SEVENTH ANNUAL REPORT

Fiscal Year 1973

DEPARTMENT OF TRANSPORTATION

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U.S. DEPARTMENT OF TRANSPORTATION

Washington, D.C. 20590

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THE SECRETARY OF TRANSPORTATION
WASHINGTON, D.C. 20590

August 23, 1974

The President
The White House
Washington, D. C. 20500

Dear Mr. President:

I transmit herewith the Annual Report of the Department of Transportation for Fiscal Year 1973.

I recommend that you forward it to the Congress in compliance with section 11 of the Department of Transportation Act.

Respectfully,

Claude S. Brinegar

Enclosure

DEPARTMENT OF TRANSPORTATION

Office of the Secretary

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Robert T. Monagan

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Administrations

United States Coast Guard Admiral Chester R. Bender, USCG, Commandant

Federal Aviation Administration Alexander P. Butterfield, Administrator

Federal Highway Administration Norbert T. Tiemann, Administrator

National Highway Traffic Safety Administration James B. Gregory, Administrator

Federal Railroad Administration John W. Ingram, Administrator

Urban Mass Transportation Administration Frank C. Herringer, Administrator

Saint Lawrence Seaway Development Corporation David W. Oberlin, Administrator

Board

National Transportation Safety Board John H. Reed, Chairman

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HIGHLIGHTS

Secretary Brinegar emphasized three elements in his concept of the appropriate relationship between the Government and transportation: Government policy must promote the development of needed transportation but must also devise economic regulation for it, and finally it must protect the public interest against transportation's adverse effects. The Secretary promised that his policies would employ competitive economic forces to the maximum extent feasible to minimize the need for regulation; his policy is being developed to permit maximum realization of other national goals as well as transportation, including enhancement of safety in all modes, conservation of energy, and improvement of the environment.

Key legislation developed and submitted to Congress by the Department included the Federal-Aid Highway Act of 1973 and the Regional Rail Reorganization Act of 1973, both of which enacted bold new approaches to major and continuing transportation problems. The Highway Act continued authority for the construction of the Interstate Highway System and for the first time authorized Federal-aid Highway funds under certain circumstances for urban public transportation. The Rail Reorganization Act mandated the restructuring of the rail systems of the Midwest and Northeast areas of the Nation, and the creation of a for-profit rail corporation authorized to exchange its own Government-guaranteed stock for selected assets of the railroads. The corporation will operate selected segments of the restructured railroads as a viable rail system.

The energy crisis emerged during the year. Because transportation is a key element in the supplying of energy resources and also a major user of fuels, the Department was deeply involved in efforts first to alleviate the crisis, and then to reduce demands for fuel made by the transportation system. Many of the Department's already existing programs were designed to increase efficiency in the use of fuel, particularly those which aim at more intensive use of transportation facilities.

Safety of operation in all modes again received strong emphasis by the Department and all its administrations in keeping with obligations established by the DOT Act. Though there were eight fatal air carrier crashes, the accident rate actually declined, as did the rate for general aviation accidents. The Federal Aviation Administration through regulation required more intensive training for pilots and expanded its services for both air carrier and general aviation pilots. Certification requirements were expanded to include certification of airports that are used by air carrier aircraft as well as certification of aircraft and of personnel involved in servicing or flying the aircraft. The Department also expanded its efforts to

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prevent aircraft hijackings; rules were adopted to require obligatory inspection of all passengers and baggage placed aboard air carrier aircraft before flight to detect any possible weapons intended to be carried aboard. Airport managements were required to maintain security guards to conduct the searches and were permitted to increase their charges so that passengers pay for the additional security services provided to them.

Although the numbers of people killed or injured on the highways continued to rise, fewer people were killed than would normally have been anticipated for the number of passenger-miles and the number of ton-miles of freight the highway system produced. Railroad safety performance also improved, in part because of the work undertaken by the Federal Railroad Administration under new legislation that expanded its safety authority.

For the future, perhaps the most significant activity of the Department, other than its formulation of national transportation policy, is its sponsorship of research and demonstration projects that attempt to anticipate needs and develop techniques to fulfill new transportation demands. Each of the modal administrations maintains a program of research in the nontechnical aspects of transportation supply as well as a program of research on the mechanical and material requirements for transportation in the future. Much research of both types is conducted by the Department's Transportation Systems Center (TSC) located in Cambridge, Massachusetts; additional information is derived from a program of university-produced research studies, as well as from research and development contracts with private corporations. Examples of the research currently underway at TSC—often long range in character—include an assessment of the long-term effects upon the upper atmosphere if a high-altitude supersonic jet fleet were to be in operation; an assessment of the possibility of developing automobiles that use less petroleum fuel without sacrificing effective emission controls; a program to improve tunneling construction methods in order to facilitate use of tunnels for transportation in urban areas; and numerous research studies to support regulation of the transportation of hazardous materials by trucks, ships, rail and pipeline.

In striking contrast with most of the Federal Government's transportation programs of a few years ago, a major thrust of DOT's current programing and planning is to aid metropolitan areas, most of which have outgrown their public transportation systems and have streets overcrowded by autos and trucks with resultant smog and noise problems. To alleviate these problems, one key approach is to strengthen the transit systems of metropolitan areas to provide citizens a viable alternative to automobile travel. The UMTA Capital Grant Program last year provided funds to assist 21 cities to stabilize their public transportation systems by purchase of 4,027 new buses and 851 rapid rail and commuter cars. At the same time it assisted with the construction or modernization of bus garages and service facilities in 15 cities.

FAA programs to assist airports also contributed to the solution of cities' transport problems. By the end of FY 1973 FAA had approved 271 airport planning grants valued at more than $10 million. Similarly under

the Airport Development Aid Program, FAA entered into agreements with the sponsors of 450 airports to provide grant assistance.

Both the Coast Guard and the Saint Lawrence Seaway Development Corporation contributed resources and skills to a new program to extend the shipping season on the Great Lakes using ice breakers and techniques they are presently developing. Again this shipping season, a cargo record was established for the Saint Lawrence Seaway.

The Department's emergency and national defense plans came into use on several occasions: Hurricane Agnes and the floods that accompanied it, the spring floods in the Mississippi Valley, the shortage of freight cars for the shipment of grain, and other emergencies tested such plans. On at least two such occasions, the Coast Guard called some of its reserve units to active duty.

Dr. Claude Brinegar's appointment as Secretary headed a list of new officials for the Department selected by President Nixon at the beginning of his second term. One major structural change was made in the Department—the establishment of the Assistant Secretary for Congressional and Intergovernmental Affairs.

Chapter I

INTRODUCTION

The issues facing the Department of Transportation in President Nixon's second term had altered significantly from those which the Administration faced during its first four years. During the first three years of his Administration, the President signed eight major pieces of legislation relating to transportation, and in October 1972, he signed seven more public laws relating to the movement of people and goods. The fundamental importance of the changes produced by the new legislation may be appreciated by examining the formulation in 1973 of the issues critical to the Nation's transportation system by Secretary Claude Brinegar who had been appointed by the President at the beginning of his second term. He no longer had to emphasize programs such as the completion of the Interstate Highway System as his predecessors had done. With the physical infrastructure for transportation either already in place or fairly well assured, the Secretary focused attention on the need to eliminate much of the Government's outmoded regulatory policy and on issues such as determining policies to facilitate beneficial land use. In 1973 it became clear that burgeoning urban development was rapidly making local transportation systems obsolete, and that land use planning was therefore prerequisite to the design of transportation facilities. Perhaps the most significant decisions in the creation or improvement of local transportation facilities are made by the local planning group which decides on the needs of the community for transportation facilities, determines resource availability and devises techniques to meet the needs. A corollary to that finding is that many Department programs and efforts during the last year have been aimed at devising better ways of using available hardware and systems to facilitate movement of people and goods rather than the creation of new forms of transportation.

Economic and social conditions within which the Nation's transportation system had to operate had changed significantly during the seven years since the establishment of the Department. Thus the programs proposed by the Department had to be redesigned accordingly. New developments that conditioned the Department's responses during the year included such diverse factors as these:

1. A long-predicted energy shortage began to emerge, forcing consideration of techniques to avert or offset the effects of such shortages for transportation.

2. The railroad crisis surrounding the bankruptcy of six rail carriers in the Northeast quadrant of the Nation became acute and necessitated Federal action to assist in the restructuring of a viable private enterprise rail system.

3. Beginnings were made in revising the economic regulation of transportation, particularly of rail and air cargo.

4. It became feasible to transmit cargo data electronically and thus eliminate an enormous load of paperwork that had increasingly hampered trade—particularly international, ocean-crossing trade.

5. Coordinating systems were devised to facilitate "intermodal air cargo" movement, and at least three U.S. airlines developed systems employing a form of surface transportation in conjunction with airlifting of cargo.

6. Cargo security became a focus of increased concern and the Department issued its first Cargo Security Advisory Standard on May 7.

Underlying the Department discussions in almost every instance was a broad and fundamental—but perhaps sometimes unstated—question: "What is the appropriate role for the Federal Government in this particular form of transportation?" Although in each case the precise point at issue was something quite specific and concrete, the controversy ultimately came down to the political—almost philosophical—issue, "What should the Federal Government be doing?"

- It appeared to be a fact that railroads, left to operate in their traditional fashion, were becoming increasingly less viable, at least in the Northeast where the population concentration was greatest, even though the need for their service was increasing. But should the Federal Government operate the railroads, or try to make them workable by subsidy or regulation? Or could the excess rail facilities in the Northeast be consolidated to produce a financially viable system?
- In highway transportation, should the Government concentrate trust fund resources on completion of the Interstate System or should it shift resources to help solve problems arising from the urban concentration?
- While no one doubted that airports and airlines must be protected against air pirates and hijackers, should the Federal Government recruit and manage the special policemen needed for airport protection?
- Although the known consequences of crowding too many automobiles on city streets were frightening, could the Federal Government require that only nonpolluting autos be used, or perhaps insist on banning private autos from central cities—moves which would conserve scarce gasoline but place tremendous restrictions on individuals' freedom of action? To what extent could relatively nonpolluting rail transport be substituted for auto and truck transport? And could the substitution be achieved without using compulsion?

Responding to separate legislative mandates, the Department last year prepared its Annual Report on the Implementation of the Statement on National Transportation Policy and also its 1972 National Transportation Report. The latter summarized the results of the Department's intensive

inquiries among governmental units of all types, the industries involved, and its own information sources as to capital investment needs and projected improvement programs of all elements—political or private—concerned with transportation. Total transportation expenditures for 1970 were reported to be $181 billion, with an annual growth rate (1965 to 1970) of 3.9 percent. The same sources estimated the growth rate during the 1970–1990 period at 4.3 percent, and their transportation capital investment needs at $670 billion. From data submitted for the report the Department summarized the conclusions which the data appeared to dictate.

The Second Annual Report on the Implementation of the Statement on National Transportation Policy discussed highlights of the Department's actions to carry out the indicated policies. The actions were designed to: (1) Provide resources to levels of government most capable of making wise transportation investment choices, i.e., State and local governments, (2) recognize that most transportation modes are already mature, and thus presumably do not need to be subsidized and can be treated in an even-handed manner, (3) recognize that the structures are largely in place, but that the need now is for more productive use of the available facilities, and (4) recognize that the transportation system was designed with little regard for its substantial undesirable side effects of all sorts, and its consumption of increasingly scarce resources, especially fuel. The reorganization of railroads in the Northeast should have first priority for Department action.

One of Secretary Brinegar's early management decisions was to employ the planning and budgeting process already installed in the Department to review the Department's programs during the normal "spring preview." His objective was to streamline operations, stimulating States and localities to undertake as much as possible, relying on non-Federal action whenever they could, but at the same time assuring Federal action on any problem which clearly required it. Priorities had to be consciously established among programs so that low-priority programs could be eliminated or curtailed. The planning and budgeting process would also provide an opportunity to consider the "external" effects of budget decisions; e.g. environmental effects or effects on energy shortages.

GOALS AND OBJECTIVES

The spring preview process just mentioned produced many ideas for a statement of "Goals and Objectives" for the Department. Goals established by the Secretary included:

1. Development of a National Transportation Policy Statement to delineate the proper roles of Federal and local governments and the private sector in the advancement of transportation systems. Reliance upon competitive forces in transportation pricing to improve efficiency and reduction of economic regulation of transportation to a minimum consistent with the public interest were to be part of the policy outlined, as was consistency with other national goals such as improving the environment, conserving energy, and improving safety.

2. Revision of transportation regulatory practices to give regulated industry maximum flexibility to adapt to changing technological and market conditions.

3. Development of a clearer understanding of the relationship of transportation to community development patterns with a special emphasis on the roles the Federal and local governments should play in improving mobility within and access to urban centers.

4. Modification of the Federal Highway Program to reflect changing policies and priorities.

5. Streamlining and restructuring the existing Northeastern railroad system, making sure it is privately owned on a financially self-sustaining basis.

6. Improving efficient use of the National Airport and Airway system by increasing operational flexibility, developing financing through equitable user charges, and decreasing unit cost of operating the system.

7. Helping to resolve the national energy problem by reducing the amount of energy consumed by the transportation sector and by assisting the development of a more effective energy distribution network.

8. Reductions in rates of accidents, fatalities and personal injuries, in all modes of transportation, especially highway transportation.

Although the Saint Lawrence Seaway Development Corporation is one of the seven administrations of the Department of Transportation, it is required by statute to submit a separate annual report to Congress. Its operations are, therefore, mentioned only incidentally in this report. Similarly, the National Transportation Safety Board is autonomous in its operations and prepares its own annual report; it is, therefore, not discussed in this report.

Chapter II

LEGISLATION

During FY 1973, the following significant legislation relating to the DOT was enacted by the Congress:

AVIATION

P.L. 93–44, The Airport Development Acceleration Act of 1973 (June 18, 1973), amended the Airport and Airway Development Act of 1970 and the Federal Aviation Act of 1958 to: (1) Provide for a higher annual program level for the Airport Development Aid Program (ADAP): $310 million for each of the fiscal years 1974 and 1975; (2) increase the maximum Federal share of airport development projects from 50 to 75 percent; (3) establish an 82 percent maximum Federal share for equipment required of the sponsor by rule or regulation for security or certification of the airport. The Act prohibited States, or political subdivisions thereof, from levying or collecting any "head taxes" on persons traveling in air commerce.

P.L. 92–574, The Noise Control Act of 1972 (October 27, 1972), to control the emission of noise detrimental to the human environment.

P.L. 92–556 (October 25, 1972) further amending the Act of September 7, 1957, to extend the Aircraft Loan Guarantee Program for an additional five years, and increase the ceiling on loans to a single carrier from $10 million to $30 million.

RAILROADS

The extension of the High Speed Ground Transportation Research and Development Act and the Emergency Rail Facilities Restoration Act (P. L. 92–591) provided additional statutory authority to the Federal Railroad Administration.

The Department prepared legislative proposals that the Secretary submitted to Congress for reorganizing the Nation's railroads; many of the ideas were incorporated in the Regional Rail Reorganization Act of 1973 (P.L. 93–236).

URBAN MASS TRANSPORTATION

P.L. 92–517 provided authority for UMTA to supply funds for the purchase of the four buslines that provided transportation to the city of Washing, D.C. and its surrounding areas.

WATER TRANSPORTATION

P.L. 92–430, the Ports and Waterways Safety Act of 1972 (July 10, 1972), grants much-needed authority to the Coast Guard to protect against oil spills by giving the Secretary of Transportation power to control vessel traffic in inland waters and territorial seas, to regulate the handling and storage of dangerous cargoes on the waterfront, to establish safety requirements for waterfront equipment and facilities, and to set standards for design, construction, maintenance, and operation of tank vessels. The legislation provides a basis for the safeguards needed to handle increased tanker traffic with minimum environmental risk.

MOTOR VEHICLES

The Motor Vehicle Information and Cost Savings Act (P.L. 92–513, October 20, 1972) provides:

- Authority to the Secretary to promulgate and enforce bumper standards to reduce economic losses in motor vehicle crashes.
- Authority to the Secretary to investigate methods of determining damage susceptibility of passenger cars; the degree of crashworthiness; and the ease of diagnosis and repair. This is to be followed by a comprehensive automobile consumer information program.
- The establishment of motor vehicle diagnostic demonstration projects, to include inspection of safety and emission control equipment.
- A Federal odometer law to prohibit tampering with motor vehicle odometers.

The National Traffic and Motor Vehicle Safety Act Amendments of 1972 were also enacted during this period.

GAS PIPELINE SAFETY

The Natural Gas Pipeline Safety Act of 1968 (NGPSA) was amended by P. L. 92–401 (August 22, 1972) to: permit Federal financial assistance to States that are agents of the Secretary with respect to interstate transmission facilities; authorize cooperation with Federal, State and local governments, and others to encourage improvement of State and local pipeline safety programs; authorize appropriation of $3 million for FY 1972, $3.8 million for FY 1973, and $5 million for FY 1974, to implement the Act; and direct the Secretary to report on Federal/State pipeline safety programs after consultation with the State agencies and the organization of State commissions.

Section 6 of P. L. 92–401 amended the Department of Transportation Act, transferring the liquid pipeline safety functions from the Federal Railroad Administration to the Secretary of Transportation. This authority was delegated to the Office of Pipeline Safety in November 1972.

HIGHWAYS

Although it was not enacted until August 1973, the Federal-Aid Highway Act of 1973 (P.L. 93–87) was developed primarily during FY 1973. In addition to providing three-year authorization for the continued construction

of the Interstate System and other Federal-aid highway programs, the 1973 Act authorized the use of Federal-aid Highway funds for urban public transportation for the first time. It provides urban areas with flexibility in the use of these funds for the purchase of transit buses, construction of rail transit systems, or construction of highways. It also permits urbanized areas, in cooperation with the State, to "trade" their allocations for controversial Interstate System segments for an equal dollar amount from the general fund which can be used for mass transit purposes. In addition, the Act contained an additional three-year authorization of $3 billion for the urban mass transportation program.

Chapter III

SAFETY AND ACCIDENT PREVENTION

INTERMODAL SAFETY ACTIVITIES

Department Safety Policy. From the legislative history of the DOT Act as well as from the Act itself, it is plain that Congress intended that safety in all modes of transportation should be a major responsibility of the Department. The Department's responsibilities concerning safety are articulated in its Safety Policy Order (5800.2, dated September 17, 1973) which states that:

> It is the policy of the Department of Transportation to provide the highest practicable level of safety for people, property and the environment associated with or exposed to the Nation's transportation systems. The Department of Transportation recognizes safety as a primary management responsibility and as a major factor in its decision-making process. Its safety programs will stress accident prevention through identification, reduction and control of hazards, and emphasize integrated efforts directed at preventing, reducing and controlling accidents caused by human, equipment or operational factors.

Each of the Department's Administrations is specifically concerned to improve the safety record of its own mode of transportation, but the Office of the Secretary has also assumed a coordinating role in enhancing the safety of all modes of transportation. Some of the safety-related projects of the Office of the Secretary are discussed below.

National Search and Rescue (SAR). The National SAR Plan signatory Federal agencies have agreed to meet periodically as an interagency planning and implementation group. The first three meetings were held this year under chairmanship of the USCG Commandant. Action items from a study by the Transportation Systems Center of SAR have been directed to the USCG for coordination with the Interdepartmental Committee, and to FAA for Emergency Locator Transmitter (ELT) monitoring. As a part of this activity the Office of the Assistant Secretary for Environment, Safety and Consumer Affairs, through the Transportation Systems Center, has been studying distress alerting and locating systems in being and under development.

Emergency Medical Services (EMS). The Director, Office of Safety Affairs, has been designated to represent the Department on an Interdepartmental Committee on EMS chaired by the Department of Health, Education and Welfare (HEW). He is also chairman of the Transportation Subcom-

mittee. As an additional assignment he is charged with organizing a DOT EMS Advisory Council which will help to develop policy and implementing procedures for EMS in all operating Administrations within the Department.

Coordination of Occupational Safety and Health Activities. Under the Occupational Safety and Health Act of 1970 the Secretary of Labor is responsible for promulgating and enforcing job safety and health standards in most circumstances. However, the Department of Transportation exercises such statutory authority in many modes of transportation. The Departments of Labor and Transportation are cooperating to delineate their respective areas of authority, to avoid inconsistency or duplication in related regulations, to provide for recordkeeping and reporting that minimizes the burden on industry and to arrange to resolve questions that arise between the two Departments in carrying out their statutory responsibiliies.

Safety and Health Regulations for Highway Construction. The Construction Safety Act of 1969 and the Occupational Safety and Health Act of 1970 are intended to assure that workers receive the benefits of the latest advances in safety equipment and have job standards that permit them to work only under safe and healthful conditions. Training for compliance with these regulations was given to construction supervisors in the FHWA field offices.

Transportation Safety Information System (TRANSIS). A study of DOT data systems for safety information was undertaken in the Office of the Secretary to improve coordination of information. A common data base for comparison of modes was needed. The first phase of the Transportation Safety Information System (TRANSIS) study was completed in January 1973. It identified the safety data elements and programs in the Department. The second phase of TRANSIS developed reporting processes to permit measurement of the Department's progress in achieving its goals.

Coordination and Monitoring of Actions Taken on Recommendations of the National Transportation Safety Board (NTSB). The Office of the Assistant Secretary for Environment, Safety and Consumer Affairs acts as the coordinator for DOT responses to NTSB reports and recommendations. The Office keeps the Secretary informed about the responses and the relationships between the various DOT offices and the NTSB.

Transportation Safety Institute. The Transportation Safety Institute trained 1,774 in 21 courses and seminars, upgrading the competence of inspectors and investigators from every mode of transportation, selected State and local officials, safety inspectors, security officers, and industry personnel. The courses included accident investigation, transportation of hazardous materials, railway equipment and track safety standards and accident prevention courses for FRA inspectors. Plans call for development of advanced accident prevention and investigation courses, an FRA safety management seminar, courses in techniques of accident report writing, and accident prevention courses for FRA inspectors.

Seat Belt Program Initiative. Seat belt usage in the United States has been identified as a key public issue for the Department and a coordinated

program has been initiated to increase public usage of this lifesaving device. The program includes public media awareness campaigns, education, legislation, and the involvement of State and local government, organizations, industry and the private citizen.

Pedestrian/Bicycle Safety Activities. The Pedestrian Safety Coordinating Committee had bicycle safety added to its objectives early in 1973. Safety is the major problem in the growing use of bicycles. There are about 83 million cyclists in the United States today. Bicycle fatalities increased nearly 30 percent in 1972 over 1971. The Coordinating Committee has surveyed the bicycle safety problem and research studies are being conducted on bikeways.

The FY 1973 funding for programs within the Department to help prevent pedestrian fatalities and injuries totaled approximately $2.75 million. This included research on special facilities to accommodate pedestrians, countermeasures for specific types of pedestrian accidents, and systems of highway illumination. The Federal Railroad Administration conducted a grade crossing inventory and disseminated information on protecting pedestrians at such locations and along railroad rights-of-way. The Urban Mass Transportation Administration began upgrading accident reporting and delineating prime causes of pedestrian accidents. The National Highway Traffic Safety Administration makes grants to States for pedestrian safety projects; develops data to support motor vehicle standards; and does research on accident types and countermeasures.

AVIATION SAFETY [1]

Air Carrier Safety Record. Certificated route and supplemental airlines, in all operations, registered higher total and fatal accident rates in calendar year 1972 than in 1971. This was the first annual upturn in rates in several years. There were 50 accidents in 1972, eight of which involved passenger fatalities. All of the accidents involving fatalities occurred on certificated route airlines. Supplemental carriers recorded a fatal-accident-free year for the second consecutive year and the third year of the last four.

Although representing an upturn in rates over those for 1971, the total of 50 accidents in 1972 represented a decrease of 18.57 percent from the average over the five-year base period used by the National Transportation Safety Board (NTSB) in its analysis. The eight fatal accidents represented a 24.53-percent reduction from the base period average.

General Aviation Safety. In 1972 general aviation recorded 4,230 accidents—677 of them fatal. In 1971 there were 4,641 total accidents including 655 fatal accidents. Fatalities decreased from 1,373 in 1971 to 1,357 last year. The resulting rates were 15.5 total accidents and 2.48 fatal accidents for every 100,000 flying hours in general aviation last year. Comparable 1971 rates were 18.2 and 2.61, respectively. But that equals 1.24 total accidents and 0.200 fatal accidents per million miles flown in 1972 as compared with 1.48 and 0.212 respectively in 1971.

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[1] For financial statement of the Federal Aviation Administration, see Table 28.

(See tables 1, 2, and 3 covering air carrier and general aviation accident statistics, 1962–1972.)

During the year 1972 the Department continued its intensive accident prevention program with over 5,200 pilot educational meetings and 2,100 pilot proficiency flight checks; in addition 41,587 pilots were counseled and 1,500 industry accident prevention counselors were appointed.

Midair Collision Hazard—Terminal Control Areas (TCA's). Terminal Control Areas are defined areas which pilots must have prior authorizations to enter (air traffic clearance), and in which all aircraft are provided separation services. The purpose of TCA's is to increase safety in busy terminal areas. Nine locations have been designated as Group I TCA's (the busiest locations in the country): New York, Los Angeles, Chicago, Atlanta, Washington, D.C., Boston, Miami, San Francisco, and Dallas-Fort Worth. Airspace action on these locations has been completed. The last TCA designation in this group, Dallas-Fort Worth, became effective on September 30, 1973. Preliminary action is underway to develop Group II TCA's (areas having somewhat less activity than those in Group I) at Philadelphia, Denver, St. Louis, Pittsburgh, Detroit, Cleveland, Houston, Minneapolis, New Orleans, Seattle, Las Vegas and Kansas City.

Advisory Service (EWAS). On August 1, 1972, FAA implemented the En Route Weather Advisory Service (EWAS) program at the Seattle, Portland, Oakland, and Los Angeles Flight Service Stations. This service was designed to reduce weather-related general aviation aircraft accidents and provide en route pilots with current weather information. They are manned by flight service station specialists trained in the collection and dissemination of aviation weather data obtained through normal channels, and supported by a direct line to the nearest National Weather Service forecast office. The EWAS facility in turn gathers weather data from pilots. FAA has scheduled the following areas for coverage:

- 1973—8 EWAS facilities from Boston to Charleston
- 1974—11 EWAS facilities from Detroit to Miami
- 1975—14 EWAS facilities from Huron, N. Dak., to Houston
- 1976—7 EWAS facilities from Great Falls, Mont., to Phoenix

Crashworthiness for Small Airplanes. Notice of Proposed Rule Making 73–1 was issued this year proposing that all future newly type-certificated small civil airplanes be equipped with shoulder harnesses and that the cabin and flight crew compartment interiors in these aircraft be designed to protect occupants from injury caused by contact with interior objects. In addition, the Notice proposed a requirement for the installation of shoulder harnesses on all small civil airplanes manufactured one year from the effective date of the amendment, and on those manufactured prior to that date which have structural provisions for the attachment of shoulder harnesses. A requirement that occupants use such harnesses was also proposed.

Minimum Performance Standards for Aircraft Equipment. The FAA is utilizing the expertise provided by technical experts from the Society of Automotive Engineers (SAE) and the Radio Technical Commission for

Aeronautics (RTCA) in the development of minimum equipment performance standards for use under the technical standard order (TSO) system. The RTCA has worked with the FAA on five documents in the past year which contributed to the performance and reliability of airborne systems. New or updated standards have been developed for altimeters, automatic pressure altitude reporting code generating equipment, alternators, flight data recorders, distance-measuring equipment, VOR receiving equipment, fire detectors, ILS glide slope and localizer receiving equipment and oxygen-generating equipment.

Carriage of Handicapped Persons in Air Carrier Aircraft. The FAA has solicited public input to proposed rulemaking designed to provide uniform conditions for the carriage and accommodation of handicapped persons in air carrier aircraft.

Certification Activities. An essential part of FAA activity to help assure safety in operation of aircraft is its program of examining and testing the performance of all airmen and all aircraft; details concerning that certification are included in tables 4 and 5. In addition, 43 aircraft engines were certificated (10 turbojet, 9 turboshaft, and 24 piston engines) as were 21 types of aircraft propellers.

This period was marked by the general introduction of large fan-jet engines in the 40,000- to 50,000-pound thrust class to power B–747, DC–10, and L–1011 widebody aircraft.

Pilots and Flight Instructors Certification. The Federal Aviation Regulations were amended to revise the standards for the issuance of pilot and flight instructor certificates, and to adopt recent experience and proficiency check requirements for pilots in command. The amendments place increased responsibility on the instructor for training applicants and on the applicants to demonstrate proficiency.

Airport Certification. The Federal Aviation Act of 1958, as amended, states that airports which serve certificated air carriers must themselves be certificated by May 21, 1973, or discontinue such operations. Airport certification requirements are intended to insure that an airport is adequately equipped to help provide safe air transportation. During FY 1973 all airports serving certificated air carriers were issued either operating or provisional certificates. As of May 21, 1973, operating certificates had been issued to 498 airports serving CAB-certificated airlines operating aircraft weighing more than 12,500 pounds on a regularly scheduled basis. These airports account for 99 percent of the annual revenue passenger enplanements in the United States.

Safety Rules and Regulations

Regulatory amendments were issued prescribing general operating rules for large or turbojet-powered multiengine airplanes, and an inspection program for large and turbine-powered multiengine airplanes. These are an outgrowth of the in-depth investigation of charter operations utilizing large airplanes conducted by the Secretary of Transportation following the fatal accident of a charter flight carrying a college football team.

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A study of air charter operations was conducted and a report written which recommended, among other things, increasing the safety of operations involving U.S.-registered large civil aircraft that are being operated under a lease or contract of conditional sale arrangement. The study indicated that leasers and conditional buyers did not fully understand their responsibilities.

To assure understanding on the part of all concerned, FAA issued an amendment, FAR 91.54, "Truth in Leasing clause requirement in leases and conditional sales contracts," for U.S.-registered, large civil aircraft, effective January 3, 1973. It provides that all interested parties will know who is responsible for the operation and maintenance of the aircraft and for complying with applicable Federal Aviation Regulations.

Amendments to Parts 25 and 121 (Federal Aviation Regulations) were issued to provide additional security on certain large passenger-carrying, turbojet-powered airplanes by requiring that each ventral exit and tailcone exit be designed and constructed so that it cannot be opened during flight.

MARITIME SAFETY PROGRAMS [1]

Boating Safety. The Federal Boat Safety Act of 1971 established authority for the Coast Guard to regulate the design, manufacture and use of boats. The Coast Guard has used that authority to promulgate regulations concerning notification of a boat purchaser of defects in his boat, certification of boats by manufacturers, and construction of personal flotation devices. In addition the Coast Guard published standards to assure that small boats are so constructed that they will not sink easily and that boat owners are informed concerning the loading capacity and appropriate powering of their boats.

As a further protection for boatmen, the Vessel Casualty Reporting System was established to require immediate notification of the Coast Guard when a boating accident results in the death or disappearance of any person so that quick investigation can establish the cause of the accident.

The systems under development are all aimed at reducing the number of deaths by drowning, and extensive media campaigns have been developed to stimulate interest in boating safety.

The National Boating Safety School at Yorktown, Va., graduated over 200 boating safety law enforcement officers and 371 students attended similar courses conducted regionally.

Coast Guard boating safety personnel conducted training for 7,212 Coast Guard, State and local law enforcement personnel in 1972. An estimated 10.9 million persons visited Coast Guard boating safety exhibits and 102,705 persons attended safety lectures. Over 4,900 radio and TV appearances were made by Coast Guard personnel in behalf of boating safety.

Boating Safety Detachments (BOSDETS)—specially trained four-man mobile units with small boats—continued a balanced program of education and enforcement in the 12 Coast Guard Districts, assisted by boating safety specialists from other Federal agencies.

[1] For Coast Guard financial statement, see Table 29.

Coast Guard Auxiliary. Achievement of the goals of the Boating Safety Program would be impossible without the support of the Coast Guard Auxiliary, an all-volunteer civilian organization of experienced boatmen, licensed radio operators, and licensed aircraft pilots. Each is trained by the Coast Guard in seamanship, navigation, weather, and other subjects necessary for proficiency in boating safety. Advanced training includes correspondence courses from the Coast Guard Institute. Auxiliarists are accorded no law enforcement authority and receive no compensation for their services. Each member must own at least 25 percent of a boat, aircraft, or radio station, or possess a speciality such as diver, doctor, or teacher. Auxiliary units have now enlisted 37,280 people.

The Auxiliary contributed to boating safety during FY 1973 primarily through:

a. Public presentation of courses in boating safety. Instruction was presented to 331,000 people.

b. Courtesy examinations for safety equipment on motorboats at request of the owner or operator. More than a quarter million boats were examined.

c. Operational activities with regular Coast Guard forces. These included 4,800 patrols at regattas, almost 27,000 safety patrols and 15,000 assistance missions. In all, 341 lives were saved.

There are currently 1,232 active Auxiliary Flotillas in the United States, Puerto Rico, American Samoa, the U.S. Virgin Islands, and Guam.

The Merchant Marine Safety Program [1]

More than 800 Coast Guard Officers are assigned to the Merchant Marine Safety program in 69 Marine Inspection Units located throughout the United States and overseas. The program has the objective of reducing the number of lives lost, property damage, and personal injury in commercial marine transportation. To accomplish these objectives, the Coast Guard develops and insures compliance with certain standards of vessel construction and repair as well as with standards of competence of operating personnel.

The Coast Guard assures that foreign vessels visiting the United States comply with certain U.S. laws and international agreements. The major Merchant Marine safety concerns are passenger safety and dangerous cargoes.

In FY 1973 there was increased emphasis on:

a. Offshore oil industry vessels.

b. Licensing of uninspected towing vessel operators.

c. Carriage of hazardous materials.

d. Marine pollution.

e. Fire protection testing.

f. Container safety.

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[1] See Table 31.

Merchant Marine Officer Training

The U.S. Coast Guard continues to encourage formal training of seamen by accepting completion of Merchant Marine officer training as meeting the intent of training requirements for unlicensed ratings, and to grant acceptance of such training in lieu of part of the sea service requirements for various Merchant Marine licenses.

Marine Casualties

Ten major marine casualties were investigated by Marine Boards of Investigation during FY 1973. Sixty persons died or disappeared as a result of these casualties.

These losses of ships and their personnel were caused by storms, collision of ships and barges with bridges or other ships, explosions, and inhalation of poisonous fumes.

The Secretary has given his approval in principle to transfer the investigation of major marine casualties from the Marine Boards to the National Transportation Safety Board (NTSB) which investigates serious accidents in other modes.

Coast Guard activity arising from offshore drilling continued to increase during FY 1973. The first of the new-generation self-propelled Column Stabilized Drilling Vessels has been issued a Certificate of Inspection and has been deployed to the North Sea.

Title II of the Ports and Waterways Safety Act of 1972 (P.L. 92–340) necessitated a change in the system of evaluating failures of a vessel's structure, machinery and other approved equipment.

The Vessel Bridge-to-Bridge Radiotelephone Act (33 U.S.C. 1201–1208), with implementing regulations in 33 CFR Part 26 and 47 CFR Part 83, became effective for compliance on January 1, 1973. This Act requires certain vessels navigating in U.S. waters to be fitted with VHF radiotelephone equipment to enable their masters immediately to exchange information essential to meeting and passing safely.

The Coast Guard formed the New England Water Traffic Separation Committee to consider marine traffic separation measures in the approaches to Portland, Maine; Boston, Massachusetts; Buzzards Bay, Massachusetts; and Narragansett Bay, Rhode Island. The Committee's sealane proposals were submitted to the Intergovernmental Maritime Consultative Organization (IMCO) and became operational on July 1, 1973.

Hazardous Materials Cargo. The increasing importance of marine safety in the carriage of hazardous materials is emphasized by the passage of the Ports and Waterways Safety Act of 1972, which delineates further Coast Guard responsibility.

U.S.-flag liquefied natural gas (LNG) carriers are currently being built in Quincy, Newport News, New Orleans, and La Seyne sur Mer, France. The technical expertise gained in reviewing foreign-flag LNG carriers is proving invaluable in the review of these U.S.-flag LNG carriers. In addition to the relatively standard cargo containment systems installed in these vessels, several second-generation LNG containment systems employing such materials as foam, fiber glass and concrete are under review.

The carriage of bulk anhydrous ammonia on U.S. waters poses a significant potential public hazard should there be a large-scale release on water. To provide an understanding of the properties of anhydrous ammonia, the U.S. Coast Guard has contracted research to study the effects of its release both on and under water. Research is underway to facilitate development of a tank standard for containers to transport anhydrous ammonia. The new standard was sent to the parent committee in June, and it is anticipated that the standard will become regulation in the fall.

Plans were completed for an experimental study of explosion characteristics of large unconfined vapor clouds resulting from spills of liquefied flammable gases (e.g., liquefied natural gas). Work is to be carried out by the Naval Weapons Center under a Coast Guard contract with technical advice being provided by the National Academy of Sciences' Committee on Hazardous Materials.

The Coast Guard's Chemical Data Guide for Bulk Shipment by Water (CG–388), of which earlier editions have been used worldwide in both marine and land transportation of hazardous materials, was revised and expanded to include new information and to cover new cargoes.

The Coast Guard continued to monitor all phases of manned underwater activity to insure that life, property and the environment are protected and preserved. Such activities include recreational and sport diving, commercial diving, underwater vehicle development and utilization, and manned oil and gas sea-floor production systems.

Port Safety

To conduct the Coast Guard Port Safety Program of protecting vessels, structures and facilities in the navigable waters of the United States against destruction, loss or injury due to sabotage, subversive acts, accidents or other causes, the Commandant has established 55 Captain of the Port (COPT) offices throughout the United States. During FY 1973 over 1,200 personnel were assigned to these offices for the purpose of promoting port safety. As the quantities and varieties of hazardous materials transported via the marine mode have increased, the Port Safety Program's workload has increased proportionally.

Passage of the Ports and Waterways Safety Act of 1972 provided authority for the Coast Guard program and civil penalties to be used in enforcing regulations. These are being prepared with the collaboration of specialists from the marine transportation industry.

AUTOMOTIVE SAFETY [1]

Compliance Test Facility. In 1971, Congress appropriated $9.6 million for the design, construction and equipping of a NHTSA Compliance Test Facility (CTF) designed to accomplish tests for the National Highway Traffic Safety Administration (NHTSA). A site was selected northwest of Columbus, Ohio, adjacent to the Transportation Research Center (TRC) of

[1] For financial statement of the National Highway Traffic Safety Administration, see Table 30.

Ohio. This location permits easy access to a high-speed track, a skid pad, a large vehicle dynamics area, and a high acceleration crash simulator—all of which have been constructed by TRC of Ohio.

The TRC of Ohio formally proposed to build the CTF, as designed by DOT, exclusive of testing equipment, and lease the completed facility to NHTSA. The proposal provides an opportunity to spread the CTF building costs over an initial 20-year lease period.

Defects Investigation. Congress recognized when passing the National Traffic and Motor Vehicle Safety Act of 1966 (section 113) that defects can occur in the manufacturing process that have a bearing on vehicle safety. Therefore, the responsibility to notify owners was clearly outlined in the event a safety-related defect was determined to exist. It is a function of NHTSA to enforce section 113 by identifying safety defects in vehicles and vehicle equipment; this is accomplished through information analyses and independent investigations.

Motor Vehicles-in-Use. Both the National Traffic and Motor Vehicle Safety Act of 1966 and the Motor Vehicle Information and Cost Savings Act of 1972 contain provisions which reflect the concern of Congress for the safe operation of vehicles from time of purchase through their useful lifetimes. NHTSA continued its efforts during FY 1973 to increase the safety of operational vehicles in several ways: by the issuance of proposed safety standards for critical vehicle components; by investigating and assisting the States to improve inspection techniques; and through research to support inspection criteria.

- The standards propose performance criteria and procedures for the inspection of brakes, steering, suspension, tires and wheels. They will not replace any State inspection procedures that may be more stringent or comprehensive.
- NHTSA is continuing its investigation to develop improved inspection techniques and equipment in order to achieve maximum inspection objectivity.
- As required by the Motor Vehicle Information and Cost Savings Act, a regulation was published requiring a person who transfers ownership in a motor vehicle to give the buyer a written disclosure of mileage the vehicle has traveled.
- Vehicle-in-use research has concentrated on the formulation of criteria and the fabrication of equipment for motor vehicle inspection.

Passenger Restraints. Safety belts, air bags or other restraints would save 10,000 to 15,000 lives a year. Greatly increased use of these devices is a primary alternative to runaway traffic fatalities.

- Stimulated by Australian seat belt experience where traffic deaths declined 23 percent, NHTSA proposed to require that each State enact a mandatory lap and shoulder belt statute. The Secretary on May 7, 1973, proposed a concurrent resolution to the Congress endorsing mandatory seat belt use. By the end of the reporting period, mandatory seat belt use legislation had been introduced in 23 States and had become law in Puerto Rico.

- The validity of standards on safety belt interlocks and passive restraints was challenged by the manufacturers. The 6th Circuit Court of Appeals upheld the validity of the interlock system in February, a decision quickly reaffirmed by DOT action. The same Court upheld Federal action on the passive restraint system subject to the issuance of new specifications for the test dummies and postponed the effective date of the standard until a "reasonable" time thereafter.
- Passive restraints were introduced for test fleets operating under normal traffic conditions. Initial crash reports confirm their reliability and effectiveness.

Safety Defect Recalls. There were 298 safety defect recalls in FY 1973 that involved 10,547,951 vehicles. Between September 1966 and the end of FY 1973, some 41,160,841 vehicles were recalled in 1,488 campaigns, of which 6,727,000 vehicles and 273 campaigns involved foreign vehicles. Of all the campaigns, NHTSA influenced 197 involving about 23 million vehicles.

Crash Survivability. "Crash survivability" is the term used for all of the measures which permit motor vehicle occupants or pedestrians to live safely through a collision which might otherwise result in death or serious injury.

The goal is approached in several ways:

- Protection through restraints, padding, and less injurious components that distribute impact forces in a manner tolerable to the human body and minimize secondary dangers such as fire, submergence and entrapment.
- Improvement of the vehicles so that in crashes components will collapse in a controlled manner and absorb impact forces before they endanger the occupants.
- Performance and feasibility studies of passive restraint systems, using human subjects in simulated crashes.
- Human simulation studies to develop criteria for reliable and representative dummies and human gross-motion simulators for research and compliance testing.
- Human tolerance studies to determine the force levels which lead to injury and the reasons why injury occurs.
- Studies to isolate damage to the forward part of the vehicle in less severe crashes, and to improve side, rear, and rollover safety.
- Studies of the vehicle front ends to devise ways of minimizing pedestrian injuries.
- Development of analytical vehicle crash simulations as research tools.

Analytical models were developed to study energy absorption characteristics in terms of the collapse of the vehicle structure, and compartment peak accelerations resulting from collisions of two unequal-weight vehicles. The occupant compartment acceleration history provides data for studying occupant response to various passive and active restraint systems. Analysis of mixed vehicle crash compatibility requirements indicated that either velocity-sensitive or fixed-force structures can be designed to provide reasonable car-to-car crash compatibility for both head-on and side crashes.

Experimental Safety Vehicles (ESV's). The purpose of the ESV program is to stimulate and test new automotive safety ideas by sponsoring the development of vehicles with safety as the principal design consideration. As a result of the U.S. ESV program, all of the major automotive producing nations in the free world are developing ESV's in various weight categories.

The Domestic ESV Program. Testing was completed on 10 test vehicles of the four prototype family sedan ESV's, developed under Government contract by General Motors, Ford, AMF Incorporated, and Fairchild Industries. With minor exceptions, the combination of performance of these ESV's demonstrated that the specification requirements were generally achievable in the areas of accident avoidance and post-crash factors. Good structural performance was demonstrated for all major specification requirements but a number of requirements relating to occupant injury remain to be demonstrated. The original prototype vehicles produced by AMF and Fairchild are being utilized in accident avoidance and structures research, and in further analysis of vehicle safety systems.

Planning is complete for the Research Safety Vehicle (RSV) Project. The RSV is an experimental development project of a compact-sized passenger car of 3,000-pounds' weight.

Motorcycle Safety. Cost and feasibility of motorcycle safety improvements have been investigated under a cost-sharing contract with AMF, Incorporated. Preliminary results indicate that it would be feasible to manufacture a motorcycle to withstand side impact by an automobile at moderate speed.

Air-Cushion Test Fleet. NHTSA has concluded that the present active systems (seat belts) are effective when used, but the agency is concerned that not enough motorists use installed seat belts. Thus, increased interest has focused on passive restraints, which when perfected and installed by regulation could conceivably provide more protection for the entire motoring public.

Passive restraint studies for the crash protection of drivers and front seat occupants of standard size cars, and for the drivers of subcompact cars are underway. Studies were completed on the development of a passive restraint system for rear seat occupants of standard size cars, the investigation and identification of alternative passive protection systems, and the development and evaluation of anticipatory crash sensors.

An air-cushion fleet test program was initiated during the reporting period with the purchase of 125 air-cushion-equipped 1972 Mercurys, for use at GSA interagency motor pools in Los Angeles, California; Salt Lake City, Utah; Miami, Florida; San Antonio, Texas; and Buffalo, New York. All seating positions in these cars have seat belts and each vehicle is equipped with an air-cushion passive restraint system for the right front passenger.

GM has produced 1,000 air-cushion-equipped 1973 Chevrolet Impala four-door sedans, half of which are retained by GM and half have been leased. NHTSA has leased 50 of the GM air-cushion cars which are assigned to the National Park Service Police Fleet for use in the Washington, D.C., area. Most of the leased vehicles will be equipped with crash recorders developed

by NHTSA to provide an accurate record of accelerations in the event of an accident. Air cushion restraint systems are provided at all front seating positions and lap belts are provided for the rear seat positions.

To date, the 1972 Mercury fleet has logged approximately 20 million miles, and the 1973 Chevrolet fleet has logged about 10 million miles. There have been no failures of the air cushion systems to deploy on demand. The passenger air cushion in one of the Chevrolets deployed accidentally. The vehicles have been involved in approximately 175 accidents at severity levels below the air cushion deployment level. Nine crashes have occurred (four Mercurys and five Chevrolets) severe enough to cause air cushion deployment.

In addition to the test fleet crashes, the Eaton Corporation crashed two of its driver and passenger air-cushion-equipped Mercurys into a barrier at 25 mph using human volunteers as test subjects. The volunteers (male driver and female passenger) suffered no injuries except for a slight bruise of the passenger's pelvic area caused by the lap belt.

On other automotive safety issues Notices of Proposed Rulemaking (NPRM) were issued that will upgrade existing standards: (1) Changes to FMVSS No. 108 to establish requirements for headlighting system; require separation of stop lights from other rear lamps; require installation of side-turn signal lamps; and provide that lighting equipment conform rather than be "designed to conform." (2) Revised notice on Uniform Tire Quality Grading to specify performance criteria for treadwear, traction, and high speed. (3) A notice on vehicle tires, other than passenger cars, was issued to provide laboratory performance criteria on strength and endurance. (4) A notice which defines failure criteria for tires tested for high speed or endurance under laboratory conditions. (5) A decision by the U.S. Circuit Court deleted the requirements for high-speed and endurance laboratory tests on retreaded tires, FMVSS No. 117. (6) A notice defining the area in which the hip point of a manikin must fall when installed in the driver's seat position in relation to the manufacturer's seating reference point was issued.

Advance Notices of Proposed Rulemaking (ANPRM) were issued on: (1) Automatic braking systems that would sense impending hazards; (2) performance requirements for the resistance of vehicles to rollover; and (3) adherence of vehicles to a curved path during braking tests.

Regulations

P.L. 92–548 (1972) amended the National Traffic and Motor Vehicle Safety Act of 1966 to give the Secretary authority to exempt vehicles from the provisions of the motor vehicle safety standards on four specified bases. Accordingly, a regulation was adopted whereby manufacturers may obtain temporary exemptions from the standards on the basis of: (1) Substantial economic hardship; (2) facilitation of the development of new motor vehicle safety; (3) low emission engine features; or (4) the existence of an equivalent overall level of motor vehicle safety.

A Defect Notification Regulation became effective in March 1973, which specifies information to be included in the defect notification to vehicle owners by manufacturers. The notice is to specify: (1) That a safety-

related defect exists; (2) the exact part of the vehicle involved; (3) the malfunction that may occur; (4) the date when parts will be available at dealerships for repairs; (5) the approximate time necessary to repair the vehicle; (6) the conditions that may cause the malfunction; (7) the precautions, if any, that the purchaser should take before repair; and (8) an evaluation of risk to traffic safety. A notification shall not contain any statement or implication that the problem is not a defect or that it does not relate to motor vehicle safety. It is expected that better notification will encourage more owners to have their vehicles repaired.

Program Plan for Motor Vehicle Safety Standards. This plan provides description and schedules for rulemaking actions over a 2- to 3-year period. These actions are those deemed to have the best potential for reducing accidents and resulting deaths and injuries. The plans are carefully coordinated to insure that a systems approach is followed.

The plan currently under revision will include a list and brief description of all supporting R&D activities, and will separate plans into categories:

1. Scheduled Rulemaking Actions (RMA's), i.e., those items that can be scheduled with reasonable accuracy.

2. Advanced Development Objectives (ADO's), i.e., those items that require research before requirements can be set.

Standards Enforcement Activity. Federal Motor Vehicle Safety Standards (FMVSS) require manufacturers of motor vehicles and equipment to insure and certify minimum levels of safety performance in their products. NHTSA is responsible for monitoring manufacturers' certification and investigating noncompliance. During the past year, 74 vehicles were tested for 224 performance requirements of the safety standards. In the same period, 4,801 tires and a miscellany of 3,740 other items were tested, including seat belts, lighting equipment, brake hoses. brake fluid, child restraints and interior materials.

Additional investigations resulted from the joint regulation (DOT and Treasury) governing conditional importation of noncomplying motor vehicles and motor vehicle equipment into the United States. More than 6,060 related customs declarations were processed during the period and these resulted in 1,036 investigations.

As a direct result of the enforcement effort, 84 civil penalties totaling over $600,000 have been imposed since the inception of the standards enforcement program in 1968. Of these, 44 penalties amounting to $146,900 were imposed during the fiscal year.

Rulemaking Activities. A new standard issued this fiscal year, FMVSS No. 126, requires manufacturers of slide-in campers and trucks that accommodate them to provide information concerning proper loading and load distribution. A Consumer Information Regulation was published to supplement FMVSS No. 126.

Two standards were upgraded by amendments during this period. FMVSS No. 105 specifies requirements for motor vehicle hydraulic brake systems and extends applicability to multipurpose passenger vehicles, trucks

and buses equipped with hydraulic brake systems. FMVSS No. 116 was amended to include labeling requirements for those brake fluids previously unregulated.

National Motor Vehicle Safety Advisory Council. The National Motor Vehicle Safety Advisory Council was established by the National Traffic and Motor Vehicle Safety Act of 1966 to advise the Secretary on the motor vehicle safety standards program. In addition, the 22-member Council is responsible for reviewing programs to carry out the Motor Vehicle Information and Cost Savings Act of 1972. The Council provides the Secretary with a cross section of opinion and experience from representatives of State and local governments, automotive manufacturers and dealers, and the public.

A major accomplishment in FY 1973 was the Council's sponsorship of the First International Congress on Automotive Safety, whose theme was standardization of automotive diagnostic systems. The Congress, attended by more than 400 persons from the United States and abroad, provided a public forum for the discussion of issues and the communication of new knowledge. Based on information derived from the Congress, the Council formulated a recommendation to the Secretary urging interchangeability and standardization of motor vehicle diagnostic systems.

The Council held approximately nine full open meetings during the year with additional committee meetings. Some of the more important actions taken by the Council during the fiscal year were: (1) Endorsing State legislation and model laws requiring the use of seat belts; (2) urging removal of legal barriers to the introduction of passive restraint systems in automobiles; (3) urging continuation and increased funding for multidisciplinary accident investigation teams; (4) urging the removal of the starter interlock aspect of seat belts required on 1974 model cars; (5) sponsoring a public forum on direct and indirect visibility standards and research; (6) meeting with representatives of Ford, GM, and Chrysler on priority safety issues; and (7) urging improved coordination with the private sector in investigation of air bag fleet test crashes.

HIGHWAY SAFETY: *The Role of the Driver*

During the 1960's, annual traffic deaths and the fatality rate per 100 million miles driven rose steadily until 1966[1] when the Highway Safety and National Motor Vehicle and Traffic Safety Acts were passed. In 1967, when the initial motor vehicle and highway safety standards were issued, the fatality rate was 5.5. The trend since that time has been a consistent downturn to 4.5 in 1972. There are preliminary indications of further improvement during the latter half of FY 1973, to 4.3 which would represent a decline of 21.8 percent in 6½ years.

These statistics are encouraging because a critical variety of factors have acted in concert to aggravate traffic safety problems beyond those of greatly increased numbers of drivers, motor vehicles, and miles of travel, including an increase in both average and deviant speed; an even-greater proportion

[1] 1966 rate—5.7.

of accident-prone drivers; and more night driving. While some 57,529[2] Americans died in traffic crashes in 1972—an enormous penalty to pay for motoring convenience—the rapid upward trend of highway fatalities during the 1960's has slowed considerably since the inception of the national traffic safety effort.

The decline in the death rate results from a multiplicity of projects, programs, decisions and actions at every level of government and industry, as well as a reflection of public attitude. It is difficult to assess the relative effectiveness of individual safety measures and devices, but sufficient time has elapsed since inception of the national traffic safety effort to generate evidence of the efficacy of broad aspects of the program:

- Initially, more of the motor vehicle safety standards governing the basic safety devices were made applicable to automobiles than to other categories of vehicles. Some 64 percent of the cars on the road have been built in conformance with the Federal standards, and they account for about three-fourths of the mileage driven. In spite of an increase of nearly 20 percent in the number of cars between 1967 and 1972, traffic fatalities of passenger car occupants have remained virtually constant. At the same time, fatalities among other vehicle riders, bicyclists and pedestrians have increased.

The relative constancy of passenger car fatalities can be attributed to the success of the motor vehicle safety standards.

- All of the States have comprehensive highway safety programs based on national highway safety standards.
- Statistics emerging from those segments receiving special emphasis, such as the federally funded Alcohol Safety Action Projects (ASAP's), and selected traffic law enforcement at high accident locations have demonstrated their lifesaving qualities. The results are being applied by the States in their State and community traffic safety programs.
- The continuing upgrading of the Nation's road networks is reflected in the fatality rates of the different systems:

	1967	*1971*
Interstate system (fully improved)	2.89	2.59
Designated for interstate (not fully improved)	5.70	5.04
Other Federal-aid primary	6.22	5.17
Federal-aid secondary—State	7.05	6.41
Federal-aid secondary—local	5.86	5.31
Other State highways	4.62	4.08
Local roads and streets	4.70	4.01
All highways	5.32	4.54

Prospects. Traffic safety is an intricate matter involving as it does the motor vehicle, the streets and highways, the enforcement and administration of safety rules, regulations and precautions, the pedestrian and above all, the skill and awareness of the driver. Furthermore, the research, the

[2] Including Puerto Rico (558).

projects, laws and programs are necessarily directed at a multitude of traffic safety elements through Federal, State and local governments, schools, private industry, and a great number of organizations.

In spite of improvements and payoffs such as those mentioned above, motoring remains a hazardous, expensive, and all too often tragic, form of transportation. The cost to society of traffic deaths, injuries and property damage is now estimated to be $36 billion a year, or $250 for every man, woman and child in the country. Continuing factors include:

- Annual vehicle-miles driven passed the trillion mark in 1968, and have increased since at more than 5 percent a year, which means even greater exposure to traffic hazards.
- Rural driving is done at higher average speeds than urban motoring, and these speeds as well as the mileage driven are increasing, which has resulted in a death rate twice as high on rural roads as on urban networks.
- There has been a steady increase of vehicles registered of more than 4 percent a year, and especially of trucks and motorcycles—5 and 13 percent, respectively, in 1972.
- A growing percent of drivers are among the youngest and oldest age brackets, the most accident-prone groups.
- Per capita consumption of distilled spirits rose 23.5 percent between 1967 and 1972, and alcohol is the number one highway killer.

Current and proposed safety alternatives have been examined to determine how best to achieve annual reductions in the fatality and injury mileage rates. Recognizing the need to reduce the severity of crashes that occur, a decision was made to improve automobile crashworthiness (especially occupant restraint systems) and to encourage mandatory seat belt legislation (to be carried out through the State and community programs). Results obtained from an evaluation of 35 separate alcohol safety action projects are favorable to a nationwide alcohol countermeasures program. Other attractive alternatives include improved hydraulic brakes and vehicle directional controls, selective urban traffic law enforcement, driver controls, and pedestrian safety in the State and community highway safety program. In considering the level of effort needed, NHTSA is mindful of the recommendation of its National Motor Vehicle Safety Advisory Council of the adoption of goals to achieve a one-third reduction in the 1968 fatality rate by 1980 (5.4 deaths per 100 million vehicle-miles). This would yield a fatality rate of 3.6 deaths per 100 million vehicle-miles and a proportional reduction of injuries.

HIGHWAY SAFETY: Alcohol and Traffic Safety

Excessive use of alcohol is the largest single contributing factor to serious crashes on American highways. Evidence continues to accumulate that intensive Government programs can be effective in reducing numbers of alcohol-involved crashes. Initial fatality data from the Alcohol Safety Action Projects (ASAP's) sponsored by NHTSA indicate that these projects

are producing a countertrend to the general increase in traffic fatalities within the United States.

The development of remedial measures for the drinking-driving problem is complex and difficult; activities of all safety agencies are interdependent. Remedial measures must be multifaceted and insure the coordination of all groups concerned with highway safety and alcoholism.

The NHTSA Alcohol Countermeasures Program, one of DOT's National Emphasis Programs, embodies six major areas of activity:

1. An Alcohol Safety Program which establishes integrated projects at the local level to demonstrate the effectiveness of new countermeasures.
2. The training of alcohol safety manpower.
3. A program to encourage remedial legislation.
4. Emphasis on alcohol-related problems in the regular State-community matching fund program.
5. A public information program aimed at gaining public understanding and support.
6. A research and development program designed to put new tools into the hands of local agencies to combat the problem.

The central feature of the NHTSA Alcohol Countermeasures Program is the 35 ASAP's, which cover approximately 15 million of the 119 million licensed drivers in the United States. Both total crashes and fatalities show a slight drop in the ASAP areas, in contrast with increases in non-ASAP areas under observation for comparative purposes. At the same time, alcohol-related arrests rose 130 to 150 percent at the ASAP sites.

Of the many measures utilized in the ASAP demonstrations, one of the most important aims at rehabilitating problem drinker-drivers. Activities include educational programs, therapeutic sessions for hard-core drinkers, and community rehabilitation efforts.

Rehabilitation efforts grow out of court referrals of convicted drunken drivers to driver improvement schools or other remedial facilities as an alternative to fines, jail terms, and/or driver license suspension or revocation. Stern penal provisions must be maintained for "clients" entering the rehabilitation programs or they do not remain in such programs for long.

The first nine ASAP's are nearing completion of, or have completed, their operational periods. Those in Nassau County, New York; Washtenaw County, Michigan; Portland, Oregon; and Seattle, Washington, were scheduled to cease operation on June 30, 1973. The one in Wisconsin ceased on December 31, 1972. Of the remainder, the Denver ASAP, the Albuquerque ASAP, and the one in Mecklenburg County, North Carolina, are scheduled to stop on December 31, 1973, and the one in Vermont, on June 30, 1974. Final reports are due 3 to 4 months after the cessation date.

Safety—A Cooperative Effort. A summary of all the Federal-State-local efforts to improve the safety of highway travel would include explanations of the FARE (Fatal Accident Reduction Effort) and ASAP (Alcohol Safety Action Program) concepts, development of programs to increase seat belt use, demonstrations of the effectiveness of intensified traffic patrolling, either

using the State Police for more hours per week, or assigning more police to traffic management. Related improvements to the traffic court systems, improvement of the operating condition of motor vehicles, and employment of more and better trained traffic control specialists will all contribute to enhanced traffic safety.

Engineering Aspects. Highway safety is a special problem of increasing magnitude which cannot be solved by any single group of countermeasures or any single governmental jurisdiction. Programs for highway safety transcend State and local jurisdictional and organizational lines, and involve a wide range of activities in various Highway Safety Program Standard areas.

Since the Highway Safety Act of 1966, Section 402(a) requires submission by the States of a "master plan" covering existing and proposed highway safety activities for a multiyear period, all States had highway safety programs approved by the Secretary by December 1969. The second Comprehensive Plan, covering 1974–1977, was due by the end of calendar year 1972. Comprehensive Plans for five States were approved without conditions for the full 4-year period. Comprehensive Plans for all other States were approved with the stipulation that continued approval beyond 1, 2, or 3 years is contingent upon compliance with certain specified conditions.

The plans were expected to include these items:

(1) *Identification of Accident Locations.* All States should be able to identify high-frequency accident locations accurately to within one-tenth of a mile in rural areas and to within 100 feet in urban areas on their Federal-aid and State highway systems by December 31, 1973. This same accuracy should be obtained for all public roads within each State by December 31, 1975.

(2) *Traffic Engineering Capability.* Traffic engineering expertise, provided through training of their own personnel, should be available to all jurisdictions within the State having responsibility for public roads, including all cities with a population of 50,000 or more and all counties of 250,000 or more by December 31, 1975. Cities of 25,000 population should achieve the engineering capability within 10 years.

(3) *Skid Accident Reduction Program.* A statewide inventory for skid resistance projects encompassing all paved roads with a posted speed limit of 40 mph or higher should be established and in operation by December 31, 1975.

(4) *Uniform Regulatory and Warning Signs.* Each State should bring all warning and regulatory signs into conformance with provisions of the 1971 edition of the *Manual on Uniform Traffic Control Devices* (*MUTCD*) by December 31, 1974.

(5) *Pedestrian Crossing Program.* Using data obtained from activities concerning the identification and surveillance of accident locations, each State, and especially its political subdivisions, should identify high hazard pedestrian crossings and establish a systematic plan for improvement by December 31, 1975.

Impact Attenuation Devices. In November 1972 FHWA issued directives to field offices which require the installation of impact attenuation devices, or crash cushions, in gores or other highway elements with hazardous fixed objects on high-speed or high-volume Federal-aid highways. Experimental installations of these relatively low-cost energy absorbing units in front of rigid objects, such as bridge railing ends, parapets, large sign supports, and other obstructions which cannot be eliminated, have proven spectacularly successful in reducing occupant injury and vehicle damage.

Rail-Highway Programs. FHWA issued a new policy in 1973 for financing railroad-highway grade-crossing improvements under the Federal-aid highway program. The new policy makes a greater share of Federal funds available to the States for financing these improvements and reduces the railroads' share of the costs of installing automatic protective devices at grade crossings from 10 percent to nothing and of constructing railroad-highway grade separations from 10 to 5 percent. The new policy has accelerated advancement of railroad-highway grade-crossing safety projects.

TOPICS (Traffic Operations to Increase Capacity and Safety). This title is used to describe urban traffic operations improvement programs. The program aims to solve some of the urgent problems of the cities where relatively minor and inexpensive alterations of physical facilities can improve traffic conditions and safety measurably. Examples include the addition of approach lanes for left turns or smoothing out of dangerous curves in city streets. Since the 1968 Highway Act, a total of $580 million in TOPICS funds has been programed to finance projects estimated to cost more than $1 billion.

The effectiveness of TOPICS projects is vividly illustrated in program summaries compiled by the various State highway departments. For example, after 1 full year of operation, 13 TOPICS projects analyzed by one State resulted in a probable reduction of 318 accidents. The economic savings attributed to this reduction alone was $1.1 million. Adding to this the highway user cost savings in the form of time savings, the total economic value is $1.6 million annually, or 136 percent of the total initial construction cost of the improvements.

During FY 1973, approximately 1,611 safety improvements were undertaken by the various State highway departments involving $190.6 million in Federal-aid highway funds. Safety improvement work was distributed among the various Federal-aid highway systems as follows:

	Million ($)
Interstate	95.8
Primary	18.5
Secondary	14.3
Urban	21.3

TOPICS funds amounting to $40.7 million were obligated for safety improvement projects in urban areas of 5,000 or more population.

HIGHWAY SAFETY: Research and Demonstration

State and local comprehensive safety programs represent only one of the approaches to the many-faceted effort to prevent accidents and to lessen their severity.

Another approach is being made through research projects undertaken by NHTSA, by FHWA, by the States, by the academic community, and by private efforts. Perhaps the best known of these are the alcohol safety action projects, now underway in 35 States, and the selective traffic law enforcement projects, in six States. Even more important is the fact that these 100 percent federally funded projects are being emulated in other locales where similar alcohol and STEP-like projects have been instituted, using State funds and Federal-aid matching funds.

FARE (Fatal Accident Reduction Enforcement). In mid-1972, planning was initiated for a program that would provide for a nationwide intensification of traffic law enforcement. In the closing days of the 92d Congress, NHTSA was authorized to obligate an additional $10 million in State-community funds during FY 1973 to finance this project. This new effort required a great deal of planning, including consultation with State and local officials, and the development of program planning guides. A how-to-approach-it manual was drawn up and refined in a series of meetings with the Governors' Representatives for Highway Safety. Each State was requested to prepare a detailed plan that would identify its high fatal accident locations and select those locations where enforcement would have the greatest impact on accidents. In May 1973 States began implementing their FARE projects by utilizing their share of the $10 million in safety program matching funds designated for the FARE effort.

STEP (Selective Traffic Enforcement Program). STEP was established in mid-1971. In 1972 four additional jurisdictions were chosen to conduct STEP projects, three of which become operational in January 1973: Fort Lauderdale, Florida; Tacoma, Washington; and the State of North Dakota. The fourth site, the State of West Virginia, has not yet submitted a detailed plan for its proposed operations. The two States will not, in fact, operate statewide programs, but rather the North Dakota Highway Patrol and the West Virginia State Police will impose STEP controls at selected rural high accident frequency locations.

Results of the first three STEP's vary. Overall, accident trends moved downward while STEP operations were in progress. Accidents declined, while city-wide levels climbed or decreased less markedly. However, this trend did not continue when STEP ceased in a particular traffic area.

Many States and municipalities are initiating STEP programs within their jurisdictions based on the limited data available. Examples: Wisconsin developed a 31-county project with the Highway Patrol. Michigan has 23 STEP programs in small communities. Florida has a partial program with the Florida Highway Patrol. All of these are financed with State/local funds or with matching funds provided through NHTSA.

In a special demonstration project initiated this year, Michigan and Texas contracted with NHTSA to conduct STEP-like programs especially

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on weekends and holidays. Each received Federal funds to pay overtime salaries to State Police highway patrolmen for special duty over these times of peak highway travel. Michigan, for instance, was able to increase such patrols by the equivalent of 60 officers each weekend.

The projects demonstrate that better use of the facilities and manpower that are already available can have a marked effect on accident rates. In Michigan, the results showed 59 fewer fatalities and 42 fewer fatal accidents than had been expected in the 5-county demonstration area.

In Texas, fatalities were down by 14 and fatal accidents by 10 in the Harris County (Houston) area. Both projects were carried out at a cost lower than the allocated amount.

Safety Standard Revision. In August 1972, the draft of the proposed revision of the Highway Safety Program Standards administered by NHTSA was published in the Federal Register. This draft represented the efforts of a task force assigned by the Administrator to work with members of the National Highway Safety Advisory Committee, numerous officials and citizens, as well as with NHTSA regional administrators, headquarters staff, and Governors' representatives. Comments on the proposed revisions were requested from public officials, organizations and citizens by February 1973.

If approved, the eight consolidated standards will cover the following:

- Program Administration and Evaluation.
- Traffic Laws and Regulations.
- Vehicle Requirements.
- Traffic Safety Education.
- Driver Licensing.
- Police Traffic Services.
- Traffic Courts and Adjudication Systems.
- Emergency Medical Services.

Information Reporting System. In December 1972, NHTSA established a Program Information Reporting System encompassing the State and local government programs covered by the Highway Safety Program Standards, to obtain data needed for measuring program progress. The system will help States improve their traffic safety programs and help NHTSA monitor the State programs, assist State efforts, and establish a uniform approach to national objectives.

National Highway Safety Advisory Committee. This group held two full meetings and numerous smaller meetings throughout the country at which it considered and publicized problems relating to highway usage and suggested remedies or solutions for such problems as implementation of highway standards, elimination of roadside hazards, and mandatory use of seat belts. The Committee recommended increased manpower for highway safety and instituted a national Alcohol Safety Action Plan; it suggested that the Department sponsor a conference on safety and efficiency on the Interstate System.

Youths Highway Safety Advisory Committee (YOUTHS). The Youths Highway Safety Advisory Committee was established by the Secretary in 1971. It includes 15 young people between the ages of 15 and 24 from throughout the country who are appointed by the NHTSA Administrator with the approval of the Secretary. The committee's purpose is to examine highway safety problems and explore, develop and recommend program ideas designed to attract and sustain the active support of young people for the cause of highway safety.

At a meeting in Washington, D.C., the Committee agreed to concentrate its efforts in the field of alcohol countermeasures as they relate to young people. It asked NHTSA to undertake a study to investigate the problems of alcohol and other drugs as they relate to the young driver in order to develop countermeasures suited to the needs of young people. A 2-year research effort has been approved, to be funded in FY 1973–1974.

MOTOR CARRIER SAFETY

Intergovernmental Activities. To date, 80 separate agreements pledging intergovernmental cooperation and exchange of information have been negotiated with 50 States and the District of Columbia. As a consequence, most States administer a safety regulatory program over intrastate carriers. In FY 1973 instructional assistance to State regulatory officials was provided on 332 occasions and evidence was gathered and forwarded to State authorities, at their request, on 250 occasions.

The need for these agreements is obvious. For example, transportation of hazardous materials entirely within a State by intrastate carriers is not generally subject to the Federal Hazardous Materials Regulations. But the regulatory standards of the individual States contain inconsistencies from State to State and with Federal standards. Therefore, when the State regulations are more restrictive than the Federal regulations, orderly transportation can be impeded. To eliminate this problem, the States are being encouraged to adopt the Federal Hazardous Materials Regulations. So far 25 States have adopted them completely and six have adopted them in part.

Prior to performing commercial transportation of regulated commodities, motor carriers must obtain operating authority from the Interstate Commerce Commission. Nearly 9,000 safety fitness reports, including responses to petitions for reconsideration, were transmitted to the Interstate Commerce Commission in connection with pending carrier applications for temporary, emergency, permanent or other kinds of operating authority.

Regulations. There were 11 significant motor carrier safety rulemaking actions published during FY 1973. The actions involved such matters as requirements for warning devices for stopped vehicles, new standards for reporting accidents, new standards for coupling devices, new regulations for drivers' log forms, revision of maintenance requirements, and disqualification of drivers arrested for intoxication. The Bureau of Motor Carrier Safety, acting as a member of the Hazardous Materials Regulation Board, also participated in rulemaking relating to transportation of blasting caps, specifications for portable tank containers, and requirements for shipping radioactive and etiologic materials.

Safety Education. During the past year the Bureau of Motor Carrier Safety conducted an intensive education program by means of publications and correspondence with trucking firms to explain its own functions and provide data on causes of motor carrier accidents. It also conducted an extensive inspection program, including 4,300 safety surveys of carriers, 27,000 roadside inspections, and 1,560 surveys and 490 inspections of hazardous materials in control of shippers and carriers.

Enforcement. In FY 1973 there were 1,252 enforcement investigations. Of these, 385 were forwarded to FHWA's legal staff for appropriate disposition. The remaining 867 were administratively closed. During this fiscal year, 128 civil forfeiture proceedings were begun. In civil cases completed during FY 1973, a total of $322,700 was paid to the U.S. Treasury. Two hundred eighty-one criminal cases were prosecuted and $188,333 in fines was collected.

Accident Investigations. Over 525 general investigations of accidents were made, as well as 303 investigations in depth. Incidents relating to carriage of hazardous materials were investigated in 8,100 cases and about 60,000 carrier accident reports were reviewed. The National Transportation Safety Board was notified of 260 accidents and on four occasions, the Board assumed control of the Federal investigation of an accident.

The "for hire" motor carriers have always been required by the regulations to report accidents. From 1964 to 1971, the accident rate of these large carriers has decreased from 3.2 to 2.2 per million miles while the total intercity vehicle-miles increased from 9.5 billion to 13.9 billion. The data from these reports are analyzed and pertinent material useful in preventing accidents is published. During FY 1973 two such reports were distributed: (1) "Analysis of Accident Reports Involving Fire"; and (2) "Analysis of Motor Carrier Accidents Involving Vehicle Defects or Mechanical Failure."

Beginning January 1, 1973, private carriers were required to report accidents as the "for hire carriers" are. Reportable accidents are those in which there are any injuries or deaths, or in which more than $2,000 worth of property damage occurs.

Studies. Two studies were completed in FY 1973. One of these, "A Study of the Relationships Among Fatigue, Hours of Service and Safety of Operations of Truck and Bus Drivers," was conducted to test the theory that driver fatigue is a major contributor to many accidents. The performance of interstate truck and bus drivers during typical operations was measured and certain indicators of their level of mental arousal were simultaneously recorded. Data reflecting the performance and physiological responses of drivers were collected during 195 truck and bus runs in every part of the country under all kinds of weather, road, and traffic conditions.

The second study was a validation of a written examination proposed to be made a regulatory requirement in the qualification of truck and bus drivers engaging in interstate commerce. The purpose of the validated written examination is to assure that driver candidates have a working knowledge of regulations critical to their own safety, the public safety, and the protection of valuable equipment prior to driving on public roads.

Four other research studies were initiated dealing with braking and acceleration, safe loading practices, preventive maintenance, and guidelines to aid examining physicians in qualifying drivers.

Cargo Security. Cargo security activities, a new duty assigned by the Department in FY 1972, involved slightly over 700 visits to trucking terminals and, by means of a questionnaire-type checklist, encouraging company officials to analyze their local problems in cargo loss by theft and pilferage. The FHWA also participated in 165 separate security education conferences in concert with the trucking industry.

RAILROAD SAFETY

Train Accidents. The number of reportable train accidents in 1972 increased by 3.1 percent over the previous year. Derailments, comprising 73.1 percent of the total, increased by 7.4 percent. Collisions decreased by 11.8 percent. Other train accidents increased by 4.8 percent when compared with 1971.

Casualties resulting from all reportable train-service, and nontrain accidents decreased by 5.3 percent.

Table 6 shows the number and types of train accidents, and the resulting casualties from accidents of all types during the calendar year 1972 and the two preceding years. 7,532 train accidents were reported in 1972, an increase of 228 accidents (or 3.1 percent) over those reported in 1971, and a decrease of 977 (or 7.0 percent) over those in 1970. There were 5,509 derailments reported, an increase of 378 (or 7.4 percent) over those reported in 1971, and a decrease of 93 (or 1.7 percent) over those in 1970.

Included in the number of accidents involving motor vehicles were 51 derailments and 344 miscellaneous train accidents, accounting for 95 deaths and 113 injuries.

Also included in the total casualties at rail-highway grade crossings were 1 fatality and 68 injuries to employees on duty.

Information concerning these accidents is summarized in Table 9.

During FY 1973 accident analysis personnel investigated 121 train accidents involving 49 fatalities and 1,314 injuries. In four additional accidents, the National Transportation Safety Board took jurisdiction. At the request of the Board, however, FRA personnel performed the fieldwork necessary for the Board to determine the "Probable Cause" and to prepare a public report on the circumstances involved. FRA published reports for 10 train accidents during FY 1973.

Table 7 records accident investigations for fiscal years 1969 through 1973.

Rail-Highway Grade-Crossing Accidents. During 1972, 3,379 train and train-service, rail-highway grade-crossing accidents were reported, a decrease of 13 accidents or .4 percent compared with the previous year.[1]

[1] In addition, there were 13 nontrain grade-crossing accidents during 1972 which resulted in 22 injuries.

A total of 1,260 deaths and 3,285 injuries resulted from these accidents, a decrease of 7.1 percent in deaths and 1.4 percent in injuries compared with 1971.

Accidents at grade crossings involving trains and motor vehicles during 1972 totaled 3,222 and resulted in 1,190 deaths and 3,201 injuries—a decrease of 2 accidents, 77 deaths, and 52 injuries compared to 1971 (Table 8).

Locomotive Inspection. The Office of Safety's field inspectors investigated 55 accidents during FY 1973. Failure of locomotive equipment contributed to 36 of these accidents and resulted in 36 injuries. There were no fatalities. (See Tables 9 and 10.) Defective conditions or major causes of these accidents involved floors, steps, and passageways, internal combustion engines, crankcase explosions, cooling systems, air compressors, energized electrical parts, cab doors, windows, and seats.

During FY 1973, the Locomotive Branch inspected 77,844 locomotives, a decrease of 9,280 compared with the number of units inspected in the previous fiscal year (see Table 11). Of the units inspected, 10,020 (or 12.9 percent) were reported defective. The percentage of defective locomotives decreased 0.2 percent from last year.

The percentage of defective equipment in use decreased from 9.3 to 9.0 percent during the year.

Inspection Activities. Tables 12 and 13 show the number of freight cars, passenger train cars, and locomotives inspected; the number found with defective safety appliances; the percentage defective; and the data for comparison with the preceding year. Of the 631,944 freight cars inspected, 9.8 percent had defective safety appliances, as did 10.1 percent of passenger cars and 2.0 percent of locomotives inspected.

Table 7 lists the results of field agents' activities related to enforcement under the Accident Reports Act.

Investigations of Complaints—Safety Appliances. About 207 of the total 269 complaints relating to safety appliances were satisfactorily resolved during the year. Investigations disclosed approximately 800 counts of violation of the Safety Appliances Act, most of which were resolved during the year.

Hours of Service Act. During the year, hours of service reports were filed by 84 railroads reporting 5,279 instances of all classes of excess service, including 2,550 by operators, train dispatchers and other employees subject to the 9-hour and 12-hour provisions of the law. A breakdown of this total is shown in Tables 14, 15 and 16. The reports also covered 2,729 cases of excess service performed by train and engine employees subject to the 14-hour provisions of the law.

Effective December 26, 1972, the Hours of Service Act, as amended by Public Law 91–169, provided for a further reduction of the hours of duty of train and engine employees from 14 hours to 12 hours.

Penalties. In 1973 the Chief Counsel of FRA negotiated settlements totaling $811,345.50 with 78 railroads under the Federal Claims Collection Act for civil penalty violations of the railroad safety laws.

In addition to the above amount, U.S. District Courts assessed penalties of $10,700 for violations of the Hours of Service Act, the Safety Appliance Act, the Accident Reports Act, and the Department's Hazardous Materials Regulations. Since violations of the Accident Reports Act and the Department's Hazardous Materials Regulations are criminal in nature, they are not subject to Claims Collection Act procedures.

Under the Federal Claims Collection Act, 4,012 safety appliance claims were filed during FY 1973, with five sent to the U.S. Attorney.

In addition, another 137 special inspections of new equipment were made by field inspectors and members of the Washington staff in response to carrier, shipper, and builder requests to insure compliance with safety standards and regulations.

Signal and Train Control Equipment. FRA controls alterations and modifications of the signal systems on railroads and also takes action to enforce correction of defects in the signal systems. FRA's investigations of defects usually result in immediate correction of the defects, both those found by its own inspectors and those that are the subject of complaints. Tables 17 and 18 show the extent of the inspection activity.

Hazardous Materials—Inspection and Control. During the year the number of full-time hazardous materials inspectors was increased to six, with two additional men detailed to this function; thus there is a full-time hazardous materials specialist assigned to each FRA region. These men, in conjunction with the equipment and safety inspectors, performed 1,891 inspections of shippers' preparation and the railroads' transportation of hazardous materials. Some inspections resulted from complaints filed with FRA.

Field inspectors investigated 103 hazardous materials incidents and 94 railroad accidents which involved the presence of hazardous materials.

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 lifesaving medals to persons who, by extreme daring, risk their own lives in saving or endeavoring to save lives in any wreck, disaster, or grave accident, or preventing or endeavoring to prevent such a wreck upon any railroad within the United States or involving any motor vehicle on the public highways. At the beginning of the year there was one pending application involving railroads and none was received during the year.

Since the enactment of the Medals of Honor Act in 1905, 137 applications have been received for the award; 82 were awarded, 54 denied, and one is pending.

RAILROAD STANDARDS AND PROCEDURES

Standards and Procedures Promulgated. Amendments were published to the Track Safety Standards adopted in 1971 and two emergency orders

were issued to prevent the use of two types of railroad cars that were found to be potentially dangerous.

Notices were issued to invite attention to proposals to formulate rules governing standards for freight car construction, standards for shielding tank cars subject to puncture damage, and standards for designing vents and valves for such tank cars. Another proposed rule would require telegraphic reports of all accidents in which there was death or serious injury to five persons.

Standards Initiated During FY 1973. Action to develop numerous new standards was initiated during the year. These included a proposal to make the accident data collected for railroads comparable to that covering accidents in other industries, various proposals for structural and mechanical improvements of railroad equipment, health standards for railroad employees and procedures for using radios to transmit train orders and instructions.

GAS PIPELINE SAFETY

During the year the Department amended the Federal gas pipeline safety standards in the following areas:

- It continued the interim Federal safety standards applicable to gas odorization.
- After several serious gas explosions from unauthorized introduction of natural gas into inactive gas service lines, the standards were amended to prevent unauthorized persons from activating gas service lines that have been deactivated or abandoned, or are not presently in use.
- Restrictions on accidental pressure buildup in certain pipelines were modified to provide more realistic pressure relief limitations.
- New standards were added applicable to those gas pipeline facilities used to store, treat, or transfer liquefied natural gas.
- An amendment to allow permanent field repair of pipeline leaks on certain lower pressure transmission lines by means other than welded repair sleeves.
- By amendment, the use of certain steel pipe manufactured before November 12, 1970, is permitted. The amendment also updated the standards with regard to certain specifications incorporated by reference.
- A more comprehensive definition of service line was provided as it applies to the distribution systems of operators subject to the Natural Gas Pipeline Safety Act (NGPSA).
- By amendments to the liquid pipeline safety standards, telephonic notice to the Office of Pipeline Safety of additional types of accidents was required.

Fifty States, including the District of Columbia and Puerto Rico, cooperated with the Office of Pipeline Safety (OPS) on the gas pipeline safety program under the provisions of the NGPSA. In 1972, the OPS conducted

on-site monitoring of all of the State agencies, except Hawaii's, which are cooperating with the Federal Government in the gas pipeline safety program.

State agencies also took an active role in the pipeline safety training courses initiated and developed in FY 1973. Six 5-day courses at the Transportation Safety Institute (TSI) on the safety evaluation of gas pipelines were attended by 90 staff members from State agencies and 11 from OPS. Also, the OPS and TSI assisted State agencies sponsoring 2-day courses in pipeline safety for intrastate gas pipeline system operators by providing instructors and training materials. Sixteen States sponsored such courses with 900 attending.

The Department has safety jurisdiction over all interstate gas transmission operators and those intrastate gas operators not under State agency jurisdiction, and reviews State agency safety programs to assure compliance by intrastate gas operators under State agencies covered by certifications or agreements under the NGPSA. During FY 1973, the OPS conducted on-site monitoring of 15 interstate gas pipeline operators, 100 intrastate gas operators, and seven liquid pipeline operators, subject to direct Federal jurisdiction.

A monthly Advisory Bulletin containing technical and regulatory pipeline safety information is mailed to more than 4,000 addressees in industry and in public interest groups. Staff members participated in the conferences of more than 20 State agency, industry, and professional groups during the year.

Chapter IV

SECURITY OF COMMERCIAL TRANSPORTATION

Hijacking. Eleven attempts were made to hijack U.S. scheduled aircraft during FY 1973. (See Table 19.) Seven hijackings occurred during July and one in August 1972. Two high-violence hijackings followed on October 29, 1972, at Houston and November 10, 1972, at Birmingham. In the Houston crime, four alleged bank robbers and murderers shot and killed a ticket agent and wounded another airline employee, commandeered a B–727 aircraft with 36 passengers and a crew of seven, and forced the crew to fly the plane to Cuba. The hijacking at Birmingham was perpetrated by three fleeing suspects alleged to have committed a variety of crimes, including robbery and rape. The aircraft was flown around the eastern part of the United States and Canada for 29 hours, landing and refueling eight times before going to Cuba. A ransom of $10 million was demanded and $2.5 million was paid. The co-pilot was shot and incapacitated, leaving the exhausted pilot to fly without assistance.

The last hijacking attempt during FY 1973 took place in early January 1973 at Baltimore International Airport. It was an unsuccessful attempt on the part of a drunk with an unloaded pistol. The number of attempts at hijacking throughout the world since 1930 is shown in Table 20.

The Department's Response. The violent hijackings at Houston and Birmingham indicated that criminal suspects desperately trying to avoid capture were using hijacked aircraft as a means of escape. Security measures in effect at that time clearly were not adequate. The Secretary concluded that the inspection of all boarding passengers and their carry-on items under scrutiny of a law enforcement officer was necessary.

Strengthened Civil Aviation Security Program. The Federal Air Transportation Security Program was strengthened during FY 1973. It was changed from an airline voluntary participation program funded by the Federal Government to a required one paid for primarily by the beneficiary of the security program—the air traveler. The Federal Government (DOT/FAA) determines and prescribes the security measures necessary to meet actual and changing threats, must see that security requirements are fully and properly administered, and assure that they are effective.

On December 5, 1972, the Federal Aviation Administrator issued: (1) Amendments to the Air Carriers' Security Programs requesting air carriers to implement a 100-percent inspection of passengers and their carry-on items

as quickly as possible, but not later than January 6, 1973; (2) amendments to the Federal Aviation Regulations (FAR) requiring airport operators to provide for the presence of local law enforcement officers at each passenger boarding checkpoint as soon as possible, but not later than February 6, 1973. To pay for these added security costs levied on the aviation industry, the Secretary strongly supported the air carriers' request to the Civil Aeronautics Board for a ticket surcharge. Certificated U.S. domestic airlines were authorized by the Civil Aeronautics Board on March 14, 1973, to assess each enplaning domestic passenger the sum of 34¢ to cover the airlines' own security costs—principally for passenger and carry-on baggage inspection, and on May 3, 1973, an additional 25¢ to defray the airport operator's costs for providing armed law enforcement officers at the passenger checkpoints. The Federal Government costs for program planning, development, evaluation and enforcement of regulations continue to be supported by congressional appropriations. The effectiveness of the strengthened program is demonstrated by the fact that no U.S. scheduled air carrier was hijacked after December 5, 1972, when the emergency regulations were announced.

International Antihijacking Accomplishments. A significant international countermeasure against hijacking occurred on February 15, 1973, when the United States and Cuba signed an agreement on hijacking of aircraft, providing that each country will submit to prosecution or extradite persons who seize an aircraft registered in either State and bring it to the territory of the other party.

A similar agreement was signed by Cuba and Mexico on June 7, 1973. These agreements are binding international obligations and go far toward solving the problem of "safe havens" for hijackers. Either party may consider extenuating circumstances in those cases in which the persons in question are being sought for strictly political reasons and were in real and imminent danger of death without a viable alternative for leaving the country. A total of 85 out of the 160 hijackings of U.S. aircraft which occurred through FY 1973 successfully reached Cuba. The International Civil Aviation Organization (ICAO) has developed proposed security measures for international aviation and is also continuing its efforts to eliminate "safe havens" for hijackers through the development of a multilateral air security enforcement convention. The Hague Convention for the Suppression of Unlawful Seizure of Aircraft, which came into force on October 14, 1971, now has 58 countries as contracting parties. Although the United States has signed this treaty, implementing legislation has not been passed.

The Montreal Convention for the Suppression of Unlawful Acts Against the Safety of Civil Aviation, which opened for signature at Montreal on September 3, 1971, came into force on January 26, 1973. Thirty-five countries have now ratified it. The Convention deals with sabotage and armed attacks against international civil aviation facilities and creates the same obligations with respect to these offenses as the Hague Convention does on hijacking.

The Tokyo Convention on Offenses and Certain Other Acts Committed on Board Aircraft has been in force since December 1969 among 64 contracting parties. It obligates members to restore control of a seized

aircraft to its commander, expedite continuation of the aircraft's journey, and to return the aircraft and its cargo to the persons lawfully entitled to possession.

Law Enforcement Support. At the beginning of the fiscal year, approximately 1,550 Federal officers (Deputy U.S. Marshals and Customs Security Officers) provided backup support to the airlines for passenger screening, covering only 42 of the some 500 U.S. airports. The emergency amendment of the Federal Aviation Regulations in December 1972 required airport operators to provide the law officer support. As the local law officers began the surveillance, the Federal force was reduced and by June 30, 1973, all Deputy U.S. Marshals had left the program. Most of the remaining 450 of the original Customs Security Officers force will be phased out of the program by June 30, 1974.

Explosives Detection. The problems involved in detecting explosive devices on passengers, in their carry-on baggage, in cargo and mail continue to be a challenge. A number of airlines have purchased X-ray equipment to screen carry-on items. This is a far more cost-effective method than using personnel to do a physical inspection. Over $4 million has been invested by the airlines for 110 X-ray devices and more are on order.

A new explosive detection capability program was developed by DOT/FAA in cooperation with the Law Enforcement Assistance Administration, Department of Justice and the U.S. Air Force. The program plan is for 40 police officer-dog teams trained in explosive detection to be located at 20 airports. Thirty police officers and their dogs have completed the U.S. Air Force course, Lackland AFB, San Antonio, Texas, and are now available at 17 cities to perform routine patrols and respond to bomb threats in their city as well as at the nearby airports.

SECURITY OF CARGO IN U.S. COMMERCE

DOT Leadership Role. In response to the alarming monetary loss to the U.S. economy as a result of cargo theft and pilferage of over $1 billion annually, the Secretary of Transportation in 1971 established an Office of Transportation Security to provide leadership and planning and policy recommendations for a National Cargo Security Program. An Interagency Committee on Transportation Security (ICOTS) chaired by DOT coordinates the Cargo Security Program among the concerned Federal agencies. A parallel industry body sponsored and chaired by the Transportation Association of America coordinates the views and positions of industry and meets periodically with ICOTS to coordinate the overall planning and implementation of the Cargo Security Program.

Analysis of the Cargo Theft Problem. Beginning in 1972, the Office of Transportation Security turned from a year of information gathering to an action program. A breakdown of the billion dollar annual loss into understandable percentages was a major advancement toward the development of corrective actions. In transportation modes except rail cargo carriers, national cargo theft and pilferage losses generally fit the following pattern:

5% After-hours break-and-enter burglaries

10% Armed hijacks or grand larcenies of entire trailers or containers.

85% Individual thefts during the course of normal operating procedures and regular operating hours of the transportation system by persons authorized access to cargo and cargo-handling areas by transportation management, including shippers and receivers. The stolen goods are carried out the front gates of transportation terminals on vehicles or by persons authorized to be in the terminal areas. Within the 85%:

60% is stolen in amounts greater than one case but less than a full load.

Rail cargo does not fit the general theft pattern: most thefts are by outsiders trespassing rail yards and sidings and breaking into freight cars, trailers and containers.

Thirteen general commodities account for 90 percent of theft-related losses. The top 10 are: clothing, electric appliances, auto parts and accessories, hardware, alcoholic beverages, food products, tobacco products, plastic and rubber items, instruments, and jewelry.

Cargo Theft Data System. The Office of Transportation Security is currently developing a capability to collect, analyze and disseminate data on the extent, nature and location of cargo theft in U.S. domestic and international commerce.

A methodology for sampling of cargo losses has been developed. Primary data sources are the quarterly cargo loss and damage reports required by the regulatory agencies from certain regulated carriers. Supplementary data sources such as Customs and FBI data, government shipping loss statistics, and insurance data will be utilized to increase the accuracy of the projections. Government and industry data sources have been identified. An Economic Model of Cargo Loss has been developed and tested on the CY 1970 cargo losses for comparison with the estimates developed by the Senate Select Committee on Small Business. The results of these two independent estimates were $1.47 billion (Senate Committee) vs. $1.06 billion (DOT).

Cargo Security Advisory Standards. The Department's approach to cargo security is to promote better protection and better accountability for cargo throughout the transportation network—from the shipper to the receiver. To assist the transportation industry in determining what specific measures or actions should be undertaken to provide for protection and accountability, the Office of Transportation Security in 1972 established procedures for the issuance of Cargo Security Advisory Standards.

After Notice of Proposed Rulemaking and consideration of public comment, a new Part 85 of the Regulations of the Secretary of Transportation (49 CFR) was established to prescribe the procedures for development and promulgation of Cargo Security Advisory Standards that are scheduled to be issued between June 1973 and December 1974.

Special Projects. DOT has undertaken a number of special activities in the Nation's transportation network to demonstrate ideas and concepts—which contribute to cargo theft prevention. In some projects, Federal funds and personnel are provided, while in others the Federal role consists of monitoring, analysis, and dissemination of the results to the transportation industry and concerned Government agencies. Several projects having particular significance are summarized below.

Cargo Theft Prevention. DOT has undertaken to demonstrate ideas and concepts which contribute to cargo theft prevention. The Federal role may consist either of providing funds and personnel for projects or of efforts to disseminate the results of the industry's own projects. For example, DOT furnished low-cost hardware items to shippers to show their utility in theft prevention. It urged the trial of helicopter surveillance of rail yards to reduce the incidence of theft, and also of marked trucks to prevent hijacking of them. Various sophisticated systems have been developed to identify trucks either from the air or from the ground control points to facilitate capture of truck hijackers.

Federal Highway Administration Activities. Safety regulation inspections of motor carriers by the Federal Highway Administration have been expanded to include advisory security surveys at truck terminals. More than 750 surveys were completed during FY 1973. The FHWA field offices will be the primary monitoring points for implementation by the motor carriers of the new Cargo Security Advisory Standards.

Cooperative Security—Trucking Terminals. Seven trucking companies having terminals located in close proximity to one another in a high theft area contracted with a local security firm to manage collectively the security for these particular terminals. This project documented the advantages, disadvantages and results of collective local security among several companies as compared with independent security for each terminal controlled from a home office many miles away from the problem area. The results: A significant reduction in cargo theft with an increase of $140,000 in profits for the seven companies. Reports on all cargo security efforts are available in Government publications.

Chapter V

TRANSPORTATION AND THE ENVIRONMENT

During FY 1973 environmental responsibilities within the Department were transferred from the Assistant Secretary for Environment and Urban Affairs to the Assistant Secretary for Environment, Safety and Consumer Affairs. The Assistant Secretary provides policy advice to the Secretary on environmental/transportation matters, and monitors and coordinates environmental programs throughout the Department.

Environmental Review Highlights. In fulfilling these responsibilities during the past fiscal year, the Office of the Secretary took a number of significant steps to insure that Departmental projects will comply with existing Federal law relating to environmental protection and historic preservation. Several of the steps involved returning program proposals to the appropriate Administration for further detailed analyses prior to final decisions. Others specified certain design changes or modifications that would be required before project approval. Some of the more important actions are discussed below.

Colorado, I–470, Denver. The Assistant Secretary returned a proposed final Environmental Impact Statement/section 4(f) determination to FHWA and the State for this partial circumferential Interstate facility in the southwest quadrant of the Denver metropolitan area, requesting exploration of further alternatives, since the facility would traverse planned and existing public parklands and an ecologically sensitive area. The air pollution effect of the highway on downtown Denver also requires further analysis.

Colorado, I–70, Glenwood Canyon/Cottonwood Pass. The Assistant Secretary returned to FHWA and the State a proposed final Environmental Impact Statement/section 4(f) determination for detailed analysis of design alternatives on the two principal alternate routes, both of which would create serious environmental problems.

Georgia, I–485, Atlanta. The Assistant Secretary returned the tendered final EIS for this proposed Interstate highway in Atlanta, for a reconsideration of alternatives that would not adversely affect residential neighborhoods, parklands, and a historic district to the extent that this proposal would.

Hawaii, Kanaha Pond, Maui. Kanaha Pond is a valuable wetlands resource, a registered natural landmark, and a critically important habitat for two species of waterbirds on the endangered list—the Hawaiian Stilt and Hawaiian Coot. Improvements to the Pond—which were proposed by

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the State—were designed to increase the nesting success of these waterbirds by maintaining summertime water levels, consistent with the safety of aircraft operating at Kahului Airport, on which the Pond is located. FAA subsequently granted the required approvals.

Louisiana, I–220 Bypass, Shreveport. The Secretary approved the routing of this proposed highway over Shreveport's Cross Lake, the city's water supply and recreation lake, subject to the condition that the final design for the closed drainage system be reviewed by the Louisiana State Health Department prior to final approval by FHWA.

Tennessee, I–40, Overton Park, Memphis. Former Secretary Volpe did not approve the proposed routing of I–40 through Overton Park in Memphis. He stated that he could not make a determination, based on the material available to him, that there was no feasible and prudent alternative to the use of parkland, that the broader environmental objectives of the NEPA and the Federal-Aid Highway Act would be met, or that the existing proposal would comply with FHWA standards on noise.

The Department let the first of a series of contracts for studies on the social and environmental assessment of transportation alternatives, focusing initially on the impacts of Federal-aid highway construction. The results should provide the means for improving the quality of environmental analysis for highway projects, and in the corresponding draft and final environmental impact statements (required by section 102(2)(c) of the National Environmental Policy Act of 1969).

Bicycles. The Department continued its support for bicycles as a mode of transportation. On May 7 and 8, the Department, together with the Department of the Interior, held a 2-day conference on issues related to increased bicycle use. Subjects included transportation planning, safety research, safety education, laws and ordinances, enforcement and theft. The shift from use of bicycles by children to use by adults for utility trips and recreation has shown a need to change transportation, safety, and legal systems now geared primarily to motorized traffic.

The conference, which brought together citizen activists and experts in law enforcement, safety, and transportation, was the first national effort to focus on all subject areas related to increased bicycle use.

Highway Noise Problems and Air Pollution. Joint endeavors of the Department's modal administrations and the Environmental Protection Agency (EPA) have resulted in modifying transportation planning techniques and procedures to assure consistency of proposed urban transportation systems with environmental standards. A model was developed for estimating air pollution emissions (hydrocarbons, nitrogen oxides, carbon monoxide) and noise levels from present and estimated future travel data for urban highway systems.

Noise standards have been issued for use in the planning and designing of federally assisted highways. So highway agencies could acquire the expertise in acoustics and noise control needed to apply these standards, a noise training course was given in 10 locations throughout the country. Approximately 450 State, FHWA, HUD, and EPA personnel completed the

course. In addition, motor carrier noise emission regulations are being developed in cooperation with EPA and will be published next year.

Environmental Impact. Responsibility for insuring that the Department meets the provisions of section 4(f) of the DOT Act rests with the Secretary of Transportation. That section specifies that the Secretary must take no action that requires use of land from a park, recreation area or historic site, unless there is no feasible and prudent alternative. He has, in turn, delegated the day-to-day operation of the review process to the various modes. The major part of this effort in the highway area takes place at FHWA field offices where highway engineers work closely with State highway department officials to insure that proposed projects fulfill environmental protection provisions specified by law. During FY 1973, FHWA processed 373 draft environmental statements on proposed highway projects, including 44 required by section 4(f). During the same period, 451 final environmental statements were prepared and filed with the Council on Environmental Quality, of which 67 involved section 4(f) lands.

To protect historic sites, procedures have been developed for coordinating Federal-aid highway projects involving possible impacts on such sites of national, State or local significance. In FY 1973, FHWA, in conjunction with Federal and State highway and historic preservation organizations, coordinated investigations of 72 such impacts. For affected sites listed in the National Register of Historic Places, the Advisory Council on Historic Preservation was consulted in efforts to eliminate or minimize adverse effects.

The FHWA has initiated a functional replacement program to compensate for the taking of publicly owned buildings, parklands, and facilities when acquiring right-of-way for a Federal-aid highway. The local community can either be compensated on the fair market value concept or, under this program, it can elect to have the old facility replaced. The functional replacement program permits Federal aid in meeting costs of acquiring substitute sites, and construction costs of the replacement facilities. Functional replacements of 26 publicly owned facilities have been determined by FHWA to be necessary, including schools, public housing, an armory, a jail, and others.

Highway Beautification. Within the Highway Beautification Program, billboard removal is receiving top priority within the Department, as contrasted to the Junkyard Removal and Scenic Enhancement titles of the Act. In FY 1973 over $35 million was obligated for sign removal by the States.

During FY 1973, the Department achieved compliance with the Highway Beautification Act by all 50 States. South Dakota was the last State to comply, after DOT applied the statutory penalty of withholding 10 percent of South Dakota's FY 1973 Federal-aid highway funds.

Vermont has the legal machinery required for compliance, but has elected not to comply by refusing to pay "just compensation" for the removal of signs. The Department is currently litigating this issue and has withheld 10 percent of Vermont's FY 1974 funds pending the outcome of this suit.

The "Fifth Annual Awards/1972—The Highway and Its Environment," conducted by FHWA, recognized programs which contributed effectively to a more esthetic highway environment. It attracted more than 600 entries from 50 States and the District of Columbia.

Sign Removal. During FY 1973, the Department issued a National Valuation Schedule by which the States could determine the value of billboards for use in the payment of "just compensation." This schedule is optional with the States; 20 States have approved State schedules. Twenty-two States have elected to use the National Valuation Schedule and the remainder of the States are completing audits of sign companies before deciding whether the National Schedule will be considered equitable in their particular States.

Approximately 120,000 signs were removed through March 31, 1973, of which approximately 35,000 had been removed prior to the beginning of FY 1973.

Marine Programs. Primary responsibility for protecting the marine environment against pollution rests with the Coast Guard. It continues to assist in the preparation, evaluation and modification of regulations to prevent pollution and to provide technical assistance for meetings at the national and international levels dealing with pollution prevention.

During the past fiscal year, the Coast Guard has undertaken a major effort in response to the passage of the Ports and Waterways Safety Act of 1972. In July 1972, the Coast Guard created a working group to help prevent discharges of oil and other hazardous substances into U.S. waters. This group has worked primarily to lend technical support to the U.S. delegation to the Intergovernmental Maritime Consultative Organization (IMCO) for the 1973 International Conference for the Prevention of Pollution from Ships, particularly with regard to accident and outflow analyses and cargo/water segregation studies.

A second aspect of the Coast Guard's antipollution activity is carried out by the National Strike Force. The Atlantic, Pacific and Gulf Strike Teams responded to all significant oil discharges in continental U.S. and Alaskan waters, providing technical expertise and supervisory support to locally responsible officials. During FY 1973, the National Response Center, which was set up at DOT Headquarters to support the Strike Force, was equipped to coordinate spill responses on a limited basis, and is being modified to permit full-time operation.

Significant research activity has led to development of improved equipment and information systems for avoiding or controlling water pollution, particularly that from oil spills. Accomplishments of the research effort include a high seas oil containment barrier and an oil recovery system. Extensive research was also conducted on the environmental effects of the Trans-Alaska Pipeline, and tests of effectiveness were made of equipment for removal of pollution in an arctic atmosphere and for detecting oil spills by infrared and ultraviolet light. A system for recording and storing information about oil spills is also under development.

Environmental Impact Statements. During FY 1973, the Coast Guard prepared environmental impact statements for 50 projects and reviewed 166 statements prepared by other agencies.

Training. Three hundred officers and enlisted personnel attended a 2-week Marine Pollution Investigation and Control School, and three officers obtained postgraduate training in environmental management.

In-House Abatement. Coast Guard activity to comply with the Federal Water Pollution Control Act of 1972 and the Air Pollution Control Act continued. Sewage collection systems were installed on 49 cutters at a cost of $3.1 million, and a bilge/ballast oily water separator and oil-in-water monitor were installed and satisfactorily tested on a 210-foot medium endurance cutter at a cost of $85,000. Abatement equipment was installed at 140 shore facilities at a cost of $1.9 million. At the end of FY 1973, action was underway at all shore stations to insure compliance with local sewage standards.

Pollution Fund. The Fund, which is available for cleanup of pollution due to oil or other hazardous substances on U.S. waters, was used to clean up 181 discharges. Accrued expenditures on these projects and on unfinished projects from FY 1972 totaled $8,804,805. Collection in fines, penalties, and reimbursements totaled $634,981.

Aviation Programs. *Sonic Boom Regulation.* A final rule was issued by the FAA on March 23, 1973, to afford the public protection from civil aircraft sonic boom. It prohibits flights by civil aircraft at speeds that would create a sonic boom at the surface over the territory of the United States.

Noise Abatement Procedures: Takeoff. FY 1973 brought the first positive step in the control and reduction of aircraft noise through uniform takeoff procedures. After a year of coordinated FAA-industry development, simulation and testing, the airlines on August 1, 1972, implemented the use of standardized departures from airports throughout the country. The new procedures, dubbed "Get 'Em High Earlier," get the aircraft higher above the ground earlier in the takeoff climb, thus providing some noise relief to communities close to airports.

Noise Abatement Procedures: Approach-to-Landing. The constraints in operational variables under approach-to-land conditions are dictated somewhat by landing aids and airborne equipment; however, some reduction in noise exposure has been realized through continuing FAA-industry procedural programs. The airlines, in mid-September 1972, instituted a new standard approach in which the aircraft operates with a lower landing flap setting when permissible and a lesser approach flap setting throughout the approach. By using lesser flap settings the aircraft drag is reduced, lowering the thrust (power) setting required to maintain a safe steady descent. With lower thrust levels come lower sound levels.

The potential use of a two-segment approach-to-land procedure—i.e., descent down a steeper initial glide slope with the transition to the normal glide slope at approximately 1,000 feet—has progressed from test research

to "on-line" airline operational evaluation. The FAA, cooperating in a NASA-airlines contract, is currently evaluating the impact of two-segment approaches on traffic flow and terminal area control for a number of airports. The airlines-FAA evaluation should be completed during the third quarter of FY 1974.

Aircraft Sound Description System. The FAA has assisted the development of a method of identifying aircraft noise near airports in terms that are readily understandable. The system quantifies noise exposure in terms of the total amount of time that noise levels exceed a preselected threshold (i.e., 80 dBA, 85 dBA, etc.) at various locations relative to the airport. The elements of input data required for application are the aircraft types, aircraft gross weights, runway utilization rates, and flight path utilization rates. To validate this new method's effectiveness in quantifying community noise exposure, practical field applications at different airports are being conducted.

International Civil Aviation Organization Environmental Action. The FAA has actively aided the International Civil Aviation Organization (ICAO) in expanding its environmental action programs to promote harmony between international civil aviation operations and the need for cleaner and quieter human environment. The ICAO's Boom Committee, with DOT/FAA legal assistance, drafted appropriate changes to the Convention on International Civil Aviation to insure that commercial supersonic transport aircraft, flying offshore, do not accidentally "boom" inhabited areas that prohibit supersonic overflight.

Chapter VI

DOT ACTION TO ALLEVIATE THE ENERGY CRISIS

Although it has been obvious for many years that the demand for fuels of all types has been expanding faster in the United States than has the supply of those fuels, only during the last year has the country become conscious of an "energy crisis." While the objective facts have not changed, perceptions have become more accurate; thus—the crisis. Clearly, the relationship between transportation and energy is multifaceted and direct. No form of transportation may occur without expenditure of energy, and transportation, like other users of energy, does not achieve 100 percent conversion efficiency. In the United States supply of fuels and other energy sources depends to a high degree on transportation. Furthermore, utilization of energy for transportation inevitably involves combustion and thus transportation contributes to the volume of pollulants in the atmosphere, though of course some forms of transportation generate relatively more pollution than others per unit of service.

A factor generally overlooked is the increasing electrification of the Nation's economy with a consequent degradation in overall conversion efficiency, e.g., space heating with electricity requires substantially more initial energy input than converting directly from a hydrocarbon fuel to heat. This problem has been further compounded in recent years by the utility industry's further conversion to petroleum fuels in order to meet recently enacted emission standards—thus putting further pressure on domestic (and Western Hemisphere) petroleum supplies and refining capacity. Ergo, the United States is forced to import increasing quantities of both crude oil and refined products from "nondollar" areas (Middle East) for domestic consumption.

For some years the DOT has had as one objective the substitution of efficient modes such as mass transportation for forms that use energy less effectively, such as the automobile. With the recognition of the imminence of the crisis, however, Secretary Brinegar designated as one of the Department's formal Presidential level goals the improvement of the efficiency of transportation in its use of energy resources. Before the end of the fiscal year, officials began to formulate action plans to accomplish the desired conservation. In one later refinement, the action plans included the following steps: (1) Develop an approach for formal appraisal of energy consequences as part of the DOT grant approval process; (2) improve efficiency of automotive transportation in using energy; (3) improve air-

craft operating procedures to reduce fuel consumption; (4) complete development of a computer simulation for analysis of alternate refinery and deep-water port locations; (5) evaluate alternative economic, institutional and technological options for reducing energy consumption in the transportation sector; (6) assist in the development of a more effective energy distribution network. The following pages contain a discussion of DOT programs and efforts to encourage conservation of energy, categorized by mode of transportation.

INTERMODAL

The Office of the Secretary undertook a number of energy research studies of a generalized character that might be related to one or more modes of transportation. The following notes describe the research studies:

Energy Consumption by Transportation Mode study presented methodologies and estimates of energy consumption by mode needed for interindustry economic analyses of the impacts of transportation energy shortages.

Impact of Transportation Energy Shortage study was performed to evaluate the implications of reductions in petroleum products for transportation use. Criteria were set forth for developing an optimum allocation or rationing plan. The impacts on GNP which could result from petroleum cutbacks were estimated.

Analysis of Diesel Shortage was performed at the request of the Office of Emergency Preparedness. Involved was the analysis of the likelihood of a transportation diesel fuel shortage during March–August 1973. The study concluded that the diesel supply would not approach a crisis level during this time period.

Study of Energy for Transportation initiated a 2-year project at the Transportation Systems Center on reduction of energy usage in transportation. It will identify and screen the most productive opportunity areas, define the most promising action options and estimate their impacts. The DOT also conducted a preliminary analysis of a wide variety of techniques to save energy in the transportation sector. They included technical changes to cars, shifts to small cars, shifts from cars to buses, shifts from truck to rail, and shifts from air to bus. They were evaluated in terms of energy savings, time for implementation, difficulty of implementation and maintenance, and costs, among other factors.

The Department continued its program of studies on mass production aspects of advanced engines for cars in collaboration with the Environmental Protection Agency. A study of the socioeconomic impact of mass production of gas turbine and organic working fluid Rankine cycle engines was completed. The Department studied the process of establishing the capability to mass-produce gas turbine engines for cars in order to identify the most significant factors and a realistic schedule.

The Transportation Energy R&D Goals Panel (TEP) completed its work and issued its report on "Research and Development Opportunities for Improved Transportation Energy Usage." The DOT chaired the interagency TEP, which has participants from Department of Defense, Environ-

mental Protection Agency, National Aeronautics and Space Administration, Office of Science and Technology as well as most of the operating administrations of DOT.

The TEP report pointed out large benefits for petroleum conservation that would result from a 30 percent reduction in the relative fuel consumption of highway vehicles and indicated that such a reduction is potentially achieveable by technology that is understood and almost "off-the-shelf." Accordingly, by the end of FY 1973, the Office of Systems Development and Technology initiated a broad survey of the state of the art of fuel economy technology potentially available to the automobile industry.

AVIATION

Most of the programs sponsored by FAA have been designed to enhance the operational efficiency of aircraft; such programs contribute to efficient utilization of energy. The following are illustrations of actions taken that make such a contribution:

1. *Gate hold procedures.* These procedures were implemented because of the critical fuel management requirements in turbojet operations. In this procedure, pilots of turbojet aircraft are advised of any anticipated delay exceeding 15 minutes prior to the start of engines. The pilots decide whether to absorb the delay at the passenger loading gate or have the aircraft towed to another area to permit other arriving aircraft or aircraft loading for that destination not affected by a delay to occupy the gate.

2. *Pre-taxi clearance.* If a need exists, facilities develop pre-taxi clearance procedures for use with departing IFR aircraft. Usually, a clearance delivery frequency is used and the pilot calls not more than 10 minutes before proposed taxi time. The IFR clearance (or delay information) is issued at the time of initial callup.

3. *Card-A-Clearance Program.* This program permits more expeditious and efficient handling of aircraft departing Special VFR (Visual Flight Rules), VFR at Terminal Control Area (TCA) locations, IFR to VFR conditions, or IFR in the tower en route control structure. Participating facilities issue special cards on which departure procedures are printed to pilots desiring the service. The program reduces ground time for the general and business aviation aircraft, thereby fostering an economic operation.

FAA also has one Research and Development Program that contributes directly to fuel conservation; it is a system for transporting aircraft on the ground. Program objectives are to provide means for recovery of disabled aircraft on and in the vicinity of an airport operational area, and to improve aircraft movement on airport taxiway systems with reduction in air and noise pollution and on the apron with improved efficiency. The proposed solution is to eliminate the use of onboard aircraft engines as a propulsive force on taxiways and replace them with a tow vehicle which will comply with the air and noise pollution reduction requirements and at the same time save fuel.

FAA has implemented several internal directives concerning the supply and conservation of power. Thus, for example, FAA has installed auxiliary

electrical generators at most of its installations to assure uninterrupted power supply for critical operations, and has issued plans to help conserve electricity and to minimize effects of energy shortages.

HIGHWAY TRAFFIC

Because its technical responsibility is that of improving highways and traffic operations, most of the programs of the Federal Highway Administration contribute to more efficient use of highways and thus to fuel conservation and reduction of the potential of the automobile for damaging the environment.

Fringe Parking. Developing a viable transportation system that will move people in fewer vehicles may be accomplished by locating commuter parking lots conveniently around the fringes of downtown areas that are served by dependable bus and/or rail mass transit. Federal-aid funds have aided in the development of such projects.

Computerized Carpool Matching System. During 1972 FHWA headquarters personnel participated in a trial of a new FHWA-developed carpool matching system which is now being refined to allow its nationwide use. For a broader application of the carpool program the Department joined with the General Services Administration to maximize the use of carpooling by all Federal employees in the Washington area through the use of the FHWA computerized carpool/buspool matching program. FHWA published the "Carpool and Buspool Matching Guide" which discusses successful ride-sharing techniques, ranging from employer-sponsored carpool programs to buspool programs initiated by employees. The guide was distributed to local, State, and Federal government agencies and to private organizations.

Highway Public Transportation. The San Bernardino Busway opened to traffic in January 1973. Buses using the lanes make the 11-mile trip to Los Angeles in approximately 18 minutes, as compared with 35 to 45 minutes required by automobiles. Another project inaugurated in 1972 was a reverse direction bus lane on Route 101 north of the Golden Gate Bridge. Similar reverse direction bus lanes on freeways continued in operation in Boston, New York, and New Jersey. On city streets, reverse direction lanes were developed in Louisville and San Juan with Federal assistance.

Use of Bicycles. Although the Federal Highway Administration recognizes the substantial benefits of the bicycle as a form of transportation—healthful, nonpolluting recreation; minimum space requirements; conservation of fuel; and possibly reduced congestion on highways—it also recognizes that bicycles and automobiles do not mix well in a traffic stream. As a means of promoting safety while encouraging bicycle travel, FHWA has authorized the use of Federal-aid highway funds for the provision of bikeways within highway rights-of-way, but separated from the automobile traveled way, wherever a need exists and conditions are suitable.

Traffic Surveillance Control. Freeway research projects now underway are expected to play an increasing role in helping to avoid fuel shortages and reducing vehicle operating costs, as well as enhancing the quality of the environment by developing traffic surveillance and information and

control systems for heavily traveled traffic corridors. The systems will notify drivers of uncongested routes, and control freeway ramp inputs to minimize congestion. Accidents and other congestion-causing incidents are detected rapidly and a systematic and prompt adjustment in traffic flow is made, thus saving fuel and motorists' time.

The Urban Traffic Control System/Bus Priority Project. Now undergoing experimental use in Washington, D.C., this traffic control system is expected to reduce stops and congestion with an overall reduction in fuel consumption. Fuel savings from smoother operations are estimated to be in the range of 10 to 15 percent if stops can be reduced by one per mile driven. The bus priority feature is designed to give buses preferential treatment at intersections, and thus make bus travel faster and more attractive.

Studies on Energy Problems. Special studies sponsored by FHWA will have significant benefits in energy conservation. Studies of special traffic lanes, restrictions on truck traffic, and utilization of earth heat to melt ice from highways are examples. The study on "Transportation Control Strategies" will help achieve the air quality standards required by the Environmental Protection Agency regulations and will also provide an evaluation of energy conservation as well. The advantages of reducing single-occupant auto driving and of keeping vehicles well tuned will be spelled out.

Motor Carrier Energy Requirements. FHWA initiated a technical evaluation of motor carrier operating practices to examine efforts to conserve energy and determine the need for revised maintenance and operational procedures, new or revised safety-related rules which can result in fuel savings, and wider dissemination of energy conservation information.

In anticipation of increased movements of domestic and imported propane and liquefied natural gas to offset the fuel shortage, FHWA has intensified its efforts to develop a tank-semitrailer specification for cryogenics to eliminate need for special permits for movements of LNG. A proposed standard should be ready for promulgation in a public rulemaking proceeding within the next fiscal year.

URBAN MASS TRANSPORTATION

Capital Grant Projects. UMTA grants of capital to urban areas are made to allow those political entities to improve the quality of transportation available to their citizens. To do that, they usually improve some form of rail transport that already exists or supply buses to extend or initiate routes to serve concentrations of people. An incidental benefit of such activities is reduction of the amount of automobile traffic on city streets with an automatic improvement in the air quality for all citizens, together with greatly improved efficiency in the use of transportation energy. The automobile is put to its most inefficient use in urban trips. Although 60 percent of urban trips are 2½ miles or less and 43 percent of urban work trips by auto are 4 miles or less, these short trips use about 6 percent of the energy used by all transportation. The bicycle offers an attractive and efficient alternative and last year began to show a rising trend of bicycle use for work trips, recreational trips, and neighborhood travel.

Research and Demonstration Projects. In conducting its programs of research and demonstration, the Urban Mass Transportation Administration has necessarily concentrated on projects to contribute to greater efficiency in moving people and goods within the confines of the urban complexes. Many of the programs, just because they aim to conserve space or time, automatically also conserve fuel and energy. A number of UMTA programs are pointed toward the more efficient use of energy, such as the steam bus programs or the use of AC instead of DC current in urban rail systems. One of the most novel is the development of a system of stored energy (flywheel) propulsion for rapid rail cars. If successful, the new flywheel systems will reduce power consumption for rapid rail cars, dissipate heat, and improve both safety and ride quality.

Another set of demonstrations has promoted the design of vehicles that will operate on some other fuel in the event of a serious shortage of petroleum products. Such a project is one to convert bus engines to operate on liquid natural gas—a system which may, incidentally, radically reduce harmful emissions from the engines. The steam buses, development of powerful batteries to make possible electrical vehicles that can operate for long periods far from their energy sources, and of gas turbine electric commuter rail cars are all projects of this type.

A third set of demonstrations is aimed at weaning the commuter away from driving his automobile. To do that, travel by bus or public transportation must be made more attractive to the commuter than is his automobile. Once enough commuters shift from private cars to carpools or buses, more exclusive bus lanes may be established, with resulting improvements in speed.

RAILROADS

Because railroads are relatively efficient users of petroleum fuel, total rail industry use of petroleum, the energy source on which the greatest demands are made, accounts for only 3.6 percent of all transportation use, or less than 2 percent of national petroleum consumption. While regulatory modernization is expected to further increase railroad efficiency, projected air pollution control measures would probably reduce it quantitatively. Thus, in a delicate tradeoff, economic benefits accruing from greater efficiency will have to be balanced against maintaining stringent standards for a clean environment.

The benefits to be gained through conversion from diesel-electric to pure-electric propulsion are being studied but wholesale change would be infeasible because of the high capital investment required. A recent study limited to the economic aspects of electrification, assessed the potential of an electrified system during a 30-year period beginning in 1975, and concluded that electrification would be of economic value only in the long term for a relatively small percentage of high-density main lines.

It is also true, however, that while diesel-electric locomotives are more energy efficient than electric locomotives, electrification offers the possibility of using nonpetroleum fuels.

In summary, diesel locomotives contribute relatively little to pollution, compared to the internal combustion engines on the Nation's highways. An independent study analyzing the relative contributions to pollution made by various transportation modes supports the railroads' claim of keeping the environment cleaner and making more modest demands on fuel supplies than do other modes.

The FRA is actively working to obtain legislation that would speed up ICC abandonment procedures and thus permit unprofitable and energy-demanding low-density branch lines to be abandoned within a reasonable time of filing the petition. (Present modus operandi takes a minimum of seven months' litigation and frequently more.) Abandonment of unneeded facilities that generate air pollution is clearly desirable.

Rail commutation offers an opportunity to replace the largest single user of transportation petroleum—the private automobile. A modern two-level commuter train uses approximately one-tenth the energy for personal travel as do automobiles carrying as many persons in urban traffic. Similar advantages can be gained by substituting rail for automobile and air transport for intercity trips in such densely populated areas as the Northeast Corridor.

PIPELINES

Several activities carried out by the Office of Pipeline Safety (OPS) in FY 1973 relate to the energy crisis and means of alleviating it with minimum harm to the natural environment. Conservation of energy by increasing the use of large pipeline systems that are the most efficient means of transporting large quantities of energy materials, and by elimination of gas losses and liquid petroleum spills through adherence to high engineering standards, is highly beneficial. The study of new technology needed to make available to consumers in the United States additional sources of energy from imported liquified natural gas (LNG), increasing oil and gas supplies from producing fields in deep water far offshore, proposed superport terminals, and pipelines from Arctic regions will all have beneficial impacts. Additional amendments were made to the Department's pipeline safety regulations during the year in a continuing effort to cover all aspects of pipeline safety and reduce transmission losses.

With rapid growth in construction and operation of facilities to transport and store LNG, the Department has acted to assure safety and concomitant energy conservation as usage of LNG is rapidly increased. The Federal safety standards for gas pipelines were amended on October 10, 1972, by adding a new section applicable to those gas pipeline facilities used to store, treat, or transfer LNG. The Department also increased its inspection of existing LNG storage tanks and plant facilities.

The Department has participated with the Department of the Interior (DOI) in reviewing proposals for constructing a crude oil pipeline across Alaska to deliver additional energy supplies. The Department also contracted for a study of the liquid and gas pipeline industries' practices for shutdown of failed facilities, and pressure limiting techniques designed to prevent pipeline failures. The Department has maintained liaison with

several agencies in the DOI with regard to the safe operation of offshore pipeline facilities for gas and liquid petroleum.

The Department has promulgated regulations which require the reporting of pipeline failures and leaks, and has developed data which will be analyzed to identify future problem areas in pipeline design, construction, and operations, thus reducing the potential for loss of LNG.

Chapter VII

PLANNING AND FORMULATION OF NATIONAL TRANSPORTATION POLICY

In passing the legislation to establish the DOT, Congress declared explicitly that one of the Department's primary missions must be to devise a rational plan for the further development of the Nation's transportation system, and provide Congress and the President with national transportation policies to accomplish the objectives laid down for the Department. The 1970 Airport and Airway Development Act required the submission to Congress of a statement of national transportation policy as well as annual implementation reports. In addition to these general statements of national transportation policy, the following list of actions taken by the Department last year illustrates specific implementation measures of national transportation policy:

1. Completion of the Report to Congress on the Northeast railroad problem, and the formulation of proposed legislation to solve the problem.

2. Development of legislation to modernize the Interstate Commerce Act, particularly its application to railroads.

3. Development of a model to be used in planning deep water ports for oil imports and the location of refineries. The model is being used in studies relating to the energy shortage by the Council on Environmental Quality. the Army Corps of Engineers, and the Department of the Interior.

4. Publication of the 1972 National Transportation Report and initiation of the 1974 National Transportation Study.

5. Completion of the Congressionally mandated Barge Mixing Rule Study.

6. Completion of Part I of the Aviation Cost Allocation Study required by the Airport and Airway Development Act of 1970. The study evaluates principal means of allocating airport and airway system costs among commercial, private and military aviation, and suggests a user-charge system.

7. Development of coordination procedures for the Department's three modal planning programs.

INTERMODAL POLICY PLANNING—RESEARCH STUDIES

1974 National Transportation Report. The Department is scheduled to send to Congress the second National Transportation Report in the middle of 1974. The National Transportation Study, on which the Report is to be

based, is now in progress, having been undertaken during FY 1972 with an initial appropriation by Congress of $2.5 million, and continued under an additional appropriation of $2 million in FY 1973. The 1974 Study is being conducted with the active participation and support of the State Governors, State transportation and planning officials, and public officials at the local levels of government. Through a survey of major shippers and in special studies, the private transportation sector also is involved.

The emphasis of the 1974 Report is on the *performance* of the Nation's present transportation system and on planned *performance improvements* in that system. Participants at both the State and local levels of government are developing information relating (1) to the physical state and operating characteristics of the system, and the level of service offered its users as of January 1, 1972; and (2) to future programs and plans for improving the existing system. Information developed at the State and local levels of government will help to determine the effects of alternative expenditure patterns. To support the preparation of the 1974 Report, several research projects were undertaken:

- *Capital Stock Measures for Transportation.* Study tabulated data on transportation capital investments for 20 transportation modes for the period 1950–1970, including major commercial and noncommercial investments, and the large amount of public capital in highways, waterways, airports and airways. The study projects investment needs for the major transportation modes for the time period 1971–1980. Such future projections of capital investment are a cornerstone of sound national transportation planning.
- *Labor in Transportation Industries.* This study investigated the importance of labor in the transportation sector of the economy, including strike activity; organization and structure of labor; labor productivity; the nature, effect and role of transportation labor legislation; and the future role of labor in transportation.
- *Transportation Capacity.* Study investigated the various theoretical concepts of transportation capacity and the possible policy applications and other uses of statistical measures of capacity utilization for the four major transportation modes of water, rail, air and motor freight. Research in this area provides the capability to predict transportation shifts which may be caused by strikes, or other emergency situations.
- *Transportation Projections: 1970–1980.* This is an attempt to place transportation activity predictions firmly within the context of the forecasted growth of the national economy. All modes of transportation are projected together in the context of GNP so that they will be consistent with personal consumption, and business and government expenditures, as well as with each other.
- *Summary Data for Selected New Urban Transportation Systems.* A study conducted at the Transportation Systems Center (TSC) presents selected information on the most advanced of the new unconventional or innovative urban transportation systems. Data are furnished on system and vehicle physical characteristics, performance capabilities, costs and availabilities.

- *Special Area Analysis Manual.* Developed for use by metropolitan transportation planning agencies, the Manual encourages and provides tools for the consideration of social and environmental factors in the planning of transportation systems for urban areas.
- *The Barge Mixing Rule Study.* Mandated by Congress, this study involved the collection, coding and analysis of rate and origin and destination information on some 15,000 barge shipments of dry bulk commodities during the calendar year 1970. The study data and analyses were used as the basis for recommendations for legislative changes to repeal restrictive regulations on barge operations in the Interstate Commerce Act.
- *The DOT Refinery-Deepwater Location Study.* Undertaken at the request of the Domestic Council, this study developed a model for examining the inland transport cost implications of various superport and refinery location scenarios for importing large additional volumes of foreign crude oil in the future. The study shows that the differential costs of inland transportation of petroleum products is not very sensitive to alternative Atlantic and Gulf superport locations if refinery locations are fixed.

TRANSPORTATION INFORMATION

To develop reliable estimates of transportation needs, planners must have data on past requirements and costs, analysis of factors that engender change, and statistical capability to extrapolate future demands on the system. To furnish those types of data, DOT has installed a Transportation Information Program which undertook these tasks during FY 1973:

- To overcome problems encountered by transportation analysts that are caused by the fact that transportation data are not generated uniformly according to geographic or political subdivisions, the Department—with the assistance of a national conference of users, and specialists from MIT—developed a computerized geographic location converter system. The system uses the county as the common denominator between various geographic location systems. The development of this conversion process now permits the ready comparison and analyses of data in the different national, State, or local data banks which contain economic, social and demographic information.
- The Department developed and published the first of a series of annual reports on National Transportation Statistics. It provided a compendium of quantitative transportation information useful to the transportation planner and policymaker as well as the private transportation industry.
- In cooperation with the State highway departments, DOT conducted an extensive survey of truck movements and the commodities carried. This is the first survey in such detail on a national scale; it will fill an important gap in basic transportation data.
- Cooperating with the Bureau of the Census quinquennial census of transportation, DOT sponsored the efforts to expand the survey of manu-

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factured commodity movements to include agricultural assemblers, mineral and wholesale industries.

- Through the effort of the National Bureau of Standards, DOT developed a computerized system to disclose automatically the shortest rail routes over which carload traffic can be moved between any two points in the United States.

HIGH-SPEED GROUND TRANSPORTATION ALTERNATIVES STUDY

The Department conducted a study of the economic, technological and institutional factors involved in implementing Improved Passenger Train (IPT) service and high-speed Track Levitated Vehicle systems (TLV) in high-density corridors throughout the Nation. Cost-revenue analyses were conducted for both systems in a number of selected corridors. The study concluded that the potential benefits and markets are sufficient to warrant Federal activity in research and development for both systems: IPT provides the basis for growth of AMTRAK; TLV's are a promising option for the longer term future. Results of this study were used to aid the evaluation of the Department's FY 1974 R&D programs. This study should also help improve internal resource allocation policies and provide future direction to advanced R&D programs.

TRANSPORTATION POLICY AND PLANS DEVELOPMENT

Toward the end of FY 1972 the Office of Policy and Plans Development was designated by the Under Secretary to support him as head of the U.S. Delegation to the NATO Committee on the Challenges of Modern Society and to chair that Committee's Experts Group on Urban Transportation. During FY 1973, the Experts Group undertook an Urban Transportation Pilot Study and selected five subproject areas for investigations. Those areas and lead countries are: urban goods movement (France), bus preference systems (United Kingdom), short-distance transport techniques (Germany), collection systems evaluation (Belgium), and urban travel forecasting (United States). These projects are currently underway.

During FY 1973, the Office of Policy and Plans Development continued its research into the effect of diversification outside of transportation on transportation companies. This research provided the basis for the Department's participation in the Civil Aeronautics Board's Air Carrier Reorganization Case (Docket 24283) and will also support the DOT's expected participation in forthcoming Congressional hearings concerning diversification in the surface transportation industries. The research consisted of a general survey of the benefits and costs of diversification, a study of diversified railroads, and an assessment of the possible effects of diversification on air carriers.

NORTHEASTERN RAILROAD PROBLEM

A major FY 1973 effort concerned the preparation of a report to the Congress and the formulation of legislation dealing with the Northeastern railroad problem. A Congressional Joint Resolution, enacted February 9,

1973, directed the Secretary of Transportation to provide within 45 days "a full and comprehensive plan for the preservation of essential rail transportation services in the Northeast section of the Nation. . . ." This directive was brought on by the critical financial condition of the six major bankrupt railroads in the Northeast, with the dominant one—the Penn Central—on the verge of court-ordered liquidation.

The end product of the research and analysis conducted by the Department was a report which discussed in detail the financial status of the Northeastern railroads, the future market for rail transportation in the Northeast, the intermodal issues involved, the energy and environmental issues involved, and the performance of nationalized railroads in other countries, leading to the presentation of a proposed plan for establishing a new private-sector rail corporation to take over the assets of the bankrupt railroads in exchange for stock in the new corporation. The key steps proposed in the Department plan were:

- The identification of Core rail service in the region in terms of areas that should be served and connected by rail service—to be prepared by the Department of Transportation;
- Formation of a new for-profit rail corporation which would select those rail properties of the bankrupt railroads deemed economically viable for inclusion in a restricted rail system and exchange its stock for title to these assets;
- Authority for the bankrupt railroads to terminate rail service, without ICC approval, on those properties which were not transferred to the new corporation;
- The concept that the "going-concern" value of the assets acquired by the new corporation should exceed their uncertain value under protracted liquidation procedures, and thus the exchange of stock for assets would provide fair and equitable value to the bankrupt estates;
- Recognition that several transitional problems would have to be resolved involving the impact on rail labor, the impact on State and local communities and shippers, and the need for emergency assistance to the bankrupt railroads to keep them operating during the transition period;
- Proposed changes in outmoded and restrictive regulatory procedures which affect the entire rail industry as a means of beginning long-term improvements to prevent a recurrence of the Northeast situation elsewhere in the Nation.

Following submission of this report to the Congress on March 26, 1973, the Department formulated and submitted to Congress legislation designed to implement the proposed plan contained in the report. Subsequently, the Congress passed and the President signed into law the Regional Rail Reorganization Act of 1973, which embodied most of the basic elements of the Department's proposed plan. While the final Act was more specific in terms of dealing with some of the anticipated transitional problems, the planning process for restructuring the region's rail system and the creation of a new for-profit rail corporation utilizing the concept of transfer of assets of the bankrupt railroads in exchange for stock in the new corporation were based very closely on the original proposals of the Department.

REGULATORY REFORM AS A POLICY OBJECTIVE

During the 92d Congress, both the House and the Senate held hearings on the Department's proposed Transportation Regulatory Modernization Act. No action was taken by the 92d Congress. As a result of the legislative experience in the 92d Congress, and following the emergence of the Northeast railroad crisis in February 1973, the Department restructured its regulatory proposals and integrated them into a major Departmental goal of regulatory reform. The action plan for this goal consists of three phases: (1) Enact railroad regulatory reform legislation to supplement the Department's program for restructuring the Northeastern railroads; (2) develop and submit legislation for regulatory reform in other modes of surface transportation (motor and water carriers); and (3) utilize regulatory agency proceedings to accomplish national transportation goals. In the latter case, the Department will continue to strive for (a) better regulation relating to rate structures, (b) use of costs in competitive rate cases including the preparation of new cost standards, and (c) modification of carrier certificate restrictions including the requirements for circuitous and limited routings via gateways.

Research in preparation for legislation on regulatory reform was commenced in June 1973 and completed in FY 1974. The suggested changes included ratemaking reform, the elimination of subsidies for Government service at the expense of other users, the restriction of certain Rate Bureau practices, the elimination of discriminatory State and local taxes, the elimination of delays in State approval of intrastate rates, and rationalization of railroad abandonment procedures.

The Department participated in cases before three regulatory agencies involving issues of major transportation policy significance, or new departures in regulation which could affect broad segments of the transportation industry, or the interests of shippers and consumers. Included among these were the Transcontinental Capacity Reduction Agreements Case before the Civil Aeronautics Board (CAB) and the North Atlantic Pooling Agreement Case before the Federal Maritime Commission (FMC). In addition, the Department intervened in situations involving the interpretation and application of policies established outside of the formal regulatory process by others in the Executive Branch. For example, the Department participated before the CAB in cases involving interpretation of the President's Statement of International Air Transportation Policy and in discussions regarding service to small communities.

URBAN TRANSPORTATION POLICY

During FY 1973, the Department's Office of Urban Transportation Systems studied urban transportation systems in the total urban policy setting reflecting three long-term objectives, and made significant progress.

- *Decision Process.* Departmental capability to specify key elements in the urban transportation decision process has been improved. The Department completed an evaluation of the urban highway planning process and discussed its findings with the Office of Management and Budget (OMB) which had requested the undertaking. The report

helped lay the groundwork for subsequent decisions on the 1972 and 1973 highway-transit legislation. In particular, the evaluation provided support for provisions concerning the urban pass-through, development of metropolitan institutions, and Interstate highway fund transfer in the Administration's proposals.

- *Metropolitan Development.* Departmental capability to identify metropolitan patterns of growth, configuration, and mobility has also been improved, and the Department has collaborated closely with HUD on joint development, land use, and joint use of planning programs. Research has been initiated on the use of transportation to revitalize small communities, e.g., an effort to strengthen regional planning to improve the quality of life in the Upper Great Lakes area. Another objective is to improve the state of the art in modeling urban transportation systems.
- *Transportation Performance.* The Department has emphasized the need to make more effective use of existing transportation facilities and it has made considerable progress in improving evaluation of the performance and delivery of urban transportation services.

A major study of low- and non-capital alternatives to capital-intensive construction is being widely disseminated to State, metropolitan, and local planning and transportation agencies. It provides, among other things, a comprehensive review and evaluation of alternative approaches and an in-depth discussion of exclusive bus lanes. There has also been research on the transportation problems of those without access to private automobiles and on the impacts of transportation services on minority groups.

A major research project on means to improve the movement of goods in urban areas was undertaken. Specifically, the project involved the New York Garment Center, which presents an extreme case of congestion in urban goods movement. Another research project initiated during the year will result in an analysis of transportation planning institutions at the urban and metropolitan level.

Transportation Planning Assistance. During 1972 the Office of Transportation Planning Assistance had a major role in the coordination of DOT planning programs and assisted in the delivery of DOT resources to States, metropolitan areas and local communities. The office also provided assistance and consultative help to those States undertaking the creation of State Departments of Transportation; it cooperated with the State of Maryland, for example, which hosted a meeting of officials of the State Departments of Transportation to provide them an opportunity to discuss their mutual problems and successful approaches to their solution.

The Transportation Assistance Planning Office coordinates DOT involvement in the San Francisco BART program. The work includes data collection and analysis, not only for San Francisco but also for the Sacramento-Stockton-San Francisco Bay Area Corridor Study; it is sponsored by several State and local agencies as well as the DOT. Comparable efforts center on the Brownsville-Matamoros area (U.S.-Mexican border) where transportation analysis of sections on both sides of the border is underway.

Similar transportation planning assistance has been supplied to the D.C. area where a number of projects have been undertaken with DOT assistance, including construction of the Metro system, construction of the Arlington Cemetry Metro station, the conversion of Union Station into a National Visitors Center Intermodal Transportation Terminal, and the Bicentennial Transportation Needs Study.

Philadelphia Bridge Tolls. The Department's authority over toll policy and the reasonableness of tolls over navigable waters was employed in a case involving the Delaware River Port Authority. The Federal Highway Administration conducted an administrative proceeding to determine validity of the new toll rates for crossing the Benjamin Franklin and Walt Whitman Bridges in Philadelphia. After appropriate hearings the Federal Highway Administrator concluded that tolls had been raised unreasonably and ordered them set back to the original levels. Further appeal proceedings are still being conducted.

MODAL PROGRAMS—AVIATION

National Aviation System Planning Review Conference. The Federal Aviation Administration's Fifth Annual Planning Review Conference was held in Washington, D.C., in May 1973. Topics discussed during the 3-day conference included Community Concern and the Public Benefit, Policy and Plans Review, Navigation/Landing Systems, System Performance Assurance, Short-Haul Transportation, Air Traffic Control and Airports. Proposals made at the conference by representatives of the aviation community, general public, State and local governments, and other Federal agencies become part of the input for FAA planning, from which emerges the annual Ten-Year National Aviation System Plan.

National Aviation System Ten-Year Plans and Policy Summary. The 1973 editions of the Ten-Year Plan and Policy Summary revisions are the FAA's official long range plans to provide 10-year guidance for development to the agency and the aviation community. These documents are products of consultations between FAA and the aviation community, whose comments and suggestions constitute a vital contribution to the planning.

Objectives of the 1973 plan include:

(1) Extending airport tower control service to additional air carrier and general aviation airports;
(2) Reconfiguring, modernizing and automating flight service stations;
(3) Providing additional Federal assistance for the planning, construction and improvement of airports;
(4) Improving system performance in terms of increased capacity, decreased delays and improved service;
(5) Improving the safety of flight through actions to upgrade the performance of airmen;
(6) Achieving compatibility between the aviation system and the community;
(7) Automating the sensing, processing and distribution of current aviation weather information.

National Airport System Plan (NASP). During the first half of FY 1973, FAA field elements continued to gather data and provide input to the first National Airport System Plan under the Airport and Airway Development Act of 1970. In the second half of the fiscal year, these data were processed for publication, and the plan was submitted to the Congress in June 1973. The printed Plan will be available to the public in FY 1974 in 12 volumes—a narrative volume explaining the purpose and content of the NASP and one volume of detailed data for each of the 11 FAA regions.

A rule was proposed to implement the Airport Aid Program for airport development and planning grant projects; it prescribes the policies and procedures for administering the Airport Development Aid Program (ADAP) and the Planning Grant Program (PGP). The new rule includes provisions required by P.L. 91–258 concerning economic, social, and environmental effects of airport expansion or site selection, with public hearings required on each project. Coordination with State, local, and regional agencies on proposed airport construction projects is required. Airport development projects involving the displacement of persons and the acquisition of real property must meet the terms of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970.

Airport Planning and Planning Grants. The Airport and Airway Development Act of 1970 authorizes the Secretary of Transportation to make grants for airport system planning and airport master planning. By year's end, FAA approved 271 projects in 47 States valued at $10,006,707. Of these, 24 grants (valued at $3,124,825) were for statewide or regional airport system plans.

During FY 1973 the following rulemaking actions were recommended: Final Rule—an amendment to Part 36 regarding Noise Type Certification and Acoustic Change Approvals; Notice of Proposed Rulemaking (NPRM's) covering (1) Noise Abatement Operating Procedures (Takeoff); (2) amendment to lower Part 36 Standards; (3) Noise Certification Standards for Propeller Driven Aircraft; (4) an advanced NPRM covering Noise Certification Standards for Civil Quiet Short Haul Aircraft. The drafting of these proposed regulations is planned for completion in FY 1974.

MODAL PROGRAMS—HIGHWAY

Process Guidelines. Process Guidelines were issued on September 21, 1972, to deal with environmental impacts, including air quality and standards for noise effects, as required by Section 136(b) of the 1970 Federal-Aid Highway Act. These Guidelines ask each State highway agency to develop an Action Plan that will address four main issues at the system planning, location, and design stages of project development. These issues are: (1) The involvement of other agencies and the public, (2) the use of a systematic interdisciplinary approach, (3) the identification of social, economic, and environmental effects, and (4) the consideration of alternative courses of action, all of which are to insure that the final decisions are in the public interest. The FHWA will not give location approval on a project to a State unless the Action Plan for that State has been approved.

The Guidelines require that the public have adequate opportunities to express its views early enough in the study process to influence the course of studies, as well as the actions taken. Public hearings are to be only one component of the State's program to obtain public involvement.

In order to meet the requirements of these Guidelines, each highway agency is required to involve the public in the development of its Action Plan. Since the Guidelines are not specific as to how this involvement is to be accomplished, each State is to develop its own procedure. Small informal meetings have been the most effective, giving a better opportunity for questions to be answered and problems resolved. There also has been an effective use of broad-based citizen advisory groups. Other means for citizen participation include workshops, public meetings, surveys, opinion polls, extensive use of radio and television, newspaper articles, and letter campaigns.

In order to reinforce the requirement for greater citizen participation efforts, FHWA has distributed informational material on citizen participation, including the proceedings of a panel discussion entitled *Community Involvement in Highway Planning and Design*. In addition to issuing these Guidelines, FHWA continued to provide supporting materials to the highway agencies. A slide-tape presentation and a summary brochure on Process Guidelines were developed and received widespread distribution and usage. Also, a transcript and slide-tape summary of a panel discussion on community involvement were developed. A similar production is underway for a panel discussion on developing a systematic interdisciplinary approach to highway development. Additional presentations are proposed for the remaining major issues of the Process Guidelines and other key social, economic, and environmental policy areas.

Highway Safety Planning. The 1966 Congressional mandate for improved highway and traffic safety called for a Federal-State-local partnership program to be based on comprehensive State plans in conformity with nationally uniform program standards. Such plans (CP's) would address problems and conditions in individual States and take into consideration each State's resources of money, manpower, and materials.

Through FY 1973, State-local implementation activities have been carried out in accordance with CP's approved by the Secretary of Transportation in late 1969. Because it became evident that these plans were outmoded, each State was requested to submit an updated CP covering the 4-year period from July 1, 1973, through June 30, 1977. The CP management concept places major emphasis on the analysis of data to identify highway safety problems; select alternative solutions; develop systematic plans; and, estimate resources required to carry out plans. The CP also provides a planning framework for the preparation and approval of the State's Annual Work Program (AWP), another systems approach by which the States detail the work to be done, identify specific goals and objectives, and allocate the resources necessary for implementation of one year of the multiyear comprehensive plan.

The updated CP's were reviewed in FHWA and NHTSA Regional Offices before being sent to Washington for further analysis prior to final approval.

All were approved by the beginning of 1974, but not necessarily for the full 4 years. In each instance, the letter of approval, signed jointly by FHWA and NHTSA officials, was sent to the Governor of the State and a more detailed follow-up letter was sent to his representative for highway safety matters.

MODAL PROGRAMS—MARITIME

Engineers Aboard Uninspected Towing Vessels. P.L. 92–339 required the Secretary of Transportation to conduct a study to determine whether a requirement for engineers aboard uninspected towing vessels would improve the safe navigation of these vessels. The Coast Guard examined the casualty data related to uninspected towing vessels and performed a job-task analysis of duties performed by engineering personnel. Based on its findings, the study recommended that at present legislation should not require engineers to be on board uninspected towboats while underway. The study also recommended that the Coast Guard monitor the effects of having towing vessels under the direction and control of a licensed operator as now required by P.L. 92–339, particularly the effect on the safety record and the relationship to the need for engineers.

Vessel Traffic Systems. During FY 1973 a portion of the Coast Guard's resources was devoted to the continued development of Vessel Traffic Systems in the Nation's port areas. A major study undertaken to achieve further improvements in current vessel traffic management techniques and to provide the framework for a long-range plan covering safety requirements for ports throughout the country was completed. The study provides decision makers with a systematic method for examining the relative need, based on casualty losses, for vessel traffic management systems. The study examined such issues as Federal liability, funding alternatives and the relationship of vessel traffic systems to other navigation systems.

Offshore Petroleum and Seafloor Minerals Industries. The Coast Guard recognizes the advantage of monitoring closely the scope and growth patterns of the offshore petroleum and seafloor minerals industries. A study was recently completed by a private contractor which inventoried mobile offshore drilling rigs, logistic service vessels, and saturation diving systems. From this survey forecasts of offshore activity were extrapolated through the year 2000. The Coast Guard intends to use much of this information to project the needs for its Commercial Vessel Safety Program through the end of the century.

Long-Range Aviation Plan. In FY 1973, the Coast Guard moved to improve effectiveness in the acquisition, deployment and use of its aviation facilities and resources. It developed a long-range aviation plan based on projections of aviation utilization and mission requirements as matched against available aircraft inventories and replacement aircraft schedules. The Plan focuses on tradeoff analyses between aircraft and cutters and boats, technical alternatives to aircraft as new techniques in air surveillance become available and optimal location of resources to perform missions.

Satellite Technologies. The Coast Guard has undertaken a study to assess the applicability of satellite technologies to its missions. Two major objectives of the study are:

a. To analyze the potential application of space telecommunication systems to specified Coast Guard mission and program areas.

b. To develop detailed implementation plans for cost-effective alternative courses of action, based on the results of objective (a).

The specific Coast Guard programs which will be examined are: Aids to Navigation, Communications, Environmental Data Collection, Automated Mutual Assistance Vessel Rescue System (AMVER), Polar Operations, Search and Rescue, Enforcement of Laws and Treaties, Military Readiness, Marine Environmental Protection, and Vessel Traffic Systems.

Enforcement of Fisheries Laws and Treaties. The enforcement of fisheries laws and treaties is the largest single mission in the Offshore Law Enforcement program. In FY 1973, in order to assist in planning for current and future resource requirements, aircraft and vessel utilization planning models were developed. The models rely on computerized processing of data; their output enables decisionmakers to assess the effectiveness of alternative resource commitments for both aerial and surface surveillance programs. The output of the combined model has been successfully used in improving the ability of the program manager to match surveillance hours against program objectives and translate this into current year budget requirements.

Chapter VIII

EFFORTS TO IMPROVE SOCIAL CONDITIONS

DEPARTMENTAL PROGRAMS

During FY 1973 the DOT's program to effect equal opportunity for its employees made progress toward the long-range goal of closing the gaps between the employment status of all other employees and that of minority and female employees. A review of the overall DOT statistics shows that at the close of the fiscal year:

9.6 percent of all employees were members of covered minority groups
17.5 percent of all employees were female

These figures represent a slight change from the status of employees at the close of the previous fiscal year. In terms of actual numbers there were fewer employees and fewer minority employees in the Department at the close of FY 1973 as compared with FY 1972, using the minority census data as a base. Total employment decreased by 992, or 1.4 perecnt. Of this total decrease, 224 employees, or 22.5 percent, were members of covered minority groups.

The major losses were in FAA and U.S. Coast Guard. Since there was an overall decrease in total FAA employment, there was only a slight change in the percentage of minority employment in the Administration:

7.1 percent of the FAA employees were members of minority groups at the close of FY 1973

7.3 percent of the FAA employees were members of minority groups at the close of FY 1972

The comparable figures for the U.S. Coast Guard civilian employment were:

21.8 percent at the close of FY 1973
23.0 percent at the close of FY 1972

The third of the large administrations, the Federal Highway Administration, showed an increase in minority employment of 44 and an increase in total employment of 78. The percentages of minority employment were: 13.3 percent at the close of FY 1973 and 11.9 percent at the close of FY 1972. Corresponding figures for other administrations were:

	FY 1973	FY 1972
Office of the Secretary	30.5	30.4
Federal Railroad Administration	10.9	11.8
Urban Mass Transportation Administration	27.4	31.8
National Highway Traffic Safety Administration	19.7	18.4

Thus, while it is true that the percentage of minority employment in the Department has not changed materially during the year, both numbers and percentages of minority employees have increased significantly over a longer period: from 4,592 employees in FY 1969 to 6,248 employees in FY 1973—an increase of 1,656. Data for individual administration follows:

OST	195 to 407	+212
USCG	1,150 to 1,235	+85
FAA	2,465 to 3,542	+927
UMTA	14 to 69	+55

Another illustration of progress is the increase in the number of minority employees holding technical positions. Thirty-six percent of DOT employees are Air Traffic Controllers. Twenty-two percent are in engineering positions. At the close of the fiscal year there were 1,222 minority members and 382 women among the air traffic controllers and 1,030 minority members and 58 women among the engineer employees of DOT.

There has been an increase during the last 4 years in the number of minority employees holding air traffic controller and engineering positions. In June 1969, 547 minority employees were Air Traffic Controllers and 115 were engineers. The increases were 675 and 915, respectively.

Ninety-eight percent of the civilian employees in the Department are in general schedule positions. Of the 5,255 minority employees in such positions, 2,031 or 38.6 percent are in positions at grades GS–10 and above. This represents an increase since June 1969 of 1,039: 992 in June 1969, 2,031 in May 1973. The number of minority employees in supergrade positions remained constant at 21 during the year. The number of female employees holding positions at those grade levels increased from one at the close of FY 1972 to four at the close of FY 1973. One of these is Chief Counsel of the Urban Mass Transportation Administration. A second is Assistant Chief of the Aircraft and Noise Abatement Division, Federal Aviation Administration. A third is Chief, Mathematical Analysis Division, National Highway Traffic Safety Administration.

The Department Office of Civil Rights in conjunction with the Office of Public Affairs had exhibits at five conventions sponsored by predominantly minority group organizations, among which were the National Urban League, the League for United Latin Americans and the G.I. Forum. Also, the Office of Public Affairs and the Office of Civil Rights published a pamphlet describing the DOT civil rights effort. Aimed at the general public and at employees of the Department, it includes brief descriptions of the total DOT civil rights program.

DOT PUBLIC PROGRAM

Under the Federal contract compliance program, DOT is participating in special area-wide affirmative action plans to increase utilization of minorities on construction projects. Monthly reports from plan areas indicate increased utilization of minorities on DOT projects in 60 home town-special-plan areas and six Department of Labor imposed plan locations.

The comprehensiveness and effectiveness of contract compliance reviews conducted by DOT civil rights personnel have been improving. Although the review process has been improved, the number of compliance reviews has declined slightly over the past 2 years. In FY 1972, 2,114 reviews were conducted; in FY 1973, 1,921 reviews were made.

The Department's Title VI Regulation, pursuant to the Civil Rights Act of 1964, has served as the model for the Executive Branch. Amendments to the regulation were developed during FY 1973 and approved by the President in accordance with the law. The strengthening amendments cover minority membership on planning, advisory, or similar bodies, affirmative action to overcome the effects of past discrimination, provision for racial and ethnic data collection, and extension of time for filing complaints to 180 days.

An August 1971 appeal by former Secretary Volpe to the Governor of each State brought about increased utilization of minority relocation employees by both State governments and contractors. Quarterly reports submitted over the past 2 years have indicated that hiring of minorities has increased, in some instances as much as 50 percent.

Because of the coverage of State and local governmental employment practices under Title VII of the Civil Rights Act of 1964 as it was amended by the Equal Employment Opportunity Act of 1972, and because minority employment has increased, the Department is discontinuing its request for quarterly reports on relocation employment from States and other contractors.

Civil rights personnel from DOT elements participated in weekly 1-hour civil rights seminars which were initiated in March 1973. The seminars focused on all phases of civil rights programs as well as on contemporary urban affairs and intergroup relations problems.

FEDERAL HIGHWAY ADMINISTRATION PROGRAMS

Last Resort Housing. The FHWA is implementing the last resort housing provision of the 1970 Uniform Relocation Act (42 U.S.C. 4601 et seq.). When a Federal project cannot proceed to actual construction because comparable replacement sale or rental housing that is decent, safe, and sanitary is not available, the head of the Federal agency may take such action as is necessary to provide such housing, using funds authorized for the Federal project. During the year, nine States—Alaska, California, Connecticut, Florida, Hawaii, Kentucky, Louisiana, New Mexico, and West Virginia—were in the preliminary planning stage of developing last resort housing, and Kentucky has implementation already underway.

Relocation Assistance. FHWA is participating with the General Services Administration Relocation Assistance Implementation Committee Working Group to achieve greater uniformity in the relocation assistance programs of all Federal agencies.

During FY 1973 a total of 29,260 persons, 238 farms, 2,694 businesses and 67 nonprofit organizations were displaced. The total of all relocation payments for the year was $43.7 million, and the State-by-State payments are shown in Tables 21 through 27.

Activities to Reduce Seasonal Unemployment. The Federal Highway Administration is promoting changes in highway construction and administrative procedures to lessen seasonality and intermittency on construction projects. A FHWA team, using instructional material with specially developed specifications and a motion picture, demonstrated to highway departments techniques for extending the bituminous paving season into periods traditionally closed because of cold weather. A number of States have tested and adopted this procedure. Other steps taken to even the flow of work are increased off-season contract awards, scheduling of certain work for the winter season only, and allowing free contract time for work accomplished during restricted production months.

Studies of Social Effects. Social and economic studies completed in FY 1973 dealt with such matters as the social characteristics of neighborhoods as indicators of the effects of highway improvements, anticipated versus actual effects of urban highways, the effects of alternative highway systems on economic development, freeway motorists' demands for services, the influence of central-city freeways on industry location, and analysis of a nationwide personal transportation survey.

Transportation needs of disadvantaged groups continue to be a matter of concern. For example, current research involves suburban transportation needs, travel patterns of adolescents, and the more effective use of existing facilities for rural people with transportation problems. Other studies are analyzing such matters as neighborhood effects of increased traffic on arterials, public sharing of social and economic gains and losses near highways, relocation needs, pedestrian needs and accommodations, and freight terminal location impact.

In the area of civil rights, a pilot demonstration project in Norfolk, Va., in cooperation with the Virginia Department of Highways, tested several techniques and procedures for identifying the effects on minorities that might be created by a new highway facility. An extensive analysis of 1970 census population and housing data was made to identify concentrations of minority populations (the poor, the young, and the elderly), substandard housing and other important sociodemographic characteristics of the area. Also, a community attitude survey of households and businesses was undertaken to solicit individual opinions on what the highway impact might mean to their community. From the information gathered through these means, a map of high, moderate, and low social disruption areas was developed and used to identify feasible highway location. The results of this pilot project will aid other urban areas in identifying highway impacts.

Contract Compliance Activities. During FY 1973, 1,254 reviews were conducted by State highway departments and FHWA of contracts valued at over $2.6 billion with total employment of 50,825. Of the total, 13,781 employees were minorities. Blacks accounted for 8,257 (60 percent of the minorities); Spanish-surnamed Americans accounted for 3,615 (26 percent of the minorities); Asian Americans accounted for 596 (4 percent of the minorities); and American Indians accounted for 609 (4.4 percent of the minorities). Others, including Filipinos, Samoans, and Hawaiians, accounted for 704 of the total, 5 percent of the minorities. Minority involvement in training programs and higher paying craft classifications in highway construction has continued an upward trend.

Of the 1,254 reviews conducted, 1,132 resulted in determinations that contractors were in compliance with EEO provisions of their contracts. Sixty-eight were found to be not in compliance; followup reviews resulted in most cases in positive action by the contractors after issuance of Show Cause Notices and conferences with contractors.

New compliance review and administration corrective action procedures are being successfully implemented and positive results have been documented. More precise criteria for program administration have been developed which eliminate issuance of unnecessary Show Cause Notices and make the program more effective by reducing administrative requirements.

FHWA has let and monitors approximately 950 contracts in 58 of the 69 Office of Federal Contract Compliance (OFCC) approved or imposed hometown plan areas. Affirmative Action Plans developed by heavy highway contractors in four States (Texas, Oklahoma, Arkansas and Tennessee) have been approved by OFCC on a statewide basis for use in lieu of hometown plans.

FHWA Internal Minority and Female Employment. In FY 1973, the total FHWA employment in full-time permanent positions increased from 4,758 to 4,836. The number of minorities in full-time permanent positions during this period increased from 602 to 646.

While minorities comprised 13.4 percent of the FHWA work force at the end of FY 1973, 150 of the 779 promotions went to minorities. Minority recruitment was 26.8 percent of a total of 597 recruitments, while minority participation in training programs of 40 hours or more was 10.3 percent of 1,527 trainees. These figures do not include formal career training programs.

The number of female employees in full-time permanent positions increased from 1,090 to 1,231 in FY 1973. Of the 779 promotions, 23.5 percent went to women, although they were 25.5 percent of the total FHWA work force at the end of the fiscal year. Female recruitment during this period was 55 percent of a total of 597 recruitments.

FHWA Summer Employment. During the summer of 1972, 238 persons were employed under the FHWA Summer Employment Program. Of this total, 192 were employed as Summer Aids, 176 of whom were minorities; 43 were employed as Student Aids (the FHWA stay-in-school program), 37 of whom were minorities; three were employed under other hiring plans, none of whom was a minority member.

Special Programs. Federal-aid employment data as of July 1972 show that 165,139 people, of whom 33,891 were minorities, were employed on Federal-aid highway projects. This represents a 1-percent increase in minorities since 1971. Also, there were 1,871 apprentices, of whom 632 were minorities (an increase of 12 percent since 1971) and 3,017 on-the-job trainees, of whom 1,667 were minorities (a 1-percent increase over 1971). During the first three quarters of FY 1973, 62 contracts amounting to $9.8 million were awarded to minority firms.

Title VI of the 1964 Civil Rights Act. The FHWA during FY 1973 employed a full-time Title VI program review coordinator. In-depth reviews have been conducted in the 50 States, the District of Columbia, and Puerto Rico by FHWA regional offices to assure compliance with Titles VI and VIII of the Civil Rights Acts of 1964 and 1968, respectively. The State highway department program areas that were covered in these reviews include:

1. Contract Award Procedures
2. Right-of-Way Acquisition
3. Relocation Assistance
4. Long-Range Highway Planning and Research
5. Highway Location and Design

The State highway departments were found to be overall in compliance with Title VI requirements. There were, however, recommendations incorporated in the reports to increase the effectiveness of affirmative compliance.

FHWA on-the-Job Training Program. Approximately 7,800 on-the-job training slots were established on selected highway construction contracts under the provisions of FHWA Order 7–2(2). During this fiscal year, 60 percent of the States had attained or exceeded their goals.

Highway projects, on which States specified trainees, totaled approximately $4.5 billion. A total of 2,050 contracts were involved, with an average of 4 trainees under 7–2(2) programs.

Of the $4 million provided for developing, conducting, and administering highway construction training, $3 million was allotted to the States to provide individual and multi-State supportive services contracts. The remaining $1 million was administered directly by FHWA.

In States participating in the Section 110 program, 57 contracts were awarded with 23 going to minority contractors and totaling approximately $880,000; $2.67 million went to nonminority contractors.

FEDERAL AVIATION ADMINISTRATION ACTIVITIES

Accomplishments:

- Approximately 30 percent of FAA accessions to full-time permanent positions were women and 20 percent were members of minority groups, as a result of increased emphasis given the programs to recruit minorities and women into the FAA work force.

- Designated Federal Women's Program Coordinators in all employing jurisdictions. Also, Coordinators were designated agency-wide to develop and implement the 16 Point Program for the Spanish-surnamed Americans.
- Employed a total of 1,629 youths during the 1972 summer, expending in salaries alone approximately $1,400,000. Thirteen hundred and three were considered disadvantaged youths. Approximately one-half of all youths employed were minority group members. Special efforts were made to recruit youths from the Spanish-speaking communities.
- Identified Housing Officers in all employing jurisdictions to assure that employees and applicants for employment are provided equal opportunity and assistance regarding housing information.
- Appointed and trained 195 disadvantaged persons within the "150" Program for the Air Traffic Control and Electronics Maintenance occupations during the fiscal year.
- Revised the FAA's EEO outreach plan covering the filling of positions by minorities and women between GS–7 and GS–15 levels.
- Produced a videotape on Equal Employment Opportunity for national presentation.
- Initiated a joint effort with the Office of Minority Business Enterprise (OMBE), Department of Commerce, to increase the participation of minority-owned business firms in construction and concession contracting at federally assisted airports.
- Collected data regarding the qualifications needed for employment on 33 airports at 25 cities, and the numbers of minorities so qualified in those cities. The information was obtained through a contract with the National Urban League.
- Implemented a $500,000 contract with the Council for Airport Opportunity in New York, N.Y., to provide an upward mobility training program for 900 people presently employed by the aviation industry at La Guardia, Kennedy, and Newark Airports, who are women, minority members, or disadvantaged persons. Present enrollment is 460, of whom 83 percent are Spanish-speaking people.
- Awarded nearly $23 million in contracts to minority-owned firms including six major construction awards averaging $2.7 million. This represents a 360 percent increase over FY 1972.
- Granted Tuskegee, Alabama, $350,000 for construction of Moton Field to serve both the city and Tuskegee Institute. The field is expected to be operational in FY 1974.
- Held meetings with national representative groups of Spanish-Americans and American Indians to determine interest in airport development in predominantly Spanish-American cities and on Indian reservations.

Other progress during FY 1973:

- One Spanish American and one woman were placed in GS–16 positions.
- Six black employees appointed to GS–14 or GS–15 positions.

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U.S. COAST GUARD PROGRAMS

Military Civil Rights

Race Relations Training. Utilizing the facilities of the DOD Race Relations Institute to train instructors, the Coast Guard has incorporated race relations into the curriculum of its enlisted training commands. In addition, human relations training programs are being conducted on board operating units utilizing race relations instructors. Race relations education has also been incorporated into the Leadership Courses taught at the Coast Guard Academy and Officer Candidate School.

Coast Guard commanding officers are being provided with a better understanding of the sociological aspects of racial problems through a series of Sociological Awareness Seminars developed in conjunction with the Northeastern University Center for Continuing Education. Thirty-six commanding officers of major Coast Guard commands received this training during FY 1973.

Upward Mobility. In order to upgrade the academic qualifications of personnel whose educational backgrounds precluded their selection for advancement training, an Educational Enrichment Program has been developed—a 6-week course in basic math and reading which also includes motivational counseling. To date, results have been good in that several Coast Guardsmen have become qualified for advanced training as a direct result of the school.

Research. Concurrently, the Coast Guard is continuing its research on racial attitudes. The contract study conducted by the National Urban League has been completed and the report is currently being analyzed. During FY 1973, a contractual study was also completed which focused on means of increasing the number of minority group officers in the Coast Guard.

Minority Group Military Personnél. The percentage of minority group military personnel increased from 9.8 percent to 10.1 percent during FY 1973.

Civilian Equal Opportunity

1972 External Youth Opportunity Program. During the summer of 1972, more than 100 contractors doing business with the Coast Guard reported a total of 1,272 hires and 4,475 disadvantaged youths who were provided educational or recreational experiences during the summer months. In addition, Coast Guard installations, boats and facilities, were utilized to provide training and recreational experiences for more than 8,000 disadvantaged youths during the indicated period.

Female Utilization Study. To meet the increasing interests, concerns, and needs of women employees, a thorough study was developed of the Coast Guard's current Federal Women's Program (FWP) including related attitudes and awareness. More than 150 persons were interviewed and 3,500 persons were surveyed by questionnaire. FWP study findings are currently being evaluated by Headquarters and district commanders throughout the Coast Guard.

Internal EEO Program Evaluation. During FY 1973 the Coast Guard completed evaluations of 6 of 20 major installations that revealed continued EEO progress. In addition, a Headquarters EEO/personnel evaluation is currently in progress.

External Programs

In compliance with Title VI of the 1964 Civil Rights Act, some 135 reviews of employment practices were held in Coast Guard Auxiliary units and among State boating officials as well as at the offices of contractors with the Coast Guard and the sites of their operations.

Under the provisions of Section 8(a) of the Small Business Act, a contract was signed with a minority business firm to operate the mess facilities of the Coast Guard Academy. Also under the provision, a $2.5 million contract was awarded to a minority firm to construct housing facilities for the Coast Guard near Miami, Florida. As a result of investigations and recommendations initiated by Coast Guard compliance personnel, black electricians were admitted to the local electricians' union in Mobile, Alabama.

Coast Guard Drug and Alcohol Programs

During the past year the Coast Guard has continued its effort to combat the abuse of drugs and alcohol among its personnel. For military personnel, the drug abuse control effort is divided into four phases—education, identification, treatment, and rehabilitation. An effective education program is the first of these phases. The major educational effort is carried out by 21 full-time Drug Education Specialists located in each Coast Guard district and at all major training commands. Films, books, pamphlets, and other training aids are centrally procured and distributed.

Treatment for drug abuse is provided at Public Health and other military service hospitals on both an in-patient and out-patient basis. Rehabilitation is provided at the local level. Where rehabilitation beyond local capabilities is required, Coast Guard military personnel can be transferred to the Coast Guard Drug Rehabilitation Center at Alameda, California, which returns approximately 50 percent of its patients to full active duty.

During the past year the Coast Guard established a comprehensive program for dealing with the most serious drug problem of all, alcoholism. The service has recognized alcoholism as a treatable illness and provided careful consideration and assistance for its alcoholic personnel. Military personnel are treated at Navy rehabilitation facilities while civilians are authorized sick leave to utilize private rehabilitation programs.

URBAN MASS TRANSPORTATION ADMINISTRATION

Internal Programs. During FY 1973, the minority representation in the UMTA work force averaged approximately 32.3 percent. As of June 30, 1973, 19.3 percent of the UMTA professional positions were held by minorities and 15.3 percent of the professional positions were held by females. The most significant female appointment in FY 1973 was that of a minority woman to the position of UMTA Chief Counsel.

Affirmative Action Requirements. The Urban Mass Transportation Administration issued a Minority Business Enterprise Clause as a part of all grants in excess of $250,000. The clause requires recipients to establish and carry out an affirmative action minority business enterprise program. Atlanta, Georgia, and Baltimore, Maryland, transit authorities received technical studies grants which require a comprehensive plan for identifying and utilizing minority business opportunities in the construction of new systems.

Compliance Activities. The UMTA Office of Civil Rights was assigned the responsibility of conducting Title VI preaward approval review of all UMTA grants and contracts.

The UMTA Office of Civil Rights conducted 160 Title VI and Executive Order 11246 civil rights compliance reviews of UMTA recipients in FY 1973. Thirty-eight contractors were cited for noncompliance with civil rights requirements. Twenty-two of the citations were resolved satisfactorily.

UMTA sponsored a 2-day conference on Equal Opportunity Requirements in UMTA Programs. Seventy-five transit properties participated. The Office of Civil Rights provided equal opportunity orientation and training for full-time Equal Opportunity Officers from three transit authorities. The UMTA Office of Civil Rights and Service Development funded 15 projects in FY 1973 to provide research and demonstrate improved mobility for the transit disadvantaged (young, old, poor, and the handicapped).

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

Minority Assistance

Assistance to Spanish-speaking and other minority groups was expanded by NHTSA during FY 1973:

- Help to Spanish-speaking persons in adjusting to American laws and customs (specifically those related to driving) was extended during FY 1973 from one region to three, with projects now underway in four States. Driver education programs in Michigan and Illinois have helped several hundred Spanish-speaking persons to obtain driver's licenses. The State Judicial Department of Colorado added Spanish-speaking staff members to the traffic courts in three counties to work with traffic offenders, and to improve relations between the traffic courts and the Spanish-speaking community. A project with the University of Miami is pinpointing driving problems of the Cuban population and working out methods to decrease accidents and fatalities among them.
- Two minority colleges are training driver education and traffic safety specialists under contract to NHTSA.

Internal Programs

- One woman supergrade was employed during the year, and the number of women in GS–14 positions increased from three to six. Women now constitute one-third of the NHTSA work force, and 47 per cent of new recruits during the reporting period were females. The NHTSA

Equal Employment Opportunity Committee established a subcommittee to serve as the focal point for discussion of the special problems and concerns of women employees and applicants, and to suggest ways of improving their status as well as employment practices. Minorities form 17 percent of NHTSA employees, but received 27 percent of the promotions during calendar year 1972.

- In addition to reviewing the minority compliance status of ASAP and STEP projects, a similar analysis has been initiated in the States' Annual Work Programs. Contracts awarded to minority businesses by NHTSA increased by 50 percent during the period which represented a 100 percent increase in funds.

Chapter IX

SYSTEMS DEVELOPMENT AND TECHNOLOGY

INTERMODAL PROGRAMS

Development and encouragement of technological advances in transportation was one of the major functions assigned to the Department by P.L. 89-670, the DOT Act. A research and development management system has been used as a tool since the establishment of the Department but during FY 1973 the system was further elaborated in the Office of the Assistant Secretary for Systems Development and Technology. This chapter contains descriptions of some of the more important research and development progress made during the year.

A large portion of the Department's research and development activity was conducted by the Transportation Systems Center at Cambridge, Massachusetts. Among the activities undertaken for various elements of the Department were a prototype air traffic flow control computer program for FAA, system analysis and development plans for a system to assist in the control of ground movements of aircraft at airports, facilities for nondestructive tire testing, vehicle detection systems for urban automobile traffic control programs, a microwave telemetry device for protecting pedestrians and vehicles at railroad grade crossings, and numerous other segments of research and design work reported below. The Center has also begun to develop a staff competent to work on economic and sociological aspects of transportation problems.

Future Management of Air Traffic. The Advanced Air Traffic Management System (AATMS) Study is a program of concept formulation and tradeoff evaluation to investigate the feasibility of major innovations in future air traffic control systems. The Transportation Systems Center, under the direction of the Office of the Assistant Secretary for Systems Development and Technology and with the cooperation of the Federal Aviation Administration, is conducting the conceptual study of an advanced air traffic management system using a coordinated contractor/government effort, embodying system and technology analysis and evaluation efforts. The Advanced Air Traffic Management System Study is oriented specifically toward the investigation of future systems concepts to provide a basis for long-range R&D planning, to support the orderly development of a future system capable of handling the projected traffic environment in the late 1980's and beyond.

During FY 1973, detailed analytical and system design studies were performed to provide a system definition which holds promise of meeting the demands of the 1990's with a cost-effective balance between orderly system transition and significant benefits to the users. These study efforts provide a basis for an advanced system R&D program to be actively pursued in the 1974–1985 time period. The experimental thrust of this R&D plan will span the next decade and is intended as a supplement to the current Ten Year National Aviation System Plan.

CARD Implementation Plan. The completion of the Joint DOT/NASA Civil Aviation R&D Policy Implementation Plan provided a detailed integration of the related R&D activities of the two agencies. The plan is responsive to the research and development recommendations contained in the "Joint DOT/NASA Civil Aviation R&D Policy Study" (March 1971) and the Civil Aviation elements of the "Recommendations for Northeast Corridor Transportation" (September 1971), adjusted by subsequent studies, events and budgetary constraints. As with many planning activities, the process of developing the plan has already implemented the principal thrust of the policy studies. Because research and development is a highly dynamic process, the plan will require modification at regular intervals and will be used as responsive guidance for the continuation of related activities of the two agencies.

Transportation Concepts Evaluation. Although the activity is still fairly small in magnitude some significant advances have been made in the examination of long-range transportation options. Close working relationships have been established between the FAA, UMTA, and OST in undertaking intermodal integration. FAA is predominantly concerned with intercity, and UMTA with intracity transport. Each of these Administrations has initiated comprehensive programs within its own responsibility (Quiet Short-Haul Air Transportation Systems and Intra-Urban Intermodal Integration). The Assistant Secretary for Systems Development and Technology (TST) has initiated some related conceptual operational analyses which will contribute guidelines for the evaluation of these results. These include the airport access studies which produced a summary analysis of 34 major airport access systems and their effectiveness. Another is the Stockton Project which addresses the operational feasibility of a small satellite air freight center as an alternative approach to goods movement in a major metropolitan area. The results of such studies will continue to be used in the working group activity examining intermodal/modal alternatives.

Dual Mode Transportation System. The Office of the Assistant Secretary for Systems Development and Technology, in conjunction with the Federal Highway Administration, the Federal Railroad Administration and the Urban Mass Transportation Administration has completed the study of Dual Mode transportation systems which was initiated in FY 1972.

Dual Mode systems incorporate vehicles which are capable of being operated under driver control on existing streets and highways, and under automatic control on specially designed guideways. The results of the

study indicate that Dual Mode systems have sufficient potential for relieving urban traffic congestion and reducing the adverse impact of transportation on the urban area to warrant further technological development of the concept. The Department's program for accomplishing this is under the management of the Urban Mass Transportation Administration.

The summary volume report of the study "Analysis of Dual Mode Systems in an Urban Area" was submitted to the Congress on May 29, 1973, in support of the FY 1974 budget request for the Urban Mass Transportation Administration.

Tunneling. The Transportation Tunneling Program is multi-modal, involving active participation by TST, FHWA, FRA, and UMTA. Each participating element has a lead role in several research areas, for which it provides coverage designed to meet the needs of all DOT modes. This permits focusing of expertise while avoiding costly duplication and, with strong coordination, provides the basis for a sound, cost-effective program.

During FY 1973, programs were underway to develop demand forecasts, and through them to predict benefit/cost ratios for each of the major projects. Savings are expected to begin to accrue in FY 1975 and build up to a total in excess of 30 percent of construction costs by the early 1980's, based on presently planned projects. Work is now underway to improve cut-and-cover tunneling, to apply laser melting, water cannon, and jet kerfing technology to rock tunneling, to develop an innovative extruded liner system, to improve site investigation instrumentation and methodology, and to identify new contracting arrangements which will improve safety and environmental impact, while simultaneously reducing construction costs. The large market (over $14 billion projected for the 1970's and 1980's) assures that savings achieved through the program will be applied to a very broad operating base.

Technology Sharing. As a result of the President's message on science and technology of March 16, 1972, an interagency committee on technology sharing was established. This committee, then chaired by a member of the Office of Science and Technology, focused on surveying existing mechanisms to communicate with State/local governments on technological requirements and advances, developing better means of using underutilized mechanisms, and evolving new programs to share technology. DOT participated extensively in the committee activities, and has been complimented both by the Executive Office and by State and local representatives for taking the most action of any Federal agency in assuring that its R&D is responsive to State/local needs and that the results are being effectively disseminated.

As a part of this effort, the Secretary, in October 1972, formally designated the Transportation Systems Center (TSC) as a central resource which would support the Department in the exchange of technical, economic, and planning information with State and local sectors of the transportation community. This TSC role is complementary to, and augments, the extensive existing programs and mechanisms of the Department.

In September 1973, the document "Technology Sharing" was published. This report summarizes and inventories the many existing and new mechanisms and programs within the DOT for sharing technology and informa-

tion with State/local agencies. The many sharing mechanisms of the various DOT Operating Administrations are being actively examined and improved or augmented, if necessary. To help assure that the Transportation Systems Center activities will provide an effective additional capability, the first steps were taken in FY 1973 to develop capabilities for research establishing the relationships between transportation, urban and regional growth, societal structure, and the quality of life. A feature of this new activity at TSC is a long-range research program to develop new understanding of the socioeconomic effects of technology. In addition to developing a TSC residential staff for socioeconomic research, it is planned to initiate a residency program for selected scholars. The program will also include cooperative efforts with local communities, implemented through technology sharing, to insure that insights evolved by the TSC team will be applied effectively to solve real transportation problems.

University Research Program. The program of University Research was inaugurated by the Secretary in FY 1973 for the purpose of supporting transportation research projects in the academic degree granting institutions of the United States to be conceived by faculty members, and undertaken by faculty members and their graduate students. The program was first announced publicly in a conference for prospective participants on September 20, 1972 in which the Secretarial Officers participated. Approximately 650 proposals were submitted and 48 contracts were awarded in FY 1973. The Under Secretary and Assistant Secretaries were personally involved in the selection process. Contracts are administered by the Office of University Research in the Office of the Assistant Secretary for Systems Development and Technology. An additional six contracts are supported by the modal administrations. The contracts are generally intermodal in scope with two-thirds of the contracts being for socioeconomic work and one-third for technological work. Most of the proposals which were not funded were deemed worthy of support, so that they still represent resources of people and skills available to contribute to the solution of the many transportation problems which face the Nation.

Research and Development Information Program. Significant advances were achieved in the development of an information system and services to support R&D managers, transportation researchers and systems planners; policies have been established for orderly production and dissemination of technical reports.

The concurrent development and operation of the Transportation Research Activities Information Service (TRAIS) provided on-line access to data stored in computers concerning R&D resources and activities. Textual and graphic displays are now rapidly provided to R&D planners and monitors to support these works.

In a parallel project, a DOT-sponsored committee at the National Research Council developed concepts and preliminary plans for the construction of a national network of Transportation Research Information Services (TRIS). Most of its recommendations are in various stages of implementation. The recommended on-line access to computerized files of research

activities has been provided and is currently available to the U.S. transportation research community.

Climatic Impact Assessment. The Climatic Impact Assessment Program (CIAP) initiated in late 1971 is to assess, by reports in 1974, the impact of climatic changes resulting from perturbation of the upper atmosphere by the propulsion effluent of a high-altitude aircraft fleet. It is intended that the CIAP report will assist the effort to devise regulatory standards such that flight vehicle operations may be conducted in the stratosphere without harmful environmental consequences.

During FY 1973 stratospheric measurements were made and data compilation was begun. Negotiations were planned to involve foreign research organizations in the effort. Cooperative agreements now involve France, England, Belgium, Australia, Canada, and Japan.

Preliminary drafts of six volumes comprising the data base for the CIAP report were prepared.

Transportation Noise Abatement. During 1973 the Department continued its aggressive program to abate transportation-related noise and reduce possible adverse effects on U.S. communities.

The Department worked closely with the Environmental Protection Agency in preparing noise emission standards for interstate motor carriers and railroads and in drafting DOT regulations to enforce those noise standards.

The Department completed demonstrations with three major truck manufacturers to produce heavy-duty diesel trucks with noise levels 12–15 decibels below the levels of standard production trucks. Nine of these "quiet trucks" were placed in routine revenue operation to evaluate their performance under in-service conditions and foresee maintenance problems which might arise from the noise-reduction modifications. In addition, a series of contracts was initiated to demonstrate near-term noise reduction potentials for heavy-duty trucks and transit coaches.

Under a contract with the General Electric Company the Department began a systematic study of suppression concepts and techniques for jet engine exhaust noise. The 4-year study will include theoretical analyses of jet exhaust noise mechanisms, scale-model and full-scale measurements of the performance of noise suppression concepts, and in-flight aerodynamic performance factors of actual suppressors.

The Department sponsored a series of 4-day training sessions for Federal, State and local law enforcement personnel on effective procedures for monitoring and enforcing highway noise control regulations. A total of 245 representatives from 47 States, the District of Columbia, DOT, and EPA, attended the six sessions held at the California Highway Patrol Academy at Sacramento.

MARITIME RESEARCH AND DEVELOPMENT

Coast Guard research, development, test and evaluation is devoted to applying the benefits of marine science and technology to Coast Guard

missions and to the accomplishment of Department of Transportation and national objectives in order to improve service to the public and to reduce costs. Projects are grouped below according to the major Coast Guard program they support.

Marine Environmental Protection. The objective of this effort is to reduce the potential hazards of transportation-induced pollution in the marine environment by preventing spills from occurring as well as ameliorating their effects and insuring rapid and effective response and cleanup. Specific projects have been devised to provide a method of locating pollution sources quickly, determining the nature of the oil or other pollutant, and then removing the pollutant. In the case of pollutants generated by operation of Coast Guard ships, systems have been perfected for treatment of wastewater and disposal of solid wastes; these are installed in most of the larger ships.

Although they were not designed exclusively to avoid pollution, the several vessel traffic systems, their radars and related communications and computer programs all have the effect of preventing accidents and thus avoiding oil spills.

Commercial Vessel Safety. The objective of this program is to minimize through prevention marine casualties, loss of life, property damage, and environmental pollution associated with commercial, scientific, or exploratory activity on the sea. Specific projects include research to provide technical data to support U.S. Coast Guard regulations on the design and construction of ships and also the regulations concerning hazardous cargo.

Major FY 1973 accomplishments in support of CG responsibilities under the Ports and Waterways Safety Act of 1972 (Title II) include research on techniques to isolate cargo from a ship's ballast, and prevent or control fires, and one complete season of instrumented evaluation of the strength of Great Lakes ore ships.

Other Coast Guard R&D projects relating to merchant marine safety included evaluation of a tug-barge concept that provides for rapid connection/disconnection of tugs and barges. Standards were devised for U.S.-built aluminum crew boats to improve their safety. Also during the year, the Coast Guard followed closely new developments in construction and use of surface-effect ships, though no such ship was currently in use by the Coast Guard.

Aids to Navigation. The objective of this program is to facilitate safe passage of marine traffic, expedite commercial transportation, and enhance the utility of national waterways for all users. Specific projects have been undertaken to improve effectiveness of the buoy systems and improve the safety and efficiency of marine navigation in restricted waters.

Major FY 1973 accomplishments can be summarized as follows:

- Completion of planning for the River and Harbor Aids to Navigation System (RIHANS).
- Fabrication and initial deployment for evaluation of experimental exposed water buoys and a permanent buoy anchor.

- Installation and test of various aids to navigation as part of the Great Lakes Season Extension Demonstration Project.

Search and Rescue. The objective of this program is to develop systems and technology to render aid to persons and property in distress on, over, or under the high seas and waters under the jurisdiction of the United States. Within this program new systems have been developed to conduct searches, including new communications systems for Coast Guard ships and aircraft. A new distress alerting system, methods of planning searches by computer and expansion of programs for complex searches with optimum use of search and rescue forces have all contributed to the effectiveness of the search and rescue efforts.

Major FY 1973 accomplishments in support of CG responsibilities under the Federal Boat Safety Act of 1971 include development of safety standards for construction of boats and new testing procedures to measure their effectiveness.

Polar and Domestic Ice Operations. Another major responsibility of the Coast Guard is the program designed to increase the availability of ice-prone waterways to essential transportation and to extend the navigation season. Specific projects have been devised to increase icebreaker capability in northern U.S. waters and to improve understanding of ice physics, oceanography and related sciences to aid in the design of both icebreakers and commercial vessels. Major accomplishments during FY 1973 included testing of mechanical ice cutters and installing an air bubbler hull lubrication system aboard the CGC *Sundew* for testing.

URBAN MASS TRANSPORTATION

Program Objective. UMTA's Research, Development and Demonstration (RD&D) program is designed to develop and demonstrate a large variety of devices and systems which can improve urban mass transportation for local authorities who may, at their option, use them to improve their transportation services. This activity was made necessary by the decades of neglect of urban mass transportation facilities in the United States followed by the decline and disappearance of the transit hardware industry.

Program Scope. UMTA's RD&D work is applied to various modes of transit (bus, rail, and innovative systems) and to the administrative and management techniques required to achieve and maintain more efficient transit performance.

Its program stresses the importance of applying the latest advanced technology to improving U.S. transit resources, but UMTA has taken precautions to fund projects that have the highest possible relevance to transit. UMTA has emphasized coordination between its RD&D and Capital Grant programs and consults with the industry in the early stages of RD&D projects.

Bus Transit. The design of currently available transit buses has not changed fundamentally since 1959. With UMTA capital grant assistance,

many cities are buying new buses to replace aging fleets and to extend public transportation service. In addition, many cities are planning to deal with air pollution problems by curtailing automobile operation in congested areas and by relying more heavily on bus transportation. UMTA's effort in bus technology is intended to help meet communities' demand for new buses with up-to-date technology. In FY 1973, UMTA developed a prototype of a modern 50-passenger bus; nine buses of three different designs will be available early in FY 1974 for intensive testing and evaluation. During the year, UMTA also contracted to develop preliminary specifications for a high-capacity transit bus.

Another UMTA objective is to evaluate improvements of the diesel engine to develop bus propulsion systems capable of meeting future requirements—including energy resource considerations—without adversely affecting operating economy.

During FY 1973 UMTA evaluated the results of tests of Rankine cycle engines and continued a test of liquid natural gas as fuel for the 2-cycle diesel bus engine. During the year work continued on developing a diesel exhaust emission control system to eliminate smoke and odor and to reduce oxides of nitrogen and noise.

Rail Transit. Most of UMTA's development projects in rail transit require long-lead-times, with investments growing as the multi-phased projects near completion. The approach involves production of vehicles and systems to provide true rider mobility and induce people to use mass transit instead of automobiles in urban areas. UMTA's four-segment rail program is discussed in the following paragraphs.

Urban Rapid Rail Vehicles and Systems. During FY 1973 two state-of-the-art cars (SOAC) were delivered to the High Speed Ground Test Center and partially tested, and the design competition for the Advanced Concept Train (ACT–1) cars was completed. Three transit system cars in Cleveland, Ohio, were equipped with a new AC propulsion and control system for testing. AC, in contrast to DC, propulsion offers significantly lowered maintenance costs, improved rider quality through smoother acceleration and deceleration, and reduced power demand and cost through power regeneration.

Commuter Rail Vehicles and Systems. With improved equipment and service, commuter rail systems have demonstrated an ability to attract, retain and increase the number of passengers. UMTA's objective is the optimum combination of service and equipment, based on the most advanced available technological devices and systems.

In several cities, commuter rail service is provided by trains having only electrical or only diesel motive power. To avoid requiring transfers between the two types of train UMTA is assisting in the development of dual-power gas turbine/electric (GT-E) commuter cars.

Urban Light Rail Vehicles and Systems. Several street car systems, notably in Boston and San Francisco, are committed to programs to replace light rail vehicles. But there has been no new development in light rail technology since 1935 and no light rail vehicle has been produced in the United States since 1952.

The Massachusetts Bay Transportation Authority (MBTA) has cooperated with San Francisco (BART) and with other U.S. operators to develop an UMTA-sponsored standard specification for new light rail vehicles that has already been used for a joint purchase of 230 new cars for Boston and San Francisco. The economic benefit of the specification was apparent in that the bids were lower by approximately $200,000 per car than the $479,000 per car bid in 1971 to individual specifications for each city.

Rail Supporting Technology. Some technological aspects of wheel-on-rail transportation are common to all modes of rail transit. For example, each mode is concerned with reducing noise, improving ride quality, increasing reliability, decreasing maintenance costs, augmenting propulsion, making braking and power collection more efficient, devoting more attention to safety, and protecting the environment. Solutions to such problems are under intensive evaluation at DOT's rail test facility at Pueblo, Colorado. The Pueblo site has a 9-mile electrified transit test track, completed in September 1972, on which effort is directed toward the development of a standard vehicle acceptance program. It is currently being used to test the state-of-the-art cars (SOAC) and will be used for testing other new vehicle systems, such as the energy storage propulsion system, and GT-E hardware.

Through the Transportation Systems Center, UMTA has undertaken technology research activities in the areas of track measurement, noise abatement, tunneling, and safety. A prototype track measurement system has been tested at Pueblo and at the MBTA in Boston. Two preproduction systems will be evaluated on the SOAC cars and on New York City transit cars. The system will diagnose track condition for maintenance and safety purposes. The noise abatement program will assess and rank noise problems for all U.S. rail transit systems.

With respect to tunneling, UMTA is concentrating on understanding and predicting geological conditions prior to construction and materials handling in urban areas.

Innovative Systems. *Advanced Transit Planning.* UMTA has created and disseminated a series of computer programs for multi-modal urban transportation planning now adopted by over 50 public and private agencies concerned with the future of urban transportation. The programs employ the most advanced techniques for measuring the effectiveness of alternative systems in terms of such factors as predicted patronage, costs, benefits and effects on land use.

During FY 1973, the first version of the UMTA Transportation Planning System (UTPS) was distributed to State and local transportation planners. Training sessions were offered to State and local transportation planners in the use of UTPS which included consideration of socioeconomic factors.

Personal Rapid Transit (PRT) Technology Development. PRT technology development involves a spectrum of study programs and the development of promising component technologies.

The segments of the PRT technology study program are: command and control studies, failure analysis and correction, engineering and site in-

tegration studies for PRT guideways and stations, high-capacity PRT technology development, and component and subsystem development.

These technology development studies are integrated into the system development tasks to provide a baseline for the evaluation of design concepts and system performance.

Command and Control. Studies to date have mapped out the major problem areas. Specific studies include vehicle management algorithm comparisons using a simple six-station network configuration, development of a vehicle-guideway dynamics simulation (APLDYN), investigation of a modified block headway control system, and study of dual-mode vehicle management techniques.

During FY 1973 four contracts were awarded for the development of hardware components: a drive system, tests of a PRT system featuring a passive vehicle, a short-headway computer-controlled safety system, and an improved steel wheel–steel rail combination.

PRT Systems Development and Demonstration. In PRT systems, small vehicles traveling on dedicated guideways provide rapid, comfortable, origin-to-destination service. The use of small vehicles coupled with computerized vehicle management allows optimum servicing of demand and efficient routing between stations. In extended configurations with closely spaced, off-line stations, a trip between any two points in the service area can be provided with little inconvenience to the passenger.

During the 10-month period from August 1971 through May 1972, four contractors under close UMTA supervision developed and installed personal rapid transit systems at the U.S. International Transportation Exposition, TRANSPO '72, at Dulles International Airport. Rigorous testing of the four TRANSPO PRT systems was started immediately after the close of TRANSPO to obtain information to be applied to the development of a system specification for an advanced PRT system for possible urban deployment.

Morgantown PRT Demonstration. The primary objectives of the Morgantown, West Virginia, PRT system are to measure the service benefits of such a system, and to assess the institutional and technical problems encountered in building such a system in an urban environment. Such factors as the costs to maintain and operate a PRT system, its reliability and availability over time, and its impact on urban congestion will be assessed.

Demand-Responsive Transit Systems. The objective of the Demand-Responsive Transit Systems Program is to determine costs, ridership, revenues, and other effects of those urban transportation systems which rely upon adaptable routing and scheduling to improve their responsiveness to needs of urban transportation users. A market test of the Dial-A-Ride concept was successfully undertaken at Haddonfield, New Jersey, before FY 1973. Ridership grew steadily and between July 1972 and March 1973, it nearly doubled. During FY 1973 the prototype computerized control system was phased into operation. Data are being made available to interested communities.

Dual Mode Transit Systems. A dual mode system provides comprehensive "origin to destination" service at minimum cost by using vehicles that operate under automatic control on fixed guideways in high-density areas and under manual control on city or suburban streets. Dual mode will provide a very flexible means of transportation, adaptable to changing traffic patterns and user needs. UMTA's goal is to develop and demonstrate the system as a viable alternative for consideration by urban planners.

During FY 1973, contracts were let for the system concept design studies to begin in August 1973 and extend through June 1974.

Urban Tracked Air-Cushion Vehicle. The Urban Tracked Air-Cushion Vehicle (UTACV) program will develop and test a prototype vehicle and guideway system, which can be implemented for high-speed, line-haul service in urban areas for airport access, airport-to-airport interchange, and travel between contiguous urban complexes. The DOT Transportation Systems Center provides technical support to monitor the UTACV contractors, and prepare system-test plans to provide a basis for thorough evaluation of the system.

At the end of FY 1973, a prototype vehicle was 95 percent complete and initial performance testing was underway. In anticipation of vehicle delivery in the fall of 1973, construction of an initial segment of guideway and a maintenance building was initiated at the High-Speed Ground Test Center in the spring of 1973.

Systems Analysis and Evaluation. Included in the program of systems analysis are UMTA analytical efforts related to formulating the UMTA RD&D program, experimental design and evaluation of UMTA RD&D projects, and detailed analysis and planning related to proposed demonstrations.

Service Development. The purpose of this program is to improve the mobility of all transit consumers, with emphasis on transit-disadvantaged consumer groups which include the young, the old, the poor, the handicapped, and the unemployed. Improvements in transportation services and equipment, oriented toward the needs of these groups, will serve also to make public transportation more attractive and convenient for all.

During FY 1973 UMTA funded approximately 20 research and demonstration projects designed to test many variables, measuring improved mobility of target groups using performance criteria of ridership, cost, and acceptance by transit operations. The major emphasis was on the handicapped and elderly.

Transit Operations. With this program UMTA will develop, test and demonstrate modernized operating procedures and service innovations that can be widely adopted by the transit industry. These include reduction in transit operating costs; more efficient utilization of existing systems; demonstrations of reserved bus lanes; automatic vehicle monitoring and communication systems, including advanced location technology suitable for multi-user vehicle systems; modifications of the existing traffic signals in order to provide preferential treatment to buses at signalized intersections; techniques for reducing crime on transit systems and on methods for im-

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proving actual and perceived passenger security; and demonstrations emphasizing improved downtown circulation and coordination.

In FY 1973 both the Shirley Highway (Virginia) and Seattle exclusive bus lane demonstrations were determined to be so successful that local authorities in each area will continue and expand the service with local funds.

Also during FY 1973 a demonstration was initiated to test the concept of bus preemption of traffic signals on a major arterial and reserving a freeway lane for buses and carpools.

Transit Management. Under the Transit Operation and Management System (TOPS) program, improvements are being developed and applied in four principal areas: (1) vehicle servicing and maintenance; (2) assignment of vehicles to routes and drivers to vehicles; (3) management hardware devices such as automatic fare collection systems and automatic passenger counters; and (4) personnel development.

Automated service and maintenance information systems have been put in operation in Dallas and Oakland. Automated driver and vehicle assignment methods were established in San Diego, Washington, D.C., and Baltimore. Transit industry interest and intention to adopt these methods is widespread.

HIGHWAY-RELATED PROGRAMS

Research Projects. The Federal Highway Administration conducts large numbers of research projects each year, many of which relate to technical aspects of highway construction; but others are related to systems employed in highway traffic control and engineering. Examples of traffic projects include experimental routing systems and electronic vehicle counters. To maximize benefits from its research projects the Federal Highway Administration undertakes to promote widespread application of its research results. Milestones in application were reached in the following projects among others:

1. Portable devices for detecting cracks in steel bridges.
2. Techniques for measuring and evaluating the air pollution impact of highways.
3. Techniques for using old auto tires in pavement construction.
4. Plastic coatings to eliminate corrosion of steel members in bridges.
5. Evaluation of traffic aid systems for ramp merging.
6. Roadway drains to eliminate curbs and improve drainage.
7. Computerized project management system.
8. Computerized roadway location and design tool.
9. Highway noise evaluation techniques.
10. Bicycle path design guide.

Automotive Research Highlights. Accident avoidance research in FY 1973 concentrated on the following subjects: vehicle handling, tires and brakes.

Vehicle Handling. Vehicle handling research during the reporting period has yielded limited performance data on 12 passenger cars of diverse configurations. It was found that their performance varied widely near, or at, their accident avoidance limits. As a result, safety performance standards are being formulated for vehicle turning maneuvers and rollover. A second study of articulated vehicles is aimed at establishing performance limits. Single unit truck and bus handling research was initiated, and is scheduled for completion in mid-FY 1974.

Tires. Research and development in Non-Destructive Testing (NDT) of tires has produced systems specifications for testing new tires, carcass selection for retreading, and for motor-vehicle-in-use inspection.

Brakes. Research on braking systems includes projects on vehicle braking performance and braking system components. An effort was begun in FY 1973 to develop a braking efficiency test technique, and to investigate radar-triggered braking systems for automotive use.

Driver and Highway Research Highlights. FY 1973 research in this field centered on alcohol usage, driver education, driver licensing, and safety belt usage.

Alcohol and Drugs. Research in support of the Alcohol Countermeasures Program developed a portable breath tester which law enforcement officials may use as a roadside screening device in those States that have "per se" laws. Additional alcohol research seeks to establish the feasibility of using a device that tests the driver for intoxication and locks the ignition of the car if the test is failed.

Drug research is directed at determining the incidence of marijuana, barbiturates and amphetamines in driver fatalities as well as in the driver population as a whole.

Driver Licensing. Research goals in driver licensing are threefold: (1) To develop improved tests of driver knowledge, skill and physical fitness; (2) to develop effective methods for improving the capabilities of those who fail the tests; and (3) to develop effective and uniform licensing enforcement practices. Other research projects have investigated the problem of enforcing driver license denials or revocation, and developed new vision and knowledge tests.

Safety Belt Use. NHTSA safety belt research has focused on methods to increase usage rates for lap and shoulder belts through educational and legal means as well as through vehicle interlock and warning devices.

Data Analysis. *Accident Investigation.* A scientific system of accident investigation, reporting and analysis is essential to an understanding of basic accident and injury causes, and to an assessment of the efficacy of the basic safety measures being applied. The system in use generates and analyzes data on the performance and interaction of motor vehicles, of drivers, and of the highways and surrounding environment contributing to traffic accidents.

The NHTSA accident investigation system is designed to provide variable "levels" of reporting ranging from basic police/driver reports up to the

multidisciplinary, investigative in-depth reports produced by professional teams. During FY 1973, for example, a system for automating much of the data contained in detailed reports was improved and fully activated. This made available over 3,500 in-depth case reports in the automated file for accessing and analysis purposes.

Fatality Analysis File (FAF). A program has been undertaken by NHTSA to collect, process, and analyze detailed data on all *fatal* highway accidents occurring in the country. Each of the States is completing a coded form for each fatal accident occurring in its territory. During this reporting period 42 States became participants.

Standard Accident File Extract (SAFE). In a separate effort, NHTSA collects data about other accidents also by having the information reported by States; the data will be used to create the National Accident Summary as well as other summary files. Presently 34 States have submitted their 1972 full year accident files.

National Driver Register. The National Driver Register is a Federal/State cooperative driver records exchange service which provides State licensing officials with a source of data on problem drivers, and serves as a clearinghouse for information on driver records.

The Register has recorded the names of almost 3.8 million persons who have had their driving privileges revoked or suspended by the States. In May 1973, the Register received over 81,000 inquiries from participating States each 24 hours.

Drunk driving accounted for 48 percent of the revocations and suspensions reported by the States in 1972, while 15 percent were for repeated moving violations, 6 percent for violations of restrictions, and 6 percent for speeding.

RAILROADS

The FRA research, development and demonstration efforts are focused: (1) On improvements in rail technology to provide better and safer freight and passenger services on the existing railroads, (2) on in-service operation of experimental rail equipment, (3) on the development of advanced equipment and technology for future service improvements, and (4) on providing facilities for testing equipment designs and technology in a controlled but variable environment including the High-Speed Ground Test Center at Pueblo, Colorado.

Rail Technology. Efforts involving conventional rail technology or intended to produce near-term benefits to the railroad industry are considered under three headings: Improved Freight Service, Improved Passenger Train and Track Structures, and Safety R&D.

Freight Service. The complexity of the process of moving goods by rail has dictated a major systems analysis to identify problem areas, though several such areas are known from research previously conducted.

Sorting methods and information systems are being investigated to eliminate delays or dead time in the movement of cars through a yard.

In a major cooperative effort, the Association of American Railroads, the Railway Progress Institute, and the Federal Railroad Administration have undertaken a study of the dynamic performance of long trains and their individual elements.

Technical Advances. The Improved Passenger Train Program was structured to achieve the design of conventional rail equipment which will cruise at speeds up to 150 mph, while providing a comfortable ride, attractive accommodations, and schedule reliability. DOT proposes to sponsor limited research to prepare appropriate designs for such trains, but will not now fund prototype or demonstration IPT's. Research on track structures aims at methods of keeping tracks smooth under conditions of heavy use.

Safety. In the Safety Program, FRA is conducting projects to achieve improved protection devices for grade crossings, improved cars for movement of hazardous materials, and better designed locomotive cabs. Safety of the rails themselves requires improved techniques for detecting flaws in rails and improved methods of laying track. FRA's Rail Dynamics Laboratory has been designed to test all elements of railroad equipment in simulated field checks.

Demonstrations. In 4½ years of scheduled revenue operations, the Metroliners in New York-Washington service and the Turbo Trains in Boston-New York service have demonstrated that there is an increasing market for improved rail passenger travel, though difficulty was experienced in keeping the Metroliner service reliable. The FRA, together with the 28 railroads using the Chicago gateway, is demonstrating an experimental freight car information system which is designed to speed up railroad shipments and provide further knowledge of terminal operations. The results of this study will also have application in the design of a national rail rolling stock information and control system.

Despite problems affecting ride quality and reliability, traveler utilization of the Metroliner trains during FY 1973 increased 19 percent to 2.3 million passengers. Suburban station experiments have continued to encourage additional riders under the Metroliner demonstration project. The Capital Beltway Station at Lanham, Maryland, attracted 126,672 passengers in FY 1973, an increase of 36 percent over the previous year. Another station, Metropark, in Woodbridge, New Jersey, opened during FY 1972 and served 19 percent more passengers during the last half of FY 1973 than in FY 1972.

The Turbo Train demonstration program, which FRA conducted with leased Turbo Trains, was concluded January 22, 1973. The trains were subsequently purchased by AMTRAK for continuing operation between New York and Boston; service has been increased to two round trips daily and ridership increased 82 percent during the first 5 months of 1973.

Installation of scanners for the Chicago Railroad Terminal Information System is complete and testing and development are on schedule. FRA has received functional specifications for the design of the system in a form that will provide a model adaptable to the information requirements of any large railroad terminal area and is currently receiving reports on a continuous sample of car movements through the terminal which will be used to evaluate the effectiveness of the new system when it is implemented.

FRA has initiated several additional research studies intended to improve the procedures used to control freight cars: (1) the use of linear programming techniques to optimize the assignment of empty cars, (2) design of systems to collect and forecast demand information. A 2-year study to develop methods of improving utilization of general service freight cars is under contract with the Penn Central. Procedures for forecasting specific car demand and supply at the trainmaster district level will be developed and tested by installation in pilot areas.

In order to develop appropriate tools for improving efficiency and responsiveness of rail transportation, research studies have been made, including a number of studies of roadway and line maintenance, and studies of the market and service needs of the national grain and grain products industries. An understanding of each of these elements will enable industry and Government planners to foster physical and operating structures within the rail industry that will provide for the service needs of shippers with the minimum consumption of resources.

Advanced Systems. The innovative vehicles being studied and developed under the FRA advanced systems program are the 300-mph Tracked Air Cushion Vehicle (TACV) and the 300-mph Magnetically Levitated Vehicle (MagLev).

The TACV program has constructed 1.5 miles of guideway at the Test Center; a full-sized research vehicle (TACRV) in its initial test phase was operated up to about 100 mph, with the fans supplying air to the cushions. Subsequent tests will use linear induction motor propulsion to cover the higher speed range.

The MagLev program is intended to establish the feasibility of both attractive and repulsive magnetic suspensions at high speeds. Accordingly, a call has been issued for proposals for construction and test of both suspension systems at a rocket sled facility, up to speeds of 300 mph.

A 150-mph Urban Tracked Air Cushion Vehicle (UTACV) program, sponsored by the Urban Mass Transportation Administration and technically monitored by FRA, has progressed to the point where the vehicle fabrication is essentially complete and guideway construction is scheduled for completion by March 1974, at which time the vehicle test program will begin.

Supporting Technology. During the past year, gains have been made in technology to support the advanced systems program.

The 2500-hp double-sided Linear Induction Motor Research Vehicle (LIMRV) has been tested up to 190 mph at the DOT Test Center, validating its predicted high-speed capability.

In conjunction with the building of the TACRV guideway, an effort is being made to reduce cost per mile. A new concept will allow slip-forming the guideway walls with inherent cost reduction benefits of $300,000 per mile.

In the tunneling program, a water cannon has been developed and fabricated and, in laboratory tests, has demonstrated a capability to fracture hard rock. Also significant in the tunneling program has been research on

tunnel linings and supports that are essential to maintain the geometry of the tunnel bore and prevent a collapse. A major output of the program has been the conceptual design of a tunnel construction system which excavates the hole and constructs a concrete lining in one operation rather than in several successive operations as has been the practice in the past.

High-Speed Ground Test Center. The DOT High-Speed Ground Test Center, located northeast of Pueblo, Colorado, has been partly constructed. It will help to fulfill DOT objectives of advancing ground transportation technology and developing cost and performance data on potential systems.

This 9-mile by 5½-mile test site is being developed to provide facilities for full-scale testing of advanced systems as well as conventional transportation vehicles. Full-scale testing is being conducted on the Linear Induction Motor Research Vehicle (LIMRV), transit vehicles such as R–42 subway cars and the State-of-the-Art Cars (SOAC), and the Tracked Air Cushion Research Vehicle (TACRV). The 6.2-mile portion of the Linear Induction Motor (LIM) test track has been used for testing of the LIM suspension, and rail-wheel interaction of the LIMRV up to 190 mph.

Construction has started on the second mile-and-a-half of what will eventually be a 22-mile oval with a U-shaped guideway for the 300-mph TACRV. In a joint UMTA-FRA program, a 60,000-square-foot Rail Dynamics Laboratory is being constructed, with occupancy expected in early 1974.

PIPELINE SAFETY

Applied research and study projects in both gas and liquid pipeline safety were sponsored by the Department in FY 1973. Data from such studies were made available to the public and to industry. Funds totaling $175,000 were obligated for this purpose during FY 1973 and some studies were continued into the year supported by funds obligated earlier. Through a contract, development of a data system to process the leak and test failure reports received by the OPS continued.

The Department continued to cooperate with the Deparment of the Interior in evaluating the technical aspects of the proposed crude oil pipeline across Alaska and contracted for a study to evaluate the adequacy of that pipeline's stress design. Engineering work completed in FY 1973 will help assure that the line can meet all Federal safety standards in design, construction, operations and maintenance.

A Department contract with the National Bureau of Standards (NBS) provides to the OPS such services as inspecting, testing, and analyzing pipeline failure specimens and other pipeline component parts to assist in the determination of the cause of pipeline failures. Resulting reports by NBS suggest means for prevention of similar pipeline failures.

Chapter X

PROGRAM DEVELOPMENTS

INTERMODAL PROGRAMS

Consumer Affairs. The Department emphasized its consumer-oriented programs. Priority was given to a study of consumer involvement in the rulemaking process within the Department. Workshops were held to discuss current procedures and make recommendations for improvements in the process. Nearly 100 consumers and Federal agency officials participated in the workshops.

During the year, 21 consumer public hearings were held in 11 cities in nine States throughout the Nation to give people the opportunity to express their views on all aspects of the several modes of transportation. The results are used in helping to determine how well the Department programs are meeting consumer needs and in program planning directed toward solutions for problems. The hearings indicated that consumers are interested in: (1) Greater emphasis on mass transit; (2) standardized rules of the road and driver requirements; (3) stricter enforcement of traffic laws; (4) improved auto inspection and driver testing; (5) more emergency services and better signs on roads; (6) land use patterns; and (7) availability of improved transportation services for the elderly and the handicapped.

The Citizens' Advisory Committee on Transportation Quality was established to recommend transportation initiatives and evaluate transportation policies for the Secretary without being inappropriately influenced by the Department or by any special interest; it meets from three to five times a year. The Committee is authorized to conduct inquiries, workshops, seminars and studies to obtain information on consumer attitudes toward transportation to assist in formulating its recommendations to the Secretary.

Consumer Protection. The National Highway Traffic Safety Administration (NHTSA) is charged with safeguarding the motoring public through the investigation of defects bearing upon safe vehicle operation; monitoring compliance of vehicle and motor vehicle equipment with the Federal motor vehicle safety standards; enforcement, or civil action court proceedings where warranted; and the dissemination of consumer information. In FY 1972, NHTSA instituted a system of responding to a flow of consumer complaints and of notifying the manufacturers of the difficulties reported. Some of the FY 1973 highlights follow:

- During the fiscal year, there were 298 defect recall campaigns affecting 10,546,679 vehicles. Of these, 56 of the recalls involving 7,578,766 vehicles were influenced by NHTSA investigations.
- Testing to insure that vehicles and equipment conformed with Federal safety standards resulted in 41 civil penalties, but the failure rate for tests is declining, and stood at 6.5 percent the end of May 1973, as contrasted with 7.2 percent on June 30, 1972.
- Litigation work undertaken by NHTSA in connection with compliance enforcement has at least doubled during the past year.
- Consumer complaints averaging 225 per month were referred to the manufacturers with a request for an action report. 65–80 percent of the referrals achieved successful redress.

Urban Transportation Advisory Council. During the year, Council subcommittees reported to the Secretary on "Transportation for the Transportation Deprived" (with particular focus on the problems of the elderly and the physically handicapped) and "Low Capital Improvements" (to increase the effectiveness of existing transportation systems). The Council also made recommendations to the Secretary and to the National Highway Transportation Safety Administration (NHTSA) as a result of which Safety Standard 17 was modified so as to permit the use of transit buses as part of urban pupil transportation systems.

Historic Preservation. The Secretary is a member of the Advisory Council on Historic Preservation and, through his designee, participates in the review of federally funded actions which may have an impact on those districts or objects of historic, architectural or archeological significance listed in the National Register of Historic Places. In response to Executive Order 11593 (Protection and Enhancement of the Cultural Environment), the Department nominated several candidates for the National Register—mostly Coast Guard properties with historical significance.

American Revolution Bicentennial Administration. The Secretary is an ex officio member of the Administration created to observe the 200th Anniversary of the Nation's birth in 1776. Among the many ongoing transportation projects sponsored by the Department as parts of the observation are: the National Visitors Center (Washington Union Station) Intermodal Transportation Terminal to serve as the Nation's Capital gateway for visitors; highway programs to improve traffic movement and safety in communities associated with historic areas; a Medical Emergency Coordination Communications Assessment program to assist Bicentennial celebration areas in emergency medical care; and a Bicentennial Transportation Needs Study for Washington, D.C., with applicability to other urban areas. As an aid to citizens and communities planning Bicentennial activities, the Department is preparing a manual and guidelines on Departmental integrated grant programs for distribution in FY 1974.

Facilitation Program. Research, planning and action-oriented programs, initiated and conducted by the Office of Facilitation, provide the means for the Department to fulfill its commitment "to facilitate the development and improvement of coordinated transportation services, to be provided by private enterprise, to the maximum extent feasible . . ." as defined in the DOT Act.

In the course of FY 1973 the Office of the Secretary:

- Issued a Progress Report on the implementation of the recommendations contained in the joint DOT/National Committee on International Trade Documentation study of October 1971. The aggregate potential annual savings resulting from the work now underway will approximate $4.6 billion a year.
- Undertook the first of a series of demonstration tests of a new electronic cargo data transmission system designed to simplify and speed cargo movements in international trade. Air cargo data applicable to 15 air shipments from JFK Airport in New York to Heathrow Airport in London were transmitted by computer with the assistance of ADP programing developed by the DOT Transportation Systems Center.
- Continued work on a new Standardized Transportation Commodity Description and Coding System applicable to domestic U.S. cargo capable of being harmonized with existing systems. October 1, 1973, is the target date for implementation of this system which will permit the integration of all the existing systems. It is estimated that an annual savings to U.S. interests will be in excess of $1 billion.
- Made progress on the alignment of key commercial documents for international trade. Almost 85 percent of the maritime carriers have aligned their documents to a standard master format, and progress has been made toward the alignment also of rail and truck documents to the same format. This program will produce an estimated annual savings of $1 million.
- Promoted international facilitation objectives through strong U.S. leadership in the International Civil Aviation Organization (ICAO), the Intergovernmental Maritime Consultative Organization (IMCO), and the regional commissions of the U.N.
- Contracted in a joint funding study effort with the Institute for Water Resources, Army Corps of Engineers, to analyze and optimize the role of the U.S. inland waterways, Great Lakes, and coastal waters systems as a transportation resource.
- Participated in national and international government and non-government organizations (American National Standards Institute and International Standards Organization) in developing the dimensional compatibility and minimum performance standards of packages, unitization containers and equipment in the total transport system.

Safe Handling of Hazardous Materials. Programs sponsored by the Office of the Assistant Secretary for Environment, Safety and Consumer

Affairs included training seminars with State and local personnel and private organizations, a centralized reporting system for incidents relating to hazardous materials, and a Hazard Information System to provide immediate guidance to police, firemen and others faced with an emergency involving hazardous materials. The Office issued special permits for transportation of such materials before standard rules could be devised. Approximately 1,000 such special permits were in force at the end of the fiscal year. A new package labeling format was issued to cover both domestic and international shipments.

Low Capital-Intensive Improvements. The Secretary of Transportation, acting on the recommendation of the Urban Transportation Advisory Committee, established a Task Force on Low Capital-Intensive Improvements to Existing Transportation Systems. These include bimodal passenger and vehicle-moving improvements, which generally involve few or no new commitments of land, capital resources or construction of new facilities. These improvements can be implemented quickly to achieve significant results in relieving transportation problems and increasing facility usage. The Task Force was instructed to suggest ways of promoting low-cost capital improvements as alternatives to expensive new construction, and ways to lend technical assistance to communities that wished to apply for such assistance.

Urban Corridor Demonstration Program. The Urban Corridor Demonstration Program (UCDP) is a joint effort of the Urban Mass Transportation Administration and the Federal Highway Administration, under the coordination of the Assistant Secretary for Environment, Safety and Consumer Affairs. Its purpose is to test and demonstrate the concerted use of the available programs of the two modal administrations in relieving peak hour traffic congestion in corridors leading to and from central business districts.

During FY 1973 grants totaling more than $6 million were awarded to seven participating Urban Corridor Demonstration Program urban areas for improved bus and rail transit service, bus priority measures, Dial-A-Ride service to a residential-area bus terminal, carpool and buspool programs, staggered work hours program, various roadway improvements and metered freeway projects.

Projects will be evaluated for the benefit of other urban areas across the Nation.

Highlights during FY 1973 included the following:

- New Jersey. The outstanding success is the exclusive bus lane on Interstate 495 from the New Jersey Turnpike to the Lincoln Tunnel in New Jersey. This one-lane, exclusive bus facility carries an average of 34,000 persons each morning, saving each of the passengers between 10 and 15 minutes traveling to downtown Manhattan.
- Minneapolis. New express bus service was introduced into the I–35W corridor; an increase in ridership of over 650 percent on the new buses which use I–35W.

- Louisville. Louisville and Jefferson Counties agreed to fund a $786,000 transit improvement program to aid the Louisville metropolitan area transit company in one of the largest public expenditures in the Nation to aid a privately owned and operated transit system. Features of the program include reduced student fares, reduced off-peak fares, elimination of transfer charges, and the purchase and installation of bus shelters.

Transportation for Transportation-Deprived Citizens. The Department of Transportation continued its efforts to eliminate constraints which inhibit mobility of the physically disabled, the aged, the young, and the poor—the "transportation disadvantaged." Among other efforts, the Department has issued an advance notice of proposed rulemaking on air transportation of handicapped persons that will establish uniform standards for the transporting of such persons.

AVIATION

Upgraded Air Traffic Control System. FAA issued a report in FY 1973 entitled "Concepts, Design, and Description for the Upgraded Third Generation Air Traffic Control System" which defines the goals for the system being developed. The upgraded third generation system will incorporate greater reliance on automation and improved beacon surveillance capabilities for high density air traffic control and collision avoidance. This system would be partially installed starting in the late 1970's and should be completely installed in the early to mid-1980's.

Some of the more notable R&D efforts during the reporting period were in the following areas:

1. *Area Navigation* (RNAV). RNAV refers to a pilot's ability to navigate along any selected course to or from any specific "waypoint" within coverage of airway navigation stations (VORTAC) by using an onboard computer which continuously computes and displays the aircraft's position left or right of the course and distance away from the waypoint. A report issued in February 1973 envisions that area navigation will be the primary system by 1982 for navigation by aircraft flying above 17,000 feet mean sea level and for operations in high and medium traffic density airport terminal areas.

Appropriate Research and Development (R&D) projects are now underway to validate the RNAV concepts, including development of a compatible high-altitude area navigation route structure, development of a digital data broadcast capability on distance measuring equipment (DME) frequencies for area navigation computers, studies on map display information content, simulation of the impact on the air traffic control system and cost-benefit analyses. A nationwide system of high-altitude area navigation routes has been established consisting of approximately 156 route segments.

2. *Radar.* A project was undertaken to procure prototype upgraded Air Route Surveillance Radar (ASAR) equipment in FY 1975.

3. *Beacon.* A major engineering effort was conducted to design the next generation beacon, the Discrete Address Beacon System (DABS)—an im-

provement on the present Air Traffic Control Radar Beacon System (ATCRBS). DABS will have a discrete address capability with which an interrogation message will be sent only to a specific aircraft.

4. *Collision Avoidance System (CAS)/Proximity Warning Indicator (PWI).* Two contracts were awarded to the leading nonsynchronous collision avoidance systems manufacturers to flight test and evaluate their equipment during FY 1973, and subsequently, at the Naval Air Development Center (NADC). A contractor was also selected for an analytical study to determine the appropriate number, location and implementation priority of T–F (time frequency) CAS ground stations, should that method ultimately be selected.

5. *Approach and Landing Systems.* Category III (very low visibility) Instrument Landing System (ILS) ground equipment will be operational at the National Aviation Facilities Experimental Center (NAFEC) to support the all-weather landing portion of this continuing program.

6. *Airport/Airside.* This continuing program concerns primarily airport safety, airport configuration design and pavement design on the outside or nonterminal side of the airport.

7. *Flow Control.* A prototype combined en route and terminal flow control computer program design has been completed. Upon completion of validation, this design will provide centralized flow control capability to interface with local flow control activities performed by the Air Route Traffic Control Centers (ARTCC).

8. *En Route Control.* FY 1973 efforts included:

- Completion of specifications for a Direct Access Radar Channel.
- Demonstration of a ground-based conflict alert capability for beacon traffic at the Jacksonville ARTCC.

Flight Service Stations (FSS). The FSS system is composed of three basic elements: a central processing facility; 30 to 50 manned hub stations; and nationwide, about 3,500 unmanned self-service terminals for pilots at some 2,000 locations. The present network of Flight Service Stations is technologically and functionally the same as it was in the 1940's, and is thus unable to meet the demands for flight services. A concept for a nationwide automated flight service station system was developed during FY 1973 by a joint FAA/OST study team.

Terminal/Tower Control. The first computer and computer program package which expands the ARTS III capabilities to include radar tracking, additional reliability features and continuous data recording was successfully demonstrated.

Aeronautical Satellites Ocean air traffic control and air carrier communications are conducted over high-frequency radio circuits which are often of low reliability and are approaching saturation in the North Atlantic and Eastern Pacific. Oceanic surveillance is based on pilot voice position reports which are limited in accuracy and rate. With the increasing traffic levels forecast, the air traffic control system will require more accurate

and more frequent aircraft positional information. Some of the FY 1973 highlights include:

- Experiments using the National Aeronautics and Space Administration's (NASA) Applications Technology Satellites (ATS). These experiments are nearing completion and have provided valuable multipath channel characteristics and scintillation data.
- A test plan for ATS–F satellite experimentation and operational demonstration. The plan has been forwarded to NASA for allocation of the necessary satellite test time.
- The awarding of a contract for the development of initial models of an L-band avionics system suitable for experimental ATC satellite demonstrations.

Aircraft Safety. The use of electromagnetic and X-ray absorption techniques for detecting weapons in carried luggage was initiated.

Modified (gelled) jet fuels, to reduce fire hazards associated with survivable crashes, were full-scale tested in survivable crashes of surplus military aircraft.

Joint FAA/USAF/NASA Runway Research Program. A study on the stopping characteristics of jet aircraft on dry, wet, icy and snow-covered runways was completed this year as part of a joint FAA/USAF/NASA runway research program. The study was designed to determine aircraft braking system characteristics, runway surface coefficient-of-friction measuring devices, and pilot operating procedures required for safe landings on wet, snow-laden, and icy runways.

Crashworthiness. During FY 1973, a research and development plan was developed whereby crashworthiness aspects of small airplane design will be further studied by FAA and NASA in cooperation with industry. Agency and contractual studies will be initiated to identify additional crashworthiness factors which could be considered during the design process.

Quiet Short-Haul Air Transportation System (QSATS). The growth of aviation over the last decade has brought it into conflict at many locations with the increasing concern for land use and the environment. In FY 1973 a National Plan was prepared keynoting policy, social, economic and technical issues as well as the goals, objectives, and activities required to insure joint Government-industry consensus and action leading to an environmentally acceptable short-haul air system.

Among the many program activities initiated or accomplished were studies of the influence weather conditions should have on design of short-haul aircraft and problems of congestion and air traffic control that will result from introduction of such aircraft. Contracts also were let to investigate appropriate microwave landing systems and other technical facilities required for short-haul operations.

Environmental R&D Accomplishments In FY 1973. The FAA Quiet Nacelle Program provided test data to assist in determining whether JT3D propelled aircraft (B–707 and DC–8) and JT8D propelled aircraft (DC–9

and B–727) can feasibly be modified for meaningful noise reduction. The JT3D retrofit installation was flight tested in April 1973 and met the noise standards of FAR 36. The JT8D testing program was essentially completed during FY 1973.

- Testing continued on development of the "two segment" approach, which offers up to a 10-decibel (dB) reduction before the aircraft transitions to the second segment at about 3 miles from touchdown. Airlines participating in this NASA/FAA program initiated in-service evaluations of the system with a B–727 aircraft.
- Noise measurements of several general aviation aircraft were made at NAFEC to obtain information required to develop a noise certification rule for propeller-driven aircraft weighing less than 12,500 pounds.

Airspace Schedule Management. During FY 1973, FAA extended for an additional 12 months the rule authorizing the establishment of flight quotas at five high density airports (John F. Kennedy International, O'Hare International, Washington National, La Guardia, and Newark Airports). Quotas are presently in effect at John F. Kennedy International and O'Hare International Airports between the hours of 3 p.m. and 8 p.m. daily. Quotas at La Guardia and Washington National Airports are from 6 a.m. to midnight daily. Newark Airport, though included in the quota rule, is not currently operating under schedule restrictions.

National Airspace System Modernization. Significant accomplishments under this program include:

- ***ARTS–III.*** At year's end, 60 ARTS–III (semiautomated air traffic control) systems had been delivered to designated terminal locations. The last system, planned for the San Francisco/Oakland Bay area, was placed in storage pending construction of new terminal quarters early in FY 1974. Sixty systems were in full operational use at the end of the reporting period.
- ***ARTS–II.*** A prototype ARTS–II system was evaluated at the Wilkes-Barre, Pennsylvania, Terminal Radar Approach Cab (TRACAB) during the latter half of the fiscal year. The ARTS–II design will provide a semiautomated display capability for lower density terminal radar control facilities not qualified for ARTS–III.
- NAS En Route Stage A. Significant progress has been made in this program. As noted in last year's report, NAS En Route Stage A is being installed and implemented in two phases at the 20 ARTCC's in the contiguous 48 States. The first phase, which is essentially complete, provides automatic flight data processing and interfacility data transfer. The second phase provides for digital radar displays and radar data processing. At year's end, all ARTCC's had a computerized flight data processing capability and all centers were using computer updating equipment which facilitates communication between the controller and the automated system.
- Three ARTCC's located outside the contiguous United States (San Juan, Honolulu, and Anchorage) are in various stages of implementing automatic flight data processing. The hardware has been delivered to the

Honolulu and Anchorage ARTCC's. San Juan is now in the process of obtaining the hardware. Flight data processing capability is scheduled to be operational at the three ARTCC facilities by the end of 1973. The planning for the three ARTCC's includes the addition of radar data processing capabilities as well as interfacing with terminal air traffic control facilities within their area of jurisdiction.

- Major contracts totaling approximately $142.5 million to effect improvements in the National Airspace System and for other requirements have been awarded for equipment and services.
- ***Electronic Voice Switching (EVS).*** The FAA is engaged in a program to provide the en route traffic control facilities and certain large control tower facilities with EVS systems, the latest technology in telephone switching to reduce cost of agency communications and improve efficiency of air traffic control.
- ***Airport Development Aid Program (ADAP).*** This program authorized FAA to obligate to eligible airport sponsors $280 million annually through FY 1973 for establishing and improving airports to meet the needs of civil aeronautics. During FY 1973, the third year of operation under the ADAP, the FAA entered grant agreements with airport sponsors for development and firefighting and rescue equipment at 450 airports.

Aviation War Risk Insurance. Under Title XIII of the Federal Aviation Act of 1958, as amended, the Department of Transportation Act of 1966, and a delegation of authority from the Secretary of Transportation, the Federal Aviation Administration continues to maintain an aviation war risk insurance program.

The current program includes a standby insurance binder plan which would make aviation war risk insurance available to U.S. civil aircraft and foreign-flag civil aircraft engaged in operations in the interest of national defense or the national economy upon the outbreak of war between any of the four Great Powers. It also includes a nonpremium aviation war risk policy insuring U.S. air carrier aircraft under contract to the Department of Defense or otherwise committed to the Civil Reserve Air Fleet.

As most of the aircraft insured under any one program are also insured in one or more others, the cumulative value of aircraft insured or the maximum contingent liability would not produce a true measure of exposure. The actual number of aircraft insured under all programs is 451, representing a maximum contingent liability of $46,788,747,400.

The Premium Hull & Liability Deductible-Coverage program which was activated in 1970 is generally being phased down due to availability of War Risk Insurance in the commercial insurance market. Remaining liabilities under this program are $16,494,000. During FY 1973 revenues of $2,157,441.39 were realized under the program. Retained earnings in the Aviation War Risk Insurance Revolving Fund at the beginning of FY 1973 were $10,555,534.46. Net adjusted administrative expense chargeable to these programs in FY 1973 was $43,353.17.

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One claim has been made under the premium Hull and Liability Deductible-Coverage program for the destruction of a Boeing 747 aircraft in Cairo, Egypt, on September 6, 1970.

Implementation of 50 kHz/Y Channels for ILS/VOR/DME. Rapidly expanding aviation services have resulted in the need for additional radio frequencies for enroute navigational aids and instrument landing systems.

FAA has actively participated in meetings with the Radio Technical Commission for Aeronautics (RTCA) and other industry groups to develop performance requirements for operation with 50 kHz channelization.

FAA also issued a notice of invitation for comments regarding 25 kHz frequency spacing of VHF communications channels on January 5, 1973. Resulting comments were analyzed and a notice of policy decision was issued on May 21, 1973, stating that 25 kHz frequency spacing of VHF communications channels will be implemented in the jet route structure beginning January 1, 1977.

HIGHWAY PROGRAMS

Progress on the Interstate System. At the end of the fiscal year, 34,848 miles (82 percent) of the designated 42,500 miles of the Interstate System were open to traffic. Sections completed to full design year standards increased by 1,482 miles. In addition to the sections in use, 3,206 miles were under construction, and engineering and right-of-way acquisition were completed or underway for 3,383 miles. This represents 98 percent of the work on the entire Interstate System.

Direct Federal Highway Construction. The Federal Highway Administration administers annual appropriations for forest highways and public lands highways and performs highway engineering and construction services on forest development roads, park and parkway roads, Indian reservation roads, and access roads. During FY 1973, work was completed on 86 projects for a total length of 273.2 miles and involving Federal funds totaling $50.2 million. Awards were made on 71 new projects for construction of 136.1 miles for a total amount of $37.3 million and at the close of the fiscal year, 83 projects were under contract with an obligation of $54.7 million for construction of 260.5 miles.

Construction Contracts and Prices. During the year 4,632 Federal-aid highway construction contracts with a total value of $4.6 billion were awarded, of which 1,400 were on the Interstate System, 2,056 were on the Federal-aid primary system (exclusive of Interstate), and 1,176 were on the Federal-aid secondary system. Contracts for urban work are included in these figures. The average size of contracts during the year was approximately $992,500 and 79 percent of the contracts were for less than $1 million. During a 3-year period, $51.2 million was spent from a revolving fund for advance acquisition of land for right-of-way.

Interim Highway Funding. A bill to provide for interim highway funding (S. 1808) was approved by the President on July 6, 1973. It provided authorization of appropriations of $1 billion for the Interstate System

and $500 million for the primary and secondary systems and their urban extensions to prevent halting of construction by the States.

Territorial Highway Program. Under the Territorial Highway Program for the Territories of Guam, American Samoa, and the Virgin Islands, funds are available on the basis of a Federal contribution of 70 percent of the cost of any project. Highway agencies have been established by the Territories, and long-range highway plans are being developed. The systems of roads have been designated; planning and design work is proceeding; and several projects are under construction in each Territory.

Special Bridge Replacement Program. By the Federal-Aid Highway Act of 1970, Congress established a program to replace a limited number of the Nation's deficient bridges during fiscal years 1972 and 1973.

To date, 8,934 applications have been submitted by the States for replacement of deficient bridges. In December 1972, each State was assigned, as a planning guide, a portion of the $250 million authorized and a list of the highest priority bridges in the State. The States then make their own determination of which bridges they wish to replace. To date, 202 bridges have been selected and are in various stages of replacement. Three of the initially authorized bridges have been completed and are now open to traffic. The other 199 bridges are in various stages of planning, design, or construction.

State Highway Department Maintenance Management Programs. Since 1971 FHWA has been providing advisory assistance upon request to 27 State highway departments in the management of their highway maintenance programs.

Appalachian Regional Highway Program. The Appalachian Regional Development Act of 1965 provided for funding joint Federal and State efforts in the solution of the special problems of the Appalachian region. FHWA participated in the designation of a system of highways to improve transportation in the region, a critical economic need. The Act and subsequent amendments authorize $2.09 billion for the construction of up to 2,700 miles of development highways and 1,600 miles of local access roads. After local approval the projects are carried out as Federal-aid highway projects. As of March 31, 1973, 735.2 miles of development highway and 374.4 miles of access roads had been built at a total cost of $1.9 billion.

Economic Growth Center Program. One hundred twelve small urban centers in 50 States and Puerto Rico have been approved to participate in the Economic Growth Center Development Highway Program authorized in the 1970 Federal-Aid Highway Act. Construction projects have been selected for approximately two-thirds of the centers and 49 centers are constructing 300 miles of roads. Most States have been conducting preliminary economic studies which will become the basis for later evaluations of the demonstration program.

MASS TRANSPORTATION

Urban Mass Transportation Administration (UMTA) Capital Grant Program. FY 1973 was a year of unprecedented activity for the UMTA capital grant program. A total of $844.2 million in grants was committed, a sum considerably greater than the entire amount committed in the period between FY 1965 and FY 1970 ($680.6 million) under the 1964 Act. In addition to the capital grant commitment, an advance land acquisition loan of $19.5 million was approved during FY 1973 for the Massachusetts Bay Transportation Authority in Boston.

There were 94 new capital grant projects and 32 amendments (involving funding) to previously approved grants. Involved in the $844.2 million commitment were projects in 88 metropolitan areas in 35 States, the District of Columbia, and Puerto Rico.

With completion of the FY 1973 program, the cumulative net total of Federal fund commitments to capital grant projects by UMTA was $2,317,439,768, involving 354 projects in 44 States and in the District of Columbia and Puerto Rico, including rail, bus, and ferry boat projects.

Grants approved in FY 1973 will assist in the purchase of 4,072 new buses and 851 new rail cars. From the beginning of the program through June 30, 1973, purchases of 14,503 new buses (including 370 trolley-coaches) and 3,257 new rail cars (including 1,009 railroad commuter cars and 228 light-rail cars) have been assisted through the capital grant program.

Examples of UMTA Grants. Among the larger, more significant grants for the year were the following:

- For the New York City Transit Authority one new grant and four amendments to two previously funded grants were approved for a total of $183.7 million. The largest project provided an additional $78.8 million for the purchase of 425 new subway cars. In total, UMTA has now provided $142.2 million for 745 cars.
- Two planned new rapid transit systems received initial funding during the year: Metropolitan Atlanta Rapid Transit Authority for which a grant of $69.5 million permits the start of construction for the 50-mile rail and 14-mile bus system, and the Mass Transportation Administration of Maryland, which received $22.5 million to begin construction of a 28-mile rail line as the first phase of a rapid transit system for the Baltimore area.
- For the Bay Area Rapid Transit District in the San Francisco region which opened for service 58 miles of its 75-mile system during FY 1973, UMTA provided an additional $88.7 million in capital grant funds, making the total commitment to the BART system $254.7 million. The latest funding permits the system to acquire 100 additional cars for a total of 350, and to continue construction work.
- The Northwest Suburban Mass Transit District in the Chicago area received a capital grant of $20,876,702 to assist in the purchase of 36 new bi-level cars and 13 diesel locomotives for the Milwaukee Road

suburban service. This is the first funding of diesel locomotives in this program.

- The Massachusetts Bay Transportation Authority in Boston, with a $32.8 million capital grant, has ordered 150 new cars for its streetcar operations of the same type as those ordered by San Francisco's Municipal Railway. These are the first vehicles of this type purchased in the United States since 1952.
- The largest grant during FY 1973 involving bus service was the $70.3 million funding for the Washington Metropolitan Area Transit Authority. This enabled WMATA to purchase the four privately owned bus systems serving Washington and its suburbs, to buy 620 new buses, and to inaugurate a modernization and improvement program.
- Other large bus purchases funded during the year included 545 for Chicago, 440 (and 110 trolley-coaches) for Philadelphia, and 220 for Los Angeles. Small bus systems, however, also received funds for new equipment. Among the communities thus assisted are: Burlington, Vermont; Frankfort, Kentucky; St. Cloud, Minnesota; and Olympia, Washington.
- UMTA assisted 21 cities to buy transit systems during FY 1973. These ranged in size from such larger systems as Buffalo, New York, and Cincinnati, Ohio, to small operations in Clarksburg, West Virginia, and the Davenport-Rock Island area of Iowa and Illinois. In several cities suburban private operations were acquired to coordinate with publicly owned major systems. Baltimore and Seattle are examples of this type of public takeover.

Throughout the Nation, UMTA's capital grant program assisted 21 cities to stabilize existing bus systems; helped in the purchase of 4,072 new buses, and 851 rail rapid and commuter railroad transit cars; and helped in the construction and modernization of 15 bus garages and service facilities. Ninety-four capital improvement grants, 32 amendments to existing grants and one advance land acquisition loan were made, totaling $863.7 million.

Under development are nine prototypes of a new modern 50-passenger bus designated "Transbus." Three different designs will be available early in FY 1974 for testing and evaluation. Also during the year UMTA contracted to develop preliminary specifications for a high-capacity transit bus.

WATER TRANSPORTATION PROGRAMS

Regulations and Notices. In March 1973, the Coast Guard published regulations dealing with the issuance of licenses for the operation of uninspected towing vessels to reduce casualties attributable to personnel error.

On July 1, 1974, the regulations on pollution prevention from vessels and oil transfer facilities become effective; they reduce the probability of an accidental discharge of oil or oily wastes during normal vessel operations or during the bulk transfer of oil or oily wastes to or from vessels.

To insure at least a minimum degree of safety from the increasing numbers of vessels carrying hazardous cargoes in U.S. waters, the Coast Guard has issued interim regulations governing the issuance of a letter of com-

pliance to foreign vessels carrying certain bulk dangerous cargoes in U.S. ports. Such cargoes include: etiologic agents, cold compressed gases and radioactive materials.

The Coast Guard issued advanced notices of proposed rulemaking during FY 1973 on regulations which would require a segregated ballast (achieved in part by fitting, throughout the cargo length, a double bottom) capability on tank ships, and on regulations to govern the design, construction, installation, and operation of any maritime sanitation device on board certain vessels.

The Coast Guard issued regulations that require uniformity of materials (fire-retardant resins) for fibrous-glass-reinforced plastic construction in small passenger vessels. The Coast Guard also has issued by regulation a revision of anchorage grounds in San Francisco Bay.

Electronics Engineering Developments. The Loran-70's Program, established to provide a unified, comprehensive plan for future Coast Guard Loran efforts, includes the replacement of aging equipment at existing stations and the construction of new stations to provide navigation signals to meet the marine requirement for the coastal confluence region, as set forth in the National Plan for Navigation.

Land was acquired for a new Loran-C transmitting station in the Presque Isle section of Maine; a construction contract will be awarded during the summer of 1973. The facility will be used to test new equipment and operations designed to permit unattended operation at some Loran-C stations and reduced manning at others.

A contract for construction of a prototype Sectionalized Loran Transmitting (SLT) Antenna has been awarded and the antenna is scheduled to be installed at the Presque Isle Test Facility in FY 1974.

Two low-cost Loran-C Navigation receivers have been developed and delivered to the Coast Guard. Each company produced one prototype and five preproduction models of its receiver under Coast Guard contracts. During FY 1973, both models satisfactorily passed preliminary testing at the USCG Electronic Engineering Center, Wildwood, N.J. All of the receivers are presently undergoing operational field evaluation on various Coast Guard and commercial vessels.

The frequency of Loran-C transmissions was adjusted to conform to the international system of Universal Coordinated Time during FY 1973. The Coast Guard acts as an agent of the U.S. Naval Observatory and the DOD as timing program manager. Procurements have been initiated for hardware to establish time monitoring stations at existing Coast Guard and DOD facilities.

A contract has been awarded for construction of two radar transponder beacons (RACONS) that provide positive geographic reference to radar-equipped vessels. User demand for more RACONS has steadily increased. To extend the navigation season on the Great Lakes, six RACONS were deployed during FY 1973. Eight RACONS are now being readied for redeployment on the north slope of Alaska.

The Lampedusa, Italy, Loran-C transmitting station was declared operational on August 28, 1972. The Air Transportable Loran-C station (ATLS) equipment was utilized for this installation. This station replaces the disestablished Loran-C station at Matratin, Libya, and restores Loran-C coverage to include almost the entire Mediterranean Sea.

Procurement specifications for high-power radiobeacon equipment for Large Navigational Buoys were completed in FY 1973. The new equipment will be ultra-reliable with redundant solid-state modules and automatic switching between module sets in the event of failure.

Under Coast Guard contract, a low-cost ship guidance system using Loran-C inputs has been developed. Complete documentation on this equipment will be released to the public in late 1973 to allow production by any interested manufacturer. The requirement to equip all Coast Guard icebreakers and oceanographic vessels with precision navigational capabilities is being met by utilizing the Navigation Satellite and Loran-C navigation systems in a time-shared manner. A computer is employed to produce the required data for automatic display of navigational information.

During FY 1973 the Coast Guard installed 40 VHF-FM communication sites to provide coastal distress coverage in the maritime mobile band with any 1-watt transmission from a vessel as far as 20 miles at sea. The installation of 80 sites in FY 1974 will complete the program. These sites will provide receiver communications coverage of the United States including Hawaii, Guam and Puerto Rico.

Also during FY 1973 the last Transportable Communications Central (TCC) was delivered to Coast Guard Air Station Elizabeth City. The Transportable Communications Centrals are equipped with all modes of communications equipment and are available for deployment to any location where a rapid on-scene communications capability for natural disasters or for search-and-rescue incidents is required. Since being placed in an operational status in FY 1972, the TCC's have performed successfully in flood relief operations during Hurricane Agnes and, more recently, in the Mississippi River delta area.

Ocean Engineering Developments. The Lighthouse Automation and Modernization Program (LAMP), now ending its sixth year, has seen a total of 26 stations automated, with 10 completions during FY 1973.

Specifications for a FY 1974 procurement of five additional Large Navigational Buoys (LNB) were completed. This will result in a population of 10 LNB's on station and a spare buoy on the East and West Coasts.

Continuing the effort to convert to lighter weight buoys, contracts were awarded to supply sample plastic buoys of the two smallest sizes for qualification testing. Thirty medium-size plastic buoys of Coast Guard design were fabricated and a contract was awarded for 10 aluminum buoys of a similar design.

Civil Engineering Developments. Coast Guard family housing standards have been revised to parallel those of the Federal Housing Administration. Continuing efforts are being made to utilize new methods of acquiring family housing including purchase of existing homes, use of the

Small Business Administration's Minority Contractor Program, and two-step formal advertising for construction of a builder's "off the shelf" product.

Naval Engineering Developments. Construction is continuing on 2 new icebreakers, the *Polar Star* and the *Polar Sea*. They are believed to be the most powerful icebreakers in the world. In addition the Coast Guard has under construction, either by contract or in its own yards, a number of special-purpose boats including a series of 41-ft. Utility Boats and Motor Surf Boats.

Other ships were in the process of rehabilitation and conversion, including the *Storis*; the *Evergreen*, being converted into an oceanographic cutter; and the *Acushnet*, being converted to support the National Oceanic and Atmospheric Administration (NOAA). Major modernization efforts are being applied to the *Westwind*, and to several buoy tenders such as the *Salvia*, *Sweetgum*, and *Sagebrush*.

Search and Rescue (SAR). Three years of evaluation of Air Cushioned Vehicles for search and rescue and other programs has produced documentation for future utilization of such surface effect rescue vehicles as a part of the Coast Guard inventory. No Surface Effect Vehicles are currently in the Coast Guard inventory.

In FY 1973 the Coast Guard fulfilled its SAR responsibility by maintaining and operating a search and rescue system consisting of 24 air stations with 49 fixed wing and 110 rotary wing aircraft; 30 high endurance and 23 medium endurance cutters; 79 patrol craft; and 144 shore stations from which some 650 small boats operated. During the year, the Coast Guard responded to approximately 64,000 calls for assistance. Recreational boaters generated approximately two-thirds of the calls for assistance and the remaining one-third was generated by commercial vessels and civilian and military aircraft. Approximately 4,000 deaths were prevented and more than 125,000 persons were otherwise assisted. The estimated value of property loss prevented exceeded $230 million.

Coast Guard Aviation. The Coast Guard's HU–16 E aircraft will have to be replaced within the next 2 years because they are approaching their maximum flight time limits. An evaluation effort has been undertaken to support a procurement program to replace approximately 40 aircraft.

Preliminary steps are now underway to construct a new Coast Guard Air Station at North Bend, Oregon. This three-helicopter unit will supplement the vessels already located in the Coos Bay area and will provide rapid response to SAR cases and foreign fisheries surveillance by late 1974.

The Coast Guard was operating 159 aircraft at 24 air stations at the end of FY 1973.

Marine Science Activities. During FY 1973, the Coast Guard had more than 30 vessels capable of significant marine science activity. During the year the number of ocean stations was reduced from 5 to 3. On these ocean stations, observations of water mass properties were made once or twice daily, with en route observations to total about 2,000 observations each time a vessel occupied a station. Among the cooperative projects in

which the Coast Guard took part were: (1) Support of the Navy environment buoy program, (2) support planning for the Global Atmospheric Research Program's (GARP) Atlantic Tropical Experiment (GATE), (3) weather observations for the National Weather Service, (4) Western Beaufort Sea Ecological Survey, (5) International Field Year on the Great Lakes, and (6) support of Office of Naval Research programs on the ocean stations. Major emphasis during 1973 was placed on utilization of Coast Guard marine science capability and expertise in support of internal mission requirements, specifically in areas of marine environmental protection and improvement of search and rescue techniques.

Icebreaking. Coast Guard icebreakers continued to serve the Nation's interests in the Arctic and Antarctic during the year. In the Eastern Arctic (near Greenland) two ships facilitated the annual resupply of U.S. Defense installations and supported various scientific investigations which benefited U.S. Navy defense-oriented research. Three icebreakers deployed to the Western Arctic (near Alaska) in the summer months and one in the winter conducted diverse investigations in ecological research, geological surveys, defense-oriented investigations, and international cooperative communications research. Three icebreakers continued the annual 5-month deployment to the Antarctic in support of the National Science Foundation research program in that part of the world.

This year brought about a significant change in the external appearance of the polar icebreakers. Based on an evaluation by CGC *Glacier*, vessels were painted red instead of the traditional white to improve visibility of the vessels.

Assistance to Great Lakes Season Extension. The increasing attractiveness of operations to keep the Great Lakes ice-free and open to navigation was demonstrated during the 1972–73 season with 19 companies participating in the movement of 3.34 million tons by sailing until February 8, 1973, seven days later than the previous season; more companies will operate more ships later into the season during the 1973–74 and later seasons.

The following statistics regarding icebreaking assistance rendered by Coast Guard units during the past two extended seasons underline the increased activity by the shipping community:

	1971–72 Extended Season	*1972–73 Extended Season*
Icebreaking operating hours	531.2	1,057
Number of Vessel Assists	132	224
Total value of cargo assisted	$16,991,794	$26,698,186

Ocean Stations. The Coast Guard continued its operation of the multimission Ocean Station Vessel Program during FY 1973 and made these contributions:

a. Four mid-Atlantic ocean stations were manned as the U.S. input to a 16-nation agreement under aegis of ICAO.

b. The cutter *Gresham* provided meteorological data from station Hotel, 200 miles east of the Virginia Capes, because it was the only USCG ship equipped with special storm-tracking radar.

c. Ocean Station November was operated in the Pacific. Although primarily for the Department of Defense, station November has definite ties to the international scheme in the Atlantic and performs nearly identical missions.

Services on stations Delta and Echo were terminated on June 29, 1973. Station Echo was closed by prior agreement at a North Atlantic Ocean Station Conference held in Paris during March 1972. Closure of Delta at the same time is the first of the remaining three Atlantic stations to be closed under a staggered schedule of withdrawal in order to reduce Federal spending during FY 1974. Notice of U.S. withdrawal from these three stations (Delta, Charlie, and Bravo at 6-month intervals, in that order) has been transmitted to the International Civil Aviation Organization (ICAO), the sponsoring organization, and member countries of the North Atlantic Ocean Station agreeement.

High Endurance Cutters. The cutters *Winona* and *Mendota*, which were decommissioned late in FY 1972, were placed back in commission early in FY 1973 for employment in fisheries law enforcement. These two cutters will remain in service until more suitable cutters become available as the United States withdraws from the Ocean Station Program.

The cutter *Taney* received the specialized storm tracking radar, previously installed in CGC *Gresham*, and was designated as the primary ship for Weather Station Hotel operations.

Bridges. The number and sizes of vessels operating on the navigable waters of the United States continue to increase to meet the need to ship an ever-growing volume of goods. For this reason more existing bridges are becoming unreasonable obstructions to navigation and possibly eligible for alteration under the Truman-Hobbs Act (33 U.S.C. 411 et seq.). The Federal Government is required to participate in funding of the alterations ordered under this Act. During FY 1973 funds for continuing the alteration of eight bridges were provided by Congress. In addition, eight investigations of existing bridges were underway to determine whether they do obstruct navigation and should be altered under the Truman-Hobbs Act. The Secretary did not approve any international bridge construction during FY 1973.

Vessel Traffic Systems. The Vessel Traffic Systems (VTS) program continued to be a major Coast Guard initiative during FY 1973, sustaining the dynamic development that began in FY 1972 in selected major ports.

Two of the vessel traffic systems became operational—San Francisco VTS in August 1972 and Puget Sound VTS in September 1972.

Although the San Francisco and Puget Sound systems were operated on the basis of voluntary participation, both systems received excellent support from the marine industry. Regulations are now being prepared to require participation in these systems by specific categories of vessels.

Saint Lawrence Seaway Development Corporation. Although the Saint Lawrence Seaway Development Corporation is an Administration of the DOT, its property is part of an international waterway, and it is a business

organization operated in such a way as to earn its own expenses, including amortization of its debt. During 1972 some 53.7 million tons of cargo passed through the Seaway in 5,962 ships. Grain and iron ore were the most important commodities in the shipments. Total revenues of the Seaway amounted to $7.5 million, of which $3.3 million was required for operating expenses and $4.0 million for payments to the U.S. Treasury to retire Seaway bonds. To develop more intensive use of the Seaway, a series of studies has been completed on world trade and the Seaway's influence on it, and research has been undertaken to lengthen the shipping season in the area, primarily by developing techniques to retard formation of ice at the end of the shipping season and clearing of ice to permit the earliest possible opening of the shipping season each spring.

RAILROADS

Relieving Financial Distress. The American railroad industry is today in a critical state. Six major railroads serving the Northeast are undergoing reorganizations in bankruptcy; several face a very real threat of liquidation. A cessation of essential services would have major impact on both the commerce of the Northeast and the well-being of the Nation.

As the causes of the industry's problems are complex, the Government's approach to resolving them is manifest in a variety of Federal Railroad Administration programs. These programs share a common policy objective—development and maintenance of a viable, privately owned railroad system capable of meeting the public service requirements of the Nation.

The Secretary's March 26, 1973, report to Congress contained the Department's recommendations for resolving the northeastern railroad problem. The plan is based on the formation of a private, for-profit corporation to operate core rail services to be designated by the Secretary. The report became the basis for the Northeast Railroad Restructuring Bill which was submitted to Congress on May 25, 1973, and subsequently its principal elements were embodied in the Regional Rail Reorganization Act of 1973 which was enacted on January 2, 1974.

In June 1972 widespread devastation was brought to parts of the eastern seaboard by severe storms and large-scale flooding. The railroads hit hardest included four major bankrupt carriers and others that were on the verge of financial collapse. These railroads were without relief under existing Federal disaster relief programs and had limited resources to invest in rehabilitation of damaged facilities. To assure that the services of these financially distressed railroads were restored, the Department of Transportation proposed, and the Congress enacted, the Emergency Rail Facilities Restoration Act.

FRA's Chief Counsel issued regulations setting forth the procedures and requirements for filing Hurricane Agnes loan applications under the Emergency Rail Facilities Restoration Act (Public Law 92–591). That office also handled negotiations between the railroads and prepared the necessary documentation to complete the loan transactions.

Acting for the Secretary, the Federal Railroad Administrator approved loans to railroads to restore or replace damaged facilities, and services

which were determined to be essential to the public. To date, loans totaling nearly $27 million have been extended under the Act either to repair or rehabilitate damaged facilities or to reimburse the carriers for funds previously spent in restoring the June 1972 storm damages.

The Federal Railroad Administration's Office of Policy and Plans also had responsibility for preparing a report to Congress evaluating the effectiveness of the legislation which created the National Railroad Passenger Corporation (AMTRAK) to operate intercity passenger services. The report submitted on March 15, 1973, also contained an analysis of AMTRAK programs and the adequacy of its route structure and services. The report concluded that, while certain of AMTRAK's services should be eliminated or altered, progress has been made toward improved rail passenger service and the unified national system as mandated by Congress. Based on these factors and considering that many of the planned improvements have not yet become operational during its first 2 years, the Department recommended that legislation be enacted to provide for continued Federal support for the new corporation.

Grade Crossings. During the year the FRA and the Federal Highway Administration completed a two-part report to Congress which (1) described the extent and nature of the safety problem associated with rail-highway grade crossings, and (2) made recommendations for a national program to improve safety at both public and private crossings and (3) discussed possible funding alternatives for financing the improvement program.

The FRA, in cooperation with the Association of American Railroads, initiated a Nationwide Railroad/Highway Grade Crossing and Inventory Project to place all available information pertaining to rail crossings in computer banks and, as accident information is entered, the Federal Government will have a site-specific grade-crossing accident inventory available to State agencies and railroad officials to assist in planning grade-crossing improvement programs.

Rail Safety Regulation. Miscellaneous amendments to the initial Track Safety Standards were issued to resolve enforcement and compliance problems, and to modify restrictions that were not required for safety of operations. The significant change authorized higher rates of speed for passenger trains over certain classes of track. A final rule was also issued amending the locomotive inspection rules to provide design, specification, inspection, and testing requirements for aluminum main reservoirs and to streamline requirements for recording of tests and inspections. Two Emergency Orders were issued under Section 203 of the Railroad Safety Act of 1970 to prohibit the further use by any railroad of certain unsafe equipment involving a hazard of death or personal injury.

Three separate notices were issued proposing minimum Federal safety standards for railroad freight cars; hearings were held and final rules are now being developed. Three other notices of proposed rulemaking were also issued. One proposes to require carriers to report by telegram any accident which results in the death of a railroad employee, and all collisions and derailments which result in a fatality or the hospitalization of five or more persons. A second notice proposes procedures and criteria

for State participation in investigative and surveillance activities under the Federal Railroad Safety Act of 1970. The third proposal provides for the filing of the various railroad operating rules with FRA, a program of instruction for the employees of the railroad, and also a program of testing and inspection as to how the railroads are meeting the requirements of these operating rules.

The Alaska Railroad. The Alaska Railroad operates 522 miles of single mainline track from Seward and Whittier, both ice-free ports, to the interior of central Alaska through Anchorage to Fairbanks. Freight service is maintained over the entire line. Passenger service is operated from Whittier to Portage and Anchorage, and from Anchorage to Fairbanks—419 road miles.

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

In FY 1973 the Railroad had an operating loss of $2,960,225. Approximately $427,000 of the operating loss was the result of collision derailment expense occurring in August 1972, and should be recoverable in the coming year. In addition, there were $187,072 of miscellaneous gains and $261,338 of miscellaneous losses for a net non-operating loss of $74,266. The total loss for the fiscal year was $3,034,491 after depreciation and other non-fund charges of $2,700,927.

During FY 1973 the Railroad handled only 1,331,527 tons of revenue freight for a total of 258,139,000 ton miles, a decrease of 17.1 percent, as a result of depressed economic conditions in Alaska. During the same period, 73,880 revenue passengers were transported for a total of 11,620,406 passenger miles.

The Fairbanks to Fairbanks International Airport spur track of 10 miles was under construction in Fiscal Years 1972 and 1973 and has since been completed.

Chapter XI

INTERNATIONAL TRANSPORTATION PROGRAMS

INTERMODAL ACTIVITIES

Within the past year, the Department of Transportation has greatly increased its international activities, especially intergovernmental cooperation in transportation programs. The Department reached agreement with France on pursuing 12 research cooperation projects; in addition, the French Minister of Transport accepted a proposal for a new cooperative program in tunneling and proposed the assignment of a one-man mission to DOT to facilitate exchanges in new rail technology.

Upon U.S. initiative, research cooperation in transportation was approved by the U.S.–U.S.S.R. Joint Commission for Cooperation in Science and Technology and DOT has been designated as the U.S. lead agency to implement that action. Policy issue meetings at the Assistant Secretary level were begun with the Canadian DOT, and program coordinators have been designated to monitor and work toward expansion of the cooperative program.

To support U.S. efforts in magnetic levitation, the DOT made arrangements for a cooperative program in this field with Germany. In addition, it has begun to implement research cooperation projects, funded by P.L. 480 excess currencies, in Poland and Yugoslavia.

A Memorandum of Understanding on transportation cooperation in the fields of highway planning, construction, and maintenance was signed by Secretary Volpe and Mexican Secretary of Public Works Bracamontes in November 1972, and significant progress was made in expanding research cooperation activities with Israel, Italy, Hungary, and Switzerland.

International Standards for Transportation of Hazardous Materials. International transportation of hazardous materials has increased markedly in recent years. The problem of incompatible and differing standards and regulations governing the classification of materials as hazardous, and their labeling, placarding, and packaging, has created delays and severe difficulties in the smooth flow of cargo. More complexities are created by differences between the modes of transportation. There is therefore an acute need to formulate a set of compatible standards that will facilitate the safe movement of hazardous materials in international transportation and in transshipment between modes. The problem is under consideration by the United Nations Committee of Experts on the Transport of Dangerous Goods,

a sub-group of which has worked for 2 years on the classification and packaging of certain dangerous goods. The recommendations developed by this group were forwarded to the parent Committee of Experts for review. If approved, they will become international standards and be submitted to each nation for adoption.

United Nations Container Conference. DOT participated extensively in the preparations for the 1972 UN Container Conference, aiding in the efforts of the Intergovernmental Maritime Consultative Organization and the Economic Commission for Europe (IMCO/ECE) toward the drafting of a convention on intermodal transport. DOT officials served on the delegation to the Container Conference. International negotiations toward an intermodal transport convention are continuing. As envisaged, it will establish documentation and a new liability regimen primarily for intermodal transport of containers.

Darien Gap Highway. The location of the 250-mile Darien Gap Highway, which connects the Inter-American Highway with the Pan American Highway system of South America, has been determined; survey and design work is underway in both Panama and Colombia; and two construction projects are underway in Panama at a cost of $30.7 million for 62.6 miles of highway. The program is administered under the direct supervision of the respective countries with review and approval of project actions by an FHWA representative in each country.

INTERNATIONAL RESEARCH COOPERATION

The Department's International Research Cooperation Program involves the exchange of experts, experience and information, and joint research undertakings designed to eliminate duplicative research efforts. The program continued to expand in FY 1973 with such partners as France, Germany, Japan and Canada. For example, the Department reached agreement with France on cooperation in tunneling research and with Germany for a cooperative program in levitated (air-cushion and magnetic) high-speed ground transportation systems. In addition, a research cooperation agreement was concluded with the Mexican Ministry of Public Works in November 1972, and significant progress was made in expanding research cooperative activities with Israel, Switzerland, and Romania.

The Department continued to exchange technical research documents with the U.S.S.R., Hungary, Bulgaria, and Czechoslovakia. Upon the initiative of the Department of Transportation, research cooperation in transportation was approved by the U.S.–U.S.S.R. Joint Commission for Cooperation in Science and Technology, and the DOT has been designated as the lead U.S. agency to implement the cooperative program. Its research cooperation dialog with the U.S.S.R. has produced a formal Soviet proposal for cooperation in railroad and transportation construction areas. The Department has also begun to implement research cooperation projects, funded by P.L. 480 excess currencies, in Poland and Yugoslavia.

During the year, the Department, through the Technical Assistance Division, continued to provide economic and technical advisory services to the

Agency for International Development (AID). Principal emphasis was on multimodal planning, review and evaluation of transport feasibility studies and reports, and selection of projects suitable for AID financing. While responding to many technical inquiries, the Department assisted AID in the preparation of transport plans for Nigeria, Nepal, and Malawi; evaluated the draft terms of reference for feasibility studies for sections of the proposed Trans-African Highway; and made a review of the market outlook for a truck-leasing program proposed by a U.S. firm for 24 African countries.

INTERNATIONAL AVIATION ACTIVITIES

The DOT/FAA continued to contribute heavily to the efforts sponsored by the International Civil Aviation Organization (ICAO) to promote the safety of international civil aviation by developing a new international anti-hijacking convention. To this end, DOT/FAA participated fully in the Special Subcommittee of the ICAO Legal Committee which met in Washington, D.C., September 4–15, 1972, to deal with this matter, and participated in the 20th Session of the Legal Committee convened in Montreal in January to consider the report of the Special Subcommittee. DOT/FAA has also participated in other programs to achieve increased aviation security, such as the ICAO Regional Seminar on Aviation Security held in Bangkok, April 10–12, 1973.

DOT/FAA also contributed to U.S. preparations for, and representatives serving on the U.S. Delegations to, the ICAO Conference on the Economics of Route Air Navigation Facilities and Airports (ERFA), held in Montreal in February 1973, and the Second ICAO Joint Financing Conference, held in Paris in March–April 1973. The purpose of the first of these meetings was to review the international guidelines issued by ICAO to its member states for the establishment or revision of systems of charges for the use of airports and route air navigation facilities and services. The second meeting dealt primarily with the establishment of a user charge system for those air navigation facilities and services provided by Iceland and Denmark in the North Atlantic which are at present jointly financed by those governments.

Bilateral Aviation Agreements. The Department's role in the international aviation area was strengthened through a series of DOT, State Department and Civil Aeronautics Board (CAB) discussions that culminated in a Letter of Understanding between State and DOT. The Understanding provides for closer coordination between the two Departments in matters of air transport negotiations and international air transport policy questions.

The Department played a significant role in the culmination of the U.S.-Soviet Air Agencies Agreement which was signed on behalf of the United States by the Secretary in June 1973. In expanding air service between the two countries a number of major issues involving long-range policy considerations were resolved in line with DOT recommendations.

In continuing efforts to improve relations with the Communist-bloc nations, the Department has met with the State Department and the CAB to

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develop a U.S. position for talks with the People's Republic of China scheduled to be held in early 1974 regarding air services between the two countries.

Foreign Assistance and Training in Aviation. During the year, FAA had available approximately $24 million for the conduct of its foreign aviation technical assistance programs, procurement, and stateside training for participants from other countries. FAA was reimbursed for these programs by the Department of State's Agency for International Development (AID), the Department of Defense's Military Assistance Program (MAP), the International Bank for Reconstruction and Development (IBRD), and individual countries. FAA provided aviation assistance groups in Bolivia, Brazil, South Vietnam, the Republic of China, Iran and Zaire.

In addition to the full-time staffing of resident groups, FAA dispatched 31 technicians in various aviation specialties on short-term assignment to 17 countries, totaling 5 man-years of service.

The FAA trained 201 participants from 34 countries in various aviation specialties during FY 1973 as compared to 237 in FY 1972. AID reimbursed FAA for the training of 45 participants, ICAO reimbursed FAA for 40, and individual foreign countries financed the training of the other 116 participants.

Flight Inspection Services. Under reimbursable agreements, FAA continued providing flight inspection services to various foreign countries. During the year, 14 foreign governments requested that assistance. These services promote the safety of international and domestic air carriers operating within the area of the air navigation facility involved.

International Air Traffic Services. A major project receiving much attention is the proposal to allow more aircraft to use airspace over the oceans at the same time by reducing separation standards, presently 100 nautical miles (nm) and 120 nm in the Pacific and Atlantic, respectively, with comparable or improved margins of safety. Oceanic air traffic controllers must have the same assurance of an aircraft's position as do the domestic controllers who "look" at its position on radar that blankets the U.S. land mass and talk directly to the pilot over static-free VHF/UHF communications channels. Radar coverage of up to 200 nautical miles and line-of-sight communications reception of up to 400 nautical miles is all the oceanic controller can presently count on to assist him.

Some progress has been made this year toward the goal of an aeronautical satellite communication system in that an agreement between the United States, Canada, and the European Space Research Organization (ESRO), for the engineering development of a satellite is in the negotiation process.

INTERNATIONAL MARITIME ACTIVITIES

Participation in International Organizations. The Coast Guard continued its mission to support and coordinate activities in international maritime safety, global marine pollution prevention, and international cooperation and training. The Coast Guard is the sponsor of the International Conven-

tion for the Safety of Life at Sea Subcommittee of the Department of State's Shipping Coordinating Committee. Working groups of the subcommittee formulate U.S. positions for the various technical subcommittees of the Intergovernmental Maritime Consultative Organization (IMCO). Through this mechanism, and by providing the representatives to IMCO subcommittees and committee meetings, the Coast Guard provides the major support of U.S. involvement with IMCO.

The IMCO has called an international diplomatic conference this fall to (1) negotiate a new International Convention for the Prevention of Pollution from Ships, and (2) extend the present International Convention relating to Intervention on the High Seas in Cases of Oil Pollution Casualties to include cases of marine casualties involving substances other than oil. It is expected that 80–100 nations will attend.

Foreign Visitors and Students. The Coast Guard's Office of Public and International Affairs coordinated protocol functions for over 200 foreign visitors to various Coast Guard facilities. Visitors from foreign countries were extended the use of the Coast Guard facilities for training in aids to navigation, Loran, search and rescue, merchant marine safety, officer candidate school, port security and law enforcement, and general orientation in the operation of a marine regulatory agency.

Representatives of 13 foreign countries participated in the training offered by the Coast Guard. The Military Assistance Program sponsored 24 visitors. The Agency for International Development and other Department of State activities sponsored 20 visitors, and 29 visitors participated in the Loran program. In addition, two Philippine nationals are undergraduates at the Coast Guard Academy.

Law Enforcement. Several laws and international agreements directed to the conservation of natural resources in the oceans were enforced throughout the year by aircraft and cutter patrols. Seven Japanese vessels were found fishing for salmon on the high seas off Alaska in violation of an international agreement and were turned over to Japanese authorities. Patrols and distribution of information continued to reduce conflict between foreign movable and U.S. fixed gear on the high seas. The Florida Surface Law Enforcement Patrol was instituted in support of the U.S.-Cuba antihijacking agreement and to deter narcotics smuggling. Patrols continue to provide information useful to the Department of State regarding compliance of foreign vessels with international agreements, and to the National Marine Fisheries Service for formulation of conservation policies.

Naval Station Kodiak, Alaska, was transferred to the Coast Guard on July 1, 1972 as a vital base for enforcement of laws and treaties; it provides three long-range aircraft and two HH-3F helicopters for extensive law enforcement patrols in the Bering Sea, Sea of Alaska and North Pacific Ocean. These aircraft are also capable of performing search and rescue missions, as are all Coast Guard aircraft and vessels. Base Kodiak is the home of three vessels engaged in ELT (enforcement of laws and treaties) work as well as marine aids to navigation in Alaska. Coast Guard vessels based in other western U.S. ports are used to augment the Alaska fisheries

patrol. Helicopters are carried on board to increase the vessels' radius of coverage and provide means of identifying treaty violators.

International Ice Patrol. The Coast Guard commenced the fifty-ninth season of International Ice Patrol service in the North Atlantic Ocean on January 24, 1973, to protect North Atlantic shipping from the iceberg hazard. The patrol utilizes C–130 aircraft and a Coast Guard oceanographic vessel to observe and study iceberg conditions. The 1973 season saw an above-average number of icebergs in the shipping lanes and was considered one of the worst seasons since 1950. By June 30, hundreds of icebergs had drifted south of 48°N, with more ice to the north which was expected to extend the ice season past mid-August. Airborne reconnaissance operations were conducted from Canadian Forces Base, Summerside, Prince Edward Island. Surface patrol vessels were used for the second consecutive year to guard the southern ice limits and warn shipping. High and medium endurance cutters were assigned this task in response to the extremely heavy ice concentration.

INTERNATIONAL TRAFFIC SAFETY ACTIVITIES

NATO and Highway Safety. The National Highway Traffic Safety Administration (NHTSA) participation in the international aspects of traffic safety is the outgrowth of President Nixon's suggestion in 1969 that NATO devote a part of its skill and resources to resolving some modern environmental problems. The Committee on Challenges to a Modern Society (CCMS) was organized and has since generated a broad range of environmental activities. At the first CCMS meeting, the U.S. representative, with the concurrence of the Secretary of Transportation, proposed a study of several components of road safety. The proposal was accepted and DOT/NHTSA assumed leadership of the study. The study was divided into seven parts, each led by a NATO ally.

During FY 1973, the study entered its final stages. Separate reports with action recommendations are expected to be received for each of the seven components shortly after the end of the current reporting period. The reports will be compiled by the United States into a Pilot Study to be presented for consideration at the October 1973 CCMS plenary session.

The International Accident Investigation Program. As part of the NATO/CCMS road safety effort, standardized protocols for scientific accident investigations have been established. During the past fiscal year, over 500 road accidents were investigated by 25 multidisciplinary accident investigation teams in seven European countries, plus Canada and the U.S. Test analysis of this data was performed at the Southwest Research Institute under a contract with NHTSA. The study showed that it was possible to combine international accident data and obtain meaningful analytic information. Project conclusions and recommendations were discussed at an Accident Investigation Workshop held in June 1973 at NATO Headquarters in Brussels, Belgium.

The International Experimental Safety Vehicle (ESV) Program. Agreements for ESV development and exchange of technological information

exist between the U.S. Government and the Governments of France, Germany, Sweden, Italy, Great Britain, and Japan. Four international conferences have been held under DOT sponsorship, of which one took place during FY 1973 at Kyoto, Japan. Companies participating in the program include Daimler-Benz, Volkswagen, BMW, Opel, Fiat, Alfa Romeo, Saab, Volvo, Nissan, Honda, Toyota, British Leyland, Citroen, Renault, and Peugeot. Daimler-Benz, Volkswagen, Fiat, Volvo, Nissan, Honda, Toyota, British Leyland, and Citroen have fabricated or are about to fabricate ESV's. Italy initiated the first exchange of test vehicles in the International ESV Project with the delivery of a Fiat ESV for testing by NHTSA. Car-to-car crash tests were conducted with the Fiat and American Machine Foundry ESV's at the Dynamic Science test facility in Phoenix, Arizona.

INTERNATIONAL SAFETY STANDARDS ACTIVITIES

NHTSA continued active participation in international safety standards activities during FY 1973 to promote worldwide harmonization of motor vehicle safety standards and to diminish trade restrictions. NHTSA attended six meetings sponsored by the United Nations Economic Commission for Europe (ECE). These meetings dealt with the development of motor vehicle safety standards on tires, vehicle lighting, visibility, braking, occupant protection, arrangement of controls, and flammability of interior materials. Seven additional meetings were sponsored by the International Standards Organization (ISO). These meetings concerned the development of test procedures for measuring vehicle dynamics and road holding ability, human tolerance to shock and vibration, road, wheels, air and hydraulic brakes, controls and displays and vehicle identification. NHTSA also was represented at a meeting of the Canadian Standards Association dealing with vehicle headlighting.

Chapter XII

EMERGENCY AND NATIONAL DEFENSE TRANSPORTATION

Departmental Emergency Readiness Program. The responsibility of the Secretary for preparedness matters stems from the Department of Transportation Act (80 Stat. 931) and from Executive Order 11490. Guidance is given in the National Plan for Emergency Preparedness, the Disaster Relief Act of 1970, and in statements of the Office of Preparedness, General Services Administration.

The Department has continued its development of plans and procedures for use in a broad range of emergencies from national defense emergencies through natural disasters and economic crises. These activities for FY 1973 were primarily focused on further development and upgrading of continuity of operations plans for the Department.

Department Response to Hurricane Agnes Disaster. Hurricane Agnes (June 23, 1972) tested the capability of the Department to respond to emergency situations. The hurricane destroyed a major portion of the transportation facilities of the area around Wilkes-Barre, Pennsylvania, as well as numerous other properties and installations throughout the Middle Atlantic and some Southern States. One of the two bridges across the Susquehanna River into Wilkes-Barre was completely destroyed. Even before the damage was assessed, the Secretary of Transportation directed his Department to support all emergency activities. The Coast Guard, using helicopters, vehicles, and boats, was able to evacuate over 1,200 people and transported special personnel and emergency supplies into the area. Federal Aviation Administration personnel kept all FAA installations in operation at all times during the emergency to facilitate relief operations. Federal Highway Administration personnel made necessary surveys and authorized immediate replacement of bridges, highway segments and similar installations with 100 percent Federal funding to speed the replacement work.

The temporary replacement bridge over the Susquehanna was in place 4 months after the hurricane. A TOPICS plan was devised to help speed traffic circulation through the city and when more transit capability was needed, the Office of Emergency Preparedness instituted a free bus service. Later the government of Wilkes-Barre established a public transportation authority which then became the recipient of grants from UMTA. Joining with DOT, the HUD Model Cities Agency, the Economic Development Agency and the Pennsylvania Department of Transportation estab-

lished a demonstration project for emergency transportation from which widely applicable lessons were drawn. The equipment supplied through that mechanism is now leased to two private carriers which supply mass transportation to the city.

Crisis Management. During FY 1973 emergency effort was required when fuel shortages developed, and also when international grain movements became unusually heavy. Professional assistance was detailed to the Office of Emergency Preparedness on several occasions to provide transportation expertise in its operations center; transportation portions of interagency fuel allocation and conservation plans were developed; and weekly reports on maritime grain movements were prepared for the Secretary's task force on freight cars and grain movement. Additionally, weekly assessments were made as to the impact the petroleum fuel shortage was having on the transportation industry.

COAST GUARD DEFENSE ACTIVITIES

Training. In its continuing efforts to train Coast Guard units and personnel to meet or exceed U.S. Navy fleet performance standards, the Coast Guard sent 45 of its cutters through refresher training. The training program has been expanded to include periodic training of the icebreaker fleet.

The multiyear antisubmarine warfare (ASW) modernization project aboard the WHEC 378 (*Hamilton*) class cutter is near completion. Ten of the 12 ships in the program have been outfitted with Navy-procured sonar sensor and ASW weapons; two more are scheduled to receive them.

The Coast Guard has developed several unique concepts in command and control and tactical data presentation. These are embodied in the Operational Automated Ship's Information System (OASIS) aboard USCGC *Chase.* OASIS is a relatively small, economical digital tactical data system developed for 378′ High Endurance Cutters which improves methods for collection, processing, dissemination and display of tactical and navigational data, and reduces Combat Information Center and Bridge personnel requirements. A prototype version of OASIS that is installed aboard CGC *Chase* has been operational for 2 years. System evaluations have been conducted during normal CG operations and in the naval environment with excellent results. OASIS has produced significant improvements in operational effectiveness. The success of the system has convinced the Navy that OASIS warrants an in-depth investigation to determine its potential application to the multiple threat task group environment.

A joint Coast Guard-Navy comprehensive 8-month study has been completed to determine the manpower requirements for the *Hamilton* Class cutters during wartime. It concluded that (a) the number of officers in the ship's existing peacetime personnel allowance is adequate for a wartime complement and (b) the number of enlisted personnel in the ship's existing peacetime personnel allowance requires a 22 percent increase for a wartime complement. The results of this study are being used as planning factors in developing Coast Guard wartime personnel requirements.

Public Law 92–479 provides authority for the Secretary to authorize, with the consent of the President, the involuntary call to active duty of any unit or member of the Coast Guard Ready Reserve for augmenting the active forces at times of serious natural or man-made disaster, accident or catastrophe. This authority was used twice during FY 1973 in connection with heavy flooding during Hurricane Agnes and in the Mississippi Valley.

Operations in Vietnam. FY 1973 brought an end to Coast Guard involvement in Vietnam. The Office of the Senior Coast Guard Officer (Vietnam), Port Security and Waterways Detail and the Aids to Navigation Detail were disestablished on February 11, 1973. They were followed closely by the close-out of the Merchant Marine Detail, Saigon, thus allowing the last Coast Guardsman to depart Vietnam.

COAST GUARD DISASTER PREPAREDNESS AND RELIEF

The Coast Guard is required by Public Law to provide disaster assistance to State and local governments in any major disaster.

Notable among FY 1973 disasters involving Coast Guard assistance were flood relief operations on the Missouri and Mississippi Rivers, flood relief operations on western Lake Erie and Saginaw Bay, and the response to the crash of Eastern Airlines Flight 401 in the Florida Everglades, as well as Hurricane Agnes discussed above.

In the flood relief operations, Coast Guard assistance included evacuation of stranded civilians, anti-wake patrols, aerial and waterborne surveys of stricken areas and medical evacuations. Twice during these operations, Coast Guard Ready Reservists were called to active duty to assist Regular Coast Guard personnel.

In the crash of Eastern Airlines Flight 401, Coast Guard rescue helicopters were the first to arrive on the scene and commenced immediate medical evacuation of survivors. Coast Guard helicopters evacuated 42 survivors and provided valuable communications and logistics support to the joint rescue effort.

FAA EMERGENCY READINESS

The Office of the Secretary of Transportation and the Federal Aviation Administration (FAA) reached agreement on the specifics of FAA's support to DOT headquarters during emergencies. FAA will provide teams to operate during emergencies at Department headquarters, at the OEP emergency operating facility, and at the DOT emergency relocation site. To support the Department of Defense in national emergencies and for continuity of operations of the National Airspace Systems, a team of approximately 120 individuals will function either at FAA Headquarters or at the FAA emergency relocation site. The FAA General Aviation District Office in each State acts as an adviser to the State aviation officials for use of general aviation aircraft and facilities during all types of emergencies.

A memorandum of understanding was signed by the FAA Administrator and the Commander of the Military Airlift Command providing for close coordination between FAA and Military Airlift Command (MAC) in any

future contingency in any part of the world where civil air carriers are engaged in supporting the Department of Defense (DOD).

In December 1972, FAA published its Air Carrier Dispersal Planning Guide and Directory of Safe Haven Airports. Both were developed to fulfill the air carrier emergency guidance requirements in Executive Order 11490 delegated by the Secretary to the FAA Administrator.

In March 1973, FAA participated in the Joint Chiefs of Staff (JCS) worldwide exercise High Heels 73. Communications and reporting procedures were tested for simulated attainment of advanced Defense Readiness Conditions (DEFCONS) and for simulated control of civil and military air traffic in accordance with current agreements between military field commands and certain FAA facilities.

FEDERAL HIGHWAY ADMINISTRATION

Emergency Preparedness. As a result of agreements with the States to cooperate in emergency planning, all of the States have submitted revised Emergency Highway Traffic Regulation (EHTR) Plans. A revised version of the "Emergency Highway Traffic Regulation Guide" was compiled to aid the States in the preparation of individual State plans.

The last four of the FHWA Emergency Standby Orders were issued, covering the necessary authorities, uniform guidelines, and procedures that are needed to carry out responsibilities that would exist under a large-scale emergency situation.

The strength of the FHWA National Defense Executive Reserve currently stands at 116 designated members, with five candidates being processed for membership.

Disaster Assistance. During FY 1973, 45 major disasters in 28 States caused an estimated $35 million in damages to roads and bridges not on any of the Federal-aid highway systems. The Federal Highway Administration expended approximately 75,000 man-hours costing $643,000 in technical and engineering assistance to the Office of Emergency Preparedness. Approximately half of the total effort was the result of Hurricane Agnes (June 1972), particularly in Pennsylvania and New York.

A major natural disaster occurred in Arizona, New Mexico, and Utah on Indian reservations and in national forests. Spring of 1973 saw record flooding in the Mississippi, Cumberland, Tennessee, and Mobile River basins. The Mississippi River was in flood stage for over 3 months, exceeding high water marks recorded for over 200 years.

During the fiscal year, $60 million was expended by the States for the repair or reconstruction of damaged highways and bridges on the Federal-aid systems, and $5.5 million was allocated to other Federal agencies for roads and bridges under their jurisdictions. In February 1973, the Regional Administrators were delegated the authority to approve projects, thereby reducing the time required to start action on individual projects. In Northeastern States, hard hit by Hurricane Agnes, FHWA personnel continue under heavy workloads to design and reconstruct the damaged roads and bridges.

Defense Access Roads. Under the defense access road program, the Federal Highway Administration administers funds transferred to the FHWA from the Department of Defense. Approximately $5.4 million was programed during the year for the construction of defense access roads. The most extensive projects provided for the construction of access roads serving Safeguard antiballistic missile facilities in North Dakota. The program also provided for snow removal on access roads serving six Minuteman installations.

SAINT LAWRENCE SEAWAY DEVELOPMENT CORPORATION

National Defense Planning. Based upon discussions with the Saint Lawrence Seaway's Committee for Emergency Readiness and staff officers and others within the Corporation responsible for continuity of operations in any emergency, specific operating items were programed into the budget for FY 1974.

Once implemented, these items will enable the Corporation to advance further toward assuring continuation of its operations in the event of emergencies, whether major disasters or minor shipping incidents.

The budget includes work programs on ship-shore communications, experimental fog detection stations, vessel and lock equipment graphics, safety equipment and the expansion of air and electrical power capabilities.

Studies and investigations are underway both in the Corporation's offices, and by government and private consultants to determine the adequacy of existing facilities to handle prospective traffic and the need for new locking facilities to replace or supplement the existing ones.

Additionally, plans and studies are continuing and construction is being undertaken to extend the present navigation season into the winter to provide a shipping season that is as long as technically and economically feasible.

Continuity of Operations. The Corporation's Emergency Plan (SEASCOOP) has been reviewed and will be updated this fiscal year.

Meetings, planning sessions and public hearings were held to assure navigation during the critical high water conditions in the Great Lakes-St. Lawrence River Basin. Temporary speed restrictions were imposed at the opening of the navigation season to protect the adjacent shoreline property and banks from excessive erosion caused by vessel-generated waves.

Chapter XIII

ADMINISTRATION OF THE DEPARTMENT [1]

New Secretarial Officers and Organizational Changes. With the beginning of President Nixon's second administration, there were a number of management changes at DOT. Dr. Claude S. Brinegar, former official of a major U.S. oil company, was named the new Secretary of Transportation, and Egil Krogh came to the Department from the White House as the new Under Secretary. Mr. Krogh resigned in May and was succeeded by John W. Barnum who was at that time serving as the Department's General Counsel.

There were also changes at the Assistant Secretary and Administrator levels: Robert H. Binder was named Assistant Secretary for Policy and International Affairs; Alexander P. Butterfield, FAA Administrator; former Governor of Nebraska Norbert T. Tiemann, FHWA Administrator; Frank C. Herringer, UMTA Administrator; and Dr. James B. Gregory, Administrator of NHTSA.

Several organizational changes reflect a shift in priorities on the part of the new management team. Having determined that the Department required a stronger and higher level representation with the Congress and State and local governments, the Secretary elevated the congressional and intergovernmental relations functions to the Assistant Secretary level. He named former Minority Leader of the California Assembly, Robert T. Monagan, to fill the new position. At the same time, he transferred the various functions of Assistant Secretary for Environmental and Urban Systems to other offices within the Department. To assure that the importance of environmental and urban matters would remain undiminished, the Office of Environmental Affairs was moved to the Office of the Assistant Secretary for Safety and Consumer Affairs, renamed Assistant Secretary for Environment, Safety and Consumer Affairs (TES), to reflect new responsibilities. The Office of Transportation Planning Assistance was moved to the immediate Office of the Secretary where it continued its effort to help cities receive much-needed guidance and assistance. A new Office of Transportation Energy Policy was established under the Assistant Secretary for Policy, Plans and International Affairs. The small International Secretariat that had been a part of that organization was shifted to the Assistant Secretary

[1] For statement of DOT Assets, Liabilities, and Equity, see Table 32.

for Administration because its functions are essentially of an information and support character.

At the same time, certain functions of the Assistant Secretary for Policy and International Affairs that relate to collection, analysis and exchange of data were transferred to the Transportation Systems Center in Cambridge, Massachusetts. The Center in turn was made responsible to the Assistant Secretary for Systems Development and Technology (TST).

The function of the Federal Railroad Administration was expanded in accordance with the Federal Rail Safety Act so that it added a rail safety staff to conduct inspections and other safety-related operations in the field. Responsibility for liquid pipeline safety, however, was transferred from FRA to the Assistant Secretary for Safety and Consumer Affairs who already had responsibility for gas pipeline safety.

A major improvement in the Department's machinery for assuring adequate coordination of the work of its modal administrations in the field was the formation of Intermodal Planning Groups, one of which was established in each of the 10 regions into which the country was divided by President Nixon for the purpose of administering grant and assistance programs. Each Intermodal Planning Group (IPG) includes the senior representative of each of the Department's modal administrations in that city and the Secretarial Representative. The job of the IPG's is the development of a unified and comprehensive transportation work program for each metropolitan area to serve as a basis for its application for Federal funds. One agency was to be designated as responsible for transportation planning in each metropolitan area. Intermodal planning within heavily traveled urban corridors was designated as a function of the groups. The headquarters organization corresponding to the IPG's, and responsive to their programs, is the Deputy Under Secretary.

Secretarial Representatives. The role of the Secretarial Representatives has gradually expanded and evolved to meet new situations and novel demands from the State and local authorities with whom the Secretarial Representatives are constantly in contact. The significance of their role is indicated by merely listing some of their accomplishments for the year.

1. Represented DOT in the Federal Regional Councils and their programs to expedite delivery of Federal funds to State authorities.

2. Represented DOT in face-to-face negotiations with Governors and local authorities.

3. Represented the Secretary in the IPG's.

4. Served as DOT coordinator for State and local inputs to the 1972 National Transportation Study.

In addition to these fairly predictable functions, each of the Secretarial Representatives represented the Secretary in coordinating the Department's response to emergency situations such as the Buffalo Valley, West Virginia, flood, Hurricane Agnes, the flood in Rapid City, South Dakota, and others. In each, Secretarial Representatives facilitated the negotiation of intermodal transportation plans, served in one case as a member of a Governor's task force on environmental legislation, assisted Federal Regional Councils to

respond quickly to local needs, and assisted a State Governor to establish a planning office within his official family. In these and many other cases, the Secretarial Representatives' presence in the field enabled the Department to respond quickly and intelligently to local transportation needs.

Management Systems. Considerable progress was made in the development of systems needed to manage the Department. The Research and Development Management System with its accompanying Information System has already been described. Numerous other systems that employ computers to manipulate information have been gradually developed and improved; these include such systems as those for managing personnel data, payroll data and check preparation, information concerning grants of funds made by all of the Department's elements, and for accounting. A rather novel application of data-processing techniques is the pilot regional management information system which includes data on all Department programs operating within a specific area of the country. Good progress was also made in perfecting the accounting system. While at the beginning of the Department, the Office of the Secretary provided the accounting services to several of the smaller Administrations, the Federal Railroad Administration assumed responsibility for its own accounting system during the year, as did the Urban Mass Transportation Administration. There were other instances of an Administration assuming functions for another; an example of that was the assumption of the function of paying civilian employees of the Coast Guard by the Federal Aviation Administration installation in Oklahoma City. Such accommodations are facilitated by computer interchanges of information, so that functions are performed in a timely fashion even though the two elements involved are very far apart geographically. Such interchanges of services had been envisaged as one reason for establishing the Department.

LABOR RELATIONS

At the end of FY 1973, 17 labor unions represented approximately 36,000 employees throughout the Department. This amounts to 63 percent of all employees eligible to be represented by labor unions and represents an increase from approximately 25,000 employees represented by unions at the end of FY 1972. This increase was due primarily to the recognition of the Professional Air Traffic Controllers (PATCO) as the national exclusive representative for all terminal/center air traffic control specialists in the Federal Aviation Administration. The recognition of PATCO which covered some 16,000 employees had the double effect of increasing the number of employees represented while at the same time substantially reducing the number of locally recognized units from 286 units in FY 1972 to 216 in FY 1973.

Sixty-five labor agreements covering some 26,000 employees were in effect at the end of FY 1973, and some 17,000 employees had authorized payroll deduction of their union dues.

FAA had approximately 29,000 employees in exclusive bargaining units and 37 negotiated labor agreements covering some 23,000 of these employees. There are two nationwide exclusive bargaining units in FAA. In addition to PATCO, the National Association of Air Traffic Specialists

represents in a nationwide unit some 3,500 Air Traffic Control Specialists assigned to Flight Service Stations.

As to the other operating administrations, the American Federation of Government Employees (AFGE) represents unionized nonprofessional employees in the Federal Railroad Administration and in the National Highway Traffic Safety Administration in separate nationwide units. AFGE also represents unionized nonprofessional employees in the Office of the Secretary, unionized professional and nonprofessional employees in separate units in Coast Guard Headquarters and the Urban Mass Transportation Administration. AFGE is also the exclusive representative of unionized nonprofessional employees of the Saint Lawrence Seaway Development Corporation. The Coast Guard has been organized mainly along facility lines and the Federal Highway Administration by regions.

The Departmental labor relations training program was continued in FY 1973. Three Labor-Management Relations Forums for Executives were conducted for a total of 90 mid-level managers. Over 500 managers have now attended this forum since its inception in 1970. In addition, the 2-week Labor-Management Relations Specialists and 1-week Personnel Management Specialists courses were continued through FY 1973. Three of the former and four of the latter courses were conducted with over 100 LMR and PM Specialists attending.

EXECUTIVE TRAINING

Executive Development. The Office of the Secretary (OST) has responsibility for the Department's Executive Development System which is a single, coordinated, formal activity to insure the systematic development of DOT's current and potential executives. While the Office of the Secretary is responsible for the continued development of current executives GS 16–18, the operating Administrations presently have the responsibility for the development of supervisors and managers GS 13–15.

Office of the Secretary. The Office of the Secretary developed and conducted several Executive Effectiveness Seminars during FY 1973. This program focuses upon the intermodal objectives and organizational structure of the Department, and emphasizes the intermodal coordinating processes and the external forces which influence the Department in carrying out its mission.

The operation of this seminar revealed a need for short, intensive workshops on single issues of major significance. Therefore, OST initiated the development of a single issue seminar which focuses on and examines the issue of DOT's approach to mission accomplishment. This consists of discussions of the Department's Mission, selected examples of the DOT management process in action—the Safety Mission, R&D Planning, Economic Efficiency—and workshops on Policy/Program Development, Organization for Planning and the Planning Process.

Federal Aviation Administration. Two classes were conducted during FY 1973 at the FAA Executive School—the 14th year of operation of the school. Fifty-one executives were graduated during the year, making a total of 1,289 graduates.

The initial 8-month Development Phase of the FAA Executive Development Program terminated in late April 1973. During that time, eight candidates completed an intensive orientation to Washington headquarters operations, two 11-week assignments in the regions, and a 9-day planning and briefing session in Washington. Five candidates began their 60-to-90 day DOT intermodal assignments in June 1973. The remaining three will go to 1-year "Assistant to" development positions within FAA. All of these experiences are designed to provide the candidates with meaningful insights into the responsibilities of the positions they will fill.

CAREER DEVELOPMENT

Federal Aviation Administration. Air Traffic Second Career Training Program resulted from the enactment of Public Law 92–297. It provides second career training for air traffic controllers with 5-years or more of creditable service who are scheduled to be removed from their jobs for loss of technical proficiency or for medical reasons. As of June 30, 1973, 146 of approximately 250 eligible employees were enrolled in training programs.

Federal Highway Administration. The Department designed a 2-year Transportation Intern Program to be implemented in FY 1974. This program, which will attract high-quality young professionals representing the cross-section of academic disciplines, provides formal training as well as rotational assignments in most of the Department's modal administrations. The Federal Highway Administration has been designated the Secretary's executive agent responsible for the administration of this program.

EQUAL OPPORTUNITY TRAINING

During FY 1973, the Equal Employment Opportunity Counselor Effectiveness Training (EEOCET) course which was developed by the Headquarters training staff was transferred to the Management Training School, Lawton, Oklahoma. It is presently being revised to reflect current FAA policy. FHWA administers an Equal Opportunity Training Program which is designed to recruit, develop and assign employees who are specifically prepared to further FHWA goals in the Civil Rights area. It provides 6 months of intensive training, consisting of both formal classroom training and rotational assignments within FHWA's Headquarters and regional offices, as well as other Federal agencies.

FAA MANAGEMENT IMPROVEMENT

After Hours College Opportunity Program. During FY 1973, FAA embarked on an education program to establish college opportunities in 20 geographical areas where FAA journeyman air traffic controllers, technicians, and other agency personnel will receive approximately 60 academic credit hours for technical and managerial training received. While several Training Program Management Officers are establishing individual agreements with colleges and universities on a regional basis, the major effort to establish a national program is being accomplished by soliciting bids on competitive contracts.

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DC–3 Replacement Program. A major training program will be required to shift the Flight Inspection work force from the DC–3 fleet to the new light-jet Sabre-liners and Jet Commanders. An integrated program involving the use of agency and industry sources has been developed to accomplish the required training for flight crews, aircraft maintenance technicians, and avionics equipment technicians. The initial phase of this program was implemented in late FY 1973 with full implementation anticipated in mid-to-late FY 1974.

Airway Facilities Training. During FY 1973, a high priority was placed on elimination of duplicative or unnecessary instruction from resident courses at the FAA Academy and, where appropriate, replacement of that resident instruction with programed learning or self-study courses. This effort has resulted in an annual return of approximately 2,500 man-days of productive time to operational field facilities in addition to the dollar savings realized through reduced student travel and per diem costs.

Alcohol Abuse and Drug Awareness Program. Both the FAA alcohol abuse program and the FAA drug awareness program are being actively pursued, with the training being extended to all supervisors and employees by the use of videotapes. During FY 1973, 1,366 FAA employees participated in the videotaped supervisory drug awareness program and 8,515 in the employee drug awareness program.

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

Management Improvement. Several steps were taken by NHTSA in FY 1973 to raise the quality of the managerial process within headquarters; between headquarters and the regional offices; and to update and integrate the automated management information and accounting system:

- Results from a management development seminar are being used as the basis of an NHTSA executive training program.
- An analysis of NHTSA Regional Offices management has resulted in improved management practices through better planning; better policy guidance on organization and staffing; and better, more timely, technical assistance to the regions and the States.
- A new Financial Management Information and Accounting System was planned and tested in FY 1973. It will meld three separate automated systems into a unified system which will generate comprehensive sets of reports cutting across program or appropriation boundaries without extensive manual adjustment or accumulation of data from various sources.

FEDERAL RAILROAD ADMINISTRATION

Management Improvement. A manpower management program was established within FRA to identify and control manpower spaces and improve utilization allocations.

An Administration-wide work measurement program was established to develop an effective system for evaluating and projecting FRA manpower usage and needs.

A major reorganization of the Office of Safety was approved by the Secretary on November 3, 1972. Two program offices and a unit for program planning and evaluation were formed. Accounting and personnel functions were transferred from OST to FRA effective July 1, 1972. Contracts valued at over $46 million were awarded in FY 1973 in support of these programs.

A safety program was implemented to improve working conditions and promote better safety practices.

FEDERAL HIGHWAY ADMINISTRATION

Directives and Regulatory Materials. The Federal Highway Administration initiated a program to revise, update and consolidate FHWA's existing Policy and Procedure Memorandums (PPM's) and to convert them to a new type of directive. All directives having impact on State highway departments will be consolidated into a Federal-Aid Highway Program Manual and all regulatory material contained in such directives will be published in the Code of Federal Regulations, in accordance with the requirements of the Administrative Procedures Act of 1946. The new Manual and the publication of FHWA regulations in the Code of Federal Regulations should be helpful to State highway departments and others working with highway laws and regulations.

FHWA Training Programs. The National Highway Institute has made progress toward stimulation of continuing education and training for FHWA, State and local highway department employees. Working contacts have been made with training officials in State highway departments and a clearinghouse for training programs and teaching aids has been established to provide for beneficial exchange of training material.

Fellowships in Highway Safety. This program, with the award of twelve $4,000 fellowships, was so well received during its first year that the National Highway Institute expanded it with 48 fellowships of $5,000 awarded for the 1973–1974 academic year. Of the fellows selected, seven are employed by cities, two by counties, and 35 by State highway departments. Four are students planning to work for public agencies in the field of highway safety.

TABLE 1.—U.S. certificated route air carrier accidents and fatalities—scheduled domestic and international passenger service.

Calendar year	Accidents		Fatalities				Passengers carried [1]	Passenger-miles flown (000)	Fatality rate per 100 million passenger-miles flown
	Total	Fatal	Passg.	Crew	Other	Total			
1962	43	5	158	25	0	183	62,548,399	45,853,343	0.264
1963	49	5	121	24	0	145	71,437,828	52,703,333	0.230
1964	53	9	200	26	1	227	81,762,273	61,022,488	0.261
1965	63	7	226	27	0	253	94,662,314	71,796,399	0.315
1966	53	4	59	13	0	72	109,390,556	83,142,197	0.071
1967	51	8	226	24	5	255	132,088,038	103,381,996	0.219
1968	53	[2] 13	305	34	6	345	150,162,701	119,612,578	0.255
1969	48	7	132	17	3	152	159,213,414	132,161,593	0.100
1970	39	2	2	0	1	3	171,697,097	139,022,475	0.001
1971	41	[2]6	174	14	6	194	173,664,736	145,678,876	0.119
1972 (Prelim)	41	7	160	13	13	186	190,600,000	[3] 162,600,000	0.098

[1] Beginning in 1970, carriers were required to report revenue passenger enplanements, whereas prior to 1970 revenue passenger originations were reported.

[2] Includes midair collisions nonfatal to air carrier occupants.

[3] Estimated by CAB.

Note—Passenger deaths occurring in sabotage accidents are included in the passenger fatality column but excluded in the computation of passenger fatality rates (1962–37, 1964–41).

Source: National Transportation Safety Board, Annual Report to Congress, 1972.

TABLE 2.—U.S. supplemental air carrier accidents and fatalities—all operations.

Calendar year	Accidents		Fatalities				Aircraft miles flown (000)	Accident rate per million aircraft miles flown	
	Total	Fatal	Passg.	Crew	Others	Total		Total accidents	Fatal accidents
1962	7	1	0	3	0	3	53,270	0.131	0.019
1963	11	3	1	4	0	5	[1] 50,692	0.217	0.059
1964	9	1	2	2	0	4	[1] 50,838	0.177	0.020
1965	10	1	0	5	0	5	[1] 62,651	0.160	0.016
1966	6	2	78	7	1	86	[1] 84,911	0.071	0.024
1967	4	1	0	3	0	3	[1] 96,071	0.042	0.010
1968	9	1	1	0	0	1	[1] 113,540	0.079	0.009
1969	2	0	0	0	0	0	[1] 115,793	0.017	0
1970	6	3	46	15	0	61	[1] 92,846	0.065	0.032
1971	1	0	0	0	0	0	[1] 101,985	0.010	0
1972 (Prelim)	2	0	0	0	0	0	[1 2] 109,100	0.018	0

[1] Nonrevenue miles not reported.

[2] Estimated by CAB.

Source: National Transportation Safety Board, Annual Report to Congress, 1972.

TABLE 3.—U.S. general aviation accidents and fatalities.

Calendar year	Accidents		Fatalities	Aircraft hours flown (000) [1]	Aircraft miles flown (000) [1]	Accident rates			
						Per 100.000 aircraft hours flown		Per million aircraft miles flown	
	Total	Fatal				Total	Fatal	Total	Fatal
1962	4,840	430	857	14,500	1,964,586	33.4	2.97	2.46	0.219
1963	4,690	482	893	15,106	2,048,574	31.0	3.19	2.29	0.235
1964	5,069	526	1,083	15,738	2,180,818	32.2	3.34	2.32	0.241
1965	5,196	538	1,029	16,733	2,562,380	31.1	3.22	2.03	0.210
1966	5,712	573	[2] 1,151	21,023	3,336,138	27.2	2.73	1.71	0.172
1967	6,115	603	[2] 1,333	22,153	3,439.964	27.6	2.72	1.78	0.175
1968[3]	[4] 4,968	[4] 692	1,399	24,053	3,700,864	20.6	2.86	1.34	0.186
1969	4,767	647	[2] 1,495	25,351	3,926,461	18.8	2.55	1.21	0.164
1970	4,707	640	1,309	26,030	[5] 3,207,127	18.1	2.46	1.47	0.200
1971	4,641	665	1,373	25,512	3,143,181	18.2	2.61	1.48	0.212
1972 (Prelim)	4,230	677	[2] 1,357	27,300 (est.)	3,400.000 (est.)	15.5	2.48	1.24	0.199

[1] Source: FAA

[2] Includes air carrier fatalities (1966–2, 1967–104, 1969–82) when in collision with general aviation aircraft.

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

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

[5] Beginning in 1970, the decrease in Aircraft-miles flown is the result of a change in the FAA Standard for estimating miles flown.

Source: National Transportation Safety Board, Annual Report to Congress, 1971.

TABLE 4.—Aircraft models certificated in fiscal year 1973.

Category	Make	Model	Make	Model
TRANSPORT	Boeing	737–204 –275 –2A1 –2B2 –2H6 –2D6C –2H7C	Hawker Siddeley	Beechcraft Hawker BH. 125 600A
			McDonnell Douglas	DC–10–30 –30F –40
BUSINESS AND GENERAL (Except Helicopters)	American Aviation	AA–1B	Reims Aviation S.A.	Cessna F172M FR127J
	Beech	A100A, B24R		
	Cessna	R172J 180J A185F 337G	Rockwell International	690A TSC–1A2
			Schweizer (Thurston)	S. 210
			SIAI-Marchetti	
			S. O. C. A. T. A.–Groupe Aerospatiale	
	Evangel-Air	4500–300 Series II		MS 892E–150
	Mitsubishi	MU–2B–25		MS 893E
	Pitts	S–1S		MS 894E
GLIDER	Caproni Vizzola	Calif A–21	Schweizer	SGS 2–33AK
	Glasflugel	Standard Libelle–201B	Slingsby	Glasflugel T. 59. D Kestrel
	Perteson	J–4	Start & Flug GmbH	H101 Salto
	Pilatus	B4–PC11		
HELICOPTER	Aerospatiale	SA316C Alouette III SA319B Alouette III SA341G Gazelle	Helicopter Technik Muchen	FJ Sky-Trac

TABLE 4.—Aircraft models certificated in fiscal year 1973.—Continued

Category	Make	Model	Make	Model
BALLOON	Raven	S-55A	Semco Semco	T TC-4A
AIRSHIP	Goodyear	TZ-123000		

TABLE 5.—Active Airman Certificates Held; December 31, 1963–72

CATEGORY	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	% Change
Pilot–Total	378,700	431,041	479,770	548,757	617,931	691,695	720,028	732,729	741,009	750,869	+1.3
Student	105,298	120,743	139,172	165,177	181,287	209,406	203,520	195,861	186,428	181,477	−2.7
Private	152,209	175,574	196,393	222,427	253,312	281,728	299,491	303,779	312,656	321,413	+2.8
Commercial	96,341	108,428	116,665	131,539	150,136	164,458	176,585	186,821	192,409	196,228	+2.0
Airline transport	20,269	21,572	22,440	23,917	25,817	28,607	31,442	34,430	35,949	37,714	+4.9
Helicopter (only)	823	1,058	1,392	1,819	2,573	3,166	4,286	6,677	7,992	7,987	−0.1*
Glider (only)	1,045	1,227	1,411	1,602	1,866	2,193	2,627	3,114	3,571	4,083	+14.3
Other pilot	2,715	2,439	2,297	2,276	[1] 2,941	2,137	2,077	2,047	2,004	1,970	−1.7
Non-pilot–Total	186,304	195,396	204,463	217,132	231,801	250,151	269,775	289,681	307,057	319,177	+3.9
Mechanic	124,945	130,131	135,351	140,799	146,572	158,211	170,716	184,647	193,295	201,700	+4.3
Parachute rigger	3,669	4,226	4,584	4,927	5,347	5,700	6,070	6,424	6,839	7,287	+6.6
Ground instructor	30,295	30,801	31,403	32,217	34,262	37,889	41,234	44,176	46,145	48,450	+5.0
Dispatcher	3,796	3,961	4,104	4,259	4,441	4,766	5,026	5,293	5,480	5,632	+2.9
Control tower operator	12,987	14,304	14,875	16,046	17,425	18,610	19,851	21,032	26,450	27,187	+2.8
Flight navigator [1]	1,620	1,625	1,797	2,384	2,891	2,966	3,011	2,950	3,052	2,957	−3.1
Flight engineer	8,992	10,348	12,349	16,500	20,863	22,009	23,867	25,159	25,796	25,964	+0.7
Flight instructor certificates	29,618	32,158	34,904	38,897	44,421	20,361	33,992	37,822	37,760	37,858	+0.3
Instrument ratings [2]	74,451	84,442	93,637	107,171	122,573	139,346	155,879	169,848	179,261	187,909	+4.8

[1] No medical examination required; therefore, no determination as to activity can be made. Numbers represent all certificates on record.
[2] Special ratings shown on pilot certificates represented above; hence do not indicate additional certificates.
* Less than 0.1

TABLE 6.—Railroad accidents and resulting casualties—years ending Dec. 31, 1970, 1971, and 1972.

	1970	1971	1972
Number of train accidents:			
Collisions	1,756	1,529	1,348
Derailments	5,602	5,131	5,509
Other	737	644	675
Total train accidents	8,095	7,304	7,532
Number of train accidents with casualties	453	404	372
Number of casualties[1]			
Trespassers killed	593	551	537
Trespassers injured	646	607	586
Passengers killed in train accidents	3	13	44
Passengers injured in train accidents	81	104	323
Passengers killed in train-service accidents	5	3	3
Passengers injured in train-service accidents	408	352	357
Employees on duty killed	155	118	127
Employees on duty injured	15,743	13,644	12,456
All other persons killed	1,469	1,325	1,234
All other persons injured	4,449	4,185	4,208
Total number of persons killed	2,225	2,010	1,945
Total number of persons injured	21,327	18,972	17,930
Highway grade crossing accidents[2]	3,571	3,406	3,392
Persons killed	1,442	1,356	1,260
Persons injured	3,351	3,351	3,307

[1] Accidents of all types. [2] Included in totals above.

TABLE 7.—Serious accidents investigated under the Accident Reports Act (45 U.S.C. 38–43), fiscal years 1969–73.

Fiscal year	Number of accidents investigated				Persons	
	Collisions	Derailments	Other	Total	Killed	Injured
1969	35	22	----	57	34	874
1970	60	55	2	117	67	621
1971	52	37	1	90	80	335
1972	55	65	----	120	30	764
1973	58	58	5	121	49	1,314

TABLE 8.—Railroad-motor vehicle accidents—years ending December 31, 1970, 1971, and 1972.

Accidents and casualties	1970			1971			1972		
	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 crossings accidents and resulting casualties[2]	3,559	1,440	3,336	3,392	1,356	3,332	3,379	1,260	3,285
Accidents at highway grade crossing involving motor vehicles	3,377	1,362	3,237	3,224	1,267	3,253	3,222	1,190	3,201
Derailments of trains at highway grade crossings involving motor vehicles[1]	67	37	48	62	26	81	51	12	31
Miscellaneous other train accidents as a result of collisions between trains and motor vehicles[1]	245	120	113	205	94	88	244	83	82
Railroad casualties:[1]									
Passengers	--------	--------	--------	--------	2	20	--------	--------	--------
Employees on duty	--------	8	85	--------	1	88	--------	1	68
Total	--------	8	85	--------	3	108	--------	1	68

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

TABLE 9.—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, fiscal years 1968–1973.

Accidents and Casualties	FY 1968	FY 1969	FY 1970	FY 1971	FY 1972	FY 1973
Number of accidents	128	78	66	48	51	36
Percent increase or decrease from previous year	+5.8	−39.1	−15.4	−27.3	+6.2	−29.4
Number of persons killed	0	0	0	*11	0	0
Percent increase or decrease from previous year	0	0	0			
Number of persons injured	141	109	72	*215	51	36
Percent increase or decrease from previous year	0.7	−22.7	−33.9	+198.6	−76.3	−29.4

*1971 adjusted to include an accident on the IC Railroad at Tonti, Illinois, June 10, 1971, that resulted in 11 deaths and 163 injuries.

TABLE 10.—Accidents and casualties resulting from failure of steam locomotives, tenders, locomotives other than steam ,multiple-operated electric locomotive units, and their appurtenances, fiscal year 1973.

Part or appurtenance which caused accident	Accidents	Killed	Injured
Air compressor	1	0	1
Air reservoirs, fittings, safety and check valves	0	0	0
Air hose coupling, train line	0	0	0
Boiler:			
Explosions	0	0	0
Fuel explosion in firebox	0	0	0
Draft equipment—adjustment	0	0	0
Steam valves, piping, and blowers	0	0	0
Brakes and brake rigging	0	0	0
Cabs:			
Doors and windows	4	0	4
Seats	4	0	4
Control equipment—mechanical, electrical, pneumatic, or electro-pneumatic	0	0	0
Couplers, draft and drawgear	0	0	0
Electrical equipment:			
Armature journals and bearings	0	0	0
Energized electrical parts	3	0	3
Insulation, short circuits, or electrical flashes	0	0	0
Pantographs, trolleys, or third rail shoes	0	0	0
Fans and shutters	0	0	0
Fires due to liquid fuel or debris	0	0	0
Floors, steps, and passageways	5	0	5
Handholds	3	0	3
Internal combustion engines and turbines:			
Crankcase or air-box explosions	2	0	2
Exhaust and cooling systems	4	0	4
Fuel injectors and connections	0	0	0
Unguarded moving parts	0	0	0
Miscellaneous	10	0	10
Total	36	0	36

TABLE 11.—Reports and inspections—steam locomotives, locomotive units othe than steam, and multiple operated electric locomotive units, fiscal year 1969–73.

	1969	1970	1971	1972	1973
Number of locomotives for which reports were filed	33,158	33,043	33,011	32,963	32,741
Number inspected	104,281	[1]95,004	82,299	87,124	77,844
Number found defective	13,117	11,988	10,609	11,424	10,020
Percent of inspected found defective	12.6	[1]12.6	12.9	13.1	12.9
Number ordered out of service	700	[1]672	595	702	660
Number of defects found	46,439	[1]44,616	[2]41,612	38,919	38,304

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

TABLE 12.—Number of freight cars, passenger cars and locomotives inspected; and the number found with defective safety appliances each year for the past ten years.

Fiscal Year	Inspected [1]	Defective [2]	Percentage defective
1964	1,506,729	96,099	6.37
1965	1,495,890	102,707	6.87
1966	1,646,299	111,096	6.74
1967	1,673,738	113,642	6.78
1968	1,307,863	92,579	7.10
1969	1,224,483	94,205	7.69
1970	998,837	88,110	8.82
1971	959,119	81,366	8.48
1972	927,684	86,169	9.29
1973	778,588	72,811	9.35

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

[2] These figures include defective locomotives which are also included in Table 6.

TABLE 13.—Inspections of safety appliances for fiscal years 1969 through 1973.

	FY 1969	FY 1970	FY 1971	FY 1972	FY 1973
Freight cars inspected	1,094,149	1,883,164	862,618	821,132	631,944
Percent defective	8.3	9.6	9.1	10.0	9.8
Passenger train cars inspected	12,738	10,855	5,431	5,081	3,918
Percent defective	7.2	8.1	7.7	11.7	10.1
Locomotives inspected[1]	117,596	104,818	91,070	81,146	77,580
Percent defective	2.5	2.5	2.9	2.5	2.0
Number of defects per 1,000 units inspected	89.16	90.93	101.69	90.08	89.37

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

TABLE 14.—Instances of excess service performed by railroad employees covered by the Hours of Service Act for the fiscal year 1973.

Name of railroad	Train dispatchers, operators, and levermen	Train and engine service employees		Total
	On duty more than maximum allowable hours	On duty more than max. allowable hours	Returned to duty without required time off duty	
Akron, Canton & Youngstown	1	5	0	6
Ann Arbor	10	0	0	10
Atchison, Topeka & Santa Fe	188	37	0	225
Atlanta & West Point	2	0	0	2
Atlanta Joint Terminal	2	0	0	2
Baltimore & Ohio	162	72	0	234
Baltimore & Ohio Chicago Terminal	9	0	0	9
Bangor & Aroostook	0	14	0	14
Belt Railway of Chicago	4	0	0	4
Birmingham Southern	0	1	0	1
Boston Terminal Corporation	19	0	0	19
Buffalo Creek	4	0	0	4
Burlington Northern	82	92	0	174
Canadian National	1	41	0	42
Canadian Pacific	4	8	0	12
Cambria & Indiana	1	0	0	1
Central Railroad of New Jersey	38	4	0	42
Central Vermont	2	14	0	16
Chesapeake & Ohio	72	25	0	97
Chicago & Eastern Illinois	6	0	0	6
Chicago & North Western	74	124	6	204
Chicago & Western Indiana	60	0	0	60
Chicago, Milwaukee, St. Paul & Pacific	80	242	0	322
Chicago, Rock Island & Pacific	82	75	1	158
Chicago Union Station Co.	1	0	0	1
Cincinnati, New Orleans & Texas Pacific	6	0	0	6
Clinchfield	6	5	0	11
Colorado & Southern	11	37	0	48
Colorado & Wyoming	0	5	0	5
Conemaugh & Black Lick	0	4	1	5
Davenport, Rock Island & Northwestern	4	7	0	11
Dayton Union	4	0	0	4
Delaware & Hudson	2	0	0	2
Delray Connecting	22	0	0	22
Denver & Rio Grande Western	4	21	0	25
DeQueen & Eastern	1	1	0	2
Detroit & Toledo Shore Line	0	4	0	4
Detroit, Toledo & Ironton	64	0	0	64
Duluth, Missabe & Iron Range	5	0	4	9
Duluth, Winnipeg & Pacific	2	0	1	3
Elgin, Joliet & Eastern	10	0	0	10
Erie Lackawanna	34	23	1	58
Galveston, Houston & Henderson	0	4	0	4
Georgia	4	0	0	4

TABLE 14.—Instances of excess service performed by railroad employees covered by the Hours of Service Act for the fiscal year 1973—Continued.

Name of railroad	Train dispatchers, operators, and levermen	Train and engine service employees		Total
	On duty more than maximum allowable hours	On duty more than max. allowable hours	Returned to duty without required time off duty	
Grand Trunk Western	28	0	0	28
Houston Belt & Terminal	25	0	0	25
Illinois Central Gulf	151	33	0	184
Indiana Harbor Belt	5	0	0	5
Jacksonville Terminal	4	0	0	4
Kansas City Southern	1	29	0	30
Lehigh Valley	16	9	0	25
Louisiana & Arkansas	12	0	0	12
Louisiana & Northern	0	5	0	5
Louisville & Nashville	25	46	5	76
Maine Central	0	8	0	8
Missouri Kansas Texas	14	4	0	18
Missouri Pacific	72	215	0	287
Monongahela	0	10	0	10
Montour	0	12	0	12
New York & Long Branch	19	0	0	19
Norfolk & Western	260	86	2	348
Norfolk Southern	9	24	0	33
Penn Central	220	870	1	1,091
Peoria & Pekin Union	1	1	0	2
Pittsburgh & Lake Erie	1	5	0	6
Point Comfort & Northern	0	4	0	4
Port Authority Trans Hudson	299	0	0	299
Reading	26	4	0	30
Richmond, Fredericksburg & Potomac	3	4	0	7
St. Johnsbury & Lamoille County	0	3	0	3
St. Louis, San Franisco	49	39	0	88
St. Loius Southwestern	10	47	0	57
Seaboard Coast Line	14	147	0	161
Soo Line	7	22	6	35
Southern Pacific	91	85	0	176
Southern Railway System	10	8	0	18
Terminal Railroad Association of St. Louis	1	1	0	2
Texas & Pacific	44	35	0	79
Toledo, Peoria & Western	19	2	0	21
Toledo Terminal	20	0	0	20
Union Pacific	6	54	1	61
Washington Terminal	3	2	0	5
Western Pacific	0	16	2	18
Youngstown & Northern	2	2	1	5

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TABLE 15.—Cause of excess service for fiscal years 1969–1973.

Classes of Offices	FY 1969	FY 1970	FY 1971	FY 1972	FY 1973
At offices where two or more shifts are employed	4,083	4,978	4,773	2,837	2,535
At offices where only one shift is employed	40	29	19	36	15
Total	4,123	5,007	4,792	2,873	2,550
Causes					
Train accidents	89	89	66	34	49
Weather conditions, floods, fire, landslides	358	278	199	141	191
Delayed trains, and held to handle train orders	20	91	45	75	9
Misunderstanding of instructions or arrangements	85	105	125	48	19
Station or clerical work	1	3	13	12	5
Sickness, death, or personal injury	2,535	2,900	2,396	1,693	1,527
Relief operator arrived late	261	450	369	216	54
Labor shortage	710	1,044	1,514	632	664
Miscellaneous	64	47	38	22	32
Total	4,123	5,007	4,792	2,873	2,550

TABLE 16.—Causes of excess service for fiscal years 1969 through 1973.

Cause	FY 1969	FY 1970	FY 1971	FY 1972	FY 1973
On continous duty in excess of maximum allowable hours					
Collisions and derailments	139	140	400	326	522
Weather conditions, track defects, floods, obstructions	278	312	571	749	1,046
Congestion of traffic	40	74	172	263	354
Mechanical defects, engines and cars	41	79	120	224	380
Wrecking and relief service	53	90	56	124	154
Miscellaneous	59	69	134	199	188
Others					
On aggregate duty in excess of maximum allowable hours	136	94	41	83	51
Returned to duty without required 10 hours off duty	14	0	13	22	21
Returned to duty without required 8 hours off duty	1	16	29	22	13
Total	761	874	1,536	2,012	2,729

TABLE 17.—Applications; block signal.

Period	Number	Pending at beginning of year	Acted upon	Pending at close of year
Year 1969	183	68	185	66
Year 1970	164	66	194	36
Year 1971	139	36	138	37
Year 1972	159	37	144	52
Year 1973	119	52	131	40
Rules, Standards, and Instructions				
Year 1969	48	12	47	13
Year 1970	51	13	53	11
Year 1971	31	11	37	5
Year 1972	29	5	26	8
Year 1973	41	8	39	10

During the year inspections were made as follows:

	Number of inspections	Signals	Switches	Other appliances	Devices on locomotives	Records of tests
Automatic block signal	806	6,532	4,938	2,950	----------	23,389
Interlockings	1,555	9,124	5,721	9,078	----------	31,992
Traffic control	1,272	9,042	5,603	8,278	----------	35,791
Automatic train stop	95	----------	----------	146	511	2,208
Automatic train control	178	----------	----------	377	957	2,844
Automatic cab signal	205	----------	----------	395	1,005	6,180
Total	4,111	24,698	16,262	21,224	2,473	102,404

TABLE 18.—Causes of false proceed failures reported by carriers for fiscal year 1973.

Railroad	Sand, rust or other deposits on rails	Failure of relays and similar devices	Circuits open, crossed, or grounded. Foreign current, etc.	Apparatus broken, defective, or out of adjustment, vandalism	Failure of apparatus due to ice, sleet, snow, wet track, weather, or lightning	Failure of apparatus due to obstruction	Errors in making connections or adjustments	Undetermined	Total
Atchison, Topeka & Santa Fe	–	–	2	3	1	–	3	–	9
Atlanta & West Point	–	–	1	–	1	–	–	–	2
Baltimore & Ohio-Chesapeake & Ohio	1	1	3	2	1	–	1	–	9
Baltimore & Ohio Chicago Terminal	–	–	1	–	–	–	–	–	1
Boston & Maine	–	–	1	2	–	–	1	–	4
Burlington Northern	1	–	1	2	3	–	1	2	10
Chicago & Eastern Illinois	–	–	–	–	–	–	1	–	1
Chicago & North Western	–	1	7	5	–	–	1	–	14
Chicago & Western Indiana	–	–	1	–	2	–	–	–	3
Chicago, Milwaukee, St. Paul & Pacific	1	2	1	1	2	–	–	–	7
Chicago, Rock Island & Pacific	–	–	5	3	–	–	1	–	9
Delaware & Hudson	–	–	1	–	–	–	–	–	1
Elgin, Joliet & Eastern	–	–	–	1	–	–	–	–	1
Erie Lackawanna	–	–	–	2	–	–	–	–	2
Florida East Coast	–	–	1	1	–	–	–	–	2
Fort Worth & Denver	–	–	–	–	–	–	1	–	1
Grand Trunk Western	–	–	1	1	–	–	–	–	2
Houston Belt & Terminal	–	–	–	1	–	–	–	–	1
Illinois Central Gulf	–	1	4	7	–	–	–	–	12
Jersey Central Lines	–	2	–	–	–	–	1	–	3
Kansas City Southern	–	–	–	1	–	–	–	–	1

TABLE 18.—Causes of false proceed failures reported by carriers for fiscal year 1973.—Continued

Railroad	Sand, rust or other deposits on rails	Failure of relays and similar devices	Circuits open, crossed, or grounded. Foreign current, etc.	Apparatus broken, defective, or out of adjustment, vandalism	Failure of apparatus due to ice, sleet, snow, wet track, weather, or lightning	Failure of apparatus due to obstruction	Errors in making connections or adjustments	Undetermined	Total
Kansas City Terminal	1	–	–	–	–	–	–	–	1
Lehigh Valley	–	–	–	1	–	–	–	–	1
Long Island	–	1	1	1	–	–	1	–	4
Louisville & Nashville	–	–	1	1	–	1	–	–	3
Missouri–Kansas–Texas	–	–	2	1	–	1	–	–	4
Missouri Pacific & Texas Pacific	–	1	1	2	–	–	–	–	4
Norfolk & Western	–	2	2	5	1	–	2	–	12
Penn Central	–	–	2	4	1	–	2	–	9
Port Authority Trans-Hudson	–	1	2	–	1	–	1	–	5
Reading	–	–	1	–	–	–	–	–	1
St. Louis–San Francisco	1	–	2	2	–	1	2	1	9
Seaboard Coast Line	–	1	5	1	–	–	2	–	9
Soo Line	–	–	1	–	–	–	–	–	1
Southern System	–	1	4	–	–	1	–	1	7
Southern Pacific	–	–	1	–	1	–	2	–	4
Staten Island Rapid Transit	–	–	1	–	–	–	–	–	1
Union (Penna.)	–	–	1	–	–	–	–	–	1
Union Pacific	–	–	–	–	–	–	–	1	1
Western Railway of Alabama	–	–	–	–	–	–	–	1	1
Total	5	14	57	50	14	4	23	6	173

TABLE 19.—U.S. Hijacking Attempts—July 1, 1972—June 30, 1973

Date	Airline Flight Aircraft	No. Aboard	Flight		Hijacker Destination/ Objective	Remarks (Incomplete—Hijacker apprehended/ killed during hijacking or as result of "hot pursuit")
			Origin	Destination		
July 2	PA/841/B–747	153	Honolulu	Saigon	North Vietnam	Unsuccessful—1 male, killed
July 5	AA/none/B–707	2	Buffalo	None	Be flown out of U.S.	Unsuccessful—1 male, surrendered
July 5	PS/710/B–737	86	Sacramento	San Francisco	$800K Ext.–Russia	Incomplete—2 males, killed
July 6	PS/389/B–727	58	Oakland	Sacramento	$450K Extortion	Incomplete—1 male, surrendered
July 12	NA/496/B–727	119	Philadelphia	New York	$600K Extortion	Incomplete—2 males, surrendered
July 12	AA/633/B–727	57	Okla. City	Dallas	$650K Extortion	Incomplete—1 male, surrendered
July 31	DL/841/DC–8	101	Detroit	Miami	$1M Ext.–Algeria	Successful—3 males, 2 females
Aug. 18	UA/877/B–727	34	Reno	San Francisco	$2M Extortion	Incomplete— 1 male shot, captured
Oct. 29	EA/496/B–727	47	Houston	Altanta	Cuba	Successful—4 males
Nov. 10	SO/49/DC–9	35	Birmingham	Montgomery	$10M Ext.—Cuba	Successful—3 males
Jan. 2	PI/928/YS11A	4	Washington	Baltimore	Toronto	Incomplete—1 male, surrendered

TABLE 20.—Worldwide Reported Hijacking Attempts

CY	1930–67	1968	969	1970	1971	1972	1973	Total
USA–SUBTOTAL*	12 (9)	22 (19)	40 (37)	27 (15)	27 (14)	31 (7)	1 (0)	160 (101)
Successful	7 (6)	18 (18)	33 (31)	18 (14)	12 (10)	10 (6)	0	98 (85)
Incomplete**	1 (1)	1 (1)	1 (1)	5 (1)	9 (1)	14 (0)	1 (0)	32 (5)
Unsuccessful	4 (2)	3 (0)	6 (5)	4 (0)	6 (3)	7 (1)	0	30 (11)
WORLD–TOTAL	65 (16)	35 (28)	87 (70)	84 (36)	58 (23)	62 (11)	7 (1)	398 (185)
Successful	45 (11)	29 (26)	70 (58)	55 (31)	22 (13)	23 (9)	3 (1)	247 (149)
Incomplete (USA)	1 (1)	1 (1)	1 (1)	5 (1)	9 (1)	14 (0)	1 (0)	32 (5)
Unsuccessful	19 (4)	5 (1)	16 (11)	24 (4)	27 (9)	25 2)	3 (0)	119 (31)
WORLD No. of Countries	23	8	19	30	23	25	6	60

TABLE 21.—Summary of Relocation Expenditures—For Period July 1, 1972 to June 30, 1973

State	Moving Costs (Sec. 202)			Owner Replacement Housing (Sec. 203)			Tenant Replacement Housing (Sec. 204)			Services Cost (Sec. 205)			Total
	Number of Claims	Amount ($000)	Average Amount Claim	Number of Claims	Amount ($000)	Average Amount Claim	Number of Claims	Amount ($000)	Average Amount Claim	Number of Claims	Amount ($000)	Average Amount Claim	Expenditures
AL	435	303	696	70	177	2,529	106	84	794	435	94	215	657,505
AK	186	163	875	24	220	9,170	95	155	1,631	186	166	893	703,905
AZ	343	485	1,414	88	364	4,133	473	376	795	343	305	889	1,529,551
AR	72	45	628	13	65	5,024	18	20	1,104	72	22	302	152,150
CA	1,856	1,225	660	709	3,022	4,262	1,494	1,340	897	1,856	621	334	6,207,381
CO	55	72	1,316	9	43	4,774	21	37	1,766	55	44	799	196,321
CT	28	72	2,587	3	10	3,412	7	16	2,216	28	24	849	121,962
DE	12	19	1,564				1	1	1,120	12	5	375	24,392
DC	8	3	344							8	7	883	9,816
FL	439	257	585	125	641	5,128	170	199	1,170	439	142	323	1,238,353
GA	374	284	761	115	710	6,175	152	130	853	374	157	420	1,281,425
HI	9	3	372				32	32	1,000	9	7	742	42,022
ID	51	64	1,255	9	23	2,596	22	35	1,595	51	20	386	142,103
IL	138	82	592	32	122	3,810	46	74	1,612	138	100	725	377,749
IN	257	188	730	51	132	2,579	77	109	1,413	257	231	898	658,612
IA	126	239	1,899	31	127	4,092	79	88	1,108	126	95	754	548,604
KS	355	310	872	111	349	3,149	225	228	1,015	355	106	300	993,850
KY	693	476	687	192	640	3,333	286	459	1,603	693	400	577	1,974,892
LA	88	53	600	21	91	4,351	31	50	1,625	88	67	767	261,990
ME	149	324	2,172	42	348	8,292	25	34	1,374	149	48	323	754,321
MD	275	271	986	64	481	7,509	180	222	1,233	275	271	985	1,244,418
MA	291	557	1,915	85	555	6,532	158	233	1,475	291	475	1,633	1,820,499
MI	483	341	706	152	765	5,034	181	338	1,865	483	237	490	1,680,691
MN	70	52	749	24	86	3,587	96	85	886	70	92	1,309	315,243
MS	219	141	644	73	335	4,585	75	89	1,184	219	96	437	660,203
MO	422	477	1,129	132	389	2,947	278	212	762	422	184	436	1,261,598
MT	54	47	863	10	64	6,365	17	26	1,533	54	16	303	152,654

TABLE 21.—Summary of Relocation Expenditures—For Period July 1, 1972 to June 30, 1973—Cont.

National Totals

State	Moving Costs (Sec. 202)			Owner Replacement Housing (Sec. 203)			Tenant Replacement Housing (Sec. 204)			Cost Services (Sec. 205)			Total
	Number of Claims	Amount ($000)	Average Amount Claim	Number of Claims	Amount ($000)	Average Amount Claim	Number of Claims	Amount ($000)	Average Amount Claim	Number of Claims	Amount ($000)	Average Amount Claim	Expenditures
NE	52	19	359	3	22	7,500	17	16	960	52	36	700	93,904
NV	105	41	392	19	142	7,481	58	56	959	105	65	622	304,338
NH	43	25	591	22	151	6,865	13	18	1,357	43	49	1,128	242,596
NJ	184	213	1,155	57	521	9,148	93	142	1,523	184	107	582	982,655
NM	93	89	958	22	189	8,605	33	32	969	93	82	885	392,688
NY	359	568	1,582	64	310	4,844	204	391	1,916	359	394	1,097	1,662,759
NC	338	192	567	64	270	4,215	77	106	1,374	338	158	467	724,873
ND	28	47	1,675	1	10	10,038	4	6	1,620	28	15	528	78,198
OH	822	966	1,176	248	1,310	5,282	426	500	1,174	822	1,132	1,377	3,908,340
OK	560	173	309	73	287	3,937	599	539	900	560	57	101	1,056,175
OR	510	387	759	75	230	3,064	256	302	1,180	510	88	173	1,007,121
PA	674	1,066	1,581	138	836	6,058	333	474	1,425	674	743	1,103	3,119,552
PR	6	2	368	3	11	3,785	1	3	2,760	6	3	515	19410
RI	24	50	2,064	2	11	5,321	4	7	1,680	24	29	1,225	96,287
SC	16	5	284	3	9	2,905	5	9	1,869	16	2	122	24,551
SD	37	36	979				1	1	600	37	4	99	40,495
TN	301	174	577	105	369	3,500	169	254	1,505	301	107	356	902,700
TX	36	45	1,248	6	25	4,184	27	25	919	36	11	296	105,509
UT	81	42	516	9	55	6,129	36	41	1,143	81	26	316	163,696
VT	130	90	690	40	283	7,075	35	77	2,188	130	133	1,024	582,378
VA	49	34	687	19	108	5,660	16	20	1,279	49	10	200	171,463
WA	293	231	789	60	270	4,497	107	144	1,347	293	242	826	887,132
WV	378	417	1,103	114	743	6,517	290	349	1,202	378	116	306	1,624,162
WI	92	124	1,344	28	59	2,091	122	83	680	92	239	2,600	504,274
WY	38	25	652	2	9	4,270	8	14	1,729	38	18	478	65,310
Total	12,737	11,611	912	3,362	15,988	4,755	7,279	8,279	1,137	12,737	7,895	620	43,772,776

TABLE 22.—Relocation Project Information—For Period July 1, 1972 to June 30, 1973

National Totals

State	Number of Projects	Residential Acquired Units								
		Total	Below $6000 Value or $60 Rental	% Total	$6,001 to $15,000 Value or $61–$110 Rental	% Total	$15,001 to $30,000 Value or $111–$225 Rental	% Total	Over $30,000 Value or $225 Rental	% Total
Alabama	73	499	238	48	211	42	47	9	3	1
Alaska	13	128	10	8	21	16	47	37	50	39
Arizona	18	221	36	16	100	46	80	36	5	2
Arkansas	9	29	4	14	7	24	17	59	1	3
California	84	1,718	59	3	387	23	1,067	62	205	12
Colorado	25	32	20	63	7	22	3	9	2	6
Connecticut	11	10			2	20	6	60	2	20
Delaware	5									
Dist of Columbia	10									
Florida	60	386	76	20	195	51	110	28	5	1
Georgia	42	213	63	30	88	41	54	25	8	4
Hawaii	6	4			1	25			3	75
Idaho	9	28	18	64	10	36				
Illinois	90	118	28	24	38	32	39	33	13	11
Indiana	36	156	108	69	39	25	8	5	1	1
Iowa	19	73	16	22	41	56	16	22		
Kansas	15	240	42	18	161	66	35	15	2	1
Kentucky	90	476	136	29	225	47	99	21	16	3
Louisiana	12	77	14	18	24	31	35	46	4	5
Maine	76	90	36	40	25	28	27	30	2	2
Maryland	22	359	219	61	107	30	33	9		
Massachusetts	27	145	33	23	40	28	50	34	22	15
Michigan	89	337	6	2	94	28	182	54	55	16
Minnesota	30	29	3	10	7	24	17	59	2	7
Mississippi	34	129	44	34	57	44	26	20	2	2
Missouri	57	354	123	35	183	52	43	12	5	1
Montana	22	21	9	43	10	47	2	10		

TABLE 22.—Relocation Project Information—For Period July 1, 1972 to June 30, 1973—Cont.

National Totals

State	Number of Projects	Residential Acquired Units								
		Total	Below $6000 Value or $60 Rental	% Total	$6,001 to $15,000 Value or $61–$110 Rental	% Total	$15,001 to $30,000 Value or $111–$225 Rental	% Total	Over $30,000 Value or $225 Rental	% Total
Nebraska	8	37	33	89	4	11				
Nevada	11	84	26	31	33	39	20	24	5	6
New Hamphsire	21	16			9	56	4	25	3	19
New Jersey	37	136	2	1	32	24	87	64	15	11
New Mexico	23	26	7	27	13	50	4	15	2	8
New York	83	283	92	33	104	37	69	24	18	6
North Carolina	61	177	69	39	64	36	41	23	3	2
North Dakota	10	3	1	33	2	67				
Ohio	127	547	159	29	264	48	113	21	11	2
Oklahoma	12									
Oregon	49	398	44	11	185	46	146	37	23	6
Pennsylvania	47	545	87	16	263	48	108	20	87	16
Puerto Rico	4	6	3	50			2	33	1	17
Rhode Island	5	10			2	20	7	10	1	10
South Carolina	6	8	2	25	4	49	1	13	1	13
South Dakota	13	1	1	100						
Tennessee	52	229	111	48	61	27	51	22	6	3
Texas	28	15	6	40	8	53	1	7		
Utah	19	53	3	6	18	34	28	52	4	8
Vermont	26	82	21	26	50	61	11	13		
Virginia	13	30	6	20	13	43	11	37		
Washington	26	196	61	31	62	32	66	33	7	4
West Virginia	66	114	21	18	71	63	22	19		
Wisconsin	26	53	2	4	19	36	32	60		
Wyoming	3	17	8	47	8	47	1	6		
Total	1,760	8,938	2,106	24	3,369	37	2,868	32	595	7

TABLE 23.—Relocation Moving Cost Payments—Farms—For Period July 1, 1972 to June 30, 1973

National Totals

State	Actual Costs								In Lieu			Total		
	Moving			Searching			Total							
	Number of Claims	Amount ($000)	Average Amount Claim	Number of Claims	Amount ($000)	Average Amount Claim	Amount ($000)	Average Amount Claim	Number of Claims	Amount ($000)	Average Amount Claim	Number of Claims	Amount ($000)	Average Amount Claim
Alabama	2		103						103			2		103
Alaska														
Arizona	2	1	277				1	277				2	1	277
Arkansas	1		350						350			1		350
California	2		108					108	1	7	7,010	3	7	2,408
Colorado														
Connecticut														
Delaware														
Dist of Columbia														
Florida	2	1	379				1	379				2	1	379
Georgia	3	2	736				2	736	1	3	2,859	4	5	1,267
Hawaii														
Idaho									1	3	2,857	1	3	2,857
Illinois	12	9	721				9	721				12	9	721
Indiana	30	10	319				10	319	1	7	7,327	31	17	545
Iowa	7	2	219				2	219	2	13	6,516	9	15	1,618
Kansas	1		45					45				1		45
Kentucky	58	11	182				11	182	2	7	3,401	60	17	289
Louisiana														
Maine														
Maryland									1	3	2,500	1	3	2,500
Massachusetts														
Michigan	1		425					425				1		425
Minnesota	2	1	348				1	348				2	1	348
Mississippi	5		96					96				5		96
Missouri	12	4	303				4	303				12	4	303
Montana	2	3	1,630				3	1,630		3	2,500	3	6	1,920

TABLE 23.—Relocation Moving Cost Payments—Farms—For Period July 1, 1972 to June 30, 1973—Cont.

National Totals

State	Actual Costs								In Lieu			Total		
	Moving			Searching			Total							
	Number of Claims	Amount ($000)	Average Amount Claim	Number of Claims	Amount ($000)	Average Amount Claim	Amount ($000)	Average Amount Claim	Number of Claims	Amount ($000)	Average Amount Claim	Number of Claims	Amount ($000)	Average Amount Claim
Nebraska	1	1	1,050				1	1,050				1	1	1,050
Nevada														
New Hampshire														
New Jersey														
New Mexico	2		81					81				2		81
New York	2		184					184	1	3	2,500	3	3	956
North Carolina	1		195					195				1		195
North Dakota	6	9	1,426				9	1,426				6	9	1,426
Ohio	12	5	408				5	408				12	5	408
Oklahoma														
Oregon	2	1	299				1		299			2	1	299
Pennsylvania	3	2	570				2	570				3	2	570
Puerto Rico														
Rhode Island														
South Carolina	1		125						125			1		125
South Dakota	5	1	128				1	128				5	1	128
Tennessee	14	5	350				5	350	1	5	5,000	15	10	660
Texas	1	1	1,200				1	1,200				1	1	1,200
Utah	3	2	500				2	500				3	2	500
Vermont									1	6	6,283	1	6	6,283
Virginia	1		320					320				1		320
Washington	9	3	320				3	320	4	1	200	13	4	283
West Virginia	13	3	228				3	228	3	8	2,500	16	10	654
Wisconsin														
Wyoming														
Total	218	75	345				75	345	20	67	3,348	238	142	597

TABLE 24.—Relocation Moving Cost Payments—Businesses—For Period July 1, 1972 to June 30, 1973

National Totals

State	Actual Costs								In Lieu			Total		
	Moving			Searching			Total							
	Number of Claims	Amount ($000)	Average Amount Claim	Number of Claims	Amount ($000)	Average Amount Claim	Amount ($000)	Average Amount Claim	Number of Claims	Amount ($000)	Average Amount Claim	Number of Claims	Amount ($000)	Average Amount Claim
Alabama	122	171	1,400				171	1,400	5	20	4,081	127	191	1,506
Alaska	31	79	2,538	6	2	379	81	2,611	3	9	3,067	34	90	2,651
Arizona	34	311	9,154	4	2	425	313	9,203	20	65	3,252	54	378	6,999
Arkansas	12	5	309	1		26	5	392	3	13	3,454	15	18	1,205
California	94	319	3,392	13	6	456	325	3,455	23	139	6,048	117	464	3,965
Colorado	10	24	2,442	2	1	500	25	2,542	7	32	4,529	17	57	3,360
Connecticut	10	66	6,639				66	6,639				10	66	6,639
Delaware	7	5	705				5	705	2	13	6,283	8	17	1,944
Dist of Columbia	1	1	907				1	907				1	1	907
Florida	82	91	1,108	3	3	1,100	94	1,149	7	33	4,723	89	127	1,430
Georgia	94	165	1,750	1	1	625	165	1,757	6	20	3,358	100	185	1,853
Hawaii	3	1	395				1	395				3	1	395
Idaho	8	9	1,165				9	1,165	6	38	6,368	14	48	3,395
Illinois	9	6	718				6	718	1	10	10,000	10	16	1,647
Indiana	67	99	1,477	8	2	238	101	1,505	1	3	2,500	68	103	1,520
Iowa	32	107	3,359	10	4	358	111	3,471	11	85	7,682	43	196	4,548
Kansas	100	105	1,049	31	15	470	120	1,195	13	96	7,398	113	216	1,909
Kentucky	130	154	1,188	1		24	154	1,188	20	105	5,269	150	260	1,732
Louisiana	2	1	313				1	313	3	24	7,944	5	24	4,891
Maine	43	223	5,196	2		63	224	5,199	17	69	4,079	60	293	4,881
Maryland	31	104	3 359	1	1	500	105	3,375	18	76	4,211	49	180	3,682
Massachusetts	31	448	14,447	2	1	333	449	14,468	2	7	3,471	33	455	13,802
Michigan	133	151	1,136				151	1,136	12	49	4,055	145	200	1,377
Minnesota	11	15	1,405				15	1,405	4	12	3069	15	28	1,849
Mississippi	34	32	939	1		173	32	944	17	53	3,096	51	85	1,661
Missouri	18	223	12,371	2	1	293	223	12,403	15	66	4,432	33	290	8,780
Montana	11	10	908				10	908	5	18	3,565	16	28	1,738

TABLE 24.—Relocation Moving Cost Payments—Businesses—For Period July 1, 1972 to June 30, 1973—Cont.

National Totals

State	Actual Costs								In Lieu			Total		
	Moving			Searching			Total							
	Number of Claims	Amount ($000)	Average Amount Claim	Number of Claims	Amount ($000)	Average Amount Claim	Amount ($000)	Average Amount Claim	Number of Claims	Amount ($000)	Average Amount Claim	Number of Claims	Amount ($000)	Average Amount Claim
Nebraska	12	7	608	1	1	500	8	649				12	8	649
Nevada	12	9	745				9	745				12	9	745
New Hampshire	8	12	1,403				12	1,843				8	12	1,483
New Jersey	30	122	4,056	2	1	474	123	4,087	4	24	5,971	34	159	4,670
New Mexico	31	18	592	1		103	18	595	9	54	5,980	40	72	1,807
New York	73	397	5,434	11	4	333	400	5,484	11	45	,4091	84	445	5,302
North Carolina	149	84	563	1		100	84	563	5	39	7,899	154	123	802
North Dakota	9	18	1,984				19	1,884	2	17	8,696	11	35	3,204
Ohio	193	648	3,544	12	21	1,725	669	3,567	10	36	3,591	193	705	3,653
Oklahoma	111	44	399				44	399	1	3	2,500	112	47	418
Oregon	99	116	1,168	75	35	468	151	1,522	13	91	7,002	012	242	2,158
Pennsylvania	136	701	5,154	11	5	482	706	5,193	24	147	6,137	160	854	5,335
Puerto Rico	1		150					150				1		150
Rhode Island	13	45	3,483				35	3,483				13	45	3,483
South Carolina	1		494					494				1		494
South Dakota	26	25	943				25	943	1	10	10,000	27	35	1,278
Tennessee	46	24	528				24	528	8	49	6,133	54	73	1,358
Texas	16	26	1,623	7	2	313	28	1,760	4	12	3,046	20	40	2,017
Utah	14	14	981				14	981				14	14	891
Vermont	41	15	362	1		499	15	374	4	30	7,491	45	45	1,007
Virginia	7	20	2,854				20	2,854				7	20	2,854
Washington	39	85	2,170	7	2	335	87	2,230	9	43	4,785	48	130	2,709
West Virginia	89	170	1,914	1	1	500	171	1,920	22	120	5,456	111	291	2,621
Wisconsin	16	91	5,674	3	1	358	92	5,741	5	19	3,804	21	111	5,280
Wyoming	19	15	799	2	1	312	16	832				19	16	832
Total	2,341	5,632	2,406	223	111	496	5,743	2,453	353	1,795	5,084	2,694	7,550	2,802

TABLE 25.—Relocation Moving Cost Payments—Non-Profit Organizations—For Period July 1, 1972 to June 30, 1973

National Totals

State	Actual Costs								In Lieu			Total		
	Moving			Searching			Total							
	Number of Claims	Amount ($000)	Average Amount Claim	Number of Claims	Amount ($000)	Average Amount Claim	Amount ($000)	Average Amount Claim	Number of Claims	Amount ($000)	Average Amount Claim	Number of Claims	Amount ($000)	Average Amount Claim
Alabama	7	4	585				4	585				7	4	585
Alaska	1	2	2,294				2	2,294				1	2	2,294
Arizona	3	4	1,356	1		154	4	1,407				3	4	1,407
Arkansas														
California	2	3	1,363				3	1,363				2	3	1,363
Colorado														
Connecticut	1	1	544				1	544				1	1	544
Delaware														
Dist of Columbia														
Florida														
Georgia	3		50					50				3		50
Hawaii														
Idaho	1	1	500				1	500				1	1	500
Illinois				1		470			1	3	2,500	1	3	2,970
Indiana														
Iowa	1		150					150				1		150
Kansas														
Kentucky	7	2	251				2	251				7	2	251
Louisiana														
Maine	1		90					90				1		90
Maryland	4	2	421				2	421				4	2	421
Massachusetts	1	5	5,326				5	5,326				1	5	5,326
Michigan														
Minnesota														
Mississippi	4	1	236				1	236				4	1	236
Missouri	1	1	545				1	545				1	1	545
Montana	4	1	299				1	299				4	1	299

TABLE 25.—Relocation Moving Cost Payments—Non-Profit Organizations—For Period July 1, 1972 to June 30, 1973—Cont.

National Totals

State	Actual Costs								In Lieu			Total		
	Moving			Searching			Total							
	Number of Claims	Amount ($000)	Average Amount Claim	Number of Claims	Amount ($000)	Average Amount Claim	Amount ($000)	Average Amount Claim	Number of Claims	Amount ($000)	Average Amount Claim	Number of Claims	Amount ($000)	Average Amount Claim
Nebraska	1		190					190				1		190
Nevada														
New Hampshire														
New Jersey														
New Mexico														
New York	3	9	3,022				9	2,322				3	9	3,022
North Carolina	6	3	458				3	458				6	3	458
North Dakota														
Ohio	1	1	1,070				1	1,070				1	1	1,070
Oklahoma														
Oregon														
Pennsylvania	5	27	5,461				27	5,461				5	27	5,461
Puerto Rico														
Rhode Island														
South Carolina														
South Dakota	4	1	143					143	1			4	1	143
Tennessee	1	1	1,488				1	1,488				1	1	1,488
Texas	1		300	2	188		1	675				1	1	675
Utah	1		298					298				1		298
Vermont														
Virginia														
Washington														
West Virginia	1		150					150	1	3	2,500	2	3	1,325
Wisconsin														
Wyoming														
Total	65	69	1,065	4	1	250	70	1,081	2	5	2,500	67	75	1,123

TABLE 26.—Summary of Relocation Moving Payments—Residential Units—For Period July 1, 1972 to June 30, 1973

National Totals

State	Actual Cost			Fixed Costs			Total		
	Number of Claims	Amount ($000)	Average Amount Claim	Number of Claims	Amount ($000)	Average Amount Claim	Number of Claims	Amount ($000)	Average Amount Claim
Alabama	3		60	296	107	362	299	107	359
Alaska	27	31	1,137	124	42	337	151	73	480
Arizona				284	104	366	284	104	366
Arkansas	7	11	1,613	49	16	318	56	27	480
California	82	37	455	1,652	720	436	1,734	757	437
Colorado	1	1	831	37	15	416	38	16	427
Connecticut	7	2	262	10	4	367	17	6	324
Delaware				3	1	425	3	1	425
Dist of Columbia	7	2	263				7	2	263
Florida	110	52	471	238	80	338	348	132	380
Georgia	50	20	400	217	75	343	267	95	354
Hawaii				6	2	360	6	2	360
Idaho				35	13	374	35	13	374
Illinois	10	9	939	105	45	425	115	54	470
Indiana	3	1	383	155	68	439	158	69	438
Iowa	3	5	1,569	70	28	397	73	33	446
Kansas	6	4	739	235	104	442	241	108	450
Kentucky	6	3	514	470	194	414	476	197	415
Louisiana	10	1	148	73	27	368	83	28	341
Maine	7	1	100	81	30	372	88	31	350
Maryland	36	16	435	185	71	385	221	87	393
Massachusetts	20	24	1,189	237	73	309	257	97	378
Michigan	2	2	795	335	139	416	337	141	418
Minnesota	5	3	574	48	21	440	53	24	452
Mississippi	2	1	425	157	54	345	159	55	346
Missouri	20	31	1,550	356	152	428	376	183	487
Montana	4	3	635	27	9	344	31	12	381

TABLE 26.—Summary of Relocation Moving Payments—Residential Units—For Period July 1, 1972 to June 30, 1973—Cont.

National Totals

State	Actual Cost			Fixed Costs			Total		
	Number of Claims	Amount ($000)	Average Amount Claim	Number of Claims	Amount ($000)	Average Amount Claim	Number of Claims	Amount ($000)	Average Amount Claim
Nebraska				38	10	267	38	10	267
Nevada	10	4	424	83	28	338	93	32	347
New Hampshire	3		153	32	13	409	35	14	387
New Jersey	19	10	509	131	57	438	150	67	447
New Mexico	7	1	207	44	15	349	51	17	329
New York	5	3	608	264	111	422	269	114	425
North Carolina	2	2	782	175	64	364	177	65	369
North Dakota	6	1	222	5	2	355	10	3	282
Ohio	105	45	431	511	231	452	616	276	448
Oklahoma				448	126	282	448	126	282
Oregon	18	12	642	378	168	446	396	180	454
Pennsylvania	24	16	683	482	172	357	506	189	373
Puerto Rico				5	2	411	5	2	411
Rhode Island				11	4	386	11	4	386
South Carolina				14	4	281	14	4	281
South Dakota				1	1	500	1	1	500
Tennessee	6	4	698	225	85	376	231	89	384
Texas				14	5	378	14	5	378
Utah	3	1	190	60	26	429	63	26	417
Vermont	6	6	1,013	78	33	417	84	39	459
Virginia	4	2	483	37	11	309	41	13	326
Washington	56	23	409	176	77	438	232	100	431
West Virginia	12	9	757	237	104	440	249	113	455
Wisconsin	6	2	358	65	12	179	71	14	195
Wyoming	1	1	1,021	18	9	476	19	10	505
Total	721	402	557	9,017	3,566	395	9,738	3,967	407

TABLE 27.—Residential Displacements—People Displaced—For Period July 1, 1972 to June 30, 1973

National Totals

State	Negro/ Black	Spanish Surname	American Indian	Asian American	Total Minority	% Total	All Others	% Total	Total	Non-DSS to DSS	% Total	Avg. Per Acq. Unit
Alabama	290	3			293	27	788	73	1,081	112	10	22
Alaska	1	3	6	1	11	3	323	97	334	3	1	2
Arizona	23	82	10	8	123	20	491	80	614	15	2	7
Arkansas	4				4	3	135	97	139			
California	2,382	698	2	105	3,187	57	2,386	43	5,573	129	4	13
Colorado		27		4	31	27	84	73	115	3	3	9
Connecticut							48	100	48			
Delaware	14				14	100			14			
Dist of Columbia	21				21	100			21	3	14	
Florida	214	10			224	19	933	81	1,157	11	1	3
Georgia	84				84	11	662	89	746	48	6	23
Hawaii		5			5	21	19	79	24			
Idaho							95	100	95	6	6	21
Illinois	13				13	4	277	96	290	10	3	8
Indiana	3				3	1	417	99	420	74	18	47
Iowa							184	100	184	5	3	7
Kansas	51	13			64	11	512	89	576			
Kentucky	25				25	2	1,469	98	1,494	95	6	20
Louisiana	20				20	8	216	92	236	1	*	1
Maine							238	100	238	13	5	14
Maryland	792				792	65	424	35	1,216	157	13	44
Massachusetts	1	6			7	2	415	98	422	5	1	3
Michigan	126	22			148	15	856	85	1,004			
Minnesota			7		7	3	246	97	253	2	1	7
Mississippi	108			1	109	21	401	79	510	51	10	40
Missouri	499	32	2	3	536	50	529	50	1,065	22	2	6
Montana		5	7		12	13	78	87	90	4	4	19

TABLE 27.—Residential Displacements—People Displaced—For Period July 1, 1972 to June 30, 1973—Cont.

National Totals

State	Negro/ Black	Spanish Surname	American Indian	Asian American	Total Minority	% Total	All Others	% Total	Total	Non-DSS to DSS	% Total	Avg. Per Acq. Unit
Nebraska	33	10			43	47	48	53	91	37	41	100
Nevada	131	3	4	1	139	75	46	25	185	20	11	24
New Hampshire		3			3	2	130	98	133	6	5	38
New Jersey	280	12			292	52	269	48	561	9	2	7
New Mexico		86	8		94	69	42	31	136	8	6	31
New York	72	11	2		85	12	640	88	725	80	11	28
North Carolina	54		26		80	14	478	86	558	28	5	16
North Dakota							22	100	22			
Ohio	200				200	11	1,642	89	1,842	89	5	16
Oklahoma	2	12	10		14	3	859	97	883	11	1	
Oregon	15	5	4	7	31	3	1,009	97	1,040	62	6	16
Pennsylvania	94	1		7	102	6	1,728	94	1,830	275	15	50
Puerto Rico		23			23	100			23	5	22	83
Rhode Island							22	100	22			
South Carolina							45	100	45	1	2	13
South Dakota							2	100	2	1	50	100
Tennessee	36				36	4	799	96	835	53	6	23
Texas	15	14			29	69	13	31	42	5	12	33
Utah		2	3	2	7	4	154	96	161	2	1	4
Vermont							265	100	265	18	7	22
Virginia	27				27	20	110	80	137	9	7	30
Washington	32			11	43	7	573	93	616			
West Virginia	54				54	7	674	93	728	24	3	21
Wisconsin	31	3			34	9	324	91	358	10	3	19
Wyoming		17			17	28	44	72	61	3	5	18
Total	5,747	1,108	91	150	7,096	24	22,164	76	29,260	1,615	6	18

TABLE 28.—Federal Aviation Administration statement of financial resources by appropriation
(in millions of dollars)

Appropriation	Fiscal year 1973			Fiscal year 1972		
	Carryover of unobligated appropriations	Appropriations and authorizations	Unobligated balance	Carryover of unobligated appropriations	Appropriations and authorizations	Unobligated balance
Operations [1]	$	$ 1,187.4	$ [2] 6.4	$	$ 998.1	$ [3] 4.3
Facilities & Equipment [1]	199.2	[4] 302.7	[7] 291.9	156.8	301.8	199.2
Safety Regulation	4.4		.6		151.0	4.4
Research & Development [1]	.9	66.0	10.8	1.2	78.4	.9
Grants-in-Aid for Airports	453.3	[5] 635.0	874.4	730.0	[5] 15.0	453.3
Civil Supersonic Aircraft Development	2.9		3.6	2.9		2.9
Civil Supersonic Aircraft Development-Termination	7.9		6.6	11.4	58.5	7.9
Operation & Maintenance, National Capital Airports		12.3			11.5	
Construction, National Capital Airports	8.4		3.1	8.0	4.9	8.4
International Aeronautical Exposition	.2		.5	2.4	2.2	.2
Total	$ 677.2	$ 2,203.4	$ [6] 1,197.9	$ 912.7	$ 1,621.4	$ [6] 680.6
Percent of Available Funds Unobligated at June 30			41.6%			26.9%

[1] Total financial resources derived from general and trust fund appropriations.
[2] Includes $3,711,300 available for carryover in Appropriation Symbol 69X1301, Operations, FAA, NO Year; $2,716,500 in Appropriation Symbol 69X8104, Operations, Trust Fund, of which $2,057,600 not available for carryover, returned to Treasury and $658,900 unobligated unavailable in 69M8104 representing excess of Receivables over Unpaid Obligations.
[3] Fiscal Year 1972 funds returned to the Treasury, not available for carryover.
[4] Includes funds authorized $112,161,300 but not drawn from the Treasury in FY 1973.
[5] Excludes $140,300,000 Liquidating Appropriation in FY 1973; excludes $32,700,000 Liquidating Appropriation in FY 1972.
[6] Excludes Aviation War Risk Insurance, $12,671,700 in FY 1973; $10,555,500 in FY 1972.
[7] The increase over the previous year in the unobligated balance is the result of an unusual number of delays in programs. For instance, several major equipment procurements slipped because of required technical changes or necessary contract modifications.

TABLE 29.—Coast Guard financial statement, fiscal year 1973.

	Funds available [1]	Net total obligations	Unobligated balances [2]
Appropriated Funds:			
Operating Expenses	$548,440,034	$548,370,104	$ 69,930
Acquisition, Construction and Improvements	158,902,599	113,985,191	44,917,408
Alteration of Bridges	11,100,000	5,425,240	5,674,760
Retired Pay	76,789,000	76,199,928	589,072
Reserve Training	31,135,000	31,125,073	9,927
Research, Development, Test and Evaluation	18,166,669	14,645,068	3,521,601
State Boating Safety Assistance	5,023,629	4,918,730	104,899
Oil Pollution Fund	19,813,645	9,439,340	10,374,305
Total Appropriated Funds	$869,370,576	$804,108,674	$ 65,261,902
Reimbursements:			
Operating Expenses	$ 11,619,819	$ 11,529,425	$ 90,394
Acquisition, Construction and Improvements	2,729,276	2,001,498	727,778
Research, Development, Test and Evaluation	325,698	312,946	12,752
Total Reimbursable Funds	$ 14,674,793	$ 13,843,869	$ 830,924
Trust Funds:			
Coast Guard General Gift Fund	$ 40,456	$ 5,206	$ 35,250
Surcharge Collections, Sales Of Commissary Stores	151,660	91,131	60,529
Coast Guard Cadet Fund	4,389,348	4,389,348	–0–
Total Trust Funds	$ 4,581,464	$ 4,485,685	$ 95,779
Intra-Governmental Revolving Funds:			
Coast Guard Supply Fund	$ 37,120,251	$ 36,993,975	$ 126,276
Coast Guard Yard Fund	26,868,207	23,609,657	3,258,550
Total Revolving Funds	$ 63,988,458	$ 60,609,632	$ 3,384,826
Grand Total	$952,615,291	$883,041,680	$ 69,573,431

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

Operating Expenses Reimbursements	$ 130,022
Acquisition, Construction and Improvements	
Appropriated Funds	27,352,599
Reimbursements	2,443,390
Alteration of Bridges	1,600,000
Research, Development, Test and Evaluation	
Appropriated Funds	616,669
Reimbursements	1,698
State Boating Safety Assistance	523,629
Oil Pollution Fund	19,178,664
Coast Guard General Gift Fund	17,421
Surcharge Collections, Sales of Commissary Stores	44,571

TABLE 29.—Coast Guard financial statement, fiscal year 1973.—Continued

Coast Guard Cadet Fund	644,032
Coast Guard Supply Fund	126,276
Coast Guard Yard Fund	3,258,550
	$ 55,937,521

[2] Unobligated balances remain available for obligation in Fiscal Year 1974 as follows:

Operating Expenses [3]	$ 90,394
Acquisition, Construction and Improvements [4]	45,645,186
Alteration of Bridges [5]	5,674,760
Research, Development, Test and Evaluation [6]	3,534,353
State Boating Safety Assistance	104,899
Oil Pollution Fund	10,374,305
Coast Guard General Gift Fund	35,250
Surcharge Collections, Sales of Commissary Stores	60,529
Coast Guard Supply Fund	126,276
Coast Guard Yard Fund	3,258,550
	$ 68,904,502

[3] Unobligated balance of $90,394 under Operating Expenses appropriation represents Accounts Receivable for costs of repairs or replacement of Coast Guard property damaged by private parties, proper for credit to Fiscal Year current at time collections are realized, as authorized in 14USC642.

	Coast Guard Projects	DOD Projects
[4] For projects deferred in Fiscal Year 1973 to be subsequently accomplished	$ 11,476,000	$ 260,000
For completion of projects started in Fiscal Year 1973 and Prior Years	33,441,408	467,778
[5] For projects deferred in Fiscal Year 1973 to be subsequently accomplished	5,350,000	
For completion of projects started in Fiscal Year 1973 and Prior Years	324,760	
[6] For projects deferred in Fiscal Year 1973 to be subsequently accomplished	3,000,000	
For completion of projects started in Fiscal Year 1973 and Prior Years	521,601	12,752
Total	$ 54,113,769	$ 740,530

Expenditures Incurred	Total Expenditures	Direct Expenditures	Reimbursable Expenditures
Operating Expenses	$555,390,960	$544,390,093	$ 11,000,867
Acquisition, Construction and Improvements	96,281,176	94,449,124	1,832,052
Alteration of Bridges	7,687,138	7,687,138	–0–
Retired Pay	76,194,121	76,194,121	–0–
Reserve Training	30,449,262	30,449,262	–0–
Research, Development, Test and Evaluation	14,939,508	14,677,718	261,790
State Boating Safety Assistance	4,559,601	4,559,601	–0–
Oil Pollution Fund	8,804,805	8,804,805	–0–
Coast Guard General Gift Fund	7,119	7,119	–0–
Surcharge Collections, Sales of Commissary Stores	91,131	−15,958	107,089
Coast Guard Cadet Fund	4,389,348	644,032	3,745,316
Coast Guard Supply Fund	36,993,975	1,953,855	35,040,120
Coast Guard Yard Fund	23,609,657	−4,315,912	27,925,569
Total	$859,397,801	$779,484,998	$ 79,912,803

TABLE 30.—National Highway Traffic Safety Administration—summary of authorization and appropriations, Fiscal Years 1967–73
(millions of dollars)

	FY 1967	FY 1968	FY 1969	FY 1970	FY 1971	FY 1972	FY 1973
Traffic Safety							
Authorized[1]	10.9	18.5	24.5	23.0	40.0	40.0	36.9
Appropriated	4.3	11.3	15.9	20.2	25.9	30.7	33.0
Highway Safety							
Authorized[2]	10.0	20.0	25.0	30.0	37.5	70.0	115.0
Appropriated	4.3	7.3	10.6	10.0	17.0	38.6	44.2
Compliance Test Facility							
Authorized[1]	3.0[4]	2.3[5]	1.1[5]	0	0	9.6[4]	0
Appropriated	0.7	1.2	0	0	0	9.6	0
Total Traffic and Highway Safety Appropriations							
Authorizations[3]	23.9	38.5	49.5	53.0	77.5	119.6	151.9
Appropriation	9.3	19.8	26.5	30.2	42.9	78.9	77.2
State and Community Safety Appropriation (NHTSA and FHWA)							
Authorization	67.0	100.0	100.0	0.0[7]	0.0[7]	105.0	130.0
Obligations[6]	2.0	25.0	65.0	70.0	75.0	85.0	95.0

[1] Authorized under the National Traffic and Motor Vehicle Safety Act.
[2] Authorized under the Highway Safety Act.
[3] The Traffic and Highway Safety Appropriation appropriates funds for programs of both substantive Acts.
[4] Lump sum authorization to remain available until expended.
[5] Remaining unappropriated balance.
[6] Limitations on obligations: Department of Transportation Appropriation Acts of 1968, 1969, 1970, and 1971 limited the amounts that could be obligated during those fiscal years to the amounts shown.
[7] Total authorization of $175 million rescinded by PL–91/605.

TABLE 31.—Summary of merchant marine safety activities.

Materiel Safety Activities	FY 1971	FY 1972	FY 1973
Vessels certificated	9,737	9,294	8,689
Vessels issued original certificates	536	No longer reported	
Inspected Vessels—Type			
Cargo and miscellaneous	2,075	1,917	1,519
Tank ships	378	413	328
Tank barges	3,129	3,156	3,659
Passenger (over 100 gross tons)	146	136	105
Small passenger	4,009	3,672	3,078
Total	9,737	9,294	8,689
Marine Personnel Activities			
Licenses issued	21,399	19,999	27,899
Merchant Mariner's Documents issued	21,343	22,831	20,107
Seamen discharged from voyage articles	381,293	292,876	351,843
Security checks for employment	23,781	13,486	12,806
Total	447,816	349,192	412,655
Casualties			
Personnel Casualties	1,902	2,052	1,515
Vessel Casualties	2,575	2,602	3,104
Total	4,477	4,654	4,619

TABLE 32.—Department of Transportation, statement of assets, liabilities and equity as of June 30, 1973—(In Thousands)

ASSETS	1972	1973
Fund Balances with Treasury:		
Budget funds	$ 2,341,055	$ 1,940,665
Budget clearing accounts		12,406
Deposit funds	8,348	7,352
Federal contribution WMATA	403,118	336,684
	2,752,521	2,297,107
Restricted Fund Balances with Treasury:		
Trust funds unavailable until appropriated	5,555,314	6,777,786
Accounts and Loans Receivable:		
Government agencies	51,394	48,144
The Public	26,828	138,129
	78,222	186,273
Advances to:		
Government agencies	18,097	18,459
The Public	68,149	18,999
	86,246	37,458
Securities Owned:	117	45
Accrued Interest Receivable:	212	1,296
Inventories:		
Items for sale	37,255	30,094
Work in process	28,910	38,424
Raw materials and supplies	221,765	272,406
Stockpile materials & commodities		190
Less: Allowances		(129)
	287,930	340,985
Real Property and Equipment:		
Land	68,492	68,345
Structures and facilities	1,262,263	1,294,369
Equipment, including aircraft, boats & vehicles	1,752,739	1,800,563
Leasehold improvements	2,908	1,938
Less: Depreciation	(135,470)	(143,489)
	2,950,932	3,021,726
Other Assets:		
Work-in-process, contractors	396,926	554,901
Materials and supplies—other		591
Acquisitions in process	59,068	80,184
Books and periodicals	2,363	2,363
Deferred charges	4,185	5,003
Intangible assets	805	1,150
Less: Allowances		(281)
	463,347	643,911
Total Assets	$ 12,174,841	$ 13,306,587

TABLE 32.—Department of Transportation, statement of assets, liabilities and equity as of June 30, 1973—(In Thousands)—(Continued)

LIABILITIES		
Accounts Payable:	*1972*	*1973*
Government agencies	$ 30,432	$ 38,536
The Public	942,030	737,245
	972,462	775,781
Advances From:		
Government agencies	243,577	24,708
The Public	332	1,582
	243,909	26,290
Deposit Fund Liabilities:	9,307	8,481
Unfunded Liabilities:		
Accrued annual leave	101,272	105,377
Debt Issued Under Borrowing Authority:		
Mortgage payable—Capehart housing	2,549	2,386
Agency securities outstanding	126,776	123,276
	129,325	125,662
Other Liabilities:		
Deferred and undistributed credits	74,811	
Assets borrowed, leased and lease purchase contracts	12,860	7,123
Contract holdbacks	5,762	
	93,433	7,123
Total Liabilities	$ 1,549,708	$ 1,048,714
GOVERNMENT EQUITY		
Unexpended Budget Authority:		
Unobligated	$	$ 5,734,458
Undelivered orders		9,632,299
		15,366,757
Unfinanced Budget Authority:		
Unfilled customer orders		(138,192)
Contract authority		(13,987,560)
Borrowing authority		(6,200)
		(14,131,952)
Invested capital:	4,666,701	3,893,800
Other Equity:		
Receipt account equity		14,798
Equity in unappropriated Hiway Trust Fund	4,489,531	5,590,688
Equity in unappropriated Airport and Airway Trust Fund	1,065,783	1,187,098
Equity in Federal share—WMATA	403,118	336,684
	5,958,432	7,129,268
Total Equity	10,625,133	12,257,873
Total Liabilities & Equity	$ 12,174,841	$ 13,306,587

TABLE 33.—Recurring Annual Reports Prepared By DOT*

Nature of Report	*Authority*
On States' progress in improving railroad-highway crossings.	P.L. 93–87 sec. 203(e)
On progress in improved highway pavement marking and resulting safety benefits achieved.	23 U.S.C. 151(g)
States' progress in improving high-hazard highway locations.	23 U.S.C. 152(e)
On States' progress in eliminating roadside obstacles, and its effectiveness.	23 U.S.C. 153(e)
On operations under Part II, Title I, Airport and Airway Dev. Act of 1970.	49 U.S.C. 1724
On activities under the Ports and Waterways Safety Act of 1972.	P.L. 92–340 sec. 203
On activities pursuant to Emergency Rail Services Act of 1970.	45 U.S.C. 669
On cost of completing the Interstate (highway) System.	23 U.S.C. 104(b)(5)
On activities of DOT.	49 U.S.C. 1658
On approvals under sec. 5 of the International Bridge Act of 1972.	P.L. 92–434 sec. 11
On operation of the Alaska Railroad.	43 U.S.C. 975(g)
On programs and policies established or authorized by Uniform Relocation Assistance Act of 1970.	42 U.S.C. 4634
On estimates of future highway needs.	P.L. 89–139 sec. 3
On USCG operations & expenditures.	14 U.S.C. 651
On approved projects re urban area traffic operations improvement programs (TOPICS).	23 U.S.C. 135(c)
On disposal of foreign excess property.	40 U.S.C. 514
On military incentive awards programs.	10 U.S.C. 1124(g)
On management improvements & review of positions vacated.	July '67 ltr; Manpower & Civil Serv. Subcomte, House P.O. & C.S. Comte.
On findings re performance of Federal-aid highway construction work that a method other than competitive-bid contract is in the public interest.	23 U.S.C. 112(b)
On outstanding grants and other contractual agreements under sec. 4(c), Urban Mass Transportation Act.	49 U.S.C. 1603(d)

* Reports are listed in approximate order of due dates, beginning January 1.

TABLE 33.—Recurring Annual Reports Prepared By DOT*—Continued

Nature of Report	*Authority*
On administration of the National Traffic & Motor Vehicle Safety Act of 1966, and recommendations for added legislation.	15 U.S.C. 1408
On number, rank, and positions of Armed Forces members detailed to FAA.	49 U.S.C. 1343(a)(3)
On amendments & modifications of contracts under authority to facilitate national defense.	50 U.S.C. 1434
On effectiveness of the Rail Passenger Service Act of 1970.	45 U.S.C. 548(b)
On administration of the Natural Gas Pipeline Safety Act of 1968.	49 U.S.C. 1683
On scope of services under subchapter III, title III, Intergovernmental Coop. Act of 1968.	P.L. 90–577 sec. 304
On progress under Title I (Bumper Standards) Motor Vehicle Information & Cost Savings Act.	P.L. 92–513 sec. 112
Joint; by Secretaries of DOT & HUD on how Fed. activity can assure that urban transp. systems best serve natl. transp. needs.	49 U.S.C. 1653
On use of USCG housing authority.	14 U.S.C. 475(f)
On number, rank, & positions of Armed Forces members detailed to DOT.	49 U.S.C. 1657(d)(2)
On financial condition of the Penn Central Railroad.	45 U.S.C. 669
On Admin. of title II, Fed. Railroad Safety Act of 1970.	45 U.S.C. 440
On transportation of hazardous materials.	49 U.S.C. 1761(c)&(d)
On contracts negotiated without advertising.	10 U.S.C. 2304(e)
On implementation of National Transportation Policy.	49 U.S.C. 1702(b)
On administrative adjudication of traffic infractions.	23 U.S.C. 403(e)
On evaluation of driver education programs.	23 U.S.C. 403(f)
On administration of the Highway Safety Act of 1966.	P.L. 89–564 sec. 202(a)&(b) as amended
On acquisition, without advertising, of property related to air navigation.	49 U.S.C. 1344(e)
On demonstration projects to relocate railroad lines from central areas of cities, etc.	P.L. 93–87 sec. 163(j)
On financial condition of the Central Railroad of New Jersey.	45 U.S.C. 669

* Reports are listed in approximate order of due dates, beginning January 1.

TABLE 33.—Recurring Annual Reports Prepared By DOT*—Continued

Nature of Report	*Authority*
On management improvements & review of positions vacated.	July '67 ltr., Manpower & Civil Service Subcomt., House P.O. & C.S. Comte. (Semiannual)
On DOT personnel.	5 U.S.C. 3101n P.L. 82–253 sec. 1310(d)
On findings re performance of Fed.-aid highway construction by a method other than competitive-bid contract.	23 U.S.C. 112(b) (Semiannual)
On number, rank, & positions of Armed Forces members detailed to FAA, w/evaluation of effectiveness of such details.	49 U.S.C. 1343(a)(3) (Semiannual)
On extent to which Ready Reserve units & individuals have met training & mobilization readiness requirements in the FY.	10 U.S.C. 264(c)
On contracts negotiated without advertising.	10 U.S.C. 2304(e) (Semiannual)
On status of the FHWA Equal Employment Opportunity Program.	Sen. Doc. 91–15, pp. 7–8 (Report, Subcomt. on Roads, Senate Public Works Comte.)
On projects approved under the special bridge replacement program.	23 U.S.C. 144(g)
On activities under the High Speed Ground Transportation Act of 1965.	49 U.S.C. 1640(a)
On studies of economic highway geometrics structures.	23 U.S.C. 307(b)
SLS Annual Report.	SLS Act PL 358

* Reports are listed in approximate order of due dates, beginning January 1.

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