Materials

SECOND ANNUAL REPORT

Fiscal Year 1968

DEPARTMENT OF TRANSPORTATION · UNITED STATES OF AMERICA

DEPARTMENT OF TRANSPORTATION

Materials Division

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U.S. DEPARTMENT OF TRANSPORTATION

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THE SECRETARY OF TRANSPORTATION
WASHINGTON, D.C. 20590

June 13, 1969

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

Dear Mr. President:

In accordance with the requirements of Section 11 of the Department of Transportation Act I transmit herewith, for submission to the Congress, the annual report of the Department of Transportation for Fiscal Year 1968.

Sincerely,

John A. Volpe

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Chapter I

INTRODUCTION

During its first full year of operation, the Department of Transportation took up the challenge of its enabling legislation to assure "the coordinated effective administration of the transportation programs of the Federal Government," while at the same time facilitating the development and improvement of coordinated transportation service, to be provided by private enterprise to the maximum extent feasible, as the legislation directed.

The primary role of the Department, as of the system of transportation to which it relates, is to serve people—to facilitate the transfer of people and their goods in the face of ever-mounting impediments to movement—distance, congestion, artificial barriers of regulations and forms, and unnecessary expense.

The Department's concerns must be as broad as a continent being traversed by endless streams of people and vehicles, but it must also give careful study to problems as small as the documentation required for employment of seamen, or the rapid and safe transfer of an airline passenger's luggage.

But movement of goods and people is not the whole concern of the Department. The nation cannot afford to build transportation systems or segments of systems if they serve only a transportation need and do it at the expense of other, often more important, considerations such as the purity of the atmosphere or the existence of open space for people to enjoy.

During fiscal year 1968 the Department carefully considered what policies it should adopt in order to effectuate an integrated balanced national transportation system. It recognized at the outset that all elements in the total transportation picture are inextricably related. To mention only a few examples—transcontinental rail and motor freight movements begin and end in city factories and warehouses and intercity air travelers spend a disproportionate time traveling by auto, taxi, or bus to urban destinations.

Since it was necessary to find an approach that would reveal the interrelationships of the various modes of transportation, the Secretary chose to employ a national multi-modal approach to focus on problem areas such as urban congestion, intercity or corridor movement, and long-haul transportation, while at the same time taking account of various environmental impact factors.

In recognition of the interrelationships between all modes of transportation and the needs of urban areas in which over 70 percent of the population resides, a Presidential Reorganization Plan was developed to transfer the urban mass transportation programs formerly in the Department of Housing and Urban Development to the Department of Transportation; actual transfer occurred on July 1, 1968. Operational responsibility for these programs was placed in the newly created Urban Mass Transportation Administration.

Transportation can either support or obstruct the realization of urban goals and objectives to the extent that transportation investments are planned to assist comprehensive urban development. The transfer of the urban transportation function will allow the Department to focus increased attention on the key role of urban transportation systems in shaping the structure of cities and influencing the rate and nature of their growth and, even more important, the quality of city life as determined by noise, air pollution, vibration, congestion, inconvenience, and the impairment of aesthetic values and cultural amenities. The Department plans to employ the most modern transportation technology to assure that urban transportation is designed as an integral component of the development of growing urban areas. The need for financing adequate urban mass transportation is enormous, but through Demonstration and Grant Programs the Department has encouraged both public and private sources to make additional investments in transportation.

Strips of dense population have developed not only in the Northeast, slashing north from Washington to Boston, but also from Chicago to Pittsburgh, in California, in Texas (from Dallas-Fort Worth southward through Austin to San Antonio and Houston), in the far Northwest, and in other areas. These urbanized corridors have certain common features with considerable transportation significance. Typically, they contain several cities from 25 to 350 miles apart and, though their transportation patterns are complex, a large percentage of travel originates and ends within the corridor boundaries. Though each has its peculiar properties and solutions they are all susceptible to multi-modal analysis. In the Northeast, the rail passenger service successfully offered by the *Metroliner* is one viable approach, but that does not rule out vertical or short takeoff and landing aircraft, or automated highway developments as complementary travel alternatives. Use of the corridor analysis technique will permit the Department to evaluate the effectiveness of varying reource allocations.

Though intercity corridors may be viewed as transportation market areas by themselves, they are not isolated. People in large numbers travel to New York from Boston and Washington, but they also arrive from San Francisco and London. Long-haul passenger transportation will continue to be primarily by air as shown by the 79 percent growth rate in enplaned passengers in the past 5 years. A capital investment of $1.5 billion over that time has allowed the system to operate, but the strains in the system evident from the congestion in the skies over major airports and traffic problems on the ground will continue to intensify, unless the Department takes vigorous action.

In at least two sections of the DOT Act the national policy "to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites" is emphasized. The

Department has taken a broad view of its obligations under these injunctions, and has emphasized enhancement of the beauty of the countryside when planning for new facilities or installations. It has also attempted to refrain from actions that would have a negative impact upon any part of the environment. Similarly, it attempts to cushion harmful impacts that cannot be avoided.

Numerous tangible gains from the Department's activities are recorded in this Report. Within the Secretary's office, the "facilitation" program that has successfully reduced the amount of unnecessary delay and paperwork in transportation of goods or people by any combination of transport modes is a good example. Grade crossing elimination—combining the efforts of the Federal Railroad and Federal Highway Administrations—is another activity that benefits directly from the existence of a Department of Transportation. The joint efforts of the Federal Highway Administration, the Federal Railroad Administration, and the Federal Aviation Administration to plan adequate access to airports as they are designed is another example of a gain to the public that results primarily from the fact that all three Administrations are able to cooperate within a single Department.

This report is divided into chapters representing the Office of the Secretary and each of the Department's Administrations. While this mode of presentation has a number of advantages, it may not demonstrate adequately the actual working of the Department as a whole. It may not, for example, present fully the concern and involvement of the Office of the Secretary and the Assistant Secretaries in the problems and programs of the Administrations. Thus it must be emphasized that most of the programs, policies, or problems discussed in any of the following sections involved were the end-products of a process of discussion, clarification, and adjustment of differences that assured that the Secretary had the benefit of the views, the insights, and the specialized competence of his senior officials—the Administrators, the Assistant Secretaries, and his immediate staff. The Department was designed and has been managed to assure that all the talents and viewpoints of its personnel would be focused on helping the Secretary by supplying him the information upon which to base thoughtful decisions.

Department of Transportation.

Chapter II

OFFICE OF THE SECRETARY

Organizational Changes

The most significant organizational change in the Department during the year was the preparation for the creation of the Urban Mass Transit Administration. That Administration was established as an element of the Department under the provisions of President Johnson's Re-organization Plan No. 2 of 1968, after many months of careful planning and negotiation. The Department of Transportation Act had envisioned this when it provided for a year-long period of investigation and discussion of the appropriate placement of urban transit affairs by the Secretary of Housing and Urban Development and the Secretary of Transportation.

After much negotiation among the officials of the two Departments, beginning shortly after the DOT was organized, the Secretary recommended to the Bureau of the Budget that the Government's urban mass transit program be transferred to the Department of Transportation. He argued that urban transportation should be integrated with other national transportation systems that the Department of Transportation was charged to promote. The President accepted most of the Department's recommendations and sent to Congress Re-organization Plan No. 2. The Plan encountered no significant opposition and became effective on July 1, 1968. A division of labor between the Department of Housing and Urban Development and the Department of Transportation was provided for in the reorganization plan by retaining in the Department of Housing and Urban Development certain functions relating to comprehensive urban planning at the local level and the attainment of balanced urban development. The Department of Transportation will foster urban mass transportation undertakings with full consideration of the needs of the Nation's cities and all factors associated with their healthy development.

Planning for the inclusion of urban mass transit in the Department had assumed (1) that any mass transportation facilities within cities would be regarded as integral elements of transportation generally within the cities, (2) that such transportation facilities must be evaluated as part of the whole urban environment, and (3) that cities must determine their own transportation needs.

A major consideration for the Department of Transportation was how to relate the new Urban Mass Transit Administration to other elements of the Department. There was concern over how the addition of a cross-modal or multi-modal organization such as UMTA would relate to the modal structure of the Department's other operating administrations. An alternative, that of placing the Administration in charge of the Under Secretary or another official in the Secretary's immediate office, was discarded because it was inconsistent with the concept that operating programs should be carried out through operating Administrations. Consequently, the Reorganization Plan provided that the urban mass transportation function should, on July 1, 1968, become the responsibility of a sixth Administration in the Department, with a status comparable to that of the Federal Highway Administration or the Federal Railroad Administration. Although the new administration (UMTA) initially had only about 38 employees, it assumed responsibility for administering annual programs totaling $175 million, mostly in grants to local governments.

OST Management

Strengthening the Office of the Secretary. In accordance with the original projections of the Department, as set forth by the Secretary in his appearances before Congressional Committees after the DOT Act became law, the number of people working for the Office of the Secretary increased slowly, as did the funds allocated to the Department by the Congress. The total staff provided for the Office of the Secretary by congressional appropriation was 470 in 1968. The estimate for 1969 called for 530 full-time employees. Salaries and Expenses funds for fiscal year 1968 totalled $7,221,000. For fiscal year 1969 an appropriation of $11,335,000 was requested; Congress appropriated $9,800,000 for Salaries and Expenses during that year.

The Department of Transportation is the fifth largest of the Government's executive Departments, having nearly 60,000 civilian employees and 36,000 officers and enlisted men in the Coast Guard. Personnel are stationed at nearly 3,000 duty stations in all parts of the United States, in about 40 other countries and on vessels on the high seas. Civilians in the Department are engaged in 465 occupational specialties.

Executive Staffing. Continued priority was given to the recruitment of executive personnel qualified to organize and operate a Department having over 95,000 employees and that effort required large expenditures of the time and energy of senior officers of the Department. While the initial Bill to establish the Department had included provision for an allocation of "supergrade" positions to help in the staffing of the Department, the provision was dropped from the legislation in the expectation that supergrade positions would be authorized in a separate measure dealing with supergrade needs of the Executive Branch. However, no such action was taken by Congress during the period covered by this report.

To take maximum advantage of the positions allocated to the Department and its Administration, the Secretary established an Executive Personnel Board and charged it with making recommendations to him concerning the positions to be designated for supergrade allocation anywhere in the Department. He retained for himself the authority to approve both the allocation of supergrade positions and the assignment of individuals to those positions. During the year the Department undertook a re-evaluation of all of its positions in the executive category to make certain that the Secretary was receiving optimal benefits from the supergrade positions available to the Department. Some additional supergrade positions were allocated to the Department by the Civil Service Commission as an interim measure until legislation could be obtained for enough positions to meet urgent needs.

Equal Opportunity Program. Another aspect of the staffing of the Department was the operation of its Equal Opportunity Program, established on July 6, 1967. Subject to the program's requirements are: Department employment practices, services rendered to the public, employment practices of contractors and subcontractors under direct and federally assisted contracts and any other programs involving Department assistance, participation, or endorsement. The officer in charge of implementing the Equal Opportunity Program reports directly to the Secretary. While the policy of the Department was thus unequivocally established early in its existence, securing the cooperation of all employees of the Department and especially compliance by the Department's contractors proved somewhat more difficult in practice. The program was being strengthened at the end of the fiscal year.

Headquarters Space Consolidation. An opportunity for improving the efficiency of headquarters operations arose when the General Services Administration agreed to house most of the Washington elements of the Department in a new building being completed in Southwest Washington, less than two blocks away from Federal Office Building 10A in which the Department headquarters is located. As soon as that agreement was announced, the Secretary approved plans to centralize certain housekeeping services for all the Administrations and provided for determinations to be made of the appropriate arrangements for several others. Special attention was given to planning for the consolidation of duplicating and copying services, automatic data processing, and libraries in the new building. Communications services, including both telegraphic and cryptographic capability, will be maintained there by the Coast Guard for the use of all Department elements. Other housekeeping functions, such as mail and messenger services, telephone, audio-visual, systems, maintenance, space design, warehousing, loan pools, and building management will be provided by the Office of Administrative Operations of the Office of the Secretary. Plans for these and other administrative arrangements were agreed to in meetings of the management officials of the several Administrations and the Office of the Secretary. Arrangements for occupying the new building were therefore well under way at least a year before the building was due to be completed. An important consequence of the move and the reorganizations associated with it will be long-term savings because the early planning eliminated the need for certain expensive alterations of a completed building that would otherwise have been necessary.

Counterpart Studies. The Department has made frequent use of the "counterpart study" as a management device to examine similar functions performed both in the Secretary's office and in the Administrations in an effort to assure that they are performed most effectively and at the lowest cost. The studies have led to clarifications of responsibility and some money-saving consolidations. Such functions as personnel services, legal services, accounting, procurement, library services, and data processing lend themselves to this type of examination. Early counterpart studies were undertaken soon after the Department began to operate. The first to be completed and adopted was concerned with personnel and training and it led to certain positions being transferred from the Administrations along with functions best carried out in the Office of the Secretary. Comparable studies of legal services, public affairs functions, investigation and security functions, and equal opportunity matters were also underway at the close of the fiscal year.

Working Capital Fund. During the year the Department activated the Working Capital Fund authorized by the Department of Transportation Act for service functions which can most efficiently be performed centrally for all elements of the Department. The first two services to be consolidated under the Working Capital Fund were those involving printing and still photography. The operation of the facilities for those functions became the responsibility of the Office of Administrative Operations of the Assistant Secretary for Administration.

Field Coordination Groups. To strengthen Departmental coordination and effectiveness in the field, 30 field coordination groups were established soon after the Department became operative. Such a group was initially established in each major city or area in which two or more of the Department's Administrations had significant activity. The groups were instructed to undertake joint program planning and coordination, to give DOT elements mutual support, to exchange ideas and to provide other assistance where possible. In the initial stages significant improvements were effected in common administrative functions, such as housing of offices, logistics, auto maintenance, and ADP services. Such changes as collocation of DOT offices in one building are also expected to help improve communications within the Department and facilitate service to the public.

Role and Management of the St. Lawrence Seaway. When the St. Lawrence Seaway became part of the new Department of Transportation, it brought with it a number of serious management problems. The Administrator subsequently recommended to the Secretary that he establish a task force to study the problems. Among them were the financing of the rehabilitation of the Seaway, coordination of the Seaway with the rest of the Department, problems of tolls, operations and maintenance, promotion of utilization of the Seaway, and numerous other matters. The Secretary appointed a task force but he broadened its scope to include study of the "seaway in its total regional context." By the end of the fiscal year the task force had completed its own organization and had begun numerous related inquiries. Experts from several elements of the Department, including the Coast Guard and the offices of the Assistant Secretaries, became members of the task force to try to devise solutions for the Seaway's problems. It was thought likely that the additional resources that the Department could devote to solving the problems might well enhance the success of the Seaway.

OST Operations

DOT Interventions. In view of its statutory responsibilities "to facilitate the development and improvement of coordinated transportation service" and to "provide general leadership in the identification and solution of transportation problems," the Department has intervened in selected cases before the Civil Aeronautics Board, the Federal Maritime Commission, and the Interstate Commerce Commission. Economic regulation of tranportation modes continues to be the exclusive province of these agencies, and the Department, therefore, expresses its views in the same manner as any other party, subject to normal procedural requirements. The Department's influence on regulatory policy, consequently, is necessarily a function of the merits of its positions and the skill with which they are presented.

A number of criteria are used to determine whether the Department should seek to participate in a particular regulatory proceeding:

1. Does the case involve issues of broad significance to the national transportation network?

2. Will any other party to the case espouse a position substantially identical to that of the Department?

3. Does the Department have resources sufficient to support its position adequately?

During the year, the Department entered a number of precedent-setting motor carrier rate cases and proceedings involving innovative forms of transportation, inter-modal coordination, and economic criteria for regulation. The Department was an active advocate of rules and practices which would enhance transportation efficiency, broaden the availability of all modes to all shippers and passengers, and reduce congestion in crowded transportation corridors.

Motor Vehicle Accident Compensation. One action of potentially great significance is the beginning of a major investigation of all relevant aspects of the system for compensating victims of motor vehicle accidents, as directed by Public Law 90–313. Both preliminary hearings and the legislation outlined a series of problems that had arisen in connection with automobile insurance, most of which resulted in inequities in the costs and coverage of insurance, and uncertainties concerning the settlement of damage claims. The organization for the conduct of the study was established and began its work during the year under review.

Uniform Time Act Administration. One of the Department's unusual functions is the administration of the Uniform Time Act of 1966; it is concerned with establishment of the time zones in the United States, establishment of uniform advanced (daylight saving) time throughout the country, and efforts to resolve controversies that arise concerning this politically sensitive issue. The Department's approach to this assignment is to encourage local solutions of difficulties that arise from the effects of the Uniform Time Act, to conduct rule-making proceedings to adjust time zone boundaries to conform to actual and preferred local usage, and to assist the localities and the States in making needed adjustments by educational and persuasive means, with legal means of enforcement only after other methods fail. Federal installations and activities, and other Governmental, transportation, and commercial activities are required by the time Act to follow the time zone boundaries set by the Department and to follow the advanced time requirements of the Act.

Maritime Policy Reform. On May 20, 1968, the President transmitted to Congress a comprehensive proposal to reform the Government's programs in support of the maritime industry. By reason of the President's concern with integrating maritime transportation policy planning into a maritime transportation policy framework, the Department of Transportation held the lead role in preparing the President's proposal. The proposed program, reflecting the Administration's assessment of the steps needed to revitalize the industry, followed well over a year of abortive attempts to arrive at a consensus program which would not only satisfy national security needs for commercial shipbuilding capacity and a mercantile fleet at a reasonable cost, but would also be acceptable to the shipbuilding industry, shipping operators, labor, and other interested parties. At the end of the fiscal year, however, the legislative proposal still had not been introduced in either house for formal consideration.

The President's program called for the restructuring of the construction subsidy program to establish clearly its function as a direct aid to the shipbuilding industry. This reform would have made it possible to determine more accurately adequate subsidy levels for commercial shipbuilding activity to meet the Nation's defense and essential civil requirements in time of emergency as well as to encourage modernization of shipyards to make them more competitive.

The program also called for innovations in the existing operating subsidy system to provide better incentives for more efficient operation. Moreover, it was proposed that these systems would be adapted to irregular carrier operations, as new vessels became available, as a substitute for present rate differentials and would lead to a more rational cargo preference system limited to routing preference which would be made more effective by centralized administration.

Provisions relating to an expanded research and development program in collaboration with private industry and modification of current tax incentives rounded out the revision element of the program which was generally acceptable to the industry.

The key reform proposed by the Administration—which would have eliminated the restrictions preventing American ship operators from purchasing vessels from foreign shipyards for documentation under the U.S. flag with full privileges—was the center of wide-ranging controversy. As a result, the program and a reorganizational proposal which would have brought the Maritime Administration into the Department so as to give it full responsibility for all elements of transportation policy developments and promotion were stalled.

Transportation Studies. A significant accomplishment was the adaptation of the input-output tables, used extensively by many government agencies and industry in planning and decision-making, to allow the Department to trace the impact of basic changes in the economy on transportation and, conversely, the impact of transportation changes on the economy. These tables will help the Department to evaluate the effects of changes in its program levels, the growth or decline of important transportation industries, and the impacts of transportation prices and wages on general inflation.

Research studies of the economics of the transportation industries were applied to practical program activities of the Department. The series of studies of productivity in the transportation industries, developed in cooperation with the Bureau of Labor Statistics (BLS), progressed to the point where annual series of indices on water transportation, pipelines, bus transportation, trucking, and related transportation services were initiated and will be issued regularly by BLS. A preliminary report was completed on the causes of productivity changes in the railroad industry, using econometric methods which for the first time make it possible to interpret the regular productivity series which merely records the changes that are taking place.

Productivity data were used for the first time during fiscal year 1968 in the Department's regulatory intervention program in a series of cases before the Interstate Commerce Commission (ICC) dealing with proposed increases in motor freight rates. In two decisions subsequently announced on February 13 and 14, 1969, the Commission accepted the Department's recommendations on the use of productivity indices as one of the factors to consider in setting rate policy.

Studies of rate structures and financial indices have enabled the Department to recommend to the regulatory commissions new approaches to general rate increases, particularly the use of indices measuring carrier equity, rates of return, the role of costs and revenues in the financial results of carriers, and the impact of freight rates on general price levels. In the two motor carrier cases decided in February, the ICC accepted the Department's position on the use of such measures as well as the findings based upon them.

A study on *Oceanborne Shipping: Demand and Technology Forecast* which had been commissioned by the Department provided near-term and long-range forecasts of demand for oceanborne shipping and ship technology to assist in formulating policy decisions relating to the maritime industry. The study indicated that world oceanborne trade will increase about twenty-fold over the next 75 years and that the major portion of world trade will continue to be carried in conventional ships with nuclear power increasingly used at about the turn of the century.

In another study the Department investigated the economic, social, technological, and financial ramifications of a "no-fare" transit system. After considering such diverse factors as the cost of transportation and quality of service as an incentive to its use, implicit income transfers, changes in transportation cost in terms of money, time and service, congestion, transportation investment, transportation facilities, air pollution, land use, financial instruments, and effect of various levels of subsidy, the study concluded that elimination of fares would not significantly increase use of mass transit facilities. To increase transit use, a major improvement in service quality would be necessary, and service would have to be extended to areas not now served. In the short run, the costs of free transit to the public would be about $2 billion per year. Though the study was based on the Boston area, the findings were extrapolated to the national level.

Some research projects accomplished within the Department included: (1) Interest rate determinations undertaken under the auspices of the Water Resources Council, (2) analyses of airport needs in preparation of Department of Transportation proposed legislation, (3) a study of Great Lakes pilotage rates to support the rate-setting functions of the Department, and (4) evaluation of a Coast Guard study of ice-breaking benefits to Lake Michigan waterborne commerce.

The results of a large portion of the Department's research efforts will start becoming evident next year with the completion of such studies as those concerning the intercity-intraurban interfaces, transportation needs of the handicapped, social indicators and ghetto mobility, intercity transportation effectiveness, airport terminals and access, and transportation needs and alternatives.

Program Planning. The construction of the program budget required by the Bureau of the Budget each year demands that the Secretary align the Department's priorities with great care.

In the fall of 1967 the Department was only a few months old so its machinery for program budgeting was not highly developed. The Office of the Secretary did, however, screen and mold the budget requests of the several elements of the Department, and the budget thus became an important instrument by which the Secretary exercised control over his developing department. Since the Bureau of the Budget had imposed rigorous limitations upon the requests for funds, an attempt was made to restrict the proposed budgets of the modal administrations, and to compare the desirability of alternative expenditure programs as envisaged by the DOT Act.

The result of the program budget process was that the Department substantially adjusted the original budget requests of the modal administrations to reflect departmental priorities and fiscal limitations. The process of developing the budget requests and justifications and comparing the probable net gain from one expenditure of funds rather than another was instrumental in building the technical capability within the Office of the Secretary to make comparative studies and judgments. These capabilities will permit the Office of the Secretary to increase the skill and sophistication with which it evaluates programs proposed by the Administrations.

Program Categories. The interests of the total Department of Transportation have been divided functionally into categories for purposes of the Planning-Programming-Budgeting System. The Department has four logical categories of programs: Urban Transportation, Interurban Transportation, International Transportation, and Other National Interests. Especially since the Urban Mass Transportation Administration became part of the Department, urban transportation has become one of its major concerns. Its actual programs and planned activities in this category include mass transit, transportation for the poor, assessment of the role of transportation in metropolitan growth, and urban transportation planning.

A second major category, Interurban Transportation, includes the great bulk of the programs of the Federal Highway Administration including the programs of the Bureau of Motor Carrier Safety, most of the programs of the Federal Aviation Administration, the programs of the Federal Railroad Administration, and many of the Coast Guard's domestic programs.

International Activities, the third category, include the Saint Lawrence Seaway, the supersonic transport program, the development of national maritime policy, and such Coast Guard programs as the ocean stations, international search and rescue, and aids to navigation. In addition most of the work of the Office of the Assistant Secretary for International Affairs and Special Projects belongs in this category, including the negotiation of international agreements, participation in international organizations relating to transportation, the promotion of international industrial cooperation, the effort to remove or minimize the restraints on international trade and travel, and telecommunications.

Those programs that belong logically in several program categories, such as transportation safety, or those which support major nontransportation interests of the nation are identified as "Other National Interests." Illustrations of programs in this group are the safety programs of the several Administrations plus the measures for pipeline safety and the transport of hazardous materials, programs to minimize the environmental effects of transportation, programs relating to marine sciences, and those relating to polar transportation.

Dividing the Department's programs in this manner will eventually make it easier to evaluate the effect of expenditures of resources for major objectives of the Department.

OST Research and Technology

One of the major arguments for the formation of the Department was the advantage to be derived from rational use of resources to advance the state-of-the-arts relevant to transportation. While it was true that each of the modal Administrations already sponsored a program of research relating to its own activity, it was likewise true that no agency had a responsibility for interrelated transportation systems research, for assessing technological gaps, or for assessing priorities for research—either that concerned with vehicles or that concerned with people. As it was originally constituted, the Office of the Assistant Secretary for Research and Technology included an Office of Research and Development, an Office of Transportation Information Planning, and two offices transferred in part from other locations: the Office of Hazardous Materials and the Office of Noise Abatement. The function of these offices was to advise the Secretary concerning matters of science and technology, and encourage and evaluate transportation-related research planned or undertaken either within the Government or outside it. The Assistant Secretary was not expected to undertake programs of research with his own staff.

Originally it proved difficult to obtain the services of an individual qualified to undertake the duties of Assistant Secretary in the area of research and technology. Mr. Frank Lehan agreed to undertake the assignment and was sworn in on December 18, 1967. The Assistant Secretary continued to be concerned with programs already established in his Office, but undertook a major reorganization of its functions so that it could more nearly approach the Secretary's standard of competence and capability. The missions of the Office were broadly stated in these phrases: (1) To provide advice and assistance to the Secretary on matters involving basic and applied research, development, engineering, science and technology, and the application of scientific and technical knowledge; (2) to broaden the Nation's capacity for scientific leadership in transportation through support of research in colleges and universities; (3) to analyze and evaluate all relevant research performed outside the Government as well as within it; and (4) to coordinate all research programs within the Government that bear on the Department's mission. The Assistant Secretary assigned these tasks to six offices: Systems Engineering, Physical Sciences, Life/Medical Sciences, Data Research, Noise Abatement, and Hazardous Materials (including pipeline safety).

Noise Abatement. In light of the responsibilities with which the Department was charged, the direction of the "Federal Aircraft Noise Alleviation Program" was transferred to the Department in the fall of 1967. In addition, the Department assumed the responsibility for sonic boom research from the Sonic Boom Coordination Committee which had been headed by the Office of Science and Technology.

Of significance in aircraft noise abatement efforts was the enactment of Public Law 90–411 amending the Federal Aviation Act of 1958 to require aircraft noise abatement regulation. It directs the Administrator of the Federal Aviation Administration, after consultation with the Secretary of Transportation, to prescribe noise standards for use in certification action as prescribed in Title VI of the Act. A publication "Summary Status Report, Federal Aircraft Noise Abatement Program", was released April 1, 1968.

External Relations. The Assistant Secretary for Research and Technology initiated a program to establish relationships with the scientific, industrial, and academic communities. These relationships serve two purposes in that they (1) provide immediate recourse to scientific and engineering talent and experience for application to present-day problems in transportation, and (2) provide a mechanism for continuing close coordination and, where appropriate, integration of public and private efforts in transportation research. The objective of this program is not only to promote the application of nationwide resources to a nationwide set of problems, but also to develop close rapport between the Federal Government, acting in a leadership capacity, and the institutions and people who face these problems and have to undertake their solutions.

Hazardous Materials. The Office of Hazardous Materials has the assignment to formulate regulations for the transportation of dangerous materials including many poisons, radioactive materials, compressed gases, flammables, oxidizing agents, corrosives, etiologic agents, and the more than 1.85 billion pounds of commercial explosives used annually. The billions of pounds of military explosives used were also transported principally by commercial modes of transport.

The continuing trend towards bulk shipments, novel containers, demands of the missile and aerospace programs, employment of new and advanced techniques in packaging, and constraints placed upon carrier operations by shipping practices, economic conditions, and refined military and commercial logistics have steadily increased the need for special permits to ship and transport hazardous materials under conditions not provided for by the regulations. A new approach is being designed to take account of those conditions in a streamlined set of regulations. To keep abreast of rapid changes in transportation technology, a completely new approach was planned to relate the regulations more closely to the hazard that may be involved in transportation rather than the physical or chemical properties of the technical material.

A continuing review and analysis in depth of the regulations pursuant to the Department's mandate to reevaluate the regulations with reference to current shipping practices and carrier operations will generate numerous changes. Conditions incident to normal transportation environment will be better identified and defined; shippers' responsibility will be made more explicit and put into better perspective, commodity descriptions and shipment nomenclature will be made more meaningful, and new hazard classifications will be added. Several existing classifications of hazardous materials will be redefined to bring into the scope of the regulations certain material possessing real hazard potential; bulk transportation of cryogenics will be provided for and simplified; a new labelling system for cargo identification will be promoted; existing separate and distinct modal regulations will be blended and harmonized into a single set of intermodal regulations; and container specifications will be clarified and consolidated into master sets leaning heavily on performance standards.

High-Speed Ground Transportation. On April 17, 1968, the Secretary of Transportation met with representatives of the Penn Central Railroad, the Budd Company, General Electric, and Westinghouse Electric. At this meeting, the Department of Transportation and the four pri ate corporations agreed to establish a technical task group to review the progress toward high-speed train service between New York and Washington and to recommend action for completing the program. This Government-industry task force was formed to identify problems delaying the initiation of the Metroliner Washington-New York high-speed rail demonstration service, to rank these problems as to importance measured against the various objectives of the demonstration, and to report the proposed solutions of these problems within 30 days.

The task force, under the chairmanship of the Office of the Assistant Secretary for Research and Technology, was comprised of representatives of the Penn Central, the Budd Company, the General Electric Company, the Westinghouse Electric Company, and the Department of Transportation. In addition to membership from the above companies, there were consultants from the member organizations and from the Office of High-Speed Ground Transportation, the Federal Aviation Administration, National Aeronautics and Space Administration, and General Steel Industries. The report of the task force outlined the major technical problems remaining to be solved before the demonstration of improved rail passenger service between Washington and New York could begin. The report also contained broad recommendations for the solution of these problems and an additional recommendation that the Secretary establish a Metroliner steering committee to continue with the major task of implementing the recommended solutions. This steering committee was established and is functioning.

Information Planning. The Office of Transportation Information Planning is responsible for providing leadership in the planning and development of a comprehensive program to produce the statistical data and other information required for improvement of the national transportation system. This work will be accomplished for the most part by private contractors.

The 1968 Transportation Information Planning program included: (a) Projects to obtain better data on sources of demand for the movement of people and goods; such as, the 1975 county population projections project, the metropolitan small area data project, and the national industry input-output tables project; (b) projects to improve data on the flows of people and goods; such as, the regional passenger travel survey design study, the national rail freight flow data project, and the national commodity movement survey study; (c) a project to obtain data on available transportation services combined with employment and other socio-economic data for the urban poor in several major cities; and (d) a project to provide diagrams of transportation systems to facilitate understanding of the systems and to help define what information is needed for programs to improve the systems.

The Transportation Information Planning activity has now been transferred to the jurisdiction of the Assistant Secretary for Policy Development.

OST Public Affairs

The Office of the Assistant Secretary for Public Affairs serves as a two-way conduit for the flow of information, news, and ideas between the

Department of Transportation and all parts of the public interested in the problems, progress, and potential of the Nation's transportation system. These include the President, the Congress, other agencies of the Federal Government, State and local governments, planning commissions, educational and research institutions, national and international organizations, news media, and representatives of labor and industry involved each year directly or indirectly in moving some 1.7 trillion ton-miles of freight and 120 billion passenger-miles of intercity traffic.

The Assistant Secretary directs the Office of Legislative Affairs, the Office of Labor and Industry Liaison, the Office of Government Liaison, and the Office of Public Information.

Program Activity. Activities included:

(a) Preparation and dissemination of dozens of news releases, Congressional testimony, addresses, and radio and television announcements.

(b) Meeting special requests for film from TV stations nationwide, brochures, articles for periodicals, reports, movies, and audio-visual displays.

(c) Arrangements for educational exhibits.

(d) Appearances before Congress in support of pertinent legislation.

(e) Arrangements for news conferences with the Secretary and other key personnel both in Washington and on speaking engagements throughout the country.

(f) Answering written and telephone inquiries to the Department or forwarded from other agencies, participation in meetings, conferences and seminars and day-to-day contact with areas of current interest.

A heavy schedule of public information services was precipitated by national and international interest in the policies, goals, and programs of the new Department. In addition to routine news media and public information activities during its first full year of operation, the Office of Public Affairs:

(a) Provided support to the 20 DOT bills proposed to Congress and to at least four additional legislative measures of interest to the Department. These included the Aircraft Noise Abatement Bill, submitted by the Federal Aviation Administration in January of 1967, which became law in fiscal year 1968; the Natural Gas Pipeline Safety Act, suggested by DOT in 1967 and passed early in fiscal year 1969; the Auto Insurance Bill and the President's Reorganization Plan No. 2, creating the Urban Mass Transportation Administration within the Department of Transportation, both enacted in fiscal year 1968. Work was completed on three major pieces of legislation—the Federal Aid to Highways Bill, the Department of Transportation Appropriation Bill, and the High-Speed Ground Transportation Authorization Bill—all of which were signed into law early in fiscal year 1969. Especially important among legislation still pending before Congress are the Airport Development Bill, the bill to impose airway user taxes, the bill to provide funds for necessary lock repair on the St. Lawrence Seaway, and the Trade Simplification Bill, which provides for the establishment of through-rates and other simplified procedures for international shipments by two or more transportation modes. Work was done to encourage support for the Rail Safety Bill and the Boating Safety Bill.

(b) Prepared a daily *Transportation News Digest* for distribution to key personnel in the Office of the Secretary and to all operating administrations within the Department, to keep them informed of activities in the world of transportation. In June, 1968 began monthly publication of *News Briefs*, a house organ summarizing and sometimes analyzing highlights of Department activities at the legislative and operational levels. Both publications contribute to the cross-fertilization of knowledge and ideas between administrators of highway, air, waterway, railroad, pipeline, and urban mass transportation functions and those charged with coordinating transportation growth.

(c) Prepared and distributed more than 200,000 copies of a brochure describing the organization and functions of the new Department of Transportation.

(d) Established a close working relationship with local and national union leaders across the country to acquaint them with the problems of the Department, its role and its interest in hearing the voice of labor in shaping transportation policy. Also established lines of communication and reporting procedures with the Department of Labor, the Federal Mediation and Conciliation Service, and the National Mediation Board on labor matters affecting transportation.

(e) Maintained contact with industry liaison officials to determine how the Department might be of service and how industry might offer assistance to the Department, keeping the Secretary advised of relevant transportation developments.

(f) Developed a series of labor-management situation reports on a timely basis to apprise the Secretary and others in the Department of trends and events involving the Department. Among the subjects discussed were: existing and potential labor-management disputes in the auto, rubber, copper, railroad, and maritime industries with emphasis on the Department's potential role in avoiding or settling such disputes.

(g) Established an information channel between the Secretary and officials of the 50 states, and developed a close working relationship with the Assistant to the President on Federal-State Relations, with the National Governors' Conference office in Washington, and with State officials.

(h) Developed avenues of information exchange for the Secretary and the Department with local governments through individual government leaders, U.S. Conference of Mayors, National League of Cities, National Association of Counties, International City Managers' Association, and private organizations representing most American cities, to disseminate information on Department goals and gather reactions from local officials.

(i) Directed formation of the first Secretary's Committee on Youth Opportunities to promote the participation of the Department and the transportation industry in the employment of disadvantaged youths and to encourage educational and recreational activities in cooperation with the President's Council on Youth Opportunity.

International Affairs and Special Programs

During fiscal year 1968 the Department moved more deliberately toward a position of national and international leadership in a number of areas that have current interest and vital implications for the Nation's transportation and telecommunications system, the cost and efficiency of world trade, and the quality of the environment.

The responsibility for this effort was placed in the Assistant Secretary for International Affairs and Special Programs.

International Transportation Policy. In fiscal year 1968, numerous policy issues with international implications confronted the Department in international forums and in national regulatory bodies. Thus, a number of national and international groups, as well as many foreign governments, became more seriously concerned about the hazards and discomforts of sonic boom and aircraft noise. Clear indications emerged that the critical questions about restrictions on overland flights must soon be answered. In addition, the advent of supersonic flight and jumbo jets forced a fresh look at the aviation policy of the United States in order to assure continuation of a sound and efficient system of air transport. In the maritime area, the growing trend away from the previous willingness of nations to entrust regulation of shipping to conferences raised difficult questions about the future of the international shipping regulation system. Finally, passage of the Highway and Motor Vehicle Safety Acts caused many countries to display a steadily increasing interest in the international implications of U.S. programs and great emphasis was placed in the development of a single set of international motor vehicle safety standards.

International Industrial Cooperation. Industrial cooperation with foreign nations, including "iron-curtain" countries, holds the promise of enormous potential benefits to the U.S. Government and to industry. Establishment of a research information exchange system, for example, can provide the knowledge that will allow program managers in the U.S. and other countries to compare their on-going and planned transportation research, and development and demonstration projects. This kind of system permits immediate identification of duplicative projects and hopefully stimulates the undertaking of mutually agreeable cooperative efforts to conduct the required research. Furthermore, by identifying programs with a mutual national and international interest, foreign and U.S. industries can be brought together to work out joint venture programs for the development, manufacture, and marketing of the appropriate transportation systems and equipment.

The establishment of such programs with individual nations has proved a real challenge thus far to the Department's management and diplomatic ingenuity. During the year, the first steps were taken to identify promising industry-to-industry programs. Proposals for cooperative efforts were made to 11 foreign countries (including "iron-curtain" countries). Specific understandings were reached with several countries to cooperate in the joint development of aircraft ground guidance systems, anti-fog systems, and aeronautical communications satellites. Agreement was reached with the United Kingdom to share jointly the cost of a model U.S./U.K. industrial cooperative program that is designed to define the specific areas where cooperation will provide the greatest return.

The initial work was completed to establish the information system that will serve as the foundation for a worldwide Research Information Exchange System.

Facilitation. Creation of a modern system for international transportation and trade depends heavily upon the ability and success of the United States in such areas as reducing the costs of doing business, removing the numerous impediments to the rapid and efficient flow of passengers and goods, and improving the aviation ground facilities so that they more closely match the technological advances made in transport vehicles.

With these needs in mind, the "Facilitation Program" was launched by the Department during 1968. Its purpose is to bring about savings of time and money in the movement of goods and people by eliminating archaic procedures, red tape, and other impediments. In addition, the program seeks the adoption of modern and simplified techniques and facilities that are essential to an effective international and intermodal transportation system.

The most significant progress in fiscal year 1968 was achieved in the legislative area. The "Trade Simplification Act" was submitted to Congress and received a hearing in the Senate. This Act is designed to modernize intermodal transportation procedures by allowing for through-rates and through-billing. The Seaman's Act of 1968, which modernizes the Shipping Articles and mechanizes documentation of merchant seamen, was also forwarded to the Congress.

In other areas, the Transportation Facilitation Committee was established and began functioning as a joint industry-government organization with task forces and work groups successfully attacking and removing barriers in all phases of transportation administration, documentation, and procedures. Progressive measures of facilitation, were advanced in various national and international forums. These measures included a one-stop inspection system, improvements in the use and movement of containers, pre-clearance of international passengers, and a system for expediting the clearance of vessels into ports.

Telecommunications. Satellites and the use of satellites to serve mankind have intrigued the world. The planning and development of new telecommunications systems, based on the latest satellite technology for use by the various modes of transportation was one of the most challenging technical and operations problems that faced the Department in fiscal year 1968. Likewise, of major concern to the Department this year was one of the Government's key management problems, the existing polyglot of telecommunications systems and responsibilities. During 1968, therefore, the Department contributed substantially to the Presidential Task Force on Communications Policy and to the Bureau of the Budget study of telecommunications organization.

Environmental Impact. Congress and the public have demanded that a number of things be done to minimize the adverse impacts of transportation on the environment. The Department assumed the burden of assuring that every available management and technological means is used to provide transportation services without destroying the Nation's natural and cultural resources or social institutions in the process. Enhancement of the environment is an additional challenge to the Department that must be met as the national transportation system is planned and built.

In recognition of his responsibilities to assure the minimum feasible impairment of the environment, and indeed whenever possible to enhance the quality of the environment as part of transportation projects and systems, the Secretary directed establishment of the Office of Environmental Impact early in fiscal year 1969.

Technical Assistance. When the Department was established, the President instructed it to "assist, in cooperation with AID, the less-fortunate nations of this world to overcome their critical transportaion problems." During the year the Department established a program to carry out the President's instruction and to assure that U.S. investments of financial and human talent resources in transportation projects for less developed countries and regions are best suited to orderly advancement of the economy involved. This year the Department began providing transportation management and technical advice and assistance to AID, international monetary institutions, and several less-developed nations.

Emergency Preparedness. Also assigned to the Assistant Secretary for International Affairs and Special Programs was the emergency preparedness function, transferred from the Secretary of Commerce by Public Law 89–670. It involves leadership and coordination of the entire national transportation community in its planning efforts and, potentially, the control of all actual transportation in time of war or other national emergency. This activity, though identified with the Department of Transportation, was initially funded entirely by the President's Office of Emergency Preparedness. It had the closest of liaison ties with the Presidential Office. Its responsibilities include preparation for emergencies affecting the entire transportation system of the country and planning for the Department's activities under emergency situations.

Though limited by paucity of funds, the Office engaged in its many essential tasks, including the collection of data on requirements for the movement of people and goods in emergency situations, analysis of the data, coordination of preparation of transportation control systems for use in emergencies, recruiting and training of Executive Reservists to assume duties in transportation during wartime, and planning for the Department's activities in time of war, including relocation of the Department. This function has recently been assigned to the Assistant Secretary for Administration.

Icebreaker *Glacier* in McMurdo Sound.

Chapter III

UNITED STATES COAST GUARD

The Coast Guard is responsible for enforcing or assisting in the enforcement of Federal laws on the high seas and waters subject to the jurisdiction of the United States. These laws govern navigation, shipping, and other maritime operations, and the related protection of life and property. The service also provides and coordinates maritime search and rescue facilities for marine and air commerce and the Armed Forces. Other functions include promoting the safety of merchant vessels, conducting oceanographic research, furnishing icebreaking services, and developing, installing, maintaining, and operating aids to maritime navigation. The Coast Guard has a further responsibility to maintain itself in readiness to function as a specialized service of the Navy in time of war or national emergency.

General Administration

Information Activities. Through its information program the Coast Guard continued to disseminate spot news, but featured materials emphasizing boating safety and oceanography. For the first time it produced its own training films in order to explain some of the unusual problems of the Service; for example, explosives handling and the techniques of servicing specialized types of aids to navigation. Radio and TV spots were released in greater numbers and steps were taken to reactivate the post of historian in order to recapture elements of the Coast Guard's rich heritage, an activity neglected since World War II. A liaison officer worked full time to establish good relationship with the Navy League.

Legislative Activities. Coast Guard Headquarters continued to monitor legislative proposals in Congress. Steps were taken to strengthen and better integrate methods of handling legislative matters. Many Congressional field tours were conducted, including two in Vietnam, to allow committee members to see the operations of the Service.

Civil Rights. The Coast Guard continued to investigate complaints alleging discrimination involving military and civilian personnel within the framework and requirements of the Civil Rights Act. In addition, inspection of activities sponsored by the Coast Guard for civil rights compliance went forward. An investigating force was kept busy to insure compliance of civilian contractors with the Civil Rights Act.

Telecommunications. New tasks were undertaken by telecommunications experts. Thus, the Coast Guard delved into requirements for satellite-oriented communications for the next 20 years ahead to prepare for a world conference on that subject. The national ocean buoy study imposed a requirement to investigate and recommend standards for national control and allotment of acoustical frequencies in the ocean medium. Coast Guard telecommunications personnel continue to represent the Service, the Rail, Highway, and St. Lawrence Seaway Administrations, and the Department of Health, Education and Welfare at domestic and international meetings to insure the reservation of frequencies for their operational usage. Probably the greatest challenge has been the investigation of the telemetry problems incident to the transmission of oceanographic data from buoys, vessels, and observation stations to the national center.

International Affairs. The International Affairs Division has continued its mission to support and coordinate activities in international maritime safety. Supervision of Coast Guard foreign assistance missions and personnel, negotiations relative to extension or changes in worldwide Loran systems, and supervision over sponsorship of the next International Lifeboat Conference were some of the activities undertaken by Headquarters. The Coast Guard provides the Executive Secretariat for the International Convention for the Safety of Life at Sea (SOLAS) 1960 Subcommittee of the State Department's Shipping Coordination Committee, the Executive Secretariat for the U.S. National Committee for the Prevention of Pollution of the Seas by Oil, and provides major support of U.S. involvement with the Intergovernmental Maritime Consultative Organization (IMCO). The latter, with its Maritime Safety Committee and many maritime technical subcommittees, has recenly been active. The Coast Guard's International Affairs Division has been largely responsible for coordinating the U.S. efforts that resulted in such accomplishments as: the entry into force on July 21, 1968, of the International Convention on Load Lines of 1966, the 1966 Amendments to the SOLAS Convention regarding existing passenger vessels, the International Dangerous Goods Code, the Code of Safe Practice for Bulk Cargoes, and the deliberations regarding prospective changes to the International Oil Pollution Convention as a result of the *Torrey Canyon* disaster.

Management Improvement

The Coast Guard continued its energetic and aggressive campaign to explore all potential opportunities for better utilization of current resources. All areas that were considered susceptible to management improvement were reviewed and the "cost effective" principle was applied when appropriate. With this positive attitude and in line with the President's cost reduction/management improvement program, the Coast Guard has reported actions with an estimated dollar-value benefit of $38 million for fiscal year 1968.

Foremost among the projects was an estimated $21 million cost avoidance for the U.S. Government as a result of the Coast Guard being able to supply five high-endurance cutters with crews for deployment to Southeast Asia for patrol duty without any major additional cost. By eliminating or reducing some programs involving its high-endurance fleet, and by substantially increasing the annual time away from home port—the Coast Guard was able to accomplish this requirement without any critical impairment to its basic mission. However, this diversion imposed a severe strain on ships and crews working many hours over the normal tour of duty to provide adequate coverage for the Coast Guard's normal missions.

Improvement in supply management contributed substantially to the cost reduction effort, with $5.5 million in cost avoidance savings reported from procurement reductions, exercising an option under the multi-year procurement contract, reducing the number of items in inventory and redistribution of stocks to avoid unnecessary procurement. A sizable portion of the supply savings came about through the screening of Federal surplus material listings, to acquire tools and related equipment which were used to fill immediate needs or to replenish inventories.

A substantial manpower gain was realized in fiscal year 1968 by reallocating some 248 military and civilian positions throughout the service to higher priority activities where additional personnel were urgently needed to cope with an increasing workload resulting from the Nation's expanding population and economy. This was achieved through redistribution of workload and more effective manpower utilization.

Important to the management improvement effort were some 1,422 military and civilian suggestions received during the fiscal year which, together with benefits realized from civilian superior performance, brought supplemental savings estimated at $738,000.

Coast Guard Operations in Vietnam

During fiscal year 1968, the Coast Guard's 26 patrol boats and five high-endurance cutters deployed to Southeast Asia for "Market Time" surveillance operations continued to build upon their already impressive record. Particularly during the last 6 months of fiscal year 1968 the tempo of operations dramatically increased, with units being called upon more and more to render naval gunfire assistance to forces ashore. This assistance, in many cases, made the difference between victory and defeat for both U.S. and South Vietnamese ground forces. The cutters fired 480 such missions resulting in the killing or wounding of over 600 Viet Cong, and the destruction or damaging of 1,100 structures and 260 junks. The tedious task of boarding and searching thousands of junks continued unabated. Coast Guard units boarded and searched 40,000 junks during the year, and, in addition, observed some 50,000 others. In July 1967, a patrol boat from Division 12 (Danang) played a large part in the capture of a 100-foot North Vietnamese trawler. One Coast Guard officer (titled Commander, Gulf of Thailand Surveillance Force/Senior Naval Advisor, Fourth Coastal Zone) served as the commander of all U.S. naval operations in the Gulf of Thailand.

For the first time since their deployment in May 1967, units of Squadron Three engaged in fire-fights with the enemy. Three of the high-endurance cutters, aided by patrol boats, were directly responsible for the defeat of three of the four North Vietnamese armed 100-foot trawlers attempting to make a coordinated infiltration into South Vietnam on March 1. Two were destroyed by mortar fire, and one was turned back while still on the high seas. In that action, termed the most important naval battle of the Vietnam War, Coast Guard units played the leading roles.

During the year, the military assistance program continued to place a heavy workload on Coast Guard explosive loading expertise. Two additional Explosive Loading Details were deployed to provide supervisory and technical assistance for the safety of U.S. vessels off-loading military explosives. The Coast Guard had four such eight-man teams operating in Saigon (Cat Lai), Cam Ranh Bay, Qui Nhon, and Danang.

In addition, the Coast Guard continued to provide aids-to-navigation and merchant marine advisory assistance in Southeast Asia. In the field of aids-to-navigation, additional areas such as Hue, Phan Ran Vung Tau, and Cua Viet in Vietnam and Sattahip, Thailand received new lights, buoys, and ranges. Coast Guard buoy tenders continued to make short-term deployments to tend aids to navigation in Southeast Asia. The Coast Guard Advisors to Military Sea Transportation Service officially became the Coast Guard Merchant Marine Detail, coming under the operational control of the U.S. Embassy in Saigon.

Search and Rescue

The Coast Guard's Automated Merchant Vessel Reporting System (AMVER) entered its tenth year of operation during fiscal year 1968. Additional international support was obtained when Australian authorities designated Sydney Radio as an AMVER station. During this year the number of passages plotted leveled off. Because of this, a program was initiated to increase public relations efforts among maritime interests in order to increase voluntary participation by merchant ships of the world. Two foreign governments which have been outstanding in their efforts to increase participation by ships under their flags were West Germany and Greece. AMVER provided a total of 1,664 lists of ship's positions for emergency use. Planning and programming of a third generation computer complex with provisions for the AMVER System and other operational applications went forward during the year. When implemented, the speed of the service provided by AMVER will increase appreciably.

During this fiscal year, a precautionary system of vessel reporting and voyage following for large ships was started on the Great Lakes. This system is called the Lake Vessel Reporting System (LAVERS) and is operated on a test basis. While the primary purpose of LAVERS is to provide earlier alerting of search and rescue personnel in cases where a casualty occurs in which no distress message is sent, additional benefits have included furnishing better information on weather and sea conditions to ships on the Lakes. The LAVERS is being tested with the St. Lawrence Seaway traffic control networks to determine whether it can improve the flow of traffic through the Seaway.

The Coast Guard Search and Rescue School, staffed by U.S. Coast Guard and U.S. Air Force instructors, offered a 4-week course of instruction to provide uniform search and rescue training to selected students of the U.S. Armed Forces, foreign military services, Federal Aviation Administration, and other appropriate foreign and U.S. Government civilian organizations. Each class had a maximum capacity of 24 students. In fiscal year 1968 the 197 graduates of this school included 129 Coast Guard, 52 Air Force, and one Navy personnel as well as 12 foreign nationals and three U.S. civilians. In addition several special courses were held. Two 2-week courses for U.S. Coast Guard Cadets provided 45 graduates and one 1-week special orientation course for senior staff officers provided five U.S. Air Force and 12 U.S. Coast Guard graduates.

The following summarizations are a few of the typical examples of Coast Guard assistance rendered during fiscal year 1968.

Resuscitation Saves Child—While walking along the beach in the vicinity of the Coast Guard Station at Pascagoula, Mississippi on July 7, the attention of the parents of a 2-year-old girl was distracted. Moments later they saw the child floating in the water. Pulling her from the water, they rushed her to the Coast Guard Station for help where a seaman immediately administered mouth-to-mouth resuscitation which revived the child after 7 minutes. The child was taken to a hospital where she was checked by a doctor and then released.

Repeated Expansion Concept in Search Operation—On July 24, 1967, the Coast Guard Station at Rochester, New York was notified that a 16-foot sailboat with two youths aboard was overdue from a day's sail. The weather was reported as: Winds to 40 miles per hour in gusts during a thunderstorm, 1- to 2-foot seas, visibility 2 miles to zero in squalls. A motor lifeboat and a 30-foot utility boat commenced a surface search. An aircraft was dispatched to conduct a first light air search. On the third expanded search the boat was located by the aircraft within the search area, dismasted but safe.

Air Search Finds Small Targets—On the evening of August 16, 1967, Petroleum Helicopters Inc. reported that one of their helicopters was overdue. It had landed on a platform in the Gulf of Mexico, embarked two passengers, and departed for another platform. No communications had been received since its departure. Gulf Oil Company had started a search with civilian units in the area. The weather was poor but improving. Coast Guard aircraft from Mobile and Corpus Christi Air Stations along with the CGC *Point Lookout* and CGC *Point Sal* were dispatched. In the early morning hours of August 17 one of the Coast Guard aircraft sighted two survivors, both of whom were picked up by the M/V *Good Tide*. A half-hour later the aircraft located the body of the third person, which was retrieved by the CGC *Point Lookout*.

Long Range Mayday by Citizens Band Radio—Coast Guard personnel receiving reports of distress transmitted by Citizens Band equipment have been cautioned not to discredit such reports which at first glance may appear to be beyond the range capabilities of the equipment.

On September 28, 1967, the Sheriff of Missoula, Montana, advised the Sheriff, San Diego, California, that a citizen of Missoula, Montana, reported a MAYDAY call on Channel 15, Citizens Band indicating that personnel were stranded on Guardian Angel Island in the Gulf of California and had requested the Coast Guard at San Diego be notified. The reported call sign was checked out and found to be registered to the University of California. It was then ascertained that the stranded vessel was a 36-foot Landing Craft Vehicle Personnel (LCVP) being operated by a student from the University of California and two other students working out of Bahia, Los Angeles on geological studies. U.S. Coast Guard Air Station, San Diego dispatched an aircraft to conduct a shore line search of Guardian Angel Island. On September 29, 1967, the wreckage of the LCVP was located along with the three survivors, who were subsequently evacuated by surface craft. Approximately 12 hours after notification, vessel ownership was verified and the wreckage found and after 14 hours the survivors were aboard a vessel and on their way to safety. The distance between Missoula, Montana and Guardian Angel Island is approximately 1,080 nautical miles. The range of Citizens Band radio is normally limited due to its relatively low power, but representatives of the FCC report that ranges in excess of 2,000 miles are not uncommon in certain atmospheric conditions.

Hurricane Beulah—The Commander, Eighth Coast Guard District began preparations for Hurricane Beulah on September 15, 1967, by alerting all of his forces to the possibility of a major disaster. On September 18, 1967, the CGC *Reliance* was ordered to sea to circle around the storm and return to the coast behind it. On the same day, one rotary-wing aircraft, with double crew, was deployed from Houston to Corpus Christi to augment the fixed-wing aircraft there and assist in post-hurricane operations. Fixed-wing aircraft from Corpus Christi began reconnaissance flights dropping message blocks to vessels and persons in isolated areas. These flights were continued on September 19, 1967. It then appeared that hurricane force winds would reach Port Isabel, Texas about midnight that night so Coast Guard small boats south of Port O'Connor were moved to secure moorings. While this deployment was in progress, five persons were rescued from a small British vessel which grounded in the heavy surf just south of Port Isabel.

Beulah struck about 1:00 a.m. on September 20, 1967, and raged for the next 16 hours in South Texas. However, before dark on September 20, 1967, the winds dropped below 50 m.p.h. and Coast Guard personnel, with their equipment, began returning to their regular stations. On the morning of September 21, 1967, in spite of bad weather, Coast Guard aircraft began reconnaissance. The helicopter at Corpus Christi and five others from Houston, New Orleans, and Mobile Air Stations were deployed to Harlingen, Texas for search and rescue operations. The CGC *Reliance* arrived off Port Isabel on the afternoon of September 21, 1967, and provided communications to an area where such facilities were almost nonexistent.

On September 22, 1967, one more helicopter and another fixed-wing aircraft from Mobile were sent to augment the forces in Corpus Christi.

A total of five fixed-wing aircraft, seven helicopters, 31 pilots and 66 air-crewmen were committed to operations in distressed areas. Six Navy and 14 Army helicopters were placed under Coast Guard operational control early in the operation. On September 23, 1967, a C–130 aircraft from Coast Guard Air Station Elizabeth City and an Air Force C–130 aircraft from New Hampshire were deployed. On September 24, 1967, personnel from the 4th Army arrived in Harlingen and a joint Coast Guard-Army Operations Center was established. Coast Guard aircraft rescued over 400 persons, including 350 Mexican nationals, from positions of peril.

Coho Salmon Fishing Disaster—On September 23, 1967, a severe squall passed through the Frankfort-River Platte area of northern Lake Michigan. Twenty-five-foot waves generated by the squall caught off guard an estimated 1,000 small boats fishing for Coho salmon. Between 150 and 200 boats were beached and many more were either capsized or otherwise in distress.

During the next four days Coast Guard aircraft flew 33 sorties for a total of 54 hours and Coast Guard small boats made 20 sorties for a total of 55 hours. State and local police provided beach patrols and private individuals also aided in the operation.

One of the greatest problems faced by the Coast Guard was the confusion created by the hundreds of people unaccounted for after the storm, most of whom were not in trouble but had just not contacted their friends or family. Each report of a missing person was carefully followed through so that within 4 days it was determined that seven bodies had been recovered and only one person remained unaccounted for. The Coho salmon which attracted the large number of boats to the area remained in season for another 3 weeks. During this time the Coast Guard maintained daily aircraft and small boat patrols of the area.

Man in Water Located—The 40-foot house boat, *Mistress*, with four persons on board reported via a MAYDAY that it had lost a man wearing a lifejacket 80 miles NW of Clearwater, Florida. The vessel was dead in the water with two forward compartments flooded due to a hull rupture in the bow. Shipboard pumps were controlling the flooding. Aircraft from Coast Guard Air Stations at Mobile, St. Petersburg, the CGC *Point Lobos* and the CGC *Point Swift* were dispatched. The vessel was located and a pump-drop made. Seventy-five minutes later the man was sighted by a Coast Guard aircraft. A raft was dropped, but the survivor could only grasp the side. The *Mistress*, vectored by the aircraft, arrived on-scene and picked him up. The survivor was found exhausted and in shock after spending 8 hours and 45 minutes in the water. He was evacuated to a St. Petersburg hospital via a Coast Guard helicopter. The CGC *Point Swift* escorted the *Mistress* (now under her own power) to Clearwater Pass where a Coast Guard Auxiliary boat completed the escort to Clearwater, Florida.

CGC Citrus Extinguishes Fire on Japanese Ship—On January 24, 1968, the *Seifu Maru*, a refrigerator vessel of Japanese registry, reported a fire in Number 5 hold and requested clearance to enter Dutch Harbor, Alaska to combat it. They also reported that two crew members had been overcome by smoke and requested their evacuation for hospital treatment. Clearance was granted and the CGC *Citrus* was ordered to proceed and assist in fighting the fire. The burning ship arrived in Dutch Harbor on January 24, 1968, established communications with CGC *Citrus* (en route to Dutch Harbor), and advised that the fire was raging between the decks in the cargo which consisted of 18 million empty cardboard cartons folded flat. Fire fighting parties from CGC *Citrus* began assisting the crew of the Japanese vessel. Three patients from the *Seifu Maru* were evacuated by a Coast Guard aircraft to Kodiak for hospitalization. Efforts to extinguish the blaze continued throughout January 25, 26, and 27, 1968. By dawn of January 27, 1968, the fire was extinguished.

The Japanese crew overhauled the debris while CGC *Citrus* personnel maintained reflash watches and conducted pumping operations. The *Seifu Maru* put to sea and jettisoned debris, then returned to Dutch Harbor to effect repairs. Personnel from CGC *Citrus* made a final inspection of the damaged Japanese vessel and were released on January 28, 1968, when the *Seifu Maru's* master advised that further Coast Guard assistance was not required. The fire fighting assistance rendered by the crew of CGC *Citrus* in a 4-day operation saved the Japanese vessel.

Rescue of the Crew of the M/V Velikii Ustiug—An assistance case of servicewide interest occurred in the North Atlantic on March 13, 1968. Argentia Radio Station reported hearing an "SOS" on 500 kHz, originated by a vessel, later determined to be the M/V *Velikii Ustiug* of Russian registry. The distress call was also heard by Ocean Stations Charlie (SPENCER) and Delta (CASCO). Although the distress call was repeated, no contact could be established with the Russian vessel. She failed to answer repeated calls from Coast Guard radio stations and vessels, although she was heard working other Russian ships. Apparently, the *Velikii Ustiug* contacted another Russian vessel which contacted the Sea Rescue Coordination Center in Leningrad, which in turn relayed the information to the vessel's agent in Montreal. The agent notified RCC Halifax then advised the Commander, Eastern Area's RCC in New York of the case. The *Velikii Ustiug* was reported to be a 495-foot cargo vessel, sinking in position 41–35N, 51–53W and her crew had abandoned ship. The Commander immediately issued an all-ships broadcast. A Coast Guard C–130 aircraft from Elizabeth City, temporarily based in Argentia for Ice Patrol duties, was ordered to the scene and was designated the On Scene Commander. ESCANABA, on Ocean Station Echo, was ordered to proceed and assist. Several ships answered the broadcast and all but four were released. A second Coast Guard aircraft arrived on the scene and established communications with the M/V *Ledus* (RU) and the M/V *Adolph Leonhardt*, which were already in the area. After an expanding square search, the aircraft located the survivors in one lifeboat and one liferaft and vectored the *Ledus* alongside them. The *Ledus* advised Argentia Radio Station "all members of the crew on board". The broadcast was cancelled, all merchant vessels were released, ESCANABA resumed OS Echo, and the aircraft returned to Argentia via Gander.

The following message (quoted in part) was received from Commander, Canadian Maritime Command:

> . . . "APPRECIATION ON SAR VELIKII USTIUG . . . THE FOLLOWING MESSAGE RECEIVED FROM I. H. MATHERS AND SON LTD, STEAMSHIP AGENTS, HALIFAX, WHO REQUESTED IT BE RELAYED TO THE APPROPRIATE AUTHORITIES QUOTE SINCERELY THANK YOU FOR YOUR DRASTIC MEASURES AND OPERATIVE IN SALVAGE OPERATION. WOULD YOU BE SO KIND AS TO PASS ON BEHALF OF THE BALTIC STEAMSHIP COMPANY, ALL OUR SEAMEN AND FAMILIES OF THE SEAMEN (RESCUED) OUR GREATEST THANKS TO THE FLYING OFFICERS OF THE COAST GUARD AND ALL THE PEOPLE WHO PARTICIPATED IN SUCCESSFUL SEARCH AND OPERATION ON SALVAGE OF THE SOVIET SEAMEN OF LATE VELIKII USTIUG. WE ARE MUCH OBLIGED TO ALL OF YOU. VASILJEV, V PRESIDENT OF BALTIC STEAMSHIP COMPANY MORFLOT LENINGRAD UNQUOTE.
>
> THE COMMANDER, MARITIME COMMAND ADDS HIS CONGRATULATIONS TO BOTH THE ATLANTIC RESCUE CENTRE AND THE CREW OF C–130 CG–1349 FOR THEIR FINE EFFORTS LEADING TO THE RECOVERY OF THE SURVIVORS OF THE M/V VELIKII USTIUG."

CGC Sedge Combats Dock Fire—On April 4 and 5, 1968, CGC *Sedge* assisted local forces in combating a fire at Ocean Dock in Cordova, Alaska. Duty personnel on board CGC *Sedge* observed a fire at Ocean Dock while the ship was moored at City Pier, in maintenance status. A small boat with fire fighting personnel and equipment was immediately dispatched. Additional personnel were sent to assist by ship's vehicle. Efforts were begun to restore to operation CGC *Sedge's* main motor, which was down for maintenance at the time of the incident.

Upon arriving on-scene, CGC *Sedge's* boat party commenced fire fighting operations alongside the dock in close proximity to numerous severe explosions. Personnel dispatched by vehicle were assigned to two groups by the Cordova fire chief. One group, manning two hoses, attacked the fire from the dock, entering burning warehouses as soon as possible. The second group fought the fire from beneath the dock where they were forced to work in water that was neck-deep. CGC *Sedge's* vehicle returned to the ship several times for additional personnel and equipment. Eventually, all the ship's portable equipment and all but 13 members of her crew were engaged in the fire-fighting operations. Additional foam, requested by Cordova authorities, was flown in by Coast Guard Air Station Kodiak and delivered to the fire by CGC *Sedge's* vehicle.

In less than 2½ hours after observing the blaze, CGC *Sedge* was able to get underway on one main engine, operating with only the 13 personnel left aboard. Considerable effort was required to maintain position alongside the dock in strong tidal currents. Two hoses were brought to bear on the fire for 3 hours until the fire came under control. The ship then remained hove to off the dock and provided illumination for another 2 hours. Many of the *Sedge's* personnel remained on the scene guarding against reflash.

The following day additional assistance was provided at the city's request to combat a fire in a crane located at Ocean Dock. Excellent coordination and cooperation was evident throughout the entire operation. Coast Guard and civilian personnel combined their efforts efficiently to extinguish the blaze.

A summary of the Coast Guard's search and rescue workload is included as Table 1.

Marine Inspection and Allied Safety Measures

The Merchant Marine Safety program of the Coast Guard has the objective of minimizing lives lost, property damage, and personnel injury in marine transportation. This preventive program had its beginning in 1838 when Congress, alarmed at the frequency and severity of boiler explosions, passed the firt Federal law "for the better security of life" on steamboats. This early law provided for "inspectors" of steamboats and set forth specific requirements regarding the examination of boilers and hulls. In subsequent years, additional laws were passed by Congress redefining the scope of inspection, broadening the inspection role to include other classes of vessels, and introducing the licensing and certification of vessel crews.

These laws, designed to afford protection through prevention are implemented by Federal regulations enforced by Coast Guard personnel. The basic organization of this Coast Guard program vests the authority for enforcing these regulations at the local level by officers in charge [marine inspectors—OCMI], each of whom is responsible for the performance of merchant marine safety duties within a specified geographical area termed a marine inspection zone. These zones include all the states of the United States, Puerto Rico, and Guam. This merchant marine safety program extends to virtually all classes of commercial vessels of the United States. Certain foreign vessels trafficking to and from U.S. ports are also subject to this program.

As a result of the piecemeal manner in which the inspection laws were extended to include additional groups of vessels, the impact of the inspection program on commercial vessels is not uniform. The term "inspected vessel" denotes those vessels which are subject to the full regulatory program and must possess a "Certificate of Inspection" issued by an OCMI in order to be navigated lawfully. Vessels which are not issued a Certificate of Inspection are collectively referred to as "uninspected vessels". The impact of the merchant marine safety program on these uninspected vessels varies. A small number are subject to regulations on manning, licensing of operators, and/or load lines. All are subject to minimal equipment and operational requirements as specified by the Motorboat Act of 1940.

TABLE 1. Search and rescue activities

	Response by			
	Aviation Units	Vessels	Shore Units	Total
Assistance calls responded to:				
Private vessels	2,470	2,713	24,557	29,740
Commercial fishing vessels	428	1,213	2,771	4,412
Other commercial vessels	235	577	2,280	3,092
Government & public vessels	43	88	255	386
Foreign vessels	71	145	177	393
Total vessels	3,247	4,736	30,040	38,023
Private aircraft	274	50	145	469
Commercial aircraft	57	22	32	111
Military aircraft	348	52	61	461
Other Gov't. & public aircraft	5	1	4	10
Foreign aircraft	5	1	4	10
Total aircraft	689	126	246	1,061
Personnel only	1,151	553	2,996	4,700
Miscellaneous	441	317	1,527	2,285
Total	5,528	5,732	34,809	46,069
Major type of assistance rendered:				
Located	1,282	343	1,537	3,162
Refloated or dewatered	54	345	3,724	4,123
Towed	208	2,460	16,141	18,809
Escorted	245	235	1,201	1,681
Fueled or repaired	20	188	362	570
Medical	622	337	1,735	2,694
Assistance to persons in position of peril	934	411	1,951	3,346
Searches and attempts to assist	1,723	1,066	6,904	9,693
Other assistance	390	347	1,254	1,991
Totals	5,528	5,732	34,809	46,069
Persons involved in assistance cases:				
Lives saved	495	351	1,588	2,434
Otherwise assisted	8,409	22,092	84,089	114,590
Total assisted	8,904	22,443	85,677	117,024
Value of property, including cargo:				
Vessels				$2,427,363,000
Aircraft				863,078,000
Miscellaneous				311,212,000
Total				$3,601,653,000

All vessels regardless of inspection status are subject to accident investigation regulation. It is this investigative process and analysis which provides the surveillance to ensure the adequacy of the Coast Guard preventive safety regulatory program as well as providing an evaluation of total Coast Guard marine safety effort. Summaries of merchant marine safety activity during fiscal year 1968 are included in Table 2.

Marine Accident Investigation. During fiscal year 1968, the Coast Guard investigated 2,601 casualties to personnel on commercial vessels not resulting from a vessel casualty. Also investigated were 2,572 vessel casualties, some of which also resulted in injury or death to personnel. An important part of the Coast Guard merchant marine safety program is the investigation of marine casualties to determine their causes and develop preventive measures when necessary. A total of 5,173 marine casualties involving commercial vessels were investigated by the Coast Guard during fiscal year 1968, six of which were considered major and were investigated by marine boards of investigation. Of the six major casualties investigated by marine boards, three resulted in the loss of 64 lives and three were considered major by virtue of the resulting properly loss.

On September 29, 1967, the SS *Panoceanic Faith* flooded and sank with the loss of 36 of its crew members. The vessel was proceeding from San Francisco to Bombay via Yokohama loaded with ammonium sulphate; it encountered severe weather early on the voyage and began flooding in its forward spaces. After 5 days of struggle with the weather and flooding, the master was forced to call for immediate assistance. The vessel had developed a heavy starboard list and boiler trouble. When the master decided to abandon ship, none of the lifeboats could be launched either from the high port side or from the lower starboard side.

Another marine casualty deemed major because of heavy loss of life occurred on March 16, 1968, at Point a la Hacha, La., when the tug *Midwest Cities* and two oil barges collided with the SS *African Star* before dawn. A fire immediately swept the deck of the SS *African Star*. Twenty-one persons were dead or missing as a result of this casualty. By the end of the year the marine board had not completed its investigation due to severe burns suffered by personnel of the SS *African Star* and their inability to appear before the board.

On March 3, 1968, the SS *Ocean Eagle* (Liberian), laden with a cargo of 19,000 tons of crude oil, broke into two sections at the entrance to the harbor of San Juan, Puerto Rico. As the vessel approached the harbor entrance the rise and fall of the seas caused it to strike bottom, break in two and release approximately 3.5 million gallons of its cargo into the harbor and onto adjacent beaches.

An explosion and fire occurred on the Continental Oil Company's Platform 43–A on October 24, 1967, in the Gulf of Mexico resulting in only minor injuries to the eight men aboard. The platform was completely destroyed by fire and property damage amounted to $3.5 million.

The sixth major marine casualty reported to the Coast Guard and investigated by a marine board during fiscal year 1968 involved the capsizing

TABLE 2. Merchant marine safety activities

Type of activity	Number F. Y. 1967	Number F. Y. 1968
Commercial vessels of the United States Total	49,051	51,590
Inspected Vessels:		
Cargo and miscellaneous*	2,223	2,192
Tank ship	408	401
Tank barge	2,782	2,889
Passenger (over 100 gross tons)*	201	200
Small passenger	3,645	3,671
Total	9,259	9,353

* Vessels in these categories over 1,000 gross tons, exclusive of Great Lakes and Public vessels at the end of FY 1967 totaled 1,083; at the end of FY 1968–1,104.

Type of activity	F. Y. 1967	F. Y. 1968
Uninspected Vessels:		
Motor towing (over 15 gross tons)	6,000	
Commercial fishing (over 5 net tons)	13,000	
Miscellaneous (included various barges, dredges, and other nondescript vessels over 5 net tons)	18,000	
Total	37,000	
Material Safety Activities:		
Vessels certificated	9,259	9,353
Vessels issued original certificates	655	580
Marine Personnel Activities:		
Licenses issued	25,361	25,390
Merchant mariners' documents issued	30,524	28,670
Seamen discharged	507,156	527,656
Personnel investigations completed	19,572	25,294
Marine Accident Investigation Activities:		
Vessel casualties**	2,353	2,572
Accidents to personnel	2,461	2,601
Total	4,814	5,173

**Includes Marine Boards of Investigation

Type of activity	F. Y. 1967	F. Y. 1968
Merchant Marine Safety Program Benefits:		
Deaths prevented	1,070	1,039
Injuries prevented	14,450	14,026
Property damage prevented (in millions of $)	$150.0	$123.2

and sinking of the oil rig *Julie Ann* on March 13, 1968, with no loss of life. The rig was in tow by three tugs when it began taking on water off the coast of Louisiana. The crew was evacuated before the capsizing.

Material Safety. The Joint U.S./Canadian Technical Committee for Great Lakes Load Lines began work in January 1967. Its purpose is to frame recommendations to the Canadian and United States administrations for up-to-date load line rules, reflecting the impact of the new International Load Line Convention and the new developments in marine technology. The Joint Committee, which is composed of industry, government, and classification society representatives, is a continuation of the cooperation between United States and Canada in joint control of the Great Lakes.

The advent of the 1966 Load Line Convention which came into force on July 21, 1968, as the new world-wide standard on Load Lines, required continual preparatory work throughout fiscal year 1968. The new regulations were presented to the Merchant Marine Council in November 1967 for inclusion in the Public Hearing Agenda (March 1968). As a result of the public hearing, it was decided to rewrite the regulations. They were published on July 12, 1968 in the Federal Register.

Yacht Documentation. A leaflet entitled Yacht Admeasurement and Documentation, CG–177, dated November 1, 1967, was published for the information and guidance of the yachting public. Public Law 80–219, approved September 29, 1967 (79 Stat. 891), authorized the Secretary, when measuring vessels for tonnage register, to omit from gross tonnage those spaces used for dry cargo and stores above the uppermost complete deck, and between that deck and the deck next below, and certain other space without requiring that tonnage openings be fitted as a condition to exemption as formerly required. This method is known as the optional dual-tonnage method, and the regulations became effective March 11, 1966. The backlog of cases to adjust the tonnages of existing vessels created by the enactment of this law was completed. Public Law 89–476, approved June 29, 1966 (80 Stat. 229), permitted the Secretary to assign gross and net tonnages to vessels intended to be used exclusively as pleasure vessels, without the necessity of formal admeasurement, by the application of a formula. The regulation became effective March 1, 1967. During the 6-month period from November 1, 1967, to April 30, 1968, 1,545 yachts were measured by this simplified method. During a 12-month period ending April 30, 1968, there were 6,245 measurements of vessels completed for all types and sizes of vessels at all ports. This figure includes admeasurements, re-admeasurements, adjustments, and yachts measured by the simplified formula. For a similar period ending April 30, 1967, there were 5,210 such cases completed. Present indications are that the increased trend of admeasurement activities will continue during fiscal year 1969.

Inter-governmental Maritime Consultative Organization. Participation in the Inter-governmental Maritime Consultative Organization (IMCO) activities has continued during fiscal year 1968. Further studies were undertaken, on both national and international levels, to which the Coast Guard made substantial contributions. This activity has resulted in significant progress toward improving international safety standards. In the Subcommittee on Subdivision and Stability the United States proposal formed the basic document for agreement on Uniform Interpretation of Regulation 27 of the 1966 Load Line Convention. The Subcommittee on Bulk Cargoes, using a draft text prepared by an *ad hoc* international group in which the Coast Guard was represented, agreed on a revised text to replace the existing grain rules of Chapter VI of the 1960 Safety of Life at Sea (SOLAS) Convention. The Subcommittee on Fire Protection initiated studies of fire safety standards for particular types of vessels and for the development of universally acceptable fire test procedures for shipboard materials. The Coast Guard analyzed fire casualty records and submitted papers which gained acceptance by the Subcommittee. Fire test programs, conducted by various national laboratories, were also coordinated and evaluated.

The IMCO Assembly in October 1967 adopted a Resolution to convene an international conference commencing May 27, 1969, to adopt a convention on the tonnage measurement of ships. The basic document of the conference has already been distributed to governments which may take part. By a Resolution in October 1967, the Assembly also decided to adopt a recommendation which had been proposed by the United States for the deduction from the gross tonnages of vessels, spaces on board for the separation, clarification or purification and the carriage of slop oil. The proposal was developed jointly by representatives of U.S. industry and the Coast Guard. It is designed to encourage shipowners to reduce pollution of the seas by oil.

Coast Guard representatives are also actively participating in the work of the Subcommittee on Ship Design and Equipment, the Working Group on Stability of Fishing Vessels, and the Subcommittee on Life-Saving Appliances. For each of these international bodies, a considerable amount of technical preparatory work and research is necessary toward the effective development, presentation, and promotion of U.S. objectives.

Traffic Separation. In the spring of 1967 traffic separation schemes (sea lanes) were established at the approaches to New York harbor and Delaware Bay. Similarly the converging of coastwise and transoceanic traffic required a traffic scheme to be established at the approaches to San Francisco Bay. The San Francisco Bay plan was established on June 1, 1968. Recently a plan was proposed for coastwise traffic along the Southern Coast of California. The northern portion of this control system has been approved and will be implemented on January 1, 1969. All of these proposals which were developed by the local communities and shipping interests involved, will be submitted to IMCO for world-wide adoption. Similar traffic controls have been used successfully on the Great Lakes since 1911.

Shipboard Fire and Safety Testing. The Coast Guard is proceeding with plans to establish a shipboard fire and safety testing activity at Mobile, Alabama. In addition to providing much needed information on means of improving fire safety aboard ships, the facility will be used for testing containers or other equipment. Industry members will be invited to participate in the project through a joint industry-government panel.

Hazardous Cargo. The transportation of hazardous liquids in portable tank containers aboard ship has become a major problem for the Coast Guard during the past year. Regulations to cover this expanding field are being developed and existing regulations are being updated. The Coast Guard is also participating in a Department of Transportation effort to consider the intermodal use of both tank and dry cargo containers. Appropriate recommendations are being made to the IMCO.

Requests for technical review of foreign vessels carrying hazardous cargoes to U.S. ports continue at a "steady" level. A follow-up inspection of the vessel at the time of its first visit to a U.S. port is normally required. United States shipping companies are increasingly interested in ships specially constructed for the carriage of hazardous cargoes requiring special considerations; requests for design approvals for such ships are increasing.

Civilian-owned Submersibles. Civilian-controlled submersibles are increasing in number; the Coast Guard is anticipating the need to establish policy concerning their operation. Since the subject is so complex the Coast Guard has begun to plan for the development of applicable design and operational standards even before appropriate legislation has been enacted. Special studies are under way concerning underwater search and rescue procedures applicable to civilian-owned submersibles.

Life Preservers. Representatives attended meetings in London of the IMCO Subcommittee on Lifesaving Appliances concerning international standards for life preservers and lifesaving appliances on air cushion vehicles and off-shore drilling and production platforms. An evaluation of the personnel lifesaving devices currently approved by the Coast Guard was initiated. A prototype circular survival capsule for use from offshore platforms constructed of fiberglass-reinforced plastic has been inspected and tested and approval is expected for its use. A system utilizing high-expansion foam (approximately 1,000 to 1 expansion) was accepted for protection of the vehicular spaces of a special car-carrying vessel. Meetings of the appropriate National Fire Protection Association (NFPA) committee were attended where the NFPA adopted a design standard for bromotrifluromethane fire extinguishing systems. Meetings with industry have resulted in a proposal for a test program to evaluate such systems for use on commercial vessels.

Merchant Vessel Documentation. The merchant vessel documentation function, a responsibility of the Bureau of Customs prior to the transfer of the function to the Coast Guard in February 1967, is established within the Coast Guard structure and is being performed by Coast Guard personnel at all but a few low-activity ports. Plans are underway to assume the work at the few remaining ports. On June 30, 1968, there were 68,707 vessels in the documented fleet representing a gain of 3,842 over the number documented as of June 30, 1967. Of the 68,707 vessels approximately 51,950 are in commercial service; the remainder are documented as yachts. Pursuant to Reorganization Plan No. 1 of 1967 and Department of Transportation Order No. 1100.2 of May 15, 1967, the Coast Guard through its documentation offices assumed the functions previously exercised by the Maritime Administration relating to the approval required by the Ship Mortgage Act, 1920, before the surrender of marine documents of vessels of the United States subject to preferred mortgages. Assumption of this function has been complete and uneventful and has resulted in considerable savings in time and money to both the Government and vessel owners.

Much progress was made during fiscal year 1968 in preparing to use automatic data processing equipment to compile data for the publication of *Merchant Vessels of the United States* and various other statistical summaries. Though not as yet completed the project is already useful in compiling in a few minutes various statistical information that heretofore took hours or days to compile.

Merchant Marine Personnel. A proposed system for modernization of shipment and discharge of merchant seamen was being developed by a Coast Guard Study team with technical assistance from the Department of Transportation Office of Facilitation. The system was readied for testing at several major ports. Following testing processes and the incorporation of any necessary changes, the modern system would become effective 6 months after the passage of the enabling legislation which is the subject of hearings by both the House and Senate. The proposed system will eliminate time-consuming procedures and outdated requirements and yet protect the merchant seaman in accordance with existing laws and statutes.

The licensing and certificating of commercial vessel operating personnel required the issuance of 108,523 documents during fiscal year 1968—a slight increase over fiscal year 1967. Coast Guard shipping commissioners supervised the completion of 10,101 sets of sign-on or sign-off shipping articles during the year. Discharge certificates representing 527,656 individual discharge transactions were filed in the jackets of seamen at Coast Guard Headquarters. The locator service at Headquarters answered 10,354 inquiries concerning individual seamen.

Marine investigating sections in major U.S. ports and details in certain foreign ports investigated 25,294 cases involving police checks, casualties, negligence, incompetence, and misconduct. Charges were preferred and hearings held on 1,657 cases by civilian examiners. Security checks were made on 36,311 persons desiring employment on merchant vessels.

Recreational Boating

In his 1968 Message to the Congress regarding the American consumer, President Johnson proposed the Recreational Boat Safety Act of 1968. The basic sections of the proposed legislation allow the Secretary of Transportation to establish safety standards for recreational boats and a grant-in-aid program for the States. On March 28, 1968, the Secretary of Transportation released his Report on Recreational Boat Safety. The report contains a detailed explanation of the proposed legislation and the programs the Department intends to undertake if the proposal is adopted.

The Boarding Officer Instructor Indoctrination Course was held at the Coast Guard Base, New York and Coast Guard Base, Alameda, California in January 1968. The schools were host to 131 Federal, state, and foreign boating law administrators and law enforcement officers. The groups represented 31 States, the National Park Service, U.S. Forest Service, Puerto Rico, and Canada. During calendar year 1967, 2,679 Coast Guard law enforcement personnel were trained by the several districts. For the first time, in the summer of 1968, boarding officers were allowed to issue written warnings for minor equipment and numbering violations. This is an effort to relieve District Commanders of some of the administrative burdens incident to issuing warnings at the District level.

In fiscal year 1968, Boating Safety Teams were established in each of the 12 Coast Guard Districts to train other Boating Safety personnel, to survey developing water recreational areas, to conduct safety patrols in those areas, and to schedule boat safety examination visits at boat yards, factories, and dealers to determine compliance with Coast Guard regulations. The resources formerly assigned to 41 Mobile Boarding Detachments were pooled for this purpose.

The Safety Patrol concept was continued during the year. However, less emphasis was placed on routine boardings but more on deterring and detecting unsafe practices and reckless or negligent operation. During fiscal year 1967, 72,791 vessels were boarded by all Coast Guard units and 36,256 found in violation. In calendar year 1967, 40 Mobile Boarding Detachments boarded 47,340 motorboats and found 48 percent in violation. Additionally, the Mobile Boarding Detachments spent 55,012 man-hours on safety patrol and 32,057 man-hours in public information and education.

During fiscal year 1968, 22 law enforcement agreements were signed with various states. Sixteen of these 22 states entered agreements with the Coast Guard for the first time. Forty-seven States and the Virgin Islands have approved numbering systems in accordance with Federal Boating Act of 1958. There were 4,458,893 craft numbered as of December 31, 1967. There are an estimated 8.3 million boats in the United States.

During calendar year 1967, 5,274 vessels were reported as being involved in 4,113 accidents which resulted in 1,312 fatalities and 1,365 personal injuries and property damage of $6,054,100. As compared to calendar year 1966, fatalities decreased 0.5 percent, injuries decreased 12 percent, and the dollar value of property damage decreased 17 percent.

A publication, *Boating Statistics*, appeared in May 1968 in compliance with the Federal Boating Act of 1958. This publication is the most complete, comprehensive, and accurate annual compilation available of facts concerning boating accidents. The analysis of these statistics provides a basis for determining what emphasis is to be placed on the overall boating safety program. A new boating accident report form was approved by the National Association of State Boating Law Administrators and adopted by the Coast Guard during fiscal year 1968. To date 32 States have adopted the form or one similar which will aid in the continuing improvement of Coast Guard statistics.

Law Enforcement

The five established law enforcement patrols continued in their enforcement of laws concerning fisheries, conservation, neutrality, navigation, and territorial sovereignty. The Alaskan Patrol enforced the North Pacific Fisheries Convention, the Halibut Convention, bilateral fisheries conventions with Russia and Japan, and Public Laws 88–308 and 89–658 which prohibit foreign fisheries within 3 and 12 miles of the U.S. coast. Two foreign vessels were seized during fiscal year 1968 for Halibut Convention violations and the cases were referred to the flag governments for prosecution. One vessel was seized and fined $5,000.00 for violation of PL 88–308 and another paid a penalty of $20,000 for violation of PL 89–658. Five other violations of these statutes were investigated by Alaskan Patrol units but in each case the violating vessel was released following a determination that the violation was inadvertent. A South Korean distant water fishing fleet appeared off Alaska for the first time in fiscal year 1968. Responding to its repeated requests for assistance and authority to enter U.S. waters increased the workload of Alaska Patrol units.

In May 1968 an exchange of fisheries enforcement officers was conducted between the U.S. and Spain. Working from the CGC *Acushnet*, enforcement officers from both countries boarded U.S. and Spanish fishing vessels so that each could learn how the other country enforces regulations under the International Convention for Northwest Atlantic Fisheries. Plans have been made for a similar exchange with the U.S.S.R. in early fiscal year 1969. In November 1967 the U.S. and U.S.S.R. agreed on a 1-year convention concerning fisheries problems in the Western Mid-Atlantic. The Soviets agreed not to fish within a 6,000 square mile area off Long Island, New York from January 1, until April 1, 1968 to ensure access of red and silver hake to the spawning grounds. This area was patrolled by Coast Guard vessel and aircraft and violations were reported to the Soviet Government.

During fiscal year 1968 the Coast Guard has continued to be active in the enforcement of Federal laws prohibiting the pollution of navigable waters and the coastal waters of the United States. In port areas and potential problem areas, Coast Guard patrol boats conduct periodic surveillance primarily to determine violations and to detect and investigate violations which occur. In coastal and off-shore areas both air and surface units are employed periodically, again primarily to act as a deterrent. In some large port areas, helicopters are employed on routine flights to augment the surface surveillance conducted by patrol boats. The patrol of any specific area may vary from several times daily to once weekly. In most areas patrol vessels are involved in several tasks and oil pollution surveillance and enforcement represent only one part of their overall mission. During fiscal year 1968, 579 reports of oil pollution were investigated by the Coast Guard. While it is actively enforcing water pollution statutes, the Coast Guard has been placing emphasis on public information, the education of potential violators, and liaison with appropriate local authorities and industry groups. The Coast Guard is also actively seeking methods of preventing major releases of oil from ships and of effectively coping with large oil spills. A joint study by the Secretaries of Transportation and Interior was conducted in fiscal year 1968 to determine how best to mobilize the resources of the nation to meet the pollution problems. In conjunction with this study the Coast Guard investigated four tankers sunk off New Jersey during World War II to determine the possibility of pollution from that source. A literature search was also conducted for the Coast Guard to survey the present state of the art in pollution control. This produced a 300-page review and analysis of control methods which includes a bibliography of 700 references.

The administration of anchorage grounds and special anchorage areas was taken over by the Coast Guard from the U.S. Army Corps of Engineers in fiscal year 1967. During the succeeding year, regulations governing anchorage grounds and anchorage areas were revised and published. Since that time a number of new anchorages and revisions to existing anchorages have been processed by the Coast Guard and published in the Federal Register.

Port Safety. Fifty-five Captains of the Port enforced security and dangerous cargo regulations throughout the United States. Waterborne commerce continued an average annual increase of 3.5 percent. Aside from the problems of marine traffic congestion in harbors and waterways created by increasing utilization, technological advances in bulk shipment of dangerous cargo and cargo packaging presented new challenges to port safety forces daily. Vessels of novel design, both foreign and domestic, continued to ply U.S. waterways during fiscal year 1968. These vessels carried bulk quantities of liquified gas under pressure and other "exotic" chemicals, thus creating new and unusual hazards to port areas. Jumbo tankers and barges used for transportation of petroleum products constituted a constant source of water pollution and a potential for marine disaster.

An acceptable level of safety in ports—the objective of the Port Safety Program—means that degree of safety which will insure full utilization of the port and will allow an orderly growth of maritime commerce. The workload in the major enforcement areas is shown in Table 3.

The value of marine industrial property loss prevented by Coast Guard port safety efforts is computed by considering this corrective action in relation to the probability of a casualty occurring and the average casualty loss. The amalgamated value of property loss prevented in fiscal year 1968 was estimated to be approximately $161,300,000. The present cost of the Port Safety Program is estimated to be $13,300,000 annually, or a cost benefit ratio of approximately 12 to 1. The actual loss to marine industry and the loss prevented are mute testimonies to the need of an effective port safety program. In addition to safety aspects, the Coast Guard is charged with security of ports, the protection of U.S. ports against sabotage, or other subversive acts. When the presence of any vessel in a U.S. port is considered possibly inimical to the national security, precautionary measures are taken. During fiscal year 1968 the number of these special interest vessels

TABLE 3. Workload of major enforcement areas—fiscal year 1968

Area	Number
Violations of Water Pollution Acts reported	1,424*
Anchorage patrols (in hrs.)	6,144*
Violations of other laws reported	2,828*
Fisheries patrols	608*
Number of waterfront facilities inspected	56,740*
Number of port security viloations deetcted	3,720*
Number of vessels boarded	32,234*
Number of dangerous cargo violations detected	3,669
Other dangerous cargo inspected (hours)	56,114*
Explosive loading supervised:	
Number of permits issued	1,545
Number of tons	4,019,244
Harbor patrols (hours)	65,842*
Port safety promotion (hours)	11,858*
Number port security cards issued	13,474*

* Total of actual figures for first half, FY 1968 and estimated figures for second half, FY 1968.

increased slightly over the previous year due to increased trade activity with Eastern European nations.

The military assistance program for Vietnam continued to place a heavy workload on Coast Guard explosive loading expertise. In 1968 two additional Explosive Loading Details were assigned in South Vietnam to provide supervisory and technical assistance for the safety of U.S. vessels off-loading military explosives. In the continental U.S. the amount of military explosives supervised increased from 2,000,000 tons to 3,900,000 tons in fiscal year 1968.

The Coast Guard acted as coordinator for the inter-agency program to prevent illegal entry of persons, articles, or things across U.S. sea coasts. An exercise to test the effectiveness of the program to detect clandestine entry was conducted during fiscal year 1968; the results were reported to the Interdepartmental Committee for Internal Security, as well as the participating agencies.

During fiscal year 1968, an administrative review of the Port Safety Program as to legislative authority and the assignment, employment, and training of forces was initiated to determine the most effective utilization of port safety resources.

Military Readiness

As part of the Coast Guard Military Readiness Program, 32 ships participated in Navy Refresher Training and six newly constructed high-endurance and medium-endurance vessels completed shakedown training during the fiscal year. The Coast Guard Anti-Submarine Warfare Integration Study was completed by the Navy on January 30, 1968, and Electronic Warfare orientation began within the Coast Guard. Approximately 90 percent of the high-endurance cutter torpedo tube installations were modified to fire the Navy's latest torpedo, with the remaining alterations scheduled for fiscal year 1969. The Joint Navy-Coast Guard Class Improvement Plan for installing new military readiness equipment was being updated.

Coast Guard units participated in a number of joint military training exercises during the year. Additionally, the Coast Guard continued to make extensive use of shore-based Navy training facilities for individual, team and unit training.

Aids to Navigation

The Joint National Navigation Planning Staff, consisting of representatives of the Coast Guard, Federal Aviation Administration, and Department of Defense, began a joint effort directed toward the development of a National Plan for Navigation. The objective of this effort is to recommend U.S. National Policy and prepare a national plan for development and operation of aids to navigation responsive to both current and future needs.

By the end of the fiscal year, the Coast Guard had taken over responsibility for all aspects of bridge functions transferred from the Corps of Engineers. The Corps agreed to continue to perform certain field work until the Coast Guard is completely staffed. One military position and 40 civilians are assigned to this duty.

The Coast Guard continued to provide aids to navigation in Southeast Asia; several additional areas in Vietnam and Thailand received new lights, buoys, and ranges. Interservice support agreements were negotiated with II, III, and IV Corps Commanders and with Commander, Naval Support Activities, Danang, for the I Corps.

The completion of new Loran-A transmitting stations at Port Isabel and Galveston, Texas and Grand Isle, La. was accomplished to meet the growing needs of maritime and air traffic throughout the Gulf of Mexico.

Table 4 contains a list of aids to navigation maintained by the Coast Guard.

Ocean Stations

The Coast Guard continued its operation of four ocean stations in the North Atlantic and two in the North Pacific. Vessels on station provided meteorological, navigational, communications, and rescue services for air and marine commerce and collected scientific data. Four new high-endurance cutters took part in the ocean station program during the year.

Oceanography

By the end of fiscal year 1968, the Coast Guard had more than 40 vessels capable of various levels of oceanographic and marine science activity.

TABLE 4. Navigation output summary

Types of aids	F. Y. 1968
Navigation Aids:	
Buoys—	
Lighted	3,845
Unlighted	20,923
Fog signals	595
Daybeacons	7,303
Radiobeacons	202
Lights (including Lightships)	11,354
LORAN transmitting and monitoring stations	76
Total	44,298
Bridges:	
Permits processed for bridge construction	166
Revised permits processed	60
Drawbridge regulations processed	38
Bridges under alteration	2
Obstructive bridges on which work is pending	14
Obstructive bridges on which alterations completed	1
Total	281

During the year, these vessels were engaged both in Coast Guard projects and cooperative projects with other agencies. On all six ocean stations, observations of the water mass were made daily. Standard sections in both the Atlantic and Pacific Oceans were occupied on an intermittent basis. Among the cooperative projects in which the Coast Guard took part were: (1) Study of the Western Tropical Atlantic, (2) Study of the Eastern Tropical Pacific, (3) Wedell Sea Survey, and (4) Water Mass Studies in conjunction with the International Commission for Northwest Atlantic Fisheries (ICNAF). The Coast Guard progressed to the final design stage for the new oceanographic vessel destined to provide broad-based support for the Coast Guard and National Oceanographic Programs. The first of seven Coast Guard SWORD Systems has been in operation for 1 year. This system collects hydrographic data from offshore light structures. The Oceanographic and Meteorological Data Acquisition System was placed in operation on one large navigation sea buoy. This system collects meteorological and water surface data and transmits the data to a shore station.

International Ice Patrol

The Coast Guard began the 54th season of international ice patrol service in the North Atlantic Ocean on March 15, 1968. International ice patrol is conducted to protect North Atlantic shipping from the iceberg hazard encountered annually during the spring and early summer. The patrol utilizes HC–130 aircraft and a Coast Guard oceanographic vessel to observe and study the iceberg conditions. Predictions as to the iceberg danger, recommendations as to the best action to be taken by shipping to avoid such danger, and scientific data concerning the oceanography of the area and the life cycle of the icebergs encountered are the major products of this service. The 1968 season is notable in that icebergs still persisted as of June 30, 1968. The patrolling season was extended beyond normal limits because icebergs were not deteriorating as quickly as expected.

Icebreaking

The Coast Guard conducted the national icebreaking program with its eight polar icebreakers, one Great Lakes icebreaker, and one auxiliary icebreaker. The design of icebreakers to replace the over-age "wind" class continues. During the year four icebreakers supported the Antarctic national program. Two icebreakers conducted ice escort of shipping and scientific and military missions in the western Arctic. Three icebreakers conducted ice escort of shipping and scientific missions in the eastern Arctic. The USCGC *Glacier's* participation in the International Wedell Sea Oceanographic Expedition in the Antarctic was the scientific highlight of the year. The Polar Transportation Requirements Study began a detailed investigation into transportation needs in polar regions.

Operational Facilities

Table 5 contains the distribution of operating hours for the major Coast Guard functions during fiscal year 1968.

Cutters. At the close of the fiscal year, the Coast Guard had 346 cutters in service. Continuing the program to replace over-age and obsolete cutters, four more 210-foot medium-endurance cutters were completed and four more new class 378-foot high-endurance cutters were accepted and placed in service. Progress continued in programs to improve the effectiveness of the high-endurance cutters for search and rescue, ocean station, and military readiness functions. Also placed in service in fiscal year 1968 were four new 82-foot patrol craft as replacements for similar vessels deployed to Southeast Asia. One major accomplishment was the installation of a JP–5 fuel system plus extension of the flight deck and enlargement of the hangar on the *Glacier* to meet requirements for handling turbine-powered helicopters.

Small Boats and Stations. Obsolete and worn out small boats were replaced during fiscal year 1968 by 93 new boats while the first four 31-foot port security boats were built for reserve training. One hundred and forty 17-foot 6-inch skiffs were constructed for the Agency for International Development and 49 were built for Coast Guard use. The first five of a series of 46-foot buoy boats were started and the design of a new 42-foot utility boat is nearing completion. The Coast Guard Station at Grand Isle,

TABLE 5. Workload distribution

Activity	Vessels (operating hrs.)	Aviation units (flight hrs.)	Shore units [1] (operating hrs.)
Law enforcement	59,400	6,905	72,893
Search and rescue	101,947	60,509	104,581
Aids to navigation	205,992	9,275	111,793
Reserve training	13,137	24	1,438
Icebraeking	31,366	545	1,322
Oceanography	23,736	622	93
Military readiness (includes Viet Nam operations)	211,372	51	5,139
Cooperation with other agencies	19,338	2,372	3,933
Port security	14,454	483	45,457
Training of Cadets & Officer candidates	4,809		312
Ocean stations	75,233		20
Nonmission movement	41,378		27,988
Proficiency training [2]		543	
Ferry [2]		2,145	
Tests [2]		1,949	
Administrative [2]		5,282	
Totals	802,162	90,705	374,969

[1] Includes shore units small boats only.
[2] Applies to aircraft only.

La. was completed to provide improved search and rescue assitance to that area.

Aviation and Aircraft. The Coast Guard operated 166 aircraft, including 72 helicopters at the end of fiscal year 1968. Delivery was received of 12 turbine-powered amphibious helicopters (HH–52A) which replaced the older H–19 reciprocating-engine helicopter. Three Lockheed Hercules (C–130) aircraft were delivered; these four-engine, turbine-powered planes replaced older aircraft in the Alaskan region. Construction began on a new air station at Chicago, Illinois and a hangar at Air Station Kodiak, Alaska was modified to accommodate the new C–130's.

Communications. During the past year the Coast Guard continued its participation in satellite communication development. Tests were conducted from October 1967 to April 1968 between the USCGC *Glacier*, operating in the Antarctic region, and NASA ground stations in Australia, North Carolina, and California. Primary test objects were to determine the performance characteristics of VHF satellite communications on board ships in the extreme southern latitudes and to demonstrate that VHF-FM ship/shore/ship communications via the ATS Satellites were feasible under shipboard operational conditions. Two way VHF-FM radio teletype and voice communications were satisfactorily conducted throughout the test period.

A series of additional shipboard satellite communication tests are scheduled during fiscal year 1969.

Two major studies having a direct impact on the Coast Guard communication system were completed. The first concerned the use of Emergency Position Indicating Radio Beacons (EPIRB) by vessels, boats, and aircraft of the U.S. Based upon this study, the Coast Guard recommended to the Federal Aviation Administration that it investigate the establishment of a regulation requiring mandatory use of EPIRB devices by all U.S. aircraft. The final Coast Guard position resulting from this study will be used internationally in the establishment of marine safety programs. The second study arose out of the growing use of Citizens Band (CB) radio by the boating public as a marine safety communications system. A contract was let to investigate the effectiveness and desirability of CB radio in providing a small-boat communications system and to recommend the level of Coast Guard participation in such a system. The study concluded that CB radio is not an effective marine safety system and that direct Coast Guard participation in such a system should be discouraged.

Coast Guard Intelligence. During fiscal year 1968, 3,086 internal security and criminal investigations and 8,485 National Agency Checks were made by Coast Guard intelligence personnel. In addition, 41,700 prospective Merchant Mariners and 12,383 applicants for port security cards were screened for suitability. The Coast Guard Intelligence Staff also made 26,454 record checks for internal purposes as well as an additional 11,593 for other agencies.

Engineering Developments

Civil Engineering. During fiscal year 1968, the Coast Guard began the construction of a 500-man barracks at the Reserve Training Center, Yorktown, Virginia and a recreation-auditorium building at the Coast Guard Academy. Projects authorized earlier which were completed during fiscal year 1968 included the 300-man Cadet Barracks at the Academy, an engineman school classroom and laboratory at the Reserve Training Center and several projects to replace and improve facilities at Coast Guard stations. Construction continued at an active rate on Governors Island, N. Y., with the large piers project completed and a new Industrial Facility to replace St. George Base nearing completion. Contracts were awarded during fiscal year 1968 for the replacement of existing facilities at selected shore units, to increase the capability of others, and to build a 500-man barracks at the Training Center in Alameda, California.

Electronic Engineering. Three new Loran-A stations were constructed and tested to provide service in the western half of the Gulf of Mexico. In addition to aiding innumerable small boat users, the Loran-A service will be of major importance to crews of merchantmen and the tankers traveling to and from Gulf ports, to aviation, for search and rescue work, and to Coast Guard vessels in the Campeche Patrols.

A study is being made by the Coast Guard Eastern Area to determine the location and requirements for long-range and district radio stations to serve the needs of the Commander, Eastern Area, and associated districts. The recently acquired transmitter site for the First Coast Guard District, the former AEW transmitting site at Otis Air Force Base, Massachusetts, was activated and is scheduled for completion during fiscal years 1969 and 1970. The feasibility of using this facility as the transmitter site for an Eastern Area Radio station was being studied. The design concepts and techniques utilized in the area radio stations will become the standards for the modernization of existing radio stations. The radio station modernization program is an effort to make the best use of personnel and facilities as well as expediting reliable communications.

The Western Area tentatively selected transmitting and receiving sites at Bolinas and Point Reyes, California. Final plans for this station will be completed during fiscal year 1969 with construction scheduled to start in fiscal year 1970.

To meet new operational requirements and to provide replacement for obsolete equipment, a contract was awarded for the design of a standard small boat and small cutter radar. Important features of this radar are: Lightness, solid-state design, ease of maintenance, low power consumption, ease of operation by nontechnical personnel, high-quality short-range resolution, improved operation for low height antenna, and its ability to withstand moisture, temperature, and vibration found in small boats, along with improved daylight viewing of its presentation.

A prototype of a large-screen display system for use aboard high-endurance cutters has been tested and evaluated; this is a computer-controlled digital system. Its applications will be: (1) Automation of interior communications, (2) automation of information display functions, (3) use as a computational tool for shipboard operations, and (4) use as a self-contained operator training device. The digital construction allows economical maintenance since the machine diagnoses its own difficulties. It also provides flexibility to perform an additional function, such as data reduction. The prototype system is now being prepared for installation on a 378-foot high-endurance cutter in fiscal year 1969.

In modernizing the eight polar icebreakers operated by the Coast Guard, a program was started to update the radio communications facilities. This program included the following: structural expansion of the 01 deck, installation of automatic cryptographic (secure teletype) facilities, and the complete redesign of the main radio room. During fiscal year 1967, the program was completed aboard *Burton Island*, *Edisto*, *Southwind*, and *Westwind*. The program greatly improved the communications capability of these ships whose facilities must match the diversified requirements encountered in their polar missions. Conversions scheduled for fiscal year 1968 were deferred until fiscal year 1969 due to the operating schedule of the icebreakers *Northwind*, *Staten Island*, *Glacier*, and *Eastwind*.

Naval Engineering. Vessels under construction at the close of the fiscal year included four 378-foot high-endurance cutters, six 210-foot medium endurance cutters, one 80-foot stern-loading tender, and three 75-foot river tenders with barges. Five 44-foot motor lifeboats and forty-four 25-foot

8-inch motor surfboats were also manufactured for Coast Guard use, as well as a number of smaller boats. During fiscal year 1968, 10 high-endurance cutters were outfitted and deployed to Southeast Asia for duty with Naval forces. A fourth Coast Guard cutter is being outfitted for full-time oceanographic survey work.

Testing and Development. A prototype large buoy, intended as a lightship replacement, was deployed early in the year. It operated successfully under observation, providing information and experience to permit improvements to subsequent large buoys. A prototype instrumentation, telemetering, and data processing system to permit acquisition of oceanographic and meteorological data was installed on the first large aid-to-navigation buoy. The system was in experimental operation at the end of the year.

Emphasis was placed on exploratory development of equipment to improve aerial search capability. As a means of acquiring background information, tests were conducted on several types of infrared detection systems and high-resolution airborne radars. Near the end of the year, a contract was awarded for a design parameter study for an improved high-resolution airborne search radar.

Development of components for remote control and monitoring of unmanned aids-to-navigation continued. Prototypes of a light- and fog-signal monitor device were received and tested. A large-scale operational evaluation of automatic fog detectors was initiated at several locations throughout the U.S. Studies also continued to improve marine transportation of hazardous cargo and to determine the effect of wave-induced stresses on Great Lakes vessels.

Coast Guard Reserve

Public Law 90–168, enacted December 1, 1967, established a Selected Reserve within the Ready Reserve of each Reserve component. At the close of the fiscal year, there were 18,070 Coast Guardsmen in the Selected Reserve while the total Coast Guard Ready Reserve consisted of 28,434 personnel. The Reserve Port Security Mission study, completed in fiscal year 1967, was to be the first of a sequence of Reserve mission studies. However, it became apparent that the interrelationship between the mission areas was of great importance to Reserve training as a total program. Therefore, a full-scale study, "Reserve Training Concepts and Force Analysis," was initiated in fiscal year 1968 so that the individual missions along with their interplay could be carefully examined. The Unit Development Plan for the Reserve Training Center, Yorktown, Virginia, proceeded and construction was completed on the Engineman School which began operations.

Improvements initiated during fiscal year 1968 included increased emphasis on quality and content of instruction during inactive duty training, addition of new courses, improvement of existing annual active duty for training courses, and re-evaluation and standardization of training unit inspection criteria.

Personnel

As of June 30, 1968, the Coast Guard consisted of 6,495 civilian and 37,392 military personnel. Tables 6 and 7 show personnel strength in detail.

Recruiting. Sixty main recruiting offices and approximately 50 suboffices were manned by 227 recruiters. During the fiscal year there were 15,199 applicants for enlistment in the Regular Coast Guard and 5,774 were enlisted. The Reserve received 18,740 applications and enlisted 1,674.

On November 15, 1967, a Special Coast Guard Reserve (SPAR) Enlistment Program was established. Female enlistees under this program were preselected for Hospital Corpsman training following a period of recruit training. Upon completion of this training, enlistees were assigned to medical clinics.

Training for Foreign Visitors. Under the sponsorship of other Government agencies, 56 visitors from 20 foreign countries were trained in maintaining aids-to-navigation, merchant marine safety, and law enforcement at Coast Guard facilities.

Coast Guard Education Program. Details concerning the education and training programs sponsored by and participated in by the Coast Guard during fiscal years 1967 and 1968 are summarized in Table 8.

Public Health Service Support. On June 30, 1968, there were 142 Public Health Service personnel on duty with the Coast Guard, serving at 20 shore stations, mobile dental detachments, and aboard ships assigned to ocean stations in the Arctic and Antarctic operations and in Southeast Asia.

Coast Guard Auxiliary

The Coast Guard Auxiliary is a volunteer, nonmilitary organization established to assist the Coast Guard in the promotion of safety, efficiency, and compliance with the law in the operation of motorboats and yachts. The Auxiliary was active in approximately 900 communities in the United States, Puerto Rico, and the Virgin Islands. Auxiliary members are experienced boatmen, licensed amateur radio operators, or licensed aircraft pilots. Each is trained in seamanship, piloting, and related subjects prior to acquiring full membership. Auxiliary members took part in advanced training programs, which included correspondence courses from the Coast Guard Institute. The Auxiliary's purpose was accomplished through three principal programs: free courses of instruction to the public in boating safety, courtesy examination of safety equipment on motorboats at the request of the owner or operator, and operational activities such as regatta patrols and assistance to boats in distress. Auxiliary members are prohibited from performing law enforcement functions. They receive no compensation for their services. Each member must own at least 25 percent of a boat, radio station, or aircraft. These "facilities" must conform to rigid safety standards. Table 9 contains comparative data on the Auxiliary for fiscal years 1966, 1967, and 1968.

TABLE 6. Personnel strength of the Coast Guard—June 30, 1967 and June 30, 1968

Personnel	Number 1967	Number 1968
Military personnel:		
Commissioned officers	3,904	4,135
Commissioned warrant officers	1,215	1,225
Warrant officer	5	0
Cadets	804	830
Enlisted men	30,620	31,202
Totals	36,548	37,392
Civilian personnel:		
Salaried (General Service)	3,594	3,900
Wageboard	2,499	2,462
Lamplighters	143	133
Totals	6,236	6,495

TABLE 7. Officers on active duty June 30, 1967 and June 30, 1968

Additions and losses	Number 1967	Number 1968
Additions of commissioned officers:		
Gradutes of Coast Guard academy	97	153
Warrant officer to lieutenant program		48
Graduates of officer candidate school, direct commission program for aviation, merchant marine safety, lawyers, engineering and oceanography, and the aviation cadet program	455	353
Reserve officers called to active duty	26	11
Totals	578	565
Losses of commissioned officers:		
Regular (through retirements, resignations, revocations, and deaths)	177	161
Reserves on completion of obligated service	137	161
Totals	314	322

Fiscal and Supply Management

Payroll computation for approximately 17,000 Coast Guard Reservists who perform scheduled drills at Coast Guard Organized Reserve Training Units was centralized at Coast Guard Headquarters on July 1, 1967, under a computerized system which also provides an accounting record for the

TABLE 8. Coast Guard education program

Education and training participation	1967	1968
Coast Guard academy:		
Applications	3,969	3,816
Applications approved	3,022	2,850 (est.)
Appointments accepted	307	387
Cadets	704	741
Graduates (Bachelor of Science degree)	98	157
Officers training completed:		
Officer Candidate School graduates	421	302
Postgraduate	67	75
Flight training	80	60
Helicopter training	12	20
C–130 aircraft training	12	12
Short term specialized courses	926	1,258
Off-duty training	231	235
Enlisted training completed:		
Recruit Training—		
Regular	5,159	5,511
Reserve	3,033	1,463
Coast Guard basic petty officer school	2,595	1,642
Navy basic petty officer schools	612	768
Advanced petty officer school (Coast Guard & Navy)	139	806
Specialized training courses (service and civilian)	2,416	2,052
Correspondence courses completed:		
Coast Guard Institute	11,776	11,948
U.S. Armed Forces Institute	247	304
U.S. Naval Correspondence Course Center	4,263	4,808
Examinations:		
Officer education and examination program	531	335*
Department of Defense officer record examinations—		
Direct commissioned officers	25	19
Officer candidate school graduates	423	301
Academy graduates	99	157

* Through 30 May 1968.

retirement points earned by each Coast Guard Reservist during his or her participation in the Coast Guard Reserve Program.

During fiscal year 1968, further progress was made toward the development and design of a computerized system at Coast Guard Headquarters for computing the payroll of approximately 35,000 active Coast Guard military personnel and for the complete integration of the centralized payroll system with the Coast Guard personnel accounting and financial management systems. The system's design and programming effort is scheduled to continue during fiscal year 1969 and system tests and evaluations are to be completed in fiscal year 1970. The target date for the operational phase of the completely integrated and centralized system for payroll and personnel accounting for active duty Coast Guard military personnel was set at July 1, 1970.

Continued emphasis was directed toward achieving cost reductions and improved management effectiveness in the procurement and inventory management functions of the Coast Guard. Excess material valued at $662,000 was accepted from the General Services Administration and the Department of Defense for utilization by the Coast Guard on a nonreimbursable basis.

During fiscal year 1968, a nonrecurring cost reduction of $995,000 was achieved by exercising the option to contract for the construction of one additional high-endurance cutter under the multi-year procurement contract for the construction of four cutters awarded in fiscal years 1966 and 1967. In addition, a contract awarded on December 1, 1967, for the construction of three 75-foot towboat (pusher) and one 100-foot barge combination units contains an option to contract for the construction of a fourth combination unit on or before November 1, 1968. Exercise of this option will achieve savings of approximately $49,262 in fiscal year 1969.

Further improvements in inventory management and procurement practices achieved a savings of approximately $946,000 as the result of item elimination, redistribution, and identification with federal stock numbers.

Table 10 shows the amount of funds available for the Coast Guard during fiscal year 1968 and the amounts of obligations and unobligated balances, as well as expenditures incurred.

TABLE 9. Coast Guard auxiliary achievement and strength

Activities	F.Y. 1966	F.Y. 1967	F.Y. 1968
Persons receiving safe boating instructions	150,793	205,439	136,371
Motorboats examined (facilities and courtesy examinations)	176,259	158,289	172,729
Regatta patrols	4,401	4,629	5,057
Assistance missions	7,044	6,809	7,644
Lives saved	129	184	132
Total membership	23,232	24,981	25,833
Total facilities	14,972	15,289	15,573
Qualified instructors	5,935	6,206	6,758
Qualified courtesy examiners	8,132	8,281	7,638

TABLE 10. Financial statement for fiscal year 1968

	Funds Available [1]	*Net Total Obligations*	*Unobligated Balances* [2]
Appropriated Funds:			
Operating expenses	$347,259,722	$347,191,021	$ 68,701
Reserve training	24,300,000	24,238,169	61,831
Retirement pay	48,199,000	48,149,936	49,064
Acquisition, construction, and improvements	123,193,847	81,549,136	41,644,711
Total	$542,952,569	$501,128,262	$ 41,824,307
Reimbursements:			
Operating expenses	21,499,631	21,499,631	----------
Acquisition, construction, and improvements	6,446,441	1,518,012	4,928,429
Total	$ 27,946,072	$ 23,017,643	$ 4,928,429
Trust Fund:			
U.S. Coast Guard gift fund	64,720	36,886	27,834
Grand Total	$570,963,361	$524,182,791	$ 46,780,570

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

Acquisitions, construction and improvements:	
Appropriated Funds	$ 16,179,847
Reimbursements	1,431,941
U.S. Coast Guard gift fund	27,347

[2] Unobligated balance of $46,573,140 under acquisition, construction and impriovement appropration remains available for obligation in fical year 1969. These funds are programmed for obligation in fiscal year 1969 for the following purposes:

	Coast Guard Projects	*Department of Defense Projects*
For projects deferred in fiscal year 1968 to be accomplished later	$20,651,000	----------
For completion of projects started in fiscal year 1968 and 1967	20,993,711	$ 4,928,429
Total	$41,644,711	$ 4,928,429

	Total Expenditures	*Direct Expenditures*	*Reimbursable Expenditures*
Expenditures Incurred:			
Operating expense	$367,683,455	$345,243,063	$ 22,440,392
Reserve training	24,392,198	24,392,198	----------
Retirement pay	48,149,936	48,149,936	----------
Acquisition, construction, and improvement	125,326,695	124,131,690	1,195,005
Sub Total	$565,552,284	$541,916,887	$ 23,635,397
Trust Fund:			
U.S. Coast Guard gift fund	32,971	32,971	----------
Grand Total	$565,585,255	$541,949,858	$ 23,635,397

Bright radar display used in daylight tower.

Chapter IV

FEDERAL AVIATION ADMINISTRATION

As its name indicates, the Federal Aviation Administration is the Department of Transportation's component concerned with transport by air. FAA is charged with insuring the safe and efficient use of the Nation's airspace, by military as well as civil aviation, and with fostering civil aeronautics and air commerce, both in the United States and abroad. These responsibilities give rise to numerous programs, involving: safety regulation; airspace management and the establishment, operation, and maintenance of a civil-military common system of air traffic control and navigation facilities; research and development, primarily in support of the foregoing activities; the fostering of a national system of airports, promulgation of standards and specifications for civil airports, and administration of Federal grants-in-aid for developing public airports; various joint and cooperative activities with the Department of Defense; and technical assistance to other countries. A discussion of the principal developments in these programs during fiscal year 1968 follows.

Aviation Safety: Certification Activities

Aviation safety is FAA's primary mission. Other organizations, both private and governmental, cooperate toward the same end, but FAA has the responsibility of leadership. A principal form of safety regulation is the imposition of standards by means of certification. FAA's principal certification activities during fiscal year 1968 follow.

Airmen. To serve as an airman in any capacity related to civil aircraft of U.S. registry in air commerce, an individual must have an FAA certificate and appropriate rating. To qualify for certification, an applicant must possess the aeronautical knowledge, skills, and experience prescribed for the rating desired, and also meet any physical standards that may be prescribed.

In the pilot category (including the subcategories of student, private, commercial, airline transport, and other), the number of active certificates held increased during the calendar year 1967 by 12.61 percent (up from 548,757 to 617,931). (This was a net increase, being the difference between the number of new certificates issued and the number of certificates that lapsed or were suspended or revoked between January 1 and December 31, 1967.) At the same time the subcategory of student pilots, the feeder group for the higher pilot ratings, achieved a net increase of 9.75 percent (up from 165,177 to 181,287). In the nonpilot category (mechanic, parachute rigger, dispatcher, air traffic controller, flight engineer, and other), the net increase in number of certificates held during the same period was 6.76 percent (up from 217,132 to 231,801).

A current medical certificate is required to make any pilot-category certificate valid, and is also required to validate certain nonpilot airman certificates (flight engineer, flight navigator, air traffic control tower operator). The necessary physical examination may be given by an FAA-designated aviation medical examiner (AME) or, in the military services, by a senior flight surgeon. Denial of a medical certificate may be appealed as high as the Federal Air Surgeon, the head of FAA's Office of Aviation Medicine. In fiscal year 1968, 414 such cases were referred to the Federal Air Surgeon; he granted certificates in 81 cases. As a last resort, an airman denied a medical certificate may petition the Federal Aviation Administrator for exemption from the requirements. There were 445 such petitions in fiscal year 1968, and the Administrator, assisted by a medical advisory panel of specialists in private practice, granted 85 exemptions. Private physicians designated by FAA as AME's numbered 6,112 at the end of fiscal year 1968 (up from the 1967 fiscal yearend figure of 5,961). To meet training requirements of both new and experienced AME's, FAA conducted eight seminars in various parts of the country.

Other notable developments:

- Pilot training as a vocation is being encouraged by a new "GI bill" provision passed by Congress during fiscal year 1968 (see under "Air Agencies" below).
- An agencywide investigation of unauthorized possession and sale of FAA airman examinations culminated, in three FAA regions, in the initiation of administrative and criminal charges against persons implicated.
- To prevent compromise of written examinations for commercial pilot certificates, a new system of procedures was scheduled at year's end to go into effect on January 1, 1969. The new system will include three "banks" of tests, with each bank consisting of four basic tests plus 12 additional randomized tests. A new bank of tests will be issued every 3 months, and no adjacent FAA regions will have identical tests.
- Toward alleviating the aviation-industry shortage of trained mechanics and to assist military dischargees, FAA was studying at year's end the feasibility of crediting training and experience as a military aviation mechanic toward FAA certification as a mechanic.

Aircraft and Aircraft Components. Type certificates are issued by FAA for new models of aircraft and aircraft components when they meet standards of design, workmanship, construction, and performance prescribed by the Federal Aviation Administrator in the interest of safety. For an approved change in a type-certificated model, FAA issues a supplemental type-certificate (unless the change is great enough to require a new type-certificate). Aircraft and aircraft components manufactured in conformity with a type certificate are individually tested for airworthiness and safe operating condition after coming off the production line. Foreign aircraft models for which U.S. certification is requested must meet standards equivalent to those applied to U.S. aircraft models.

Certification activities of the kind just described are reflected for fiscal year 1968 in the following statistics (for comparison, fiscal year 1967 figures are given in parentheses): New aircraft models type-certificated, including foreign models, 114 (103); supplemental type-certificates issued, 1,055 (999); new engine models type-certificated, 75, including 37 turbine types (37, including 26 turbine types); new propeller models type-certificated, 48 (35); airworthiness certificates issued, including original and export certificates and related approvals, approximately 15,000 (approximately 16,600).

Notable among the aircraft type-certificated during the fiscal year were the:

- Boeing 737–100, on December 15, 1967—a short-range, swept-wing transport (maximum passenger capacity: 107), with two wing-mounted jet engines.
- Boeing 737–200, on December 21, 1967—"stretched" version of the 737–100, with the fuselage 6 feet longer (maximum passenger capacity: 125).
- Grumman G–1159 (Gulfstream II), on October 19, 1967—a high-performance executive transport (maximum passenger capacity: 19), with twin turbofan engines mounted at rear of fuselage and with a T-tail.
- Beechcraft Model 99, on May 2, 1968—a twin-engine turboprop designed specifically for air-taxi operators and certificated under special conditions increasing the safety level provided (maximum passenger capacity: 17).

(For complete list of other models type-certificated during the year, see Table 11, pages 60–62.)

Other notable certification activities in the area of aircraft or aircraft components/appliances involved:

- Inertial navigation systems: The first INS to meet prescribed standards of accuracy and reliability for cockpit navigation, in lieu of a professional navigator, received FAA approval, effective May 15, 1968. This INS is to be used by a U.S. trunk airline on Pacific routes flown under Military Airlift Command contract; ground alignment of the INS is limited to the area between 65° N. and 65° S.
- Tentative V/STOL airworthiness standards: Drafting of these standards, ready at year's end for issuance early in fiscal year 1969, was a step in preparing for the fast-approaching commercial operation stage of V/STOL (vertical/short takeoff and landing) aircraft; the effort was limited to transport-category V/STOL's plus all others having more than one jet engine. The work was done by an FAA evaluation team, assisted by a proposed draft of V/STOL standards submitted by the Aerospace Industries Association to FAA on October 2, 1967,

TABLE 11. Aircraft models certificated, fiscal year 1968

Category	Make	Model	Make	Model
BUSINESS AND GENERAL (Except Helicopters)	Aero Commander	S–2R (Part 21)	Cessna	150H, 150J
		S–2R (Part 23)		172F, 172I, 172K, R172F
		100–180		177A
		500–S		182L
		680W		P206C, TP206C, TU206C, U206C
	Aeronautica Macchi SpA	AL 60–C5		
		–F5		
	American Aviation	AA–1		210H, T–210H
	Beech	3N,3NM, 3TM		305E, 305F
		19A		310N
		B23		337C, T337C
		E33, E33A	Dornier-Werke G.M.B.H.	Do 28 D
		V35A		D–1
		36	Mitsubishi	MU–2B–20
		D55	Mooney	M20G
		60	Reims Aviation S.A.	Cessna F150H
		A65–8200		FR172E
		B90	Short Brothers & Harland	SC7 Skyvan Series 3
		E95		
		99	Siai-Marchetti SpA	S. 208
	Biemond	Teal CB1	Swearingen	SA–26AT
	Britten-Norman	BN–2	Ted Smith	Aerostar 400
				600

TABLE 11. Aircraft models certificated, fiscal year 1968—*Continued*

Category	Make	Model	Make	Model
TRANSPORT	Aero Commander	1121A, 1121B	Boeing	–222
	Boeing	707–312B		–223
		–348C		–231
		727–24C		–235
		–27		–291
		–44C		–295
		–63		737–130
		–82C		–201
		–95		–222
		–114		–247
		–116		–293
		–121C	British Aircraft Corp.	BAC One-Eleven
		–123		400 Series 419/EP
		–134	Dassault/Sud	Fan Jet Falcon
		–151C		Series D
		–155C	Douglas	DC–8–62F
		–171C		–63F
		–172C		DC–9–31
		–173C		–32F
		–180C		–33F
		–185C		–41
		–214		

TABLE 11. Aircraft models certificated, fiscal year 1968—*Continued*

Category	Make	Model	Make	Model
TRANSPORT (Cont'd)	Fairchild Hiller	FH-227C -227D -227E	Lear Jet Nihon (NAMC) North Star Aviation	25 YS-11A-200 NA-B25D
	Grumman Hawker Siddeley	G-1159 D.H. 125 Series 1A/R-522 1A/S-522 3A/R 3A/RA		
GLIDER	Entwicklungsgemeinschaft	Phoebus C	Schweizer	SGS 2-33A
BALLOON	Semco	TC-4		
HELICOPTER	Bell	205A	Enstrom Hughes	F-28A 369 HM

and by conferences and discussions with the aviation community. Since these emerging aircraft are featured by variety and novelty, and since experience in their certification and operation is virtually nonexistent, the tentative standards are not expected to be appropriate for all designs. They should, however, provide basic guidelines useful to both aircraft designers and FAA in working out appropriate special conditions for type certification of particular designs. Rulemaking of general applicability will be undertaken by FAA when accumulated knowledge and experience provide adequate technical support.

Air Agencies. The Federal Aviation Administrator is empowered to examine, rate, and certificate (1) schools that teach flying or the repair and maintenance of aircraft and aircraft components and appliances, (2) repair stations for the repair of aircraft and aircraft components and appliances, and (3) such other air agencies as he considers necessary in the public interest.

Certificated schools and repair stations of the kind described in (1) and (2) above, like other elements of the aviation industry, showed notable growth in fiscal year 1968. Pilot schools increased 26 percent (1,364 to 1,720); mechanic schools, 20 percent (80 to 96); and repair stations, 15 percent (1,638 to 1,883).

An outstanding development of the year relating to pilot schools stemmed from the Veterans' Pension and Readjustment Assistance Act of 1967, which became fully effective October 1, 1967. By this act, the U.S. Government authorized 90-percent reimbursement through the Veterans Administration to eligible veterans for flight training "generally accepted as necessary for the attainment of a recognized vocational objective in the field of aviation." Two conditions were specified: (1) The eligible veteran must have a valid private pilot certificate (or have satisfactorily completed the flight-training hours required therefor), with at least a second-class medical certificate, and (2) the "flight school courses must meet the Federal Aviation Administration standards and be approved both by that Agency and the appropriate State approving agency." By an amendment to Part 141 ("Pilot Schools") of the Federal Aviation Regulations, issued December 7 and effective December 13, 1967, FAA approved, at qualifying schools, courses leading to certain additional ratings on a pilot or flight-instructor certificate, or to certification as an airline transport pilot, a rotorcraft external-load operator, or an agricultural aircraft operator. Standards of instruction to be met by the schools were specified in the same amendment.

Aviation Safety: Surveillance of Aircraft Operations and Maintenance

FAA inspectors exercise surveillance over the entire range of activities involving safety in civil aviation. Certificated airmen and aircraft must operate in accordance with duly promulgated safety rules, and aircraft must be maintained in accordance with prescribed standards. In the area of aircraft operation and maintenance, the surveillance approach has for some years emphasized efforts to achieve a more precise matching of inspection with the need for it than is usually achieved by routine inspections at arbitrary intervals. Helping the new approach have been the increasingly sophisticated methods of data collection and data analysis available, and the introduction of equipment-reliability factors into the scheduling of inspection and maintenance programs. Notable developments in fiscal year 1968 follow.

Systemsworthiness Analysis Program (SWAP). SWAP applies the foregoing approach to the inspection and surveillance of airline operations and maintenance. Adopted by FAA in July 1966 on a trial basis, SWAP was fully implemented during fiscal year 1968. Under this program, teams of inspectors are strategically based within an inspection area to complement small cadres of inspectors domiciled at the carriers' main operations and maintenance bases. The resident cadres maintain routine surveillance, while the SWAP teams, periodically and as necessary, perform comprehensive, in-depth inspections of the carriers' programs for keeping personnel and materiel up to standards. The program's objective—optimum use of FAA inspectors in the face of the constant growth of airline operations in both size and complexity—is being achieved. The airlines have reacted favorably.

The latter half of fiscal year 1968 saw the beginning, in FAA's Southern Region, of a 6-month test of the SWAP method of surveillance as applied to general aviation activities (such as air taxis, repair stations, and airman schools).

Performance and Reliability Program (PAR). During the fiscal year, the PAR system for monitoring airline performance continued as a test program with 15 participating U.S. carriers. At year's end, an operational analysis of the PAR system's effectiveness was in process.

Maintenance Analysis Center. Established in fiscal year 1967 at the FAA Aeronautical Center, Oklahoma City, the maintenance analysis center (MAC) is a focal point for the assembly, overall review, and diagnosis of data related to the operational malfunctioning of aircraft. In fiscal year 1968, it continued to modernize and automate FAA's aircraft-maintenance-data collection, storage, and retrieval systems. During the year, automatic processing of data on service difficulties with general aviation aircraft (under 12,500 pounds) began—the first such program at MAC. Trends spotted in the data were the basis for a number of directed safety investigations that FAA conducted on specified aircraft makes and models to prevent or promptly detect mechanical problems. Plans to install similar automatic data processing (ADP) for air carrier aircraft were in abeyance at year's end, pending results of a 9-month trial program using a new reporting concept designed for ADP. Other MAC activities in fiscal year 1968 included responding to more than 800 requests for information and furnishing monthly, annual, and quarterly printouts of mechanical-malfunction and aircraft-utilization reports. As intended, MAC is rapidly developing into the central source of mechanical reliability information on the U.S. civil aviation fleet.

Aircraft Reliability Control. Starting with aircraft engines in 1962, FAA has sought to develop reliability control methods embracing, ultimately, all the complex systems and components of today's transport aircraft. Considerable headway has been made in prescribing standards, methods of application, and procedures for approving programs of this type. The standards, reflecting industrywide experience, call for realistic inspection cycles and replacement schedules, which is in line with the agency's previously mentioned efforts to use inspector personnel to optimum advantage. During fiscal year 1968, 13 additional airline reliability programs were approved, covering airframes, powerplants, and systems. Also approved was a reliability program called Regional Operators Program for Aircraft Reliability (ROPAR). Like the Regional Operators Program for Engine Reliability (ROPER), approved in fiscal year 1967, ROPAR was conceived by a group of local service operators to take advantage of the more efficient reliability control possible when their aircraft are maintained on a single-fleet basis rather than in several separate small groups of aircraft. The administration of ROPAR, as well as that of ROPER, functions through liaison committees made up of the principal maintenance inspectors assigned to the participating air carriers.

Aviation Safety: Surveillance of Navaids

Electronic air navigation facilities must be flight-inspected to insure accuracy of the signals they emit to guide aircraft. In surveillance of these facilities, as in surveillance of aircraft operations and maintenance, FAA has been seeking to revise a system consisting wholly of routine inspections at arbitrary intervals to one in which the selective matching of inspection effort to inspection need plays a major role. Central computer processing of performance data on a given navaid, by revealing its degree of reliability, provides a basis for the selective scheduling of flight inspections. This technique—applied to instrument landing systems (ILS's), starting in fiscal year 1965, and extended to precision approach radars (PAR's) in fiscal year 1968—has permitted effective concentration of flight-inspection effort on these airport facilities; that is, those ILS's and PAR's showing highly reliable performance have been receiving the minimum number of inspections necessary to maintain their reliability, and those that are less reliable are, in proportion to need, inspected more frequently. As fiscal year 1968 ended, these techniques were in process of being extended to include en route navigational aids (VOR's and VORTAC's: the VOR, or very high frequency omnidirectional radio range, is the standard short-range navigational aid for civil aircraft en route between airports; the VORTAC is a combined VOR and TACAN, the latter being a military navaid whose name is derived from "tactical air navigation").

Flight inspection, whether selective according to need or done at routine intervals, insures the accuracy of the navaid signals within proper tolerances. But to serve their purpose, these signals must be received in aircraft. A fiscal year 1967 study found the errors present in 214 VOR receivers installed in general aviation aircraft were larger than anticipated. In a follow-on project in fiscal year 1968, actual tracks of 619 aircraft were photographed on radarscopes for the purpose of comparing performance of general aviation aircraft in following the airway with similar performance of air carrier and military aircraft. Preliminary analysis indicates that the present airway dimensions are adequate. A complete analysis will attempt to define differences in performance capabilities related to various types of aircraft, operations, and airways that may justify narrower airways and obstacle-clearance standards for certain types of aircraft and aircraft operators. It may also confirm (or, on the other hand, throw doubt on) the advisability of not providing technical standards for general aviation VOR receivers.

In another project started in fiscal year 1968, FAA has been reducing the mean error of VOR/VORTAC facilities by adjusting their radial alignment on the basis of data derived from the semiautomatic flight inspection (SAFI) operations. (SAFI, in use for some years, is a method of flight-inspecting these facilities on a mass-production basis.) For the first 147 facilities, the average improvement in the mean error has been 70 percent.

Aviation Safety: Rulemaking and Rule Enforcement

The mandatory rules, requirements, and standards applying to aviation activities under FAA's regulatory authority are codified in the Federal Aviation Regulations (FAR's). Numerous amendments to the FAR's are necessary each year to keep them current and applicable to the changing civil aviation environment.

Crashworthiness and Passenger-Evacuation Standards. Probably the most significant safety rules issued in fiscal year 1968 were those adding to or revising crashworthiness and passenger-evacuation standards previously issued for transport airplanes—most recently in 1965. The new rules, issued September 15, 1967, were in the form of amendments to FAR Part 21 ("Certification Procedures for Products and Parts"), Part 25 ("Airworthiness Standards: Transport Category Airplanes"), Part 37 ("Technical Standard Order Authorizations"), and Part 121 ("Certification and Operations: Air Carriers and Commercial Operators of Large Aircraft"); many of the new requirements were to be complied with by October 24, 1967, but longer periods were allowed for procurement of certain required equipment and for certain required aircraft alterations.

Two major revisions of the earlier crashworthiness and evacuation standards may be specially noted: (1) Instead of 2 minutes, the new rules specify 90 seconds as the time limit within which planes with more than 44 seats must be capable of permitting evacuation of a full load of passengers through only half the exits, and (2) the actual demonstration of this capability, required of airlines and commercial operators under the 2-minute rule, is now, under the 90-second rule, additionally required of airplane manufacturers. Other key provisions of the new rules relate to: definition of ventral, tail-cone, and type A exits; improved exit distribution; better ratio of exits to passengers on large aircraft; retention of excess exits; evacuation slides deployable in 10 seconds; improved interior lighting and new exterior lighting; improved access to overwing exits; self-extinguishing cabin-interior materials; better protection of fuel and electric lines.

Protection From Lightning. Other safety rules issued during the year variously modified certification and operational requirements pertaining to airmen and aircraft. Notable among these was one made feasible as the result of several years' research and development efforts—a rule (issued August 7, effective September 10, 1967) amending FAR Part 25 to require that the design of transport category airplanes include protection of the fuel system against lightning.

Air-Taxi Operations. Because of the continued rapid growth of air-taxi operations, FAA was preparing at year's end to issue new safety regulations for this segment of general aviation.

The most significant element of growth in air-taxi operations during fiscal year 1968 was the Post Office Department's expanded use of this form of transport for the U.S. mail (first-class as well as air mail). In June 1967, the number of mail routes thus served was 15 (under contract with 11 air-taxi operators); in June 1968, the number of routes had grown to 94 (and the operators to 32). Further growth of this kind was expected. Carrying the mail, however, is only part of the type of air-taxi operations experiencing the principal growth—scheduled service. The main demand for air-taxi scheduled service has come from commuters—people who want air transportation from points infeasible for inclusion in local-service or trunk airline routes. The dimension given scheduled air-taxi operations by this growing commuter demand in the past several years is reflected in the following FAA-compiled figures: U.S. operators of scheduled air-taxi service, numbering only 12 as of January 1, 1964, had increased by November 1, 1966, to 116, and by October 1, 1967 (the latest count available within fiscal year 1968), to 165. Aircraft used for scheduled air-taxi service increased in number during the same 45-month period from 72 to 685.

This growth trend led FAA to issue an advance notice of proposed rule-making on March 24, 1967, soliciting public participation in determining new regulatory steps appropriate to the situation. Comments and recommendations received were being considered in the preparation of new safety regulations taking place for all air-taxi operations as fiscal year 1968 ended.

Enforcement. Reported FAR violations referred to the Office of the General Counsel during fiscal year 1968 numbered 3,273. Actions processed to completion during the same period numbered 3,127.

Of the latter figure, 1,518, or approximately half, were proceedings involving suspension or revocation of airman certificates; 124 of these certificate cases were appealed to the National Transportation Safety Board.

Of the completed cases not involving certificate suspension or revocation, civil penalties in the form of fines accounted for 855; of these, all but 89 were voluntary compromises between FAA and the airmen or operators involved (the 89 exceptions resulted from U.S. District Court judgments or voluntary compromises between the Department of Justice and the airmen or operators). Total civil penalties collected amounted to $168,643.88, of which the Department of Justice collected $22,820.88 and FAA the remainder.

Completed cases not involving certificate actions or fines were disposed of by administrative action consisting of letters of reprimand or letters of correction.

Violations during fiscal year 1968 involving military personnel, and therefore referred to the Department of Defense, numbered 46. Violations during the year involving airmen holding foreign certificates, and therefore referred through the State Department to the appropriate foreign nations, numbered 19.

Aviation Safety: Research and Development

FAA conducts or sponsors numerous R&D programs designed to make U.S. civil aviation safer. These programs seek better equipment, devices, or methods for FAA's activities, or the activities of other components of the aviation community, directly bearing on aviation safety.

Aircraft Crashworthiness. R&D efforts to improve the chances of aircraft occupants to survive crashes were aimed especially at preventing, or minimizing effects of, post-crash fire:

- Flammability, smoke, and toxic-gas characteristics of 140 new and improved cabin-interior materials were determined, providing support for safety-rule revisions referred to above.
- A crash-resistant, multitank bladder-type fuel system equipped with self-closing, tank-isolation valves was successfully demonstrated under full-scale catastrophic crash conditions at low speeds. Crash resistance of the same system under high-speed impact will be demonstrated in fiscal year 1969.
- Compatibility of gelled and emulsified fuels with jet transport and engine fuel systems was under study during the year; previous tests had shown that these fuels can appreciably reduce the fire hazard following a survivable aircraft accident. As part of the fiscal year 1968 work, detailed laboratory tests explored compatibility of these fuels with fuel-nozzle and combustor components of jet engines; also, a J57 jet engine was successfully started and operated on a new gelled fuel, privately developed with FAA's encouragement, that shows promising safety, stability, and system characteristics. At year's end, further study and testing of compatibility between gelled and emulsified fuels and jet transport and engine systems was continuing, to identify potential problem areas and necessary solutions to qualify these safety fuels for flight tests.
- Tests with the two conventional jet fuels (kerosene and JP–4, the latter a mixture of kerosene and gasoline), conducted in a full-scale vent system ground rig, determined flame-propagation characteristics for aircraft fuel-tank vent systems. Several preliminary tests also

established that reticulated polyurethane foam, properly installed in a vent system, will bar low-speed flames. The same two fuels were being compared for hazardousness in tests at year's end under FAA sponsorship at the Naval Air Propulsion Test Center, Aeronautical Engine Department, Philadelphia, Pa. Performed in a special chamber, these tests permit determination of fuel ignition properties under various simulated conditions of crash-caused fuel leakage or spillage and a range of wind conditions.

Work was also done toward improved emergency evacuation of aircraft:

- Development of a prototype emergency exit system using linear-shaped tubing and liquid explosives to create a cabin exit was completed, and the system was demonstrated. Evaluation of the system was underway at year's end.
- A study report, "New Concept for Emergency Evacuation of Transport Aircraft Following Survivable Accidents," was completed. The report describes and provides theoretical evaluations of 51 concepts concerning hardware and procedures for improving emergency evacuation of passengers.
- Antismoke hoods for airline passengers, under study and development the previous 2 years, were subjected to important additional studies in fiscal year 1968 at FAA's Civil Aeromedical Institute (CAMI), at Oklahoma City, including full-scale controlled evacuations from a leading airliner model. At year's end, an improved revision of the hood was being given final form.
- Supersonic transport (SST) evacuation studies made at CAMI, using the fuselage mockup constructed by one of the airframe manufacturers in the design-competition phase of the SST development program, showed the new, type A airliner exits (at least 42 by 72 inches) are about twice as effective as the older, type I exits (at least 24 by 48 inches) in passenger flow rates.

Accident Investigation. Aviation safety R&D may both benefit, and benefit from, investigation of accidents. Either way, aviation safety is ultimately promoted. Following are examples of research or R&D in this area during fiscal year 1968:

- Work was initiated to improve the ability of the magnetic tape or other recording medium used in flight recorders or cockpit voice recorders aboard aircraft to withstand impact and heat, thus improving the chances of these devices to survive aircraft accidents undamaged. Information recorded in such devices, when retrieved intact at the scene of a crash, is very valuable to both FAA and the National Transportation Safety Board in carrying out their accident-investigation responsibilities.
- An acoustic underwater locator beacon—a device to facilitate post-crash location of flight and cockpit voice recorders, or of other key aircraft components or pieces of equipment—was favorably evaluated.
- Toxicological analyses of specimens from 81 general aviation accidents, involving 133 fatalities, were made by the pharmacology-biochemistry

laboratory of FAA's Civil Aeromedical Institute between the fall of 1967 and the end of fiscal year 1968, to determine the rate of involvement in such accidents of alcohol, drugs, or toxic chemicals. Significant levels of these agents were found in approximately 25 percent of the victims.

Turbulence. There were several programs approaching the problem of atmospheric turbulence in various ways or dealing with specialized aspects of the problem during fiscal year 1968:

- Tests, analyses, and studies of aircraft wake turbulence, begun in calendar year 1967, had by the end of fiscal year 1968 verified simple theory for determining the characteristics of such turbulence. The problem giving rise to this program exists because the layer of disturbed air behind an aircraft in flight rolls up into two horizontal tornadolike vortexes, and another aircraft's encounter with such vortexes adversely affects its operation. The tests in fiscal year 1968 included interaction of aircraft-emitted smoke with smoke emitted from two tall towers, and tests concerning wake vortexes at various ranges behind jet aircraft operating at higher altitudes. Further information is needed to assure proper procedural consideration of turbulence-associated hazards. Negotiations were completed during fiscal year 1968 for procuring a three-tower sensing and recording system with which to conduct future phases of the program.
- A clear air turbulence (CAT) detector being developed with private funds by two manufacturers was being test-flown in airline aircraft during the year. The usefulness of this device, which is a simple infrared radiometer, depends on the correlation between remote air temperatures, which it measures, and the presence of CAT. The possibility of improving CAT forecasting by using the variability of balloon ascension rates will be investigated under an agreement consummated in fiscal year 1968 between FAA and the Environmental Science Services Administration/Weather Bureau.
- Engineering-quality flight data for scheduled airline operations—especially data on such unusual events as encounters with severe turbulence—are being sought in a project for which FAA awarded a contract toward the end of fiscal year 1968. Few data of this kind exist, though much is known about the performance and handling characteristics of airplanes as flown by engineering pilots during test and certification programs. The contract calls for instrumenting three jet transports with systems capable of providing the desired data.
- The adequacy of currently recommended turbulence-penetration techniques was confirmed during fiscal year 1968 by analysis of data on earlier tests at the U.S. Navy's Johnsville (Pa.) centrifuge simulation facility. In the tests, compatibility of jet pilot and aircraft had been examined under closely controlled conditions as the pilot's "flew" into simulated turbulence.

Collision Avoidance. The threat of midair collision increases with air traffic congestion, and is further increased as faster aircraft speeds reduce the time available for preventive action in case impending collision is perceived. A desirable way of helping the air traffic control system prevent midair collisions is to equip aircraft with a collision-avoidance system (CAS)—when a practical CAS is available. Such equipment aboard an aircraft in flight will, as now envisioned, monitor the positions of other similarly equipped aircraft and, if collision with one of them should threaten, warn the pilot and indicate the maneuver he should execute to end the threat. FAA and industry have been working on this approach to the problem for a number of years.

At year's end, with several manufacturers fabricating CAS equipment, coordination was underway between FAA and the Air Transport Association (ATA) to define the extent of FAA's participation in the initial flight testing of the equipment. Also, FAA has underway an in-house simulation effort to determine what the interaction of collision-avoidance systems with the air traffic control system will be and, if necessary, what corrective actions can be taken.

General Aviation. A number of FAA's R&D programs during fiscal year 1968 were concerned specifically with safety problems in general aviation:

- Tests using pictorial map displays, both as a training aid for pilots learning to fly on instruments and to reduce cockpit workload for the single pilot flying on instruments, were completed during fiscal year 1968. Results showed that workload reduction was about 25 percent and that pilots more quickly perceived their geographic position and navigational situation.
- Need for a low-cost solution to icing problems for single-engine aircraft prompted the start of a combined FAA-NASA-industry examination of new and promising materials for coating propellers and wings. The icing wind tunnel at NASA's Lewis Research Center, Cleveland, Ohio, will be used for tests.
- An objective flight test for student pilots seeking private pilot certificates is the goal toward which a national survey of pilots during fiscal year 1968 was directed. Basis for developing the new test will be the flying habits of the pilot population as revealed through responses to a detailed questionnaire sent to some 3,000 private pilots in the survey.
- An angle-of-attack instrument was determined to be an effective aid to student pilots in learning to make proper approaches, landings, and takeoffs and to avoid stalls. Performance of 15 students experimentally trained in an aircraft equipped with this device was superior to that of a control group of students trained in a conventionally instrumented aircraft.
- Pilots' visual detection of airspace intruders posing potential collision hazards was experimentally improved 50 percent in another project—training with a low-cost ($200) device modeled after a sophisticated flight simulator successfully used by the Navy for a similar purpose. Acceptability of this device as a collision-avoidance training aid depends on field evaluation by an organization with pilot members.

- An aeromedical study of general aviation pilots' ages and accident histories revealed that some individuals had experienced three or four or more accidents in their careers (these were identified for participation in an aviation safety program) and that general aviation pilots did not tend to have additional accidents with increase in calendar age.

Airports. There were several notable R&D programs in fiscal year 1968 to make airports safer:

- Grooved-runway development projects continued, in cooperation with the National Aeronautics and Space Administration (NASA) and the Air Transport Association. Results of the service test of 18 different experimental groove patterns on taxiways at five different airports with widely varying climatic conditions were informally reported to NASA and the industry. Pilot reaction to the previously grooved runways at Kansas City, New York, and Washington, D.C., under adverse weather conditions was favorable.
- Work toward correlating aircraft stopping distance on slippery runways with friction measurements obtained by a vehicle on the runways was begun.
- Antiskid runway coating and surfacing was begun for a section of New York's John F. Kennedy International Airport.
- An aircraft arresting system using a retractable pendant cable across the runway and requiring benefiting aircraft to be hook-equipped was subjected to a series of tests at FAA's National Aviation Facilities Experimental Center (NAFEC), Atlantic City, N.J. The objective is a system that can make available to military aircraft on runways at civil airports the emergency arresting capability now available to military aircraft at some Air Force bases. The test results indicated a need to position the cable within slots on the runway.
- Spill-fire tests were conducted at NAFEC, and preliminary information was developed on types of agents, discharge rates, and quantities required to obtain "control time." Heat-transfer data were developed, and fuselage fuel fire tests were completed. Final reports were in preparation on the latter, as well as on tests conducted earlier on use of foam and dry chemicals.

Aircraft Sabotage and Hijacking. Though FAA has evaluated since 1960 a number of promising R&D approaches to the aircraft-sabotage problem, no economically feasible as well as effective solution has been found. These efforts continued in fiscal year 1968. Efforts were also directed during the year toward an R&D solution to the aircraft hijacking problem.

Flight Inspection. Work continued during the year on development of a new flight inspection system referred to as Signal Evaluation Airborne Laboratory (SEAL). SEAL subsystems under development will be integrated under an operational concept designed to make flight inspection of navigational aids more efficient because of: (1) Stable, repeatable measurements; (2) in-flight compatibility and error readouts; (3) operation under instrument weather conditions; and (4) real-time go/no-go information.

During fiscal year 1968, four of the six SEAL subsystems were installed on an FAA aircraft and tested.

Other Aviation Safety Developments

Besides the foregoing, the following were significant items of FAA effort during fiscal year 1968 in behalf of aviation safety:

- Air travel clubs using large (over 12,500 pounds) transport aircraft were to be grouped, under notices of proposed rulemaking issued during the year, with supplemental air carriers and commercial operators of large aircraft instead of general aviation for purposes of safety regulation. This would mean more comprehensive and exacting regulation, covering in greater depth such areas as flight-crew qualification, training, and proficiency; passenger protection; airborne navigational and communication equipment; and aircraft operation and maintenance.
- FAA's third annual symposium on maintenance reliability was held on November 6–7, 1967, at the agency's Aeronautical Center, Oklahoma City. The subject was "Maintainability and Reliability of Aircraft Systems." Those attending included representatives of U.S. Government agencies and of U.S. air carriers and manufacturers, foreign representatives of the same categories, and representatives of repair stations and facilities.
- Project 85, a new approach to general aviation accident prevention, was ready at year's end to begin its 2-year tryout in FAA's Central and Southwest Regions. Fiscal year 1968 was used for preparation: selecting and specially training FAA inspectors for assignment to the general aviation district offices (GADO's)—one to each GADO—to devote full time to a systematic, aggressive program to prevent general aviation accidents. If the program is judged sufficiently effective during its 2-year trial period, it will be extended to FAA's other regions.
- A test program of airport inspections begun in fiscal year 1967 was completed. Revealed by the program, besides the willingness of airport owners to participate in such a program, were various items of airport improvement needs, many of which were voluntarily remedied after the inspection.
- A special 1-year study of why midair near-collisions occur was established by FAA as of January 1, 1968. Pilots, controllers, or other persons involved were invited to report all such incidents to FAA under a grant of immunity from any regulation enforcement or other adverse action that might otherwise seem applicable.
- Latest data on adverse physiological effects from crossing time zones and formulae for calculating rest periods appropriate after travel across a certain number of time zones were included in a joint paper prepared for the American Association for the Advancement of Science (AAAS) and was scheduled for publication during 1968 in the AAAS official journal, *Science*.

- Further steps to make parachute jumping safer took place. FAA action begun in May 1967 to require deployment-assisting devices on all parachutes for static line jumps had, by the end of fiscal year 1968, become a rule scheduled to take effect on August 7, 1968. The tragic drowning of 16 sport parachutists in Lake Erie on August 27, 1967, resulted in a concerted FAA-industry effort to develop and widely disseminate basic safety criteria and training minima.

Safety Record for the Year

Annual figures on the accident rate in civil aviation offer a basis for appraising the aviation safety record. Such figures are compiled by the National Transportation Safety Board (NTSB) in connection with its statutory function of determining the probable cause of each civil aviation accident. Since the significance of accident figures is not apparent except in perspective, tables of such figures for the scheduled and supplemental ("nonsked") airlines and for general aviation (all non-air-carrier civil aviation) follow (see Tables 12, 13, and 14), showing the annual record for each of these segments of aviation for the past decade. The figures are for calendar years; the NTSB does not compile these figures for fiscal years.

Inspection of the tables shows that the supplemental airlines had no accidents or fatalities in 1967 (the calendar year ending during fiscal 1968), and that the accident and fatality rates in that year for the scheduled airlines and for general aviation were creditably low—the lowest or next to the lowest in the tables.

On the other hand, the supplemental airlines' average annual passenger fatality rate for the decade is inferior to that of the scheduled airlines. Moreover, the favorable showing of the latter and of general aviation in the rates for recent years, as compared with earlier years, is not due to any reduction in the absolute number of accidents and fatalities. The absolute number of accidents and fatalities shows no downward trend in the 1960's for the scheduled air carriers; rather, the number of passenger-miles flown (in terms of which the accident and fatality rates are computed) has greatly increased. The case is similar for general aviation: though the absolute number of accidents and fatalities has been rising from year to year, the number of hours flown has tended to rise more rapidly.

But the number of potential fatalities per accident increases with aircraft capacity, and both air carrier and general aviation aircraft have been increasing in size. A challenge, therefore, lies ahead for all concerned with aviation safety: It will not be enough merely to maintain a favorable accident rate as compared with the past; the absolute number of accidents must be substantially reduced.

National Airspace System Modernization

Since the appearance of the Project Beacon Report in 1961, FAA has been engaged to one degree or another in semiautomating the air traffic

TABLE 12. 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			
1958	54	6	124	15	5	144	48,853,324	32,497,133,000	0.382
1959	67	10	268	42	0	310	56,002,094	37,765,609,000	0.710
1960	67	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

*Includes two midair collisions nonfatal to occupants of air carrier aircraft involved.

General notes: 1. Passenger deaths occurring in sabotage accidents are included in the passenger fatality column, but excluded in the computation of passenger fatality rates. Years and deaths involved: 1960, 29; 1962, 37; 1964, 41.

2. The 1958 figures do not include those for Alaskan air carriers.

Source: National Transportation Safety Board
Department of Transportation
Washington, D.C. 20591

TABLE 13. Accidents, fatalities, fatality rates—U.S. supplemental air carriers—passenger operations (civil and military)

Calendar year	Accidents		Fatalities				Passengers carried	Passenger-miles flown	Passenger fatality rate per 100 million passenger-miles flown
	Total	Fatal	Passg.	Crew	Other	Total			
1958	2	0	0	0	0	0	676,072	1,152,988,000	0
1959	5	1	1	2	0	3	895,518	1,629,556,000	0.061
1960	3	2	93	9	0	102	1,057,933	2,207,595,000	4.213
1961	2	2	151	9	0	160	978,171	1,543,027,000	9.786
1962	1	0	0	0	0	0	823,838	1,789,154,000	0
1963	2	0	1	0	0	0	749,164 (est.)	1,533,810,000	0
1964	0	0	0	0	0	0	674,489	1,502,018,000	0
1965	0	0	0	0	0	0	1,060,206	2,489,173,000	0
1966	1	1	78	5	0	83	1,597,911	4,125,445,000	1.891
1967	0	0	0	0	0	0	2,315,820	5,995,901,000	0

Source: National Transportation Safety Board
Department of Transportation
Washington, D.C. 20591

control subsystem of the National Airspace System (NAS). These efforts are designed to meet the expected future growth in air traffic by increasing the capacity and efficiency of the air traffic control subsystem and by relieving the controller of tasks better performed by machine.

That these efforts are necessary was amply borne out by recent aviation activity and forecasts of future activity. FAA's airport traffic control towers (ATCT's) handled 52,998,583 takeoffs and landings (a new high) during the reporting period, exceeding the fiscal year 1967 total of 47,584,327 by 11 percent. Similarly, FAA's air route traffic control centers (ARTCC's) handled 18,093,385 aircraft flying under instrument flight rules (another new high), exceeding the fiscal year 1967 total of 15,067,727 by 20 percent. This was the seventh consecutive year in which U.S. aviation activity registered new highs at both centers and towers. Over this 7-year period (1962–1968), ATCT activity rose 107 percent; ARTCC activity, 93 percent. The future bodes more of the same. FAA's forecasts predict that by 1979 ATCT activity will increase by approximately 200 percent and ARTCC activity by approximately 130 percent. It is to meet this growth that FAA is modernizing the National Airspace System.

New York Interim Automation. The Metropolitan New York terminal area moved another step closer during this reporting period toward achieving integrated semiautomatic air traffic control with the check-out of both the basic and alphanumeric hardware at the New York common instrument flight rules (IFR) room. Located at John F. Kennedy International Airport, this facility is expected to go into limited manual operation in July 1968 by taking control of terminal operations at Kennedy International.

TABLE 14. General aviation—accidents, fatalities, and rates calendar years 1958–67

Year	Hours flown (000)[1]	Total accidents[2]	Rate[3]	Fatal accidents[2]	Rate[3]	Total fatalities[2]	Rate[3]
1958	12,579	4,584	36.4	384	3.1	717	5.7
1959	12,903	4,576	35.5	450	3.5	823	6.4
1960	13,121	4,793	36.5	429	3.3	787	6.0
1961	13,602	4,625	34.0	426	3.1	761	5.6
1962	14,500	4,840	33.4	430	3.0	857	5.9
1963	15,106	4,690	31.0	482	3.2	893	5.9
1964	15,738	5,070	32.2	504	3.2	1,056	6.7
1965	16,733	5,196	31.1	538	3.2	1,029	6.1
1966	21,023	5,712	27.2	573	2.7	1,151	5.5
1967	22,154	6,000	27.1	576	2.6	1,186	5.4

[1]Estimated hours flown 1958–61 and 1963 are based on inspection report (FAA Form 2350) and have been revised by a correction factor drawn from the 1962 survey of aircraft use in general aviation. The 1962 figures are taken directly from the survey of that year.

[2]1958–67 CAB–NTSB data. 1967 data are preliminary.

[3]Rates are per 100,000 hours flown.

The control functions for Newark and La Guardia Airports will be taken over shortly thereafter; however, the facility is not expected to employ alphanumerics before the spring of 1969.

Once consolidated operations are fully in force at the facility, the New York terminal area's airspace will be used a great deal more efficiently. One of the drawbacks to the present scheme of split responsibility is its inflexibility. Airspace with more or less inviolable boundaries is assigned to each of the control facilities at Kennedy, Newark, and La Guardia. Between these boundaries are large buffer zones, also more or less inviolable. Because of the slowness of communications between the various control facilities, boundaries and buffer zones cannot be easily shifted to meet the shifting traffic flow. Under the contemplated procedures for the common IFR room, however, controllers working one control area will practically be able to reach out and touch controllers working another. Hence, when necessary, they will be able to shift buffers and boundaries almost instantaneously.

Another notable feature of the new facility is the use of two 9- by 12-foot rear-projection screen displays. Identical to the closed-circuit video screens used in motion picture theaters, these displays went in place during this reporting period and are expected to go into operation in fiscal year 1969. Conventional radar displays, however, will also be employed by the facility.

In another development, FAA abandoned its efforts to provide the New York center with an interim capability in alphanumerics and automatic radar tracking. In the first quarter of calendar year 1966, FAA had moved the Stored Program AlphaNumerics (SPAN) equipment employed in the Indianapolis ARTCC field appraisals to the New York ARTCC in Islip, N.Y. Renamed BAN (New York center Beacon AlphaNumerics), this equipment went into limited operation in fiscal year 1967. But while BAN had been perfectly capable of handling the en route traffic assigned to the Indianapolis ARTCC, it was incapable of meeting the considerably greater control demands imposed by the New York center, which has perhaps the most difficult radar beacon and traffic control environment in the United States.

FAA had been well aware of the complexities of the New York center control area; indeed, the agency had looked upon deploying this equipment in New York as a calculated risk. The risk was taken primarily because the congested New York center area needed, and BAN (if it proved out) could provide, relief. Additionally, whether BAN proved out or not, FAA stood to gain in the process a great deal of knowledge that could be used to advantage in bringing on board more capable follow-on configurations: BAN could illuminate for the agency some of the major pitfalls in introducing automation into highly complex center environments. It was decided, therefore, to bring the equipment into the area.

The chief difficulties with BAN in the New York environment were those growing out of the configuration's limited capacity. The New York center area is divided into 37 sectors; BAN could cover only nine. In consequence, aircraft were flying out of sectors with automation into sectors without automation, and vice versa. This presented too many complexities to cope with. Though the configuration's shortcomings could have been corrected for a price, it had been understood from the first that BAN was an interim configuration and would not, therefore, enjoy the luxury of unrestricted augmentation. Hence, in the fourth quarter of fiscal year 1968, BAN was dismantled and shipped to the Atlanta terminal, where it would be used to augment the Advanced Radar Traffic Control System (ARTS) configuration operating successfully at that facility. (The ARTS and BAN hardware components are virtually identical.)

NAS En Route Stage A. FAA's semiautomated en route subsystem—NAS En Route Stage A—will ultimately go into 20 air route traffic control centers in two separate phases, according to a NAS implementation plan approved during this reporting period. The first implementation phase calls for the early installation of computers and computer updating equipment designed to provide the centers with an automated flight-data-processing (FDP) capability. The second phase will bring automatic radar tracking and alphanumerics on board.

In accordance with this plan, the Chicago, Los Angeles, and Washington (D.C.) ARTCC's received and installed automated flight-data-processing equipment during fiscal year 1968. In the initial stages of operation, none of these centers will have a NAS En Route Stage A computer updating capability. The Washington ARTCC, however, like the Cleveland ARTCC—which was the first to receive (December 1966) and operate (September 1967) the NAS central computer complex (IBM 9020)—will be able to retain and use an earlier version of computer updating equipment until the NAS version is operating. At year's end, the Chicago center's computer equipment was expected to go into operation in fiscal year 1969, as was the previously installed FDP equipment at the Jacksonville (Fla.) center.

The Jacksonville ARTCC is scheduled to be the first FAA field installation equipped with a complete NAS En Route Stage A functional capability (flight-data processing, automatic radar tracking, and alphanumerics). At the end of fiscal year 1967, all major hardware for this configuration had been assembled and installed at the center. Throughout this reporting period, hardware and software testing was performed to prepare the system for initial operations in fiscal year 1969.

At the same time, NAFEC's System Support Facility, which is responsible for providing experimental support to the Jacksonville effort, completed integration testing of all the hardware elements of the NAS En Route Stage A configuration (Model 1a) in place at that facility. The flight-data-processing package went through complete shakedown tests, but only a portion of the total En Route Stage A system was shaken down. Additionally, NAFEC received, installed, and began operating an IBM 9020 Duplex computer that will be used to support Jacksonville's computer software program. All elements of En Route Stage A will be appraised in a test environment at NAFEC before being employed in a live environment at Jacksonville and other centers.

Including fiscal year 1968 appropriations, Congress has allotted a total of $117 million to NAS En Route Stage A. FAA had obligated $106 million of this total by year's end.

NAS Terminal Automation. The terminal automation program has progressed at a slower pace than the en route program because of the complexity and diversity of terminal-area problems. Indeed, it can be said that the terminal program is really composed of three programs—one for high-, one for medium-, and one for low-density terminal environments. Moreover, each terminal area requires a more or less customized system (though hardware requirements within a density grouping are the same). Air route traffic control centers, on the other hand, have relatively common hardware and software requirements.

FAA was preparing itself at year's end to begin evaluating the first prototype of the ARTS II terminal configuration. Also known as direct altitude and identity readout (DAIR), this configuration (AN/TPX–42) is designed for low-density terminals and military radar control facilities. It employs beacon aircraft identity and numerics. In July 1967, FAA completed the preliminary review for the production prototype design; in October 1967, it completed the critical design review. Before the fiscal year was out, the ARTS II contractor had demonstrated the configuration's on-scope high-speed-writing technique. Since this is a joint FAA-Department of Defense program, technical and operational testing of the system will be conducted by a joint DOD-FAA team at NAFEC.

FAA was also preparing at year's end to contract for a production model of the more capable beacon-tracking-level system (ARTS III). This configuration is designed for medium-density terminals equipped with airport surveillance radar and air traffic control beacon interrogating equipment. ARTS III is modular and can, therefore, be expanded to satisfy a variety of terminal needs. During fiscal year 1968, FAA prepared both a system description and a system specification for this configuration. A request for proposals went out to industry, and FAA was evaluating incoming proposals at year's end. According to present plans, ARTS III will go into 62 terminals in the United States.

Other Air Traffic Control Developments

If for no other reason than to stay abreast of the unceasing growth in air traffic, FAA is continuously making discrete improvements in the existing air traffic control system. The existing system represents a total outlay of $1.21 billion. In addition, FAA obligated $78.9 million during this reporting period for new facilities and equipment (including equipment for NAS automation). (See Table 15, pg. 88, for list and number of major facilities in commission.) Some of the more notable in-service improvements instituted or under development during fiscal year 1968 follow.

Solid-State ATCT's. A prototype airport traffic control tower equipped with solid-state electronic equipment went into operation at Reid-Hillview Airport (San Jose, Calif.) in October 1967. Designed primarily for small airports, such a tower will provide essentially the same service as towers at larger airports operating with vacuum-tube equipment; however, it can be built in about half the time required by larger towers and at considerably less cost. This is possible because, compared to conventional communication equipment, solid-state equipment requires less space and less maintenance, is easier to install, and has a higher reliability. FAA anticipates constructing many solid-state towers in the future at a cost of approximately $260,000 each. In contrast, the cost of comparable vacuum-tube-equipped towers has run between $300,000 and $400,000 each. The agency is also looking into the feasibility of using solid-state electronics at flight service stations.

Continuous-Power Program. This is a three-phase program designed to provide FAA facilities with a continuous electrical power supply commensurate with their needs. The program, in progress over a number of years, began to move at an accelerated rate after the massive power failure of November 1965.

During this fiscal year, the program's first phase—providing a noncommercial power source sufficient for keeping in continuous operation all critical facilities at each of 50 strategically spaced "safe haven" airports—reached its final stage. The delivery of generators was completed, and a substantial number were installed. When the last of these standby generators is in place, the control towers, airport surveillance radars, approach light systems, instrument landing systems, and runway-edge lights on the primary runway of all 50 airports will be able to obtain emergency power within 15 seconds after failure of their commercial power source.

The next two phases of the program are still in the preliminary stages. Under these phases, facilities at less critical locations will be provided continuous power according to their importance in the National Airspace System.

Satellite Communications. FAA continued to investigate the use of earth satellites as communication relays in transoceanic air traffic control. This interest in satellites stems from the present difficulty of maintaining radio contact with aircraft flying international overwater routes.

NASA's ATS I applications technology satellite was again tested as a very high frequency air-ground-air relay, as was ATS III, which was launched in December 1967. The satellites successfully relayed both voice and digital signals. At year's end, test data were still being reduced and analyzed; however, indications thus far are that the use of these synchronous-orbit satellites in transoceanic air traffic control is technically feasible.

Computer-Aided Approach Spacing. This is an experimental computer-based method for assisting terminal air traffic controllers in calculating optimum spacing between aircraft in landing sequence. Developed at NAFEC, this computerized system has a general-purpose digital computer, controller input-output panels, a symbol generator, and a standard ASR–4 radar as its basic components. The system was first tested and evaluated in a simulated environment at NAFEC and then taken to Kennedy International for field appraisal. It performed well at this airport. With the computer determining aircraft intervals, the airport's landing rate increased by at least two aircraft per hour. The equipment is scheduled for relocation at Philadelphia International Airport for further evaluation. If this method ultimately proves out, it will lessen the workload of the experienced controller and increase the ability of the less experienced controller in handling traffic.

Other Developments. Other notable efforts in this area during fiscal year 1968 were concerned with:

- Area positive control: In November 1967, FAA lowered the floor of area positive control over the northeastern and north central United States from 24,000 to 18,000 feet. This action was taken to assure the safe separation of aircraft in this heavily traveled airspace.
- New tower construction: Twelve new air traffic control towers were commissioned during this reporting period, bringing the total number of towers commissioned under the current tower program to 46.
- Maintenance personnel certification: FAA continued examining and certificating technicians maintaining agency facilities. Only certificated technicians may certify to the operational fitness of FAA's 8,400 primary facilities. Through fiscal year 1968, more than 7,000 electronic technicians have been certificated.
- Bright radar displays: Initial installation of these displays at air traffic control towers began in fiscal year 1968. This equipment permits controllers to observe traffic in high ambient light. Some 86 ATCT's are scheduled to receive the equipment; at year's end, deliveries had been made to 19 terminals.
- Low-cost instrument landing system: This is a prepackaged solid-state ILS that will cost 50 percent less than comparable equipment now in existence. FAA awarded the initial contract for this system during this reporting period.
- ARTCC electrical system: This effort looks to the development of an electrical system capable of providing uninterrupted and stable electrical power to FAA centers. In fiscal year 1968, an electrical distribution system was designed, and the design of a modular uninterruptible power device was approved.
- Pilot automatic telephone weather answering service (PATWAS): FAA assumed the responsibility of operating this service from the U.S. Weather Bureau during this reporting period.
- Multiple radar data display: Because of clutter and other factors, a single radar system does not always provide adequate coverage in some locations. Looking for ways to solve this problem, FAA combined the coverage of several radars on a single display in the Los Angeles ARTCC. It was concluded that this technique offered some possibility of enhancing the controller's ability to control traffic with existing equipment.
- Simultaneous instrument operations: Procedures were worked out at Los Angeles International Airport permitting simultaneous IFR departures from two runways. With these procedures in effect, controllers at this airport were able to handle a greater volume of traffic with a

minimum of delay. By year's end, procedures were also worked out for simultaneous ILS approaches on two parallel runways.

- Reduction of ATC radar separation: This program was launched in fiscal year 1968 to determine the feasibility of reducing current minimum separation standards between aircraft. A reduction in these standards could result in a significant increase in the air traffic control system's capacity. The program is part of FAA's total effort to increase system capacity and decrease traffic delays.

National Defense

The Federal Aviation Act of 1958 entrusts to FAA all airspace management functions essential to support the common needs of both civil and military aviation. The act also charges the FAA Administrator with the responsibility of giving "full consideration to the requirements of national defense. . . ." Hence, the agency engages in defense readiness programs and emergency planning covering the Nation's civil airports, civil aviation operational facilities, and civil aircraft other than air carrier aircraft. In addition, the agency participates in emergency tests and exercises.

Military Airspace and Air Traffic Control Needs. FAA normally handles military aircraft in the same way as civil aircraft. But when maneuvers or other special military operations dictate, FAA reserves the necessary airspace exclusively for military use. The job of handling and coordinating military requests for such airspace reservations belongs to FAA's Central Altitude Reservation Facility (CARF), in Washington, D.C.

During this reporting period, CARF processed 10,525 military altitude reservations. These reservations supported numerous national defense exercises and military-command aircrew proficiency training missions conducted by three major Air Force operational commands (Air Defense Command, Tactical Air Command, and Strategic Air Command) and air defense components of the Army and Navy. CARF also provided specialized services for overseas deployments of Air Force combat and support units to Southeast Asia and Europe. Processing these operations involved plotting 230,700 air navigation fixes to establish flight routes.

Vietnam-Related Activities. FAA continued to provide support services to both military and civil aviation engaged in military-related operations in Southeast Asia; the agency also continued to regulate contract civil air carriers engaged in airlifting men and supplies across the Pacific.

This reporting period saw the volume of these activities rise to a record level, as did each preceding reporting period since the initial buildup of American forces in Vietnam. At Oakland, Calif., FAA's ARTCC recorded 89,848 oceanic overs, surpassing the fiscal year 1967 total by 18 percent. The Anchorage ARTCC showed an even greater increase, handling 56,548 overs—a 36 percent jump from the previous year. Activity at the Honolulu ARTCC was also fed by the Southeast Asia buildup as traffic at the center rose 29 percent between the end of fiscal year 1967 and the end of fiscal year 1968 (56 percent between the end of 1966 and the end of 1968).

The number of aircraft operations recorded by FAA's center/radar approach control facility (CERAP) on Guam increased only slightly (0.6 percent), from 112,482 in fiscal year 1967 to 113,107 in fiscal year 1968; however, air traffic activity at this facility has expanded by 51 percent in the 2-year period between July 1, 1966, and June 30, 1968. Even the Wake Island airport, which was put temporarily out of commission by a late summer tropical storm in 1967 (see "Typhoon Sarah," below), experienced a 9-percent traffic increase, from 63,798 aircraft operations (fiscal year 1967) to 69,712 operations (fiscal year 1968).

Though military aircraft accounted for a great deal of this activity, they scarcely accounted for all; indeed, one of the chief characteristics of the Southeast Asia airlift is the extent to which it relies on civil air carriers. During this reporting period, 23 civil carriers under contract to the Military Airlift Command (MAC) transported an estimated 1.6 million passengers over the Pacific (840,000 outbound from the U.S. mainland; 729,000 inbound). They also airlifted an estimated 149,000 tons of cargo and mail. All in all, the Southeast Asia airlift represents the greatest mass movement of people and goods by air undertaken to date.

In addition to handling the flow of transpacific traffic, FAA supplied both U.S. Air Force and U.S. Army airfields in Southeast Asia with air traffic control towers and electronic systems—*viz.*, began construction on and/or installation of (1) 20 control tower electronic systems for the U.S. Army in Vietnam; (2) 15 runway supervisory units at 12 U.S. Air Force bases in Vietnam and Thailand; and (3) 10 control tower consoles for Air Force bases in Vietnam and Thailand. Again in Vietnam and Thailand, FAA completed construction on four fully equipped control towers and finished installing five control tower consoles. Four FAA electronic technicians will remain in Southeast Asia through fiscal year 1969 to assist Air Force and Army technicians in maintaining control tower electronic systems.

FAA also had to contend with two extraordinary situations during this reporting period—the January 1968 Tet offensive and the *Pueblo* incident. Both events tested FAA's ability to respond to nonroutine requirements and to rapid and unexpected traffic buildups. The Honolulu ARTCC, for example, handled approximately 27,000 aircraft in November 1967. When the Tet offensive was in full bloom in February 1968, the center handled 37,000 aircraft. This amounted to a 37 percent traffic rise in 3 months. Quick improvements were necessary to enable the center to handle the upsurge—principally, establishing new VOR airways and creating a system of airway extensions into the oceanic control areas. Normally, a period of 90 to 120 days would have been required for these improvements. Under the pressure of Tet, FAA did the job in a matter of 3 weeks.

The capture of the U.S.S. *Pueblo*, on January 23, 1968, by North Korean gunboats necessitated another quick response. Less than 12 hours after the ship's capture, a Tokyo-based Convair T–29 was in South Korea flight-inspecting and certificating 14 DOD navaids being brought into service because of the crisis. Forty-eight hours later, another T–29 and a Honolulu-based C–135 (equipped for high-altitude inspection) were also active on the scene.

In Vietnam, FAA personnel continued to assist both U.S. military units and the Vietnamese Directorate of Civil Aviation—though this assistance was rendered under less than ideal circumstances during the Tet offensive. On February 18 and 23 and again on March 1, 1968, the Area Control Center at Tan Son Nhut Airport in Saigon, which is partially manned by FAA's Civil Aviation Assistance Group, came under heavy rocket fire. Despite these attacks, service at the center continued uninterrupted. On one occasion, with a fire fight raging within 200 feet of the center, FAA controllers went about their work with rifles and revolvers beside their radarscopes. Personnel at the center put in particularly long hours during the emergency. Two controllers, for example, stayed on their radarscopes continuously for 38 hours. In Dalat, two FAA technicians were pinned down in their hotel when the Vietcong attacked the city. The technicians joined the troops defending the hotel and were not evacuated from the city until 9 days later. Though FAA controllers and technicians came under direct fire on numerous occasions, only one man was wounded during the entire offensive.

Defense Readiness. Fiscal year 1968 saw FAA and DOD move another step closer toward fully implementing Executive Order 11161. Issued July 7, 1964, the order sets forth the basic guidelines for a coordinated FAA-DOD response to a war emergency or a lesser national emergency. The first major step in implementing the order was taken on April 13, 1966, when FAA and DOD signed a memorandum of understanding covering the relationship between the two agencies in the event FAA became an adjunct of DOD in time of war. Since the signing of this memorandum, FAA and DOD have been developing plans designed to insure the satisfactory performance of FAA's mission during war or an emergency short of war.

During this reporting period, three such draft plans reached an advanced stage of development. One plan (drawn up by FAA and the North American Defense Command) covered the continental United States; another (drawn up by FAA's Pacific Region and the U.S. Commander in Chief, Pacific) covered the Pacific; the third (drawn up by FAA's Europe, Africa, and Middle East Region and the U.S. Commander in Chief, European Command) covered Europe and adjacent areas. By year's end, all three plans had been forwarded to appropriate FAA and DOD authorities for review and approval. Once approval is granted, FAA and DOD will begin immediately to implement the plans in the field.

Civil Aviation Defense Planning. Under the provisions of Executive Order 11003 (February 16, 1962), FAA has responsibilities in national emergency planning covering the management of the Nation's civil airports, civil aviation operating facilities, and general aviation aircraft.

State and Regional Defense Airlift (SARDA) planning continued to make progress on the State level. All the States (except Pennsylvania, which has chosen not to participate), the District of Columbia, Puerto Rico, the Virgin Islands, and Guam have submitted emergency resource-management plans to FAA for approval. Four such plans were approved by the agency during this reporting period, bringing the number of State and territorial plans approved to 39. The 14 remaining SARDA plans have been returned by FAA with comments. At year's end, it was expected that these plans would be approved by the middle of fiscal year 1969.

Aviation War Risk Insurance. FAA maintains a standby insurance binder program making aviation war risk insurance available upon an outbreak of war. The agency also provides (at the request of the Defense Department) aviation war risk insurance to U.S. civil air carriers under contract to the Military Airlift Command, as well as aviation war risk insurance binders to U.S. civil air carriers under contract to the State Department.

As of June 30, 1968, the insurance in force under this program represented a maximum contingent liability of approximately $40.8 billion. A total of 479 aircraft, either engaged in military airlift operations or committed to the Defense Department in the event of an emergency, were covered by active insurance policies. The maximum contingent liability under these policies came to approximately $34.6 billion ($2.5 billion, hull; $32.1 billion, people and property). Insurance binders were also in effect for 43 aircraft under contract with the State Department. The maximum contingent liability under these binders amounted to approximately $3.8 billion ($300 million, hull; $3.5 billion, people and property). In addition, 55 civil aircraft engaged in private operations were covered by premium insurance binders carrying a maximum liability of approximately $2.3 billion ($300 million, hull; $2 billion, people and property).

The program's fiscal year 1968 revenues were $12,800 (including one recovered claim for $625.76). Operating expenses were $26,000 (including a $200 adjustment in prior year figures). At the beginning of the year, retained earnings stood at $49,700; at year's end, at $36,500.

Typhoon Sarah: Unscheduled Emergency Test. FAA's emergency mission encompasses preparation for the full range of emergency conditions—war and emergency short of war, and also such events as floods, hurricanes, earthquakes, and massive power failures. Fiscal year 1968 appeared to have more than its share of natural disasters. Rampaging flood waters victimized Fairbanks, Alaska; a major tropical storm struck Wake Island with winds exceeding 140 miles an hour; Hurricane Beulah ravaged south Texas for days, bringing torrential floods in its wake. Each of these three disasters tested FAA's ability to cope with emergency. Typhoon Sarah, which struck Wake on September 16, 1967 (September 15, U.S. time), probably put FAA's emergency readiness to the severest test.

The typhoon, accompanied by towering wind-whipped waves, ripped off housetops, smashed windows and walls, and knocked out the island's electric power plant, its air traffic control tower, and all its navigational aids. Though it inflicted neither death nor serious personal injury, the storm did enough damage to family housing, the sanitation system, and the fresh-water supply to threaten the health and welfare of the island's residents. This necessitated the immediate evacuation of a large part of the island population, including dependents of FAA employees. In the first 32 hours following the storm, FAA, U.S. Air Force, and U.S. Coast Guard aircraft evacuated 441 people to Hawaii, where housing, clothing, and medical attention awaited them. In all, a fourth of Wake's population was evacuated.

Meanwhile, a special FAA-Air Force task force, which was directing the airlift to Hawaii, had been working round the clock restoring critical navaids and getting the Wake airport back in operation. Seventeen engine generators were located shortly after the storm and flown in from various FAA installations and from military installations on Oahu and Kwajalein. This equipment was joined by a portable tower from Alaska, a portable VOR from Fort Worth, Texas, and a portable TACAN borrowed from the Air Force. Within 48 hours after the typhoon struck, the airport had resumed transpacific airlift operations on a reduced scale. Eight days later, all the airport's essential facilities had returned to service.

Joint FAA-DOD Use of Long-Range Radar. As a way of avoiding unnecessary duplication of equipment, FAA and the Department of Defense share the use of long-range and terminal radar and other facilities as long as this sharing meets the needs of both. (See Table 15.) The number of long-range radars (LRR's) in joint use increased steadily during the sixties, hitting an all-time high in fiscal year 1967. Of the 89 LRR's (44 FAA and 45 DOD) in operation at the end of that year, 64 (19 FAA and 45 DOD) were in joint use—and plans called for this number to rise eventually to 84. In fiscal year 1968, however, this joint-use program underwent a major revision. The Defense Department decided to reduce the number of long-range radars in the U.S. Air Force air-defense network. By year's end, the number of LRR's in joint use was down to 23 (two FAA and 21 DOD).

Other Developments. Other fiscal year 1968 defense-related developments included:

- Developing jointly with the U.S. Air Force a new control tower console that will be used in the operational quarters of 134 Air Force control towers.
- Participating in various exercises, military and civil, simulating nuclear attacks on the United States.
- A further decline in the FAA military component, from 52 officers at the end of fiscal year 1967 to 44 at the end of fiscal year 1968.
- Training 573 U.S. Air Force individuals in basic electronics, hydraulics, and jet engine fundamentals at the FAA Academy. Running from March 1967 to March 1968, this apprentice electronic training program was begun when the Air Force could not find a sufficient quantity of personnel trained in these skills on the labor market.

Fostering Domestic Aviation

Under the Department of Transportation Act of 1966 and the Federal Aviation Act of 1958, one of FAA's major missions is "to encourage and foster the development of civil aeronautics and air commerce in the United States and abroad." The agency indirectly responds to this broad respon-

TABLE 15. Number of major air navigation facilities in civil–military common system at end of fiscal years 1967 and 1968[1]

Major facility	Number	
	June 30, 1968	June 30, 1967
Air route traffic control center (ARTCC)[2]	27	28
Air route surveillance radar (ARSR)	89	89
Remote communications air/ground site (RCAG)	376	350
VOR/VORTAC (all combinations)	948	950
Airport traffic control tower (ATCT)	291	269
Combined station/tower (CS/T)	50	59
Airport surveillance radar (ASR)	154	117
Military radar approach control facility (RAPCON or RATCC)	33	42
Precision approach radar (PAR)	32	44
Instrument landing system (ILS)[3]	280	264
Approach light system with sequence flashing (ALS/SFL)	254	232
Flight service station (FSS)	332	332
International flight service station (IFSS)	11	12
Airport surface detection equipment (ASDE)	5	4

[1]Source: FAA Air Traffic Service Fact Book. Figures shown include all facilities in the civil-military common system–i.e., facilities installed and/or operated with FAA funds; military facilities performing services for civil users; non-Federal facilities in the common system.

[2]Fiscal 1967 figure includes three center/radar approach control facilities (CERAP's); fiscal 1968 figure, two CERAP's. Five ARTCC's were equipped with computers at the end of both fiscal years.

[3]Figures include partial ILS's.

sibility by carrying out the more specific one of insuring the safe and efficient use of the Nation's navigable airspace. In addition, the agency serves the broader objective by making cash grants for airport construction, recommending transfer of surplus Federal property for airport purposes, contracting for the development of new aircraft, and, in general, trying to create an environment in which aviation can flourish.

Airport Systems Planning. The National Airport Plan (NAP)—the annual preparation of which by FAA is a major requirement of the Federal Airport Act of 1946—specifies by location and type of development the projects considered necessary to provide a system of public airports adequate to meet the foreseeable needs of civil aviation. The 1968 amendment to the NAP, covering fiscal years 1969–1973, lists over 4,100 existing and proposed landing facilities in the United States, Guam, Puerto Rico, and the Virgin Islands. Total cost of development included in the Plan is estimated at $2.16 billion, an increase of more than $600 million over the estimate in the preceding NAP (fiscal years 1968–1972). For the first time in the NAP, the 1968 amendment includes airports to accommodate short takeoff and landing (STOL) aircraft. General locations of these "STOLports" are identified in the eastern megalopolis and on the west coast—areas of dense traffic and a short-haul intra- and intercity market where this type of aircraft is expected to provide a valuable service. Long-range requirements beyond the 5-year period covered by the Plan were also considered in its formulation, to help alert communities to their prospective aviation-facility needs.

To encourage and assist local communities in carrying out long-range airport-system planning, FAA prepared and distributed the report "Aviation Demand and Airport Facility Requirement Forecasts for Large Air Transportation Hubs Through 1980." (A "large hub" is a community that generates at least 1 percent of the Nation's total airline passenger traffic.) Besides forecasting the number or volume of such items as aircraft operations, passengers, cargo, and air-carrier and general-aviation based aircraft at the Nation's 22 large hubs, the report translates the forecasts into airport needs, quantified in units or areas, for terminal aprons, terminal buildings, cargo facilities, and public vehicle parking areas.

A similar report for 34 of the Nation's 36 medium transportation hubs (a medium hub generates in the range of 0.25 percent to 0.99 percent of the total U.S. airline passenger traffic) was under preparation at year's end and expected to be completed in fiscal year 1969.

Airport Design and Construction. In this area, special attention was given to preparing guidance and criteria for developing and adapting airports to accommodate:

- Jumbo jets and airbuses. Notably, an advisory publication ("Is Your Airport Ready for the Boeing 747?") compared needs of the jumbo jet nearest to operational status with an airport layout conforming to pre-jumbo-jet design criteria, thus indicating areas of change likely to be required to enable a current airport to accommodate this forthcoming extra-large aircraft.
- General aviation. Comprehensive design criteria for utility airports to serve this segment of civil aviation were under development during the year; when published, they will be accompanied by model plans.
- Business jets and STOL aircraft. In the case of business jets, new and distinct airport design criteria were developed and published. For STOLports, design guidance was ready at year's end for early release as interim criteria, to allow planning and design of these facilities to proceed on the basis of the best information available.

The agency's widely used "Standard Specifications for Construction of Airports" was completely revised during fiscal year 1968 to reflect improved technical developments.

Federal-Aid Airport Program. During fiscal year 1968 the FAA-administered Federal-aid airport program (FAAP) remained the principal Federal instrumentality for providing financial assistance to civil airport development projects. Like the NAP, FAAP was authorized by the Federal Airport Act, and only projects listed in the NAP are eligible for FAAP funds. For fiscal year 1968, FAAP's congressional appropriation was $66 million, but this was supplemented by carryover funds and grants from appropriations under the Appalachian Regional Development Act and the

Public Works and Economic Development Act. In selecting projects to receive assistance, FAA continued to emphasize importance of the projects to the national system of airports; and in allocating funds, the agency again gave first priority to safety facilities for all-weather operations at major air carrier airports and high priority to improvements needed to permit accommodation of late-model airliners and to expand airport capacity. The originally announced allocations for fiscal year 1968 were increased during the year from $70.2 million assisting 386 civil airports to $76.4 million assisting 393 civil airports. (Additional details are provided in FAA's Twenty-third Annual Report of Operations Under the Federal Airport Act.)

All-Weather Landing. FAA continued to make progress during the reporting period toward its ultimate goal of all-weather landing. Currently, many aircraft are able to land under Category I weather minimums—that is, when the pilot's vertical vision affords him a decision height of at least 200 feet above the ground and his horizontal vision a runway visibility range (RVR) of at least 2,400 feet. The next important phase of aircraft all-weather-landing capability is qualification for Category II minimums (in the final step of the category, a decision height of at least 100 feet and an RVR of at least 1,200 feet). By the end of the reporting period, six air carriers had qualified for the first of the category's two steps—a decision height of at least 150 feet and an RVR of at least 1,600 feet. For general aviation, on the other hand, equipment and procedural standards required to qualify for Category II operations were not ready until early in the reporting period; in the making since fiscal year 1965, they were set forth in a rule issued in August 1967.

As places for qualified aircraft to land, eight airports had qualified by the end of the reporting period for Category II operations, five of them during fiscal year 1968. (Two previously qualified airports lost their Category II status when they developed glide-path difficulties.)

One of the standards that airports qualifying for Category II operations must meet was issued in July 1967. Applying to airport approach lights, the new standard calls for the addition of (1) red light barrettes on either side of the last 1,000 feet of the white centerline lights, (2) a red and white crossbar 500 feet from the end of the runway, and (3) white centerline lights at 100 and 200 feet from the runway threshold. Eliminated by the new standard were (1) the red-wing and terminating-bar light barrettes located 100 and 200 feet from the runway threshold, and (2) the sequenced flashing lights over the last 1,000 feet of the approach lights system.

The final phase of all-weather-landing capability is Category III, the last step of which will enable aircraft to land under zero-zero weather conditions. Equipment to implement the Category III system is still undergoing development and testing, and its introduction is, therefore, some years in the future.

National Capital Airports. Fiscal year 1968 was the busiest year in the history of the two FAA-operated airports serving the Washington, D.C., area—Washington National Airport and Dulles International Airport. The two airports handled a combined total of 11,359,191 passengers during the reporting period (an increase of 15.5 percent over the previous period) and 562,717 aircraft operations (an increase of 9.9 percent over the previous period). By far the greater part of the passenger traffic was at Washington National—9,705,370 passengers, or 85 percent of the total. However, Washington National's traffic grew at a rate of only 14.2 percent during the year, whereas Dulles' traffic registered a 24-percent increase.

The airports' combined fiscal year 1968 gross income of $12.0 million exceeded their combined direct operating expenses by $4.0 million. This represented an increase of $1.7 million in direct operating profits (before interest and depreciation) over fiscal year 1967. But when interest and depreciation (mainly writeoffs against Dulles) are taken into account, the airports had a combined net loss of $3.6 million.

Other notable developments at the two airports during the reporting period included:

- Formulating plans for the operation of STOL (short takeoff and landing) aircraft at both airports.
- Starting a project at Washington National designed to provide 1,000 automobile parking spaces for ultimately relieving somewhat the still-serious parking problem at the airport.
- Reaching agreement with scheduled air-taxi operators limiting their operations at Washington National to no more than eight in any hour.
- Leasing more space to airlines for expanding their present operation buildings on Dulles' main jet ramp.
- Contracting for the construction of an up-to-500-room privately owned airport hotel overlooking the lake near the Dulles terminal.

Noise Abatement. FAA's efforts in combating aircraft-engine noise were highlighted during this reporting period by the creation of the Office of Noise Abatement on July 21, 1967. Hitherto, the agency's noise-abatement program had been under the direction of a small noise abatement staff. Creating the new office was a measure of the importance the agency attached to the problem of aircraft-engine noise.

A major stumbling block to significantly reducing aircraft-engine noise has been FAA's lack of power to deal with the problem at its source. The agency has no authority to promulgate noise standards as criteria for aircraft certification. During this reporting period, an administration-sponsored aircraft-noise bill passed the U.S. House of Representatives and was awaiting Senate approval at year's end. As amended, the bill vests in the FAA Administrator (after consultation with the Secretary of Transportation) the power to (1) certificate new aircraft for noise, (2) require retrofit of existing aircraft with quieter engines or noise-abating devices, and (3) enforce noise-abating operating procedures.

Fiscal year 1968 saw the agency launch a number of new noise-abatement projects. A total of $670,000 went for studies designed to (1) reduce, and improve the prediction of, fan and compressor noise, (2) improve the prediction of noise generated by engines with a high bypass ratio, (3) refine the yardstick for rating human reaction to aircraft noise, and (4) improve the method of determining an airport's total exposure to noise by forecasting noise around airports according to airport size and type. In addition, $534,254 was allocated by the agency to record sonic booms generated by military aircraft. The recorded data will be used by the Environmental Science Services Administration to determine the magnitude and frequency of sonic boom variations caused by atmospheric conditions. This study will run for 2 years.

U.S. Supersonic Transport Program. The most notable development in the supersonic transport program during this reporting period was the apparent abandonment by The Boeing Company of the variable-sweep-wing design.

Even though it had won the Phase IIC competition, the variable-sweep-wing design was not altogether free of deficiencies. The first 6 months of 1967 had been set aside for Boeing to improve its design, after which the company hoped to go into prototype development. But the improvement task took longer than expected, and it was January 15, 1968, before Boeing submitted a modified design to FAA. Moreover, the proposed modifications affected virtually all aspects of the aircraft, forcing FAA to set up a rather elaborate and comprehensive review process that included the participation of NASA's Langley and Ames Research Centers.

The evaluation did not go well for Boeing. The prototype's problems had nothing to do with safety; FAA judged Boeing had designed an air-worthy aircraft. Unfortunately, it was an uneconomical aircraft. The design changes had increased the aircraft's gross weight from 635,000 pounds to 675,000 pounds. The ensuing penalty was a poor weight-payload ratio. Indeed, this overweight condition limited range and payload to such an extent that the prototype's calculated performance fell far below the performance specified for the production model in the Phase III contract.

Boeing was given until January 1969 to submit a design that, in the judgment of the FAA Administrator, would satisfactorily meet the Phase III contract requirements. In the event that FAA should find Boeing in default, Boeing would be liable for any Government money expended on the program between March 29, 1968, and February 15, 1969. All this was set forth in an amendment to the Phase III contract.

Boeing approached its task by considering a large number of designs and technical solutions. At year's end, the company had still not narrowed its choice to a single design, although it appeared to be leaning to a conventional fixed-wing aircraft with a horizontal tail.

Information and Education Programs. FAA's mission to foster civil aeronautics and air commerce includes bringing civil aviation programs and policies to public attention and maintaining public awareness of civil aviation's relevance to daily life. In this work, the agency employs a variety of information channels. During this fiscal year the agency:

- Issued nearly 130 press releases to the news media, providing timely announcements of FAA's major activities.
- Introduced "FAA News Briefs," a periodic situation report about American aviation. The report capsules unusual facts and figures

bearing on the social, economic, and cultural aspects of contemporary flight.

- Reprinted 30,000 copies of an *FAA Aviation News* article about flying safely in Mexico. The article was written as an aid to American private pilots planning to fly to Mexico for the 1968 Olympic Games.
- Showed FAA-produced motion pictures to approximately 510,000 people, the single largest single-year viewing audience of FAA films in the agency's history. One color film, *A Place to Land*, documented a 2-day exercise in New York City (Operation Metro Air Support) demonstrating the ability of V/STOL (vertical or short takeoff and landing) aircraft to provide air access and logistic support to a metropolitan center city area.

International Aviation Activities

FAA's activities abroad are primarily directed toward insuring an environment in which international aviation can flourish. To this end, the agency takes an active part in the activities of a number of international civil aviation organizations, provides foreign countries with a variety of technical and other assistance, and undertakes a number of other activities in the interest of international aviation.

Participation in International Organizations and Meetings. In fiscal year 1968, FAA representatives participated in 10 International Civil Aviation Organization (ICAO) conferences and in a number of other international meetings. In addition, the agency helped prepare and coordinate the U.S. position on questions before 16 international conferences. These position papers were submitted to the Interagency Group on International Aviation (IGIA) for its consideration. Among the more notable conferences attended by agency representatives during the reporting period were:

- Third ICAO South American/South Atlantic Regional Air Navigation Meeting, held in Buenos Aires during September and October 1967, which updated the facilities and services plan for this region.
- Meeting between U.S. and Mexican Aviation Officials, held in Mexico City during September 1967, which considered arrangements for facilitating the expected heavy traffic between the United States and Mexico during the 1968 Summer Olympics.
- ICAO Meeting on the Hague Protocol to the Warsaw Convention, held in Montreal in July 1967, which considered the problem of raising the liability limitation of international carriers set by the Hague Protocol. The United States has long favored raising this limitation.

Foreign Assistance and Training. FAA had a total of $8.3 million available from all sources during the fiscal year for foreign assistance operations. Of this amount, $4.5 million went to maintain 17 technical assistance groups with personnel stationed in 21 countries ($3.2 million went for procuring aeronautical aids; $600,000 for training foreign specialists). Twelve of these groups were staffed and managed for the Agency for International Development (AID); five, for the Defense Department. Additionally, 31

FAA specialists provided 20 countries with short-term technical assistance, for which FAA was reimbursed by Federal agencies or by foreign governments.

Although the number of technical groups declined during the year, the number of authorized technical assistance positions overseas increased, from 113 to 116. The largest increases were in Southeast Asia. The authorized strength of the Civil Aviation Assistance Group in Thailand rose from 11 to 15 positions; that of the Vietnam group, from 34 to 52.

In other developments, FAA trained 265 visiting specialists (compared to 242 in fiscal year 1967) from 41 countries in a variety of aviation skills. Training for the bulk of these specialists—198—was financed by AID. Twelve specialists were financed by ICAO; 55, by their own governments.

Tokyo Convention. The increasing incidence of aircraft hijacking during the reporting period served to draw attention to the Tokyo Convention of 1963, which the United States helped frame but has yet to ratify. This convention provides, among other things, that any ratifying nation may apply its own laws to incidents on board aircraft of its own registry, irrespective of the aircraft's location. The convention also gives aircraft commanders authority to use reasonable force to maintain law and order on board their aircraft.

During the fiscal year, FAA participated in intragovernmental discussions looking to the convention's ratification and to the passage of implementing legislation. These discussions ultimately led to agreement within the administration on the form of the implementing legislation. At year's end, a recommendation for the convention's passage was in the process of being forwarded to the U.S. Senate by the State Department.

North Atlantic Lateral Separation. The data-gathering program designed to measure the navigational capability of turbojet aircraft flying the North Atlantic was completed in March 1968. Still to be completed is the data analysis, which should ultimately determine whether a 90-mile lateral separation between turbojets flying North Atlantic routes can replace the present 120-mile separation. Reducing lateral separation to 90 miles would permit the addition of one more flight track across the most heavily traveled portion of the North Atlantic and hence add significantly to the capacity of this route.

Soviet-American Civil Air Transport Agreement. Following up their 1966 air transport agreement, the United States and the Soviet Union held a series of meetings during 1967 designed to pave the way for scheduled air carrier service between the two countries. In November 1967, these meetings culminated in a U.S.-Soviet Memorandum of Understanding. In June 1968, the President approved a Civil Aeronautics Board permit authorizing Aeroflot Soviet Airlines to provide scheduled service between Moscow and New York. Aeroflot and Pan American World Airways were scheduled at year's end, to inaugurate weekly flights between these two cities in July 1968.

Administration

Fiscal year 1968 witnessed a number of noteworthy administrative developments. A realignment of regional- and area-office functions was undertaken; a large number of air traffic control personnel were successfully recruited; an aviation education and training program was inaugurated in cooperation with institutions of higher learning. These and other developments are discussed in detail in the following pages.

Organizational Developments. The most far-reaching organizational development during this reporting period was the approval of a plan realigning the functions and responsibilities of FAA's regional and area offices. This was the first major regional-area realignment since fiscal year 1966, when 18 area offices were activated in the contiguous 48 States under the agency's long-range decentralization program. At that time, area managers were given line authority over all FAA operational activities within their areas, as well as the responsibility for carrying out certain administrative and support functions. After operating under this decentralized area office concept for 2 years, FAA concluded that area managers could better discharge their day-to-day operational responsibilities if relieved of their more burdensome support functions. These latter functions would be centralized at the regional offices.

Among the more important support functions that were taking up too much of the area managers' time and, therefore, will be transferred in whole or in part to the regional offices are: (1) Facilities establishment, (2) management analysis, (3) administrative service, (4) budget, (5) air carrier enforcement, (6) legal counsel, (7) compliance and security, and (8) personnel classification, placement, and records. The area offices will retain authority for general aviation enforcement. They will still have a limited contracting authority for supporting operational activities. And they will retain small administrative and personnel staffs to advise the area managers, counsel employees, and maintain liaison with the regions. The plan is expected to take 2 years to implement fully.

Other fiscal year 1968 organizational developments of note included:

- Establishing the Office of Associate Administrator for Plans, in August 1967. The new associate administrator's primary responsibility is developing long-range plans insuring FAA's ability to meet foreseeable future demands for its services. During the year, the new office developed a cyclical consultative-planning concept that includes the annual publication and distribution of a 10-year National Aviation System Plan (budget year plus nine) and the holding of an annual industry-Government planning review conference. The first National Aviation System Plan was developed in January 1968 and used by the Secretary of Transportation in developing the Johnson administration's airways proposal to Congress. The plan, however, was not publicly distributed. At year's end, the new office was still not completely organized.
- Realigning the functions of the Associate Administrator for Personnel and Training, in January 1968. Under the new organizational struc-

ture a separate Office of Personnel and a separate Office of Training were established. Also established were a Manpower and Planning Staff and an Executive and Military Personnel Staff. This realignment provides a closer grouping among traditional personnel and training functions and permits a quicker and better response to agency needs.

- Redesignating the Installation and Materiel Service as the Logistics Service, in December 1967. The new name is more descriptive of this service's revised functions.

Financial Management. The financial management improvement program continued to stress efforts leading to formal approval of FAA's complete accounting system by the Comptroller General of the United States. Six segments of this system that had been submitted to the General Accounting Office (GAO) in fiscal year 1967 for informal review were field tested by GAO in fiscal year 1968. This arrangement—having GAO informally review and field-test FAA segments prior to their submission to the Comptroller General for formal approval—is both new and unique. At year's end, informal GAO-staff approval of the six segments was expected early in calendar year 1969.

In other fiscal year 1968 accounting developments, FAA substantially realized plans for revising its allotment accounting system and developing concepts and specifications for a mechanized cost accounting system. Additionally, the agency published the first "FAA Financial Report," covering fiscal year 1967. To be published annually, the report summarizes the agency's financial operations during the year and discloses its yearend financial condition. (See Tables 16 and 17.)

In the planning-programing-budgeting area, FAA worked closely throughout the fiscal year with the Office of the Secretary of Transportation in developing a Department-wide Planning-Programing-Budgeting System (PPBS). This uniform system will be employed by all DOT elements, including FAA. Accordingly, in developing its current 5-year (1970–1974) financial plan, FAA employed the new DOT-wide PPBS. In conjunction with this and other programing and budgeting efforts, FAA continued to work toward a more meaningful program structure by making discrete refinements in the PPBS category structure.

Considerable effort was also devoted to increasing both the understanding and acceptance of PPBS among agency personnel. Providing adequate analysis for major FAA programs received special emphasis. As a result of these efforts, FAA program analyses should be considerably improved in the future.

FAA's internal audit function, a vital part of the agency financial management system, completed five national and 35 local internal audits, 249 audits involving Federal-aid airport program (FAAP) funds, 45 air carrier audits, and 87 contract audit evaluations. Over 64 significant corrective actions were initiated by the audit function to improve agency operations, and $8.3 million in FAAP and contract costs were either saved or questioned. The audit function also prepared agency responses to 28 contract protests and 43 General Accounting Office audit reports.

TABLE 16. Statement of financial resources by appropriation
(Millions of Dollars)

	Fiscal Year 1968			Fiscal Year 1967		
	Carryover of unobligated appropriations	Appropriations	Unobligated balance	Carryover of unobligated appropriations	Appropriations	Unobligated balance
Research & development	$ 16.8	$ 27.0	$ 9.1	$ 23.0	$ 28.5	$ 16.8
Operations		[1]617.2	[2].5		575.3	[2]2.6
Facilities & equipment	130.8	54.0	99.1	186.5	28.0	130.8
Operation & maintenance, national capital airports		8.7	[2].1		8.5	[2].1
Construction, national capital airports	6.6	.2	6.3	7.8		6.6
Grants-in-aid airports	74.8	66.0	55.1	65.2	71.0	74.8
Civil supersonic aircraft	143.2	142.4	222.9	53.1	280.0	143.2
Total	$372.2	$915.5	[3]$393.1	$335.6	$991.3	$374.9
Percent of available funds unobligated on June 30			30.5%			28.3%

[1] Net of appropriation transfers to other agencies ($.2 million FY 1968).
[2] Returned to Treasury Department, not available for carryover.
[3] Excludes $37,000 Aviation War Risk Insurance.

TABLE 17. Federal Aviation Administration statement of financial condition
(Thousands of Dollars)

Assets	June 30 1968	June 30 1967
Cash:		
Funds in U.S. Treasury	$ 746,935	$ 725,680
Trust, deposit, and general funds	45,740	31,580
	$ 792,675	$ 757,260
Accounts receivable:		
Federal agencies	21,367	19,201
Other	23,574	22,533
	$ 44,941	$ 41,734
Inventories:		
General operating and facilities construction material	99,188	105,736
Other inventories	17,787	18,531
	$ 116,975	$ 124,267
Fixed assets (net):		
Realty and facilities	481,846	452,857
Personal property in use	588,033	606,252
	1,069,879	1,059,109
Construction work-in-progress	163,936	190,480
	1,233,815	1,249,589
Other	$ 95	$ 613
Total Assets	$2,188,501	$2,173,463

Liabilities and equity	June 30 1968	June 30 1967
Liabilities:		
Accounts payable & accured liabilities	$ 84,036	$ 98,068
Advances from other agencies	4,042	1,778
Funds held for others	45,752	31,590
Accured leave of FAA employees	45,005	44,553
Assets on loan to agency	11,637	6,460
Deferred credits	10,257	129
Total liabilities	$ 200,729	$ 182,578
Equity:		
Invested capital, July 1	1,245,939	1,216,078
Net change in invested capital	(24,924)	29,861
Invested capital, June 30	1,221,015	1,245,939
Unexpended appropriations	766,757	744,946
Total equity	$1,987,772	$1,990,885
Total Liabilities and Equity	$2,188,501	$2,173,463

Cost Reduction. FAA continued to reduce the cost of its operations without reducing the quality of its service to the public. The agency achieved savings of $10.4 million during this reporting period under the Government-wide cost-reduction program. This brought the total savings realized by the agency since the introduction of an FAA cost-reduction program in fiscal year 1961 to $204.2 million.

All of fiscal year 1968's savings were realized either by eliminating low-priority activities or by substituting less costly alternative activities. Seventy-five percent of these savings were in the category of cost avoidance—i.e., they were derived from actions averting increase in fund requirements. The rest were direct, or hard, savings; these actually reduced the projected level of approved expenditures. Further analysis of the total savings indicates that $5.3 million is recurrent, and will therefore continue into future years. The remaining $5.1 million consists of one-time savings.

Personnel Administration and Training. FAA's personnel strength reached an all-time yearend high during this reporting period. On June 30, 1968, the agency had 46,825 employees on board—2,497 more than the fiscal year 1967 yearend strength of 44,328 and 393 more than the previous yearend high of 46,432 (fiscal year 1963). Because of the expected continued growth in air traffic, FAA is forecasting additional increases in personnel strength for each of the next 5 years.

The bulk of the fiscal year 1968 increase went to bolster the ranks of air traffic control specialists. Two thousand, or 80 percent, of the 2,497 new positions were absorbed by this occupational group. This brought the ATC specialists' strength to 18,949 at the end of the year, an increase of 12 percent over their strength when fiscal year 1967 ended. (In contrast, the combined strength of all other FAA occupational groups increased only 1.8 percent.) At the same time, the proportion of ATC specialists in the total work force rose from 38 percent at the end of fiscal year 1967 to 41 percent at the end of fiscal year 1968.

Increasing the ATC work force by 12 percent required a recruitment effort of sizable proportions. The burden of this effort fell on personnel and management staffs in the field. These staffs applied a variety of recruitment techniques: television and radio spot announcements were used to advantage; special recruitment teams were formed; testing, interviewing, and medical examinations were often carried into the weekend. The Chicago Area Office, for example, organized no fewer than 15 teams to publicize the area's needs and canvass for recruits. It also instituted special hiring procedures over a three-state area that reduced the normal waiting period for making a job offer from 6 weeks to 1 day. Through methods such as these, FAA succeeded in hiring more than 1,000 ATC recruits between December 1967 and June 1968.

Hiring such a large group to become ATC specialists made considerable training demands on the agency. Because air traffic control is FAA's exclusive domain (except in the military services), trained controllers are not to be found on the labor market. Since fiscal year 1966, FAA has relied on individual control facilities to train apprentice controllers and flight service specialists. However, it was becoming apparent that a faster and more efficient training program would be required; hence, at year's end, the agency was considering the possibility of resuming basic ATC training at the FAA Academy in Oklahoma City.

The agency also sought other ways of meeting its ATC personnel needs. Perhaps the most notable new development was the inauguration of a cooperative aviation education program at a number of junior colleges. Miami-Dade Junior College (Miami, Fla.), for example, began offering FAA-approved courses in air traffic management as part of its regular curriculum. Students wishing to enroll in these courses are tested by FAA to determine their suitability for ATC work. Successfully enrolled students serve tours of duty at FAA installations while pursuing their normal college work. During their first semester of ATC course work, they are employed as GS–3 flight data aids; during their second semester, they become eligible for promotion to GS–4. If this program proves successful, FAA will have a valuable new resource for developing potential employees.

Other fiscal year 1968 developments in the area of personnel administration and training included:

- Publication of a Manpower Planning Guide, in April 1968, containing a series of detailed charts and graphs on personnel separation, accession, and retirement rates and on work-force mobility (internal), age, and length of service, plus other information useful to agency managers in their manpower planning.
- Abolishing of 16 FAA positions in foreign countries as part of the overall Government program to curtail the flow of gold from the United States.
- Participation in the Youth Opportunity Campaign (YOC) by employing 1,055 economically disadvantaged youngsters during the summer of 1967. This employment figure exceeded FAA's quota of YOC hires by approximately 100 percent.
- Selection of the first FAA "Outstanding Handicapped Employee of the Year" in a program designed to recognize the achievements of the handicapped. In recognition of this program, which is the first of its kind in the Federal Government, the Civil Service Commission awarded FAA the CSC Special Service Award. FAA was also awarded the B'nai B'rith National Service Award for a distinguished record in hiring handicapped people.
- Continuation of a 3-year downward trend in the personal-injury rate. FAA's rate of 2.1 disabling injuries per million man-hours bettered the goal set by the President's Mission Safety-70 program. FAA's injury-compensation costs were approximately $162,000 less in fiscal year 1968 than in fiscal year 1967.
- Emergence of the Professional Air Traffic Controllers Organization (PATCO), in January 1968. The founding of this new employee organization was the single most important development in FAA employee-organization activities. By year's end, PATCO had a membership of well over 5,000 FAA employees.

Occupational Health Program. FAA's air traffic controller health program completed its second full year of operation during this reporting period. Established late in fiscal year 1966, the program is designed to provide the agency with data useful in formulating policies for selecting, employing, and retiring air traffic controllers.

Though inconclusive, the data gathered by this program through fiscal year 1968 suggest that air traffic control is a high-stress occupation. Using the airman population as a control group, FAA has found that air traffic controllers have a higher incidence of stress-related diseases than airmen in general. Particularly significant were statistical findings on the following afflictions, for which incidence per 1,000 is shown for airmen in general (the first figure in each case) as compared with controllers: Coronary artery disease, 1.99 versus 3.76; coronary thrombosis, 0.70 versus 1.44; hypertension, complicated, 4.14 versus 11.76; hypertension, uncomplicated, 5.33 versus 12.72; peptic ulcer, 13.33 versus 20.40; diabetes, 2.50 versus 5.44. It should be borne in mind that while these rates are suggestive and significant, they are not based on a statistical sample large enough to yield conclusive results. FAA will continue compiling annualized morbidity data.

Another FAA study reinforced a tentative conclusion drawn from previous findings that older controllers do not perform as well as their younger colleagues. It is unknown, however, whether the difference in performance is due to age or to laxer screening standards prevailing at the time the older controllers were hired.

Finally, in another development, the Civil Service Commission approved FAA's revised psychological test for air traffic controllers. The revised test will be employed in the next round of psychological testing.

Equal Employment Opportunity (EEO). FAA continued to prosecute programs guaranteeing equal employment opportunity to qualified people from all segments of the population. Significant fiscal year 1968 developments in this area included:

- A rise in minority-group employment. Two agencywide minority-group censuses (one conducted in November 1967, the other in June 1968) revealed that FAA minority-group employment rose to 6.3 percent of the work force. (Comparisons with previous-year figures are not possible because Hawaii and Puerto Rico are no longer included in the minority-group census.)
- Conducting a series of equal opportunity seminars entitled "Organizational Bias." FAA developed and conducted these seminars in conjunction with Dr. Leonard P. Aries, vice president, National Conference of Christians and Jews. The seminars were designed to give FAA managers a better understanding of civil rights issues and motivate them to make constructive contributions to the agency's EEO program.
- Consolidating EEO directives relating to internal employment policy into a single issuance.
- Devising and operating a computerized system identifying FAA contractors and their record of compliance with EEO requirements.

Other Administrative Developments. In addition to the foregoing, among notable developments in the administrative area were the following:

- A problem of inequitable rental rates in Alaska was solved through the efforts of an Alaskan Interagency Committee, chaired by an FAA representative. The problem resulted from failure of the guidelines in the Bureau of the Budget circular on establishing rental rates in the United States to accommodate the unique conditions in Alaska. Approved exceptions to the circular's provisions were developed and implemented by the Alaskan Interagency Committee.
- The information-retrieval capability of the FAA library system was expanded, without extensive programing costs, by the adapting of commercially available automatic-data-processing library-system software to produce catalogs, indexes, announcement bulletins, and subject searches. This system is providing a centralized service for processing speeches, technical reports, and agency policies at the Washington headquarters, and for National Airspace System documentation at FAA's National Aviation Facilities Experimental Center, Atlantic City, N.J.
- An estimated 17,000 man-hours will be saved annually as the result of the Washington headquarters' canceling 25 reports required of the regions and centers and sharply reducing the data requirements of 37 others.
- A census of scheduled air-taxi operators was completed, filling a data gap on a phenomenally growing segment of general aviation.
- Construction began at FAA's Aeronautical Center, Oklahoma City, Okla., on a new systems training building. New headquarters buildings for FAA's Eastern, Western, and Pacific Regions (in Hempstead, N.Y., Los Angeles County, Calif., and Honolulu, respectively) were in various stages of planning or construction.

Freeway near Pittsburgh's Golden Triangle.

Chapter V

FEDERAL HIGHWAY ADMINISTRATION

Organization and Responsibilities

Since the Federal Highway Administration was established in 1967 within the U.S. Department of Transportation, the dimensions of the U.S. highway program have been expanded, and the Federal interest in highway transportation has been broadened.

The Federal Highway Administration is concerned with integrating highway transportation facilities with the Nation's transportation system to improve the efficiency of all modes of transportation. It also is dedicated to making the Nation's highway system as safe as possible.

Improvement of the highway resource is carried on by the Federal Highway Administration through three operating components: The Bureau of Public Roads, the Bureau of Motor Carrier Safety, and the National Highway Safety Bureau.

The Bureau of Public Roads has been in existence since 1893 under various names and jurisdictions. It was founded as the Office of Road Inquiry and was basically a research and development agency, building so-called "object lesson" roads long before there was a Federal-aid highway construction program.

The Federal-State construction program was inaugurated by the Federal-Aid Road Act of 1916 with an appropriation of $5 million. This has grown to a Federal assistance program of over $5 billion annually.

Through the years, the program has expanded in scope and direction. Even though the Bureau of Public Roads still administers a huge Federal-aid program, it is now also concerned with the impact of the program on human and social values, and its interests far transcend the construction of highways.

The Federal-aid highway system encompasses slightly over 900,000 miles of the Nation's 3.7 million miles of streets and roads. Those highways are therefore eligible to have Federal highway funds spent for their improvement. The bulk of Federal-aid funds is now being spent for constructing the National System of Interstate and Defense Highways, the coast-to-coast, border-to-border network of safe and efficient controlled-access highways. Federal funds used for highways are derived from special taxes on highway users.

The safety performance of all motor carriers engaged in interstate and foreign commerce is the domain of the Bureau of Motor Carrier Safety. It is the only one of these bureaus whose role is almost entirely regulatory in nature. It previously operated as a component of the Interstate Commerce Commission.

Through its 100-man field staff, it deals with more than 2,250,000 vehicles belonging to nearly 150,000 certificated and private motor carriers, and performs such services as checking driver qualifications, analyzing accident reports, checking on the movement of dangerous cargo, and conducting safety education campaigns and clinics.

A much more recent creation is the National Highway Safety Bureau, an outgrowth of two laws passed by Congress in September 1966—the National Traffic and Motor Vehicle Safety Act and the Highway Safety Act of 1966. Congress originally established two separate bureaus to implement this legislation—one under each Act. After the establishment of the Department of Transportation, the two agencies were combined by Presidential executive order into the National Highway Safety Bureau.

The Bureau is charged with responsibility for the most comprehensive highway and traffic safety program in history—a program dealing primarily with motor vehicles and their operators. Federal motor vehicle standards as well as standards for developing, improving, and expanding State and local highway safety programs have been issued. (See Tables 18 and 19.)

Bureau of Public Roads

The Bureau of Public Roads (BPR) plans America's integrated highway networks, including the National System of Interstate and Defense Highways. It also administers the Federal-aid highway program—some $4.4 billion annually—devises practical road financing plans, and engages in a broad research effort that encompasses the whole range of highway transportation from improved design and construction methods to defining the causes of highway crashes and devising means to prevent them. (See Tables 20, 21, 22, 23, and 24.)

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 $55,433,000.

2. The fixed assets are stated at cost. Specific authorization is required for the procurement of fixed assets. Machinery and Equipment are utilized for administrative operations and are replaced as needed.

3. The Congress grants contracting authority to the Federal Highway Administration in advance of actual appropriations in order to permit the Federal Highway Administration and the States to plan highway construction and State and community highway safety programs. This authority is apportioned to the States and the Federal Highway Administration records 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 Statement of Operations includes both obligated and unobligated balances of contracting authority plus unliquidated obligations for administration and research.

TABLE 18. FHWA consolidated statement of assets and liabilities—June 30, 1968

ASSETS

Current assets:		
Funds in U.S. Treasury–Available		$ 39,428,543
Accounts receivable—		
Repayments to funds	$ 5,758,482	
Emergency relief[1]	55,433,000	
Advances to travelers	371,939	
Other advances	337,975	
		$ 61,901,396
Fixed assets[2]:		
Land	$ 14,152,407	
Machinery and equipment	4,907,288	
Building and structures	2,780,773	
		$ 21,840,468
Contracting Authority[3]		10,129,764,211
Total assets		$10,252,934,618

LIABILITIES AND UNITED STATES GOVERNMENT INVESTMENTS

Current liabilities:		
Disbursements in transit		$ 61,899
Accounts payable and accured liabilities for States[1] completed work		855,192,578
Accured liabilities–Other		3,865,007
		$ 859,119,484
Accured annual leave of employees		5,621,488
U.S. Government Investment:		
Unobligated contracting authority		
Federal-aid	$3,312,494,167	
State and Community Highway Safety	240,088,877	
Emergency relief and other	42,985,219	
		$ 3,595,568,263
Undelivered orders and contracts		
Federal-aid	$5,726,873,135	
State and community highway safety	29,678,395	
Emergency relief and other	19,854,873	
		$ 5,776,406,403
Invested capital		16,218,980
		$ 9,388,193,646
Total liabilities and United States Government investment		$10,252,934,618

TABLE 19. FHWA consolidated statement of operations—July 1967 through June 1968

APPROPRIATIONS

For Contracting Authority

New	$ 4,950,000,000
From last year	8,496,157,837
Reimbursable earnings	13,273,344
Administrative obligational authority	22,867,000
Available	$13,482,298,181

For Working Capital

New	$ 4,218,739,000
From last year	12,866,506
Reimbursable collections	15,628,653
Available	$ 4,247,234,159

OPERATING EXPENSES

	Payments	*Change in Accruals*
Primary	$ 407,450,611	$ +32,716
Secondary	265,105,908	−5,926,117
Urban	243,560,556	−12,428,193
HPR	72,180,398	−4,187,678
Interstate	3,112,217,556	−81,065,252
State and community highway safety program	3,695,749	+5,588,089
Administration and research	72,354,174	+1,247,498
Purchase of fixed assets	361,181	-------------
D and L funds	-------------	−18,885
	$4,176,926,133	$−96,757,822
Emergency relief	16,767,432	−1,451,978
Roadway over dams	175,153	−8,108
Pentagon road network	4,483	−1,476
Reimbursable	13,644,157	−288,413
TOTALS	$4,207,517,358	$ −98,507,797
Decrease in accruals	−98,507,797	
	$4,109,009,561	

DEDUCT

Accured expenses	$ 4,109,009,561
Lapsing authority emergency relief	1,309,394
Unobligated balance of administration	4,561
USED	$ 4,110,323,516

DEDUCT

Payments	$ 4,207,517,358
Increase-advances	316,089
Increase-unpaid project leave	+12,584
Intransit	+54,082
Unobligated cash returned to Treasury	38,835
USED	$4,207,805,616

AVAILABLE BALANCES, JUNE 30, 1968

Contracting Authority[4]	$ 9,371,974,665
In Treasury	$ 39,428,543

In addition, the Bureau has direct supervision of certain allied highway programs for the National Park Service, the Bureau of Land Management, the Bureau of Indian Affairs, the Forest Service, and the Department of Defense. The most significant work includes construction of park roads, trails, parkways, timber access roads, service roads in or adjacent to Indian reservations, forest development roads, and some defense access roads.

While the Bureau's major function is to represent the Federal interest in the Nation's huge and continuing highway construction program it has other related activities such as traffic operations, defense plans, landscaping, and research and development that have grown in size and scope with the expansion of the program. The Bureau is concerned not just with provision of motor transport facilities, but with all the implications of the program and its impact on human and social values.

Traffic Operations. During fiscal year 1968 the BPR put major emphasis on a program to facilitate traffic and relieve congestion in urban areas. The program, called Traffic Operations Program to Increase Capacity and Safety (TOPICS), was initiated on a pilot basis in 24 cities. It resulted from increased recognition by the Bureau of the urban traffic problem and made it possible for the first time to use Federal-aid highway funds to improve traffic conditions on arterial streets in cities.

A program was also emphasized which stressed the lifesaving advantages of maintaining clear roadsides, free of fixed objects (solid sign supports, dangerous guardrails, large trees, unprotected bridge parapets, raised drainage structures, etc.) which frequently cause fatal injuries if struck. Elimination of such obstructions, their removal to a safer location, re-design to reduce the severity of an impact, or protection by adequate guardrails was made formal Bureau policy and the consequent application of these principles by State highway authorities became standard practice.

A unit was developed within the Office of Traffic Operations with concern for the identification of traffic operational research needs and the application of research results to the operating highway system.

Efforts were continued toward encouraging the States to program improvements designed to correct specific high-accident locations. This program has over the past 4 years resulted in more than 4,000 improvements made with Federal aid at a total cost of $750 million, and a total of over 11,000 improvements financed entirely by State funds in the amount of $350 million. Thus, more than a billion dollars has been devoted to this problem in a 4-year period.

A new position called Regional Traffic Operations Engineer was created and filled in each regional office. These new field engineers conduct the programs of the Office of Traffic Operations throughout the country. Their creation reflects the growing concern of the Federal Government for the operational aspects of the highway task.

Work continued on the improvement of traffic control devices and the development of uniform traffic-control mechanisms in all the States. A deadline of December 31, 1968, for compliance with the standards set by the Manual on Uniform Traffic Control Devices has provided impetus to

TABLE 20. Federal-aid highway program trust fund—June 30, 1968

ASSETS		
Current assets:		
Funds in U.S. Treasury	$ 981,571,811	
Less unappropriated receipts	978,070,016	
Available fund balance with Treasury		$ 3,501,795
Accounts receivable:		
Repayments to fund	$ 5,754,000	
Emergency relief[1]	55,433,000	
Advances to travelers	318,057	
Other advances	161,954	
		$ 61,667,011
Fixed assets[2]:		
Land	$ 14,152,407	
Machinery and equipment	4,591,391	
Building and structures	2,780,773	
		$ 21,524,571
Contracting authority[3]		9,889,690,973
Total assets		$9,976,384,350
LIABILITIES AND UNITED STATES GOVERNMENT INVESTMENTS		
Current liabilities:		
Disbursements in transit		$ 10,785
Accounts payable and accured liabilities for States completed work		848,776,593
Accrued liabilities–other		3,865,007
		$ 852,652,385
Accrued annual leave of employees		5,123,357
U.S. Government investment:		
Unobligated contracting authority		
Federal-aid	$3,312,494,167	
Emergency relief and other	42,985,219	
		$3,355,479,386
Undelivered orders and contracts		
Federal-aid	$5,726,873,135	
Emergency relief and other	19,854,873	
		$5,746,728,008
Invested capital		16,401,214
		$9,118,608,608
Total Liabilities and United States Government Investment		$9,976,384,350

TABLE 21. Federal-aid highway program trust fund statement of operations July 1967 through June 1968

APPROPRIATIONS

For Contracting Authority

New	$ 4,850,000,000
From last year	8,322,053,139
Reimbursable earnings	13,273,344
Available	$13,185,326,483

For Working Capital

New	$ 4,170,872,000
From last year	3,740,244
Reimbursable collections	15,628,653
Available	$ 4,190,240,897

OPERATING EXPENSES

	Payments	Changes in Accurals
Federal-aid:		
Primary	$ 407,450,611	$ +32,716
Secondary	265,105,908	−5,926,117
Urban	243,560,556	−12,428,193
HPR	72,180,398	−4,187,678
Interstate	3,112,217,556	−81,065,252
Administration	55,219,882	+620,661
Purchase of fixed assets	206,282	
D and L Funds		−18,885
	$4,155,941,193	$−102,972,748
Emergency relief	16,767,432	−1,451,978
Roadway over dams	175,153	−8,108
Pentagon road network	4,483	−1,476
Reimbursable	13,644,157	−288,413
TOTALS	$4,186,532,418	$−104,722,723
Decrease in Accruals	−104,722,723	
	$4,081,809,695	

DEDUCT

Accured expenses	$ 4,081,809,695
Lapsing authority	
Emergency relief	1,309,394
USED	$ 4,083,119,089

DEDUCT

Payments	$ 4,186,532,418
Increase–advances	222,236
Increase–unpaid	
Project leave	+12,584
Intransit	+2,968
USED	$ 4,186,739,102

AVAILABLE BALANCES, JUNE 30, 1968

Contracting authority[4]	$ 9,102,207,394
In Treasury	$ 3,501,795

TABLE 22. Federal-aid highway program trust fund—
July 1967 through June 1968

U.S. Government investment, July 1, 1967		$ 8,338,506,600
Increases:		
Contracting authority	$4,850,000,000	
Reimbursable work	13,273,344	
Total increases		$ 4,863,273,344
		$13,201,779,944
Decreases:		
Expenses	$4,081,603,413	
Property dispositions	55,962	
Lapsing contract authority	1,309,394	
Leave earned but not used	202,567	
Total decreases		$ 4,083,171,336
U.S. Government investment, June 30, 1968		$ 9,118,608,608

ANALYSIS OF UNITED STATES GOVERNMENT INVESTMENT

Invested capital		$ 16,401,214
Obligated:		
Federal-aid	$5,726,873,135	
Emergency relief	19,565,406	
Roadways over dams	224,057	
Pentagon road network	65,410	
		$5,746,728,008
Unobligated		
Federal-aid	$ 265,315,753	
Emergency relief	41,860,110	
Roadways over dams	917,076	
Pentagon road network	208,033	
		$ 308,300,972
Reserved–not available		3,047,178,414
U.S. Government Investment, June 30, 1968		$9,118,608,608

Table 23. Federal-aid highway program trust fund change in working capital

CURRENT ASSETS	June 30, 1968	July 1, 1967	Increase	Decrease
Funds with U.S. Treasury	$ 3,501,795	$ 3,740,244		$ 238,449
Accounts receivable:				
Repayments to fund	5,754,000	12,278,467		6,524,467
Advances to travelers	318,057	257,774	60,283	
Other advances	161,953	-0-	161,953	
			$ 222,236	$ 6,762,916
CURRENT LIBAILITIES				
Disbursement in transit	$ 10,785	$ 7,817		$ 2,968
Accounts payable and accrued:				
Liability for States completed work	848,776,593	957,899,090	$109,122,497	
Other accrued liabilities	3,865,007	3,621,807		243,200
			$109,122,497	$ 246,168
Subtotals			$109,344,733	$ 7,009,084
Change in working capital				102,335,649
Totals			$109,344,733	$109,344,733

TABLE 24. Federal-aid highway program trust fund statement of application of funds

Funds Provided by:		
Appropriation	$4,170,872,000	
Repayments to appropriation	13,273,344	
Total funds provided		$4,184,145,344
Funds applied to:		
Federal-aid	$4,052,968,445	
Bridges over dams	167,045	
Pentagon road network	3,007	
Emergency relief	15,315,454	
Reimbursable work	13,355,744	
Total funds applied		$4,081,809,695
Increase in working capital		$ 102,335,649

the efforts of the States to eliminate nonstandard signs, signals, and markings as an aid to traffic facilitation and safety. Present indications are that substantial conformance with the Manual will be achieved on roads maintained by the States, but that work will remain to be done on local streets and roads.

Traffic accidents on highway systems in all the States were tabulated. For the first time, it has been possible to compare the safety record of Federal-aid primary, Federal-aid secondary, and non-Federal-aid roads and streets, thus providing valuable data to help establish priorities for the application of available highway funds.

A special study of fatal accidents on the Interstate System was made to provide basic information on accident types and characteristics as well as to identify specific high-accident locations for which corrective treatment could be developed.

Considerable attention was devoted to regulation of traffic and to highway lighting. A major study of police services on controlled access roadways was completed, the work having been performed under contract by the International Association of Chiefs of Police. Also, as the result of a contract arrangement, this time with the National Committee on Uniform Traffic Laws and Ordinances, a volume was published which compares the statutes of all the States with the provisions of the "Uniform Vehicle Code" relating to rules of the road and accident reporting.

Interstate System. During fiscal year 1968, more than 2,000 miles of interstate highways were opened to traffic, of which over 1,700 miles were completed in rural areas and slightly over 300 miles in urban areas. No toll road mileage was opened to traffic during this period. With the addition of the mileage completed in 1968, the 41,000-mile Interstate System was brought to 64 percent of completion. The Interstate System can boast of nearly 26,100 miles of highway open to traffic, including 2,300 miles of toll roads. Of the 21,400 miles of interstate highway in the rural areas, toll roads comprise slightly more than 1,800 miles. In urban areas, toll roads represent nearly 500 miles of the total of nearly 4,700 miles of interstate highways.

Total interstate highway mileage under construction at the end of fiscal year 1968 was nearly 135 miles greater than a year earlier. Mileage under construction, as of June 30, 1968, in rural areas was nearly 5,150 compared with nearly 5,100 a year earlier, and in urban areas nearly 840 miles were under construction, compared with about 790 miles for the corresponding date in 1967.

Federal-aid Secondary Highway System. On the 641,000-mile Federal-aid secondary highway network improvements with a total cost of $570 million ($289 million in Federal-aid funds) were undertaken during fiscal year 1968. The secondary system augments the Federal-aid primary system and is composed of farm-to-market, feeder, and connector routes serving more localized traffic needs. It is developed in cooperation with the State and local governments and includes roads with only a gravel surface and a few vehicles per day in sparsely settled areas as well as some full freeways serving many thousands of vehicles per day in the more densely populated areas.

Defense Plans and Operations. Defense access-road construction estimated to cost approximately $3 million was programed during the fiscal year. Feasibility studies of the access and haul-road requirements at alternative sites for eight Sentinel antiballistic missile facilities were made for the Department of Defense. A report of the bridge reconstruction necessary to provide a 16-foot vertical clearance on the Interstate System was prepared. The American Association of State Highway Officials (AASHO) approval of a policy requiring that all bridges on the Federal-aid primary system be built to provide a 16-foot vertical clearance was obtained. Coordination of highway and water resource developments was continued.

An emergency operation plan for the Federal Highway Administration was developed. The communication capability of the BPR-FHWA emergency operating site was substantially improved as were other facilities at the site. Three manuals on emergency highway traffic regulations were issued and training courses were developed for the several thousand Federal, State, and local highway, highway-user, and police employees that would be involved in any transportation emergency. Detailed procedures for the reporting of damage to highways and the interdiction of highways by fallout were issued. All employees were instructed in procedures to follow in an emergency.

During fiscal year 1968, supervision was provided for the expenditure of approximately $24 million by the Office of Emergency Planning for the emergency repair of damage to roads and streets not included in the Federal-aid highway systems.

Overseas Activities. The Foreign Projects Division staffed highway projects in the following countries at the beginning of fiscal year 1968: Bolivia, Brazil, Burundi, Dominican Republic, Iran, Laos, Peru, Philippines, Sudan, and Yemen. One hundred twenty specialists were on duty in foreign countries. As of June 30, 1968, projects in the following countries had been phased out: Burundi, Iran, Sudan, and Yemen, leaving 85 specialists in the remaining countries. At the request of Libya and Kuwait feasibility studies were completed by Foreign Projects engineers to determine the best method of improving their highway systems.

Work continued on construction of the Inter-American Highway with the final contracts being awarded in Costa Rica and Guatemala. All work in Panama was completed and final payments were made. Advisory services were provided to Costa Rica, Nicaragua, and Guatemala for construction of access road projects. Detailed exploration and survey of a highway location across the Atrato Swamp in Colombia and Panama were completed.

Landscape. Of particular note and potential during fiscal year 1968 was the application of acoustical principles in developing immediately usable methods of reducing urban highway noise by using available prefabricated exterior acoustical wall materials. The Washington Office design team of architect, landscape architects, and artist developed new techniques for public presentation of proposed solutions of urban highway problems including animated movies of "birds eye" graphics, "before" and "after" colored slides, and illustrated brochures.

The first full year with landscape architects assigned in all regions, assistant landscape architects in five regions, and landscape architects in three division offices saw increased concern for preserving all social and natural values during highway construction, thus giving effect to a "total environment concept."

Research and Development. During fiscal year 1968 the national program of highway research and development continued both theoretical and applied research to devise methods to make streets and highways safer, less congested, more efficient, and less expensive to build and maintain. The program also concentrated on realization of research-developed projects. One of the more notable examples of research application was a project for replacing rigid structures, such as sign supports along the highways, with research-developed "breakaway" supports to reduce injuries in single-vehicle accidents. Another application of research was the implementation in several States of newly evolved systems for maintenance operations and management which could net cost reductions of about $500 million per year if they were adopted nationally.

Several new developments were at the threshold of implementation as a result of research conducted during the past several years. These included prototype vehicular and roadway equipment for an electronic-guidance system to help drivers on the Nation's highways, an experimental merge-control system by which motorists on freeway entrance ramps are kept moving and are guided into gaps in the freeway traffic stream by rampside displays, a rational design method for flexible pavements based on methods developed for determining stresses and displacements caused by moving and repetitive loadings to reduce the cumulative damage to the roads themselves, and a program to reduce injuries, fatalities, and property damage in single-vehicle accidents in which simple types of energy-absorbing barriers such as clusters of empty oil drums will be used.

Other important research programs included the development and implementation of an experimental system that will enable motorists while moving to summon help for other motorists whose vehicles are disabled on the highway, continued effort to eliminate roadside hazards by developing methods to lessen vehicle impact in accidents, and a new test method for determining density of granular materials. In other research dealing with materials, a direct testing method, using ultraviolet absorbence measurements, was developed to help control the quality of highway paints.

On-going Research Programs and Other Achievements. Research continued on a large-scale systems analysis and simulation model of complete transportation systems, begun in 1965 to provide policy and decision makers a rational planning tool for studies of viable solutions to overall transportation problems.

In an active research program for methods to improve traffic operations on streets and highways, the following developments were progressing: an electronic system to aid motorists in passing slow vehicles on two-lane rural highways, an improved basis for using computerized systems to control urban traffic systems and increase traffic flow on streets, and a system to monitor traffic at intersections with the ability to preserve on video tape a record of the 20-second period preceding an accident.

Research continued on pavements, hydrology, and bridge design in an effort to provide safer, less expensive highways having longer life and better riding qualities. The use of nuclear gages for measuring of soils and asphaltic pavements was continued successfully and research on nondestructive testing techniques continued. Nuclear techniques were being developed for determining cement content in fresh concrete. Improved inlets with double the usual water-carrying capacities were developed for box culverts at highway stream crossings and the method of determining required pipe sizes was improved by developing techniques to determine depth of flow at any point in a storm drain as a flood wave moves along it. Structural research to develop more rational design specifications, in which fatigue, dynamic loading, and structural response are adequately considered, is continuing and will result in bridges with lower construction and maintenance costs and greater safe-life expectancy. A new data acquisition system was developed and used in a pilot study to gather statistical loading history data on highway bridges.

In the search for improved highway materials and processes, studies on chemical soil stabilization produced results that will allow a better understanding of lime-soil-water reactions and, consequently, increase efficiency and economy of lime stabilization. Research continued on the design of valid specifications for highway construction based on random sampling and statistical concepts; future emphasis will be on the development of realistic specifications and on education of the highway industry in their use. Means to reduce or eliminate deterioration of concrete bridge decks were being developed, treatments for protecting concrete surfaces were being evaluated, studies were underway to isolate aggregates that cause deterioration and cracking in pavements, and new materials for highways were being investigated. Research to improve and increase the use of natural materials for highway construction sought to provide methods of stabilizing in-place soils to reduce the necessity of importing large amounts of materials to construction sites and to retard the depletion of critical aggregate sources. Also sought were methods that would permit the use of aggregates usually considered substandard. Remote multi-sensor techniques for preliminary surveys were being developed for use in planning and location phases of any transportation system.

Preliminary work was completed for the development of an integrated, operational highway engineering system directed to increasing engineering productivity, improving engineering quality, and achieving greater construction economy through the effective and extensive use of electronic computers, photogrammetry, and improved design concepts and methodology. As a demonstration of the results of the work, a typical bridge design for a grade separation was completed in a few minutes using a remote teletypewriter telephone connected to a computer center several miles away.

Route Location. One of the Bureau's most important concerns involves route location in the urban areas of the Nation, characterized by their complex of social, environmental, historic, and recreational values. The most efficient routings from the standpoint of physical, engineering, and economic factors is often complicated in some of the largest cities by substantial displacement of families and businesses when highways are built and by involvement with recreational facilities, historic sites, or other resource areas. During fiscal year 1968 BPR continued to work with State highway and resource officials, and with local official and citizen groups throughout the Nation, to resolve these urban location problems to the advantage of all interested groups.

By the end of this fiscal year, approximately 2 percent of the Interstate System lacked final route determination and approval.

Appalachian Highway Program. Fiscal year 1968 was the third full year during which the Bureau of Public Roads assisted the Appalachian Regional Commission in carrying out those portions of the Appalachian Regional Development Act of 1965 relating to highway improvement. States included in this program are: Alabama, Georgia, Kentucky, Maryland, Mississippi, New York, North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee, Virginia, and West Virginia.

As of March 31, 1967, construction had begun on 233 miles of Appalachian development highways. Preliminary engineering and right-of-way acquisition were underway for an additional 1,001 miles, centerline locations had been approved for another 338 miles, and location studies were underway or completed on all but 151 miles. The Appalachian Regional Commission had approved 368 miles of local access roads by March 31,

1968. Of this 368 miles, construction was completed on 58 miles and construction had begun on 86 miles, preliminary engineering and right-of-way acquisition were underway on an additional 143 miles, centerline locations were approved on an additional 12 miles, location studies were underway or completed on 39 miles, and no work had been done on 30 miles.

Of the $316.7 million appropriated funds obligated at the end of the third quarter fiscal year 1968, $228,579,478 were for Appalachian development highways and $15,417,016 for local access roads. As of June 30, 1968, $298,350,000 had been obligated for development highways and $19,100,000 had been obligated for local access roads.

Environmental Development Division. The Bureau of Public Roads has in recent years sought ways in which to make Federal-aid highways more compatible with the environment through which they pass. Accordingly, during fiscal year 1968, a new Environmental Development Division was created to help insure that the environment of affected areas will be studied and considered in the future location, design, and construction of all Federal-aid highways.

The new division is specifically charged with protecting and enhancing human values and resources along Federal-aid highways. While new highways and the reconstruction of old ones will serve the transportation needs of a city or community, the new division seeks ways for highway construction to enhance the environment as well. The division will be staffed by multi-disciplinary teams including urban planners, architects, sociologists, economists, real estate appraisers, highway engineers, and others.

Joint Development and Multiple Use. The Bureau of Public Roads is vigorously encouraging joint development or multiple-use projects, in which double or triple use can be made of the Federal-aid highway rights-of-way. During fiscal year 1968 it stimulated considerable interest in such projects.

Since enactment of Section III of Title 23 on June 29, 1961, BPR has partially or completely processed 233 requests from 40 States and the District of Columbia for permissive joint use of highway land for non-highway purposes. Of the requests, 105 involved vehicle parking under structures, 75 involved other miscellaneous uses under structures, and 20 contemplated uses over the traffic lanes while 33 were within adjacent areas of the travel way. Of the 105 requests to allow parking under structures, 24 were from California, 12 from Illinois, nine from New York, six from Ohio, five each from Missouri and Wisconsin, two or more from Massachusetts, Oregon, Washington, Connecticut, Florida, Tennessee, Texas, Colorado, North Carolina, Kentucky, Kansas, Louisiana, and Utah.

Accommodation and Relocation of Utilities. During this fiscal year two major studies in the utility-highway program area were undertaken by BPR. One study concerns the accommodation of utility lines within the rights-of-way of Federal-aid highway projects and the other concerns a "management by selection" process for use where it is necessary to adjust or relocate utility lines which fall in the path of proposed highway construction projects.

The objective of the accommodation study is to develop a policy to allow utilities to use space on highway rights-of-way but in a manner that will preserve and protect the integrity of the highway and safety of highway traffic. The objective of the "management by selection" study is to seek ways and means to reduce the time, effort, and cost of administering the utility relocation program and to accelerate the advancement of proposed highway projects to the physical construction state.

Archeological and Paleontological Salvage. The use of Federal-aid highway funds for archeological and paleontological salvage has been authorized in 23 States since the passage of the Federal-Aid Highway Act of 1956, involving an accumulated expenditure of more than $1.5 million. Fiscal year 1968 saw another increase in such salvage activities in the Federal-aid highway program. The number of active projects increased from 43 to 72 and the number of participating States from 21 to 23. The total amount of Federal-aid highway funds reserved for new salvage work during the year approached $400,000.

A most successful paleontological salvage project was undertaken in cooperation with the Ohio Department of Highways and the Natural Science Museum of Cleveland during the construction of Interstate Highway 71 in Cleveland. The highway project cuts through about 5½ miles of what has long been considered one of the richest deposits of Devonian Age fossils in the western hemisphere. A preliminary report by the Museum indicates that knowledge of paleontological history has been substantially increased by the nature and quality of the specimens salvaged on this project. The Museum estimates that at least 10,000 major specimens of significant value to science have been collected, including about 75 species of animals and 25 plant species new to the world of science.

Highway Design. One of the Bureau's major efforts for the improvement of highway standards and design during fiscal year 1968 was directed toward safety. This effort included preparation of the Safety Handbook and other safety standards.

Additional important undertakings in highway standards and design included the formulation of new policies concerning pavement overlays to improve skid resistance and the beginning of a new revision of the publication, "A Policy on Arterial Highways in Urban Areas."

New programs included experimentation with different film emulsions for photogrammetry surveys and plans, specifications, and estimates reviews by the Plans Analysis Branch which was absorbed into the Highway Standards Design Division during the year.

Construction Contracts and Prices. The Federal-aid highway construction program is accomplished under the traditional American practice of competitive bidding for contracts let by the State. Competitive bidding during fiscal year 1968 stimulated an average of 4.8 bids per contract in the Federal-aid primary and interstate programs.

During the year, 5,532 Federal-aid highway construction contracts with a total value of $4.5 billion were awarded, of which 1,923 were for the Interstate System, 1,695 were for the Federal-aid primary system (exclusive of the Interstate System), and 1,914 were for roads in the Federal-aid secondary system. Contracts for urban work are included in these figures. The average size of contracts during the year was approximately $815,000. Eighty 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 5.1 percent from the end of fiscal year 1964 to the end of fiscal year 1967. The composite indexes of contract prices (1957–59 calendar year average – 100) for the four quarters of fiscal year 1968 were 123.0, 119.2, 120.6, and 121.0, respectively. The composite index for the fourth quarter of fiscal year 1967 was 112.3.

The costs of labor and materials during the fiscal year amounted to 25 percent and 48 percent, respectively, of the Federal-aid primary highway construction (excluding costs of right-of-way and engineering). The remaining 27 percent was for equipment expenses (excluding operators' wages), overhead, and profit.

Average hourly earnings of labor on Federal-aid primary highway construction increased 9.1 percent during fiscal year 1968 but as a result of improving productivity in highway construction, the cost of labor increased only 8.6 percent. The cost of highway construction materials decreased 0.3 percent during this period and equipment expenses rose 4.1 percent. The weighted composite of Federal-aid highway construction labor, materials, and equipment costs during fiscal year 1968 was 3.0 percent.

Structures and Drainage. During fiscal year 1968—following the collapse of the Point Pleasant Bridge over the Ohio River—the BPR began the National Bridge Safety Inspection Program. The BPR completed a review of design and collapse loadings and stresses relative to this bridge failure. A median barrier designed by the Bureau was installed on the Woodrow Wilson Memorial Bridge on I–495. Of the aproximately $500 million in tunnel work now under way on the Federal-aid system, eight contracts in seven States were awarded for a total of almost $122 million.

To comply with Executive Order 11288 on the prevention of stream pollution, an instructional memorandum was distributed to the field to outline procedures to be followed in highway construction involving Federal funds, including a report entitled "Guidelines for Minimizing Possible Soil Erosion from Highway Construction" as prepared under Public Law 89–574, 89th Congress.

A development program for ultrasonic testing of bridge welds was completed with publication of a procedure manual and a specification applicable to Federal projects. Frequent shop inspections by Bureau personnel stressed quality control of fabricated steel for domestic and overseas bridge projects. The BPR participated in research on the characteristics of curved girders, hybrid steel girders, unsymmetrical plate girders, and steel box girders.

Relocation Assistance Activities. The BPR has sought to improve its relocation assistance activities for those persons, families, and businesses displaced by Federal-aid highway improvements. Although the work had to be done within the framework of present Congressional authorizations, the Washington office staff has been augmented for this task.

Planning. Highway planning in the BPR involves evaluations and estimates of existing transportation systems, of transportation planning techniques for urban areas, of long-range planning and scheduling of regional transportation facilities, and of the Nation's total transportation needs and resources.

In line with this mission, the Bureau's major activities during the fiscal year included preparation for the Secretary to transmit to Congress the 1968 Highway Needs Report, as directed by Public Law 89–139 of 1965.

This initial report, transmitted to Congress in January 1968, is oriented to assist Congress in shaping the broad outlines of a future highway program. It provides information on present highway transportation deficiencies and on those that can be foreseen within the next two decades. It also explores a variety of possible modifications in the Federal-aid highway program to meet existing deficiencies and to make the Nation's highway transportation system adaptable to the changing needs in the future. Because rapid urbanization has focused particular attention on the critical highway transport problems in our urban areas, needs of those areas are prominently reviewed in the report.

Work is now progressing on detailed studies for the 1970 and 1972 reports. The 1970 report will offer an analysis of a nationwide functional highway classification study to be made in cooperation with the State highway departments and with local government participation. The purpose of such a study is to permit the alignment of the Federal-aid systems to correspond to functional importance of routes and thus better anticipate future needs.

Preliminary work on the 1972 report consists of a thorough study of the costs and benefits of various components of the Nation's highway system, looking to develop recommendations for highway programs that can most efficiently meet highway needs.

Currently accepted urban planning methodology requires the acquisition and analysis by computer of large volumes of travel and socio-economic data. During fiscal year 1968 the BPR developed an IBM 360 urban transportation planning battery of computer programs to enable transportation planners to utilize the power and speed of the latest third-generation computers. It also permits them hypothetically to distribute traffic by several models and then to assign it to alternative highway and transportation networks. Using programs included in the battery, the networks may be plotted on mechanical plotters, thus giving the planner an accurate and efficient analytical tool previously not generally available.

Several studies were initiated to determine feasible ways of increasing the capacity of urban highways in moving people. In the Washington, D. C. area, Federal-aid highway funds are financing a feasibility study of high-speed express bus service on the reversible lanes of the Shirley Highway (I–95). Other studies include types of traffic engineering needed to improve operation of important bus routes. In addition, the BPR is participating in a 2-year feasibility and preliminary engineering study for a bus rapid transit system in Milwaukee.

An airport access study obtained information on distances, travel times, and overall speed of travel to all commercial airports serving urbanized areas over 50,000 population. Long-term improvements of airport accessibility will be recommended as a part of the continuing urban transportation studies.

The annoyance to the motorist of having his vehicle stopped for on-site acquisition of origin and destination data and for obtaining information on commodities carried by trucks has long been a problem. The growing availability of electronic computer files in motor vehicle registration departments may offer a solution. A pilot study was conducted in the Boston, Massachusetts, area to determine the feasibility of identifying vehicles on the highway by photographing their license plates, making a computer search of the registration file, and mailing questionnaires to vehicle owners. A similar study has been started in Kansas. Comparison of the result with actual roadside interviews will indicate the feasibility of this new technique.

A contract was executed with the Bureau of the Census for the conduct of a Nationwide Personal Transportation Study. The study should produce urban-rural estimates of various characteristics related to personal trips which will be invaluable for model building and policy decisions.

As an initial step toward meeting the growing need for more and better rest area facilities a nationwide rest area usage study has been undertaken.

As in the past, the BPR published an annual edition of *Highway Statistics*, which has come to be the principal recognized authority on highway matters, used for both industrial and government purposes.

Bureau of Motor Carrier Safety

The Bureau of Motor Carrier Safety (BMCS) establishes, administers, and enforces rules and regulations governing commercial driver qualifications and hours of service, commercial-vehicle safety equipment and appliances, safe operating procedures, commercial-vehicle inspection and maintenance programs, and safe transportation and handling of hazardous materials moving by highway.

The effects of the establishment of the BMCS within the Federal Highway Administration in April, 1967 and the transfer to it of all motor carrier safety activity from the Interstate Commerce Commission include:

- First, motor carrier safety activity was upgraded to "Bureau status" and its safety programs were separated from the economic regulatory activities of its predecessor agency. This emphasis on the safety programs was in keeping with Congressional and public demand for increased governmental activity to reduce highway fatalities, and property damage.
- Second, the transfer of the authority to determine causes of accidents to the newly created National Transportation Safety Board (NTSB)

and its conditional delegation of the authority to the BMCS placed motor carrier accident investigation activity in a relatively higher priority category than it had previously occupied.

- Third, the requirement by statute that the BMCS report to the Interstate Commerce Commission on the safety fitness of motor carrier applicants for operating authority had the effect of formalizing what had been an internal procedure.

During fiscal year 1968 when the transition was accomplished, with its attendant adjustments after the establisment of the new headquarters and field alignment, the BMCS field staff continued its vigorous work program. It inspected 58,411 commercial motor vehicles, performed 4,615 safety compliance surveys, and completed 262 in-depth accident investigations and 1,135 enforcement investigations which resulted in the submission of 422 enforcement prosecution cases.

The BMCS released 17 published accident reports and held 1,210 carrier safety meetings during the year as part of its continuing educational and informational activity. It processed 43,000 reports from carriers and released summary reports of the data for the years 1965 and 1966 in connection with its on-going accident analysis function. The BMCS also co-sponsored two regional training conferences for State regulatory personnel and continued to make safety fitness reports to the Interstate Commerce Commission. It produced some 7,273 individual reports in response to applications for motor carrier operating authority. (See Tables 25, 26, 27, 28, and 29.)

Development of Important Regulations. The administration of regulatory law demands continuous review to be responsive to the needs of the public and the segment of the economy that is regulated. In order not to continue out-dated rules or requirements and to take account of new developments and technology, periodic issuance of new or revised regulations is necessary. A list of actions taken during fiscal year 1968 on some of the more important new or revised Motor Carrier Safety Regulations and Hazardous Material Regulations and the causative development requiring their issuance includes:

- Proposed revised regulations to meet the problem of regrooved, recapped, and retreaded tires on heavy commercial vehicles—an action that resulted from a series of bus skidding accidents in which the condition of the tires was a causative factor.
- Adopted regulations to require shippers of hazardous materials to certify on the shipping papers that dangerous commodities were properly identified and described.
- Issued an order revoking requirements for the motor carrier industry to file Monthly Hours of Service Reports—an effort to reduce the paperwork burden on the industry.
- Took emergency action to prohibit the transportation in the same vehicle of Class B poisonous liquids or solids and food-stuffs—an action inspired by several catastrophic incidents in foreign countries and an effort to prevent similar occurrences in the United States.

- Took emergency action to require certain cargo tanks constructed of quenched and tempered steel to be internally inspected and tested for evidence of stress-corrosion cracking. Defective tanks were required to be repaired—an action resulting from reports indicating that a serious safety problem existed in this area.
- Adopted regulations requiring private carriers transporting hazardous materials to file Annual Safety Reports on their accident experience and to identify their vehicles.

Hazardous Materials Regulations Board. Another important program change was the establishment of an intermodal Hazardous Materials Regulation Board. Establishment of the Board was prompted by a need for a cohesive set of authoritative regulations which the regulated industry can rely on in the preparing, shipping, and transporting of hazardous materials, regardless of the mode. The BMCS provides the Federal Highway Administration representation and support to this Department Board. This approach has resulted in better service to the public and to shippers using more than one mode of transportation in moving their products.

TABLE 25. Motor carrier safety program—June 30, 1968

ASSETS		
Current assets:		
Funds in U.S. Treasury		$ 87,989
Accounts receivable	$ 11	
Advances to travelers	10,247	
		10,258
Fixed assets:[2]		
Office furniture and equipment	$ 24,184	
		24,184
Total assets		$ 122,431
LIABILITIES AND UNITED STATES GOVERNMENT INVESTMENTS		
Current liabilities:		
Disbursements in transit		$ 738
Accounts payable and other liabilities		95,245
		95,983
Accured annual leave of employees		$ 160,368
U.S. Government investment:		
Undelivered orders and contracts	$ 2,264	
Invested capital	(–)136,184	
		$ (–)133,920
Total liabilities and United States Government investment		$ 122,431

(See Notes to Financial Statements—p. 106.)

TABLE 26. Motor carrier safety program statement of operations July 1967 through June 1968

APPROPRIATIONS

For Obligational Authority

New	$	1,833,000
From last year		18,492
Available	$	1,851,492

For Working Capital

New	$	1,833,000
From last year		87,857
Available	$	1,920,857

OPERATING EXPENSES

		Payments		*Change in Accruals*
Administration	$	1,820,995	$	+14,984
Purchase of fixed assets		10,368		
TOTAL	$	1,831,363		
Increase in accruals		14,984	$	+14,984
	$	1,846,347		

DEDUCT

Accrued expenses	$	1,846,347
Unobligated balance of administration		2,882
USED	$	1,849,229

DEDUCT

Payments	$	1,831,363
Decrease in advances		+639
Disbursements in transit		+738
Unobligated cash returned to Treasury		2,882
USED	$	1,832,868

AVAILABLE BALANCES, JUNE 30, 1968

Unliquidated obligations	$	2,263
In Treasury	$	87,989

Appointment of Advisory Committees. Because of the need to utilize the expertise of the private sector of the economy in fulfilling the regulatory responsibility of BMCS, an Advisory Committee for Promotion of Compliance with Carrier Safety and Hazardous Materials was established. The job of this Committee is to develop ways and means of reaching carriers utilizing heavy commercial vehicles on the highways as an incident to their primary business and apprise them of the safety requirements under the law. Additionally, the BMCS is studying the feasibility of reconstituting the present Advisory Committee on Vehicle Parts and Accessories into a Motor Carrier Safety Advisory Committee designed to attack the total

TABLE 27. Motor carrier safety program U.S. Government investment July 1967 through June 1968

U.S. Government investment, July 1, 1967		$ (–)112,948
Increases:		
Appropriated	$ 1,833,000	
Property acquired at no cost	2,971	
		$ 1,835,971
		$ 1,723,023
Decreases:		
Expenses	$ 1,835,979	
Leave earned but not used	18,082	
Unobligated cash returned to U.S. Treasury	2,882	
		$ (–)1,856,943
U.S. Government investment, June 30, 1968		$ (–)133,920

ANALYSIS OF UNITED STATES GOVERNMENT INVESTMENT

Invested capital	$ (–)136,184
Obligated:	
Undelivered orders and contracts	2,264
U.S. Government investment at June 30, 1968 as shown on Statement of Assets and Liabilities	$ (–)133,920

problem of commercial vehicle safety. It would include members from Government, trade unions, trade associations, the motor carrier industry, and other experts.

Cooperative Agreements. Following the concept of "creative Federalism," enunciated by the President, an order was issued inviting State safety regulatory agencies to enter into cooperative agreements with the Federal Highway Administratin Bureau of Motor Carrier Safety jointly to enforce motor carrier safety and hazardous materials regulations. These agreements provide for the exchange of information on violations coming to the attention of either agency and for making available staff members for testifying in each other's enforcement cases where appropriate.

As of June 30, 1968, some 31 State agencies in 29 States had formally entered into such agreements. These agreements, while not adding resources to either Federal or State agencies, have resulted in a closer working partnership in this important segment of the total motor vehicle safety program effort.

TABLE 28. Motor carrier safety program change in working capital

	June 30, 1968	July 1, 1967	Increase	Decrease
CURRENT ASSETS				
Funds in U.S. Treasury	$ 87,989	$ 87,857	$ 132	
Accounts receivable	11	167		156
Advances to travelers	10,247	10,886		639
			$ 132	$ 795
CURRENT LIABILITIES				
Disbursements in transit	$ 738	$	$	$ 738
Accounts payable and accrued liabilities	95,246	80,418		14,828
				$ 15,566
Sub-totals			$ 132	$ 16,361
Change in working capital			16,229	
Totals			$ 16,361	$ 16,361

TABLE 29. Motor carrier safety program statement of application of funds

Funds provided by:		
Appropriations	$ 1,833,000	
Less:		
Unobligated cash returned to Treasury	2,882	
Total funds provided		$ 1,830,118
Funds applied to:		
Administrative operating expenses	$ 1,835,979	
Purchase of fixed assets	10,368	
Total funds applied		$ 1,846,347
Decrease in working capital		$ 16,229

New Programs. The BMCS conducted an overall review of the approach to the administration of its functions and is developing a program proposal to increase the States' capability to administer a joint Federal-State motor carrier safety program designed to cover the safe operation of both interstate and intrastate medium and heavy commercial vehicles on the Nation's highways.

The National Highway Safety Bureau

The National Highway Safety Bureau (NHSB), established by Congress in 1966, is spearheading the national effort to prevent motor vehicle crashes with their attendant human suffering and economic loss. The NHSB is the first Federal organization established to attack the motor vehicle crash problem in all its aspects simultaneously—the vehicle, the operator, the road, and the traffic conditions. Evidence at hand indicates the attack is paying off.

In calendar year 1967—in contrast to the trend of previous years—there was no increase in the death rate from highway crashes. Statistics like this—for one year—are, of course, no adequate basis for firm conclusions about the effectiveness of safety efforts. But the statistics are bolstered by growing scientific evidence from research workers which shows that the public is receiving positive benefits from safety features now required by the motor vehicle standards, particularly energy-absorbing steering assemblies and the newer laminated windshields now required on all new vehicles. Having these accomplishments to its credit, however, the NHSB intends to reinforce its determination to achieve a dramatic reduction in deaths and injuries on America's highways.

New Motor Vehicle Standards. On January 31, 1967, the NHSB issued the first set of motor vehicle safety standards as required by the National Traffic and Motor Vehicle Safety Act. These 20 standards applied to domestic and foreign motor vehicles manufactured after January 1, 1968, for sale in the United States.

During fiscal year 1968 six more standards were added. On November 27, 1967, the first two of these, covering new pneumatic tires and tire selection and rims, (Standards 109 and 110) were issued. Like those preceding, Standard 109 became effective on January 1, 1968, while No. 110 went into effect on April 1, 1968. A third, No. 202, covering head restraints, was issued February 13, 1968, to become effective on January 1, 1969.

The remaining three, Nos. 112, 113, and 114, which concern headlamp concealment, hood latch systems, and theft protection, respectively, were issued on April 24, 1968. Standards 112 and 113 will become effective January 1, 1969. Standard No. 114 will be effective on January 1, 1970. In addition to the new standards seven modifications have been issued. The details of these amendments and new standards are available in a publication entitled "Federal Motor Vehicle Safety Standards."

Currently the NHSB has 26 new standards and 20 amendments under consideration. These future standards will include requirements for: a uniform tire quality system, regrooved tires, new restraint systems for small children, brake lining performance, protective features on motorcycles, warning devices for vehicles stopped in emergencies, windshield mounting, and strengthening of side structures.

The formulation of a standard is a long and detailed process that involves both the NHSB and its components and many outside elements. The first step is a review and analysis of relevant technical data involving such elements as accident statistics, research publications, vehicle defects data, existing standards and specifications, cost and lead-time data, proposals and suggestions, and NHSB research reports. From this may come the identification of needed research which may then be contracted out to organizations that provide the necessary safety-research data.

The next step is the development and issuance of the preliminary standard which apppears in the form of Advance Notice of Proposed Rule Making published in the *Federal Register*. This outlines the contents of the proposed standard and invites comments. The comments are evaluated, conferences are held, and a Notice of Proposed Rule Making is developed. This Notice contains the standard as revised to incorporate relevant comments and solicits additional remarks. Once again suggestions are considered, and consultations are held. From this comes the issuance of the standard in final form. Interested parties then have the right to petition for interpretation, amendment, or revocation of the rule.

Defect Notification. The National Traffic and Motor Vehicle Safety Act requires that motor vehicle manufacturers notify original owners, dealers, and the Secretary of Transportation of any safety-related defect discovered in their products and issue notice of appropriate remedial meausures. These notices are available for public inspection at the NHSB's offices. In fiscal year 1968 there were 138 recall campaigns involving 3,275,574 vehicles.

Compliance. The Bureau is in the process of developing compliance procedures for vehicle manufacturers. In support of that effort, two contract studies have been published concerning the most efficient and productive means of implementing compliance procedures. Development of a Compliance Procedures Manual was a recommendation of one of these studies. An initial draft was completed in December 15, 1967, and an in-house review was in progress at the end of the fiscal year.

On November 4, 1967, a notice was published in the *Federal Register* concerning the regulation on certification notices. This regulation required that before January 1, 1968, manufacturers submit to the Director of the NHSB information concerning the certification label or tag to be used on their products. By the end of fiscal year 1968 approximately 600 certification letters had been received from domestic and foreign manufacturers.

A compliance testing program has also been undertaken. Eight firms were awarded contracts in fiscal year 1968 to carry out this testing.

Used Motor Vehicle Standards. Vehicle deterioration is an important highway safety factor and, consequently, State and Federal governments and the general public must work together to assure the safety of all vehicles permitted on public thoroughfares. At present, the NHSB is directing its efforts toward the development of standards for all vehicles in use as required by the National Traffic and Motor Vehicle Safety Act of 1966. The standards are concerned with such critical performance properties as braking, steering, handling, suspension, and tires. These standards will complement standards for new vehicles and vehicle equipment already issued.

Since the safety performance of a vehicle in use cannot be isolated from its original design, safety in used cars may be enhanced by appropriate advance planning. For this reason the NHSB will begin work on standards for the manufacture of new motor vehicles and equipment which will insure safety performance over a designated period of use.

Highway Safety Standards for States. The 13 original standards for State and community highway safety programs, developed in accordance with the National Highway Safety Act, were issued in final form on June 27, 1967. Three additional standards are currently being developed: pedestrian safety, police traffic services, and debris hazard control and cleanup.

State response has been encouraging. All of the States have passed legislation in one or more functional areas that generally meet requirements for the standards. The numbers of States having laws conforming to standards on June 30, 1968, are:

- Periodic Motor Vehicle Inspection – 31 plus the District of Columbia.
- Motorcycle Safety (helmet laws) – 37.
- Special licenses or endorsements – 33 States and District of Columbia.
- Driver Education (licensing laws for commercial training schools and instructors) – 40 States.
- Driver Licensing (holding of one license per individual) – 36 States plus District of Columbia.
- Re-examination – 18 States.

- Alcohol and Highway Safety (implied consent laws) – 29 States.
- Chemical/drink driving tests – 42 States and District of Columbia.

State Highway Safety Funding and Programs. In fiscal year 1968 there was a substantial increase in the number of grant applications submitted by States and communities as compared to the previous year. In fiscal year 1967, 22 projects were approved involving $900,000 in Federal funds. In fiscal year 1968 project applications totaled 846, requesting Federal funds of $45.4 billion. (See Tables 30, 31, 32, 33, and 34.)

To aid the States in their programs the NHSB developed a Highway Safety Program Manual, the first draft of which was issued on May 31, 1968. The Manual provides guidelines for planning and administration and covers the substance of the 13 existing standards as well as the proposed additional standards.

TABLE 30. State and community highway safety program June 30, 1968

ASSETS

Current assets:		
Funds in U.S. Treasury		$ 35,838,759
Accounts receivable	$ 4,471	
Advances to States	176,021	
Advances to travelers	43,635	
		$ 224,127
Fixed assets[2]:		
Office furniture and equipment	$ 291,713	
		$ 291,713
Contracting authority[2]		240,073,238
Total Assets		$ 276,427,837

LIABILITIES AND UNITED STATES GOVERNMENT INVESTMENTS

Current liabilities:		
Disbursements in transit		$ 50,376
Accounts payable and other liabilities		6,320,740
		$ 6,371,116
Accrued annual leave of employees		337,763
U.S. Government investment:		
Undelivered orders and contracts	$ 29,676,131	
Contracting authority	240,088,877	
Invested capital	−46,050	
		$ 269,718,958
Total liabilities and United States Government investment		$ 276,427,837

(See Notes to Financial Statements—p. 106.)

TABLE 31. State and community highway safety program statement of operations—July 1967 through June 1968

APPROPRIATIONS

For Contracting Authority

New	$	100,000,000
From last year		174,086,206
Administrative obligational authority		21,034,000
	$	295,120,206

For Working Capital

New	$	46,034,000
From last year		9,038,405
	$	55,072,405

OPERATING EXPENSES

	Payments	Change in Accruals
State and community highway safety program	$ 3,695,749	$ +5,588,089
Administration and research	15,313,297	+611,853
Purchase of fixed assets	144,531	
TOTALS	$ 19,153,577	$ 6,199,942
Increase in accruals	6,199,492	
	$ 25,353,519	

DEDUCT

Accrued expenses	$	25,353,519
Unobligated balance of administration		1,679
USED	$	25,355,198

DEDUCT

Payments	$	19,153,577
Increase advances outstanding		94,492
Disbursements in transit		+50,376
Unobligated cash returned to Treasury		35,953
USED	$	19,233,646

AVAILABLE BALANCES, JUNE 30, 1968

Contracting authority[4]	$	269,765,008
In Treasury	$	35,838,759

Research and Support. Research undertaken in fiscal year 1968, which will provide support for the promulgation of new standards, includes: force deformation patterns of various parts of the vehicle, human tolerance to impact forces, vehicle handling characteristics in various maneuvering situations, flammability and other properties of fuels and materials used in interiors which create dangers in post-crash situations, improved rear lighting and signals, safety performance of motorcycles, crashworthiness of vehicle structures, post-crash escape and recovery features, tire properties such as traction, resistance to abrasion, and other deteriorations, control systems such as steering, braking, and proper operation of power-operated items, and visibility and other sensory demands upon the driver.

Accident Investigation. Perhaps the most fundamental and significant research engaged in by the NHSB is to determine the relationship between causes of crashes and the effects on the human occupants and pedestrians. Obtaining cause-effect relationships requires thorough investigations of accidents, starting with analysis of the scene, engineering analysis of the vehicle, and retrospective investigation into the condition of the driver, the vehicle, and the environment prior to the accident. This program is the first nationally coordinated, systematic program of accident investigation.

TABLE 32. State and community highway safety program—July 1967 through June 1968

UNITED STATES GOVERNMENT INVESTMENT

U.S. Government investment, July 1, 1967		$ 174,079,013
Increases:		
Contracting authority	$ 100,000,000	
Appropriation for administration	21,034,000	
Property acquired at no cost	17,193	
		$ 121,051,193
		$ 295,130,206
Decreases:		
Expenses	$ 25,208,989	
Leave earned but not used	200,580	
Unobligated cash returned to U.S. Treasury	1,679	
		$ 25,411,248
		$ 269,718,958

ANALYSIS OF UNITED STATES GOVERNMENT INVESTMENT

Invested capital		$ (–)46,050
Obligated:		
State and community highway safety	$ 15,469,192	
Administration and research	14,206,939	
		$ 29,676,131
Unobligated:		
State and community highway safety		49,913
Reserved–not available		240,038,964
U.S. Government investment, June 30, 1968		$ 269,718,958

TABLE 33. State and community highway safety program changes in working capital

	June 30, 1968	July 1, 1967	Increase	Decrease
CURRENT ASSETS				
Funds with U.S. Treasury	$ 35,838,759	$ 9,038,405	$ 26,800,354	
Accounts receivable	4,471	19,161		$ 14,690
Advances to travelers	43,635	9,297	34,338	
Advances to States	176,021	115,866	60,155	
			$ 26,894,847	$ 14,690
CURRENT LIABILITIES				
Accounts payable and accrued:				
Liabilities for States completed work	$ 5,588,089			5,588,089
Accrued liabilities—other	783,027	$ 135,487		647,540
				$ 6,235,629
Subtotals			$ 26,894,847	$ 6,250,319
Change in working capital				20,644,528
			$ 26,894,847	$ 26,894,847

TABLE 34. State and community highway safety program statement of application of funds

Funds provided by:		
Appropriations	$ 46,034,000	
Less:		
Unobligated cash returned to Treasury, June 30, 1968	35,953	
Total funds provided		$ 45,998,047
Funds applied to:		
State and community highway safety programs	$ 9,283,838	
Administration and research	16,069,681	
Total funds applied		$ 25,353,519
Increase in working capital		$ 20,644,528

In fiscal year 1968 the NHSB started a pilot program of accident investigation and research, consisting of: (1) Describing a curriculum for training accident investigators in uniform investigation techniques, (2) providing six medical-engineering teams to investigate approximately 70 accidents in different regions of the U.S. (as a field test of the investigation techniques), and (3) beginning research on the more common and recurring types of injuries in relation to types of vehicle damage which caused injury.

Information and Analysis Systems. This program deals with the analysis and comparison of laboratory data and data from accident investigations. It consists of: mathematical analysis of accident and injury information, a National Highway Safety Information System comprised of coordinated and interconnected State systems, and registers of the files of driver, vehicle, and accident and injury data. Of the latter, only the driver register is currently operating. This register is designed to help the States identify and control problem drivers whose licenses have been revoked or suspended. All States and territories are now participating to some degree in this computerized program. Nearly 24 million requests to check names against those in the file are received a year—65,000 a day.

The fiscal year 1968 program which will be continued in fiscal year 1969 involves: (1) Completion of overall planning study, (2) expansion of the driver register and starting those which will contain data on vehicles and accidents and injuries, and (3) data reduction and mathematical analysis of selected data available through other Federal agencies, State motor vehicle departments, universities, insurance companies, and other private organizations.

When operational, the program will: (1) Facilitate the factoring of cause-effect relationships relative to highway deaths, injuries, and property damage, (2) provide a scientifically valid basis for analyses leading to new or improved cost-effective standards, (3) provide information to States and local jurisdictions essential for their safety programs to be most effective, and (4) permit accurate and rapid response to legitimate inquiries from States, local jurisdictions, and private parties.

Facilities. During fiscal year 1968 studies were completed which defined the types of facilities that are needed to conduct the complex array of tests and measurements which are essential to implementing an effective motor vehicle and highway safety research program. These requirements have been incorporated into a coherent, overall facilities program which will utilize existing facilities where it is technically and economically feasible to do so, and will provide for new construction when the need cannot be satisfied by other means.

The investigations establish that although most of the facility requirements can be met, in whole or in part, through the utilization or modification of existing facilities, the two foundation requirements of the entire program cannot be provided by this means; they are: (1) A proving ground, and (2) a driving simulation laboratory.

Accordingly, plans have been developed to acquire the facilities as expeditiously as possible, consistent with sound engineering practices. The plan contemplates the use of existing facilities with such modifications as are dictated by testing requirements. It also provides for the initiation of detail engineering leading to the preparation of Preliminary Engineering Reports which will serve as a basis for budgetary requests.

A study was also initiated on Compliance Testing Facilities to establish the kinds, number, location, and equipment required for the facilities which are needed for testing and to develop criteria which can serve as the basis of design for the recommended facilities and supply cost estimates and manning levels for those recommended.

Demonstration Projects. Demonstration projects bridge the gap between research and practice. They provide a means of evaluating and giving visibility to new procedures, techniques, and systems. During fiscal year 1968 the emphasis has been on the post-crash program phase. Five projects involving experiments with all aspects of emergency medical care are underway. Also, a program has been funded to evaluate the use of automated teaching equipment and driving simulators.

Dissemination of Information. Since its activities affect those of countless individuals and groups, and because of the regulatory nature of some of its work, the NHSB has continually pursued a program of wide public dissemination of information about its policies, decisions, and actions. It has cooperated in the development of articles, extensive interviews, and films for use in national news magazines and on local and national radio and television programs. In addition, it has prepared numerous articles for various special purpose and trade publications.

To supplement these efforts, officials of the Federal Highway Administration and the National Highway Safety Bureau have undertaken a series of personal appearances and speeches explaining various aspects of NHSB programs to professional and technical societies, to the scientific community and to various State and local government groups, industrial organizations and civic associations.

The NHSB publishes information concerning standards and programs. A number of these publications, such as "Motor Vehicle Safety Defect Recall Campaigns" have been widely disseminated. Additional publications include: "Motor Vehicle Safety Standards," "Highway Safety Program Standards," "Report on the Highway Safety Program Standards," "Summary—Highlights of Highway Safety Articles Available from the NHSB Documentation Center," "National Highway Safety Standards—A Resume of Projects Being Initiated and Conducted by the States and Their Local Communities," and "National Highway Safety Standards—Outstanding Examples of Specific Projects in Each Standard Area."

The NHSB disseminates to the staff of the Department, field offices, concerned contractors, and research workers in various parts of the country scientific and technical information for those working in highway and motor vehicle safety. Availability of information is announced in the journal *Highway Safety Literature.*

Contract Research Report. The contract research reports published to date are:

- Two project definition phase studies for the National Traffic Safety Data Center.
- Three project definition phase studies for the National Traffic Safety Documentation Center.
- Two automotive industrial engineering studies.
- Two compliance procedures studies.
- Three investigations for motor vehicle standards for integrated seat and occupant restraint.
- Three investigations of motor vehicle interiors.
- One investigation of motor vehicle performance standards for fuel tank protection.
- Five studies in vehicle handling properties.
- One report on research in improving the process of accident investigation; one evaluation of literature on police traffic services and road safety.
- One report from the Travelers Research Center.
- One report on methods for surveying highway emergency medical services.
- One report on schoolbus safety.
- One report on automated diagnostic systems of vehicle inspections.
- One report on escape and spillage of hazardous materials and vapors from motor carriers.
- One report on initial tests on stopping distance and spin-out characteristics of regrooved tires on buses.

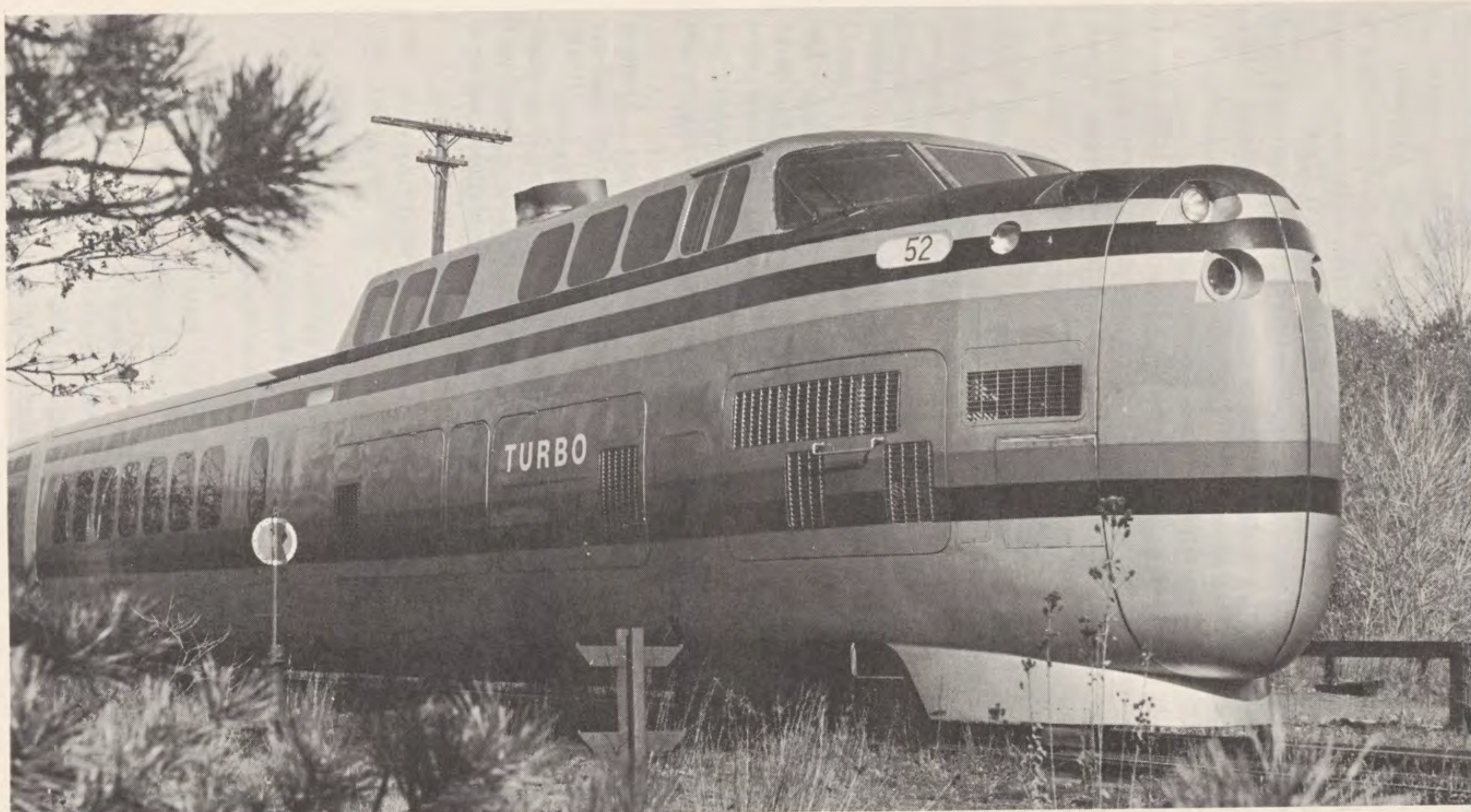
These reports are available through the Clearinghouse for Federal Scientific and Technical Information, Springfield, Virginia, 22151. A more detailed list of report titles can be obtained from the National Highway Safety Bureau Documentation Center.

National Highway Safety Advisory Committee. The National Highway Safety Act called for the formation of the National Highway Safety Advisory Committee. This Committee was appointed by the President, to consult with and make recommendations to the Secretary of Transportation on highway safety, especially State program standards. The membership, recently expanded to 35 by Federal law (Public Law 90–150), includes the Federal Highway Administrator, representatives from State and local governments, public and private interests concerned with highway safety, research scientists, and other experts in the highway safety field. The Under Secretary of Transportation serves as Chairman.

The Committee met twice in fiscal year 1968. In a July 10, 1967, report, the Committee made recommendations on driver education, driver licensing, traffic records, alcohol in relation to highway safety, periodic motor vehicle inspection, identification and surveillance of accident locations, emergency medical services, and police traffic services.

National Motor Vehicle Safety Advisory Council. The National Traffic and Motor Vehicle Safety Act provided for the establishment of a National Motor Vehicle Safety Advisory Council, a majority of whose members represent the general public; the minority represents motor vehicle and motor vehicle equipment manufacturers and dealers in those products. The Act directs the Secretary of Transportation to consult with the Council on motor vehicle safety standards to be established under the Act. The original membership of 17 has recently been expanded to 22 to discharge Council responsibilities and insure representation of organizations most concerned with vehicle safety problems. Dr. Thomas F. Malone, Vice President and Director for Research of Travelers Insurance Company serves as Chairman.

The Council held nine major meetings during the fiscal year. At these meetings members dealt with a wide range of motor vehicle safety subjects and offered guidance with respect to the program and goals of the NHSB. The Council made recommendations in the following areas: New tires, international affairs, small-volume manufacturers, certification, purchaser information on standards and performance, import regulations, advance effective dates of standards, retreaded tires, tire gauges, and research.



TurboTrain to operate between Boston and New York.

Chapter VI

FEDERAL RAILROAD ADMINISTRATION

The Federal Railroad Administration (FRA), one of five* operating agencies within the Department of Transportation, has three major components: the Bureau of Railroad Safety, which also has responsibility for liquid pipeline safety; the Federally-owned Alaska Railroad; and the Office of High-Speed Ground Transportation. In addition to having the responsibility for administering these programs, the FRA has the responsibility of providing the principal reservoir of expertise in the Executive Branch on railroad matters.

During fiscal year 1968, the FRA began focusing on what it considered critical railroad policy areas; safety of operations, safety at railroad-highway grade crossings, long-distance intercity passenger service, and railroad research.

It was apparent at the time FRA came into being that the piecemeal statutory basis of Federal rail safety activity was not suited for modern-day rail operations. Evidence of that fact was the steady rise in the number of train accidents between 1961 and 1967, a good many of which were attributed to causes beyond the reach of existing law.

On April 29, 1968, a proposal for a broad, comprehensive railroad safety law was submitted to Congress by the Secretary. The proposal would give the Department authority to prescribe standards for the design, construction, and performance of track, bridges, locomotives, rolling stock, and the authority to promulgate inspection criteria for each. Authority would also be vested in the Department to regulate the qualifications of railroad operating employees and other procedures of railroad operations, as deemed advisable in the interests of safety.

Efforts to reduce the hazards of railroad-highway grade crossings were renewed, including (1) development of uniform guidelines for diagnosing the hazards at the Nation's 214,000 public crossings, (2) development of more economical train detection devices, including advanced highway warning systems, and (3) a preliminary study of more economical and durable crossing structures.

The intercity passenger problem heightened during fiscal year 1968, and the year ended with hearings scheduled before the House Interstate and Foreign Commerce Committee on numerous bills to amend Section 13a of the Interstate Commerce Act. The FRA previously had begun several preliminary studies on the complex questions involved.

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* The Urban Mass Transportation Administration, the sixth of the Administrations, became part of the Department on July 1, 1968.

During the final months of the year, the FRA also made plans to initiate important new research programs, including a joint Rail Administration-industry study of the possibilities of self-acting or fully automatic coupling systems. Major benefits predicted for such a system included: (1) Reducing costs in time and money for making up trains and the inevitable delays of trains in terminals, (2) smoother handling of long trains, (3) developing a method of monitoring all mechanical components of a train from within the train, and (4) reducing hazards to employees of coupling and uncoupling operations.

The FRA also continued its program utilizing the Department's four fully-instrumented research cars. Included in that program are projects to: (1) Perfect track measuring equipment and techniques, that could revolutionize maintenance-of-way planning, (2) test improved track designs, (3) investigate an active suspension design that will improve roll control and train performance on curves, and (4) test on-board surveillance systems to monitor brakes, motors, suspensions, and controls.

Office of High-Speed Ground Transportation

The organization and program of the Office of High-Speed Ground Transportation (HSGT) provide for the integration of three lines of effort—the Northeast Corridor Transportation Project (NECTP), research and development, and demonstrations of equipment. The goal of the NECTP is to offer policy makers a spectrum of comprehensive transportation investment alternatives. The techniques developed by the Corridor project for systems analysis will draw upon the new technology options from the HSGT research and development program and information on the public reaction to HSGT demonstrations. In response to policy decisions, the NECTP will provide advanced planning techniques for implementation of the decisions; the R & D effort will yield developed transportation equipment and systems; and the demonstrations will contribute some invaluable operating experience as well as basic data against which the results of new experience can be measured.

Northeast Corridor Transportation Project. Just as the NECTP provided the impetus for the High-Speed Ground Transportation Act, so does it continue to be the focal point for the activities of the Office of HSGT. It is a long-range project to develop alternative transportation system investments looking toward a solution of the corridor congestion problem.

Based on a study design presented in 1965, the NECTP has given primary emphasis to the development of analysis and forecasting techniques, namely:

- Generating regional transportation system configurations suited to the region and responsive to transportation policy.
- Predicting the impact of transportation systems on the economic, social, and demographic development of the region.
- Forecasting the demand for transportation based on the characteristics of the transportation modes available and on the socio-economic descriptors of the population centers of the region, making use of data

generated by the demonstrations, by the Bureau of the Census, and other sources.

- Simulating and analyzing the interactive operation of several possible transportation systems within the region.
- Utilizing the output of systems engineering and cost analysis programs to evaluate candidate systems.

These techniques, together with design-optimization and cost-estimating techniques developed by other research and development activities, are intended to provide the tools for a three-phase transportation evaluation effort:

- Synthesis of complete transportation systems, including extensions of existing modes and new technologies.
- Analysis of the transportation system operation and impacts, including projection of the regional development to a future "horizon" date.
- Evaluation of the effects and impacts of proposed systems against goals for an overall regional policy based on both an aggregation of local objectives and a response to projected national, regional, and local demands.

Several advanced analytical techniques pioneered by the NECTP are sufficiently operational to be ready for testing with transportation mode characteristics obtained from the research and development activity. The research and development program can now provide early estimates of performance and cost of the technologies under study for possible Corridor use, making use of systems engineering and cost analysis techniques. Similarly, the demonstration project planning incorporates provisions for generating under controlled conditions needed data on public reaction to new transportation service. These and other data are expected to produce further refinements in analysis techniques, but the NECTP has now reached a stage where a gross evaluation of system alternatives is possible.

Research and Development. The HSGT research and development program during fiscal year 1968 followed the program and project plans set forth in 1965 at the time the HSGT legislation was passed. A broad spectrum of technology has been examined and U.S. capabilities in system design for high-speed ground transportation have been evaluated. Hardware system options have been identified, developed, and organized for evaluation in the overall systems context provided by the NECTP.

The development program for a tracked air-cushion vehicle reached the point where a full-size research vehicle is undergoing preliminary design by both General Electric Company and Grumman Aircraft Corporation. Good progress has been made on basic analytic and laboratory work on critical tracked air-cushion vehicle subsystems at NASA's Langley Research Center. Wind tunnel tests were conducted to establish design criteria for vehicle body shapes and certain air-cushion aerodynamic characteristics.

Following basic analysis work in the first year of HSGT efforts, small-scale models and theoretical studies were undertaken to establish a basis for design of a full-scale linear electric motor. The world's first 2,500 hp. linear electric motor is now being fabricated. Following static tests in the laboratory and slow-speed dynamic tests on a quarter-mile section of track, the motor will undergo high-speed operational testing at a proposed Department of Transportation HSGT test facility. These tests will be conducted on both wheeled and air-suspended research vehicles.

A number of site locations have been evaluated in accordance with HSGT test facility and technical experimentation requirements of the various HSGT developments. Final selection of the location for this test facility is expected during fiscal year 1969.

The Department's rail research cars, operating at speeds in excess of 150 m.p.h., have collected a variety of data on phenomena associated with high-speed rail operation. These cars, equipped with approximately 70 separate sensing systems, are now able to assemble information on power collection, vehicle dynamics, track geometry, and many other operational characteristics that must be understood if high-speed rail operation is really to be achieved. This information is being used to "calibrate" the many models and simulations that have been developed to describe the behavior of various parts of the systems during high-speed operation. These "models" will become the basic experimental and analytical tools to be used in the design of future systems and subsystems and should reduce time needed for hardware experimentation.

The future of tube vehicle systems depends upon the state-of-the-art of tunneling technology. Parallel programs covering tube-system development and tunneling technology are at a point where major investments will have to be made to achieve the capabilities that are needed. The present HSGT program in these areas has resulted in identification of specific techniques that should be investigated further.

Demonstrations. Demonstrations, carried out under the Office of High-Speed Ground Transportation Act ". . . to measure and evaluate such factors as the public response to new equipment, higher speeds, variations in fares, improved comfort and convenience, and more frequent service . . ." have been delayed by technical problems with the equipment. The problems will be cleared up but the corrective actions are taking time. The Washington-New York demonstration will begin upon receipt of notification from the Penn Central Railroad that it has accepted at least 28 of the 50 Metroliner cars and is prepared to inaugurate service. The Boston-New York demonstration will begin when the Department accepts the Turbo-Trains and enters into an operating contract with the Penn Central Railroad. Training of Penn Central Railroad crews to operate the Turbo-Trains has started.

The demonstration contracts provide for very little expenditure by the Federal Government until the new service is inaugurated. At the end of fiscal year 1968, the total Government expenditure has been slightly over $3 million. This expenditure is particularly modest in relation to the substantial expenditures of $81 million by the railroad, equipment manufacturers, and others involved in the demonstrations.

The Department of Transportation has participated financially in several demonstration-related improvements. A baggage handling ramp has been constructed at Baltimore Station and improvements have been made at Washington's Union Station and the station at Trenton, New Jersey.

Negotiations are nearly complete to build two jointly financed park-and-ride suburban stations, one at Woodbridge, New Jersey, and the other at Lanham, Maryland. These stations will have easy access to major suburban highways and will test the value to intercity rail service of ample, inexpensive parking.

The Department of Transportation and the States of Maryland and Delaware have agreed to improve safety at the 20 Penn Central Railroad grade crossings on the route of the Washington-New York demonstration. The improvements include changes in highway approaches, removal of obstructions to vision on approach roads, and installation of new train-activated warning devices and special advanced highway warning signs. Surveys are presently under way to determine the requirements of grade crossing improvements for the rail line through Connecticut, Rhode Island, and Massachusetts.

Work on the auto-train has been discontinued in accordance with the decision of Congress not to provide additional funds for fiscal year 1968 but several private business interests have investigated the auto-train concept and are presently considering it as a commercial venture.

Ground access to commercial airports in large metropolitan areas is often both congested and expensive and represents a major hindrance to more effective use of air transportation. The problem of ground access to airports is likely to increase as highways become more congested and as high-capacity jet aircraft are introduced. The Office of High-Speed Ground Transportation has completed a comprehensive survey of the users of National, Friendship, and Dulles Airports in the Washington, D.C. area. A report of the survey was set to be published early in 1969.

The next phase of this research is to conduct feasibility studies of high-speed ground service to Washington and Baltimore area airports. One such proposed service is presently under consideration. The study will determine the feasibility of operating a rail shuttle service between Friendship Airport and Baltimore and Washington. The service might involve the construction of a new line from the Penn Central mainline tracks to the lowest level of the terminal at Friendship Airport. Both rail diesel cars and rail-bus cars (which would also operate on paved roadways) are being investigated.

The Alaska Railroad

The Alaska Railroad operates 482 miles of main line from the ports of Seward and Whittier to Fairbanks. Its fiscal year 1968 depreciated value is about $132,000,000 and its annual gross income about $14,828,000. It is not dependent upon Congressional appropriations for either operating expenditures or capital replacements.

The severe earthquake on March 27, 1964, caused damage that changed the Railroad from a net income to a net loss operation. The deficit for fiscal year 1968 was $1,398,517 after depreciation charges amounting to $2,249,000. The 1968 deficit included about $202,000 of earthquake damage repairs. At the end of the fiscal year, the earthquake rehabilitation program, which involved a total cost of more than $27,000,000, was more than 99 percent complete. Disaster struck again during the fiscal year with the floods of August 1967 at Nenana and Fairbanks. The costs of repairing this flood damage amounted to more than $430,000. Nearly concurrently with these floods, high water resulted in washouts at various points along the railroad.

As reported last year, passenger service was improved during the year on an experimental basis with an automobile-on-flatcar service for passengers to the port of Whittier for connection with Alaska State ferries, and by tourist passenger service to Seward where there had been no scheduled passenger trains for several years. The results of these experiments show that the automobile-on-flatcar service is worth continuing. However, passenger service to Seward during the tourist season may be discontinued.

An important change in personnel procedures occurred on January 1, 1967, when, by order of the Civil Service Commission, employees were transferred from the noncompetitive to the competitive civil service. The change continued to cause operating difficulties during fiscal year 1968 in that personnel ceilings for both permanent positions and temporary positions proved highly restrictive, especially during the first and fourth quarters when personnel needs peak because of seasonal climatic and business conditions. These quarters not only reflect the months generating the most favorable business conditions but they present the weather conditions necessary to carry out the Railroad's capital replacement program, a program necessary to keep railroad facilities from deteriorating to the point that unsafe conditions appear in the equipment, roadbed, track, and structures.

Major wage negotiations have taken place with union representatives of both operating and nonoperating employees which resulted in substantial wage increases. They also resulted in a request from certain nonoperating union officials for changes in the Railroad's historic policy of basing its wages on those paid by private railroads in the Pacific Northwest plus a cost-of-living differential to meet the higher price level of the railbelt. During fiscal year 1969 approximately 550 employees will be paid in accordance with Alaska Army and Air Force Wage Board wage-fixing procedures. The impact of the negotiations on over-all additions to payroll will not be known until both negotiations and wage calculations are completed during fiscal year 1969.

Bureau of Railroad Safety

The Bureau has safety jurisdiction over locomotives, signal installations, safety appliances, and the transportation of explosives and other dangerous articlès. The Bureau has no jurisdiction over railroad operating rules, track structures, bridges, rail-highway grade crossing protection, track clearances, or running and draft gear on cars.

Train Accidents. In 1967, 7,294 train accidents were reported (see Tables 35, 36, and 37) an increase of 501 accidents or 7.4 percent over those reported in 1966, and an increase of 1,327 or 22.2 percent over those in 1965. Derailments increased by 513 or 11.5 percent over those reported in 1966, and by 1,091 or 28.2 percent over those in 1965. The major factor in this increase is failure of equipment and defective track.

Through its Office of Chief Counsel, the Federal Railroad Administration has continued vigorously to prosecute carriers violating the safety laws and regulations. Preparations are being made to utilize the Federal Claims Collection Act procedures to negotiate settlements of civil penalty violations. If successful, this procedure will impress upon the carriers the magnitude of the safety problem and the patterns of their violations. In addition the cost and manpower savings for the Administrator will be substantial. Flexible rule-making procedures presently being prepared will

TABLE 35. Railroad accidents and resulting casualties, calendar years 1965, 1966, and 1967

	1965	1966	1967
Number of train accidents:			
Collisions	1,380	1,552	1,522
Derailments	3,869	4,447	4,960
Other	718	794	812
Total train accidents	5,967	6,793	7,294
Number of train accidents with casualties	457	492	478
Trespassers killed	634	678	646
Trespassers injured	668	702	696
Passengers killed in train accidents	1	10	4
Passengers injured in train accidents	187	264	126
Passengers killed in train-service accidents	10	13	8
Passengers injured in train-service accidents	1,002	980	928
Employees on duty killed	172	159	166
Employees on duty injured	18,644	18,195	17,529
All other persons killed	1,582	1,824	1,659
All other persons injured	5,288	5,411	5,244
Total munber of persons killed	2,399	2,684	2,483
Total number of persons injured	25,789	25,552	24,523
Highway grade crossing accidents[1]	3,839	4,117	3,955
Persons killed	1,535	1,782	1,633
Persons injured	3,826	4,073	3,847

[1]Included in totals.

TABLE 36. Serious accidents investigated under the Accident Reports Act (45 U.S.C. 38–43), fiscal years 1964–1968

Fiscal year	Number of accidents investigated			Persons	
	Colli-sions	Derail-ments	Total	Killed	Injured
1964	34	18	52	70	1,284
1965	35	18	53	51	1,044
1966	44	16	60	75	639
1967	34	20	54	35	534
1968	23	22	45	25	428

TABLE 37. Enforcement activities—Accidents Reports Act

Activities	F.Y. 1967	F.Y. 1968
Number of regular inspections	452	420
Accident and casualty cases investigated	35,628	40,386
Infractions disclosed by regular inspection	83	75
Number of complaints investigated	17	6
Infractions disclosed by complaints investigated	14	7
Violation cases transmitted for prosecution	77*	27*

*Includes cases pending at close of preceding fiscal year.

aid in safety regulations and will assist in making the safety rules compatible with modern techniques in rail operation.

Rail-Highway Grade Crossing Accidents. During calendar year 1967, 3,932 grade crossing accidents were reported, a decrease of 165 accidents or 4.0 percent compared with the previous year;* 1,632 deaths and 3,812 injuries resulted from these accidents, representing a decrease of 8.3 percent in deaths and a decrease of 5.7 percent in injuries compared with 1966 (see Table 38).

Collisions at grade crossings involving trains and motor vehicles (trains striking or being struck) totaled 3,733 and resulted in 1,520 deaths and 3,726 injuries—a decrease of 129 accidents, 137 deaths, and 201 injuries compared to 1966.

Included in the total number of accidents involving motor vehicles were 64 derailments and 266 miscellaneous train accidents accounting for 133 deaths and 179 injuries. Also included in the total casualties at rail-high-

* In addition, there were 23 nontrain grade crossing accidents during 1967 which resulted in one fatality and 35 injuries.

TABLE 38. Accidents at highway grade crossings, calendar years 1965, 1966, and 1967

Accidents and casualties	1965			1966			1967		
	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]	3,820	1,534	3,801	4,097	1,780	4,043	3,932	1,632	3,812
Accidents at highway grade crossings involving motor vehicles	3,602	1,434	3,663	3,862	1,657	3,927	3,733	1,520	3,726
Derailments of trains at highway grade crossings involving motor vehicles[2]	60	27	70	62	37	75	64	28	63
Miscellaneous other train accidents as a result of collision between trains and motor vehicles[2]	256	122	82	272	138	131	266	105	116
Railroads caualties:[2]									
Passengers	--------	--------	42	--------	10	28	--------	--------	24
Employees on duty	--------	12	122	--------	4	102	--------	3	83
Total	--------	12	164	--------	14	130	--------	3	107

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

way grade crossings were 24 injuries to passengers, as well as three fatalities and 83 injuries to employees on duty.

Locomotive Inspection Activities. Under the provisions of the Locomotive Inspection Act, 204 accidents were investigated during fiscal year 1968 by the Federal Railroad Administration's Bureau of Railroad Safety. Of these, 163 accidents were reported by the carriers, and 26 accident investigations were initiated by district inspectors. Fifteen investigations were initiated after referral by sources other than the carriers. Twenty-five accidents which were investigated occurred prior to the beginning of this fiscal year and were either not reported or the investigations were not completed in time to be included in the annual report for last year.

Failure of locomotive equipment contributed to 128 of these accidents and resulted in 141 injuries (see Tables 39 and 40). There were no fatalities. Major causes of these accidents were defective cab doors and windows; unsafe cab floors, steps, and passageways; defective cab seats; defective electrical insulation, short circuits, or electric flash; brakes and brake rigging; and crankcase or air-box explosions in diesel engines.

During fiscal year 1968, of the 103,703 locomotives inspected 13,017 or 12.6 percent were reported as defective, compared to 12.3 percent in the previous fiscal year (see Table 41).

Under the provisions of Section 6 of the Locomotive Inspection Act, locomotives are ordered out of service by Federal Railroad Administration inspectors through written notice requiring repairs for defective conditions considered to be unsafe, or to be in violation of the locomotive inspection rules. The number of locomotives ordered out of service during the past fiscal year was 755. The total for fiscal year 1967 was 768. The principal causes for locomotives being ordered out of service were diesel engine de-

TABLE 39. Accidents and casualties caused by failure of some part or appurtenance of steam locomotives, locomotive units other than steam, and multiple-operated electric locomotive units.

	Year ended June 30					
	1963	1964	1965	1966	1967	1968
Number of accidents	71	76	87	65	121	128
Percent increase or decrease from previous year	*5.9	*7.0	*14.5	25.3	*86.0	*5.8
Number of persons killed	0	1	0	0	0	0
Percent increase or decrease from previous year	0	*100	100	0	0	0
Number of persons injured	98	96	93	68	140	141
Percent increase or decrease from previous year	*34.2	2.0	3.1	26.9	*105.9	*0.7

*Increase

TABLE 40. Accidents and casualties resulting from failure of steam locomotives, tenders, locomotives other than steam, multiple-operated electric locomotive units, and their appurtenances.

Part or appurtenance which caused accident	Year Ended June 30, 1968		
	Accidents	Killed	Injured
Air compressors[2]	1	0	1
Air reservoirs, fittings, safety and check values[2]	0	0	0
Air hose coupling, train line[1]	1	0	1
Boiler:			
Explosions[2]	0	0	0
Fuel explosion in firebox[3]	0	0	0
Draft equipment–adjustment[2]	0	0	0
Steam valves, piping, and blowers[3]	3	0	3
Brakes and brake rigging[1]	4	0	9
Cabs:			
Doors and windows[1]	27	0	28
Seats[2]	18	0	18
Control equipment-mechanical, electrical, pneumatic or electro-pneumatic[2]	1	0	1
Couplers, draft and drawgear[2]	1	0	1
Electrical equipment:			
Armature journals and bearings[3]	0	0	0
Energized electrical parts[3]	0	0	0
Insulation, short circuits, or electrical flashes[2]	11	0	12
Pantographs, trolleys, or third rail shoes[2]	1	0	1
Fans and shutters[2]	0	0	0
Fires due to liquid fuel or debris[3]	1	0	1
Floors, steps, and passageways[1]	19	0	19
Handholds[2]	1	0	1
Internal combustion engines and turbines:			
Crankcase or air-box explosions[3]	7	0	8
Exhaust and cooling systems[2]	1	0	1
Fuel injectors and connections[3]	1	0	2
Unguarded moving parts[2]	0	0	0
Miscellaneous[1]	31	0	34
Total[1]	128	0	141

Note: [1]–Increase
[2]–Decrease
[3]–Constant

fects; defective brake equipment; floors in an unsafe condition; fuel oil leaks, including injector pipes; defective sander equipment, and wheel defects.

Safety Appliance Laws. Deficiencies in maintenance of safety appliance and power brakes on equipment in service continued to be a matter of concern in fiscal year 1968. (See Table 42.) Despite vigorous BRS efforts, no improvement was noted over conditions found during the previous year as the percentage of defective equipment increased three-tenths of one percent from 6.8 to 7.1 percent.

The operation of trains which had not been given proper train brake tests increased from the previous all-time high level of 16.1 percent to 17.7 percent. In addition, carriers' shop track repair practices involving air brake attention for freight and passenger cars continued inadequate, as discrepancies were noted in 8.1 percent of the observations of the BRS.

Although the Order of May 1, 1958, relating to the installation, inspection, maintenance, and repair of power or train brakes, adopted and placed into effect the carriers' own rules more than 10 years ago, facilities provided by some carriers for compliance with that order remained inadequate and in many cases have deteriorated further.

Specialized Equipment. The technical staff of the BRS General Safety Division reviews drawings submitted by carriers and builders and inspects prototype cars to make certain the purpose, intent, and requirements of the Safety Appliance Acts are met and to uncover any potential hazards which might exist in new and untried designs. The staff of the division works closely with representatives of carriers and builders to insure that the safety of railroad employees and the traveling public is not jeopardized.

During fiscal year 1968, the aggressive competitive effort of the railroad industry to obtain additional traffic through the introduction of new types of equipment and changes in operating practices affecting the condition of safety appliances continued to have great impact on the workload of the Safety Inspection Division. Additionally, shipper demands for specialized and new equipment continued at a high pace.

The broad changes for safety appliance requirements made by the Interstate Commerce Commission's Order of April 1, 1966, (Docket No. 34468) continued to generate numerous inquiries from carriers and car manufacturers. Cars built and in service prior to that date, which were not designed with the new requirements in mind, present different and complex problems. Experience during this year further indicated that questions concerning such older equipment will continue to arise during the course of the 7-year transition period.

A close watch will be kept on both new cars and the conversion programs for older cars to assure compliance with the new standards. In order to achieve uniformity of application, the Division's technical staff is attempting to keep fully informed of the carrier and car builder activities in this area. This will be accomplished by working closely with interested parties in conferences, studying submitted drawings and prints, and making physical inspections at the carrier's and car builder's shops and plants.

During the past year, 228 special inspections of new equipment were made by field agents and members of the Washington staff.

Signal Inspection Activities. During the year, 197 applications for approval of proposed modifications of block signal and interlocking systems were filed by the carriers (see Table 43). At the beginning of the year,

TABLE 41. Reports and inspections; steam locomotives, locomotive units other than steam, and multiple-operated electric locomotive units

	Year ended June 30					
	1963	1964	1965	1966	1967	1968
Number of locomotives for which reports were filed	34,473	34,350	34,072	34,048	33,916	33,475
Number inspected	79,781	79,682	76,044	95,840	107,932	103,703
Number found defective	8,497	8,852	9,391	11,447	13,243	13,017
Percent of inspected found defective	10.7	11.1	12.3	11.9	12.3	12.6
Number ordered out of service	420	579	646	666	768	755
Number of defects found	25,718	28,453	31,596	36,556	42,609	44,918

TABLE 42. Inspections of safety appliances for fiscal years 1964–1968

	1964	1965	1966	1967	1968
Freight cars inspected	1,381,754	1,371,855	1,500,855	1,520,162	1,176,166
Percent defective	6.7	7.2	7.1	7.2	7.5
Passenger-train cars inspected	28,833	30,977	32,400	29,304	16,377
Percent defective	5.9	7.4	7.2	6.9	7.4
Locomotives inspected [1]	96,142	93,058	113,144	124,272	115,320
Percent defective	1,2	1.3	1.5	2.1	2.4
Number of defects per 1,000 units inspected	71.91	79.34	79.72	78.37	81.01

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

action was pending on 33 applications previously filed. Of this total 162 applications were acted upon during the year, and action was pending on 68 applications at the close of the year. Public hearings were held on 10 applications.

Forty-three applications were filed for modifications or relief from the Federal Railroad Administration's requirements. At the beginning of the year, action was pending on five such applications. Of this total, 36 were acted upon, and action was pending on 12 at the close of the year. Public hearings were held on one application for relief from the requirements of the Rules, Standards, and Instructions. Also during the year, two applications were filed for relief from the Federal Railroad Administration's Order 13413 relating to the removal of automatic train-stop and automatic cab-signal systems.

Table 43 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 modification of the Rules, Standards, and Instructions prescribed by order of the Federal Railroad Administration.

These signal inspection activities resulted in bringing to the attention of railroad managements, for necessary corrective action, a number of unsatisfactory maintenance conditions which were found to exist.

In the year ended June 30, 1968, 51 complaints were received regarding alleged violations of the Rules, Standards, and Instructions. At the beginning of the year, action was pending on 16 complaints previously filed. During the year investigations were completed on 44 and action was pending on nine at the end of the year.

Also during the year, 147 counts involving violations of the Signal Inspection Law (49 U.S.C. 26) were forwarded to the Chief Counsel for consideration. One case for 10 counts was transmitted by the Chief Counsel to the U.S. Attorney, compared with two cases for four counts during the previous year. At the beginning of the year 11 cases comprising 54 counts were pending in the district courts. During the year, eight cases comprising 27 counts were closed. On June 30, 1968, four cases comprising 37 counts were pending action in the district courts.

Hazardous Materials. Section 831–835 of Title 18, United States Code, as amended, authorizes the Department of Transportation to formulate regulations for the safe transportation of explosives and other dangerous articles. The overall coordination of administration of the Hazardous Materials Regulations is now vested in the Office of Hazardous Materials, Office of the Secretary of Transportation. However, the Bureau of Railroad Safety, Federal Railroad Administration, conducts all investigations and inspections relating to the rail and pipeline transportation of hazardous articles. Close liaison has been effected between the BRS and the Office of Hazardous Materials since the establisment of the Department and close liaison is maintained with the other operating administrations through representation on the Hazardous Materials Regulations Board.

During the year, Safety Inspectors of the BRS made 1,153 inspections of hazardous materials shipments either in transit or in storage. In many of

Table 43. Applications; block signal

Period	Number	Pending at beginning of year	Acted upon	Pending at close of year
1964	220	55	212	63
1965	221	63	212	72
1966	213	72	202	83
1967	172	83	222	33
1968	197	33	162	68
Rules, Standards and Instructions				
1964	33	6	32	7
1965	43	7	46	4
1966	59	4	52	11
1967	53	11	59	5
1968	43	5	36	12

During the year, inspections were made as follows:

System	No. of inspections	Signals	Switches	Other appliances	Devices on locomotives	Record of tests
Automatic block signal	932	8,004	6,289	2,131	----------	24,977
Interlockings	2,047	13,910	9,437	11,718	----------	32,705
Traffic control	1,455	11,385	7,107	10,502	----------	32,907
Automatic train control	90	----------	----------	170	401	2,975
Automatic train stop	615	----------	----------	3,456	1,639	10,735
Automatic cab signal	337	----------	----------	1,029	2,380	8,664
Total	5,476	33,299	22,833	29,006	4,420	112,963

these inspections, inspectors were able to effect corrective action with the appropriate carrier or shipper personnel so as to prevent recurrence of any irregularities noted.

During the year, 97 field inspection reports were developed concerning amendments to the regulations. The substance of these reports was transmitted to the Office of Hazardous Materials. Thirteen complaints alleging violation of the regulations were received during the same period, and were assigned to appropriate Regional Directors for investigation. Thirty-eight investigations developed evidence of violation of the regulations involving 49 counts and were forwarded to the Chief Counsel, Federal Railroad Administration, for consideration.

A total of 324 permits authorizing the trial transportation of certain hazardous items not covered by the regulations were prepared by the Office of Hazardous Materials and approved by the BRS. Requests for extension of 76 special permits were likewise processed. Copies of these permits and extensions were forwarded to appropriate Regional Directors for enforcement purposes.

New explosive and petro-chemical products—having unique transportation hazards—continued to be developed every week. The quantities of hazardous materials transported also continued upward. As a result, the Nation's railroads are being called upon to transport ever-increasing amounts of hazardous materials, many of which were only laboratory curiosities a few years ago. It can be expected, therefore, that personnel of the BRS will be devoting a greater amount of time and energy to this area of safety enforcement.

Hours of Service Act. During the year ended June 30, 1968, hours of service reports were filed by 114 railroads reporting 3,590 instances of all classes of excess service, a decrease of 738 instances as compared with the previous year.

The reports covered 557 instances of excess service performed by train and engine employees subject to the 16-hour provision of the law, and 3,030 instances of excess service by operators, train dispatchers, and other employees subject to the 9-hour and 13-hour provisions of the law, classified as follows: 442 instances of employees who remained on duty longer than 16 consecutive hours; 115 instances of employees who continued on duty after having been on duty 16 hours in the aggregate in a 24-hour period; three instances of employees who returned to duty with less than 8 to 10 consecutive hours off duty after having been on duty 16 aggregate or continuous hours; 3,020 instances of employees who remained on duty longer than 9 hours in a 24-hour period at continuously operated offices; and 10 instances of employees who remained on duty longer than 13 hours in a 24-hour period at offices operated only during the daytime. (See Table 44.)

Rule Changes—Ex Parte 243. The Federal Railroad Administration, in an Order served August 15, 1967, effective October 15, 1967, denied petitions for reconsideration and ordered the Administration's *Rules and Instructions for Inspection and Testing of Locomotives Other Than Steam* be amended or deleted in the manner shown in the Appendix to said Order.

TABLE 44. The classes of offices, and the causes of instances in which operators, train dispatchers, or other employees who by 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 calendar years 1964–1968

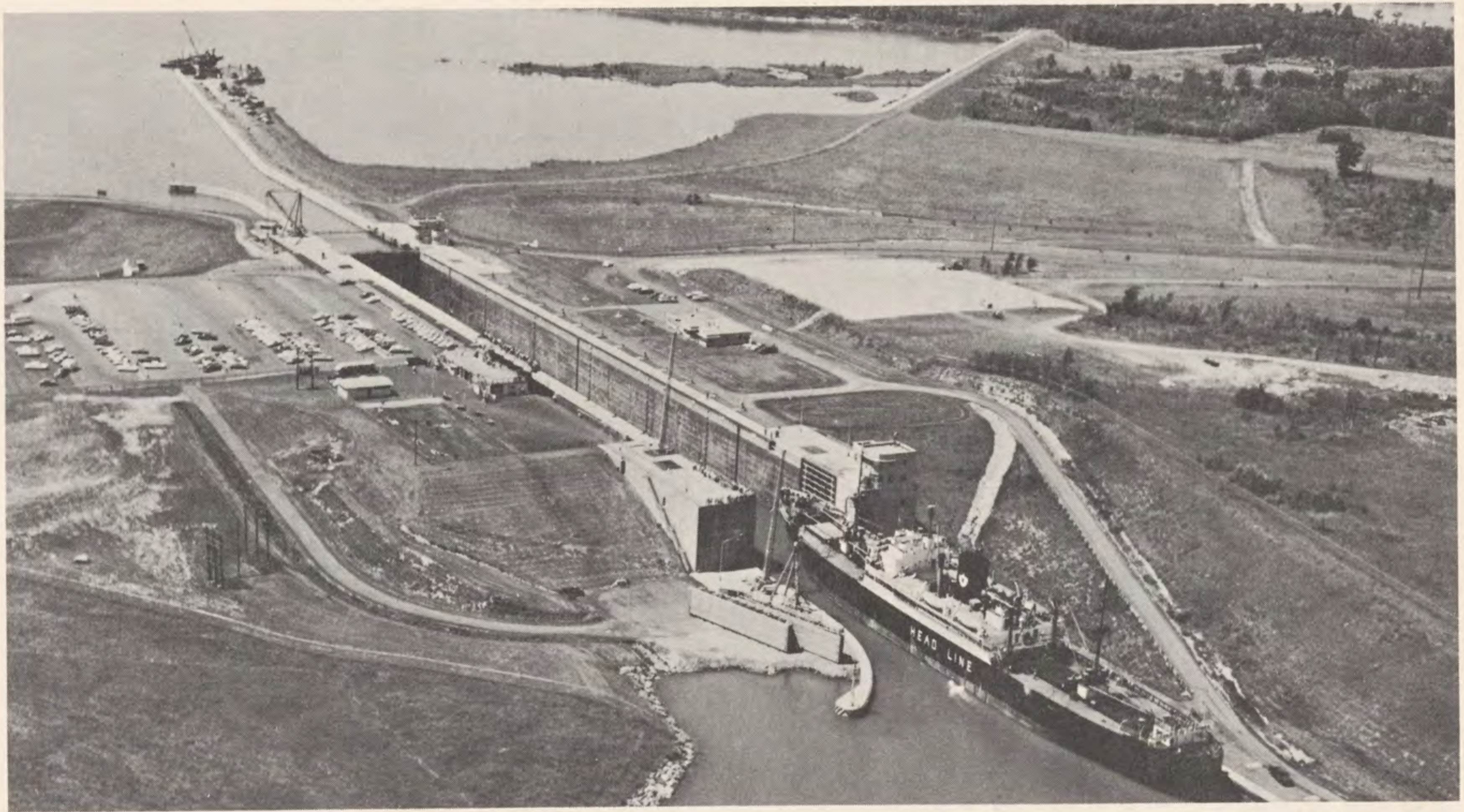
Classes of Offices	1964	1965	1966	1967	1968
At continuously operated offices	2,220	2,305	2,062	3,616	3,020
At offices operated only during the daytime	42	22	58	3*	10
Total	2,262	2,327	2,120	3,647	3,030
Causes					
Train accidents	231	89	56	126	78
Weather conditions, floods, fire, landslides	215	392	314	642	112
Delayed trains, and held to handle train orders	27	76	55	26	6
Misunderstanding of instructions or arrangements	51	86	56	103	132
Station or clerical work	13	9	4	3	11
Sickness, death, or personal injury	1,221	1,209	1,054	1,948	1,764
Relief operator arrived late	97	124	85	112	158
Labor shortage	351	226	168	600	716
Miscellaneous	56	116	328	87	53
Total	2,262	2,327	2,120	3,647	3,033

The amendments and deletions were in agreement with those set forth in the Interstate Commerce Commission's Decision and Order served March 17, 1967, with the exception that the phrase "the function of which is to apply or release the air brakes" was ordered deleted from Rule 191, 208 (c).

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 endanger their own lives in saving or endeavoring to save lives from any wreck, disaster, or grave accident, or in preventing or endeavoring to prevent such wreck, disaster, or grave accident upon any railroad within the United States engaged in interstate commerce, or involving any motor vehicle on the public highways, roads, or streets of the United States.

At the beginning of the year three applications were pending of which one was granted and two were pending as of June 30, 1968.

Since enactment of the Medals of Honor Act, there have been 128 applications involving railroad incidents for such award, 77 of which were granted after meeting the exacting standards for approval. Forty-nine applications were denied.



Vessel entering Eisenhower Lock.

Chapter VII

SAINT LAWRENCE SEAWAY DEVELOPMENT CORPORATION

The 1967 shipping season of the St. Lawrence Seaway was the second best year in 9 years of operation. A total of 44 million tons was carried through the system, resulting in revenues of $6.1 million for the Corporation. As a result, $4 million was repaid to the U.S. Treasury raising the total repayments for 9 years of operation to $28.9 million.

A new record was established for general cargo during 1967. Total general cargo transported reached an all-time high of 6 million tons, half a million tons higher than the 1966 figure. A new record was also established for iron ore shipments which reached 16.4 million tons.

Despite these achievements, Seaway tonnage and revenues were lower than the 1966 record of 49.2 million tons and $7.1 million, respectively. The decline resulted from a Canadian seamen's strike against 32 shipping companies from August 17 to September 21, 1967. In addition, world demand for grains fell off during the year.

The Corporation was able to maintain a normal navigation season despite the need to replace deteriorated concrete at the Eisenhower Lock and to remedy structural cracking in both U.S. locks. It is anticipated that more than $13 million will be spent during the next 5 years to complete the rehabilitation program. A proposal was submitted to Congress on July 10, 1967, requesting that this program be financed by appropriated funds.

Tolls Review

On March 31, 1967, the Governments of the United States and Canada reached agreement on tolls for the Montreal-Lake Ontario and Welland Canal sectors of the St. Lawrence Seaway. It was agreed that toll levels would not be changed on the Montreal-Lake Ontario sector, but that Canada's percentage of toll income from the seven locks of the St. Lawrence River would be increased from 71 percent to 73 percent. The United States portion of tolls was reduced proportionately.

While the action of the two countries made no change in the Montreal-Lake Ontario sector, a new lockage-fee system was established by Canada for the eight locks of its Welland Canal. In 1967, the new charges on the Welland Canal specified a lockage fee of $20, increasing to $40 in 1968, $60 in 1969, $80 in 1970, and $100 in 1971. The total charge for any vessel passing through the Welland Canal in 1967 was $160. In 1971, the total cost per vessel would be $800. However, the lockage charge may be divided between vessels passing through the Welland locks in tandem, and vessels in ballast are also allowed a 50 percent reduction in lockage fees.

Tolls on the Montreal-Lake Ontario sector remain at 40 cents a short ton for bulk cargo and 90 cents a short ton for general cargo, plus the charge of 4 cents per gross registered ton of vessel.

The 1967 agreement between the United States and Canada regarding Seaway tolls further provides "that the sufficiency and division of tolls may, at the request of the Seaway Authority or the Seaway Development Corporation, be reviewed with a view to any necessary adjustment at the expiry of the 1970 navigation season, in accordance with the provisions of the 1959 agreement". The 1959 agreement was effected by the exchange of notes between Canada (No. 57) and the United States (No. 205) on March 9, 1959, which incorporated the Memorandum of Agreement between the Corporation and the Canadian Seaway Authority respecting the St. Lawrence Seaway Tariff of Tolls, signed January 29, 1959.

1967 Navigation Season

The Corporation's tug, *Robinson Bay*, began icebreaking below Snell Lock on March 7, 1967, allowing the commissioning of navigation aids to start on March 31. The first vessel through the U.S. locks was the Canadian "laker" *John E. F. Misener*, loaded with grain for Montreal, clearing the Snell Lock at 1:28 p.m. on April 7. The first ocean vessel to transit upbound was the *Carrigan Head* loaded with general cargo for Detroit, clearing the Eisenhower Lock at 10:50 a.m. on April 8, 1967. This was the fourth consecutive year that the Seaway opened earlier than the official April 15 date.

The season closed with the upbound transit of the last commercial vessel, the *Hutchcliffe Hall*, clearing the Eisenhower Lock at 8:57 p.m. December 15, 1967, with a load of pig iron for Hamilton.

Vessel Traffic Control Radio Stations KEF and WAG were signed off the air on December 16, 1967.

Decommissioning of navigation aids began on December 15 and was completed December 20, 1967, in abnormally mild weather. (See Tables 45 and 46.)

Traffic

Seaway traffic in 1967 fell 10.6 percent. Total tonnage reached only 44,029,000 tons compared with 49,249,000 tons in 1966. This was the first year since 1960 that traffic did not set a new record.

One of the major reasons for the tonnage loss was a strike lasting from August 17 to September 21, 1967, of the Seafarer's International Union of Canada against 32 shipping companies. More than 5,000 seamen were involved. During this period, tonnage fell to 3.7 million from 7.8 million during the same period in 1966.

Another reason for the loss of tonnage was the slackening of demand for grain. Wheat shipments fell from 10.8 million tons in 1966 to less than

Table 45. Saint Lawrence Seaway Development Corp.—operations on most active days

	Lockages	*Ships*	*Small craft*
May 4	32	37	—
May 14	34	41	3
May 18	34	41	2
May 22	35	41	1
May 28	32	38	6
May 29	34	40	2
June 5	33	36	3
June 11	31	36	9
June 15	35	36	14
June 20	34	38	12
June 29	32	36	20
July 5	33	40	42
July 7	32	40	32
July 8	34	38	44
July 9	35	40	48
July 11	36	42	48
July 13	32	36	33
July 19	34	38	48
July 21	35	41	37
July 22	33	37	44
July 26	36	38	48
July 27	30	37	66
August 2	38	40	24
August 7	34	38	42
October 6	32	37	4
November 2	27	38	—
November 9	37	38	—
November 21	34	41	—
December 4	32	44	—

On July 2, 95 yachts were handled; on July 3, 93; and on July 17, 110 yachts transited the system. Most of these vessels were visiting Expo '67 at Montreal.

7 million tons in 1967. Corn shipments fell from 2.6 million tons to only 2 million tons; rye shipments dropped from 223,000 tons to less than 140,000 tons; oat shipments fell from 717,000 tons to 400,000 tons; and soybean shipments slipped from 1.2 million tons to less than 900,000 tons.

Overall, bulk cargo movement dropped from 43,761,000 tons in 1966 to 38,066,000 tons. On the other hand, general cargo increased from 5,489,000 tons to 5,963,000 tons. The increase in general cargo resulted from expanded imports of steel mill products. Of approximately 11 million tons imported into the United States in 1967, 3.3 million were shipped through the Seaway.

TABLE 46. Lockages and transits—1967

Date	*Lockages*	*Ships*	*Small craft*
April 7–30	489	548	2
May	852	950	47
June	897	948	425
July	970	1,033	1,593
August	845	776	991
September	638	597	340
October	805	879	37
November	778	885	2
December 1–15	211	268	—
Total	6,485	6,884	3,437

Delays to Shipping—1967

	Hours	*Minutes*
Weather (wind, fog, etc.)	137	09
Ships-shipping	13	51
Malfunctions of lock equipment	16	31
Other (Awaiting pilots, congested traffic, divers, small craft, etc.)	16	02
Total	183	33

During the navigation season, there were 102 incidents, seven of which required the services of the Corporation Tug *Robinson Bay*. Of these, 13 incidents resulted in damage to lock structures and reimbursement for damage has been initiated.

Iron ore shipments also were higher with traffic moving to 16 million tons compared with 15.1 million in 1966. This increase was largely due to greater demand from Canadian steel mills on Lake Ontario.

Rehabilitation Program

In 1967, based on reports from the Corps of Engineers, the Seaway's own personnel, and outside consultants, the Corporation decided to proceed with a contracting program to replace deteriorated concrete at the Eisenhower Lock and remedy structural cracking that had appeared in both the Eisenhower and Snell Locks. The program will cover five winter seasons, beginning in December 1967.

The Buffalo District of the North Central Division of the Corps of Engineers has been retained by the Corporation to design and direct the repair operations. As the first step, on November 6, 1967, the Corporation awarded Peru Associates of Plattsburgh, New York a contract to erect a cover for the lock that stretched over 800 feet long by 80 feet wide. Under this "roof" temperatures can be held above freezing even when outside temperatures are as low as 40° below zero. This heating was accomplished by the Corporation's own maintenance division which installed and operated forced-air oil furnaces to supply approximately 5 million BTU per hour to the lock's chamber area. The contractor supplied heat to individual areas under repair to provide higher temperatures.

A cofferdam was built upstream so water could be removed from the entire chamber. The downstream end was closed off with the stoplog sections used each year for normal maintenance and inspection.

The Corps awarded Peter Kiewit Sons' Company a contract to rehabilitate the highway tunnel and lift gate sill and to conduct monolith N–54 repairs. The same company was awarded a contract on October 25, 1967, to repair the culvert crack at Eisenhower Lock.

The repair itself involves removal by "dental methods" of about 2,900 cubic yards of concrete along with reinforcing steel and miscellaneous metal work. The structure must then be restored to its original shape and strength.

Inspection last season disclosed a crack in the top rear corner of the culvert through all monoliths. This crack permits the passage of water into the backfill beyond the walls, increasing the pressure on them. With the assistance of instrumentation and computer computation, the stability of the wall monoliths against overturning was confirmed. However, the original assumptions on possible combinations of forces have proven to be wrong since there are tensile stresses set up at times that cannot be resisted by unreinforced concrete.

To remedy this situation, the monolith cracks are being washed and then filled with cement grout. In addition, steel reinforcing is being installed to build up resistance against the tensile forces. In each monolith, six holes are being drilled, starting on the inside face about 17 feet below the top and extending alternately 90 and 95 feet through the concrete past the culvert crack. A bundle of high-strength tendons is being inserted into each hole. These are capable of resisting a stress of 636,000 pounds. The bundles are anchored to the bottom, then prestressed and anchored at the top. Following this step, the hole is filled with cement grout.

All repair operations are being conducted during the winter months to avoid interference with the navigation season.

Preliminary estimates indicate the cost will be in excess of $13 million. The President, in the budget presented for fiscal year 1969, requested that this sum be appropriated to cover the cost of repair.

Tables 47, 48, 49, and 50 present comparative reviews of the St. Lawrence Seaway Corp., for 1966 and 1967.

NOTES TO FINANCIAL STATEMENTS

1. Plant, property, and equipment are stated at cost of acquisition or construction. Interest and other indirect costs incurred prior to the opening of the Seaway on April 25, 1959, have been allocated to the related permanent features of the Seaway.

2. The straight-line method of depreciation is used and is computed on balances in-plant in service. Accumulated reserves are accounted for on a composite basis by groups of assets. The cost of plant retired, as well as the cost of removal, less average, is charged against these reserves. Neither depreciation nor amortization allowances have been provided for lands in fee.

3. The Cornwall International Bridge Company, Limited is owned jointly by the Saint Lawrence Seaway Development Corporation and The St. Lawrence Seaway Authority. On July 2, 1962, the bridge company ceased to operate the international toll bridge system (now operated by the Seaway International Bridge Corporation, Limited) across the St. Lawrence River between Ontario and Rooseveltown, New York, and has been in the process of liquidation since July 3, 1962. The Saint Lawrence Seaway Development Corporation's investment in the Cornwall International Bridge Company, Limited was $300,699. On September 29, 1967, the Corporation received $169 representing a final distribution of surplus from the liquidation proceedings bringing the total distribution to $18,473. As of December 31, 1967, the $18,473 was credited to the Corporation's investment of $300,699 and the balance written off to the deficit.

4. Included in tolls and other receivables at December 31, 1967, are the following amounts:

(a) Tolls of $36,241 are due the Corporation from bankrupt debtors. Agreements provide for shipowners to pay $29,897 of the outstanding amount on a pay-as-you-go basis. One claim in the amount of $6,344 will be paid in full as a preferred claim according to a notice received from the bankruptcy trustee on December 22, 1967. Collection of these amounts is being handled for the Corporation by The St. Lawrence Seaway Authority of Canada in accordance with the 1959 Memorandum of Agreement respecting the tariff of tolls. No provision has been made for doubtful accounts on these tolls.

(b) Damage to Seaway facilities amounting to $36,439 is due from a shipowner. The Corporation agreed to settle this claim on December 7, 1967. A bankrupt shipowner owes the Corporation for the cost of recovering an anchor. Bankruptcy proceedings in regard to this claim are pending. The provision for doubtful accounts includes an amount of $11,113 for these two accounts.

5. Deferred charges represent costs incurred as of December 31, 1967, for repairing deteriorated concrete at Eisenhower Lock and consists of intake manifold and chamber face repair, culvert crack repair of 28 monoliths, highway tunnel modifications, and other related costs. The write-off of these expenditures to operations is deferred pending Congressional action on proposed legislation permitting appropriated funds to be used for reimbursement of costs of work undertaken prior to the availability of appropriated funds and financed from borrowings from Treasury under present law.

6. In accordance with Section 5 of the Act of May 13, 1954, as amended July 17, 1957 (33 U.S.C. 985), the interest payments on the revenue bonds may be deferred with the approval of the Secretary of the Treasury, but such deferred payments shall themselves bear interest after June 30, 1960. Deferred interest is not chargeable against the borrowing authority limitation of $140 million.

7. Not included in the current liabilities at December 31, 1967, are undelivered orders and contracts amounting to $195,675. The Corps of Engineers, the Corporation's construction agent for the lock rehabilitation program, has reported undelivered orders and contracts amounting to $3,041,131 which are also not included in the current liabilities. At this date, there are no outstanding claims pending against the corporation.

TABLE 47. Comparative statement of financial condition
December 31, 1967 and 1966

Assets	*1967*	*1966*
Plant, Property, and Equipment:		
Plant in service, at cost (Note 1)	$ 131,066,230	$ 131,053,421
Less acculumated depreciation (Note 2)	12,016,682	10,355,011
Net plant in service	$ 119,049,548	$ 120,698,410
Work in progress	8,215	905
Total plant, property, and equipment	$ 119,057,763	$ 120,699,315
Investment in and loans to seaway international bridge companies:		
Capital stock in Cornwall International Bridge Company, Limited (Note 3)	----------	18,304
Seaway International Bridge Corp., Ltd.:		
Promissory notes	15,810	15,810
Debenture bonds–due Dec. 31, 2012	7,440	7,440
Total investment in and loans to seaway international bridge companies:	$ 23,250	$ 41,554
Current assets:		
Cash	486,127	501,895
Tolls and other receivables, net (Note 4)	139,009	107,810
Inventories, at cost	153,385	128,887
Total current assets	$ 778,521	$ 738,592
Deferred charges (Note 5)	937,308	----------
Total assets	$120,796,842	$ 121,479,461

TABLE 47. Comparative statement of financial condition December 31, 1967 and 1966—Continued

Investment and Liabilities	*1967*	*1966*
Investment of the U.S. Government:		
Revenue bonds outstanding (authorized $140,000,000)	$ 125,076,050	$ 124,776,050
Deferred interest during construction (Note 6)	6,706,437	6,706,437
Deferred interest during operations (Note 6)	11,557,411	10,501,006
Total bond and interest debt	$ 143,339,898	$ 141,983,493
Deficit	(−)23,435,879	(−)20,747,290
Net investment of U.S. Government	$ 119,904,019	$ 121,236,203
Current Liabilities:		
Accounts payable	683,228	37,922
Accrued liabilities and deferred income (Note 3)	209,595	205,336
Total current liabilities (Note 7)	$ 892,823	$ 243,258
Total investment and liabilities	$ 120,796,842	$ 121,479,461

TABLE 48. Comparative statement of revenues and expenses calendar years 1967 and 1966

	1967	1966
Revenues:		
Seaway tolls	$ 6,051,280	$ 7,064,510
Other	58,327	50,375
Total revenues	$ 6,109,607	$ 7,114,885
Expenses:		
Operation and maintenance	1,549,677	1,430,711
General administration	445,821	452,540
Interest on investment of U.S. Gov't.	5,106,405	4,964,210
Allowance for doubtful accounts (Note 4)	5,866	7,827
Depreciation (Note 2)	1,690,596	1,689,893
Total expenses	$ 8,798,365	$ 8,545,181
Net loss (-) for the year	$ −2,688,758	$ −1,430,296

TABLE 49. Statement of source and application of funds calendar year 1967

Source:		
Borrowings from U.S. Treasury	$	300,000
Revenues:		
Seaway tolls		6,051,280
Other		58,327
Proceeds from property disposals		2,674
Proceeds from liquidation of Cornwall International Bridge Company, Limited		18,473
Decrease in working capital		609,636
	$	7,040,390
Application:		
Acquisition of assets	$	51,718
Operating expenses		2,001,364
Rehabilitation of locks		937,308
Interest payments to U.S. Treasury		4,050,000
	$	7,040,390

TABLE 50. Comparative statement of plant, property, and equipment December 31, 1967 and 1966

In service	1967		1966	
	Cost	Accumulated depreciation	Cost	Accumulated depreciation
Lands in fee	$ 962,783	$	$ 962,616	$
Land rights and relocations	5,956,284	250,172	5,956,284	187,631
Locks	67,304,987	6,625,531	67,304,701	5,835,983
Roads and bridges	9,119,157	1,572,096	9,119,157	1,389,713
Channels and canals	38,016,187	1,596,702	38,016,187	1,197,532
Public use facilities	570,798	87,553	570,457	76,137
Navigation aids	1,364,663	225,049	1,374,398	218,974
Buildings, grounds, and utilities	4,161,367	692,828	4,148,542	609,601
Permanent operating equipment	3,610,004	966,751	3,601,079	839,440
Total	$ 131,066,230	$ 12,016,682	$ 131,053,421	$10,355,011

HIGHLIGHTS OF OPERATING PROGRAMS

United States Coast Guard

New programs have been added to Coast Guard responsibilities, and programs of long standing have been expanded to keep pace with the growth in maritime activities as the national economy and population have grown. The following are illustrations of new or expanded activities:

- In Southeast Asia, 26 Coast Guard patrol boats are participating in operation "Market Time"; five large cutters are also helping to prevent the North Vietnamese from bringing reinforcements and supplies to South Vietnam by sea. In addition to the Market Time operations and the operation of three Loran stations serving the area, the Coast Guard maintains over 100 aids to navigation—buoys, ranges, and beacons—in the approaches to major South Vietnamese ports. There are two explosives-loading supervisory teams and a Merchant Marine detail. These activities keep almost 1,400 officers and men of the Coast Guard in the area.
- Another continuing but significant operation is the Coast Guard's increased patrol activities in the area between Cuba and the Florida Keys. Many hundreds of Cubans seeking refuge in the United States who have slipped away from the Cuban coast in all sorts of small craft become distress cases before they are able to reach the Florida Keys or the mainland by themselves. Many have been assisted by Coast Guard air and surface units. Others not necessarily in distress have also been assisted in finding safe haven in the United States where they are further assisted by the Immigration Service.
- Some of the most familiar Coast Guard facilities such as the fleet of cutters and boats, lightships, and coastal stations are being modernized. Three outstanding examples are the new high-endurance 378-foot cutters, 210-foot medium-endurance cutters, and the newly designed 44-foot motor rescue boat. The new larger cutters are equipped for helicopter landing and refueling at sea. They have the newest control and propulsion systems and they feature great improvements in habitability for the crew. The Coast Guard now has 80 new 44-foot motor rescue boats—one of the finest and most effective designs ever built for the purpose.
- Other classes of boats and cutters have been or are being replaced with more modern designs. The same is true of aircraft, and of light-

ships that have been replaced by platforms built over the ocean, or in one case, by a giant automated buoy.

- The original chain of three Loran transmitting stations established on the East coast in the middle of World War II has been expanded into a complex of about 80 stations covering the Mediterranean, the North Atlantic, and most of the Pacific from Japan to Alaska, the Hawaiian Islands, the Philippines, and other islands between. A "second generation" transmits a more accurate, longer range Loran signal from an additional 30 stations that cover an even wider area, including Southeast Asia.
- Coast Guard vessels maintained four ocean water stations in the Atlantic and two in the Pacific. Additional stations in both oceans are maintained by Canada and some of the Western European countries. Using modern techniques of radar tracking and new communications equipment Coast Guardsmen are responsible for a steady flow of meteorological observations to weather centers. Transoceanic aircraft are assisted with weather and navigational observations. It is not unusual for a single ocean station vessel to track and assist 1,500 to 2,000 aircraft during a 3-week patrol.
- The ocean station vessels are a good source of oceanographic observations both while they are on station and while they are proceeding to and from station. Cutters equipped with a variety of instruments and men specially trained for this purpose supply data that makes an important contribution to the greatly stimulated national program in marine sciences. A good deal of similar oceanographic data collection is one task of polar icebreakers in both the Arctic and Antarctic areas. Two cutters are employed exclusively on oceanographic work. Funds have been requested from Congress to build a new oceanographic research vessel.
- One of the most significant changes that has come about for the Coast Guard was the formation of the Department of Transportation; Coast Guard was the second largest element to be transferred to it. The Coast Guard was transferred without changing its basic roles and missions or its character as a military organization. Certain functions were added to it. The documentation and admeasurement of vessels formerly performed by the Bureau of Customs is now carried out by the Coast Guard. It also issues permits to build bridges over the navigable waterways of the United States, a function formerly carried out by the Army Corps of Engineers, and supervises the Great Lakes Pilotage Association.
- Pollution of navigable water is a long-time concern of the Coast Guard. The growth in shipping, including the transportation of larger and larger quantities of petroleum products and other hazardous materials, has required greater attention to preventing the spilling of those cargoes into harbors and waterways.
- By no means the least of the Coast Guard's expanded activities is recreational boating safety; small boat accidents have risen as the

number of boats has increased since World War II. In the United States there are more than 8 million boats and more than 40 million Americans engage in one form or another of recreational boating.

- All of these new activities for the Coast Guard and the expansion of older programs have required more people. From a post World War II low of a little over 20,000 officers, enlisted men and civilians, the Coast Guard has grown to about 44,000.
- Because in some metropolitan areas it has become increasingly difficult for Coast Guard personnel to afford housing for themselves and their families, government-owned or leased housing has been provided in a number of places to ease the financial burden on some personnel.

Federal Aviation Administration

New records for the seventh consecutive year were set in aircraft activity at the FAA-manned airport traffic control towers (ATCT's), which handle all landings and takeoffs at their locations (317 at year's end), and the FAA-manned air route traffic control centers (ARTCC's), which handle only aircraft flying on instruments between airports (there were 27 such centers at year's end). Operations at the towers (52,998,383) exceeded those for fiscal year 1967 by 11 percent. Aircraft handled at the centers (18,093,385) exceeded those for fiscal year 1967 by 20 percent. For the entire 7 years, the activity increase at the towers amounted to 107 percent; at the centers, 93 percent.

Accident and fatality rates, fairly constant for a number of years (as reflected in calendar-year figures issued by the National Transportation Safety Board), continued in the same pattern in both air carrier operations and general aviation, despite the significant traffic expansion during the calendar year (1967) ending in fiscal year 1968.

Issuance of new crashworthiness and passenger-evacuation standards, in September 1967, constituted probably the most important single step during the year to improve air carrier safety. The new standards require, among other things, (1) demonstration that large transport aircraft can empty a complete passenger load through only half the exits in 90 seconds (instead of the previously allowed 2 minutes), and (2) performance of the foregoing demonstration by aircraft manufacturers as well as airlines and commercial operators of large aircraft (the manufacturers did not have to perform the demonstration under the 2-minute rule).

An important experimental project to improve general aviation safety (Project 85) completed the phase of personnel selection and training and was ready at year's end to begin a 2-year operational phase in two FAA regions.

At New York, in the common instrument flight rules room (IFR), where field-tested advanced equipment is being used for improvement of aircraft handling in the New York terminal area, checkout of both basic and alphanumeric hardware took place; at year's end, the facility was approaching readiness to go into limited manual operation at the John F. Kennedy

International Airport. A parallel effort to improve aircraft handling at the New York air route traffic control center proved unsuccessful; the equipment was therefore dismantled and moved to Atlanta, where it will be used to increase the capacity of the automated radar tracking system (ARTS I) installed in the Atlanta Airport tower.

Progress was made on more sophisticated National Airspace System (NAS) equipment than that referred to in the foregoing paragraph. For the air route traffic control centers, this equipment is called the NAS En Route Stage A. FAA's Jacksonville, Fla., center is scheduled to have the first complete NAS En Route Stage A operational capability (including flight-data processing, automatic radar tracking, and alphanumerics). At the beginning of fiscal year 1968, all major hardware for this configuration had been installed at Jacksonville; testing took place during the year; initial operations were expected, at year's end, to begin in fiscal year 1969. At other centers, the first phase of implementation will be installation of the automatic flight-data-processing capability; this was done during fiscal year 1968 at Chicago, Los Angeles, and Washington, D.C.

Progress was also made with the complementary advanced equipment for terminals. ARTS II (also called DAIR) is a joint FAA-Department of Defense configuration for terminals of low-density air traffic; review of its production prototype design was completed in fiscal year 1968, and fabrication of the prototype, well advanced at year's end, was expected to be completed in fiscal year 1969. FAA will do the technical and operational testing of ARTS II. ARTS III (formerly called a TRACON configuration) is designed for medium-density terminals; present plans call for installation at 62 locations in the United States equipped with airport surveillance radar and air traffic control beacon interrogating equipment. During fiscal year 1968, both the system description and system specification for this configuration were prepared by FAA; a request for proposals from industry was issued, and, at year's end, responses were being evaluated.

In other steps to improve the situation in the vital air traffic control area, FAA lowered the floor of area positive control from 24,000 to 18,000 feet above mean sea level in the heavily traveled airspace of the northeastern and north-central United States, intensified recruiting and training of air traffic controllers (the air traffic control work force was increased 12 percent; more than 1,000 new recruits were hired between December 1967 and June 1968), made initial installations of bright radar displays in some airport traffic control towers to permit better display-viewing in lighted surroundings, and began operating a prototype airport traffic control tower with solid-state electronic equipment (a development presaging greater equipment reliability at much lower cost).

FAA support of national defense activities was again prominent in services rendered to Vietnam-related aviation. Though such aviation using FAA services rose to record levels in fiscal year 1967, fiscal year 1968 saw new records set: At the Oakland, California center, the 89,848 oceanic overs were an 18-percent increase over the fiscal year 1967 figure; 56,548 oceanic overs at the Anchorage center marked a 36-percent increase; at the Honolulu center, aircraft handled increased 29 percent; at the Guam center/radar approach facility (CERAP), the 113,107 aircraft handled exceeded those handled in fiscal year 1967 only slightly, but were 51 percent more than those handled in fiscal year 1966; the Wake Island airport's 69,712 operations in fiscal year 1968 topped the previous year's figure by 9 percent. Included in the foregoing statistics were special operations caused by the 1968 Tet offensive and the North Korean seizure of the U.S.S. *Pueblo* (on January 23, 1968).

Federal-aid airport program (FAAP) funds administered by FAA totaled, in allocations for fiscal year 1968, $76.4 million (appropriation of $66 million plus carryover and other funds). The money helped pay for construction or improvement of 386 public airports.

The problem of aircraft noise was attacked on several fronts. An Office of Noise Abatement was created to manage FAA's expanded efforts. At year's end, awaiting Senate action after passage by the House, was legislation that would authorize the Federal Aviation Administrator to take aircraft noise and sonic boom into consideration in setting certification standards for aircraft.

In the supersonic transport (SST) development program, a Government-industry re-evaluation of the variable-sweep-wing (swing-wing) design became necessary because of modifications proposed by the contractor. The re-evaluation found the design airworthy but uneconomical. The contractor was given until mid-January 1969 to submit a design that, in the opinion of the Federal Aviation Administrator, fulfilled the contractual requirements.

Technical aviation assistance continued to be rendered to free-world countries. Though the overall number of technical assistance groups was cut back from 20 to 15, the heightened activity in Southeast Asia caused strengthening of groups there: In the Thailand civil aviation assistance group, from 11 to a total of 15 authorized positions; in the Vietnam group, from 34 to 52 authorized positions. Within the United States, FAA trained 265 foreign nationals (versus 242 in fiscal year 1967) from 41 countries in various aviation skills. Financing for 198 of these trainees was by the Agency for International Development; for 12, by the International Civil Aviation Organization; and for 55, by their own governments.

FAA's major organizational developments for fiscal year 1968 were: (1) Establishment (in August 1967) of the new position of Associate Administrator for Plans (during the year, to help the agency prepare for long-range foreseeable demands for its services, the new office developed a cyclical consultative-planning concept that includes annual publication and distribution of a 10-year National Aviation System Plan and the holding of an annual Government-industry planning review conference); (2) approval of a plan realigning the functions and responsibilities of the agency's regional and area offices; and (3) creation of the previously mentioned Office of Noise Abatement.

Federal Highway Administration

America's private and commercial motor vehicles and local, State, and national highway systems make up the Nation's most comprehensive resource for moving people and goods.

During fiscal year 1968—its first full year of operation—the Federal Highway Administration laid the groundwork for making this resource serve the Nation better. The Administration—composed of the Bureau of Public Roads, the Bureau of Motor Carrier Safety, and the National Highway Safety Bureau—began the job of making road travel safer and more efficient, extending roads where needed, and bringing road travel into phase with other modes of transportation.

The Administration undertook to build—in cooperation with State and local governments and with industry—the safest, most economical, and most efficient highway system possible. At the same time the Administration took measures to enhance the total highway environment. The Bureau of Public Roads included among its accomplishments:

- Opening of over 2,000 miles of Interstate Highways to traffic, bringing the total number of miles completed of the 41,000-mile system to almost 26,100 or 64 percent of completion.
- A major study of police services on controlled access roadways, results of which were published in a document which also compared progress in the 50 States with the provisions of the Uniform Vehicle Code relating to rules of the road and accident reporting.
- Tabulation of traffic accidents on highway systems of all the States so that, for the first time, it became possible to compare the safety record of Federal-aid primary, Federal-aid secondary, and non-Federal-aid roads and streets—a capability invaluable in providing data on the establishment of priorities for the application of available highway funds.
- Performance of survey, design, and construction supervision, either directly or in cooperation with other government agencies, for highway construction on National Parks and Forests and other federally owned lands. Federal funds authorized for fiscal year 1968 for the programs amounted to $300 million. The Bureau of Public Roads was directly responsible for, or charged with supervisory responsibility for, $90 million of this amount.
- Development of an emergency operation plan for the Federal Highway Administration and the substantial improvement of the communication and other facilities of the Federal Highway Administration-Bureau of Public Roads emergency operating site.
- Development of immediately usable methods of reducing urban highway noise by employing available exterior acoustical wall materials.
- Completion of groundwork for the development of an integrated, operational, highway engineering system directed toward increasing construction economy; increasing the effective and already extensive use of electronic computers and photogrammetry, and improving design

concepts and methodology. In a demonstration of the results of the work, a typical bridge design for a grade separation was completed in a matter of minutes using a remote-control typewriter, telephone-connected to a computer center several miles away.

- Holding conferences with the States about right-of-way organization, policies, and procedures developed since the issuance of Policy and Procedures Memorandum 80–1 through 80–9. The conference brought about significant improvement in the States' organizations, policies, and procedures. They also gave the States a better understanding of BPR needs and requirements and gave BPR a fuller insight into the States' problems.
- Completion of a systematic program of on-site evaluation of right-of-way activities and practices of division offices and State highway departments. The program made a substantial improvement in BPR right-of-way operations and in the management and procedures of State highway departments.
- Undertaking a paleontological salvage project during the construction of Interstate 71 in Cleveland in cooperation with the Ohio Department of Highways and the Natural Science Museum of Cleveland. A preliminary report by the Museum indicates the project is highly successful and that—based on the nature and quality of specimens salvaged—the knowledge of paleontology has been substantially increased. The Museum estimates at least 10,000 major specimens of significant value to science have been collected, including about 75 species of fossil animals and 25 species of fossil plants new to the world of science.

The Bureau of Motor Carrier Safety, the Federal Highway Administration Bureau responsible for safety regulation and inspection of all types of commercial vehicles engaged in interstate commerce, included among its accomplishments for fiscal year 1968:

- Issuing new or revised regulations to meet new developments and technology and to eliminate outdated rules or requirements.
- Continuous review of regulatory laws in order to be as responsive as possible to the needs of the public and to the segment of the economy regulated.
- Providing Federal Highway Administration representation on the Department of Transportation's intermodal Hazardous Material Regulations Board, established to meet the need for a cohesive set of authoritative regulations upon which the regulated industry can rely in preparing, shipping, and transporting hazardous materials.
- Establishing an Advisory Committee for Promotion of Compliance With Motor Carrier Safety and Hazardous Materials Regulations to develop ways of communicating with carriers using heavy commercial vehicles on the highways incidental to their primary business to apprise these carriers of safety requirements under the law. The Committee is composed of operators in the motor carrier industry. It was established because the Bureau needed to utilize the operators' knowledge in fulfilling its regulatory responsibilities.

- Issuing an order—following the concept of "creative Federalism" enunciated by the President—inviting State safety regulatory agencies to enter into cooperative agreements with the Federal Highway Administration jointly to enforce motor carrier safety and hazardous materials regulations.

The National Highway Safety Bureau, spearheading efforts to combat the human misery and economic costs caused by motor vehicle crashes, began to deal effectively with many aspects of the problem—the vehicle, the operator, the road, and traffic conditions. Included in the Bureau's achievements during fiscal year 1968 were:

- Issuing of six new motor vehicle safety standards, modification of seven others, and re-issuance of one.
- Publishing of a summary of vehicle-recall campaigns in December 1967 and in March 1968. During the fiscal year there were almost 140 recall campaigns involving over 3 million vehicles.
- Making grants of $45.4 million in response to grant applications from States and communities to carry out safety programs.
- Initiation of 174 safety research contracts and publishing of 29 research reports.
- Sponsoring nine meetings of the National Motor Vehicle Safety Advisory Council which made recommendations in areas vital to motor vehicle safety. Eleven new members were appointed by the Secretary on March 7, 1968.
- Sponsoring two meetings of the National Highway Safety Advisory Committee which discussed draft proposals of highway safety standards on police traffic services, pedestrian safety, and debris hazard control and cleanup. The Committee also discussed policy and procedural questions regarding the preliminary draft of a Highway Safety Program Manual.

Federal Railroad Administration

Developments during the year included the following:

- Prepared for the Secretary to present to Congress a comprehensive railroad safety bill, to give the Department authority it now lacks to prescribe standards for equipment in safety fields, and qualifications for railroad operating employees.
- Made new approaches to the problem of safety at grade crossings.
- Undertook new research programs to: (1) Design a fully automatic coupling system, (2) alter planning for maintenance of right-of-way, (3) design a new suspension system that will allow higher speeds for trains on curves, and (4) test on-board surveillance systems that monitor train performance.
- The Office of High-Speed Ground Transportation arranged for two demonstration projects in the corridor from Washington to Boston, using two types of specially designed trains.

- The same office continued its efforts to perfect analysis and forecasting techniques to help it in its planning and evaluation efforts.
- Research and development progress included design of a tracked, air-cushion vehicle; design of a new type of linear induction motor; and developments in tunneling technology.
- The Alaska Railroad suffered extensive damage from floods and washouts.
- Personnel of the Alaska Railroad were transferred to the competitive Civil Service from the earlier noncompetitive service.
- Train accidents, and particularly derailments, were increasingly frequent during the year; they were attributable in part to worn-out or obsolete equipment.
- Statistics showed some decrease in both deaths and injuries resulting from grade crossing accidents.
- There was a slight increase in the percentage of defective locomotives discovered during inspections, but a slight decrease in the number of locomotives ordered out of service because of serious defects.
- There was also a slight increase in the incidence of faulty maintenance of safety appliance and power brake equipment.
- Inspectors made 1,153 examinations of hazardous materials in transit, making suggestions for improvement of safety practices.

St. Lawrence Seaway Development Corporation

Achievements of note were:

- For the 1967 operating season, the Seaway's tonnage and revenues were down from the previous season, due in part to a strike of Canadian seamen.
- About $4 million was repaid to the Treasury against loans made for construction and maintenance of the Seaway.
- A new agreement was concluded with Canada concerning division of tolls collected on the waterway, allowing Canada a slightly larger proportion of the toll revenue.
- Shipments of bulk cargo declined somewhat and shipments of general cargo increased, as did shipments of iron ore.
- A needed rehabilitation program was begun to repair damage to the installations.

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