—depreciable | 11,427 | |
| Less allowance for depreciation | −9,505 | |
| Land | 818,961 | |
| Buildings and structures | 14,842,546 | |
| | | 15,704,337 |
| Total assets | | $ 39,204,022 |
| **LIABILITIES AND U.S. GOVERNMENT INVESTMENTS** | | |
| Current liabilities: | | |
| Disbursements in transit | $ 114,414 | |
| Accounts payable and other liabilities | 13,178 | |
| Accrued liabilities for uncompleted work | 837,407 | |
| | | $ 964,999 |
| Accrued annual leave of employees | | 43,182 |
| U.S. Government investments: | | |
| Unobligated contracting authority | $ 8,846,646 | |
| Undelivered orders and contracts | 13,688,039 | |
| | | 22,534,685 |
| Invested capital | | 15,661,156 |
| Total liabilities and U.S. Government investments | | $ 39,204,022 |

TABLE 42.—Federal Highway Administration, Miscellaneous funds—U.S. Government investment July 1969 through June 1970.

| | | | |
|---|---|---|---|
| U.S. Government investment at July 1, 1969 | | | $ 38,054,176 |
| Increases: | | | |
| Contracting authority—Chamizal | $ 4,000,000 | | |
| Restoration—Alaskan roads | 231,786 | | |
| Acquisition of buildings—Inter-American highway | 20,129 | | |
| Refund—Inter-American highway | 710 | | |
| Unbilled receivable—Alaskan railroad | 7,403 | | |
| Increase in fixed assets | 3,441 | | |
| Advances from State cooperating agencies | 72,455 | | |
| Total increases | | | 4,335,924 |
| Decreases: | | | |
| Expenses | $ 4,191,512 | | |
| Leave reserve earned—not used | 2,747 | | |
| Total decreases | | | 4,194,259 |
| U.S. Government investment at June 30, 1970 | | | $ 38,195,841 |

ANALYSIS OF U.S. GOVERNMENT INVESTMENT

| | | | |
|---|---|---|---|
| Invested capital | | | $ 15,661,156 |
| Obligated: | | | |
| Undelivered orders and contracts— | | | |
| Inter-American highway | $ 6,732,742 | | |
| Consolidated working funds | 7,240 | | |
| Chamizal memorial highway | 2,900,000 | | |
| Alaskan assistance | 4,011,971 | | |
| Advances from State agencies | 36,086 | | |
| | | | 13,688,039 |
| Unobligated contracting authority: | | | |
| Inter-American highway | $ 2,702,994 | | |
| Access roads, Act of 1950 | 112,317 | | |
| Woodrow Wilson memorial bridge | 152,623 | | |
| Chamizal memorial highway | 4,944,359 | | |
| Alaskan assistance | 911,044 | | |
| Advances from State agencies | 23,309 | | |
| | | | 8,846 646 |
| U.S. Government investment at June 30, 1970 | | | $ 38,195,841 |

TABLE 43.—Federal Highway Administration, Miscellaneous funds—statement of application of funds July 1969 through June 1970.

| | | |
|---|---|---|
| Funds provided by: | | |
| Appropriation—Chamizal | $ 4,000,000 | |
| Restoration—maintenance of Alaskan roads | 231,786 | |
| Advances from State cooperating agencies | 72,455 | |
| Reimbursement—Alaskan assistance | 7,403 | |
| Refund Inter-American highway | 710 | |
| Total funds provided | | $ 4,312,354 |
| Funds applied to: | | |
| Inter-American highway | $ 3,701,506 | |
| Consolidated working fund | 683 | |
| Maintenance of roads—Alaska | 231,786 | |
| Advances from State cooperating agencies | 19,412 | |
| Chamizal memorial highway | 153,737 | |
| Alaskan assistance | 84,388 | |
| Total funds applied | | 4,191,512 |
| Increase in working capital | | $ 120,842 |

TABLE 44.—Federal Highway Administration, Miscellaneous funds—change in working capital.
(accounted for as follows)

| | *June 30, 1970* | *July 1, 1969* | *Increase* | *Decrease* |
|---|---|---|---|---|
| Current assets: | | | | |
| Funds with U.S. Treasury | $ 23,117,668 | $ 23,231,735 | | $ 114,067 |
| Accounts receivable | 381,692 | 204,726 | $ 176,966 | |
| Advances to travelers | 325 | 75 | 250 | |
| | | | $ 177,216 | $ 114,067 |
| Current liabilities: | | | | |
| Accounts payable | $ 13,178 | $ 18,426 | $ 5,248 | |
| Accrued liabilities | 837,407 | 1,004,267 | 166,860 | |
| Disbursements not cleared by Treasury | 114,415 | | | $ 114,415 |
| | | | $ 172,108 | $ 114,415 |
| Sub totals | | | $ 349,324 | $ 228,482 |
| Increase in working capital | | | | 120,842 |
| Totals | | | $ 349,324 | $ 349,324 |

TABLE 45.—Federal Highway Administration Bureau of Public Roads forest highways program—statement of operations July 1969 through June 1970.

APPROPRIATIONS

| *For contracting authority* | | *For working capital* | |
|---|---|---|---|
| New | $ 33,000,000 | New | $ 25,000,000 |
| From last year | 74,627,288 | From last year | 1,177,151 |
| Reimbursable earnings | 4,378,917 | Reimbursable collections | 4,379,299 |
| Available | $ 112,006,205 | Available | $ 30,556,450 |

OPERATING EXPENSES

| | *Payments* | *Change in Accruals* |
|---|---|---|
| Administration | $ 1,249,494 | |
| Reimbursable | 4,378,917 | |
| Construction | 23,959,314 | $ −1,720,507 |
| Total | $ 29,587,725 | $ −1,720,507 |
| Decrease in accruals | −1,720,507 | |
| | $ 27,867,218 | |

| DEDUCT | | DEDUCT | |
|---|---|---|---|
| Accrued expenses | $ 27,867,218 | Payments | $ 29,587,725 |
| | | Decrease in advances | 548 |
| | | Disbursements in transit | +5,233 |
| | | Unpaid project leave | +191,689 |
| | | Proceeds from sale of personal property | +43,177 |
| Used | $ 27,867,218 | Used | $ 29,348,174 |

AVAILABLE BALANCES AT JUNE 30, 1970

| | | | |
|---|---|---|---|
| Contracting authority | $ 84,138,987 | In Treasury | $ 1,208,276 |

TABLE 46.—Federal Highway Administration, Bureau of Public Roads forest highways program—balance sheet at June 30, 1970.

| | | |
|---|---|---|
| **ASSETS** | | |
| Current assets: | | |
| Funds in U.S. Treasury | $ 1,208,275 | |
| Advances to travelers | 702 | |
| Repayments to funds | 268,757 | |
| Materials and supplies | 91,989 | |
| | | $ 1,569,723 |
| Fixed assets: | | |
| Equipment depreciable | $ 6,124,798 | |
| Less allowance for depreciation | −3,595,851 | |
| Equipment work-in-process | 12,657 | |
| Buildings and structures | 3,259 | |
| | | 2,544,863 |
| Contracting authority | | 85,950,000 |
| Total assets | | $ 90,064,586 |
| **LIABILITIES AND U.S. GOVERNMENT INVESTMENTS** | | |
| Current liabilities: | | |
| Accounts payable | $ 310,387 | |
| Accrued liabilities for uncompleted work | 2,978,360 | |
| | | $ 3,288,747 |
| Accrued annual leave of employees | | 49,147 |
| U.S. Government investments: | | |
| Unobligated contracting authority | $ 65,847,773 | |
| Undelivered orders and contracts | 18,291,214 | |
| | | 84,138,987 |
| Invested capital | $ 2,634,392 | |
| Retained earnings | −46,687 | |
| | | 2,587,705 |
| Total liabilities and U.S. Government investments | | $ 90,064,586 |

TABLE 47.—Federal Highway Administration, Bureau of Public Roads forest highways program—U.S. Government investment July 1969 through June 1970.

| | | |
|---|---|---|
| U.S. Government investment at July 1, 1969 | | $ 76,960,335 |
| Increases: | | |
| Contracting authority | $ 33,000,000 | |
| In fixed assets | 268,242 | |
| In materials and supplies | 3,506 | |
| Reimbursable earnings | 4,378,917 | |
| Total increases | | 37,650,665 |
| Decreases: | | |
| Expenses | $ 27,867,218 | |
| Leave reserve earned—not used | 17,090 | |
| Total decreases | | 27,884,308 |
| U.S. Government investment at June 30, 1970 | | $ 86,726,692 |

ANALYSIS OF U.S. GOVERNMENT INVESTMENT

| | |
|---|---|
| Invested capital and retained earnings | $ 2,587,705 |
| Obligated: | |
| Undelivered orders and contracts | 18,291,215 |
| Unobligated contracting authority | 65,847,772 |
| U.S. Government investment at June 30, 1970 | $ 86,726,692 |

TABLE 48.—Federal Highway Administration, Bureau of Public Roads forest highways program—statement of application of funds July 1969 through June 1970.

| | | |
|---|---|---|
| Funds provided by: | | |
| Appropriation | $ 25,000,000 | |
| Reimbursable earnings | 4,378,917 | |
| Total funds provided | | $ 29,378,917 |
| Funds applied to: | | |
| Administration | $ 1,249,494 | |
| Reimbursable programs | 4,378,917 | |
| Construction | 22,238,807 | |
| Total funds applied | | 27,867,218 |
| Increase in working capital | | $ 1,511,699 |

TABLE 49.—Federal Highway Administration, Bureau of Public Roads forest highways program—change in working capital. (accounted for as follows)

| | *June 30, 1970* | *July 1, 1969* | *Increase* | *Decrease* |
|---|---|---|---|---|
| Current assets: | | | | |
| Funds in U.S. Treasury | $ 1,208,275 | $ 1,177,151 | $ 31,124 | |
| Accounts receivable— | | | | |
| Advances to travelers | 702 | 1,250 | | $ 548 |
| Repayments to fund | 268,757 | 352,399 | | 83,642 |
| | | | $ 31,124 | $ 84,190 |
| Current liabilities: | | | | |
| Disbursements in transit | | $ 5,233 | $ 5,233 | |
| Accounts payable and accrued liabilities | $ 3,288,747 | 4,848,279 | 1,559,532 | |
| | | | $ 1,564,765 | |
| Sub totals | | | $ 1,595,889 | $ 84,190 |
| Increase in working capital | | | | 1,511,699 |
| Totals | | | $ 1,595,889 | $ 1,595,889 |

TABLE 50.—Federal Highway Administration Bureau of Public Roads public lands program—statement of operations July 1969 through June 1970.

APPROPRIATIONS

| *For Contracting Authority* | | *For working Capital* | |
|---|---|---|---|
| New | $ 16,000,000 | New | $ 7,000,000 |
| From last year | 41,543,358 | From last year | 4,974,631 |
| Available | $ 57,543,358 | Available | $ 11,974,631 |

OPERATING EXPENSES

| | *Payments* | *Change in Accruals* |
|---|---|---|
| Administration | $ 369,229 | |
| Construction | 9,237,077 | $ −100,615 |
| Total | $ 9,606,306 | −100,615 |
| Decrease in accruals | −100,615 | |
| | $ 9,505,691 | |

| DEDUCT | | DEDUCT | |
|---|---|---|---|
| Accrued expenses | $ 9,505,691 | Payments | $ 9,606,307 |
| | | Increase in advances | 150 |
| | | Decrease in liabilities | 10,017 |
| Used | $ 9,505,691 | Used | $ 9,616,474 |

AVAILABLE BALANCES AT JUNE 30, 1970

| | | | |
|---|---|---|---|
| Contracting authority | $ 48,037,667 | In Treasury | $ 2,358,157 |

TABLE 51.—Federal Highway Administration, Bureau of Public Roads public lands program—balance sheet at June 30, 1970.

ASSETS

| | | |
|---|---|---|
| Current assets: | | |
| Funds in U.S. Treasury | $ 2,358,157 | |
| Advances to travelers | 150 | |
| | | $ 2,358,307 |
| Contracting authority | | 46,300,000 |
| Total assets | | $ 48,658,307 |

LIABILITIES AND U.S. GOVERNMENT INVESTMENTS

| | | |
|---|---|---|
| Current liabilities: | | |
| Accrued liabilities for uncompleted work | | $ 620,640 |
| Accrued annual leave of employees | | 18,538 |
| U.S. Government investments: | | |
| Unobligated contracting authority | $ 39,636,558 | |
| Undelivered orders and contracts | 8,401,109 | |
| | | 48,037,667 |
| Invested capital | | −18,538 |
| Total liabilities and U.S. Government investments | | $ 48,658,307 |

TABLE 52.—Federal Highway Administration, Bureau of Public Roads public lands program—U.S. Government investment July 1969 through June 1970.

| | | |
|---|---|---|
| U.S. Government investment at July 1, 1969 | | $ 41,529,657 |
| Increases: | | |
| Contracting authority | | 16,000,000 |
| Decreases: | | |
| Expenses | $ 9,505,691 | |
| Leave reserve earned—not used | 4,837 | |
| Total decreases | | 9,510,528 |
| U.S. Government investment at June 30, 1970 | | $ 48,019,129 |

ANALYSIS OF U.S. GOVERNMENT INVESTMENT

| | |
|---|---|
| Invested capital | $ −18,538 |
| Obligated: | |
| Undelivered orders and contracts | 8,401,109 |
| Unobligated contracting authority | 39,636,558 |
| U.S. Government investment at June 30, 1970 | $ 48,019,129 |

TABLE 53.—Federal Highway Administration, Bureau of Public Roads public lands program—statement of application of funds July 1969 through June 1970.

| | | |
|---|---|---|
| Funds provided by: | | |
| Appropriation | | $ 7,000,000 |
| Total funds provided | | $ 7,000,000 |
| Funds applied to: | | |
| Administration | $ 369,229 | |
| Construction | 9,136,462 | |
| Total funds applied | | $ 9,505,691 |
| Decrease in working capital | | $ 2,505,691 |

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TABLE 54.—Federal Highway Administration, Bureau of Public Roads public lands program—change in working capital.
(accounted for as follows)

| | *June 30, 1970* | *July 1, 1969* | *Increase* | *Decrease* |
|---|---|---|---|---|
| Current assets: | | | | |
| Funds with U.S. Treasury | $ 2,358,157 | $ 4,974,631 | | $ 2,616,474 |
| Advances to travelers | 150 | | $ 150 | |
| | | | $ 150 | $ 2,616,474 |
| Current liabilities: | | | | |
| Accounts payable and accrued liability for States' completed work | $ 600,038 | $ 700,654 | $ 100,616 | |
| Other accrued liabilities | 20,601 | 30,618 | 10,017 | |
| | | | $ 110,633 | |
| Sub-totals | | | $ 110,783 | $ 2,616,474 |
| Decrease in working capital | | | 2,505,691 | |
| Totals | | | $ 2,616,474 | $ 2,616,474 |

TABLE 55.—Federal Highway Administration Bureau of Public Roads highway beautification program—statement of operations July 1969 through June 1970.

APPROPRIATIONS

| *For Contracting Authority* | | *For Working Capital* | |
|---|---|---|---|
| New | $ 1,100,000 | New | $ 6,100,000 |
| From last year | 65,747,314 | From last year | 48,584,997 |
| Available | $ 66,847,314 | Available | $ 54,684,997 |

OPERATING EXPENSES

| | *Payments* | *Change in Accruals* |
|---|---|---|
| Administration | $ 1,040,820 | $ +18,315 |
| Outdoor advertising | 1,857,958 | −116,571 |
| Junkyards | 543,276 | −166,861 |
| Landscaping and Scenic enhancement | 10,412,190 | −2,059,678 |
| Totals | $ 13,854,244 | $ −2,324,795 |
| Decrease in accruals | −2,324,795 | |
| | $ 11,529,449 | |

| DEDUCT | | DEDUCT | |
|---|---|---|---|
| Accrued expense | $ 11,529,449 | Payments | $ 13,854,244 |
| Lapsing program authority | 868,667 | Unobligated cash returned to Treasury | 871,726 |
| Supplemental payroll act | 13,233 | Supplemental payroll act | 13,233 |
| | | Restoration administration | +3,060 |
| | | Decrease-receivables | +33 |
| | | -advances | +1,162 |
| | | -disbursements in transit | +355 |
| Used | $ 12,411,349 | Used | $ 14,734,593 |

AVAILABLE BALANCES AT JUNE 30, 1970

| | | | |
|---|---|---|---|
| Contracting authority [4] | $ 54,435,965 | In Treasury | $ 39,950,404 |

TABLE 56.—Federal Highway Administration, Bureau of Public Roads highway beautification program—balance sheet at June 30, 1970.

| | | | |
|---|---|---|---|
| **ASSETS** | | | |
| Current assets: | | | |
| Funds in U.S. Treasury | | | $ 39,950,404 |
| Accounts receivable—other | | $ 43 | |
| Advances to travelers | | 5,111 | |
| | | | 5,154 |
| Fixed assets: [2] | | | |
| Office furniture and equipment | | | 4,462 |
| Contracting authority [3] | | | 20,000,000 |
| Total assets | | | $ 59,960,020 |
| **LIABILITIES AND U.S. GOVERNMENT INVESTMENTS** | | | |
| Current liabilities: | | | |
| Disbursements in transit | | $ 511 | |
| Accounts payable and other liabilities | | 74,279 | |
| Accrued liabilities for uncompleted work | | 5,444,803 | |
| | | | $ 5,519,593 |
| Accrued annual leave of employees | | | 94,413 |
| U.S. Government investments: | | | |
| Unobligated contracting authority | $ 16,811,558 | | |
| Undelivered orders and contracts | 37,624,4 | | |
| | | $ 54,435,964 | |
| Invested capital | | −89,950 | |
| | | | 54,346,014 |
| Total liabilities and U.S. Government investments | | | $ 59,960,020 |

TABLE 57.—Federal Highway Administration, Bureau of Public Roads highway beautification program—U.S. Government investment July 1969 through June 1970.

| | | |
|---|---|---|
| U.S. Government investment at July 1, 1969 | | $ 65,652,513 |
| Increases: | | |
| Appropriation | $ 1,100,000 | |
| Leave reserve earned—not used | 3,278 | |
| Restoration of contract authority—administration [5] | 3,060 | |
| Increase in fixed assets | 1,573 | |
| Total increases | | 1,107,911 |
| Decreases: | | |
| Expenses | $ 11,529,450 | |
| Unobligated cash returned to Treasury June 30, 1970 [5] | 871,727 | |
| Supplemental pay act—decrease | 13,233 | |
| Total decreases | | 12,414,410 |
| U.S. Government investment at June 30, 1970 | | $ 54,346,014 |

ANALYSIS OF U.S. GOVERNMENT INVESTMENT

| | | |
|---|---|---|
| Invested capital | | $ −89,951 |
| Unobligated: | | |
| Outdoor advertising | $ 157,773 | |
| Junkyards | 2,900,176 | |
| Landscaping and scenic enhancement | 13,753,609 | |
| | | 16,811,558 |
| Undelivered orders and contracts: | | |
| Outdoor advertising | $ 553,138 | |
| Junkyards | 3,885,746 | |
| Landscaping and scenic enhancement | 33,185,523 | |
| | | 37,624,407 |
| U.S. Government investment at Juue 30, 1970 | | $ 54,346.014 |

TABLE 58.—Federal Highway Administration Bureau of Public Roads highway beautification program—statement of application of funds July 1969 through June 1970.

| | | |
|---|---|---|
| Funds provided by: | | |
| Appropriation | $ 6,100,000 | |
| Restoration of administration authority | 3,060 | |
| Less unobligated cash returned to Treasury at June 30, 1970 | −871,727 | |
| Less decrease in supplemental pay act | −13,233 | |
| Total funds provided [5] | | $ 5,218,100 |
| Funds applied to: | | |
| Administration | $ 3,033 | |
| Outdoor advertising | 1,741,387 | |
| Junkyards | 376,416 | |
| Landscaping and scenic enhancement | 9,408,613 | |
| Total funds applied | | 11,529,449 |
| Decrease in working capital | | $ 6,311,349 |

TABLE 59.—Federal Highway Administration, Bureau of Public Roads highway beautification program — change in working capital.
(accounted for as follows)

| | *June 30, 1970* | *July 1, 1969* | *Increase* | *Decrease* |
|---|---|---|---|---|
| Current assets: | | | | |
| Funds with U.S. Treasury | $ 39,950,403 | $ 48,584,996 | | $ 8,634,593 |
| Accounts receivable | 43 | 77 | | 34 |
| Advances to travelers | 5,111 | 6,273 | | 1,162 |
| | | | | $ 8,635,789 |
| Current liabilities: | | | | |
| Disbursements in transit | $ 510 | $ 155 | | $ 355 |
| Accounts payable and accrued liabilities | 5,519,082 | 7,843,877 | 2,324,795 | |
| | | | $ 2,324,975 | $ 355 |
| Sub-totals | | | $ 2,324,795 | $ 8,636,144 |
| Decrease in working capital | | | 6,311,349 | |
| Totals | | | $ 8,636,144 | $ 8,636,144 |

TABLE 60.—Federal Highway Administration Bureau of Motor Carrier Safety statement of operations July 1969 through 1970.

## APPROPRIATIONS

| *For Obligational Authority* | | *For Working Capital* | |
|---|---|---|---|
| New | $ 2,510,301 | New | $ 2,510,301 |
| From last year | 1,401 | From last year | 99,088 |
| Available | $ 2,511,702 | Available | $ 2,609,389 |

## OPERATING EXPENSES

| | *Payments* | *Change in Accruals* |
|---|---|---|
| Administration | $ 2,381,802 | $ +90,473 |
| Purchase of fixed assets | 10,663 | |
| Total | $ 2,392,465 | |
| Increase in accruals | 90,473 | |
| | $ 2,482,938 | $ +90,473 |

| DEDUCT | | DEDUCT | |
|---|---|---|---|
| Accrued expenses | $ 2,482,938 | Payments | $ 2,392,465 |
| Unobligated balance of administration | 3,436 | Decrease in advances | +438 |
| | | Disbursements in transit | +45 |
| | | Unobligated cash returned to Treasury | 3,436 |
| Used | $ 2,486,374 | Used | $ 2,395,418 |

## AVAILABLE BALANCES AT JUNE 30, 1970

| | | | |
|---|---|---|---|
| Unliquidated obligations | $ 25,328 | In Treasury | $ 213,971 |

TABLE 61.—Federal Highway Administration, Bureau of Motor Carrier Safety balance sheet June 30, 1970.

| | | |
|---|---|---|
| **ASSETS** | | |
| Current assets: | | |
| Funds in U.S. Treasury | | $ 213,971 |
| Accounts receivable | $ 190 | |
| Advances to travelers | 11,324 | |
| | | 11,514 |
| Fixed assets: [2] | | |
| Office furniture and equipment | | 105,772 |
| Total assets | | $ 331,257 |
| **LIABILITIES AND U.S. GOVERNMENT INVESTMENTS** | | |
| Current liabilities: | | |
| Disbursements in transit | $ 72 | |
| Accounts payable and other liabilities | 200,086 | |
| | | $ 200,158 |
| Accrued annual leave of employees | | 223,723 |
| U.S. Government investment: | | |
| Undelivered orders and contracts | $ 25,327 | |
| Invested capital | −117,951 | |
| | | −92,624 |
| Total liabilities and U.S. Government investment | | $ 331,257 |

TABLE 62.—Federal Highway Administration, Bureau of Motor Carrier Safety U.S. Government investments July 1969 through June 1970.

| | | |
|---|---|---|
| U.S. Government investment at July 1, 1969 | | $ −85,657 |
| Increases: | | |
| Appropriated | $ 2,510,301 | |
| Property acquired at no cost | 1,477 | |
| | | 2,511,778 |
| | | $ 2,426,121 |
| Decreases: | | |
| Expenses | $ 2,472,276 | |
| Leave earned but not used | 43,033 | |
| Unobligated cash returned to Treasury | 3,436 | |
| | | −2,518,745 |
| U.S. Government investment at June 30, 1970 | | $ −92,624 |
| **ANALYSIS OF U.S. GOVERNMENT INVESTMENT** | | |
| Invested capital | | $ −117,951 |
| Obligated | | |
| Undelivered orders and contracts | | 25,327 |
| U.S. Government investment at June 30, 1970 | | $ −92,624 |

TABLE 63.—Federal Highway Administration, Bureau of Motor Carrier Safety statement of application of funds July 1969 through June 1970.

| | | |
|---|---|---|
| Funds provided by: | | |
| Appropriations | $ 2,510,301 | |
| Less unobligated cash returned to Treasury | 3,436 | |
| Total funds provided | | $ 2,506,865 |
| Funds applied to: | | |
| Administrative operating expenses | $ 2,472,276 | |
| Purchase of fixed assets | 10,663 | |
| Total funds applied | | 2,482,939 |
| Increase in working capital | | $ 23,926 |

TABLE 64.—Federal Highway Administration, Bureau of Motor Carrier Safety change in working capital.
(accounted for as follows)

| | *June 30, 1970* | *July 1, 1969* | *Increase* | *Decrease* |
|---|---|---|---|---|
| Current assets: | | | | |
| Funds in U.S. Treasury | $ 213,971 | $ 99,088 | $ 114,883 | $ |
| Accounts receivable | 190 | 328 | | 138 |
| Advances to travelers | 11,324 | 11,762 | | 438 |
| | | | $ 114,883 | $ 576 |
| Current liabilities: | | | | |
| Disbursements in transit | $ 72 | $ 27 | | $ 45 |
| Accounts payable and accrued liabilities | 200,086 | 109,750 | | 90,336 |
| | | | | $ 90,381 |
| Sub-totals | | | $ 114,883 | $ 90,957 |
| Increase in working capital | | | | 23,926 |
| Totals | | | $ 114,883 | $ 114,883 |

TABLE 65.—National Highway Safety Bureau statement of operations July 1969 through June 1970.

APPROPRIATIONS

| *For Contracting Authority* | | *For Working Capital* | |
|---|---|---|---|
| New | $ 100,000,000 | New | $ 60,171,665 |
| From last year | 327,906,775 | From last year | 70,920,611 |
| Reimbursable earnings | 2,071,221 | Reimbursable collections | 2,071,221 |
| Administrative obligational authority | 30,171,665 | | |
| Available | $ 460,149,661 | Available | $ 133,163,497 |

OPERATING EXPENSES

| | *Payments* | *Change in Accruals* |
|---|---|---|
| State and community highway safety program | $ 50,489,919 | $ +11,589,488 |
| Administration and research | 26,169,517 | +1,093,001 |
| Purchase of fixed assets | 39,353 | |
| Total | $ 76,698,789 | $ +12,682,489 |
| Increase in accruals | +12,682,489 | |
| | $ 89,381,278 | |

| DEDUCT | | DEDUCT | |
|---|---|---|---|
| Accrued expenses | $ 89,381,278 | Payments | $ 6,698,789 |
| Unobligated balance of administration | 464,790 | Increase in advances outstanding | 210,016 |
| Lapsing program authority | 2,369,181 | Disbursements in transit | +17,486 |
| | | Unobligated cash returned to Treasury | 464,713 |
| Used | $ 92,215,249 | Used | $ 77,356,107 |

AVAILABLE BALANCES AT JUNE 30, 1970

| | | | |
|---|---|---|---|
| Contracting authority [4] | $ 367,934,412 | In Treasury | $ 55,807,390 |

TABLE 66.—National Highway Safety Bureau balance sheet at June 30, 1970.

| | | |
|---|---|---|
| **ASSETS** | | |
| Current assets: | | |
| Funds in U.S. Treasury | | $ 55,807,390 |
| Accounts receivable | $ 990 | |
| Advances to States | 403,962 | |
| Advances to travelers | 43,430 | |
| | | 447,382 |
| Fixed assets: [2] | | |
| Office furniture and equipment | $ 399,233 | |
| | | 399,233 |
| Contracting authority [3] | | 332,926,267 |
| Total assets | | $ 389,580,272 |
| **LIABILITIES AND U.S. GOVERNMENT INVESTMENTS** | | |
| Current liabilities: | | |
| Disbursements in transit | | $ 17,722 |
| Accounts payable and accrued liabilities for States' completed work | $ 19,054,812 | |
| Accrued liabilities—other | 2,174,093 | |
| | | 21,228,905 |
| Accrued annual leave of employees | | 729,702 |
| U.S. Government investments: | | |
| Undelivered orders and contracts | $ 90,013,726 | |
| Contracting authority | 277,920,686 | |
| Invested capital | −330,469 | |
| | | 367,603,943 |
| Total liabilities and U.S. Government investments | | $ 389,580,272 |

TABLE 67.—National Highway Safety Bureau U.S. Government investment July 1969 through June 1970.

| | | |
|---|---|---|
| U.S. Government investment at July 1, 1969 | | $ 327,766,942 |
| Increases: | | |
| Contracting authority | $ 100,000,000 | |
| Appropriation for administration | 32,242,886 | |
| Property acquired at no cost | 285 | |
| | | 132,243,171 |
| Total increases | | $ 460,010,113 |
| Decreases: | | |
| Expenses | $ 89,342,002 | |
| Leave earned but not used | 189,604 | |
| Unobligated administrative cash returned to U.S. Treasury [5] | 464,713 | |
| Property disposition | 40,671 | |
| Lapsing contract authorization | 2,369,181 | |
| Total decreases | | 92,406,171 |
| U.S. Government investment at June 30, 1970 | | $ 367,603,942 |

ANALYSIS OF U.S. GOVERNMENT INVESTMENT

| | | |
|---|---|---|
| Invested capital | | $ −330,469 |
| Obligated: | | |
| State and community highway safety | $ 66,705,137 | |
| Administration and research | 23,308,588 | |
| | | 90,013,725 |
| Reserve—not available | | 277,920,686 |
| U.S. Government investment at June 30, 1970 | | $ 367,603,942 |

TABLE 68.—National Highway Safety Bureau statement of application of funds July 1969 through June 1970.

| | | |
|---|---|---|
| Funds provided by: | | |
| Appropriations | $ 62,242,886 | |
| Less unobligated cash returned to Treasury at June 30, 1970 | 464,713 | |
| Total funds provided | | $ 61,778,173 |
| Funds applied to: | | |
| State and community highway safety programs | $ 62,079,407 | |
| Administration and research | 27,301,871 | |
| Total funds applied | | 89,381,278 |
| Decrease in working capital | | $ 27,603,105 |

TABLE 69.—National Highway Safety Bureau change in working capital.
(accounted for as follows)

| | *June 30, 1970* | *July 1, 1969* | *Increase* | *Decrease* |
|---|---|---|---|---|
| Current assets: | | | | |
| Funds with U.S. Treasury | $ 55,807,390 | $ 70,920,611 | $ | $ 15,113,221 |
| Accounts receivable | 990 | 1,072 | | 82 |
| Advances to travelers | 42,430 | 36,387 | 6,043 | |
| Advances to States | 403,962 | 91,938 | 312,024 | |
| Other advances | | 108,000 | | 108,000 |
| | | | $ 318,067 | $ 15,221,303 |
| Current liabilities: | | | | |
| Accounts payable and accrued liabilities for States' completed work | $ 19,054,812 | $ 7,465,217 | | $ 11,589,595 |
| Accrued liabilities-other | 2,191,815 | 1,081,541 | | 1,110,274 |
| | | | | $ 12,699,869 |
| Sub-totals | | | $ 318,067 | $ 27,921,172 |
| Decrease in working capital | | | 27,603,105 | |
| Totals | | | $ 27,921,172 | $ 27,921,172 |



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