

1019

1019  
H/8/4  
90-37

KANSAS STATE UNIVERSITY LIBRARIES  
HIGH-SPEED GROUND TRANSPORTATION—EXTENSION

Y4  
. In 8/4  
90-37

GOVERNMENT  
Storage

HEARINGS  
BEFORE THE  
SUBCOMMITTEE ON TRANSPORTATION  
AND AERONAUTICS  
OF THE  
COMMITTEE ON  
INTERSTATE AND FOREIGN COMMERCE  
HOUSE OF REPRESENTATIVES  
NINETIETH CONGRESS

SECOND SESSION  
ON

H.R. 16024

A BILL TO EXTEND FOR ONE YEAR THE ACT OF SEPTEMBER 30,  
1965, RELATING TO HIGH-SPEED GROUND TRANSPORTATION

JUNE 12, 13, 1968

Serial No. 90-37

Printed for the use of the  
Committee on Interstate and Foreign Commerce



U.S. GOVERNMENT PRINTING OFFICE  
WASHINGTON : 1968

KSU LIBRARIES  
A 11900 807450 ✓

HEARINGS  
COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE

HARLEY O. STAGGERS, West Virginia, *Chairman*

SAMUEL N. FRIEDEL, Maryland	WILLIAM L. SPRINGER, Illinois
TORBERT H. MACDONALD, Massachusetts	SAMUEL L. DEVINE, Ohio
JOHN JARMAN, Oklahoma	ANCHER NELSEN, Minnesota
JOHN E. MOSS, California	HASTINGS KEITH, Massachusetts
JOHN D. DINGELL, Michigan	GLENN CUNNINGHAM, Nebraska
PAUL G. ROGERS, Florida	JAMES T. BROYHILL, North Carolina
HORACE R. KORNEGAY, North Carolina	JAMES HARVEY, Michigan
LIONEL VAN DEERLIN, California	ALBERT W. WATSON, South Carolina
J. J. PICKLE, Texas	TIM LEE CARTER, Kentucky
FRED B. ROONEY, Pennsylvania	G. ROBERT WATKINS, Pennsylvania
JOHN M. MURPHY, New York	DONALD G. BROTZMAN, Colorado
DAVID E. SATTERFIELD III, Virginia	CLARENCE J. BROWN, Jr., Ohio
DANIEL J. RONAN, Illinois	DAN KUYKENDALL, Tennessee
BROCK ADAMS, Washington	JOE SKUBITZ, Kansas
RICHARD L. OTTINGER, New York	
RAY BLANTON, Tennessee	
W. S. (BILL) STUCKEY, Jr., Georgia	
PETER N. KYROS, Maine	

W. E. WILLIAMSON, *Clerk*

KENNETH J. PAINTER, *Assistant Clerk*

*Professional Staff*

ANDREW STEVENSON  
JAMES M. MENDER, Jr.

WILLIAM J. DIXON  
ROBERT F. GUTHRIE

SUBCOMMITTEE ON TRANSPORTATION AND AERONAUTICS

SAMUEL N. FRIEDEL, Maryland, *Chairman*

JOHN D. DINGELL, Michigan	SAMUEL L. DEVINE, Ohio
J. J. PICKLE, Texas	GLENN CUNNINGHAM, Nebraska
DANIEL J. RONAN, Illinois	ALBERT W. WATSON, South Carolina
BROCK ADAMS, Washington	DAN KUYKENDALL, Tennessee

## CONTENTS

	Page
Hearings held on—	
June 12, 1968.....	1
June 13, 1968.....	61
Text of H.R. 16024.....	1
Report of—	
Bureau of the Budget.....	2
Commerce Department.....	2
Statement of—	
Boyd, Hon. Alan S., Secretary, Department of Transportation.....	4
Fox, Dr. Thomas G., science adviser to the Governor of Pennsylvania, chairman, Governor's Science Advisory Committee, and chairman, Pennsylvania Science and Engineering Foundation.....	76
Irwin, Hon. Donald J., a Representative in Congress from the State of Connecticut.....	74
Jones, Hon. Clifford L., secretary of commerce, Commonwealth of Pennsylvania.....	68
Lang, A. Scheffer, Administrator, Federal Railroad Administration, Department of Transportation.....	4
Marburger, John H., Jr., administrator, Prince Georges County (Md.) Department of Public Works.....	80
Minor, Robert W., senior vice president, Penn Central Railroad.....	61, 71
Nelson, Robert A., Director, Office of High Speed Ground Transporta- tion, Department of Transportation.....	4
Spellman, Hon. Gladys N., chairman, Board of County Commission- ers, Prince Georges County, Md., presented by John H. Marburger, administrator, Prince Georges County Department of Public Works.....	80
Additional material submitted for the record by—	
Connecticut State Transportation Authority, letter from Frank M. Reinhold, chairman.....	82
Council of State Governments, letter, with resolution, from James A. R. Johnson, legislative assistant.....	86
Gilbert Systems, Inc., letter from Milton A. Gilbert, chairman of the board.....	87
Illinois Central Railroad, letter from William B. Johnson, president.....	83
National Association of Railroad Passengers, letter from Anthony Haswell, executive director.....	86
New Jersey State Department of Transportation, letter from David J. Goldberg, commissioner of transportation.....	83
Railway Labor Executives' Association, letter from G. E. Leighty, chairman.....	85
Transportation Department:	
Estimated expenditures for high speed ground transportation program for fiscal years 1969-71 (table).....	57
High speed ground transportation legislative extension, statement in explanation of request for.....	9



## HIGH-SPEED GROUND TRANSPORTATION— EXTENSION

WEDNESDAY, JUNE 12, 1968

HOUSE OF REPRESENTATIVES,  
SUBCOMMITTEE ON TRANSPORTATION AND AERONAUTICS,  
COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE,  
*Washington, D.C.*

The subcommittee met at 10 a.m., pursuant to notice, in room 2318, Rayburn House Office Building, Hon. Samuel N. Friedel (chairman of the subcommittee) presiding.

Mr. FRIEDEL. The committee will now come to order.

The Subcommittee on Transportation and Aeronautics is meeting this morning to open hearings on H.R. 16024, a bill to extend for 1 year the so-called High Speed Ground Transportation Act of 1965. (H.R. 16024 and departmental reports thereon follow:)

[H.R. 16024, 90th Cong., second sess.]

A BILL To extend for one year the Act of September 30, 1965, relating to high-speed ground transportation

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That (a) the first section of the Act entitled "An Act to authorize the Secretary of Commerce to undertake research and development in high-speed ground transportation, and for other purposes", approved September 30, 1965 (79 Stat. 893; Public Law 89-220; 49 U.S.C. 1631), is amended by striking out "Secretary of Commerce" and inserting in lieu thereof "the Secretary of Transportation".

(b) Section 5 of such Act of September 30, 1965, is amended by striking out "Department of Commerce" and inserting in lieu thereof "Department of Transportation".

(c) Section 7 of such Act of September 30, 1965, is amended by adding at the end thereof the following: "In furtherance of these activities, the Secretary may acquire necessary sites by purchase, lease, or grant and may acquire, construct, repair, or furnish necessary support facilities."

(d) Section 9 of such Act of September 30, 1965, is amended by striking out "Administrator of the Housing and Home Finance Agency" and inserting in lieu thereof "Secretary of Housing and Urban Development".

(e) The first sentence of section 11 of such Act of September 30, 1965, is amended by striking out "and" and by striking out the period at the end thereof and inserting in lieu thereof a semicolon and the following: "and \$16,200,000 for the fiscal year ending June 30, 1969."

(f) The first sentence of section 12 of such Act of September 30, 1965, is amended by striking out "1969" and inserting in lieu thereof "1970".

EXECUTIVE OFFICE OF THE PRESIDENT,  
BUREAU OF THE BUDGET,  
Washington, D.C., April 29, 1968.

HON. HARLEY O. STAGGERS,  
*Chairman, Committee on Interstate and Foreign Commerce, Rayburn House Office  
Building, Washington, D.C.*

DEAR MR. CHAIRMAN: This is in reply to your request for the views of the Bureau of the Budget on H.R. 16024, a bill "To extend for one year the Act of September 30, 1965, relating to high-speed ground transportation."

The draft bill originally submitted by the Secretary of Transportation proposed a two-year extension of the High-speed Ground Transportation Act in order to allow continuation of the program and facilitate its planning and administration.

We support the recommendation of the Department of Transportation to extend the Act and authorize appropriations for an additional two years. Enactment of such an extension would be consistent with the Administration's objectives.

Sincerely yours,

WILFRED H. ROMMEL,  
*Assistant Director for Legislative Reference.*

EXECUTIVE OFFICE OF THE PRESIDENT,  
BUREAU OF THE BUDGET,  
Washington, D.C., June 3, 1968.

HON. HARLEY O. STAGGERS,  
*Chairman, Committee on Interstate and Foreign Commerce, Rayburn House Office  
Building, Washington, D.C.*

DEAR MR. CHAIRMAN: This is in reply to your letter of May 15, 1968, concerning H.R. 16024, a bill "To extend for one year the Act of September 30, 1965, relating to high-speed ground transportation."

The Bureau of the Budget continues to recommend enactment of the draft bill submitted to the Congress by the Department of Transportation which would extend the Act for two years, from June 30, 1969 to June 30, 1971, and authorize appropriations for the fiscal years subsequent to 1968.

In answer to your specific questions, we support the request in the President's 1969 budget of \$16.2 million new obligational authority for this program. At this time we are unable to determine the precise appropriation needs for fiscal 1970 or beyond, but in order to facilitate planning and administration of the program we believe that the Act should be extended as recommended.

Sincerely yours,

WILFRED H. ROMMEL,  
*Assistant Director for Legislative Reference.*

DEPARTMENT OF COMMERCE,  
Washington, D.C., April 29, 1968.

HON. HARLEY O. STAGGERS,  
*Chairman, Committee on Interstate and Foreign Commerce,  
House of Representatives, Washington, D.C.*

DEAR MR. CHAIRMAN: This is in further reply to your request for the views of this Department concerning H.R. 16024, a bill to extend for one year the Act of September 30, 1965, relating to high-speed ground transportation.

The Act of September 30, 1965 (Public Law 89-220; 49 USC 1631) authorized the Secretary of Commerce to undertake research and development in high-speed ground transportation.

Subsections (a) and (b) of H.R. 16024 would amend the Act to reflect the transfer of responsibility for programs under the Act from the Secretary of Commerce to the Secretary of Transportation pursuant to Public Law 89-670, the "Department of Transportation Act." These amendments are desirable and we recommend their enactment.

H.R. 16024 also amends the Act in a number of other respects, including an extension of the termination date of the Act for one year, from June 30, 1969, to June 30, 1970. We would defer to the views of the Department of Transportation concerning such other amendments.

We have been advised by the Bureau of the Budget that there would be no objection to the submission of our report to the Congress from the standpoint of the Administration's program.

Sincerely,

PEDRO R. VAZQUEZ  
(For General Counsel).

Mr. FRIEDEL. That act authorized the Secretary of Commerce, now the Secretary of Transportation, to undertake research and development in high-speed ground transportation and authorized total appropriations of \$90 million for the 3 fiscal years ending in 1968. Unless that act is extended, further authorizations cannot be made although the Secretary has authority to obligate the funds which have been appropriated and not obligated through fiscal year 1969.

The authority to engage in research and development in high-speed ground transportation was recommended by this committee and authorized by the Congress 3 years ago as the result of the request of the President and of the Department of Commerce for legislation to explore the feasibility of an improved ground transportation system for heavily traveled corridors such as that here in the northeast between Washington and New York.

I think it appropriate here to quote from this committee's report accompanying the House bill as to what we had in mind in enacting the legislation:

It is unnecessary to set forth here at length the evidence respecting the overburdening of these facilities. Every Member of the House personally has experienced the inadequacies of our crowded air terminals and facilities, has observed the overcapacity loading of our highways, and is well aware of the demand constantly being made for the enlargement of both types of facilities. But what every Member has experienced and what he has observed is as nothing compared with what lies ahead.

The time has come to see whether passenger traffic on the ground can be made attractive to people; to see whether it is possible to provide facilities that are convenient and economical and which people will use; to see whether this kind of transportation might relieve air congestion and save on the cost of additional air facilities.

I think it unnecessary for me further to document the fact that the authorization made by the Congress for the expenditure of \$90 million, much of which was for research in high-speed ground transportation and the operation of certain demonstration projects, was predicated on the desire to relieve aviation and highway facilities from overcrowding, and attempt to meet transportation demands by increased use of rail facilities, especially in the northeast corridor.

Accordingly, this morning in considering an extension of this authority we are desirous of hearing from the Department of Transportation just what it has done under this legislation (1) to relieve aviation and highway facilities from overcrowding; (2) what it intends to do in further research and development if the act is extended; and (3) just how it is that at a time that the Congress authorizes the expenditures of these funds for the relief of aviation and highway facilities, the Department of Transportation continues to enlarge its aviation facilities particularly those for attracting northeast corridor passengers which would seem to be directly in opposition to the purpose of this legislation.

We welcome the witnesses here this morning and hope that we can understand just what is the policy of the Department of Transporta-

tion for it seems as though its left hand does not know what its right hand is doing. On the one hand it proposes to put passengers on the rails between here and New York; on the other, it appears to propose a vast enlargement of Washington National Airport to take these same passengers off the rails and put them in the air.

In connection with the hearings also I am hopeful that it will be developed the reasons for the delay in the Washington-New York demonstration project which we had thought was to be inaugurated last year, and some of the results which we thought would be available to the committee in its consideration of any further authorization to be made under this act.

Now, we have the pleasure of having as our first witness, the Secretary, Mr. Alan S. Boyd, and I understand he has to leave here within an hour because he has to attend a Cabinet meeting so we could like to hear your statement, Mr. Boyd.

**STATEMENT OF HON. ALAN S. BOYD, SECRETARY, DEPARTMENT OF TRANSPORTATION; ACCOMPANIED BY A. SCHEFFER LANG, ADMINISTRATOR, FEDERAL RAILROAD ADMINISTRATION; AND ROBERT A. NELSON, DIRECTOR, OFFICE OF HIGH-SPEED GROUND TRANSPORTATION**

Secretary BOYD. Thank you, Mr. Chairman, and members of the committee.

I am accompanied this morning by Mr. A. Scheffer Lang, Federal Railroad Administrator, and Dr. Robert Nelson, Director of the Office of High-Speed Ground Transportation.

I appreciate the opportunity to appear before you on the extension of the High-Speed Ground Transportation Act proposed by H.R. 16024.

The bill would extend the act for 1 year and establish June 30, 1970, as the expiration date of the act. Other procedural amendments would take account of the establishment of the Department of Transportation and the transfer to it of elements previously in the Department of Commerce.

A more substantive change is the amendment to section 7 which would clarify the authority to acquire necessary real property by purchase, lease, or grant and to construct, make repairs, or furnish necessary support facilities. This clarification is necessary in order for the Department to acquire a test site for the development of advanced ground transportation systems. The amendment would not change in any way the prohibition now in the act against the Secretary's acquisition of any interest in any line of railroad.

The bill which the administration proposed provided for a 2-year extension of the High-Speed Ground Transportation Act. We believe the 2-year extension is essential to orderly planning and execution of the program. We are aware of this committee's policy that no authorization legislation be introduced without an accompanying dollar authorization level. We have not yet fully analyzed what that request would be as submitted by the President. But we would estimate that the maximum figure would be \$36.5 million and that would be an appropriate figure if one was required to fulfill the committee's policy.

The High-Speed Ground Transportation Act was passed in 1965 with a sense of urgency that the demand for transportation in the urbanized intercity corridors which have grown up about the Nation will far exceed our present capability to handle it. The purpose of the act was to try, through research, development and demonstrations, to stimulate alternative modes of transportation which could better handle high volumes of movements in densely populated regions.

Today there is an even greater sense of urgency than there was in 1965. Travel volumes have increased at a greater rate than predicted and the period of time before we will completely run out of transportation capacity in the Northeast Corridor has been shortened. The growth in air transportation has been most dramatic. Between 1962 and 1966, intercity air passenger miles in the United States nearly doubled. Intercity passenger miles by all modes increased by more than 17 percent.

In the Northeast Corridor the problem of congestion is now critical at several major airports. According to Federal Aviation Administration estimates, delay time at J. F. Kennedy, Newark, La Guardia, Washington National, Boston, and Philadelphia Airports in 1965 amounted to 49,000 hours. Estimates indicate that at three airports—Kennedy, La Guardia, and Newark—there will be an increase in delay time from 33,000 hours annually in 1966 to 133,000 hours in 1970 and the delays will become very much larger by 1975 if nothing is done to expand capacity.

Estimates by the Bureau of Public Roads indicate that highway travel on intercity routes in the Northeast Corridor will almost double between 1965 and 1985 and that approximately \$2½ billion will be needed just on the intercity portion of the Corridor highway system. The total cost to Federal, State and local authorities of all street and highway construction in the Northeast Corridor for the same 20-year period is estimated at more than \$33 billion. These new facilities will have to be accommodated into what is already the most heavily developed region in the country—14 percent of the Nation's total road mileage is concentrated on less than 2 percent of the land area.

As income levels go up, we can anticipate that transportation demand will continue to expand at a very rapid rate. There is no doubt that most of the cost of meeting this demand can be, and should be, imposed on the users of these services. In today's economically and technologically complex world, however, the direction which the development of new systems and the improvement of the old should take is not clear. Research and development, testing and demonstrations should be carried on in several directions until we begin to see clearly the more useful and productive path.

It is unrealistic to expect completely private sponsorship during this experimentation phase. The costs are too high and the risks are too great. Government must provide the seedbed and must stimulate and encourage involvement by private firms. This is essentially what this program has tried to do and, I believe, has done with a high degree of success. We estimate that over the 3-year period, Federal appropriations of \$52 million have been met by \$75 to \$100 million of expenditures and commitments by private firms.

The Office of High Speed Ground Transportation of the Federal Railroad Administration has direct responsibility for the Northeast Corridor transportation project under my general authority to carry out research and development in intercity transportation, and has responsibility for the research and development and demonstrations in high speed ground transportation under the Act of 1965. In carrying out its responsibilities, the Office of High Speed Ground Transportation has retained essentially a task force orientation to the problems of transportation in urbanized regions. Close integration and coordination has, therefore, been maintained between the Northeast Corridor transportation project and the research and development and demonstration activities pertaining to high-speed ground transportation systems.

The High-Speed Ground Transportation Act of 1965 authorized appropriations of \$20 million for fiscal year 1966, \$35 million for fiscal year 1967, and \$35 million for fiscal 1968 for research, development and demonstrations in high-speed ground transportation and for the national transportation statistics program. Of the authorized \$90 million, \$52 million have been appropriated.

I should like to describe briefly what we have accomplished since the High Speed Ground Transportation Act was passed. The major categories of activity have been research and development, and demonstrations.

Section 1 of the High Speed Ground Transportation Act authorizes the Secretary of Transportation "to contract for demonstrations to determine the contributions that high speed ground transportation could make to more efficient and economical intercity transportation systems." The purpose of demonstrations carried out under the act, is "to measure and evaluate, such factors as the public response to new equipment, higher speeds, variations in fares, improved comfort and convenience, and more frequent service." In connection with contracts for demonstrations under the section, the Secretary shall "provide for financial participation by private industry to the maximum extent practicable."

Within this pattern of objectives, two rail passenger service demonstrations were set up for the Northeast Corridor. One was to operate between New York and Washington and the other between New York and Boston. A third demonstration of auto-on-train service between Washington, D.C., and Jacksonville, Fla., was planned and partly funded. The three demonstrations would help to determine the role that rail passenger service, based on generally contemporary technology, can play in transportation in the future. In both the New York-Washington and New York-Boston demonstrations substantial improvements in rail passenger service were to be made. Terminal to terminal time were to be reduced, new equipment was to be acquired, and roadbeds and stations were to be upgraded.

In carrying out the Washington-New York demonstration, the Department entered into a contract with the Pennsylvania Railroad—now Penn-Central. Under the contract the railroad was to acquire a fleet of not less than 28 and not more than 50 new MU, multiple-unit, cars capable of sustained speeds of up to 150 miles per hour. The railroad was to upgrade its roadbed to very high standards specifically

set out in the contract; to build high level platforms at Wilmington, Baltimore, and Washington, D.C.; to retrain personnel to be utilized in the new service and to operate the new trains on schedules of not more than 3 hours between Washington and New York. The consideration to be paid to the Penn-Central Railroad for the performance of the contract was \$9.6 million. The Penn-Central Railroad was to bear all costs which, excluding the Government's contribution, were estimated at the time of the signing of the contract to be between \$20 and \$25 million. The contract also provided that the Department of Transportation would be able to collect data on passenger movement on board trains between New York and Washington prior to and during the demonstration.

The conduct of the demonstration between New York and Boston posed a different situation. There the New Haven Railroad has been in bankruptcy for 7 years. The Department of Transportation had to take full responsibility for the conduct of the demonstration. Early in 1966 the Department contracted with United Aircraft for the lease of two trainsets for a 2-year period at a cost of \$1.7 million. The Department agreed to pay maintenance costs for the 2-year period which would amount to \$2.8 million. We estimate that the operating and other costs of the New York-Boston demonstration will be about \$9.5 million. Some of this expenditure may be returned through revenue sharing arrangements with the New Haven Railroad.

From the New York-Boston demonstration we expect to make a determination of the prospective usefulness of equipment which can operate at a substantially higher speed than conventional equipment over curved roadbed. If this equipment is successful and is attractive to the public it may be tried out in short and intermediate rail passenger hauls through many areas of the country. It offers the prospect of substantially upgrading service at minimum cost.

Both the Washington-New York and New York-Boston demonstrations have been delayed beyond starting times we originally hoped for. Very clearly we were unduly optimistic about the time that would be required for the design, building and testing of new equipment. In both cases the equipment is a substantial advance in the state of the art. United Aircraft TurboTrains are relying on turbine power for propulsion and have adopted an advanced suspension system. The cars for the Washington-New York demonstration, built by the Budd Co., are electronically the most complicated ever built. They will have a sustained speed capability of 150 miles per hour and will have automatic controls of speed, braking, and wheel slide. If the speed requirement of 150 miles per hour had not been imposed, it is probable that the cars could have been built much more quickly. This would have precluded the possibility in the future, however, of advanced improved performance with better roadbed.

The target dates for the start of the demonstration were set to convey a sense of urgency in the program. When it was apparent that the project would not meet these target dates, I called a meeting of the major industry participants in the demonstration program. At that meeting I suggested that all of us form a task force to identify and establish the priority of the unresolved technical problems. The task force identified these as follows:

- (1) Electronic maintainability;
- (2) Wheel thermal stress under specified deceleration when using air brakes alone;
- (3) Pantograph-catenary current collection stability at high speed during winter months, particularly under the remaining light wire; and that light is opposed to heavy wire; and
- (4) Acceptability of ride quality.

The task force found that many of the individual problems which delayed the demonstration had been identified by the contractors and that substantial resources were now being devoted to their resolution. The task force also found that all concerned with the project—Government, railroad, car builder, and equipment operator—were overly optimistic with respect to the planning and scheduling, given the magnitude and complexity of the project. The task force concluded that a reliable demonstration could be initiated within 7 months given prompt action in the major problem areas.

The implementation of the task force report is now being planned by all concerned.

It should be perfectly clear that the hold up in the delivery of equipment for these demonstrations has been completely without funding cost to the Government.

In completing this discussion of the demonstrations, I should like to commend the Penn-Central Railroad and the rail supply firms involved in the construction of equipment for the demonstrations. The rail industry and the rail equipment industry have clearly not enjoyed financial proseprity since the end of World War II. Yet the firms involved here have been willing to commit sizable resources to research and development and to the improvement of their engineering and production capability. This has been done, moreover, with the prospect of only a relatively small Federal financial participation.

The research and development in high-speed ground transportation has proceeded more slowly than anticipated at the time of the passage of the High-Speed Ground Transportation Act. Almost all of the reduction in appropriations has been taken by this activity. Nevertheless, in addition to specific advances in technology in several areas, the program has marked out the general directions for research and development in high-speed ground transportation for the future. Work has been done in systems engineering, research and development in high-speed rail operation, research and development in new high-speed ground systems, and research and development in tunneling, power pickup, and guideway surveillance. Among the accomplishments of the program are the construction of four rail research cars which have been operated under test conditions at speeds of 150 miles per hour on upgraded roadbed; the design and current construction of a 2,500-horsepower linear electric motor; the development of designs for tracked air cushion vehicles; and breakthroughs in tunneling technology. These accomplishments will lead to the building of test vehicles, guideways, and propulsion systems and ultimately to commercial demonstrations.

The work in the high-speed ground transportation program has been done with a total authorized staff for the first 2 years of 27. This was increased for fiscal year 1968 to 34.

I should like to request that a detailed "Statement in Explanation of Request for High-Speed Ground Transportation Legislation Extension" prepared by the Office of High-Speed Ground Transportation be entered into the record. This statement is intended to provide detailed information in review of the program and in explanation of work which remains to be done. It outlines the major areas in which the new authorizations which we have requested will be obligated.

I strongly urge upon this committee the passage of H.R. 16024, with the amendments proposed.

Thank you, Mr. Chairman.

(The document referred to follows:)

STATEMENT IN EXPLANATION OF REQUEST FOR HIGH-SPEED GROUND TRANSPORTATION LEGISLATIVE EXTENSION, PRESENTED BY THE DEPARTMENT OF TRANSPORTATION, OFFICE OF HIGH-SPEED GROUND TRANSPORTATION

INTRODUCTION

The High-Speed Ground Transportation Act of 1965 authorized research, development, and demonstrations in high speed ground transportation and authorized appropriations for these purposes for the fiscal years 1966, 1967 and 1968. Although, at the time the Act was being considered, the House Committee on Interstate and Foreign Commerce and the Senate Commerce Committee recognized the desirability of a continuing program, they recommended that it be reviewed in three years.

If the high-speed ground transportation program is to be continued and funded with 1969 appropriations, the High-Speed Ground Transportation Act of 1965 must be extended, and authorization for appropriations must be granted for fiscal year 1969 and such succeeding years as the Congress deems appropriate. The Secretary of Transportation has requested that Congress extend the expiration date of the Act (PL 89-220) to June 30, 1971, and authorize appropriations for fiscal years 1969 and 1970. The only significant change in the proposed legislation from the existing Act is in clarification of the authority for site acquisition for development testing of proposed new high-speed ground transportation systems and components.

The national transportation information program provided for in Section 4 of PL 89-220 will not terminate on June 30, 1969, along with the rest of the Act. The intent of the 1965 legislation was to consolidate the existing powers of the Secretary of Commerce to collect data for transportation planning, but not in any way to limit his existing authority. The Secretary of Transportation has separated administratively the transportation information and high speed ground transportation programs and has included appropriations requests for the information program with those of his office. This request for extension, therefore, is concerned only with the provisions of the High Speed Ground Transportation Act referring to research and development, and demonstrations.

This statement will—

1. Discuss the need for continued focus on the intercity transportation problems of urbanized regions;
2. Review the background and administration of the high speed ground transportation program and summarize its major accomplishments;
3. Discuss the status of the program; and
4. Outline the proposed continuing program activity.

THE TRANSPORTATION CRISIS IN URBANIZED REGIONS

The work of the Office of High Speed Ground Transportation is being carried on with a sense of urgency which arises from the realization that the demand for transportation in urbanized regions of the United States will more than double in the next twenty years. The economic cost of adding to existing capacity to meet these increased demands will be great; however, the economic and social costs of failing to meet them would be greater still.

Transportation is a moving force in a technologically oriented society. It enhances personal mobility, brings people closer to work and recreation, and provides business and industry with broader markets, fostering specialization of effort, decreasing average cost, and other economies of scale.

If the nation's transportation system is to continue to benefit society, it must grow to handle the flood of people and products which will need to be served over the next 20 to 30 years. Over this period of time, the population of the United States will increase by an estimated 50 to 75 per cent and the production of goods and services will expand even faster. The demand for transportation will increase most rapidly of all in response to rising incomes and greater use of transportation in the productive and distributive processes.

Much of this anticipated growth will take place in our cities and metropolitan areas. Currently about two thirds of the population resides in urban places. By 1985, this proportion will rise to 80 per cent; with much of this increase being concentrated in a few regions. Transportation growth will be greatest within the metropolitan areas themselves and in the urbanized corridor regions between cities.

The extent to which intercity passenger travel on each mode has changed since 1950 is shown in the following table:

INTERCITY PASSENGER TRAVEL IN THE UNITED STATES

[In billions of passenger-miles]

Year	Airline	Rail	Bus	Auto	Total
1950.....	8.0	26.8	22.3	402.8	458.8
1951.....	10.5	29.7	22.3	457.8	502.3
1961.....	31.1	16.2	19.7	714.0	780.9
1962.....	33.6	15.9	21.3	736.0	806.8
1963.....	38.5	14.4	21.9	766.0	840.8
1964.....	44.1	14.0	22.7	802.0	882.9
1965.....	51.9	13.3	23.3	838.0	926.4
1966.....	60.6	12.9	24.8	880.0	978.3

Over the fifteen year period covered by these data, total intercity travel more than doubled. Air travel increased eight-fold, or at a rate approximately four times that of the average for all modes combined.

These airline passenger data also show a generally increasing growth rate changes for the years since 1961. For example, the percentage increase in air travel between 1961 and 1962 was 8 percent, for 1962 through 1964 it was 15 percent annually, and 17 percent for each year between 1964 through 1966.

On the basis of these trends, it is evident that intercity travel will again more than double over the next twenty years and that air travel will increase more rapidly still. This growth, were it to be distributed uniformly over the nation, would pose a serious challenge to government and the transportation industry; focused, as it will be, on a relatively few urban complexes, this projected demand assumes crisis proportions.

Taking each of the modes separately and projecting the requirements using the Northeast Corridor as a base, the following statements indicate the magnitude of the problems which will have to be faced over the next 20 to 30 years.

A fourfold projected increase in air traffic will be superimposed on the air space which is already virtually saturated. In 1965, for example, delay times using the operators' own measures for 23 large United States hub air terminals totalled 115,000 hours. This figure represents 34.2 per cent of total delays for the 292 airports in the United States receiving scheduled flights. Total air carrier delay costs for these same 23 airports due to extra crew and fuel requirements amounted to \$31.7 million, or 68.4 percent of the total operator delay costs for the same 292 airports. The situation is even more critical in the six major Northeast Corridor airports: J. F. Kennedy, Newark, La Guardia, Washington National, Boston and Philadelphia. According to Federal Aviation Administration estimates, delay time and increased costs for air carriers in 1965 for those six airports were 49,000 hours and \$13.1 million. The estimates indicate that three airports, Kennedy, La Guardia and Newark, will have a rise in delay times from 33,000 hours annually in 1966 to 133,333 hours in 1970 and the delays will become very much larger by 1975, if nothing is done to increase capacity. These cost and time figures do not, of course, take into account the personal losses in inconvenience and delay to millions of air passengers on taxiways waiting for runway clearance or circling airports awaiting landing instructions.

Solutions which have been proposed include the construction of larger jet aircraft and the separation of common carrier airports from general aviation airports. Both of these solutions will create severe problems of land use in

heavily populated areas, noise pollution, air pollution, and access to and from new airports. The current minimum standards for an average jet port require 10,000 acres of land which must often be taken from other productive uses. In addition, airport construction is a relatively expensive activity. For example, estimates of federal and local expenditure for 1967 amounted to \$515 million on new airport facilities, with an additional \$120 million being provided from airline funds for improving existing facilities.

From the table above it can be seen that in spite of the exploding rates of growth from 1950 to 1966, air transportation comprised only 6 per cent of the intercity passenger travel in the United States during 1966. Forecasts of the requirements to 1975 indicate a need to double airport facilities, involving a planned expenditure of \$6 billion for airports in the next 8 years. Of these planned expenditures at least one half of the funds will have to be found before 1970. If the 1975 demand for air support facilities is to be satisfied, the Air Transport Association estimates that the airlines will have to invest an additional \$18 billion for ground and flight equipment.

Estimates by the Bureau of Public Roads indicate that highway travel on intercity routes in the Northeast Corridor will almost double between 1965 and 1985 and that approximately \$2.5 billion will be needed just on the intercity portion of the corridor highway system. The total cost by Federal, State, and Local Authorities of all street and highway construction in the Northeast Corridor for the same 20-year period is estimated at more than \$33 billion.

These new facilities will have to be accommodated into what is already the most heavily developed region in the country—fourteen percent of the Nation's total road mileage is concentrated on less than 2 percent of the land area. The freeway network alone in the Corridor now occupies an area equivalent to one-quarter of the State of Rhode Island; the entire road and street network covers an area equal to all of Connecticut, Rhode Island, and the District of Columbia.

The significance of such demands for space should be considered within the context of land values in the Northeast Corridor, which have a mid-range of approximately \$4000 per acre in rural areas of one person per acre to \$½ million for urban land at a density of 100 persons per acre.

More efficient use of the highway system would result from greater use of bus transportation as a substitute for travel by private auto. However, there is little evidence in the figures presented above that such a shift is likely. Intercity passenger-miles by bus have risen only slightly over the past 25 years. Although increases in population improved vehicles, and further development of limited access highways will probably result in a continued growth in bus volumes, the degree of relief to highway congestion which this would represent would be slight.

The one existing intercity transportation mode with excess passenger capacity and which is relatively economical in its land use is the railroad. Passengers can be transported at significantly higher rates than at present, with considerable expansion of capability possible at an investment cost which is relatively minor compared with the other transportation modes discussed above. Railroads have a huge sunk cost in the Northeast Corridor; there are 25,100 miles of track or 12 percent of the national total in the States encompassed by the Corridor. Recent estimates indicate that a \$500 million improvement could greatly improve comfort and time on the 229 mile right-of-way between New York and Washington to permit 2-hour schedules on trains. Even less, possibly half this amount, need be spent if the schedule requirement is raised to 2½ hours. Such improvements would permit at a maximum a tripling of passengers serviced over the number of passengers who used this transportation mode in 1963.

Given the continuing concentration of population and economic activity in and around urban areas, it is evident that the capacity of transportation networks in the Northeast Corridor and in similar corridors in other parts of the Nation will have to be substantially expanded over the next ten to twenty years. Many of our present problems of congestion, inefficiency, and deteriorating service arise out of the mis-match between a massive and relatively fixed system of facilities and a rapidly growing demand for a wide variety of transportation services. Without concerted action to redress this imbalance, there is a danger that congestion and delay will increase in many areas while excess capacity will continue to exist elsewhere.

More efficient use will have to be made of existing facilities; and new systems, less demanding of space than those presently in use, will have to be introduced to accommodate dense corridor flows. High speed ground transportation, which

in the near term can take advantage of the availability of existing track and right-of-way, offers the prospect of efficiently transporting large volumes of people at high speeds in safety and comfort. The potential of this technology is, as yet, relatively untapped; the pay-off from a vigorous program of research, development, and demonstrations could, therefore, be correspondingly great.

The reports of the Office of High Speed Ground Transportation, which will be based on systematic research, will focus on the most effective and efficient use of resources to maintain mobility in the Northeast and in other densely populated regions of the United States.

BACKGROUND, ADMINISTRATION, AND SUMMARY OF ACCOMPLISHMENTS OF THE  
HIGH-SPEED GROUND TRANSPORTATION ACT OF 1965

*Background*

In June 1962, Senator Claiborne Pell of Rhode Island introduced into the Congress a resolution (S.J. Res. 194, 87th Congress, 2d Session) which would have authorized the District of Columbia and eight Northeastern States to "... enter into a compact to establish a multi-state authority to construct and operate a rail passenger transportation system within the area ..." In the following October, Senator Pell requested that the Administration provide assistance in analyzing the transportation problem which had prompted his resolution. The President responded by directing that an interagency task force be assembled "... to survey available information, to identify issues and to estimate the time, expense and staff required to prepare such proposals as may be appropriate." The interagency task force reported to the President on December 10, 1962, recommending that a "... comprehensive analysis of transportation problems in the Northeastern Megalopolis ..." be carried on by the U.S. Department of Commerce.

Work began on the Washington-Boston study in June 1963 with funds which had been previously appropriated by Congress for transportation research in the Commerce Department. In September 1964 the study was given formal project status as the Northeast Corridor Transportation Project, first, in the Office of the Secretary of Commerce and, in April 1965, in the Office of the Under Secretary of Commerce for Transportation.

It soon became apparent that, in order adequately to evaluate alternative ways in which the transportation needs of the Northeast Corridor could be met, much more and better information was needed, including technological and cost data for both current high speed ground systems and possible new systems. The President, therefore, asked the 89th Congress for legislation which resulted in the High Speed Ground Transportation Act of 1965. This Act authorized the Secretary of Commerce to undertake research and development in high speed ground transportation, to contract for demonstrations in high speed ground transportation and to collect and collate transportation data, statistics, and other information.

Although the demonstration projects described in the legislative background were to be in the Northeast Corridor, the single area of greatest regional population density and transportation congestion, the High Speed Ground Transportation program was to be national in scope. The information gained in the Corridor would have general application in other highly urbanized regions. Planners, builders and operators of urban and interurban transportation systems throughout the United States would have available to them the new technology coming out of high speed ground transportation research and development, as well as the data obtained in testing public acceptance of improved rail service. The systems engineering, costing, and system simulation and evaluation techniques to be developed for analyzing alternative transportation systems for the Northeast Corridor would also be available for application in other regions of the nation.

### Administration

The Office of High Speed Ground Transportation was established in October 1965 in the Department of Commerce to administer the High Speed Ground Transportation Act. The Northeast Corridor Transportation Project, a task force organization formerly in the Office of the Under Secretary of Commerce for Transportation, was made an element of the Office of High Speed Ground Transportation along with research and development and demonstrations. On April 1, 1967 the office became a component of the Federal Railroad Administration in the new Department of Transportation. It has responsibility for the Northeast Corridor Transportation Project under the general authority of the Secretary of Transportation to carry out research and planning in intercity transportation, and has responsibility for the research, development, and demonstrations in high speed ground transportation under the Act of 1965. In carrying out its responsibilities, the Office of High Speed Ground Transportation has retained essentially a task-force orientation to the problems of transportation in urbanized regions. Close integration and coordination has, therefore, been maintained between the Northeast Corridor Transportation Project and the research, development, and demonstration activities pertaining to high speed ground transportation systems.

The activities of the office are carried out through three divisions: Transport Systems Planning, which conducts the Northeast Corridor Transportation project; Engineering Research and Development, which is responsible for the engineering work of the office and for research and development under the Act; and Demonstrations, which administers the demonstrations. All three divisions report to the Director of the Office of High Speed Ground Transportation, whose own staff includes administrative and clerical personnel, as well as an Intergovernmental Relations unit to handle liaison and specialized research projects associated with the Northeast Corridor project.

The 30-man professional staff of the Office, which includes engineers, economists, operations research specialists, data specialists, planners, political scientists, and a lawyer, is exceptionally well trained in many academic disciplines relating to transportation. Six hold doctorates and fourteen more hold master's degrees. (See Appendix A.)

### Funding

The High Speed Ground Transportation Act of 1965 authorized appropriations of \$20,000,000 for FY 66, \$35,000,000 for FY 67, and \$35,000,000 for FY 68 for research, development, and demonstrations in high speed ground transportation, and for the national transportation statistics program. Of the authorized \$90,000,000, \$52,000,000 has been appropriated, of which \$2,028,000 was allocated to the statistics program in the Office of the Secretary.

The amounts appropriated have been expended or allocated as follows:

Systems engineering.....	\$6,200,000
High-speed railroad R. & D.....	6,755,000
Unconventional systems R. & D.....	3,075,000
Advanced technology and test facility.....	6,745,000
Washington-New York demonstration.....	11,749,000
Boston-New York demonstration.....	8,426,000
Auto-train demonstration.....	3,887,000
Data collection.....	1,521,000
Administration.....	1,614,000
<b>Total.....</b>	<b>49,972,000</b>
Data program.....	2,028,000
<b>Total appropriations.....</b>	<b>52,000,000</b>

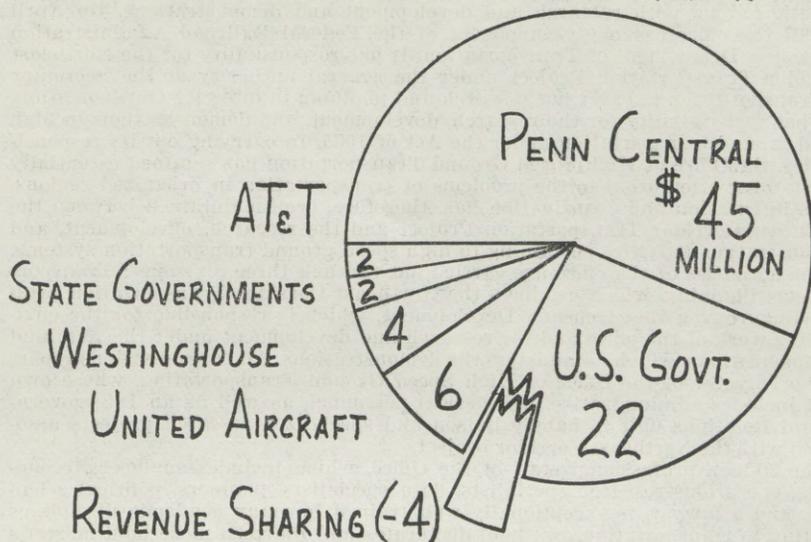
The Office has obligated or committed most of these funds. The chart of program activity in Appendix B provides a detailed accounting for funds appropriated.

## DEMONSTRATIONS

FINAL EXPENDITURES

BOSTON - N.Y. - WASH.

\$ 81 MILLION

*Compliance with statutory requirements*

The record of committee hearings in 1965 made it clear that the Congress did not intend the High Speed Ground Transportation Act to provide for continued support for rail passenger service, and that maximum private participation should be obtained. The following chart breaks out estimated total private and public funding.

The High Speed Ground Transportation legislation specified that activities under the Act not be confined to any particular mode of transportation.

The Congress required in the Act that contractual expenditures of HSGT funds should be given wide geographical distribution. Contracts under the program to date have been awarded to firms domiciled in the District of Columbia and 17 States—California, Colorado, Connecticut, Florida, Illinois, Kentucky, Maryland, Massachusetts, Michigan, Missouri, New Jersey, New Mexico, New York, Ohio, Pennsylvania, Rhode Island, and Virginia. The auto-train demonstration project was proposed for Washington, D.C.-Jacksonville, Florida. A complete breakdown of contract information is contained in Appendix B.

To assure protection of the Government's interest in any patents that might be developed under any OHSMT financed research, contracts are written in accordance with the Presidential "Statement of Government Patent Policy", issued on October 10, 1963.

The Act required the appointment by the Secretary of an advisory committee to advise him with respect to policy matters arising in the administration of the Act. The full membership of the Advisory Committee appointed by the Secretary is:

Mr. Robert M. Jenney, President,  
Jenney Manufacturing Company,  
Chestnut Hill, Massachusetts

Mr. Donald W. Douglas, Jr., President,  
Douglas Aircraft Company, Inc.,  
Long Beach, California

Mr. William B. Johnson, President,  
Illinois Central Industries,  
Chicago, Illinois

Professor Raymond R. Tucker,  
Washington University,  
St. Louis, Missouri

Mr. George E. Leighty, Chairman,  
Railway Labor Executives Association,  
Washington, D.C.

Mr. Charles A. Webb, President,  
National Association of Motor Bus  
Operators,  
Washington, D.C.

Mr. Milton A. Gilbert,  
Chairman of the Board,  
Gilbert Systems, Inc.,  
New York, New York

The Advisory Committee first met in formal session on June 21, 1966, and has met on six subsequent occasions with the Secretary (or his designate) and the Director and functional staff of the Office of High Speed Ground Transportation. The Committee has been organized and has functioned in accordance with Executive Order 11007 of February 26, 1962, and supplementing orders of the Department of Transportation. In addition to formal meetings, the Committee has also contributed advice on the program through exchanges of correspondence between the Director and the members. Professor Tucker was designated Committee Chairman.

In its demonstration contracts, OHSGT has been careful to comply with the employee protective arrangements in Section 6a of the HSGT Act. The Secretary of Transportation has appointed the President of the Railway Labor Executives Association as a member of the Advisory Committee required by the Act, in order to assure a continuing and open relationship with the railroad employee organizations that may be most directly concerned with changes in service that affect numbers of positions or conditions of employment. Contracts with consultants and research and development firms are also written to assure compliance with all Federal labor standards as required by Section 6b of the Act.

Reports on HSGT activities were submitted to the Congress by the Secretary of Transportation at the end of fiscal years 1966 and 1967 in keeping with the requirements of the Act. (A report reviewing and evaluating existing and proposed programs and projects was also submitted in February 1968 at its request to the Subcommittee on Transportation of the House Appropriations Committee.)

#### *Significant achievements*

In authorizing the original \$90 million for the HSGT program, the Congress recognized the need for public investment in seeking solutions to the problems of ground transportation and encouraging future private transportation investment. Spending at the rate of approximately \$35 million per year for research, development, and demonstrations was determined to be needed for the conduct of the program and to insure the continuing interest and participation of the transportation industry and its equipment suppliers.

The Office of High Speed Ground Transportation has not yet reached all of its three-year objectives. Appropriations for the program have been substantially less than the amounts requested; recruiting of qualified technical personnel has been difficult; hardware projects have been slowed by shortages; and time has been needed for careful design of the program. Nevertheless, significant progress has been made as shown in the following:

#### *Achievements in research and development*

1. The most promising areas for high speed ground transportation research and development have been identified and a comprehensive research and development program has been laid out to exploit the full potential in each area.

2. Pertinent engineering efforts in other public and private technical sectors have been investigated for application to transportation. Technical information has been exchanged with foreign governments and firms.

3. Four fully instrumented rail test cars have been acquired and a 21-mile section of mainline track has been upgraded and instrumented to provide a unique test facility for acquiring comprehensive data on the effects of high speed rail operations. In this operation, all parameters of track geometry and vehicle motion are recorded simultaneously, permitting direct analysis of the many interactions which govern the performance of rail vehicles, tracks, and power collection systems.

4. Research and development in unconventional systems has provided the basic understanding necessary for evaluating the potential of ground operations at speeds about 250 miles per hour.

5. Laboratory testing has shown the potential of radically improved tunneling techniques in reducing the cost of underground tube systems to a level competitive with surface systems.

6. Knowledge transferrable from aircraft and space technology has been substantially enhanced by pioneering research in the aerodynamics of tube and tracked air cushion vehicles.

7. New systems of ground transportation have been developed to the point where large scale testing is now feasible.

8. A linear electric motor has been designed and is under construction. This motor will provide the first test in a vehicle of a completely new electric propulsion system.

#### *Demonstration achievements*

1. Planning and engineering have been completed for high speed rail demonstrations between Washington and Boston. Service will begin when testing of the equipment is finished.

2. Track upgrading has been completed on the Penn Central and is continuing on the New Haven.

3. Station improvements have included construction of raised platforms to expedite the loading and unloading of passengers, some major refurbishing, and an experimental baggage-handling system; two suburban stations are under construction.

4. An on-train public telephone system which will connect Penn Central demonstration train riders with the worldwide telecommunications network has been designed and installed at no cost to the Government.

5. A new food handling system has been put into use by the Penn Central Railroad.

6. Data collection and processing procedures have been refined for gathering, analyzing and disseminating information on passenger response to changes and improvements in rail service. Data is now available on all rail passenger movements between major points in the Northeast Corridor, and also on the characteristics of rail passengers.

#### PROGRAM STATUS-RESEARCH AND DEVELOPMENT

The High Speed Ground Transportation Act authorized the Secretary of Transportation to "... undertake research and development in high speed ground transportation." In carrying out this responsibility, three major objectives of the program has been established.

1. To advance the technology of ground transportation, including railroads as well as more advanced systems.

2. To conduct research and development to make possible the design and demonstration of advanced ground transportation equipment, systems, and services.

3. To develop cost and performance data on existing potential systems for the Northeast Corridor.

The magnitude of this research and development activity has made it essential that it be done within a strong analytical framework that will highlight research opportunities and assure sound allocation of resources. Hence, a large proportion of the research and development effort is going into systems engineering/cost analysis. The other major areas into which the research and development activities fall are High Speed Railroad R&D, Unconventional Transportation Systems R&D, and Advanced Technology R&D.

In the following sections, each of these major activities is highlighted in terms of why research and development should be undertaken, what has been accomplished so far, and what else must be done in the near future. The timing of the work is discussed at the conclusion of this section.

### *Systems engineering*

Systems engineering should be done because:

The rapid advance of technology in recent years provides a base from which to develop transportation systems which would be faster, more efficient, and more comfortable than present ones. The systems engineering undertaken by the Office of High Speed Ground Transportation will provide information essential to determining what systems and what combinations of systems could serve to meet future transportation needs in urbanized regions of the United States.

The systems engineering work was begun in fiscal year 1967 and is continuing in accordance with procedures initially recommended by the Massachusetts Institute of Technology. A major part of the work has been contracted to TRW Systems, Inc. The primary tasks in systems engineering are to analyze key technical features of alternative transportation systems, to prepare performance and cost estimates, and to evaluate subsystem alternatives.

#### *Accomplishments in systems engineering*

1. Studied potential improvement in ride quality at high speed to be gained by varying track structure stiffness.
2. Investigated design requirements in detail of tracked air cushion vehicle system for operation at speeds up to 300 mph.
3. Reduced candidate technological configurations of HSGT systems to meaningful number of alternatives.
4. Developed specification and technology base so that detailed descriptions of physical, performance, and cost characteristics of unit elements for each significant HSGT alternative could be examined.
5. Developed methodologies for comparative system evaluation and for making rapid cost estimates.
6. Determined system requirements for fleet and vehicle control, including vehicle allocation, fixed fleet scheduling, detection of vehicles and foreign objects, hardware systems for fixed and mobile installation, and system evaluation of advanced concept alternatives.
7. Evaluated requirements for electromagnetic suspension and developed a system-oriented research and development program.
8. Determine human factor requirements to insure passenger comfort.
9. Determined aerodynamic characteristics of tube vehicles.
10. Progressed in evaluating critical problem areas in evacuated tube systems.
11. Developed techniques for sizing terminals according to passenger flow rates and system schedules.
12. Collected cost data and developed cost estimating relationships.
13. Completed research for preliminary design study of tracked air cushion vehicle.

#### *Work to be done in systems engineering*

1. Perform Northeast Corridor Transportation project simulation of baseline High Speed Ground Transportation system definitions to be completed in FY 69.
2. Analyze inter-modal transfer of passengers and goods with a view toward improving overall system performance.
3. Assemble cost estimating relationships into total system cost model.
4. Analyze and evaluate ways to improve the transfer of passengers and goods between and within transportation modes.
5. Develop a model to select right-of-way routes which will minimize impact of noise on the adjacent community.
6. Analyze the feasibility of electromagnetic suspension systems.

#### *High-speed railroad R. & D.*

High speed railroad research and development should be done because:

High speed railroad research and development has been undertaken in order that the potential of wheel-supported concepts may be explored fully before major decisions are made on radically new systems. Rail passenger service will benefit from these efforts as will the future development of rail freight transportation, whether or not totally new systems are ever built. The Office of High Speed Ground Transportation, in order to evaluate and advance wheel-rail technology within the broad framework of long-range needs, is probing the underlying phenomena of rolling support and guidance, the theory of track structure behavior, and the application to this area of modern technology from other fields. Very little fundamental data exist on the physical phenomena involved in rolling support and wheel-rail interfaces, especially at high speeds. Such knowledge is

necessary for analysis of current test results and for simulation of future operations.

Active vehicle suspension systems would offer a means of enabling rail cars to negotiate curves at significantly higher speeds than are presently practical. Schedules are seriously restricted by the need to slow down for existing curves. Elimination of curves in existing rights-of-way requires costly land acquisition and relocation. A successful "active" banking system would enable the vehicle body to lean into the curve at high speed. This concept would be useful for new systems as well as for rail.

Research results to date indicate that track structures must be improved for safe, comfortable, high speed rail passenger service. Theoretical studies and operations of the research cars thus far indicate that track structures maintained according to current railroad standards will not provide acceptable rides at very high speeds. There is also an indication, however, that conventional track installed to high standards may deteriorate less rapidly than widely supposed by the rail industry. An improved balance between installation cost and maintenance cost may therefore be found to exist. If more stable structural designs can successfully be developed, maintenance cost would be lowered, possibly resulting in a basic reduction in rail service cost. The fruits of these efforts will also be applicable to future HSGT facilities.

Drive system investigations fall in two areas: power collection and on-board power conditioning and control. Intermediate speed systems for rail are included here; radical departures for very high speed work are being investigated in Advanced Technology.

*Accomplishments in high-speed railroad R. & D.*

1. Acquired four 150 mph rail research cars and establishment of specially upgraded and instrumented 21-mile high speed test track.
2. Developed instrumentation for four research cars, test track, and overhead catenary and initiated a comprehensive test program.
3. Evaluated track upgrading on Penn Central demonstration project.
4. Programmed track upgrading on New Haven Railroad demonstration project.
5. Supported testing of telephone service between New York and Washington for demonstration project.
6. Established feasibility of auto-train service and determined ride quality through actual test of automobiles in railcar.
7. Developed auto-train concept and supervised detail design.
8. Collaborated in developing pantograph modifications for Metroliner trains.
9. Developed computer simulations of railroad car, roadbed, and overhead catenary.
10. Initiated study to determine requirements of laboratory equipment for study of interaction and upper speed limits of steel-wheeled vehicles on steel rails.
11. Evaluated alternative means of noncontacting electric energy transfer.
12. Initiated design of servo-pantograph for high speed trains.
13. Determined aerodynamics of large freight cars and studied improvements thereto.
14. Initiated industry-Government study of automatic freight car couplers, trainlined control systems, and their resulting operational economics and flexibilities.
15. Designed surveillance equipment for high-speed rail vehicles.
16. Analyzed and developed new track structure designs.
17. Analyzed active suspensions and made initial design of prototype for rail applications.
18. Initiated study of adhesion improvement through rail cleaning by plasma torch.
19. Supervised technical progress of Metroliner and TurboTrain development programs.
20. Made initial design of 250 mph truck for the linear electric motor project.
21. Derived extension of theory of rolling contact.
22. Evaluated turbine drive concepts.

*Work to be done in high-speed railroad R. & D.*

1. Utilize Office of High Speed Ground Transportation rail research vehicles and previously developed computer simulation to study phenomena of: (a) truck stability and adhesion, (b) ride quality as a function of speed and guideway quality, and (c) pantograph-catenary interaction.

2. Continue monitoring alignment of track and quality of ride on Penn Central and New Haven demonstration projects.
3. Build, instrument, test, and analyze performance of short test sections of experimental track structures previously developed.
4. Determine deterioration of experimental track structures versus time with research cars.
5. Establish performance capabilities of industry-loaned evolutionary railroad equipment at higher speeds.
6. Design and construct research laboratory for simulating rolling dynamics at speeds up to 300 mph, with industry support, if possible.
7. Build and test prototype active suspension system.
8. Determine capabilities of developmental servo-pantograph at high speeds using rail research cars.
9. Study catenary structures to determine most cost-effective design for new electrifications.
10. Cooperate with industry in rail electrification feasibility studies and development of advanced drive systems.
11. Collaborate with industry on improved maintenance and inspection procedures, using demonstrations as case studies.

#### *Unconventional transportation systems R. & D.*

Unconventional transportation systems research and development is being done because :

A need exists to determine the relative advantages of improved existing systems and unconventional systems in meeting future transportation needs. Much of this work is therefore directed toward defining promising new transportation system alternatives.

The Office of High Speed Ground Transportation has concentrated research in unconventional systems during the past few years on high speed tracked (or guided) air cushion vehicle systems and tube (or enclosed guideway) vehicle systems. Both offer promise for operation well above 250 miles per hour. The tracked air cushion vehicle (TACV) systems can be brought into operation earlier. Initiation of research on other novel systems will depend on the results of the systems engineering studies.

A very major reason for research on tube vehicle systems is the possibility of attaining high speeds with relatively low power consumption. In addition, tubes can provide all-weather operation, increased safety, reduced use of surface right-of-way, and higher acceleration.

No base of experience exists for high speed vehicles operating in tubes. Thus, research and development is needed before the potential of the tube vehicle systems can be estimated.

#### *Accomplishments in unconventional transportation systems R. & D.*

##### *Tracked air cushion vehicles*

1. Completed trade-off analyses and developed alternate feasible configurations for operational TACV systems.
2. Identified critical aerodynamic problem areas for wind tunnel investigation.
3. Completed wind tunnel tests of TACV body configurations; partial completion of TACV cushion configuration wind tunnel tests.
4. Acquired French "Aerotrain" TACV research vehicle test data.
5. Continued analytical investigation and subscale experiments on air cushion dynamics. Investigations to date show a need for secondary suspensions.
6. Prepared and issued RFP for the Office of High Speed Ground Transportation TACV Research Vehicle Design Study. Proposals received and evaluated. Research objectives based on results of analytical studies and subscale testing results.
7. Acquired results to date of British TACV development program.
8. Developed basic cost data for TACV subsystems; e.g., guideway, vehicle, propulsion, suspension.
9. Evaluated the "Hovair" principle as applied to high speed TACV.
10. Investigated active controls for TACV suspension systems.

##### *Tube vehicles*

11. Developed theory for predicting stability of vehicles travelling in tubes.
12. Investigated drag of vehicles in tubes on subscale experimental basis.
13. Developed experimental facility for validating theory of internal propulsion of tube vehicles.

14. Investigated radiative power transfer to tube vehicles on theoretical and subscale basis.

15. Studied feasibility of vehicle in evacuated tube system.

16. Developed system engineering and cost tools for future evaluation of alternate tube vehicle systems.

*Work to be done in unconventional transportation systems R&D*

1. Design, fabricate, and test a TACV research vehicle and guideway.

2. Conduct scale model tests of tube vehicles to gain further knowledge of system dynamics and of scaling effects prior to initiation of full-scale tests.

*Advanced technology R. & D.*

Advanced technology research and development is being done because—

High speed ground transportation systems can be no better than the subsystems of which they are composed, the construction methods by which they are built, or the materials of which they are made.

This R&D is being carried out in the following major areas: guideways, communications and control, power collection, obstacle detection, linear electric motors, and magnetic suspension, and planning for a high speed ground transportation test facility.

Significant advantages are to be gained by the use of subsurface routes for HSGT systems. Unfortunately, present costs for tunnel construction tend to make tunnels less attractive economically than surface routes. Wholly insufficient efforts have been devoted in the past, either by Government or by industry, to advancing scientific and engineering knowledge of tunneling. Advancements in tunneling technology create many possibilities for the future development of economically feasible subsurface systems.

High speed ground transportation will require improved communications to maintain safe and efficient operations. Unfortunately, there are an insufficient number of radio frequencies available to provide the necessary level of communications capacity. Research is therefore being carried out in nonradiating communications to determine their feasibility for HSGT systems.

For speeds above 200 mph, it is apparent that a stiff contact-rail approach or a noncontact technique for electric traction power pick-up is necessary. Studies have been performed on noncontact electric energy transfer. This work evaluates possible techniques for transferring large amounts of electrical energy without physical contact, such as through induction or arc plasma transfer. Results so far are not encouraging for the early use of noncontact methods.

Safety is one of the most vital aspects of a HSGT system, since the consequences of accident are more serious at higher speeds. HSGT systems must, therefore, employ a separate guideway having no crossings at grade. It may be necessary to have an obstacle detection system protecting against possible collision with foreign objects on the guideway to guarantee the safety required by the speeds envisioned for HSGT. Obstacle detection systems may have application to conventional railroads as well.

Propulsion of ground transportation vehicles is typically accomplished by transmitting power through axles and wheels to a roadway or rails. This method requires adhesion for the vehicle to accelerate or decelerate. To eliminate the need for adhesion for wheeled vehicles, or to propel an air cushion vehicle, research has centered on linear electric motors. Propellers and turbo-jet engines also eliminate the requirement for adhesion; however, they are less desirable because they are noisier, less safe, and create more air pollution.

Magnetic suspension is being evaluated for use in those applications where neither wheels nor air cushions are feasible. A high speed vehicle operating in an evacuated tube may be one case where a magnetic suspension system is required.

The final step in the evaluation of new ground vehicles and components must be full scale testing. Experimental vehicles, when tested at high speed, cannot be operated in close proximity to commercial traffic. A test facility is therefore needed where test and evaluation can proceed unhindered and without endangering public transportation.

Initial tests of the linear electric motor would require a track several miles long. Tests at 300 mph would necessitate a track from 10 to 20 miles in length. The TACV research vehicle would require tracks of the same length but of entirely different cross section. This facility may ultimately serve as the testing site for early tube vehicles.

*Accomplishments in advanced technology*

1. Started on construction of full-scale 2500 HP linear induction motor and test vehicle.
2. Undertook approaches to communications and control without use of radio frequency spectra.
3. Established feasibility of surface conduction line for communications and control.
4. Undertook design of optical laser system for obstacle detection.
5. Established feasibility of flame-jet tunneling system.
6. Established practicability of using lasers for fracturing rock.
7. Improved on technique of using chemical surfactants to weaken rock.
8. Pioneered use of high velocity fluid jets for fracturing rock.
9. Advanced the technique of using light gas gun for firing high velocity projectiles for fracturing rock.
10. Initiated study to improve materials and techniques for lining tunnels.
11. Examined use of cavitation for eroding rock.
12. Developed new methods of predicting nature of and magnitude of rock slippage.
13. Developed mathematical models to predict settlement of fills and heave of excavations.

*Work to be done in advanced technology*

1. Investigate various communication and control techniques including surface wave transmission lines, W-type continuous access communications waveguides, leaky waveguides, and millimeter waves in special waveguides.
2. Conduct studies to determine best configurations, voltage levels and supply point spacing for a stiff contact-rail system for power collection.
3. Continue to study noncontact techniques for power collection.
4. Test optical laser device for detecting obstacles on guideways.
5. Test prototype linear induction motor on wheeled research vehicle as preparation for installation of later model on TACV research vehicle.
6. Investigate feasibility of electromagnetic suspension, examining possible configurations, transient magnetic field effects, and cryogenic insulation strengths.
7. Continue rock fracture research using high power lasers.
8. Research the phenomena of rock weakening by chemical agents.
9. Conduct studies as to feasibility of using lasers and chemical weakening agents in combination with hard rock tunneling machines (moles).
10. Conduct system development and field testing of flame jet tunnelers.
11. Develop tunnel excavation systems using high velocity fluid jets.
12. Develop design for a high velocity water jet nozzle using multiple low-speed orifices.
13. Continue light gas gun fracture research by field experiments.
14. Continue analysis of requirements and costs for tunnels in the Northeast Corridor.
15. Fabricate scale models of advanced-technique tunneling systems.
16. Conduct field experiments and demonstrations of new techniques on actual tunnel construction projects in Chicago, New York, and other locations.

*Timing*

The fulfillment of the growing transportation requirement places an increasing demand on the best possible use of technology. Continuing research and development is required to improve steadily the performance potential of HSGT subsystems. High priority is now being given to alternative system selection so that efforts can be focused on the more promising concepts. It is estimated that HSGT classes such as auto-train, high speed rail, and multi-modal systems could be operational in the early 1970's, tracked air cushion vehicle systems in the mid-1970's, and tube vehicle systems in the later 1970's. Research and development on advanced systems is now underway and includes analytical studies and small-scale laboratory experiments. This should progress to larger-scale experiments, prototype hardware and passenger demonstrations. Full-scale field experiments are already underway with the high speed rail research vehicles and track structures; and large-scale laboratory rail-vehicle dynamics experiments are planned to commence in FY71. Full-scale field experiments of a tracked air cushion vehicle are planned to commence in FY71 and of a tube vehicle in FY74. The present laboratory phase of the Advanced Technology research will likewise require larger-scale field experiments in the next few years.

## PROGRAM STATUS DEMONSTRATIONS

Section 2 of the High Speed Ground Transportation Act authorizes the Secretary of Commerce (now Transportation) "to contract for demonstrations, to determine the contributions that high-speed ground transportation could make to more efficient and economical intercity transportation systems."

The purpose of demonstrations, carried out under the Act, is "to measure and evaluate, such factors as the public response to new equipment, higher speeds, variations in fares, improved comfort and convenience, and more frequent service." In connection with contracts for demonstrations under the section, the Secretary shall "provide for financial participation by private industry to the maximum extent practicable."

*Purpose of the demonstration project*

President Johnson emphasized the need for demonstration in his letter of March 4, 1965, which proposed the High Speed Ground Transportation Act to the Congress—namely, that ". . . we must learn about travel needs and preferences, in part through the use of large-scale demonstration projects."

Congress authorized the demonstrations on the finding that there is insufficient information about traveler needs and desires, particularly in intercity movements, to provide a sound basis for public and private investment policies. Within this broad context there may be cited two specific and immediate end uses for the data generated by the demonstrations.

One is input for the Northeast Corridor Transportation Project. The information on public response to improvements in railroad intercity passenger service will shed light on the contribution that rail transportation can make toward meeting the need for additional transportation facilities in densely populated urbanized corridor-type areas around the country. In addition, by providing detailed analysis of public preference, shown by actual use and by payment for varying combinations of service, the demonstrations will indicate the relative weight of individual service components in attracting public patronage.

The demonstrations will evaluate the influence of speed, schedule frequency, terminal convenience, comfort levels, and fare structure and will identify the relative impact of each on public acceptance. Since these basic elements of service are common to all modes of passenger transportation, the results of the Corridor rail passenger demonstrations will be important in determining passenger preferences for all modes.

The second immediate application of information produced by the demonstrations is to indicate the limits of economic viability and customer acceptance of improved railroad passenger service over the country as a whole. The findings would provide a more up-to-date and realistic determination of the capacity of the present railroad network to meet new needs by testing, under revenue service conditions, the reliability and traveler reaction to equipment improved to the limit of existing railroad technology.

The demonstrations now planned will produce information about public response to improvements in the quality and range of railroad service which can be obtained with relatively modest expenditures and without significant developmental lead time. The demonstration between Washington and New York, for example, costing the Government about \$12 million, will help decide whether investments ranging from one-quarter to five billion dollars in new rail facilities between these points would be worthwhile.

A by-product of the demonstrations is the physical improvement of the railroad properties selected for the experiments. Although these improvements are related directly to requirements for data-gathering and evaluation, they will produce measurable long-term benefits for passengers using other trains on the demonstration routes, including commuters, and shippers and receivers of railroad freight. In the Washington-New York demonstration program, the contribution by the Federal Government of \$12 million has encouraged the railroad to invest more than \$45 million in upgraded facilities and in new equipment.

The two demonstration projects in the Northeast Corridor at the time of completion will have cost the Government approximately \$21.4 million. In addition to information for decision-making by both the railroad industry and Government the demonstrations will provide seed money for immediate improvements in railroad passenger equipment, track and station facilities. The railroad and equipment manufacturers involved have greatly exceeded the Government's contribution to the demonstration cost.

Criteria for selection of demonstration projects have included the following:

1. Minimum duplication in the factors to be tested in each project, including natural limitations such as terrain and route location.
2. Use of limited available resources to provide improvements which will provide most efficiently and promptly the positive service improvements and innovations needed for a valid test of public reaction.
3. Train speeds measurably faster than, and standards of riding comfort substantially superior to those, now attained, as a basis for an adequate test of the market.

The timing of both the Washington-New York and the New York-Boston demonstrations of rail passenger service deserve an explanation.

Undoubtedly in the winter and early spring of 1966 when the demonstrations were being set up an optimistic view prevailed as to the time that would be required for the engineering, the building and the testing of new equipment. Considering that none of the equipment suppliers had built equipment of this kind before delivery commitments could not be based on prior experience. Nevertheless the car builders for both demonstrations accepted in their contracts penalty provisions for late delivery. Based on the estimates of time of delivery for equipment starting dates were set for the demonstrations. In the case of the demonstration between Washington and New York the time required for up-grading of the roadbed was thought to be the critical element and it governed the starting date. In April 1966, before the contract for the building of the Washington-New York demonstration cars was awarded, the Department of Commerce and the Pennsylvania Railroad agreed that "... the demonstration was expected to start in October 1967."

About 8 months after the award of contracts for construction of the equipment it became apparent that the Budd Co. would have difficulty in delivering equipment on time for the Pennsylvania Railroad to start the demonstration on October 29. A decision had to be made by the Railroad and the Government as to whether to hold to the original starting date. The Government took the view that an extra effort should be made by the Budd Co. to get equipment built as soon as possible. On this basis the Government agreed to pay for over-time and extra costs incurred by Budd up to a total of \$220,000. Also the Government insisted that October 29 be retained as a target for starting the demonstration and public statements were made to that effect by the director of the Office of High Speed Ground Transportation.

Very clearly at this time the Pennsylvania Railroad, the Budd Co. and the electrical suppliers had very serious doubts that enough equipment could be ready for service by October 29. The office of High Speed Ground Transportation is responsible for holding to the original starting date.

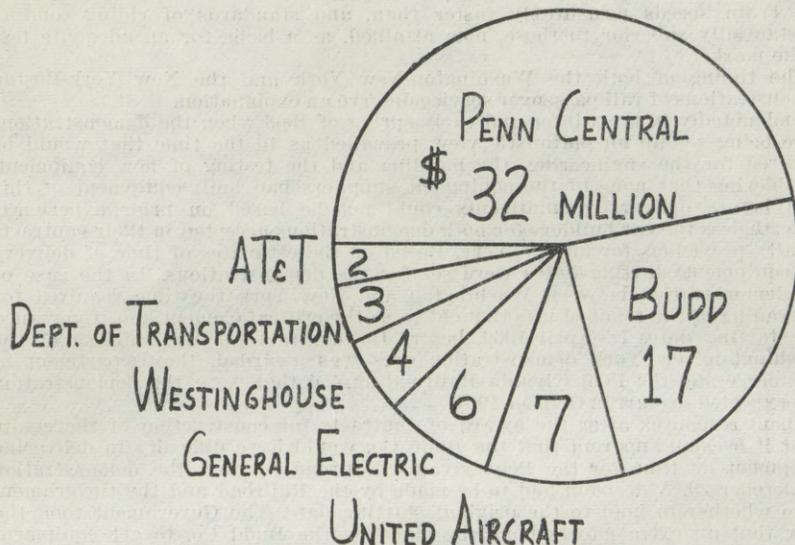
The Government believed that there was an urgency (and there still is) to get the information which would be provided by the Washington-New York demonstration and in light of this urgency that it was desirable to set an early date for the start.

The measure of success or failure, however, in getting equipment designed, built, tested and into operating condition expeditiously should probably rest more on a comparison with the time required to carry out other similar projects than on whether or not an early estimate of time of delivery was met.

In making this determination it should be understood first that there is not an easy basis of comparison between this equipment and other rail passenger equipment which has been built in recent years. The electrically propelled cars which are to operate between Washington and New York are the most technologically advanced ever built. The complexities in the control system have required much more testing than was anticipated.

It may be noted that the Japanese National Railroad cars, the only ones comparable to the Metro-liners, were engineered, built, tested and put into service over a three year period. The delivery time for transit cars, without major design improvements, averages 14 months. Also it may be pointed out that a study of 12 U.S. Air Force weapon system development programs has revealed that on the average the time required for these programs has been 36% longer than estimated. Looked at in this light and considering the amounts of their own money committed over the contract price, the record of the equipment suppliers in this project does not seem to deserve much censure. In any case the holdup in the delivery of the cars has been completely without funding cost to the government. The chart following shows the present expenditures by the government and estimated expenditures by the private parties.

DEMONSTRATIONS BOSTON-N.Y.-WASH.  
EXPENDITURES THRU 4-1-68 \$71 MILLION



The order for the metro-liners was given to the Budd Co. in late May 1966. The cars have been completely built in less than 24 months after the award of the order. They must, however, go through further testing before they can go into operation.

Equipment and roadway facilities to provide improved performance are attainable under present technology, but do not now exist in this country. Hence, an important consequence of the demonstration will be the testing in actual revenue service, under severe operating conditions of advanced designs and components of railroad equipment. This will contribute significantly to the research and development aspect of the HSGT program.

Improvements such as automatic doors and gas turbine propulsion have been considered in the selection of equipment for the demonstration because they promise to cut operating costs while enhancing, rather than diminishing, service standards. At the same time, equipment specifications must look toward high reliability of operating performance and minimum of down time so that the primary purpose of the demonstrations—determination of public reaction to improved service—will be satisfied.

*Washington-New York demonstration*

A demonstration between New York and Washington on the Penn Central will measure public response to a wide range of substantial improvements in service. The route selected has the largest existing intercity rail passenger volume in the country. It is well located with regard to station access and will sustain increased speeds and frequency with the least new outlay. It serves a greater population than any rail of similar length in the United States.

A completed operating contract between the Government and the Penn Central Railroad specifies all identifiable elements of the demonstration service, including penalties for schedule failures. Under its provisions the railroad has prepared its fixed property to meet service standards, including substantial improvement of roadway and station facilities. The contract establishes four consecutive operating phases, in each of which the mix of variable service elements—such as food service, seating arrangements and crew complements, fares, frequencies, etc.—can be modified.

Among the special contractual obligations the railroad is required to meet throughout the two-year demonstration are :

1. An advertising and promotion campaign designed to inform the traveling public fully of significant service features both before they are introduced and during their availability;

2. A comprehensive training program for public-contact railroad employees. Nearing completion are negotiations with the State of New Jersey, Prince George's County, Maryland, and the Maryland State Roads Commission to build two suburban rail stations. Each would be near a major highway net. The stations will permit a test of the attractiveness of ample, inexpensive parking in connection with intercity transportation service.

Additional experiments sponsored or encouraged by the Office of High Speed Ground Transportation include a new type of baggage handling facility at the Baltimore station and the installation of newly-designed on-train telephone service over which passengers can receive as well as initiate calls on the standard commercial telephone network. The American Telephone and Telegraph Company has paid the entire cost of developing and installing the mobile telephone system.

Public service operation of the Washington-New York project for a period of two years will start as soon as the Penn Central has accepted 28 of its total order for 50 new high-speed electric cars to provide a partial demonstration service.

Developmental testing and modification required to meet the high standards established for the equipment—including a speed capability of 160 mph, rapid conversion to commercial power frequencies, and compatibility between equipment produced by individual builders—have delayed the start of operations.

#### BOSTON-NEW YORK DEMONSTRATION

A demonstration between Boston and New York on the New Haven Railroad will test public response to a light-weight, turbine-powered train of advanced design. The Government entered into a two-year lease with the United Aircraft Corporation in fiscal year 1966 for two 3-car TurboTrains. Demonstration service will be in addition to regular schedules on the route and will be designated in public timetables as experimental.

The trains are designed to accomplish several important objectives:

1. The use of gas-turbine engines is expected to cut operating, repair and fuel costs as well as to provide faster acceleration.

2. Use of a suspension system which has a novel self-banking mechanism which should permit the trains to take curves at speeds at least 30% higher than can be achieved with conventional equipment.

3. A three-hour and fifteen-minute schedule between Boston and New York, with four intermediate stops. More stops will be made if they can be accommodated in the three-hour and fifteen-minute schedule.

The TurboTrain is well suited for fast rail shuttle service for distances of 200 to 300 miles. If the equipment meets expectations, its use could lead to improvements without electrification in passenger service in many parts of the country. It could provide an economic intercity train service faster and more comfortable than can be produced presently.

The present status of the Boston-New York project is as follows:

Under a contract with the Government for maintenance and servicing of the two TurboTrains, the builder and lessor, United Aircraft Corporation, has completed a shop facility in Providence, Rhode Island, designed specifically to support new methods of preventive maintenance, including rapid change-out of components. The builder has established procedures for detailed statistics of maintenance, and operating costs which the Government will evaluate and distribute to the railroads and others who are interested.

The Government and the New Haven Railroad have reached tentative agreement on schedules, meal service, fares, public information and reservations systems. Although the demonstration is planned primarily as a test of equipment, the Department will utilize it also as an opportunity to test the effect on passenger demand of experimental fares, control of passenger seating, modern quick-preparation food service and ticketing.

Since the railroad is in bankruptcy and has agreed to operate the demonstration only if no loss is suffered from it, the Government has agreed to pay up to \$1.7 million for upgrading roadway maintenance levels required directly to prepare the property for higher speeds and increased passenger comfort. To date a total of \$1.4 million has been authorized on work orders approved by the Office of High Speed Ground Transportation for additional maintenance expenditures.

The Department expects to draw upon the amount of \$500,000 authorized by the State of Connecticut for work performed within the State.

The two trainsets to be operated in the demonstration are currently undergoing modification following extensive development testing and will be made available to the railroad for scheduled-service testing and employee training as soon as the equipment meets the Government's performance specifications.

#### AUTO-TRAIN MARKETING AND FEASIBILITY STUDIES

Prior to the decision by Congress not to provide additional funds for an Auto-Train demonstration for fiscal year 1968, the Office of High Speed Ground Transportation had planned the purchase of locomotives and cars and an operating demonstration of an auto-train, a new rail service for motorists. This was to test the usefulness of an automobile-carrying rail service in which passengers could keep their automobiles with them and use them for seating en route. It was based on the recognition that long-haul rail passenger service is no longer competitive with air and highway, and that this service might provide a means for the railroads to obtain greater utilization of their plants. The risks involved in experimenting with the service seemed to be greater than the railroads would accept in their present condition of a capital shortage. Also, only the Government had the means to carry out the necessary research for the service.

At the time when Congress indicated it favored greater private capital for the auto-train equipment and operation and refused further appropriations, the Department had completed studies and tests which gave clear indication, that at equipment standards and costs then contemplated, a profitable service could be operated on a proposed 750-mile route between Washington, D.C., and Jacksonville, Florida. Initial economic and public acceptance studies of all experiments to date, world-wide, of the movement of private motor vehicles by rail had led to the conclusion that service of a wholly new kind was required to produce speed, cost and convenience competitive with driving over modern American highways. The emphasis, it was clear, would have to be on rapid terminal handling, non-stop operation between facilities strategically located with respect to the highway network, and use of the autos themselves as the main occupancy unit during the rail journey, supported by quick-service utility amenities designed for volume use.

Extensive marketing studies showed a potential patronage of more than 500,000 automobiles yearly, far more than the capacity of the 15-car bi-level train for which conceptual designs had been completed. OHSGT explored alternative operating and maintenance arrangements and reached tentative agreement with the Seaboard Coast Line Railroad. It completed designs for fast loading terminals. Investment and operating costs and probable load factors had been refined to the point where a viable fare structure could be established.

In the last 9 months the Office of High Speed Ground Transportation has been exploring with sources of private investment capital the operation of auto-train as a business undertaking. Available for interested parties are the studies described above; ride quality studies, both simulated and from actual prototype operation; completed conceptual drawings and description of railcar equipment tested for auto loading, unloading and safe carriage en route in full-size mock-up experiments; and partially completed engineering production drawings. Both the Ford Motor Company and a financial group in New York City have extensively investigated the auto-train and are considering it as a business venture.

#### AIRPORT GROUND ACCESS

Ground access to commercial airports in large metropolitan airports which often is both congested and expensive, is presently a major deterrent to more effective use of air transportation. These impedances are likely to increase when ultra-high-capacity jet aircraft, including SST's, are introduced. The problem is also likely to become more acute because land use patterns and social pressures against noise and space allocation in residential areas may force new airport construction to areas 50 to 100 or more miles distant from metropolitan centers.

The Office of High Speed Ground Transportation has completed a survey of the uses of National, Friendship and Dulles Airports in the Washington, D.C., area. In addition to air travel information, it provides up-to-now unavailable data on local origins and destinations, and mode and time patterns of ground access transportation. Included are the demographic characteristics of airport travelers, traveler-connected visitors and employees.

If funds and program authorization are granted, the Department will take the next step—namely, an estimate of future traffic patterns and levels. This information will be obtained in coordination with other agencies involved in airport access in the Baltimore-Washington area. If the surveys show market viability, the Department would initiate preliminary engineering feasibility analyses of a high-speed ground access system. *Particular attention will be given to the possibility of a rail shuttle service between Washington, and the Capital Beltway station, Friendship Airport, and Baltimore.*

#### DATA COLLECTION

Since the collection and evaluation of information on traveler response is the prime purpose of the demonstrations projects, the Office of High Speed Ground Transportation has well in advance of the start of the demonstrations given priority of the formulation and implementation of statistical systems.

Three principal means of obtaining information have been in operation and will be expanded and amended as the demonstrations move through successive phases:

1. *Datacheck Passenger Count.*—The Department devised, and has had in effect since 1966, a new means of obtaining prompt counts of passenger travel, identified by stations, of origin and destination and individual train, by means of a machine-readable, hand-punched seat check. This technique meets the need for a "cash register" measurement of public reaction and, also important, a firm basis for identifying the changes in patronage which determine the sharing of expenses and revenues in the Penn-Central and New Haven service contracts.

A computed linked with a tag reader has been installed in the OHSGT and provides details of travel on all through trains on demonstration routes of both railroads within a few days after its performance. Data of this quality had been unobtainable prior to installation of the system.

2. *On-Train Survey.*—To obtain more comprehensive information about travelers' behavior and needs, the Office of High Speed Ground Transportation inaugurated in November 1966 a continuing questionnaire survey of a sample of rail passengers presently on the demonstration routes. Continuing controls will maintain sampling reliability. Questionnaires will be modified periodically to get a wide range of information as the demonstration develops, specifically as to reasons for choice of mode and reactions to various changes.

3. *Total Population Survey.*—Changing travel habits of the total population in the Northeast Corridor are to be measured prior to and during the demonstration periods. In March 1966 arrangements were made with the U.S. Bureau of the Census to increase the coverage in the Northeast Corridor region of the Bureau's 1967 National Travel Survey. The survey has been in operation this past year and should be continued in the Northeast Corridor for the Office of High Speed Ground Transportation during calendar years 1969 and 1970.

#### GRADE CROSSING SAFETY ACTION

The Office of High Speed Ground Transportation is actively involved in a national program for elimination of, or improved safety features for, railroad-highway crossings at grade. This participation is related directly to the prospect of more frequent and somewhat faster service on the Washington-New York and Boston-New York demonstration routes.

By direction of the Secretary, the Department of Transportation formed a joint Federal Railroad and Federal Highway Administration Action Committee to launch a program to upgrade protection measures. Special emphasis is to be placed on the heavily-traveled Northeast Corridor. An OHSGT representative participated in a safety inventory of each public crossing on the Penn Central between Washington and New York and will shortly participate in a similar inventory on the New Haven Railroad between New York and Boston. It is expected that these inventories will produce recommendations for better grade crossing protection across the Nation.

In addition, OHSGT is participating financially in a joint program for immediate crossing protection improvements on the Penn Central. This effort involves the Federal Government, the State of Maryland and, thus far, its constituent counties of Prince George's and Baltimore. A similar program is being negotiated with the State of Delaware. The OHSGT will provide partial funding to implement such recommendations for crossing improvements on the New Haven route as may be advanced by an inventory team.

## WHAT REMAINS TO BE ACCOMPLISHED

*Washington-New York Demonstration*

A date for the start of revenue demonstration service on the Washington-New York route is tied directly and solely to completion of developmental testing, modification—principally of electrical components—and final acceptance by Penn Central of new self-propelled electric cars designed for the operation. It is anticipated that the railroads may be able to provide initially nonrevenue and excursion runs, using the first cars accepted. The full demonstration service cannot start until 28 cars meet acceptance tests.

All of the other elements of improvements for which the Penn Central is responsible, and which are required to support the experimental design of the demonstration experiment, have been completed. These include roadway improvements, station modernization, and changes in overhead catenary for electric power distribution. Schedules, fare structures, food service, employee training, advertising and public information and all other administrative elements of the demonstration service are ready for immediate implementation.

Construction of suburban automobile-parking station facilities in New Jersey and Maryland, which are a shared responsibility of the railroad, the Federal Government and local authorities (as noted), is proceeding. Start of the work has been delayed by the need to scale down standards set forth in original plans for the stations. Excessive costs not foreseen in the planning stage, which relate chiefly to modifications in railroad plant to meet operating problems have forced these changes.

Penn Central will operate the new demonstration trains as an integral part of its New York-Washington service. The Government and the railroad have agreed, however, on detailed conditions of the service to be provided. These are precisely set forth in a 60-page operating contract providing four separate service phases over a two-year test period of revenue operation. Each phase will effect a new combination of service elements.

The operating contract calls for experiments in varying types of meal service, luggage handling aboard cars, use of coach attendants, fixed or reversible seating and deletion or addition of intermediate station stops, among others. Food service in the new Metro Club (parlor) cars, for example, will be varied in price from phase to phase, and in one period will be included in the ticket price.

The parties may agree upon experiments in fare levels beyond those already planned. These may include, for instance, premium charges for nonstop service, fees for coach seat reservations, bargain rates for off-peak hours, or special inducements for non-commuter patrons to increase the frequency of their travel on the route.

Variation of a number of service elements simultaneously is required because the two-year limitation on the period of the demonstration will not permit isolated exposure to the test of public acceptance of individual changes.

The task of testing the maximum possible number of service elements in a relatively short time span requires that the Office of High Speed Ground Transportation exercise continuous, detailed surveillance over the demonstration service and, in coordination with the operating railroad management, plan for prompt corrections and changes as necessary to carry out the overall design of the experiment. The contracting parties must inform the public fully and rapidly of forthcoming changes. The Government staff must modify its continuing data collection and evaluation procedures accordingly. The contents of on-train survey questionnaires, for example, must be reviewed constantly so that they will reflect service modifications and identify, so far as is possible by statistical techniques, public acceptance of the individual elements of successive service combinations.

*Boston-New York demonstration*

As is true of the demonstration to be conducted on the Penn Central, the most critical step to be accomplished before operation of the Boston-New York demonstration can start is acceptance by the Department of Transportation, as lessee, of the two trainsets which will perform the service. It has been necessary for the builder to carry out important modifications, after development testing showed original noise levels, ride quality, braking rates and reliability of power and gearing to be unsatisfactory. As revised, the equipment must again be subjected to road testing. If the two trainsets meet the Department's specifications, they must undergo next a period of scheduled-service testing by the New Haven Railroad lasting approximately six weeks, during which training of employees will

be carried on simultaneously. These tests may turn up the need for additional modifications.

Unlike the Penn Central operation, however, there are also other tasks to be accomplished before any level whatever of a demonstration service on the New Haven Railroad can start. These include completion of roadway upgrading, curve adjustment at a critical point on the route and provisions for electrical operation within New York City. At this writing, it appears probable that these improvements can be completed in short order.

Planning and preparation of all administrative elements of the service—such as schedules, fares, ticketing, reservation system and meal service—are in general completed. Since the TurboTrains have not been subjected to intensive daily scheduled use under actual service conditions, and no spare, or relief, equipment will be available in substitution, OHSGT plans to start the demonstration at a reduced level of service for an initial period until reliability and speed of repairs have been proven—perhaps two to three months. The demonstration on the New Haven is not designed to coordinate with or serve in substitution for the existing service on the route; it will be superimposed on a reduced level of conventional train service. The public, therefore, will not be inconvenienced by postponement of full level of service (equivalent of four round trips between Boston and New York daily).

In contrast to the Washington-New York demonstration, where the Penn Central is responsible for carrying out all of the requirements of the experimental design imposed by the Department of Transportation, the demonstration on the New Haven Railroad is entirely a Government responsibility. The railroad will perform transportation and traffic functions only, under direction of the Office of High Speed Ground Transportation. The two TurboTrains, as noted earlier, will be leased by the Government from United Aircraft and furnished to the railroad for operation. In view of their advanced and novel design and propulsion, the trainsets will be maintained and serviced by United at its own shop in Providence. The railroad will turn over the equipment to United Aircraft each night.

The OHSGT must, therefore, coordinate the responsibilities of the New Haven Railroad and United Aircraft, respectively, which are covered under separate contracts, but require joint action at numerous points. This task requires that the Government's staff give continuous, detailed surveillance and evaluation to activities of both contracting parties throughout the period of the demonstration.

Complete estimates of operating costs will not be available until the railroad has had experience with the equipment. Hence, the net cost to the Government will not be known until it can be determined to what extent the demonstration trains will attract new revenues which would offset the Government's burden.

#### DATA COLLECTION

Collection and evaluation of the data on public reaction to service elements and changes will be a continuous responsibility of the Office of High Speed Ground Transportation throughout the two-year span of the two railroad passenger service demonstrations in the Northeast Corridor. Government staff will revise information sources to correspond with service changes. It will also make modifications in both source and handling which appraisal of the data received indicates is necessary to meet the objectives of the Projects. It is likely that successive changes will be necessary also to satisfy the requirements of the Northeast Corridor Transportation Project, as experiments and testing of transportation demand models dictate.

Continuous coordination of demonstrations data handling with the evolving Corridor analysis will be required particularly because the usefulness of statistics of public response to actual rail demonstration service is not confined to determining the role of that mode in meeting future needs. Demonstrations-produced data will also be used as a control in testing the validity of mathematical models of future demands based on socio-economic factors and price-time-convenience characteristics of all modes of transport. Finally, since the basic individual service elements—such as speed, frequency, fare, etc.—are common to all modes, determination of their relative weight in public acceptance of the demonstration service will assist the Corridor Project staff in evaluating the influence of these factors on the effectiveness of any other mode. In addition to the traveler-reaction data obtained from the three sources described in an earlier section of this report, the demonstrations staff will be responsible for

collecting, evaluating and summarizing operating and equipment maintenance cost data covering the two rail demonstrations.

An important objective of the demonstrations is to determine whether new equipment and advanced prevent maintenance techniques which will reduce operating costs substantially. Added to increased revenues these savings may move certain essential intercity rail services out of the direct-cost deficit status, in which many now fall, to a more economic basis.

To make a valid determination, the Office of High Speed Ground Transportation must administer a continuous and sophisticated cost study of the major expense elements of the demonstrations obtained from the railroads and, in the Boston-New York operation, from United Aircraft.

At the conclusion of the demonstrations, the Government's staff must undertake a task without which the demonstrations project would be essentially fruitless. This is the evaluation of the large amounts of demand and cost data collected. There also will be a complete review of the effectiveness of equipment performance, operating methods, pricing, and other elements of the merchandising process utilized in the tests. The final report on the demonstrations project should furnish the Government and the public, including carriers, the suppliers of transportation equipment and local authorities the detailed information they require for future planning.

#### AIRPORT GROUND ACCESS DEMONSTRATION

On the basis of present demand data relating to the Baltimore-Washington area airports now in hand, an estimate of future traffic patterns and demand levels should be compiled to determine the range of ground transportation loads and schedule patterns required to meet these demands. If these studies show that sufficient potential demand exists, market studies, including service and price characteristics of alternative means of transport, will be conducted followed by engineering feasibility studies of a high-speed service between the city centers of Baltimore and Washington and Friendship Airport. This project would utilize existing transport technology and the present main line of the Penn Central Railroad and would require the construction of only a new short loop rail line to the airport terminal.

The Office of High Speed Ground Transportation will also give attention on a broader basis, and with a view to more advanced technology, to airport access problems of application generally to other areas of the country. There is a need for analysis of patterns and volumes of ground travel to and from those airports where it appears high-speed ground transportation could be used. These findings would be used to determine at what points it would be profitable to make more detailed engineering studies of alternative systems of high-speed, exclusive-route ground transport systems. The purpose of these investigations would be to determine the best approach to a solution at each of the selected airports. The feasibility studies would draw upon the technical information on potential forms of high-speed ground transport compiled under the research and development program.

If one or more new systems show promise of successful application in the solution of a local problem, the Office would then seek to undertake an actual demonstration, including the construction of fixed facilities and procurement of the equipment required.

#### CONTINUING PROGRAM ACTIVITIES

The program of the Office of High Speed Ground Transportation for the next three years will emphasize development of components of transportation systems which research has proven feasible for the improvement of transportation in densely populated areas.

If projects now underway are continued, it is possible that the United States in the next decade could have operational tracked air cushion vehicle and tube vehicle transportation systems. The experiments which have already been planned for such systems will result in the development of prototype hardware and, eventually, in the conduct of demonstration projects.

The Office of High Speed Ground Transportation will continue to coordinate with the research and development programs of other Federal agencies, foreign governments, and private corporations to assure immediate application of technological innovations from these sources to the work of the Department to increase the speed, efficiency and economy of our intercity transportation systems.

The work of the Office of High Speed Ground Transportation has already had and will continue to have the effect of encouraging private industry to increase its attention to research and development related to intercity transportation. This cooperative Government-industry undertaking will, if continued, provide many benefits to the American public.

Another obvious but indirect benefit of a continued Federal effort to improve ground transportation will be the development of new academic programs in this field and the renewal of concern within universities in this significant area of research.

The transfer of certain urban mass transportation programs from the Department of Housing and Urban Development to the Department of Transportation will provide new opportunities to relate intercity and intracity research, development, and demonstrations.

Finally, the Northeast Corridor Transportation Project's investment planning analysis can adequately evaluate alternative systems only if current and accurate data are available on the cost and performance characteristics of both conventional and advanced systems as well as on passenger acceptance of the equipment and services to be tested by the Office of High Speed Ground Transportation demonstration projects.

Not only is each of the three activities of the Office of High Speed Ground Transportation important in its own right, therefore, but also each is dependent on results from the others for success.

APPENDIX (A)—STAFFING  
ORGANIZATION AND PERMANENT EMPLOYEES

Professional fields	Authorized total	Filled May 1, 1968	Office of Director	Divisions		
				R. & D.	Demonstration	Transportation systems planning
Engineering.....	12	9	1	9		2
Economics.....	5	5	1	1		3
Operations research.....	4	3		1		3
Transportation.....	4	4			3	1
Intergovernmental.....	3	2	2		1	
Statistics.....	2	1			2	
Data systems.....	4	3			1	3
Legal.....	1	1	1			
Administrative and clerical.....	21	20	6	4	7	4
<b>Total.....</b>	<b>56</b>	<b>48</b>	<b>11</b>	<b>15</b>	<b>14</b>	<b>16</b>
Fiscal year 1969 requests.....	+5			+5		

Note: Education 3; Master's degrees, 14; doctorates, 5; law, 1.





## APPENDIX (B)—PROGRAM ACTIVITY—FINANCIAL

PROGRAM ACTIVITY, MAY 1968

## ENGINEERING RESEARCH AND DEVELOPMENT

[ In thousands of dollars ]

Scope of work	Contracts obligated fiscal year—		Planned use, fiscal year, 1968 availability	Future funding requirements (5 year)	Contractors and location	Estimated completion, month/year
	1966	1967				
<b>Unconventional systems R. &amp; D.:</b>						
Tracked air cushion vehicle:						
Aerofram test data		25	92		Aeroglide, Inc., New York, N.Y.	August 1968.
Self-stabilized air cushion vehicle	8	40	71		University of Kentucky, Lexington, Ky.	Completed.
Air cushions	45	72	10		MIT, Cambridge, Mass.	September 1968.
Potential of flexible diaphragm air cushion					General Motors Research Labs., Santa Barbara, Calif.	Completed.
Investigation of air cushion seal materials				11	Johns-Manville, Manville, N.J.	December 1968.
Designs and tests				1,434	Contractors to be selected	
<b>Total</b>	<b>45</b>	<b>145</b>	<b>173</b>	<b>1,445</b>		
<b>Tube vehicle systems:</b>						
Feasibility of cryopumping	26	3			Celestial Research Corp., South Pasadena, Calif.	Completed.
Technical background data on gravity vacuum tube system					Tube Transit, Inc., Palo Alto, Calif.	Do.
Feasibility of air-supported vehicles in a nonevacu-ated tube and microwave transmission.	225	323	60	118	Rensselaer Polytechnic Institute, Troy, N.Y.	Feb. 1969.
Aerodynamics of tube vehicle stability	29	85	62		Oceanics, Inc., Plainview, N.Y.	June 1968.
Application of Coanda effect to TACV's and tube systems					Illinois Institute of Technology, Research Institute, Chicago, Ill.	July 1968.
Drag of vehicles in tubes	75	58	44		MIT, Cambridge, Mass.	Sept. 1968.
Research in aerodynamic drag				37	Carnegie-Mellon University, Pittsburgh, Pa.	Dec. 1968.
Long tube resistance to high speed vehicles				112	Ohio State University, Columbus, Ohio.	Do.
Designs and tests				18,605	Contractors to be selected.	
<b>Total</b>	<b>335</b>	<b>496</b>	<b>203</b>	<b>240</b>		
<b>Advanced technology R. &amp; D.:</b>						
Communication and control:						
Literature survey on communications and control of HSGT	2	295			Hughes Aircraft Corp., Fullerton, Calif.	Completed.
Feasibility of surface wave guide transmission line					Environmental Sciences Services Administration, Boulder, Colo.	June 1969.
System control requirements	50	27	19		Massachusetts Institute of Technology, Cambridge, Mass.	September 1968.

Coupled waveguide systems.....	13				Sumitomo Electric, Osaka, Japan.....	December 1968.
New communications devices.....	310			11,240	Contractors to be selected.....	
Total.....	52	322	19	323	11,240	
Power collection:						
Simulation.....	52				General Electric, Schenectady, N.Y.....	October 1968.
Noncontact method.....	48				do.....	Completed.
Design and test new methods.....	19			8,460	Contractors to be selected.....	
Total.....	52	67		8,460		
Obstacle surveillance:						
Laser beams.....	100			259	Radio Corporation of America, Princeton, N.J.....	November 1968.
New detection methods.....				2,300		
Total.....	100			259	2,300	
Linear induction motor:						
Feasibility of linear induction motors in HSGT.....	30	41			AIRsearch Corp., Torrance, Calif.....	Completed.
Feasibility of advanced electric systems.....	90	50			Massachusetts Institute of Technology, Cambridge, Mass.....	September 1968.
Design and fabricate test LIM propulsion system.....	1,200			531	AIRsearch Corp., Torrance, Calif.....	July 1969.
Lateral stability of test vehicle.....				35	British Railways Research Department, Derby, England.....	February 1969.
Test LIM propulsion system.....				2,030	Contractors to be selected.....	
Total.....	120	91	1,200	2,596	8,110	
Magnetic suspension: Preliminary research.....					Contractors to be selected.....	
Total.....					4,950	
Tunneling:						
Feasibility of tunneling by flame jet.....	75	94			United Aircraft Corp. Research Laboratory, East Hartford, Conn.....	Completed.
External augmentation of velocity of fluid jets for tunneling.....	12	18			Bowles Engineering, Silver Spring, Md.....	Do.
Research in high pressure water jet delivery optimization for tunneling.....	21	32			do.....	June 1968.
State of the art, hypervelocity water jets.....	11	14			University of Missouri, Rolla, Mo.....	Completed.
Soil mechanics and chemical, thermal, and laser techniques for rock fracture.....	90	287			MIT, Cambridge, Mass.....	September 1968.
Rock tunneling by water jet using cavitation principle.....	37	21			Hydraulics, Inc., Laurel, Md.....	May 1968.
National Academy of Science, tunneling research requirements.....	9				U.S. Bureau of Mines, Washington, D.C.....	Completed.
Geological mapping of Northeast Corridor.....	103				U.S. Geological Survey, Department of Interior, Washington, D.C.....	Do.
Reference and bibliography service.....				2	Library of Congress, Washington, D.C.....	Do.
Hypervelocity fluid jet driver system.....		25			Bowles Engineering, Silver Spring, Md.....	June 1968.
Design of tunnel liners.....		60			University of Illinois, Champaign, Ill.....	February 1969.
Correlation of rock properties to fracturability.....		29			University of Missouri, Rolla, Mo.....	December 1968.
Rock breakage by light-gas guns firing liquid pellets.....		40		10	Illinois Institute of Technology Research Institute.....	Do.
Design and test.....				161	Contractors to be selected.....	
Total.....	90	555	413	171	5,750	

APPENDIX (B)—PROGRAM ACTIVITY—FINANCIAL  
 PROGRAM ACTIVITY, MAY 1968  
 ENGINEERING RESEARCH AND DEVELOPMENT

[ In thousands of dollars ]

Scope of work	Contracts obligated fiscal year—		Planned use, fiscal year 1968 avail- ability	Future funding requirements (5 year)	Contractors and location	Estimated completion, month/year
	1966	1967 1968				
<b>HSGT test facility:</b>						
Construction, maintenance, and operation.....			284	11,268	Contractors to be selected.....	June 1968.
Analysis of prospective facility sites.....		17	14		Limbaugh Engineering, Albuquerque, N. Mex.....	
<b>Total.....</b>		17	298	11,268		
<b>DEMONSTRATION</b>						
<b>Washington-New York demonstration:</b>						
Operation of demonstration service.....	5,400	4,200	532	15	400	Penn Central RR., Philadelphia, Pa..... 1970.
Primary car engineering design.....	100					L. T. Klauder & Associates, Philadelphia, Pa..... Completed.
Railroad baggage handling systems.....	31					Do, Do, Do, Do, Do, Do.....
Preparation of auditing procedures program.....	2					Peat, Marwick & Mitchell, New York, N.Y.....
Survey of cost and revenue data.....		37			30	Cuccio & Chiedo Design Associates, Philadelphia, Pa.....
Plans for improvement of Washington, D.C., Union Station.....		2	8			University of California, Los Angeles, Calif.....
Computer simulation of Penn Central RR. train operations.....		2	72		600	Penn Central RR..... August 1968.
Suburban stations.....				1,300		Penn Central RR..... 1968.
Grade crossing safety.....		40	10			Maryland State Roads Commission; Delaware State Roads Commission..... 1968.
<b>Total.....</b>	5,533	4,239	652	1,325	1,030	

Boston-New York demonstration: Lease of 2 turbo trains.....	1,220	274	175	50	United Aircraft Corporate Systems Center, Farmington, Conn.	1970.
Maintenance and servicing of trains.....	940	100	1,266	15	United Aircraft Systems Corp., Providence, R.I.	1970.
Survey of cost and revenue data.....	3	2			Not yet determined	Completed.
Survey of track conditions.....	2				New Haven Railroad	Do.
Training railroad personnel.....				46	do	1968.
Installation of transformer at Grand Central Station.....		1,379		2,953	Penn Central RR, Philadelphia, Pa	1970.
Track upgrading and operation of demonstration.....					New Haven RR., New Haven, Conn	
Total.....	2,160	380	2,822	3,064		

Data collection activities:						
Data-tag supplies and lease of EDP equipment.....	158	169	157	700	Kimball Systems, Inc., Washington, D.C	Continuing.
Procedures for and analysis of airport passenger data.....	101	44			Abt Associates, Cambridge, Mass.	May 1968.
Passenger survey for Washington-New York project.....	104	48	45	750	Opinion Research Corp., Princeton, N.J	Continuing.
Develop, tabulate and analyze travel data in NEC.....	85	265		960	U.S. Bureau of Census, Washington, D.C	Do.
Computer programming.....	2		4	10	Smithsonian Institution, Washington, D.C	June 1968.
Rental of ADP machines.....		54	33	200	IBM Corp., Washington, D.C	Continuing.
Rental of Tick-O-Meters.....	6	2		5	Pitney-Bowes, Inc., Washington, D.C	Do.
Passenger survey of Duifles-National-Friendship.....	145	13			Human Sciences Research, McLean, Va	Complete.
Experimental design for demonstration.....		50			Mathematica, Inc., Princeton, N.J.	August 1968.
Data utility.....		35			Economic Sciences Corp.	December 1968.
Market analyses.....				575	Not yet determined.	
Total.....	601	681	239	3,200		

Auto-train demonstration:						
Determination of feasibility.....	4	24			H. O. Whitten & Associates, Washington, D.C	Completed.
Research and testing of autos on railroad cars.....	8				Association of American Railroads, Chicago, Ill	Do.
Equipment and facilities for ride test.....	3				Baltimore & Ohio RR, Baltimore, Md.	Do.
Develop scale model.....		2			Sundberg Ferrar, Detroit, Mich	Do.
Determine market potential for auto-train service.....		40	12		Center for Advanced Administrative Research, Boca Raton, Fla.	Do.
Detail design and engineering of equipment.....		1,700	1,043		United Aircraft Corp., Systems Center, Farmington, Conn	Do.
Storage of materials.....			10	11	Rudd Co., Philadelphia, Pa	1968.
Terminals.....				1,030	Not yet determined.	
Total.....	15	1,766	1,065	1,041		

Mr. PICKLE (presiding). Mr. Secretary, if we could just accomplish the speed on these high-speed ground transportation projects with the speed with which you have delivered your testimony this morning, we would have the problem solved.

Secretary BOYD. Sometimes I think it would be better not to have the fastest tongue in the East. [Laughter.]

Mr. PICKLE. We did appreciate your testimony and we are glad that you are here.

Now, I realize that you must go to another meeting shortly, and we will respect your time. If you and your associates will help us to keep you on schedule, why, we would appreciate it. But as I understand it, Mr. Lang and Dr. Nelson will stay for further questioning.

Secretary BOYD. Yes, sir.

Mr. PICKLE. I want to make clear that what you are asking for first, you are simply asking for an extension of the bill this committee and the Congress passed about 2½ years ago, and you are asking for a 2-year extension. Have you added in the measure other things that would be different other than the straight extension?

Secretary BOYD. There is one amendment we would propose, Mr. Chairman, which would have to do with the authorization to purchase land for test facilities. I understand, or let me say this, our lawyers are concerned about the authority contained in the original act for us to purchase or lease land for use as a test facility for the high-speed equipment which we must have if we are going to pursue this program.

I also understand that there is some feeling on the part of the committee that that was clearly authorized in the original legislation, that that was clearly the intent of the committee, and all we are concerned with is being sure that when we move to set up a test facility by purchase or lease of land that we are not violating the law.

Mr. PICKLE. Now, I was a member of the committee when this matter was brought to our attention and in which we put a provision in the law. The intent primarily was that the Department of Commerce then and the Department of Transportation now, would not be acquiring any railroad or railroad facilities as such. You weren't getting into the railroad business or the management of railroads. Is that the intent of your Department at this time? You have no intention of buying a railroad, railroad company?

Secretary BOYD. No, sir.

Mr. PICKLE. In no shape, form, or fashion?

Secretary BOYD. No, sir.

Mr. PICKLE. Then the reason for your section (c) being in the measure then would be primarily to participate in demonstration projects to find better answers to the overall high-speed ground transportation problems, and it is not for the operation or maintaining of any kind of railroad or railroad system; is that correct?

Secretary BOYD. It is strictly for research and development and it is not to engage in operating a railroad.

Mr. PICKLE. I notice your testimony said that this particular amendment would not change in any way the prohibition now in the act against the Secretary's acquisition of any interests in any line or of any railroad.

Secretary BOYD. That is correct, Mr. Chairman. One of the major purposes of this act and of our efforts under it is to provide through

research, development, and testing the kind of facilities which railroads can operate so that somewhere down the line the Federal Government doesn't have to buy the railroads.

Mr. PICKLE. In the pursuit of a proper site for demonstration projects, and assume that language is left in the measure either as written or similar, would it not be the intent of the Department to obtain those sites for research that would be Government owned, or where the Department would not have to go out and buy or lease land at high expense to the Government?

Secretary BOYD. That would certainly be our hope. We have not sought appropriations to purchase land. We are as yet unable to identify a location where we want to place a test site, but of the ones which are under review at the moment, it would appear that we will be able to obtain the land or the use of the land for a nominal figure. Now, we will have to spend some money on drainage and fill and other things of that nature because in the high-speed testing we have got to have pretty level trackage.

Mr. PICKLE. Well, the intent of your Department, would be to use those lands, if such sites would be deemed advisable, that would be governmentally owned and obtained at the lowest minimum cost?

Secretary BOYD. Yes, sir.

Mr. PICKLE. But with the right, of course, to purchase or add to any particular tract if it was necessary to complete the overall picture. Well, that makes sense to me, because we are in a bind moneywise and that would be a sensible approach.

Now, one other question and then I will pass you on to the other members. I notice that your bill, and I see it includes the additional sum of some \$16 million, this would be authorized for fiscal 1969. Could you tell me in a general sense again just how this would be used? Would it be for the continuation of the northeast corridor, the one or two different phases we have in operation now, or for such other demonstrations that might be entered into or that you might carry on?

Secretary BOYD. Yes, sir.

Mr. PICKLE. It is a total figure, then?

Secretary BOYD. That is right.

Dr. Nelson can give you a rundown either orally now or for the record of how we would propose to spend that money.

Mr. PICKLE. Well, Dr. Nelson, I will ask you to give that to us at a later point and not infringe on the Secretary's time at this particular point.

Mr. Devine?

Mr. DEVINE. In that connection, Mr. Chairman, I see in your statement, Mr. Boyd, that I think \$90 million was authorized and only \$52 million had been appropriated for this?

Secretary BOYD. Yes, sir.

Mr. DEVINE. I would ask you, either you or Mr. Nelson, whether this \$16,200,000 that is contained in the bill, section (e) of the bill, is in addition to those amounts; whether this is new money or whether it is budgeted?

Secretary BOYD. It is new money, but it is within the \$90 million authorization.

Mr. DEVINE. I see.

Is it contained in the budget?

Secretary BOYD. Yes, sir.

Mr. DEVINE. The only other question, Mr. Secretary, has to do with your statement in which you said the Government, the railroad, the car builders, and the equipment operators had all been optimistic on this. This doesn't come as any particular surprise to you. Did you really anticipate that this would be off the ground as quickly as they had estimated?

Secretary BOYD. Well, I have learned a lot since then, Mr. Devine. One of the things I have learned is that our colleagues in the Department of Defense who have had vast experience in this area seem to, on the average, miscalculate by about 36 percent on their time, so I don't feel too bad about it. But we were, sure we were, optimistic, and I don't think any of us fully appreciated the complexities of the interfacing of the different systems that had to be put together.

Mr. DEVINE. Do you think the provisions of this particular bill, H.R. 16024, give you sufficient time to at least complete the study and to know the direction in which you are going?

Secretary BOYD. Well —

Mr. DEVINE. Or is this another stopgap measure?

Secretary BOYD. Well, let me say this: I think this gives us—we sought a 2-year authorization. Now, the bill that was introduced is a 1-year authorization. So in that context we certainly would like to have the 2-year authorization to complete this series of projects.

I would not want to leave any inference, however, that we think there will be no further requirement for governmental research and development activities in this area after this is completed.

Mr. DEVINE. But you feel that this particular extension asked for in this legislation gives you sufficient elbow room for your present demands?

Secretary BOYD. Yes, sir.

Mr. DEVINE. Thank you, Mr. Chairman.

Mr. PICKLE. Mr. Kuykendall?

Mr. KUYKENDALL. It is good to have you, Mr. Boyd.

Secretary BOYD. Thank you.

Mr. KUYKENDALL. Can we determine yet this great big \$64 million question as to whether it is going to be feasible to have multipurpose roadbeds? In other words, are we going to be able to maintain the proper ride characteristics on a roadbed that is used daily by freight trains also? Are you that far along yet?

Secretary BOYD. I will have to ask Mr. Lang. He has the technical competence if we have any.

Mr. KUYKENDALL. Don't you agree this is probably one of the first big ones we are going to have to really answer here?

Secretary BOYD. I would guess that the answer is going to have to depend, Mr. Kuykendall, largely on the type of track that is used. I think that it would be possible, and probably is the case today, over some roads in this country. But the track itself is usually not sufficiently heavy to handle freight cars with the weights they have today, with the roadbed being maintained as it generally is, and still provide a decent ride on a passenger train.

Now, the Penn-Central has at its own expense spent a great deal of money to upgrade its track between Washington and New York, and

we think that it is going to prove out to be satisfactory provided they keep their maintenance standards. Is that a fair statement?

Mr. KUYKENDALL. I am sure all three of you gentlemen have visited the Bay area system, probably a great deal more thoroughly than we have, but in my visit with those people I am very impressed incidentally, with their overall project, I was impressed with the extreme amount of care that they seemed to feel they were going to have to take over their roadbed to have an acceptable, and as an ex-soap salesman, may I say merchandisable ride on their car, and you are familiar with their abrasive machines they have for the constant grinding of their roadbed, and the thing that bothered me in seeing this as a necessity here, is whether or not hundreds of miles of roadbed on a widespread commercial system can ever demand that much attention or whether or not we are going to maybe dream of getting steels that will eliminate this almost monthly care to give a kind of a cradle-like ride.

Secretary BOYD. Let me give you two answers to that. One is that the train which we are leasing from United Aircraft to operate between New York and Boston has a novel suspension system in it, which we think will have some beneficial effect on ride quality on what you might call run of the mill maintenance of the roadbed. This we don't know yet.

The other is that in various aspects of our research activities, we are going into this whole question of the rail itself, and it may well be that we come up with a different kind of rail, different kind of connection of the rail to the tie, different kind of ballast. These are all areas which are being researched at the present time. So either or both of these may, in fact, become a reality.

Mr. KUYKENDALL. Two more quick questions: Let me get back to my ancient history background and ask you at what point do you have plans, I am sure you must have plans, at what point do you have plans, to study the merchandising and advertising of this type service, because I think in the end this is going to be one of the keys to the whole thing.

Secretary BOYD. We have been riding the trains for, I think, the last year doing surveys so that we could get a base period and a basic data bank on who the people are now, why they are riding the trains, where they come from, where they go, and so forth, so we have got a base.

As soon as we can get the demonstration moving with scheduled service we will go through the same approach and make a comparison to see what we have accomplished in a market sense.

Now, this is also going to involve, however, in the course of the demonstration, some variations in the demonstration itself, such as differential fare, pricing, depending on time of the day and day of the week. It will also have variations in food service; service at your seat, airline style; and I believe we will have some automatic vending machines, sort of Horn & Hardart, you put your quarter in and you get a bowl of beef stew out, and regular snack bar service. All of these things are going to go into the mix of the study that we will make.

Mr. KUYKENDALL. If you will yield there just a moment.

Secretary BOYD. Yes, sir.

Mr. KUYKENDALL. I would like to get a little more specific because I am very sold on the necessity of this and this is, I think, a terribly

important point because I am convinced that no matter how good this demonstration is if we don't have some Madison Avenue hooked onto it we are not going to be successful because we have got to merchandise our product and I mean, in my opinion, really merchandise it, and—

Secretary Boyd. Let me add one more thing: The Pennsylvania Railroad in cooperation with HEW and Labor is putting, I believe, 4,000 of its employees through charm school. This is the kind of thing that sounds funny but it is an indication of the seriousness, and sincerity, on the part of the Pennsylvania to try to see to it that the public feels wanted when they get on the train and that the fellows who work the trains have all the answers about "what's that going on outside," and "where do I get off," and "what time does the 9 o'clock leave," and things like that.

Mr. SPRINGER. Will the gentleman yield at that point? May I say to the distinguished Secretary that if you can get them over at Union Station to answer the telephone you have accomplished a great deal. My wife was on the telephone for an hour, a week ago Sunday, and never did get any answer for just anyone, anybody even picked up the telephone. I finally called the roundhouse and found out what time the train was going.

Some of this at Union Station is outlandish. I hope you won't talk about getting on the train. I hope you will talk about some service to let one know what time the train leaves, and also some ticket sales to improve the situation over at Union Station.

Secretary Boyd. Mr. Lang and I have just delegated this to Dr. Nelson.

Mr. PICKLE. Mr. Secretary, I noticed in an article that came over the wire services yesterday, an AP story or UPI, which wrote of the case of the vanishing passenger train, and the inference was that the railroad companies themselves were shedding no tears over the fact that the passenger train was out of, going out of, existence. Is this a fact? Is this, in your judgment, an improper interpretation of their attitude or is that story an improper interpretation?

Secretary Boyd. Well, that story, as I understand it, was related to the publication by the Association of American Railroads of a pamphlet called, "The Case of the Vanishing Passenger Train" and it was—the wire service story did not provide the same sort of interpretation of what was involved in this pamphlet that I get out of it.

On page 9 of the pamphlet the report says:

Washington-New York-Boston Corridor is an area where there appears to be a growing need for train service. This is talking about passenger trains. "New multiple high-speed trains developed in cooperation with the U.S. Department of Transportation will be introduced on runs this year in an expensive experiment to determine the extent to which the public will support Tokaido-like passenger service." Tokaido is the line which runs between Tokyo and Osaka. "There is a growing belief in some quarters that passenger trains on 200 to 300 mile runs through heavily populated corridors will be an essential part of the overall transportation picture in future years just as commuter trains already are. If this proves true the rail lines will still be there. Broad new equipment designed and developed to meet the needs of these future years can run on these rails. Meanwhile there is nothing to gain and much to lose by continuing these runs with present equipment."

This is not an indication on the part of the railroad industry that they think the passenger service is gone. What I get out of it is they

are saying with the present equipment they are just not making any headway.

MR. PICKLE. Your testimony indicated that the railroad companies or at least private sources had invested some \$75 million or more.

Secretary BOYD. Yes, sir.

MR. PICKLE. On this venture, more than had been appropriated by the Congress.

Secretary BOYD. Yes, sir.

MR. PICKLE. To me then that would be an indication that they are joining hands and making vast expenditures trying to find an answer. That would in effect refute the fact they are trying to do away with passenger service.

I keep thinking, whether we like this particular approach or not, that generally speaking, railroad transportation is probably the cheapest means of transportation we have, or at least I am led to believe that, and it is about the only hope for mass transportation in some form. So it would seem to me like we must pursue it, at least do the best we can on it.

Mr. Springer?

MR. SPRINGER. Mr. Chairman, I don't have but just one or two observations that I would like to get the Secretary's thinking on.

There have been a lot of changes in 18 years and I will admit when I first came to Washington I went to New York all the time on the train, very seldom flew. Now, I never think of going on the train because I can get there any hour on the hour by airplane. I can be downtown roughly in an hour and 30 minutes if I can get a taxi and it is not too busy a time of day.

Did your studies indicate that with high-speed transportation you can equal this between here and New York City?

Secretary BOYD. Well, there are a couple of factors involved, Mr. Springer. One is that there is a limitation on the amount of and number of aircraft that can fly between New York and Washington. The airways are not limited, but the runways are limited.

MR. SPRINGER. Now, my second observation. If you are going to update, as you say here, the National Airport, Kennedy, LaGuardia, Newark, Boston, and Philadelphia, aren't you intending to make them keep up with the times so that they can carry the load.

Secretary BOYD. Well, let me say in that connection that these—I didn't mean to indicate in my testimony that we were going to upgrade these airports.

MR. SPRINGER. It was my understanding that you have requests in for that, isn't that true? You have statements by the Department of Transportation that certain things will have to be done at O'Hare, Kennedy, LaGuardia, National in the near future if we are going to meet this problem?

Secretary BOYD. Oh, there is no question about that. But my point is that even with the upgrading of these airports, the Department has stated, that all of these airports need to be upgraded—even with that we are not going to be able to handle the traffic demand which is being placed on the system. This is the key item in this whole business, Mr. Springer.

I don't know how valid it was, but in 1965 the State of New Jersey Highway Department ran a survey and concluded that by 1980 they would need 60 additional highway lanes in and out of Manhattan.

Well, you just think about that and it is a manifest impossibility. We are trying all over the country in the airways and airports side to improve the use of the airport through developments of blind landing systems, for example, high-speed turnoffs and things of that nature. But there is still a limit. You can just get so much use of one runway, you can get so many planes on and off no matter how you do it.

I was told by the Port of New York Authority, in connection with the so-called fourth jet airport for New York, that from the time they are able to get a site where they can build the thing, it will be 10 years before the first airplane, commercial airplane, operates off that airport.

Mr. SPRINGER. That was about the story on O'Hare.

Secretary BOYD. Yes, sir.

Mr. SPRINGER. Eight, 8½ to be exact.

Secretary BOYD. The demand is growing at a rate which is just phenomenal.

Now, 3 weeks ago at Washington——

Mr. SPRINGER. Are you taking into consideration though the improvement in aircraft with the jumbo jets?

Secretary BOYD. Yes, sir.

Mr. SPRINGER. In small runs such as Chicago to Champaign, Ill., you are increasing your load in the next 10 years. They will tend to more than double their load capacity.

Secretary BOYD. Right.

Mr. SPRINGER. Yes.

Secretary BOYD. The people at MIT had a study, on the impact of the Boeing 747 which is the jumbo jet on air traffic in the New York area, and what they came up with was a line which shows a continual growth up to the advent of the 747, and then a plateau for 6 months and then the line goes up again. That is the kind of traffic growth we have. And every indication——

Mr. SPRINGER. I would like to see a chart on that because I am not quite getting that kind of information, but if you say that is true you are an expert in the field and your staff ought to know. I would like to have a memorandum on that if I could.

Secretary BOYD. All right, sir.

Mr. SPRINGER. I have seen the figures between now and 1975, but I didn't anticipate we were going to be able to take care of them, I am talking about air growth.

Secretary BOYD. We can't possibly take care of it. Three weeks ago at Washington National Airport, three weeks ago today, were 4,000 movements of aircraft at Washington National, landings and take-offs, in a 24-hour period, and Washington National is geared to a capacity of 2,500 movements.

The result was that many planes were waiting on the ground, or in the air, as much as an hour and 40 minutes. This is getting to be commonplace in LaGuardia.

Mr. SPRINGER. Is this commonplace in Dulles?

Secretary BOYD. No, Dulles is a great airport in every sense of the word.

Mr. SPRINGER. We are going to have to make some adjustments some way.

To wind this up in one thing, this comes in three parts, and you have answered this quite well, as I get your viewpoint at least, are you anticipating higher than the present railroad fares on these Washington to New York, Boston to New York runs?

Secretary BOYD. We anticipate they will be higher fares, we also anticipate some of them will be lower. As I mentioned to Mr. Kuykendall in the course of this demonstration we expect to vary the fares to see what happens, what the impact is on volume of movement.

Mr. SPRINGER. All right.

I was thinking the other day, my daughter coming home from Durham, N.C., on a standby fare, and she shouldn't ride a bus half way for that much money, tourist class, we will say, by air, so this raises some questions in my mind if you are anticipating higher fares than present railroad rates.

Secretary BOYD. Well, even where—

Mr. SPRINGER. But to sum it up, what you are going to do is make a study to determine what would attract them on the railroad instead of going by bus or by airplane?

Secretary BOYD. Yes, sir, but I want to make clear, Mr. Springer, we don't visualize this rail service as being a substitute for bus, automobile, or air. What we visualize is a tremendous increase in the number of people who desire to move. We have absolutely limited capacity, both in our highways and in our airways, and we have to use the railroad, as we see it, as a safety valve. If that doesn't work then we have to go to something else. But that is the way we look at it for the moment.

Mr. SPRINGER. Thank you, Mr. Chairman.

Mr. PICKLE. Mr. Adams?

Mr. ADAMS. Mr. Secretary, I appreciate very much your coming before the committee. I really don't have to read your statement because I have been strongly supporting this project for such a long time, and Dr. Nelson and I have discussed it so many times that I hope we can produce this. Some of us who have worked at great length with the 747 and the airport problems can assure members of this committee that it will not solve the problem particularly in the northeast corridor. So I just want to state we appreciate your being here and I am looking forward to discussing this with Dr. Nelson some more and I hope we can report it out and I hope we can make this project move and that we will not be just creating another "to hell with the day coach" situation.

Secretary BOYD. Thank you, sir.

Mr. PICKLE. Mr. Secretary, 2 years ago one provision of the legislation that was added was an advisory committee of all component parts of the transportation industry to sit in on a conference. Would you care to express an opinion on the development of the advisory committee as we have gone along or would you have one of your people do it?

Secretary BOYD. I would like to provide for the committee the names of the members of the committee, and then give you some views on it. Yes, sir.

The full membership of the advisory committee is as follows: Mr. Robert M. Jenney, president of the Jenney Manufacturing Co., Chestnut Hill, Mass.; Mr. Donald W. Douglas, Jr., president of Douglas Aircraft Co., Long Beach, Calif.; Mr. William B. Johnson, president, Illinois Central Industries, Chicago, Ill.; Prof. Raymond R. Tucker of Washington University, St. Louis, Mo., a former mayor of St. Louis, by the way; Mr. George E. Leighty, chairman of the Railway Labor Executives Association, Washington, D.C.; Mr. Charles A. Webb, president of the National Association of Motor Bus Operators, Washington; and Mr. Milton A. Gilbert, chairman of the board of Gilbert Systems, Inc., New York, N.Y.

We have worked very closely with the advisory committee, and they have taken a very deep interest in this work and have been far more than figureheads. We have worked up our programs in conjunction with them, and I would say that their efforts have been most helpful indeed. Mr. Lang or Dr. Nelson may want to comment further on this, but I think they have been very helpful.

Mr. PICKLE. I am glad to know they have met regularly and you are keeping it all tied together because I think this is important, because this is not just simply a rail matter, but related to the entire transportation field.

Secretary BOYD. Yes, sir.

Mr. PICKLE. Before you go I want to ask your judgment on one other matter that is somewhat different from the high-speed problem we have this morning, but it might be tied in. When we built Dulles Air Field there was an access road, of course, running from the air field to a point near the Beltway, at the silo.

Secretary BOYD. Yes, sir.

Mr. PICKLE. We turn off then at the access road onto the Beltway or into the Madison Highway and then the problem starts. What are the possibilities, and are there any plans, for extending that access road from its present terminating point on into the heart of the city, some 12 additional miles, so that we would have a straight shot from Dulles into the heart of the city? If that extension were advisable could it be adjusted so that the centerlane of that road, the dividing section, might possibly be the high-speed ground system that could take passengers to and from?

Secretary BOYD. There is a possibility of using the right-of-way of the Washington and Old Dominion Railroad which ties in somewhere in that vicinity as part of Route 66, interstate Route 66, which would bring you right down to the Roosevelt Bridge on a limited access highway.

There is also the possibility of using the median strip for high-speed rail facility.

Mr. PICKLE. There is a time for this discussion, and not related directly to this, but I think there is a great deal to be said for extending that access road into a point near the center of the city and provide the median strip a rail system for access to and from the airport.

Secretary BOYD. There has been a very considerable amount—

Mr. PICKLE. You have the making of a perfect demonstration project not only for the airfield which is the largest and probably the best operated in the country but because it has access to a big metropolitan area and I think it has unlimited possibilities.

Mr. Secretary, we thank you for coming and we appreciate your time schedule and you are always welcome before the committee.

Secretary BOYD. Thank you, sir. I appreciate the opportunity of appearing before you.

Mr. PICKLE. We have the other men with the Secretary. Do you gentlemen care to submit your testimony first? Mr. Lang, are you poised and ready?

Mr. LANG. I am poised, Mr. Chairman, but I don't have a prepared statement over and above what the Secretary had and I don't believe Dr. Nelson has either.

Mr. PICKLE. Then neither of you have any prepared testimony and you are therefore available for questioning by the committee.

We will start off then with the gentleman from Tennessee, Mr. Kuykendall.

Mr. KUYKENDALL. I am always surprised when the chairman doesn't say ex-Texan from Tennessee.

I would like to carry the chairman's line of questioning just a little bit further on this matter of Dulles, not so much specifically Dulles but the general attitude here. You know we start talking about high-speed ground transportation as a competitor to air transportation, yet it is going to be both a competitor and a contributor at the same time.

Do you anticipate that, let's say, the high-speed ground transportation system from here to Dulles, which we all know is ultimately going to be essential, do you anticipate this being a publicly or privately owned operation?

Mr. LANG. Well, Mr. Kuykendall, I don't believe we have addressed ourselves specifically to that aspect of the problem yet, because we are concentrating still on the more fundamental question of what kind of a high-speed ground system, that is what kind of technology, can best serve this very special sort situation that we have between here and Dulles and between here and Friendship Airport and which, of course, we have in many other cities throughout the country.

One of the areas that we plan to look into in greater depth than we have had an opportunity to so far under the present program is this specific question of airport access and at this point in time we are particularly interested in the possibility that we could use the existing right-of-way and facilities of the Pennsylvania, or Penn-Central Railroad now, between here and Friendship to put together a "high-speed service" from downtown to the airport which would give us an opportunity to learn more about the characteristics of that market, what kind of people would use a high speed facility if it existed, where would they come from in the metropolitan area, and what kind of terminal facilities would you have to provide for the high speed part of the service, that is in the downtown area?

We have under the existing program collected a large amount of data on the origins and destinations of passengers and others using the three airports in the Washington area. We do not yet have the final report from the research organization that did that work for us although I think we do expect to have it relatively soon.

What we have found in looking at this problem so far is that we still need to know more about the characteristics of these trips to the airport. They are not all by airline passengers, in fact air passengers.

are in the minority, it turns out, and they are not all by any means coming from the downtown part of the metropolitan area. In fact, an increasing number of these trips are starting out in suburban sections of the metropolitan area, and many of them, therefore, will not be reached conveniently by a high-speed system that had its terminus right in the downtown area.

So, to sum this all up, and Dr. Nelson may want to comment further on this problem, we feel that we have both a problem in identifying what the best kind of technology is to be used in this sort of situation, and also a problem in identifying more precisely the structure of the market, both present and future, as it will affect the location of any facilities that might be used, not just in the Washington area but in any major metropolitan area.

Mr. KUYKENDALL. In the testimony before this subcommittee concerning the discontinuance of passenger service by the railroads, I have continually, in my questions and in discussion, pleaded with the railroads not to lose this capability of the whole passenger outlook and I would hope they would just not limit their interest and their investment in things like up and down the Northeast Corridor. I would like to see them interested in things like from here to Friendship, from here to Dulles and so forth because, personally, I would rather see it run by private enterprise if at all possible.

Let me ask one other quick question here just for the record because I think this is something that might well be asked on the floor. What is your experience in the area covered under section (c) of the comparative cost of contracting this testing on land owned by the railroads under specifications, that is contracting under specifications as opposed to buying the land and conducting your own tests. Let's talk not about the philosophy of ownership but simply the matter of cost. What would be your thinking, either of you would answer that?

Mr. NELSON. We have one instance of carrying on a test program on rail property. We had a 21-mile stretch of track upgraded between Trenton and New Brunswick in New Jersey on the main line of the Pennsylvania Railroad.

We were able to upgrade to the point where it was the finest 21 miles of railroad anywhere in the world without any question—and to operate test cars on this stretch of track at a cost which was very, very much less than what the cost would have been if we had had to go out and build a 21-mile stretch of track.

Now, we have had some problems with that in the sense that we have had to carry on the testing program on an operating railroad which has a pretty high volume of traffic. Thus, we have not had the test facility available for 24 hours a day. On the other hand, we haven't needed it for 24 hours a day, and furthermore some of the conditions associated with an operating railroad have been valuable in the test program.

Mr. KUYKENDALL. All right, now, just for the record and to make some history here, would either of you gentlemen care to state here what the conditions could possibly be that would cause you to purchase instead of contract?

Mr. NELSON. Well, we undoubtedly will have to establish our own facility or contract with a firm to establish a facility, and we will have to pay the entire cost for an advanced system, a system that is

not in commercial operation anywhere in the United States or possibly anywhere in the world.

What we particularly have in mind is a test facility—and this would be noncommercial—a test facility for a tracked cushion vehicle. There is such a vehicle operating on the Continent in Europe, none in this country, and at this point it has no commercial usefulness in France although it is expected to within the next year or two. So for a facility of that kind we would have to acquire it directly or pay a contract for the full amount. I don't think there is much question about that.

Mr. PICKLE. Mr. Adams?

Mr. ADAMS. Dr. Nelson, I have gone over in some degree the more detailed report as well as the Secretary's remarks, but I can't from this get in my mind specifically where we are with the three projects. I ask this because I want to see them go ahead much faster than where we are now and I would like to know where we are and what we ought to be doing about it. First, I would like to take the Jacksonville-Washington, D.C., project. There were some announcements, as I remember several months ago we were going to start this and try the piggy-back between here and Jacksonville. Would you tell me precisely where we are in this now, what happened to it, because I notice in your statement it is still in a proposal stage and so far as I know it has never been implemented. I want to ride it once, and I haven't seen it yet.

Mr. NELSON. Yes, sir.

As you probably will recall, we were moving ahead pretty rapidly on this project. However, we did need funds appropriated in fiscal year 1968 to go ahead with the project. These funds were denied entirely by the Appropriations Committee.

Now, we have spent from fiscal year 1966 and 1967 appropriations enough money to have done a number of tests, both of a technical kind and a marketing exploration of the demand for the service. We had also expended some money for the design of equipment. This was after we had made the market evaluations and after we had done the technical testing of the feasibility of carrying an automobile on a railcar.

Then we went ahead and we expended about \$2 million on the design of the train of about 15 cars.

We have also had extensive discussions with the Seaboard Coast Line and we have understandings with that railroad as to how this service should be operated. We also have in mind the terminals in the Washington area and in the Jacksonville area and the Seaboard Coast Line has options on the land.

However, we are unable to go ahead with the project until we obtain funds to build the cars. This is where we have a shortfall, and the Appropriations Committee indicated to us that it felt we should attempt to get private funds to complete the project.

Mr. ADAMS. How much money do you need for the cars? These are the flatcars on which you would drive the automobiles?

Mr. NELSON. These are not flatcars.

Mr. ADAMS. What are they, tell me what they are.

Mr. NELSON. They are newly designed cars, completely new bilevel cars, onto which a driver would be able to drive his automobile.

Mr. ADAMS. And this has been designed?

Mr. NELSON. Yes, sir.

Mr. ADAMS. Has a company indicated that it would produce them for you based on the design?

Mr. NELSON. Yes sir; several companies have indicated a great desire to build those cars provided someone pays them to build them.

Mr. ADAMS. At what cost?

Mr. NELSON. The cost of one train would be about, somewhere about \$7 and 7½ million. That is a train of 15 cars exclusive of the locomotives, the locomotives would add about another million.

Mr. ADAMS. Now have you asked for that in this authorization?

Mr. NELSON. No, sir.

It is not included in the \$16.2 million.

Mr. ADAMS. In other words, the Jacksonville-Washington project is at a standstill?

Mr. NELSON. Yes, sir.

Mr. ADAMS. Until more money is appropriated into it, and you have felt in this program you couldn't go with it, OK?

Mr. NELSON. Well, if I may add—

Mr. ADAMS. You haven't even asked for it?

Mr. NELSON. No; we haven't asked for further money but we have been asking for money from private sources, and the announcement that you are referring to came from the Ford Motor Co., not from the Department of Transportation. The Ford Motor Co. stated that it was interested in this project, and very seriously considering putting up its own money.

Mr. ADAMS. If you got the money from a private source, you could start the Jacksonville to Washington project?

Mr. NELSON. Yes, sir.

Mr. ADAMS. All right.

Let's take the Washington, D.C., to New York project which was over the Penn-Central.

Mr. NELSON. Yes, sir.

Mr. ADAMS. I read in here you have made some contract with them. The first question, did you ever strengthen the total roadbed or what is the status of the roadbed work between Washington, D.C., and New York? Is it capable of handling speeds over 70 miles an hour?

Mr. NELSON. Oh, yes.

Mr. ADAMS. Up to what speed?

Mr. NELSON. It is easily capable of handling higher speeds throughout most of the run. Of course, this varies in different stretches of the track, but throughout a good part of the railroad it can handle speeds up to 120 miles an hour.

Mr. ADAMS. Could you make your 3-hour schedule with the present roadbed?

Mr. NELSON. Yes, sir, very easily.

Mr. ADAMS. All right.

What is your status of equipment, are you going to use the Budd cars on the Penn-Central or another method?

Mr. NELSON. The Penn-Central has ordered from the Budd Co. a fleet of 50 MU cars.

Mr. ADAMS. They have ordered?

Mr. NELSON. They are all built.

Mr. ADAMS. They are built?

Mr. NELSON. They are built. And they are being sort of burned in. They are having technical—

Mr. ADAMS. So that on this project of the 3-hour schedule between Washington, D.C., and New York it is possible for this now to occur within how many months?

Mr. NELSON. Well, the task force, which was set up by the parties involved in the demonstration, made a prediction that it could be in operation within 7 months.

I think that is conservative.

Mr. ADAMS. In other words, within the next fiscal year, by July of next year, you think it will be possible for some of us to get on a Budd car in Washington, D.C., and ride it to New York in 3 hours?

Mr. NELSON. By July first of 1969?

Mr. ADAMS. Well—

Mr. NELSON. I guess if you can't I would have to carry you myself.

Mr. ADAMS. All right.

In other words, you feel within the fiscal year, people are going to be able to see something and get on and ride it?

Mr. NELSON. Yes, sir. Much before that I hope.

Mr. ADAMS. Now, the last one is the New Haven to—can I ask unanimous consent for 1 more minute to ask about the third project?

Mr. PICKLE. The gentleman is recognized for an additional minute.

Mr. ADAMS. On the third project between New York and Boston.

Mr. NELSON. The equipment has been built.

Mr. ADAMS. You are going to use their—

Mr. NELSON. Two turbotrains.

Mr. ADAMS. Terminal trains?

Mr. NELSON. Turbotrains. These are gas-turbine-propelled trains of a new light design. I might point out to you they are over at Union Station this morning, and the committee was invited to go over and I am sure that some of the committee—

Mr. ADAMS. Will they be there during the day today?

Mr. NELSON. Yes, sir.

Mr. ADAMS. So we can get over there and look at them?

Mr. NELSON. Yes, sir.

Mr. ADAMS. The turbotrains are in the terminal and they exist?

Mr. NELSON. Yes, sir, they surely do.

Mr. ADAMS. All right.

What is your roadbed situation on the New Haven?

Mr. NELSON. We have put in up to now a little over a million dollars into the roadbed on the New Haven. We will add about another \$500,000 or \$600,000. This will not by any means result in as good a roadbed as we have between Washington and New York, but it is going to be—

Mr. ADAMS. New Haven roadbed is pretty bad?

Mr. NELSON. Well, it is pretty curvy.

Mr. ADAMS. What sort of speed and schedule and when would you take off on them?

Mr. NELSON. We would hope sometime in the summer, I say hope sometime this summer, and unless there is some unforeseen technical breakdown we will be in operation by the end of the summer, with four round trips a day between New York and Boston.

Mr. ADAMS. How many hours?

Mr. NELSON. In 3 hours and 15 minutes which is a 1-hour reduction from present schedules. Top speeds will be about 120 miles an hour.

Mr. ADAMS. And newly designed cars you mentioned.

Mr. NELSON. Yes, sir, completely new.

Mr. ADAMS. In addition to the turbine power, you will have newly designed cars?

Mr. NELSON. These are integrated.

Mr. ADAMS. These are integrated?

Mr. NELSON. These are self-propelled cars.

Mr. ADAMS. Who designed these cars? Who are they by?

Mr. NELSON. United Aircraft Corp.

Mr. ADAMS. And they are over in the station where you can see them?

Thank you very much, thank you Mr. Nelson, I appreciate it.

Mr. PICKLE. Mr. Watson?

Mr. WATSON. Thank you, Mr. Chairman. I am sorry I was not here to hear the earlier testimony, but I want to ask perhaps one or two questions related to this. I strongly support the effort being made in this field, but as Mr. Lang knows and certainly the other members of this committee and probably a number of people listening know, we have just gone through some experiences in the full committee in reference to rail safety, and, Dr. Nelson, we have had quite a problem there. We were convinced by the Department and many other agencies that railroads, even in their present state, are very unsafe. You stress the fact that we are trying to get the roadbeds to accommodate trains with speeds of 150 miles per hour. What is the safety factor; how is that going to be affected?

Mr. NELSON. Well, we know that the main-line roadbed between Washington and New York on which the demonstration trains will run is at a par in every respect with any roadbed anywhere in the world with the possible exception of the level of the catenary wire. There we have some shortcomings in comparison, for example, with the Japanese. But with that exception, most of that line is at a par with any railroad anywhere.

We have paid particular attention to safety matters in the building of the equipment, and the cars have built into them redundancies in several respects, in braking, in speed control, and so on.

We have put into these cars, and the U.S. Government has paid for this, popout windows so that, in the event of a crisis situation, the passengers can get out of the train quickly. So, these cars have every safety feature that is available at the present time and in some cases we have redundancies in the system which make it almost impossible for any situation to occur which would cause damage or injury.

Mr. WATSON. I heard you earlier say that you have raised—

Mr. PICKLE. Would the gentleman yield?

Mr. WATSON. Yes.

Mr. PICKLE. I want to ask a question related to the aspect of safety that the gentleman from South Carolina has raised. Do you have any figures to indicate the safety record of the Japanese train system, the Tokaido high-speed system?

Mr. NELSON. Yes, we do.

Mr. PICKLE. What have they been?

Mr. NELSON. There have been no accidents of any kind involving passengers in the years since the Japanese system has been in operation. However, there have been quite a number of injuries and fatalities of workmen on the roadbed, but no accidents involving passengers.

Mr. PICKLE. All right, thank you, and I yield.

Mr. WATSON. Let's pursue that a little further. You say there have been quite a number of accidents and fatalities involving workmen on the roadbed. What about other cars and so forth? I have been over to Japan and it is amazing to me that I drive a block without killing people because they are just like this all the time. But what about your crossings, what particular features would you have or would they all be elevated?

Mr. NELSON. Well, as to the Japanese on the new Tokaido line—my comments are to that stretch of railroad—there are no crossings on the new Tokaido line. We have crossings on the main line of the Penn-Central between Washington and New York. There are no grade crossings north of the State of Delaware. We are going to be able to close up some of the crossings. We have spent a good deal of time in conjunction with the States and the counties to improve crossing protection. Everything is being done, I believe, that can be done, to make the crossings that must remain open as safe as possible. You understand we just cannot eliminate the crossings even if we wanted to in time for this 2-year demonstration.

Mr. WATSON. I am sure you will have practical trouble there, but I just thought it would be wise to bring in the safety factor and have a little dialog on that. I imagine Mr. Lang knows that we wrestled with this problem and it is certainly serious. If we increase the speed perhaps, in turn, it would jeopardize the safety factor.

Mr. NELSON. The Penn-Central, formerly the Pennsylvania Railroad, has spent a good deal of money on improvement of the right-of-way. It has already spent some \$32 million and they will finally spend some \$35 million. This has included bridge strengthening and a good part of it has gone into areas where safety is involved.

Mr. WATSON. Just one final question, Mr. Chairman, if I may: I believe we expect the 747's to be in operation by the latter part of 1969 or 1970, Mr. Lang?

Mr. LANG. Yes.

Mr. WATSON. What is the number of passengers they will carry?

Mr. NELSON. It has a variable configuration. Boeing has a number of mockups. One of them is 400, for example. It can go, as I understand it, up to 450.

Mr. WATSON. 450 people. Well, I should think we would be looking at the transportation, ground transportation, problem in trying to take care of these 747's. Someone said, or at least I heard it said, that they have about 19 scheduled to come into Dulles here. With 450 people per plane, there is going to be a problem of getting baggage and people into Washington and over to Friendship, and so forth.

Mr. NELSON. Well, making a determination of the role that high-speed ground transportation can play in the improvement of airport access is a very important part of this program.

Mr. WATSON. Good. Thank you, Mr. Chairman.

Mr. PICKLE. I believe the gentleman from Tennessee, Mr. Kuykendall, has a question.

Mr. KUYKENDALL. I would like to pursue something we got into just momentarily with the Secretary. It is both near and dear to me and something I consider just essential if we are to succeed in this overall program, no matter how good our equipment is.

Do you anticipate the employment under contract, of course, of an advertising agency upon the launching of the really serious part of our tests?

Mr. NELSON. Well, so far as the Penn-Central demonstration is concerned, our contract provides that this is the responsibility of the Penn-Central. The contract is specific, however that the Penn-Central will conduct sufficient advertising to assure the public full information of the availability and the nature of the service. This is stipulated in our contract with the railroad.

To my knowledge, the railroad has made very substantial plans for carrying out advertising programs.

Mr. KUYKENDALL. Even not knowing whether the Penn-Central for instance, intends to employ or use a capable advertising agency? I see a gentleman over here nodding his head.

Mr. NELSON. I would not care to comment on the capability of the advertising agency, but the Penn-Central—

Mr. KUYKENDALL. The reason I am saying this is because I want to make myself clear. I think it is absolutely essential that, no matter how many charm schools the crews have gone to, if an ad is not run telling the public about the charm schools you are not going to get any customers from the charm school. This is a fact of life in merchandising. I respect the railroads' great ability in hauling freight and running railroads, but I have not been a great admirer of their merchandising techniques over the past few years and this is one reason for it.

Mr. NELSON. I agree with you, and that is one of the reasons why we tried to be just as specific as we could in our contract.

Mr. KUYKENDALL. I am trying to be specific here today. I hope they get competent people.

Mr. PICKLE. Dr. Nelson, in the general sense with respect to the project we have been carrying on, are you satisfied with the progress that has been made in your department? Have you been scheduling as much as expected or what is your overall recommendation at this point?

Mr. NELSON. No, sir, I am not satisfied. But maybe I was asking for too much.

We have had difficulties in a number of areas. I am afraid that these difficulties tend to be endemic so I guess I shouldn't complain too loudly. We have had problems in getting qualified personnel onto our staff. This is partly as a result of a general scarcity of knowledgeable, capable and competent people in this field, which is a heritage of a number of years of lack of attention to these problems. However, I must say that the current very buoyant level of economic activity of the economy as a whole has made it much more difficult to attract good people into the Government. So I would say we have not been as successful there as I wish we had been.

Secondly, I think it is fair to say we have not been as successful in dealing with the industry, despite the fact that I believe the industry is doing the very best job it can. I am speaking now of the rail industry and the rail equipment supply industry. I would have hoped that the industry would have been able to attract more resources and to commit more resources to this field. I am particularly disappointed that we have not had a greater interest in this program from the industries which have been associated with space, defense and aeronautics.

Mr. PICKLE. Now, have you asked them for assistance?

Mr. NELSON. Yes, sir.

Mr. PICKLE. In what way have they not cooperated?

Mr. NELSON. Well, in my judgment, we have not had as much interest in our program in the sense of following up with proposals for research and developments. I perfectly well understand why they haven't. Vietnam has had a great impact on these firms, and the tremendous expansion in demand for air transportation has affected a good many of them, but you asked me where I felt we had not—

Mr. PICKLE. Are you saying that, if these defense industries or defense-oriented industries could pursue this type of a project with the same resources that we would make a great deal of progress?

Mr. NELSON. Yes, sir.

Mr. PICKLE. But on what basis should we have expected this? We haven't had money really to pursue this with them.

Mr. NELSON. I think this certainly is a major problem. We had authorization for \$90 million, but we were cut back to \$52 million in appropriations.

Mr. PICKLE. Well, the appropriation we have before us now, the \$16.2 million that you are asking can't do much more than carry on the present work and possibly set up a demonstration site somewhere at the same time.

Mr. NELSON. Yes, sir.

Mr. PICKLE. And your sum, your request of \$16.2 million is for a 1 year appropriation?

Mr. NELSON. Yes, sir. That is fiscal year 1969.

Mr. PICKLE. Now then, a year later you will submit then a recommendation for fiscal year 1970 or 1971?

Mr. NELSON. Yes, sir.

Mr. PICKLE. And would it be anticipated that it would be larger than \$16 million?

Mr. NELSON. Yes, sir.

Mr. PICKLE. Assuming our financial picture is improved.

Mr. NELSON. The figure the Secretary mentioned in his testimony was \$36½ million.

Mr. PICKLE. I see.

Mr. NELSON. But that is not in the President's budget. The 16½ million is in the President's budget.

Mr. PICKLE. Yes, that is budgeted.

Mr. NELSON. Yes, sir.

Mr. PICKLE. And we have a letter from the Bureau of the Budget indicating that was in the budget for that particular year?

Mr. NELSON. Yes, sir.

Mr. PICKLE. Has there been any delay with respect to the building of cars? Have you had to wait for the cars to be manufactured or the roadbeds to be prepared or have they been dovetailed close together.

Mr. NELSON. Well, the Pennsylvania Railroad had its roadbed largely upgraded by October of 1967 when we had hoped to start the demonstration.

Mr. PICKLE. At their expense?

Mr. NELSON. Yes, sir, at their expense.

The cars were not built at that time. To some extent this reflects an underestimation of the complexity involved in building the cars, but also to some extent it does involve the generally strained situation of the resources in the American economy today. It is difficult to get competent people in sufficient numbers. There have been delays in materials. For example, United Aircraft was held up for some 54 days because the Air Force had taken an aluminum press. There have been a number of instances of that kind where the Department of Defense has had priority and the needs of the carbuilders have simply had to stand aside.

Mr. PICKLE. Did you wish to ask any questions, Mr. Adams?

Mr. ADAMS. Yes, I wanted to ask a question and make this statement. Last Friday I went to New York on the shuttle which was to leave at 4 o'clock. I left the office at about 3:15 and the shuttle finally left at 4:30. I got into LaGuardia about 5:30 and downtown sometime after 6. I just want you to know that when you start the train schedule between New York and Washington, D.C., if we can go to that terminal here in a cab and be dropped in the center of New York City in 3 hours, it is very attractive to at least some of us. So I hope you will inform us in accordance with the question of the gentleman from Tennessee about advertising. I think if you let us know we will be there, thank you, Mr. Chairman.

Mr. PICKLE. Dr. Nelson, I wish that you would furnish for the committee for possible inclusion in the record a breakdown of how the \$52 million has been spent.

Mr. NELSON. Yes, sir.

Those figures appear in the explanatory statement submitted earlier by Secretary Boyd.

(See p. 9 and appendix B, p. 32.)

Mr. PICKLE. Also in what categories and, as much as you can, how you anticipate the additional sum you are asking for now will be spent.

(Information requested follows:)

## HIGH-SPEED GROUND TRANSPORTATION 3-YEAR PROGRAM

[In thousands of dollars]

	Fiscal year 1969	Fiscal year 1970	Fiscal year 1971
<b>I. Research and development:</b>			
Systems engineering .....	1,000	1,000	1,000
High-speed railroad R. & D.:			
Research car field testing .....	300	500	500
Rail vehicle dynamics .....	1,900	2,305	470
Vehicle suspension and guidance .....	400	300	3,500
Experimental track structures .....	200	200	200
Vehicle drive systems .....	800	1,300	300
Unconventional systems R. & D.:			
TACV .....	2,900	10,800	2,900
Tube vehicles .....	1,000	4,260	2,475
Advanced technology:			
Communications and control .....	340	2,050	5,900
Obstacle detection .....	300	500	1,350
Linear electric motor .....	1,400	1,085	1,000
Magnetic suspension .....	146	300	500
Power collection .....	400	2,820	3,250
Guideways .....	750	1,000	2,000
Safety and human engineering .....		370	571
Test facility .....	950	1,800	1,375
Administration .....	434	500	500
<b>Total .....</b>	<b>13,220</b>	<b>31,090</b>	<b>27,791</b>
<b>II. Demonstrations:</b>			
New York-Washington demonstration .....	630	400	100
New York-Boston demonstration .....	260	800	100
Data collection .....	1,200	1,000	1,000
Airport ground access .....	500	2,850	2,500
Administration .....	390	390	390
<b>Total .....</b>	<b>2,980</b>	<b>5,440</b>	<b>4,090</b>
<b>Grand total .....</b>	<b>16,220</b>	<b>36,530</b>	<b>31,881</b>

Mr. PICKLE. I want also to voice what I am sure is the feeling of every member of this committee and the Congress that, as we consider this problem, we must keep in mind we are trying to find ways to improve passenger service and not ways that we can cut out passenger service. I get discouraged sometime about the lack of volume on the trains, but I think we must admit it is because railroad passenger service simply has not kept pace, hasn't been modern.

Mr. NELSON. Yes, sir.

Mr. PICKLE. And I think the railroad companies themselves will admit they have spent their money in other areas not in passenger service.

I said earlier this morning that railway transportation ought to be probably the cheapest mode of transportation we have and it is about the only hope to move large bodies of people, so we must pursue the possibility in this thing.

Two years ago we had some concern, I was one, that this might be pouring good money after bad. I am convinced that we must carry it on. I personally think that the answer will lie perhaps not in our rail system we are talking about now, but something entirely innovative, even a tube type of train system.

Mr. NELSON. Yes, sir; right.

Mr. PICKLE. But we must find ways to move these large bodies of people and I just hope that you pursue this demonstration project with all the vigor that your Department has, and that you institute a good test facility somewhere so that all phases of these types of systems can be tried, because therein lies our answer and our hope of mass transportation.

Mr. NELSON. Yes, sir.

Mr. PICKLE. Does anybody else have any questions?

Mr. WATSON. Mr. Chairman, may I ask Mr. Lang, as I understand some of these turbotrains or at least some cars are down at the station now?

Mr. NELSON. Yes, sir, Union Station.

Mr. WATSON. I recall we were invited to take a ride to Bowie or something. Will that be available during the day?

Mr. LANG. Unfortunately, Congressman Watson, they are going to have to take the trains north at noon, so I am afraid that the opportunity has been missed.

Mr. NELSON. We have 10 minutes.

Mr. LANG. They made runs at 9, 10, and 11 o'clock. The runs were originally scheduled last week and we had to take them off.

Mr. WATSON. At what speeds?

Mr. LANG. 110 miles an hour. I rode the 9 o'clock run. It was the first opportunity I had had to ride the trains. I had seen them before, and I must say the ride was extremely gratifying to me, because they do a good job and I think they offer real promise for a little bit of revitalization of passenger business in this country.

Mr. PICKLE. When are these trains going to come back that you just made reference to?

Mr. NELSON. These trains will not be back in Washington now. This is the last time they will be in Washington.

They will now go up to New England and run, to be seen in New England for a week or two, and then we are going to start crew training and hope that we will go into operation very shortly.

Mr. PICKLE. I noticed that there was a statement by one official in the paper this morning which was in considerable criticism of the Pennsylvania system, the manner in which the train bearing Senator Kennedy's body and the group accompanying him was conducted. Do you care to comment on the conditions of the cars, the tracks, the safety provisions or the lack of them?

Mr. NELSON. I would be happy to, but I think Mr. Lang should.

Mr. LANG. Well, Mr. Chairman, I don't know that I am fully informed of the precautions and the special arrangements that the Penn-Central made in connection with that train, but I do know they felt they had done everything they could to assure safety of bystanders and watchers.

Mr. PICKLE. Well, I thank you gentlemen for appearing before the committee. If there are no other questions—

Mr. LANG. Mr. Chairman, there is just one other slight thing I think perhaps would help clear up the record.

The Secretary earlier when he was here in referring to the authorization levels associated with this program suggested, I think incorrectly, that the \$16.2 million, which is in the President's budget for fiscal year 1969, were under the original \$90 million authorization. That, of course, is not so since the \$90 million authorization was for fiscal years 1966, 1967, and 1968, and the \$16.2 million in the President's budget for fiscal year 1969 would have to be authorized by the bill which is before you this morning.

Mr. PICKLE. I don't know as I understand you. You are asking for a sum of \$16.2 million in addition to the original \$90 million that was asked?

Mr. ADAMS. The \$90 million was asked but never given.

Mr. NELSON. The remainder of the \$90 million has now expired.

Mr. PICKLE. So this is not in addition, you are just asking for a total of \$16.2 million?

Mr. LANG. That is right, we are starting out all over again, so to speak, with this new authorizing legislation.

Mr. PICKLE. I understand.

Well, thank you, gentlemen, again for coming. The committee is adjourned.

(Whereupon at 11:55 a.m., the hearing was adjourned, to reconvene at 10 a.m., Thursday, June 13, 1968.)

The committee's report when it was first published in the  
annual report, suggested that the 1955 budget should be  
revised to show a deficit of \$100 million. The original budget  
was \$1,000 million and the revised budget was \$1,100 million.  
That of course is not so. The \$100 million deficit was  
based on the 1955 budget and the \$100 million deficit was  
based on the 1955 budget. The \$100 million deficit was  
based on the 1955 budget and the \$100 million deficit was  
based on the 1955 budget.

Mr. Boardman: I don't know as I understand your question  
as to the \$100 million deficit in the original budget. It was  
asked.

Mr. Boardman: The \$100 million was asked in the original  
budget. The remainder of the \$100 million has now expired.  
I don't know as this is not in addition, you are just asking for a  
total of \$100 million.

Mr. Boardman: That is right, we are starting out all over again, so to  
speak, with this new budget legislation.

Mr. Boardman: I understand.

Mr. Boardman: Thank you, gentlemen, again for coming. The committee is  
adjourned.  
(The hearing was adjourned at 11:55 a.m. The hearing was adjourned  
at 10:00 a.m., June 18, 1955.)

## HIGH-SPEED GROUND TRANSPORTATION— EXTENSION

THURSDAY, JUNE 13, 1968

HOUSE OF REPRESENTATIVES,  
SUBCOMMITTEE ON TRANSPORTATION AND AERONAUTICS,  
COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE,  
*Washington, D.C.*

The subcommittee met at 10 a.m., pursuant to notice, in room 2318, Rayburn House Office Building, Hon. Samuel N. Friedel (chairman of the subcommittee) presiding.

Mr. FRIEDEL. The meeting will come to order.

This is a continuation of the hearing we had yesterday on H.R. 16024 to extend for 1 year the act of September 30, 1965, relating to high-speed ground transportation.

I am sorry I had to leave for another committee yesterday, and one thing I want to have cleared up is that the House bill calls for 1 year, the Senate bill calls for 2 years, and the Secretary would like to have it extended for 3 years.

I have the figures here, requested at yesterday's session. The amount requested for fiscal year 1969 would be \$16,220,000, for the year 1970 it would be \$36,530,000, and for fiscal year 1971 it would be \$31,881,000.

Our first witness this morning will be the senior vice president of the Penn Central Railroad, Mr. Robert Minor. You may proceed.

Mr. DEVINE. Mr. Chairman, if you will yield, I would like to say Mr. Minor is an old friend of mine originally from the Columbus, Ohio, area, and who has made great progress in the railroad industry and I am happy to welcome him as a witness.

Mr. MINOR. Thank you, Mr. Devine.

Mr. FRIEDEL. I understand you are a former Marylander.

Mr. MINOR. Yes, sir.

### STATEMENT OF ROBERT W. MINOR, SENIOR VICE PRESIDENT, PENN CENTRAL RAILROAD

Mr. MINOR. I am very happy to support the extension of the High Speed Ground Transportation Act. Penn Central recognizes the need for orderly and efficient program planning and concurs with the recommendation made yesterday by the Secretary of Transportation that you consider extending the act for 2 years instead of 1 year.

We at Penn Central are optimistic over the prospects for success of this marketing demonstration. The so-called Northeast Corridor between Washington and Boston—with its burgeoning population, high concentration of industry and ever-increasing urbanization—

offers a timely and promising opportunity to test the market demand for modern, high-speed rail passenger service.

We are convinced that high-speed rail transportation offers the best solution to the transportation problems in our multiplying urban corridors. It is clearly the most economic means of moving large numbers of people through crowded metropolitan areas.

The unacceptable alternative is a steady worsening in the ability of our highways and airways to handle peakloads. The resulting congestion threatens health and safety and represents a growing economic loss in wasted man-hours. We cannot continue to strangle our cities and stifle our economy for want of solutions that are obtainable today through technological innovation, creative marketing, and ambitious promotion.

The time to unplug our arteries of commerce is now—before the spiraling rise in intercity passenger traffic overwhelms us. The High Speed Ground Transportation Act is the vehicle by which we may determine the sure course to our objective—the maintenance of the high degree of personal mobility that is essential to a dynamic society.

Under the leadership of Transportation Secretary Alan S. Boyd, Federal Railroad Administrator A. Scheffer Lang, and Dr. Robert A. Nelson, director of the Office of High Speed Ground Transportation, we have made significant progress in developing the potential for high-speed rail passenger service in the Northeast Corridor.

Penn Central's participation in the development of high speed passenger service between Washington and New York has been right on schedule. We have dedicated our best efforts, assigned top engineers and technicians and have spent substantial amounts of money to help assure the success of this program.

Once the decision was made to participate in this program with the Department of Transportation and various railroads suppliers, Penn Central embarked on an extensive 2-year program to upgrade its roadway and related facilities between New York and Washington.

The track upgrading program alone included the following requirements: new welded rail, 298 miles; rail surface grinding, 302 miles; track raising and tie renewals, 352 miles; ties renewed, 388,000; switch timbers installed, 160,000 lineal feet; joint welding and reformed splices, 67 miles.

In addition, we constructed the new high-level train platforms at Wilmington, Baltimore, and Washington, and at Baltimore we now have in operation a moving ramp for the convenience of passengers and their baggage. We completely rebuilt Penn Central Station in New York and extensively modernized Union Station in Washington. Other improvements included upgrading our electrical system, installing the most modern signaling devices and replacing the standard-weight overhead power wire, the catenary system, with heavy-weight wire.

By October 1967, all necessary plant improvements were completed and Penn Central was ready for operation of the Metroliner service.

We have already spent \$31,740,000 of our own funds on plant improvement to prepare for high-speed service. We have an additional \$17 million scheduled for investment in the project. The Penn Central roadbed between New York and Washington now is the finest in the Nation.

In addition we are investing approximately a million dollars in a training program for some 2,600 employees in all categories of service. This is in cooperation with the Departments of Labor and the Department of Health, Education, and Welfare which are supplying an additional half million dollars to assist in the training of employees for the Metroliner service.

We are experimenting now with a new dining service on our regular trains in which parlor car passengers are served meals in their seats. This airline style food service will be a feature of the Metroliner service and has been extremely well received by our customers.

The new Metroliner cars will be the finest passenger cars in the world for this type of service. We are employing the best of the tried and proven components combined with the latest developments in all fields of technology.

The performance characteristics of the new Metroliners far exceed those of the cars on Japan's new Tokaido line, the world's only true high-speed service in daily operation. The Metroliners have an accelerating rate of 1 mile per hour per second from zero to 100 miles per hour compared with 0.68 mile per hour per second for the Japanese trains. Motors produce a maximum of 2,560 horsepower per car versus only 1,120 per car on the Tokaido line. Many of the freight locomotives in service today on the major railroads have 2,500 horsepower so you can compare the power in these passenger cars.

The Japanese trains have reached 159 miles per hour in testing, but in production operate at speeds up to 130 miles per hour. Our specifications call for a maximum speed of 160 miles per hour with a six-car train, and we have already exceeded that figure and reached a speed of 164 miles per hour with two cars.

Because of our high strength and higher performance requirements and our different electrical supply system, the Metroliners are somewhat heavier than the Tokaido cars. To complement such safety features as the strongest car body, sturdy cast steel trucks, the largest passenger car axles, and the absence of any flammable fuels aboard the train, we have also insisted upon a superior braking system. In fact, there are three braking systems: dynamic (electric braking), electro-pneumatic which is a combination of electric and air, and straight pneumatic in the air brake system. We specified these systems not only to make these high-speed cars safe, but to provide the high rate of deceleration essential to our reliability meeting the proposed operating schedule.

Another development is the new hook-type coupler, designed especially for this service. It represents a complete departure from anything ever before used in long-distance intercity railroad operations. We were able to specify such a coupler because the equipment is not being interchanged with other railroads. The new design gives us a strong, tight, self-locking coupling between cars. Instantaneously, it makes or breaks the mechanical, electrical, and pneumatic connections. There are 102 contacts in the couplers which provide passage for the various electrical circuits between the cars.

One of the two propulsion systems employs a silicon controlled rectifier system using thyristors for phase-shift voltage control. This is the first time that such solid state devices have been employed on

railway passenger cars in the United States or on any railroad propulsion equipment having such high horsepower.

We have in these cars a high degree of sophistication unmatched anywhere in the world. When the Metroliners are operated as an eight-car train (with a seating capacity of 472 passengers), they in effect are equivalent to a train of eight locomotives. They will contain more than 70 miles of wire and some 25,000 electronic components.

Obviously, we were disappointed when the cars were not ready at the same time our plant improvements were completed. However, many of the individual problems delaying our acceptance of the cars and, ultimately, the demonstration, have already been identified by the various builders and equipment suppliers. Substantial resources have been and are being dedicated to the prompt resolution of the remaining problems—and we are confident they will be overcome soon.

When the Metroliner service is ready to begin, we will employ every practical modern marketing technique to “merchandise” the new concept. The public will be advised, informed, and enticed through an extensive multimedia advertising campaign.

Now, our motives are not purely altruistic. As I said we have invested \$32 million in the Metroliner project already. By the time the demonstration begins we will have some \$50 million of our own money at stake. We want to get a return on it and we are confident—and will make every effort to insure—that our investment will produce a reasonable return.

Moreover, and perhaps more important, in terms of long range public benefit, the return will more than justify the relatively modest Federal investment in this program. We strongly urge that the High Speed Ground Transportation Act be extended for an additional 2 years.

Thank you very much.

Mr. FRIEDEL. I want to thank you, Mr. Minor, for your very fine statement and for the progress you have made.

One thing I was hoping you would dwell on is something which has been in my mind for a very long time. To get passengers back on the trains, you have to provide ample parking at the stations, and I think that ought to be one of the things brought into the picture, too, because people nowadays don't mind driving a few miles to a train station if they can get the proper parking space there. I hope in the future your plans will provide for ample parking space around the station. If this is done I think you will get a lot of passengers back on the train that you have lost.

Mr. MINOR. We are well aware of that problem, Mr. Chairman. As a matter of fact, the plans for the National Visitors Center here at Union Station contemplate the building of a quite large garage.

Mr. FRIEDEL. 4,000 cars.

Mr. MINOR. 4,000 cars over the train sheds in back of the existing station.

In our suburban areas, and this will apply to certain of the stations between New York and Washington, there are plans for building new stations to serve large areas of the surrounding suburb and areas with ample parking space. This is true in Maryland and also in New Jersey.

Mr. FRIEDEL. I am glad to hear that.

Mr. MINOR. Yes, sir.

Mr. FRIEDEL. Mr. Devine?

Mr. DEVINE. Mr. Minor, I see in your statement where you say your industry is right on schedule. Yesterday, Mr. Boyd testified, I don't believe you were here at the time, but he pointed out and I quote from his statement.

The Task Force also found that all concerned with the project, government, railroad, car builder and equipment operator, were overly optimistic with respect to the planning and scheduling.

And apparently you haven't run into this problem in Penn Central.

I would also like to commend your company for investing what ultimately will be \$50 million in this project of your own funds, and it is a good thing to have people coming before congressional committees not asking for Federal funds to do everything. I think your position on the bill is quite sound and I appreciate your testimony.

Mr. MINOR. Thank you.

Mr. FRIEDEL. Mr. Kuykendall.

Mr. KUYKENDALL. It is good to have you, Mr. Minor. Let me delve into an area that we talked about some yesterday and which I think is awfully important. I know you are not quite at this stage yet but I know enough about this phase of the business world to know that you have to start considering this quite early.

Basically how are you going to market this commodity?

Mr. MINOR. Well, as I included in my statement, Mr. Congressman, we intend to market this through advertising to insure that the public is well aware that the service exists and what the service is. In other words, that they can travel from the heart of New York to the heart of Washington in 3 hours.

Now, this in and of itself, I think, when they begin to compare the driving time to the airports, spend an hour and a half circling Washington Airport like I did last night, when you measure this time from center city to center city against the elapsed time center city to center city by air I think we are going to be competitive and I think a lot of businessmen who will need to come from Washington or from Philadelphia down to New York will want to use our convenient service.

Mr. KUYKENDALL. Let's be a little more specific here. How long do you anticipate giving to this marketing test?

Do you not agree with me you are not going to have a sudden success?

Mr. MINOR. No, sir; I agree with that, yes, sir.

Mr. KUYKENDALL. And I think if we give the impression here we are going to get a sudden success we have done a disservice.

Mr. MINOR. Let me put it this way, Mr. Kuykendall, we are going to push an advertising campaign and a marketing campaign, and by marketing campaign this includes adjustment of schedules, changes in the confirmation of the cars, whatever is necessary to maximize the number of people who are going to ride this train, and we are going to push it as long as we have to until it is successful because we have got too big a stake in this. Now, I am talking over a period of a couple of years.

Mr. KUYKENDALL. I heard the remark yesterday given, I don't know whether it was Dr. Nelson or someone else, who mentioned the fact

you were sending some of your people to charm school, and this rather excited me, only if it is merchandised right. I like to see the old conservative, staid railroad industry thinking about something glamorous because, in my opinion, it is going to have to be glamorous to sell it, just that glamorous, because I don't think the fact and figures are going to sell it. I think you are going to have to get people excited and get people talking about it. I think it is going to have to become the thing somehow to ride a train Washington-New York instead of ride an airplane.

Mr. MINOR. We are very hopeful that we will be—that this will be done with enormous competence. I might point out to you that the Penn Central and its predecessor companies were the initial companies in the U.S. rail companies to set up marketing departments in our companies, based primarily at that time on freight marketing but certainly the same principals are applicable to the passenger traffic. I appreciate your comments and we intend to have a real go at it.

Mr. KUYKENDALL. Thank you, sir; and I appreciate the very constructive part your company is playing in this far-moving program.

Mr. MINOR. Thank you.

Mr. FRIEDEL. Mr. Devine?

Mr. DEVINE. Mr. Chairman, may I ask two clarifying questions, please?

Mr. Minor, I don't understand what a thyristor is. Would you for the sake of the record—it says “our propulsion system employs a silicon controlled rectifier system using thyristors for phase-shift voltage control.” Will you describe what this is?

Mr. MINOR. I told Dr. Stevenson earlier that I knew I was going to get that question.

Yes, sir. A thyristor, as I understand it, is an electronic device, solid state, which operates as a valve does on a hydrant, it slows down or increases the amount of voltage which flows through, and these are set in series so this tremendous voltage can be brought down to workable levels in the operation of the train, for control purposes.

Mr. DEVINE. Fine.

The other question, perhaps you can describe it in layman's terms, you have a new type hook coupler, is there any way you can describe that?

Mr. MINOR. Yes; I can describe that. In appearance the coupler is unlike any of the couplers we are all familiar with, the standard interlocking coupler.

Mr. DEVINE. Yes.

Mr. MINOR. In appearance this coupler has a face of approximately 1 square foot, perhaps a little larger, and across this face are 102 different connections, so that when the two faces of the cars being coupled come together each of the 102 electronic control circuits is automatically—

Mr. DEVINE. Drawn together.

Mr. MINOR. Drawn together. The pneumatic system, the air hose system is also drawn together in this way.

You see the problem with an innovation of the sort in the railroad industry is that we are, we necessarily must be, uniform throughout the industry because we interchange cars so much.

Now, in this case, happily, we don't have to interchange these cars with anyone, we keep them local to our railroad so we can innovate all we like and this is an enormously significant development not only for this train, but for all trains in the future.

Mr. DEVINE. Thank you very much.

Mr. KUYKENDALL. Will you yield?

You mentioned electronic connections for coupling, and the first thing that pops into my mind is the possibility of the electronic failure creating a lack of coupling. I know this—I think we ought to clarify it in the record.

Mr. MINOR. Yes, sir.

It would not create the lack of coupling. It might create an interference in the control system. These electronic connections have nothing to do with holding the car together, the two cars together. They have to do with relaying impulses through the control system of the entire string of cars to make them responsive to the engineer's electronic controls.

Mr. KUYKENDALL. I see.

Mr. MINOR. Someone described this car as being a rolling computer in a very unfriendly environment, and I think it is a very good description.

Mr. FRIEDEL. Mr. Minor, I just want to ask two questions: One, in your opening statement you said that you consider extending the act for 2 years instead of 1 year?

Mr. MINOR. Yes, sir.

Mr. FRIEDEL. And my opening remark was that I understand Dr. Nelson would like to have it extended for 3 years. What is your opinion on that?

Mr. MINOR. I have no feel for that, Mr. Chairman. If the subcommittee would like—we think that 1 year is probably too short. We think that in the interests of orderly planning and programing 2 years would be better, but 3 years would be fine.

Mr. FRIEDEL. All right.

One other question now: On page 2, you said track operating programs are including the following requirements, and I notice one is track raising and tie renewals 352 miles. What is the track raising?

Mr. MINOR. We have highly mechanized equipment, Mr. Chairman, which operates both on and off track. This particular device goes down the track and lifts the rails off the ties in order to permit a realignment of the rails and replacement of the tie bars, the rail anchors, where necessary, and generally a renovation of the rail, and we have gone 352 miles this shows.

Mr. FRIEDEL. Thank you.

Mr. MINOR. Thank you, sir.

Mr. FRIEDEL. Any other questions? Thank you very much.

Our next witness will be the Secretary of Commerce of the Commonwealth of Pennsylvania, Mr. Clifford Jones.

STATEMENT OF HON. CLIFFORD L. JONES, SECRETARY OF  
COMMERCE, COMMONWEALTH OF PENNSYLVANIA

Mr. JONES. Thank you, Mr. Chairman, and members of the subcommittee. I most appreciate being allowed the opportunity to testify. We did not realize the hearing would be on as short notice as it was and thus I do not have prepared testimony. I will have to speak from notes.

My name is Clifford L. Jones. I am Secretary of Commerce of the Commonwealth of Pennsylvania. I would like to speak to you not only in that capacity but also as vice chairman of the Governor's Science and Engineering Foundation and as the governmental counselor assigned to Governor Shafer's Science Advisory Committee.

I am here to testify in favor of the extension of the high-speed ground transportation program for 3 years.

The Commonwealth is most appreciative, without even having been asked, to have the Northeast corridor extension run through one of our metropolitan areas, namely the Philadelphia area, and we are also cognizant of the fact that some of our Pennsylvania industries have been responsive and have bid successfully on various contracts in what we consider to be the new mode of transportation for the very near future.

We have not been just "reaping where we sowed not" for we, too, have sowed.

Our research and evidence and facts that we have uncovered to date in Pennsylvania make us believe that the new technology in the field of ground transportation is a must for Pennsylvania if we are to continue our economic development.

I thought you would be interested in our commitments on this new role of high-speed ground transportation from the Commonwealth's point of view since 1966, and I have present in the hearing room our staff member, Mr. William Underwood who will help me if I falter in questioning, who has been responsible for our coordination on high-speed rail projects in, high-speed projects of all types in, Pennsylvania.

Our commitments include a study, with the then Carnegie Institute of Technology, on the Keystone corridor in Pennsylvania. It also includes a study of the transportation industry of Pennsylvania which was completed in 1966, what we call the Klauder report, which is a study also financed by the Commonwealth of Pennsylvania on high-speed passenger service connecting between Philadelphia and Harrisburg on electric lines and connecting to the Northeast Corridor which is under discussion today; and finally a much larger study and we have had such a demand for it I only have mimeographed copies of it now, on what we call the Westinghouse study on the demand, supply, and economic impact of transport in the Keystone corridor through Pennsylvania and the metropolitan area and markets of the Midwest. This study covers the entire section of Pennsylvania from the point of view of all types of high-speed ground transportation.

We feel in Pennsylvania, because of our geographical location, that we have had to be a pioneer in transportation. The fact of the wagon trails and old turnpikes, and these had State monetary support and local and State government helped the canals and the railroads; the first east and west highway pioneer of the turnpikes was the Pennsyl-

vania Turnpike, and our present highway program in Pennsylvania is the astronomical sum for us of a billion dollars, and this is not just for Pennsylvania, but to open up arteries to the east and west and north and south, and we have been conscious, too, that this can't be done with just Federal dollars.

In the Appalachia program where we have been allowed 70 percent for north-south highways per mile, the State has used less than 50 percent, we have purchased our own right-of-way, we paid for our own engineering and design, and because we believe in the tomorrow as well as today we have built these highways four lanes instead of two lanes so we can open up Appalachia north and south for tomorrow as well as today.

I mention that because our past secretary of highways, Henry Harrel, and our present secretary of highways, Robert Bartlett, believe firmly that it is not possible for new highways alone to solve the problems of passenger and freight transportation.

One of our metropolitan areas alone is costing now to acquire, just acquire, not build, a new highway, \$40 million a mile.

We do not believe that you can continue with just highway development with its displacement of people and businesses, it is bisecting of important and vital recreation and wilderness areas, and we believe there must be new methods of technology and ground transportation particularly when existing rights-of-way can be used with costs for welded steel rails at \$60,000 a mile or \$120,000 for two tracks, and we came here to tell you that we are going to continue to do our part in advancing the goal and developing this new technology in ground transportation now and you have our commitment that our State, both at a governmental level and at a private industry level, will do everything it can within our capabilities and resources of funds to help pioneer this new effort.

Therefore, we would like to urge that you continue in your efforts here which have been so pioneering and we think will be so worth while in the future. Thank you for letting me testify.

Mr. FRIEDEL. I want to thank you, Mr. Jones, for your very fine statement, and for the work that you have done to help speed up this ground transportation system.

Could we have a copy of those three reports of your studies there for our record or files?

Mr. JONES. Yes, sir, I will be happy to supply these to you. May I mail them or would you—shall I leave these three that are here?

We further have committed ourselves to joining the northeastern corridor on a ground transportation rail project for passenger service between central Pennsylvania, specifically Harrisburg as its terminal point, and Philadelphia with connecting links through your Northeast Corridor project.

To date we have committed ourselves for \$2,035,000 for this project which involves the purchase and engineering of these costs.

As of yesterday, awards were made from our Science and Engineering Foundation to Carnegie-Mellon in Pittsburgh for a grant for resident professorships and visiting professorships in the field of high-speed ground transportation and a scholarship grant to the Urban Transit Council of Pittsburgh for the University of Pittsburgh, again in this same field.

The Governor has recently created a transportation committee with a budget of \$600,000, \$300,000 of which are appropriated funds and \$300,000 were donated by Pennsylvania industries and foundations to make a systems approach to all forms of transportation in Pennsylvania, and in particular studying high speed and new methods of transportation.

Recently the Olmsted Air Force Base phased out of existence in Pennsylvania and the majority of this property had been turned over to the Commonwealth for airport usage, educational usage and some industrial usage, and among the plans in mind for the huge parking lot in that airport in conjunction with the city of Harrisburg we are planning a new transportation terminal to include both air, bus, and rail, at which this new demonstration study that we are proposing will undertake in the 4 years of its life, and incidentally that is one of the reasons that I am testifying for 3 years is that our contract with the Penn Central Railroad lasts for 4 years on our demonstration project on this route.

Gentlemen, I don't think I have to say to you, because you know it better than I do, that commerce, growth, and jobs depend on transportation. As evidence, you have heard of the Penn Central Railroad commitments, they have made a commitment to us of \$2.5 million for the purchase of these cars, or 11 cars for our demonstration project, plus operating and maintenance costs for the 4 years, and in Pittsburgh a group of industrialists, Westinghouse, Mellon's, United States Steel, universities have formed an Urban Transit Council, they have helped organize a transportation institute at Carnegie-Mellon and they have funded two transportation conferences in the city of Pittsburgh which have been international in scope and character.

Mr. FRIEDEL. Leave them with the staff.

Mr. JONES. All right, I will do that.

(The documents referred to were placed in the committee files.)

Mr. FRIEDEL. Mr. Pickle, any questions?

Mr. PICKLE. Mr. Chairman, thank you.

Mr. Jones, I certainly agree with your statement in the first page in which you point out—I stand corrected, I was reading the statement of Mr. Minor. May I ask then what is your organization, whom do you represent?

Mr. JONES. I am secretary of the Pennsylvania Department of Commerce. I am also vice chairman of their Science and Engineering Foundation in Pennsylvania.

Mr. PICKLE. Well, I was handed the statement of Mr. Minor, and I thought you were Mr. Minor.

Mr. JONES. I must apologize because I did not realize the hearing would be today and I did not know it until yesterday and I was at a meeting all day and did not have time to prepare written testimony.

Mr. PICKLE. I will ask you in general, do you think that the companies, that is Pennsylvania Railroad system, and the Department of Transportation are working in harmony and that you are making significant progress on this, the east corridor problem?

Mr. JONES. Yes, sir.

We will be meeting on our own corridor project this afternoon with the Pennsylvania Railroad in Philadelphia. I feel they are making every effort, there has been some, as you know technological problems

in cars but from the Penn Central's point of view I think on this project they have really demonstrated they want to move ahead and not hold back.

Mr. PICKLE. Is Mr. Minor still here, Mr. Chairman?

Mr. MINOR. Yes.

Mr. PICKLE. I don't propose to call you to the stand now, but after other witnesses are finished I would like to ask Mr. Minor some questions.

Mr. DEVINE. I want to compliment the gentleman. The absence of a prepared statement certainly did not bother your testimony. Thank you very much.

Mr. JONES. Thank you, Mr. Devine.

Mr. FRIEDEL. Thank you.

#### FURTHER STATEMENT OF ROBERT W. MINOR

Mr. PICKLE. If Mr. Minor will take the stand I would like to question him briefly. I was saying, I thought you were Mr. Minor. I did agree that the high-speed rail system properly was the most economical and probably held the best hope for us to economically move people and, therefore, we must pursue our efforts on it now.

On page 2 of your statement—

Mr. MINOR. Yes, sir.

Mr. PICKLE (continuing). You point out that you have dedicated your best interests, assigned your top engineers and technicians and spent a substantial amount of money to help assure the success of this program.

Yesterday I was handed a little pamphlet of "The Case of the Vanishing Passenger Train," which led one of the wire services to prepare a feature story which said the passenger train was going if not gone and the railroad companies were shedding no tears over it. Does this represent the sentiment of your organization?

Mr. MINOR. No, sir.

Where there is a public need for rail transportation, demonstrated public need capable of supporting rail transportation, we are all for it, and I think the best evidence of that is the fact that we intend to spend and have spent already a substantial part of \$50 million in this program.

Mr. PICKLE. I thought you testified it was around \$32?

Mr. MINOR. \$32 so far, we have \$17 more to go.

Mr. PICKLE. That was going to be my additional question, \$17 you plan.

Mr. MINOR. Yes, sir.

Mr. PICKLE. During the pursuit of this project?

Mr. MINOR. Yes, sir; that is correct.

Mr. PICKLE. I am glad to hear that. One reason I ask you that, 2 years ago I had some rather heated conversations with a representative of the Penn Central and I had the feeling then that your official, I hope it wasn't you—

Mr. MINOR. I don't think so, Mr. Congressman.

Mr. PICKLE. I had the feeling then that they just more or less resented the fact that we were raising questions about what the company or the lack of things that the Penn Central and other railroad com-

panies were doing. To me though, after 2 years of operation, if you have spent \$32 and are going to spend another \$17 or \$18 million it would indicate to me your intent is to pursue this to the fullest, and I compliment you for it and I hope you maintain this position. We must find an answer.

Mr. MINOR. Indeed we do.

I must make our position perfectly clear, Mr. Congressman. When you are talking about the longer runs then there is doubt as to the future of the long haul passenger train.

Mr. PICKLE. I would agree with this. I think surely we are talking about the metropolitan or the urban movement between urban areas.

Mr. MINOR. We think there is a great market there and we are going to find out.

Mr. PICKLE. Now, I noticed yesterday or the day before yesterday that one representative of the trainmen, brakemen, but anyway one of the employee representatives, had considerable criticism about Penn Central about the movement of the train and entourage of Senator Kennedy as his body was being brought from New York to Washington. He had several things to say about the poor service, the poor cars, the brake going out, the accident that occurred on the tracks. Would you care to comment on this?

Mr. MINOR. In general; yes, sir.

I hope you will forgive me if I do not comment in detail on the accident at Elizabeth. That is a matter that involves legal liability. We are at present conducting a thorough investigation of that, the investigation is not complete, and I think anything I would say about the details of that would be at best premature.

As far as the other comments made by Mr. Charles Luna, who is president of the Brotherhood of Railway Trainmen, who was the author of the editorial—

Mr. PICKLE. Yes, sir.

Mr. MINOR. We think it was both unfair and unwarranted. He commented about the consist of the train and the mixture of cars. But those cars were selected from our available inventory of cars by representatives of the Kennedy organization by type or car. Consequently, it was impossible for us to provide a train that was made up entirely of, for example, stainless steel cars. We simply don't have a stainless steel car with the configuration they needed.

As far as the scheduling of the operation is concerned, that train was scheduled to make that run in 4 hours and 10 minutes. The train was delayed for two reasons. One, for safety, and two, at the request of the members of the Kennedy organization who were aboard the train, so that the people lining the tracks would have an opportunity to pay their last tribute to Senator Kennedy.

Mr. PICKLE. I would assume then that your report will be put together as quickly—

Mr. MINOR. On the accident; yes, sir.

Mr. PICKLE. As quickly as you can.

Mr. MINOR. Yes, sir.

Mr. PICKLE. Would you furnish this committee a copy of such report that you make?

Mr. MINOR. We will be glad to supply the committee any material which can be made public as a result of the investigation; yes, sir.

Mr. PICKLE. I understand.

Mr. Chairman, if I may make one more observation to the gentlemen who is representing the Penn-Central. Two years ago I was somewhat of a reluctant dragon on this demonstration project. I didn't know whether we were going to be pouring good money after bad and we have had some delays and some heartbreaks in the progress of the schedule of this project. The more and more I look at it it seems to me we have got to pursue the possibilities on this thing. I think your organization as just representing one railway company in the United States, you will have to admit you have been derelict in your business in pursuing improvement in the field of passenger service or these mass transportation approaches, at least I think that we have also in Government been slow to do something about it and I think you people have. I think we have to join hands and do this thing with full intent about it.

Mr. MINOR. Let me say in answer to that, Mr. Congressman, we have—I would not accept the word “derelict.” We have devoted our less than adequate capital each year to projects on which we could show some return, but to ask us to invest capital in a business which overall is running at an annual rate of loss of \$100 million a year for the Penn-Central alone, is something that we cannot in the best interests of our company do.

Mr. PICKLE. I can't accept that, Mr. Minor. I don't wish to argue the point. I can't accept it at all. The fact you are suffering this \$100 million loss is because you haven't done something about it in the last 50 years, you have basically the same type of service you had 50 years ago and I think we could have prevented this type of loss if we had done something about it 50 years ago, perhaps the Government was shortsighted about it, but the fact is we haven't. But there is no use arguing the point. We have to go from here forward as I see it.

Mr. MINOR. I don't want to argue, certainly, but the New York Central alone spent a quarter of a billion after World War II in completely reequipping its passenger fleet and advertising that fleet and trying to attract people to the rails, and the consequence of that was that our deficit went to \$58 million in 1957. We have made the effort.

You know what the experience of the Santa Fe Railroad has been. No one has been more aggressive in trying to get the long-haul passenger back to the rails and they finally have given up. We will serve the market where the need is, Mr. Congressman.

Thank you very much.

Mr. FRIEDEL. Thank you very much.

Our next witness is Dr. Thomas G. Fox, Mellon Institute, Pittsburgh, Pa.

Mr. Fox. Mr. Chairman, Congressmen—

Mr. FRIEDEL. Pardon me, Mr. Fox. Congressman Irwin is now here to testify. The Chair recognizes our colleague from Connecticut.

STATEMENT OF HON. DONALD J. IRWIN, A REPRESENTATIVE IN  
CONGRESS FROM THE STATE OF CONNECTICUT

Mr. IRWIN. Thank you, Mr. Chairman.

Forgive me for being late. I should have been here at 10 but I had an appointment that kept me.

Mr. FRIEDEL. We understand.

Mr. IRWIN. I have come here to testify briefly and informally on the matter that is before you.

I want, first of all, to congratulate the committee for the work it has done in this field, and to encourage you to continue to give a hand in this field. I know the chairman of the subcommittee lives in that great northeastern metropolitan area which faces a very critical problem in this field right now. The other two gentlemen come out from the open spaces, and I am very, very grateful to them for the thought and attention they have given this problem which isn't as serious for them as it is for us.

Mr. Pickle just said that he was a reluctant supporter of this legislation when it first came before the committee. Yesterday morning I was on the turbotrain that United Aircraft is working on under this program, and I wish that I had thought of calling you all up to come out and look at it. I don't know if any of you got to see it yesterday.

Mr. PICKLE. No, we did not, Mr. Irwin. We had wanted to, but it left.

Mr. IRWIN. I don't know whether it is still in town. It is not in town. But the next time it is in town I will make a special point of getting you down because I think it really forcefully indicates what can be done and what should be done and what perhaps hasn't been done.

Your colloquy with Mr. Minor just now, I think, underlines what the problem has been. We are all delinquent in a way. The great highway expansion programs of the last 15 to 20 years have had their impact and, in fact, they have accelerated the loss of revenue traffic to the railroads, and I don't know who we blame for that.

The public itself has enjoyed this great new freedom that the automobile has given it, and yet in the Northeast we see that this is not the long-term solution. I come down here once a week and return every weekend, and I find myself, for example, driving by automobile from Norwalk, Conn., into LaGuardia Airport because that is where the frequent service is from.

The traffic tangles around New York in the morning are fantastic and I really wonder how the people who drive into the city every day do it, and whether any one has given much thought to the tremendous expenditures involved in driving cars into the city every day, the pollution that is created, the ulcers that are promoted. What it does to their health, it seems to me, must be brutal, and yet no one has thought about stopping this. We do need some real breakthroughs in ground transportation, something between the plane and the automobile.

I think here in Washington we have a very dramatic situation and that is the Dulles Airport and its use, and I think the breakthrough some day will come when we figure some way to get people out there quickly. You are going to need real high speeds. There is no question, for example, that unless trains can get close to the 200 miles an hour speed you are not going to get a change in travel habits.

Mr. FRIEDEL. Include Friendship in there, too.

Mr. IRWIN. Yes, Mr. Chairman, that is correct.

But I hope that the subcommittee will be able to approve the request that has been made. I think that a long-term commitment will be helpful and, as I said, this turbotrain shows what can be done. For example, one of the things that this train has is a radically new form of suspension.

Now, you made the point we have got old equipment and old ideas. This is true not only in terms of the technology but even in the attitudes toward travel. I mean the railroads really haven't been trying to get people to travel by train for quite a few years now. They don't advertise that way, they don't service that way, they are stuck even with old attitudes as to how you get people to travel. But we are all to blame, I think. I don't think it would pay us to try to retrace our steps and find out where the fault lies because we will find every one of us shares in the inability to see what we should have done.

So I hope the committee will be able to approve a program that will look beyond just the next year, hopefully for 3 years, because I think some real good work has been done.

Mr. FRIEDEL. Thank you very much. Any questions?

Mr. IRWIN. Thank you.

Mr. PICKLE. Mr. Chairman, I just want to welcome our colleague here this morning. He rightfully points out that he lives in the Northeast area, and in a sense my heart goes out to you, but you have to accept things.

Mr. IRWIN. We are happy to see the growth that is going on in Texas, Mr. Pickle, and we want to assure you that sooner or later if you do as well as you should you are going to have the same problems.

Mr. PICKLE. We may have but our situation will be a little different inasmuch as the gentleman before you pointed out the passenger service for long hauls may not be as feasible as it was 50 years ago and we have to accept that.

Mr. IRWIN. I understand that. I am talking about——

Mr. PICKLE. Between our areas between Dallas and Fort Worth, yes.

Mr. IRWIN. That is what I am talking about.

Mr. PICKLE. Perhaps even in that area into the Houston area.

Mr. IRWIN. Yes.

Mr. PICKLE. I compliment you on your interest and the fact you come here and I am glad to know you lend support to this measure. The gentleman from Connecticut is a very active, energetic, and expressive member of our delegation and it is always good to see him.

Mr. IRWIN. Thank you, Mr. Pickle.

Mr. FRIEDEL. Mr. Devine.

Mr. DEVINE. I too would like to commend my colleague from Connecticut, and a close personal friend, and I appreciate his statement. If you will pardon a personal reference, in the 1940's I was stationed in New York City and spent about 3 hours a day commuting by bus to the New York Central—to Grand Central Station—where I then took a subway and it was quite a trip. So I understand your problem of getting from Norwalk to the airport. I would say also that it takes me longer to get from Dulles or Friendship to the District of Columbia than it does for me to fly from Columbus, Ohio, to fly to either of these two airports, and again referring to Mr. Minor's

problems with progress and whether or not passenger traffic is economically feasible, my experience in coming from Columbus, Ohio, to Washington, it costs me \$48.10 and 13½ hours by train where I can come for less than \$25 and less than an hour by air. So these are progress problems, and we would hope this high-speed ground transportation would help solve our problems.

Mr. IRWIN. I think, Mr. Devine, that that illustrates the problem in such a clear way. We have spent tremendous amounts of money to make the air transportation what it is today, and it is absolutely magnificent. We shouldn't for a minute forget what a great convenience it is. When I first started coming to Congress I used to drive from Connecticut here by car and it would take me, I will say, a little over 5 hours to make it, and it is a rough, rough trip. I hope there is nobody from the State police here. But it was a tough, tough trip. It took a lot out of me and dangerous, frankly, to do that every week. So we have got a lot to be grateful for. But it is very obvious that there is one very weak link and that is that mode of transportation that is halfway between the automobile and the plane, and there we have to make some real progress. We have to put money into it. We put money into all these other areas of transportation, large amounts, and now we have to do the same thing here so we can catch up at this level.

Mr. FRIEDEL. Thank you very much.

Now, Dr. Fox, you may proceed.

**STATEMENT OF DR. THOMAS G. FOX, SCIENCE ADVISER TO THE GOVERNOR OF PENNSYLVANIA, CHAIRMAN, GOVERNOR'S SCIENCE ADVISORY COMMITTEE, AND CHAIRMAN, PENNSYLVANIA SCIENCE AND ENGINEERING FOUNDATION**

Mr. Fox. Thank you, Mr. Chairman, and Congressmen.

I appreciate the opportunity to visit with you here. First, I am the Governor's science adviser in Pennsylvania and chairman of his Governor's Science Advisory Committee, and chairman of the Pennsylvania Science & Engineering Foundation.

I too, do not have a prepared script. I learned about this yesterday as I was giving a lecture in a university in New York State.

The airway system, which I also find inconvenient in this instance, delayed us 4 hours sitting in the airport and I got in at 3 a.m. this morning, so if I am a little incoherent I hope you will excuse me.

Now, I think I don't really have anything to add in specifics to what I have heard here this morning and what I am sure you have heard many times. But I do want to—I think I represent the scientific community in Pennsylvania. Back in 1962 Governor Scranton said to the science community "we have a lot of new knowledge and a lot of new science. There are needs, human needs. What is it that we should be doing for the future?" And the question of economic growth, of course, was involved in that, and the question of meeting the needs of our society.

Now, I don't want to draw this out, but we did send out a letter to 400 Pennsylvanians in the science community, in industry, in universities, and in Congress, generally. This was in 1963 before this present program. Of course, defense and space were the technological ad-

vances that were most in people's minds and receiving most attention in those days. I am very proud of the fact that our science community, our technological community, our industrial community in Pennsylvania spotted a lot of the growing human needs at that time, the needs to control environment, to clean up pollution, the needs to move people around. So this led to a dedicated effort in Pennsylvania to these problems.

You have heard the Secretary of Commerce report to you on several studies in depth that have been going on since then. I think it boils down to this, I am from the science community, we put a lot of money in science and new knowledge and now the question is how can we use it to meet human needs today, to advance our economy, to move people around and make our society viable and to improve the quality of life.

I think, I am not talking about long-distance transportation of people, although I think I am talking about long-distance transportation of freight which we are—the growth of the freight load is tremendous, it clogged up our highways, it is now going to the rail, but the growth in the volume of rate ahead is terrific.

The problem of urban transportation and inner-city transportation, of course, is a tremendous one.

So I think, in short, what we have is a shortage of capacity. We cannot build highways fast enough, air cannot carry the volume of freight and the volume of people, so in our transportation system we face a shortage of capacity, particularly for freight and particularly, high-speed freight and for people between cities, and in urban areas.

Now, we have the technology, we have the scientific know-how to create any technology we wish, and the question is will we turn now to develop the technology needed for this.

Now, the urban problem is critical right now, and the quality of life, moving people around locally and between cities, that is a critical problem right now.

I believe that the business of moving freight will be a critical problem within the last quarter of this century.

If we are to meet this we must develop technology from knowledge. Developing it efficiently and economically you can't do it overnight. So we must turn to this question and begin now, as we have, and continue developing the technology needed for this purpose.

I think the history of this country is of developing the technology it needs, particularly in transportation. We had the turnpikes in the early days, we had rail and steel developed just at the time we needed them and they were a tremendous impact on our Nation and our economy. The auto came along at a time, we were coming out of a country industrial life to an urban life, air came along, the air transportation came along at a good time. We have emphasized those. We have the highways of the midcentury, we have the air traffic, air technology is terrific, both of these have received big Government support. We have rail technology of the last century, and I submit we can't enter the last part of this century and the beginning of the next century comfortably with the rail technology of the last century. We are very pleased in Pennsylvania to support efforts along this line as you have heard. We are very pleased that the Federal Government has been so aggressive in supporting this, and I think that prudence would dictate

that we continue to support the program of high-speed ground transportation now and in the coming years.

Thank you.

Mr. FRIEDEL. I want to thank you, Dr. Fox.

Mr. Pickle, any questions?

Mr. PICKLE. Thank you, Mr. Chairman.

Dr. Fox, I enjoyed your testimony. As I understood what you were saying is that we have actually got an urban crisis now.

Mr. Fox. That is right.

Mr. PICKLE. In moving not only people but of freight, is that correct?

Mr. Fox. In the sense that the highways get clogged by the trucking and complicate the movement of people and goods particularly in the urban areas, I think we have a problem right now, yes.

Mr. PICKLE. This questionnaire that you said your institute sent out—

Mr. Fox. Yes, sir.

Mr. PICKLE (continuing). To some 400 scientists.

Mr. Fox. And industrialists.

Mr. PICKLE. This was sent out in 1963?

Mr. Fox. 1963, yes, sir.

Mr. PICKLE. Has anything been sent out in the last 5 years?

Mr. Fox. We have a continuing program, as a result of this there was a Governor's Science Advisory Committee formed and on that are 20 Pennsylvanians representative of industry and of universities and of various technologies throughout the State. This is a voluntary, unpaid committee which nevertheless works very hard both in its committee meetings and in its panels which add other Pennsylvanians to its committees, so we have had a continuing. Also we have had a Governor's Transportation Committee which is a larger segment of Pennsylvania, I think there are 50 Pennsylvanians on it and there is a technical committee, representatives of the main committee, with also about 50 representatives so we have worked very hard on these matters in a continuing fashion.

Mr. PICKLE. The study of your urban crisis just one of the projects that the Mellon Institute is pursuing.

Mr. Fox. Sir, I happen to be a scientist at the Mellon Institute which is now part of Carnegie-Mellon University. My role as Governor's science adviser is an unpaid part-time role although over 50 percent of my time and the studies we are making are not Mellon Institute studies, they are Pennsylvania studies made by these committees and subcommittees and by paid consultants and grants and so on.

We have, for example, established the Pennsylvania Science and Engineering Foundation in Pennsylvania attached to the department of commerce. Now, the purpose of this is to invest moneys in looking into problems of the future and to seed activities in the universities, like the Transportation Research Institute at Carnegie-Mellon, for example, it happens to be local but it is just an accident, and we have invested \$1.4 million of Pennsylvania's taxpayers money

into these kinds of things, in environmental pollution, health care, transportation and so on.

Mr. Jones, secretary of commerce, I think commented on this and I think if I have any purpose here it is to try to impress you that the scientific community and the industrial community and the political community in Pennsylvania are working together very hard, and voluntarily, a lot of high paid men working free for this, seriously on these problems. What can science do to develop technology to better the human condition.

Mr. PICKLE. Do you speak for this group of scientists, generally speaking?

Mr. FOX. Well, I am the Governor's science adviser. I am the chairman of the Governor's science advisory committee and I am the chairman of the Pennsylvania Science and Engineering Foundation so in an official sense, yes, sir.

Mr. PICKLE. Your statement that you need to develop a technology is a rather strong statement particularly when you add that you have got the rail technology of the last century.

Mr. FOX. Yes, sir, I think —

Mr. PICKLE. That is some sort of an indictment to the entire industry.

Mr. FOX. No, sir; I would agree with those who have said that, here that, I don't think anybody is to blame. I believe when we needed rail we developed it and we utilized it. When we needed the automobile and the highways we put our energies in that and we became enamored over them. They served us well up until this point of getting clogged locally. We needed the airplane and we put the effort in and we are still putting it in to make sure we have an advanced technology there. When I say we, transportation has been mainly developed with not private funds over the history of our country but private and governmental funds. This is an area, I believe that we have agreed that the private sector can't do it alone. We, as a group, we as a people must work on it. So I think that if you—if highways are serving you well and aircraft are serving you well and you don't yet have a critical problem railroads aren't going to make money out of it and it is going to be difficult to put money into it. I think that must be turned around. I think your efforts and the efforts in Pennsylvania and other places are turning it around and I think that is important.

Mr. FRIEDEL. They will pay off, that is your opinion?

Mr. FOX. Yes, sir.

Mr. FRIEDEL. Anything else?

Thank you, Dr. Fox.

Mr. FOX. Thank you.

Mr. FRIEDEL. I was looking forward to the pleasure of hearing from the next witness, Mrs. Gladys Spellman, chairman of the Board of Supervisors of Prince Georges County. She is a dynamic figure and I was looking forward to seeing her, but I understand she was taken ill yesterday and I hope it is nothing serious and she will have a rapid recovery. But we have Mr. John Marburger to present her case.

You may proceed.

STATEMENT OF GLADYS NOON SPELLMAN, CHAIRMAN, BOARD OF COUNTY COMMISSIONERS, PRINCE GEORGES COUNTY, MD.; PRESENTED BY JOHN H. MARBURGER, JR., ADMINISTRATOR, DEPARTMENT OF PUBLIC WORKS

MR. MARBURGER. Mr. Chairman, my name is John H. Marburger, Jr., and I am the administrator of the Department of Public Works for Prince Georges County. I have a statement that Mrs. Gladys Noon Spellman, chairman of the board of county commissioners has asked me to present for her as she could not be here in person because of a rather sudden virus attack. Here is her statement:

"My name is Gladys Noon Spellman and I am chairman of the Board of County Commissioners of Prince Georges County, Md.

"I am delighted to appear before this committee in support of H.R. 16024 to extend for 2 years the High Speed Ground Transportation Act of 1965.

"The Washington-to-New York demonstration project has special meaning to the people of Prince Georges County and we commissioners who serve them.

"As I am sure all of you know, we hope to have in the near future a new railroad station in our county at the junction of the Penn-Central Railroad and the Capital Beltway and near the John Hanson Highway to Annapolis.

"This station, first suggested by our own citizens and chamber of commerce, has received the wholehearted support of the county government. Obviously, the Capital Beltway station, used in conjunction with the new high-speed trains, will be a boon to the entire Washington metropolitan area.

"Prince Georges County was asked more than 21½ years ago to demonstrate its concrete interest in this new facility. This we did—both with time and money. And we know that a lot more will be needed before the station is built. These we will also provide.

"To abandon this project and others equally worth while at this stage of development would be costly and illogical.

"I claim no special knowledge of railroads or their problems. But I do read a lot about the disappearance of passenger trains from the American scene. It seems to me that the Office of High-Speed Ground Transportation, which is directly affected by this legislation, is the only organization I have heard about that is trying to put passenger trains back into our way of life. In cooperation, of course, with the Penn-Central.

"We have enjoyed an excellent working relationship with representatives of the Office of High-Speed Ground Transportation and the entire Department of Transportation. To us, this relationship has represented the best in intergovernmental cooperation—a field in which I have a special interest.

"Thus, I urge you to approve speedily H.R. 16024—not solely for our new station, but for all the other fine programs currently underway by this agency which hold out such great promise for the future of mass transportation."

That is Mrs. Spellman's statement.

I would like to add that the county, at its own expense has spent a considerable amount of time and money making feasibility studies for location of this station, and we have completed plans for the grading and construction of a 2-acre parking lot adjacent to the proposed station, the construction of this work can be advertised for bids immediately and construction could be completed in 60 days.

We have entered into an agreement with the Maryland State Roads Commission for a 15-acre parcel of land, if that much is necessary for parking facilities, and all arrangements have been made for access roads. In other words, Prince Georges County is ready to go.

I understand that there has been some difficulty about the station platform being erected on railroad property, and then reverting to the railroad at the end of the demonstration period. I sincerely hope that this problem can be speedily resolved, and that this very needed project can get on its way. We believe that this station at Lanham will serve the people, not only of Prince Georges County, but the people of southern Maryland in St. Marys, Calvert, and Anne Arundel Counties because it would be so easy to get to because of the beltway, and we certainly would like to see this project on its way.

Mr. FRIEDEL. I am very familiar with that.

Mr. MARBURGER. Thank you, sir.

Mr. FRIEDEL. I want to thank you for your statement. I am very familiar with the site and extend my best wishes for a speedy recovery to Mrs. Spellman.

Mr. MARBURGER. Thank you, sir.

Mr. FRIEDEL. Just a little bit about Lanham: You made a statement there was a little legal problem about building the platform in the station. Can you elaborate on that a little bit?

Mr. MARBURGER. This I have been informed by the Department of Transportation people. We, of course, have all the necessary facilities ready to go or rather planned for the parking lot itself.

Now, of course, the station platform would be on the railroad property, and I am certain that Dr. Nelson can expand on this.

Mr. FRIEDEL. Now, this parking lot that you are speaking of, will that cost the Government any money?

Mr. MARBURGER. The county government; yes, sir.

Mr. FRIEDEL. The Federal Government?

Mr. MARBURGER. No, sir. Only the county government, and we have already spent approximately \$20,000 for feasibility studies and plans and we are prepared to spend approximately \$160,000 to develop the first portion of this. We have an agreement with the State roads commission, this was surplus land that the State roads commission had, and they have given us an option, a 3-year option, on this land, for 2 acres at this time and the remainder if we need it for this project.

Mr. FRIEDEL. Well, I want to compliment the people of Prince Georges County for being so farsighted.

Mr. MARBURGER. Thank you, sir.

Mr. FRIEDEL. And looking ahead, and as I said earlier I believe a lot of passengers will come back to the trains if they can provide park-

ing at the station, and you are already way ahead, you have ample space.

Mr. MARBURGER. We think we are.

Mr. FRIEDEL. I want to thank Mr. Marburger. Any questions?

Mr. PICKLE. Mr. Chairman, I appreciate the testimony of Mr. Marburger and I also want to compliment Prince Georges County for the initiative they are showing for providing the parking space and for preparing in other ways to be ready to take advantage of this demonstration project.

I would also want to say to you simply that we think highly of Mr. Dixon here, our counsel, and when he thinks highly of someone, you come highly recommended.

Mr. MARBURGER. Well, thank you, sir. He has been very kind—

Mr. FRIEDEL. Thank you.

The meeting now stands adjourned.

(The following material was submitted for the record:)

CONNECTICUT STATE TRANSPORTATION AUTHORITY,  
Hartford, June 12, 1968.

HON. HARLEY O. STAGGERS,  
Chairman, Interstate and Foreign Commerce Committee,  
House of Representatives, Washington, D.C.

DEAR REPRESENTATIVE STAGGERS: It has been brought to our attention that your Committee has scheduled hearings on Thursday, June 13, 1968, on the matter of continuation of the High Speed Ground Transportation Act. I regret that we cannot have representation at this meeting, but ask that this letter be made a part of your record. We would be pleased to testify at any future session of your hearings on this matter.

Pursuant to existing legislation, a high-speed demonstration program will be operated between Boston and New York, through Connecticut, over the New Haven Railroad shoreline route, by use of high-speed turbine powered trains. This demonstration program is vital to the continuation and improvement of essential rail service serving the State of Connecticut and the northeast area of the nation. The results of initial tests have indicated that this newly designed railroad equipment can greatly reduce the rail travel time between Boston, Massachusetts and New York City, which will result in relieving highway and air travel congestion, since this fast rail service will be competitive with these other modes of transportation.

We urge most strongly that your Committee report favorably upon the continuation of this vital program. We must breathe new life into this essential industry in which virtually no research has been conducted for many years.

The State of Connecticut, in cooperation with the States of New York, Massachusetts and Rhode Island, is presently supporting the operation of the bankrupt New Haven Railroad with both tax relief and almost \$7 million per year in cash support. Connecticut and New York, with the assistance of the Department of Housing and Urban Development, are sponsoring an \$80 million Connecticut-New York modernization program. We are committed to improve railroad facilities, purchase 144 new high-speed cars and rehabilitate 100 of the most recently built New Haven cars.

The New York-Boston high-speed train demonstration is not a subsidy program for the New Haven Railroad. This demonstration will develop potential utility of high-speed rail passenger service. For this reason, Connecticut has committed \$500,000 per year in cash support for this program.

We believe that the nation cannot rely on our crowded highways or congested airplanes to meet our transportation requirements. We must make more effective use of our most efficient means of ground transportation—our indispensable rail system.

We ask your favorable action on this bill.

Sincerely,

FRANK M. REINHOLD, *Chairman.*

STATE OF NEW JERSEY,  
DEPARTMENT OF TRANSPORTATION,  
*Trenton, N.J., June 12, 1968.*

HON. HARLEY O. STAGGERS,  
*Chairman, House Committee on Interstate and Foreign Commerce, Rayburn  
House Office Building, Washington, D.C.*

DEAR CONGRESSMAN STAGGERS: I understand that hearings have been scheduled by the House Subcommittee on Transportation and Aeronautics of the House Committee on Interstate and Foreign Commerce with regard to H.R. 16024 which will extend the High Speed Ground Transportation Act of 1965 and authorize further appropriations for this important program.

The New Jersey Department of Transportation has worked closely with the U.S. Department of Transportation and the Office of High Speed Ground Transportation since the inception of this program. We believe that the experimental and research programs being conducted by this agency are of great benefit to the entire spectrum of transportation. The demonstration projects, particularly for the Boston to Washington corridor, are also of inestimable value to this nation at a time when transportation modes complementary to our highway system are desperately being sought.

This Department has been gratified by the fact that the Governor and the legislative leaders of this State have publicly indicated their support for this Department's public transportation program. Last March, the New Jersey Department of Transportation recommended that the sum of \$200 million be provided for public transportation purposes in this State by way of a bond referendum. Legislation to authorize a bond issue of this size for public transportation has been agreed upon and is now pending before the New Jersey Legislature.

The New Jersey program is predicated upon a continuing and reasonable level of effort by the Federal government. We, therefore, strongly support the request of the U.S. Department of Transportation as it is set forth in H.R. 16024.

Sincerely,

DAVID J. GOLDBERG,  
*Commissioner of Transportation.*

---

ILLINOIS CENTRAL RAILROAD,  
*Chicago, Ill., 14, 1968.*

HON. HARLEY O. STAGGERS,  
*Rayburn House Office Building,  
Washington, D.C.*

DEAR MR. CHAIRMAN: My purpose in writing you is to recommend extension of the High Speed Ground Transportation Legislation as proposed in H.R. 16024.

As I am sure you are aware, the Illinois Central Railroad has one of the larger commuter operations in this country, and operates several intermediate and long-distance intercity passenger trains including the Panama Limited-Magnolia Star, the City of New Orleans, and the City of Miami.

I am a member of the High Speed Ground Transportation Advisory Committee whose Chairman is Professor Raymond R. Tucker of St. Louis, Missouri. Other members include Mr. Robert M. Jenney, President, Jenney Manufacturing Company; Mr. Donald W. Douglas, Jr., President, Douglas Aircraft Company, Inc.; Mr. George E. Leighty, Chairman, Railway Labor Executives Association; Mr. Charles A. Webb, President, National Association of Motor Bus Operators; and Mr. Milton A. Gilbert, Chairman of the Board, Gilbert Systems, Inc. In addition to functioning as required by Executive Order, the Committee has carried on correspondence and participated in field trips.

The principal demonstrations, on the Penn Central between Washington and New York, and on the New Haven between New York and Boston, have not progressed as anticipated because of various technical difficulties. As a result there is not sufficient time to gather information and get meaningful results before the expiration of existing legislation, which would be in June of 1969. Hopefully, however, the demonstrations will be in operation soon and the operational results would begin to become available for evaluation. It would be wasteful of the effort, time and money spent so far if this project were not followed through with a thorough analysis of these demonstrations, while they are in operation.

The research and development funding under the High Speed Ground Transportation Legislation has been cut back and, therefore, has not been emphasized

to the extent contemplated under the original legislation. Extension of the project, if funded as set forth, would allow for catching up on the research and development, which is really the most significant part of the entire High Speed Ground Transportation project.

Although originally contemplated, the project was to consist of demonstrations within the Northeast Corridor, it was recognized that such demonstrations would have application elsewhere in the country. Unless the legislation is extended as set forth in the bill which I have mentioned, there will be no possibility for extending the demonstrations or even passing on the information gained to other parts of the country.

It is my understanding that you have been quite fully apprised of the technical difficulties with the demonstrations both between Washington and New York, and between New York and Boston, which have delayed the actual operation of new railroad equipment between those points. We, on Illinois Central, had similar setbacks when installing on our commuter operation what was then the first fully operational automatic revenue collection system (ARCS).

The booklet attached entitled "Private Breakthrough for a Public Cause" details rather candidly the history of the ARCS system, with its setbacks and pitfalls, as well as its accomplishments. In early 1967 the system was functioning so badly, with thousands of ticket failures each day, the the Illinois Central was at a point of making a decision on whether to rip out the entire installation.

At the eleventh hour, a new read-write mechanism was developed by the manufacturer, solving the ticket rejection problem, and the automatic revenue collection system has now been extended to practically the entire 49 stations of the commuter operation and is doing a superior job. We have had days with as few as three ticket failures out of 100,000, which is much lower than might be expected.

My point is that there is a parallel here between the High Speed Ground railroad demonstrations and the ARCS pioneering. As a private enterprise, it would probably have been easier for us to reach a decision to rip out the equipment and write it off as a failure, but we stick with the project and really gained because of our fortitude. It is my sincere recommendation that similarly the time for the High Speed Ground tests be extended so that the demonstrations can be carried out as planned.

With the accelerating disappearance of long-distance intercity passenger trains in this country, there may be a tendency on the part of some interested parties to involve the High Speed Ground Transportation Legislation with the passenger train issue. I emphatically urge that the Congress not be so tempted and rather continue the development of high speed ground transportation systems on its present legislative base. The question of whether or not to provide passenger train service to some particular town in one of our states, has not any relationship to the High Speed Demonstration. To attempt to weave such an issue into the High Speed Project would only result in dilution of effort and, in my opinion, absolutely nothing would be accomplished from what otherwise appears to be a rather promising project.

Our Committee has given some consideration to the impending transfer of Urban Transportation Administration from the Department of Housing and Urban Development to the Department of Transportation. We felt that some of the research that was being carried out in the urban transportation areas, particularly having to do with access to airports, might also be applicable in the intercity ground transportation arena and vice versa. I suggest that no definite steps be taken at this time to merge the research and development efforts in the two areas of Urban Transportation and High Speed Ground Transportation. There should first be an assimilation of the Urban Transportation Administration in its new department. Administratively, coordination has been effected and will continue with both of these administrations now being in one department. At the end of the recommended extension of the High Speed Ground Transportation Legislation, the two important areas of urban transportation and intercity ground transportation can perhaps then be folded together based on the working knowledge that will be gained.

Finally, I wish to comment on the decision which will be facing Congress on this legislation. If the High Speed Ground Transportation Legislation is not extended, the Congress would in affect be pre-judging the merits of this type of transportation, without giving it the benefit of a full investigation through the demonstration program which, considering all factors, has been proceeding quite well. It is easy to set target dates that are too ambitious and perhaps prove to

be a little unrealistic. This is a trait common to development of new systems which frequently turn out to be more complicated technologically than considered at the outset. I have every confidence that the technical difficulties will be overcome as a result of the demonstration trains, and that the operation of these trains in public service will tell us whether improved rail passenger systems can play a significant future role in the intermediate distance travel market and heavily populated sectors of the country.

In conclusion, I urge that the legislation be extended.

Sincerely,

WILLIAM B. JOHNSON, *President.*

RAILWAY LABOR EXECUTIVES' ASSOCIATION,  
*Washington, D.C., June 18, 1968.*

HON. SAMUEL N. FRIEDEL,

*Chairman, Subcommittee on Transportation and Aeronautics, Committee on Interstate and Foreign Commerce, House of Representatives, Washington, D.C.*

DEAR MR. CHAIRMAN: On behalf of the Railway Labor Executives' Association, a voluntary association the chief executive officers of the 23 standard national and international railway labor organizations, I would urge your favorable consideration on H.R. 16024, amended to provide for a two year, rather than the presently included one year extension. It is our conviction that the High Speed Ground Transportation Act must be extended and broadened if this nation is to effect a rational and integrated passenger system.

That we do not presently have such a system is altogether too apparent. Air transportation, only a decade ago thought to be the wave of the future, has reached a saturation point at many city airports. A TIME magazine article of June 14, 1968, cites Los Angeles Airport, designed to handle 15 million passengers a year with their seven highly automated "satellite terminals" as already obsolete. The article also reports that O'Hare airport of Chicago has almost reached the saturation point. In short, as put by New York Port Authority Aviation Director, John R. Wiley, "What we have is an air transportation crisis."

Auto transportation, too, has reached a saturation point in terms of expense, in terms of death and destruction. Last year 55,000 persons were killed in auto accidents and another 4 million were injured. The property damage resulting from automobile accidents was approximately \$12 billion. The pollution which hovers over every metropolitan area owes much of its existence to the internal combustion engine. As a nation, we have spent in excess of \$50 billion for highway construction, thinking that it could fulfill our needs. Now, even before the completion of Interstate Defense Highway program, it is obvious to all that no highway system can relieve pressure of increased passenger transportation.

Side by side with this saturation of highways and airports, we are witnessing the dismantling of our railroad passenger system, which could, with proper planning, technology and financing provide a comfortable, and efficient alternative. The High Speed Ground Transportation program is the only means by which that alternative might be developed. Railroad management generally has shown no desire to develop the kind of railroad passenger service which could meet today's needs with their own money or their own planning. Penn Central's commitment of funds and organization is the exception, not the rule.

Much of today's lopsided and inefficient transportation system is a consequence of railroad management's failure to meet the challenge of modernizing its segment of the passenger transportation industry. Their steadfast refusal to uphold their portion of the transportation sector has placed the initiative for doing so at the doors of Congress.

The promise of the High Speed Ground Transportation Act is not only that it can help relieve the congestion in the northeast corridor, but that its success can persuade the nation's railroads to accept their responsibility for intercity transportation by showing them its profitability. We have never accepted the proposition that rail passenger service must be limited to those areas where, due to congestion in air transportation, the train is the fastest transportation available. Comfortable, efficient ground transportation when available is always in demand. Certainly, the present carnage on our highways suggests a need that could be translated into sales and profit for efficient rail service.

Consequently, it is our hope that your subcommittee will continue to impress upon the industry the need for service which the present demonstration projects promise.

Yours very truly,

G. E. LEIGHTY, *Chairman.*

NATIONAL ASSOCIATION OF RAILROAD PASSENGERS,  
Chicago, Ill., June 19, 1968.

HON. SAMUEL N. FRIEDEL,  
Chairman, Subcommittee on Transportation and Aeronautics, House Interstate  
and Foreign Commerce Committee, Washington, D.C.

DEAR MR. CHAIRMAN: The National Association of Railroad Passengers strongly supports HR 16024, which would extend the High Speed Ground Transportation Act. We concur with the recommendation that the bill be amended to provide for a two-year extension instead of one year as presently drafted.

NARP's 2400 members throughout the country are users of rail passenger service. They believe that exclusive reliance on air and highway transport alone will not meet future needs. The "Northeast Corridor" program holds great promise not only for improving transportation in that crowded area, but for pointing the way towards improved passenger train service in all parts of America. Certainly the technology and experience developed in the Northeast Corridor can be applied to similar intercity corridors throughout the country.

In recent weeks, attention has been focused upon the regrettable delays in beginning high-speed "Metroliner" service between New York and Washington. While we too are concerned about this problem, we urge that these temporary difficulties not stand in the way of prompt action by Congress on extension of the program.

Since our formation a year ago, NARP has often been critical of the railroad industry's attitude and policies towards passenger service. Hence, it is a pleasure to commend Penn Central for the time, money, and energy it is committing to the "Northeast Corridor" project. NARP believes that this kind of attitude and commitment by responsible railroad management can and will attract new passengers who will use efficient and comfortable trains.

We would appreciate it if this letter could be made part of the hearing record.

Very truly yours,

ANTHONY HASWELL, *Executive Director.*

THE COUNCIL OF STATE GOVERNMENTS,  
Washington, D.C., June 14, 1968.

HON. HARLEY O. STAGGERS,  
Chairman, Committee on Interstate and Foreign Commerce,  
House of Representatives, Washington, D.C.

DEAR MR. CHAIRMAN: Enclosed for insertion in the record of the hearings on the High Speed Ground Transportation legislation is a resolution by the National Legislative Highway Committee.

This committee, composed of key State legislators concerned with transportation matters, has asked that this statement be made part of the committee record.

Your cooperation is greatly appreciated.

Sincerely,

JAMES A. R. JOHNSON,  
*Legislative Assistant.*

NATIONAL LEGISLATIVE HIGHWAY COMMITTEE

RESOLUTION

Whereas we live in a time when it is increasingly easier, safer, and faster to fly between cities, or drive from one state to another, than it is to drive from our suburban homes to the office downtown, and,

Whereas the challenge of mass transportation in the Nation's growing metropolitan areas is one of the most serious problems facing the states today, and,

Whereas population, motor vehicle registration, and miles traveled by all vehicles in urban areas will almost double in a decade, and,

Whereas problems of traffic congestion, lack of parking facilities, decline in patronage of public transit systems, and lack of adequate integration of different modes of transportation add up to a chaotic urban transportation situation: Now, therefore, be it

*Resolved*, That the National Legislative Highway Committee express its support for federal grant programs enabling statewide and regional transportation planning and coordination of all transportation modes with other aspects of urban development. The Committee maintains that the most logical point for such coordination is at the State Government level; and be it further

*Resolved*, That the Committee support United States Senate Bill 3237, and similar legislation in the House of Representatives, to extend for two years the program of research and development undertaken by the Secretary of Transportation in high-speed ground transportation systems: and be it further

*Resolved*, That the Committee express its support for further study of alternative means of financing the development of public transit systems, by both United States Congressmen, and State Legislators.

April 16, 1968, Washington, D.C.

---

GILBERT SYSTEMS, INC.,  
Secaucus, N.J., June 14, 1968.

Prof. RAYMOND R. TUCKER,  
St. Louis, Mo.

DEAR PROFESSOR: The question of continuing the work of the Advisory Committee Office of High Speed Ground Transportation is of lesser importance than that of increasing the scope of its activities, and of providing the increased funds needed for it to effectively achieve its objectives.

In response to the first question, the almost paralyzing nature of the transportation congestion problem plaguing so many areas of the country is mounting in its severity.

Unless solutions are found to alleviate these conditions, stagnation conditions will evolve that will have repercussions affecting all facets of our society, economic and sociological. As one example that can directly be related to both these factors and current civil unrest is a need for opening up job opportunities emerging in the industrializing suburbia to the populations of our inner cities.

In another context, the overall economic growth of the country is directly affected by the ability to move both peoples and merchandise from their available locations to their points of need.

The High Speed Ground Transportation committee does not presume to claim it will solve the nation's transportation ills. Its research, experimentation and demonstration projects, however, are forming the foundation from which will emerge new directions in transportation concepts that will contain the solution.

A specific purpose of the committee is to explore all of the varied concepts available, along with theoretical alternatives and their practicalities, and ultimately executing such demonstrations projects that might offer the answers to these problems. Already, research and study conducted by the office has produced the embryonic stages out of which will emerge new directions in transportation concepts.

One of the most important demonstration projects now nearing fruition is the high speed rail experiment between Washington, D.C. and New York—part of the overall Northeast Corridor program. A similar demonstration between New York and Boston soon will follow.

The February 1968 "Report on Continuing and Planned Program Activity in High Speed Ground Transportation" by the Secretary of Transportation to the Committee on Appropriations of the House of Representatives, comprehensively details these programs and effectively evaluates the results anticipated.

The report not only comprehensively details work accomplished to date, but provides compelling reasons why this work must be continued. However, it would also seem essential that this work—the objectives and goals—must be broadened beyond the specific program of moving peoples between the terminal points of the Northeast Corridor. The total problem is far more complex. In this respect, and to cite a specific, it is equally important to solve the congestion problem of intra-city transportation as it is to solve the inter-city situation.

There is a need for establishing a coordinated study of intra-city rapid transit concepts as they can be integrated into an overall regional program. This should involve research into new subway theories, moveable sidewalks concepts, road

improvement, etc. Particularly important is the need for moving persons from commuter lines into local transit systems.

In terms, too, of the commuter, we cannot assume that new concepts in rail transportation will represent the panacea that solves all current problems. It must be viewed as one of the modes that is and will be available for such travel. This is a nation of the private automobile, and it would be thoroughly impractical to envision any reduced importance in this phenomenon. Studies, therefore, must be initiated to seek new concepts in our basic highway approach.

In this area, we include studies into both vehicle design for all types of free-wheel automotive products—cars, trucks, and buses—as well as the highways themselves. Are there possibilities, for example, of developing automated highways to control traffic flow and movement? How practical, too, are the concepts of exclusive bus lanes or truck lanes?

We believe deeper research must be made into the potentials for the recently introduced rail-and-road bus, and how this can be coordinated into existing transit systems.

Moving from rail and road, shorter or intermediate air distance travel has a proportionate importance in the overall objectives of bringing order out of chaos. The vertical take off and landing plane apparently holds great promise for a number of purposes.

Currently, there are discussions being held on the possibilities of setting up a VTOL airport on the Hudson River alongside Manhattan's West Side. The primary purpose, apparently, is to provide an air service link between New York and intermediate distance cities, thus freeing New York major international airports for exclusive long distance service. Here, again, there must be some coordinated plan of utilizing local transit systems and suburban links to bring passengers in and out of the VTOL port, particularly as we develop new techniques in all these areas.

The importance of moving products has an importance equal to that of moving people and, within the framework of all these studies, this factor should be given proportionate consideration.

In this respect, product movement utilizes the same basic transportation modes available for passenger or commuter travel. And here, too, we already are witnessing almost revolutionary changes taking place in the techniques of materials handling and shipping, particularly in the emerging of container concepts.

Without studies on methods of coordinating such merchandise traffic possibilities with evolving commuter travel changes taking place, now and in the future, the probabilities for massive confusion are enormous.

In essence, it is suggested that the role of the committee should be broadened. Regional transportation congestion is the basic problem, and any ultimate solutions in solving the regional problem must take into consideration all transportation modes available within the area. To take the Northeast Corridor as a case in point, since this has been the focal point of our programs to date, it should be obvious that the results of our research in improving rail travel will have a profound effect on all the other transportation modes in this corridor.

It is not a question of "High Speed Ground Transportation," but rather "High Speed Regional Transportation."

To achieve all of these objectives, adequate funding is essential. It is equally important that this be considered of immediate importance. Delays will have serious ramifications effecting all facets of society, economic and sociological. Delays, too, will make the final costs of achieving success that much more expensive.

Very truly yours,

MILTON A. GILBERT,  
Chairman of the Board.

(Whereupon, at 11:30 a.m., the hearing was adjourned.)