

B-164497(5)
1-27-71

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REPORT TO THE CONGRESS

Administration Of Metroliner And Turbo-Train Projects

B-164497(5)

Federal Railroad Administration
Department of Transportation

BY THE COMPTROLLER GENERAL
OF THE UNITED STATES

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JAN 27, 1971



COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON D C 20548

B-164497(5)

To the President of the Senate and the
Speaker of the House of Representatives

This is our report on our review of administration of
the Metroliner and Turbo-Train projects by the Federal
Railroad Administration, Department of Transportation

Our review was made pursuant to the Budget and Ac-
counting Act, 1921 (31 U S C 53), and the Accounting and
Auditing Act of 1950 (31 U S C 67)

Copies of this report are being sent to the Director,
Office of Management and Budget, the Secretary of Trans-
portation, and the Administrator, Federal Railroad Ad-
ministration

A handwritten signature in black ink, appearing to read "James B. Rector".

Comptroller General
of the United States

DIGEST 1

CHAPTER

1	INTRODUCTION	4
	Photograph of Metroliner train	7
	Photograph of Turbo-Train	8
2	OBSERVATIONS ON THE ADMINISTRATION OF THE METROLINER AND TURBO-TRAIN PROJECTS	9
	Metroliner demonstration	11
	Technical problems delayed the start of the demonstration	11
	Status of the Metroliner demonstra- tion	14
	Federal costs	15
	Suburban stations	17
	Turbo-Train demonstration	18
	Technical problems delayed and curtailed the demonstration	20
3	GAO PROPOSALS AND AGENCY COMMENTS	22
4	SCOPE OF REVIEW	23

APPENDIX

I	Letter dated September 28, 1970, from the Assistant Secretary for Administration, Office of the Secretary, to the General Accounting Office	27
II	Principal officials of the Department of Transportation and Department of Commerce responsible for the administration of the activities discussed in this report	29

ABBREVIATIONS

GAO	General Accounting Office
NHRR	New York, New Haven and Hartford Railroad

BEST DOCUMENT AVAILABLE

D I G E S T

WHY THE REVIEW WAS MADE

The Federal Railroad Administration (Agency) sponsors demonstrations to determine whether high-speed ground transportation can improve intercity transportation. During fiscal years 1966-70 the Agency obligated over \$25 million for demonstration programs (See footnote, p. 4.)

The Agency is sponsoring two high-speed passenger-train demonstrations--the Metroliner between New York City and Washington, D C , and the Turbo-Train between New York City and Boston, Massachusetts. The objectives of the two demonstration projects were to test the trains while in operation, and to determine the public's response to new equipment and service.

To accomplish the objectives, the Agency planned that the Metroliners would make 18 round trips daily--nine between Washington and New York City and nine between Philadelphia, Pennsylvania, and New York City except Saturdays, Sundays, and holidays when reduced service would be provided. The Turbo-Trains would make four round trips daily between New York City and Boston.

The estimated cost to the Government for both demonstrations is about \$19 3 million. Because significant delays were encountered in the start of these projects and because equipment failures were experienced during the trains' operation, the General Accounting Office (GAO) reviewed the planning and administration of these projects.

FINDINGS AND CONCLUSIONS

The Penn Central Transportation Company (Railroad) began routine passenger service with six Metroliners in January 1969. The official demonstration did not start until October 1, 1970--3 years late--and with seven round trips daily between Washington and New York City. The Turbo-Train demonstration did not start until April 1969--over 2 years late--and with only one round trip daily. (See pp 11 and 20.)

GAO found that the Metroliner and Turbo-Train demonstration projects had not accomplished their objectives as originally planned, because technical problems with the trains had delayed the start of the projects and had prevented the contractors from maintaining operational enough cars to run the number of round trips necessary to fully accomplish the demonstrations' objectives.

Since the trains were an advancement of the state of the art and never before had been constructed or used in the United States, the Agency did not know whether the trains would operate as anticipated. Nevertheless, in 1966 the Agency authorized the Railroad to contract for construction of 50 Metroliners and agreed to lease two Turbo-Trains being developed by the United Aircraft Corporation. (See p 9.)

GAO found that, although the contracts for the demonstrations provided that, in general, revenues from the operation of the trains in excess of cost be shared, the contracts did not provide that a reduction be made in the amounts of the contracts in the event the trains did not run as often as anticipated. Because it was not known whether the trains would work satisfactorily, the contracts should have provided for such a reduction.

The Department of Transportation did negotiate a \$500,000 reduction in the Metroliner contract because the trains cannot be used to the extent planned. The \$500,000 does not appear significant when compared with the remaining contract cost of \$10.7 million and the substantial reduction in the use of the Metroliners during the demonstration. Because of the recent start of the demonstration, the amount of the Government's investment that will be recovered from revenues is unknown. (See pp 15 and 17)

The Agency has made full lease and maintenance payments for the Turbo-Trains in accordance with contracts which, as of October 1, 1970, totaled about \$1,085,000 and \$924,000, respectively. Because of the limited operating schedule of the trains, no recovery of the Government's investment through excess revenues is expected. (See pp 18 and 19)

The Metroliner demonstration is planned to run for 2 years from October 1, 1970. In April 1970 the Railroad informed the Secretary of Transportation that a research and development program using some of the Metroliners as prototypes was essential to overcome the Metroliners' technical deficiencies and to ensure success of the demonstration. As of November 30, 1970, the Agency was negotiating contracts with Westinghouse Electric Corporation and General Electric Company--builders of the Metroliner--for 90-day studies of technical problems. (See p 14)

The Turbo-Train demonstration was scheduled to end October 22, 1970. On October 12, 1970, the Secretary of Transportation announced that it would be extended on a month-to-month basis pending negotiations for additional use of the trains. As of November 30 the Agency was still negotiating with United Aircraft Corporation.

Because technical problems have not been resolved, it appears that any long-term extension of the demonstration would contribute little toward the improved service which the Agency anticipated would be provided by the Turbo-Trains. It is also questionable whether an extension would provide additional beneficial data on public reaction to the Turbo-Trains. (See p 21)

RECOMMENDATIONS OR SUGGESTIONS

When the Department sponsors future demonstration programs involving new or novel equipment, it should encourage the use of a prototype to ensure, to the extent possible, that the equipment will perform as anticipated. Future contracts should provide for price adjustments if the equipment is not used to the degree planned. (See p 22.)

AGENCY ACTIONS AND UNRESOLVED ISSUES

The Department agreed with GAO's findings and proposals and on December 21, 1970, the Agency issued a policy statement (FRA 4400.9) which provided for adopting the GAO proposals in sponsoring future demonstrations (See p 22)

MATTERS FOR CONSIDERATION BY THE CONGRESS

Members of the Congress have expressed interest in the reasons for the delays in the start of the Metroliner and Turbo-Train demonstrations and in the current status of these projects

CHAPTER 1

INTRODUCTION

The General Accounting Office has reviewed selected aspects of the two high-speed passenger-train demonstration projects of the Federal Railroad Administration (Agency), Department of Transportation. The demonstration trains are operated by the Penn Central Transportation Company (Railroad) between New York City and Boston and between Washington and New York City. The Agency is responsible, however, for the management of the projects. This report contains our observations on the conduct and current status of the two projects. The scope of our review is described on page 23.

The Agency was created within the Department of Transportation when it was established on April 1, 1967. The Agency comprises (1) the Bureau of Railroad Safety, transferred from the Interstate Commerce Commission, which is responsible for the safety of railroad equipment and the hours of service of railroad employees, (2) the Alaska Railroad, transferred from the Department of the Interior, which is responsible for assisting in the development of the economy of Alaska, and (3) the Office of High-Speed Ground Transportation, transferred from the Department of Commerce, which is responsible for carrying out the provisions of the High-Speed Ground Transportation Act of 1965, as amended (49 U.S.C. 1631), as it relates to research and development on high-speed ground transportation systems and the conduct of demonstration programs.¹

The High-Speed Ground Transportation Act of 1965 authorized the Agency to sponsor demonstration projects to determine the contributions that high-speed ground transportation modes could make to more efficient and economical intercity

¹In this report, we have attributed all Government involvement in the projects to the Agency. All actions taken prior to April 1, 1967, however, were the responsibility of the Department of Commerce.

transportation systems. The two high-speed passenger-train demonstrations account for about \$19 million of the \$25 million obligated by the Agency for demonstration projects during fiscal years 1966-70.

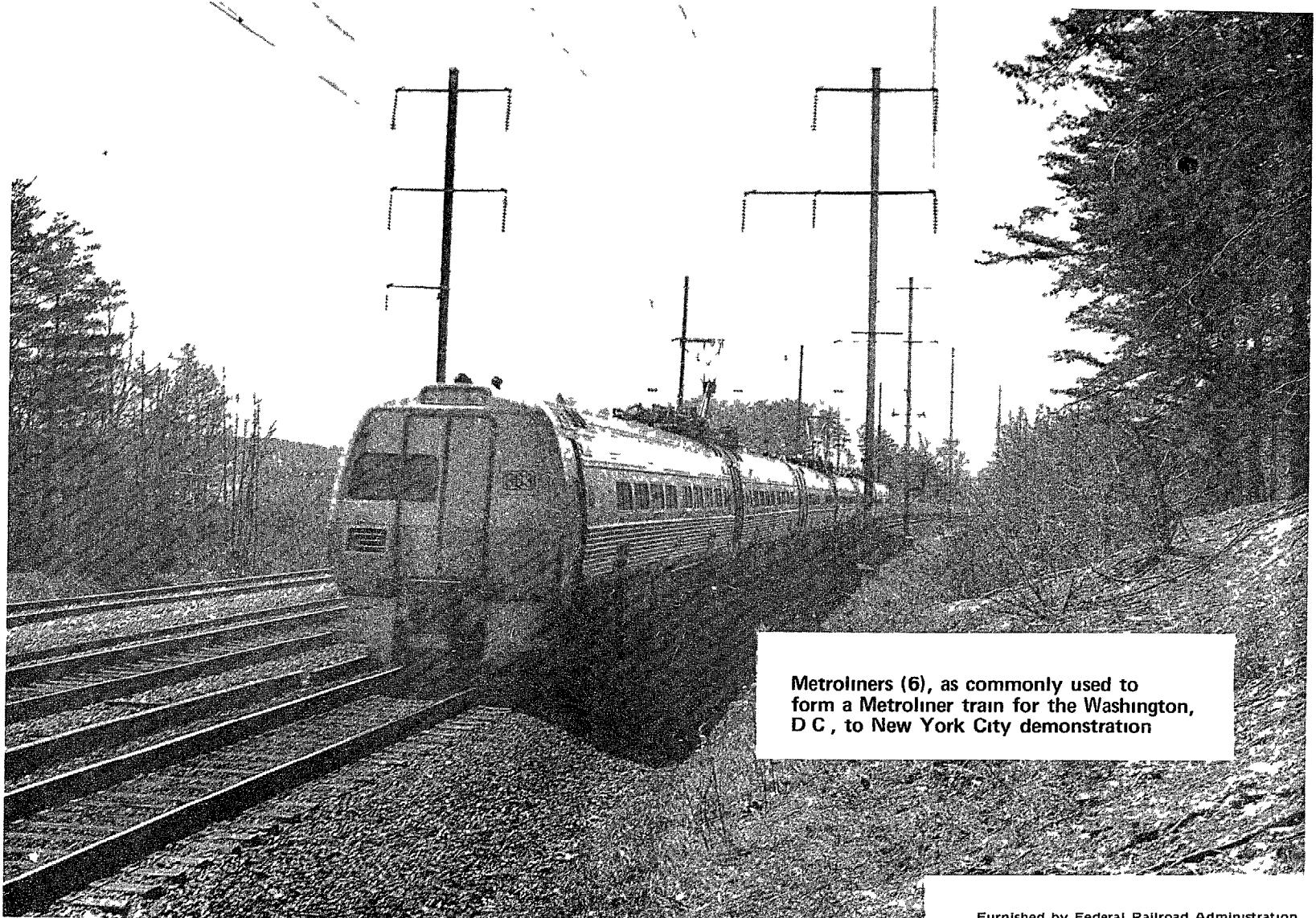
The objectives of the two high-speed passenger-train demonstrations were to test the trains' operating characteristics and to measure and evaluate public response to new equipment and to changes in various service factors. The demonstration between Washington and New York City, which began on October 1, 1970, utilizes Metroliners--high-speed electric trains. The demonstration between New York City and Boston utilizes two three-car gas-turbine trainsets, commonly referred to as Turbo-Trains. (See photographs of trains on pp. 7 and 8.)

Two types of rail passenger trains were selected for conducting the demonstrations, because of the different conditions on the routes over which each type of train would operate. The route between Washington and New York City was fully electrified but the route between New York City and Boston was not and thereby prohibited the Metroliners from operating all the way to Boston. Further, the route between New York City and Boston contained numerous curves and drawbridges that prohibited attainment of high speeds with the Metroliner or conventional equipment. The Turbo-Trains are designed to attain higher speeds than conventional equipment, especially on curved track, without requiring substantial improvements in the roadbed. The Turbo-Trains are capable of operating at speeds of about 170 miles per hour (m p h). The Metroliners can operate at speeds of about 150 m p.h.

Although the Agency initiated the demonstration projects, the Railroad and the suppliers of the Metroliners--Budd Company, Westinghouse Electric Corporation, and General Electric Company--and the lessor of the Turbo-Trains, the United Aircraft Corporation, have incurred substantial expenditures in support of or in relation to the demonstration projects. As of October 1, 1970, the total estimated cost to the Government for the Metroliner demonstration was about \$12.9 million. The Railroad and its equipment suppliers have reported costs of over \$60 million in support of the

demonstration The Government is paying the entire cost of the Turbo-Train demonstration, which, as of October 1, 1970, was estimated at about \$6 4 million The Government, however, is leasing the Turbo-Trains for about \$1 1 million from United Aircraft Corporation which reported that it had incurred expenditures of about \$7.5 million in the development of the Turbo-Trains

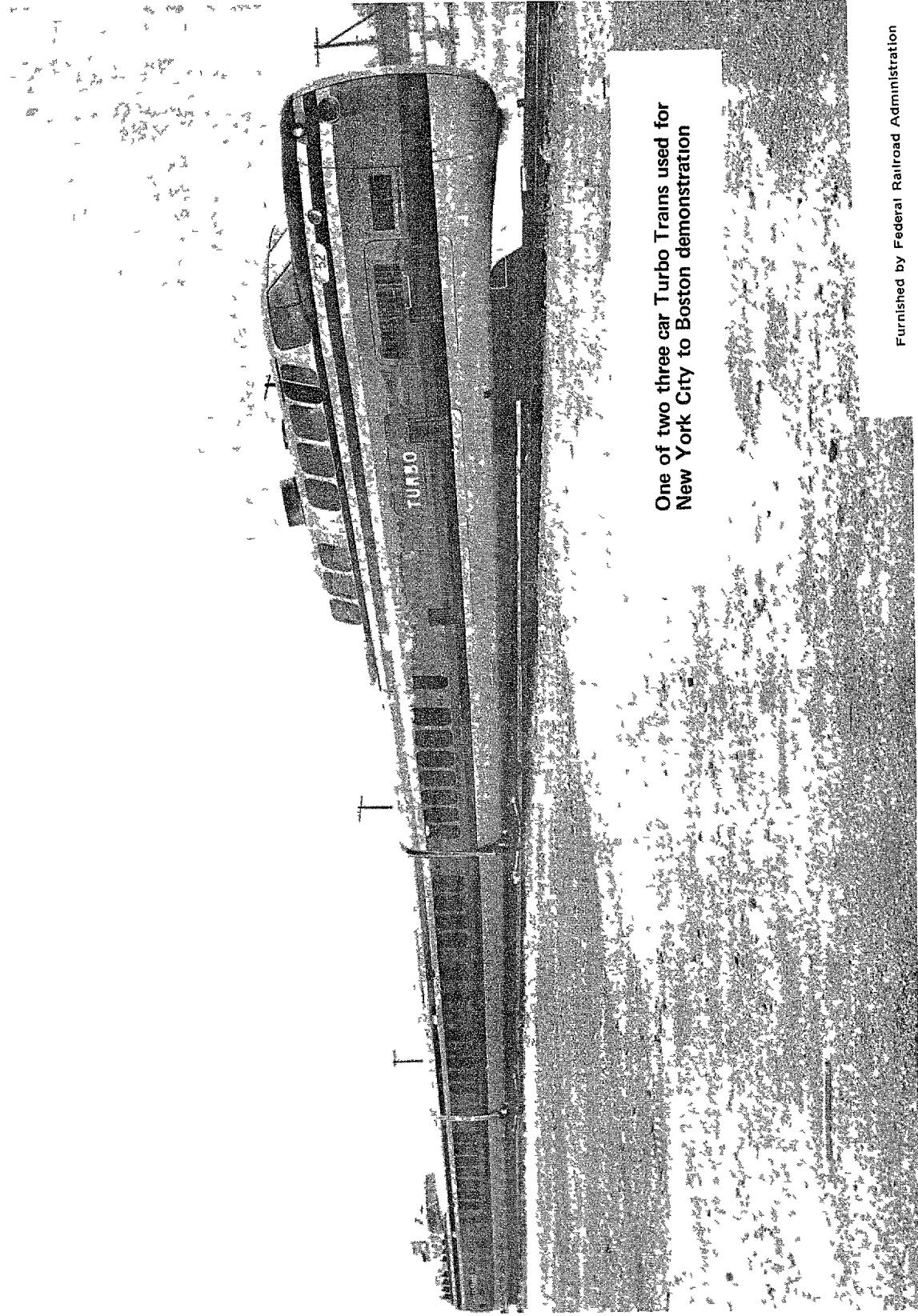
The principal officials of the Department of Transportation and Department of Commerce responsible for the administration of the activities discussed in this report are listed in appendix II



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Metroliners (6), as commonly used to form a Metroliner train for the Washington, D C , to New York City demonstration

Furnished by Federal Railroad Administration



One of two three car Turbo Trains used for
New York City to Boston demonstration

Furnished by Federal Railroad Administration

CHAPTER 2

OBSERVATIONS ON THE ADMINISTRATION OF THE METROLINER AND TURBO-TRAIN PROJECTS

The Metroliner and Turbo-Train demonstration projects have not accomplished their objectives on a timely basis and have not been conducted as originally planned. Technical problems encountered with the trains delayed the start of the projects and prevented the contractors from maintaining operational enough cars to run the number of round trips necessary to fully accomplish the projects' objectives.

The Metroliners and Turbo-Trains were an advancement of the state of the art. No similar equipment had ever been constructed or used in regular passenger service in the United States. In 1966 the Agency agreed to lease two Turbo-Trains being developed by the United Aircraft Corporation and authorized the Railroad to contract for the construction of 50 Metroliners, without knowing whether the trains would be able to operate to the degree anticipated for the demonstrations. In view of the significant Government funds committed to the demonstrations, the Agency should have encouraged the development and testing of prototypes to provide greater assurance that later demonstrations could be carried out as planned.

The Agency's contracts with the Railroad and with the lessor of the Turbo-Trains did not provide for a reduction in the amount of the contracts in the event the trains could not be used as planned. As the Agency did not know whether the trains would perform as anticipated, a provision should have been included in the contracts to protect the investment of the Government. The Department informed us, however, that a reduction of \$500,000 in the amount of the contract had been negotiated with the Railroad in consideration of the fact that the Metroliner demonstration which began on October 1, 1970 (3 years after planned), was decreased in scope. No reduction has been made in the payments required under the contracts with United Aircraft Corporation for the lease and maintenance of the

Turbo-Trains, even though the scope of the demonstration was substantially reduced.

Our more detailed comments on the administration of the demonstrations are contained in the following sections of this chapter.

METROLINER DEMONSTRATION

On April 15, 1966, the Agency awarded a contract to the Pennsylvania Railroad Company--now part of the Penn Central Transportation Company--to conduct a high-speed passenger-train demonstration between Washington and New York City, a distance of 226 miles.

The purpose of the demonstration was to test public response to improved passenger rail transportation and to provide information on public response to various service factors in intercity rail passenger service, such as changes in fare levels, faster, more convenient service, improved train information, and improved baggage-handling facilities. Conventional train equipment, as well as the new Metroliner equipment, was to be used to measure these service factors.

Under the terms of the contract, the Railroad agreed to (1) upgrade and maintain to certain specifications the roadbed and the facilities between Washington and New York City, (2) procure at least 28, but no more than 50, electrically propelled rail passenger cars (Metroliners), and (3) assist in the conduct of the demonstration. The Agency was responsible for (1) assisting in the development and preparation of specifications for the Metroliners, (2) approving a contract for the manufacture of the railcars and (3) consulting with the Railroad on the nature and extent of experimental features of the demonstration.

Technical problems delayed the start of the demonstration

At the time the contract was awarded, the Agency estimated that the demonstration would begin about October 1967 and run for 2 years. The Agency planned that the Metroliners would make nine round trips daily between Washington and New York City and an additional nine round trips daily between Philadelphia and New York City except Saturdays, Sundays, and holidays, when reduced service would be provided.

October 1967 was established as the anticipated starting time because both the Agency and the Railroad felt that the most time-consuming task prior to the initiation of the demonstration would be to upgrade the roadbed to accommodate

the higher speeds of the Metroliners. The Metroliners, according to the contract, would be capable of operating at speeds of 150 m p.h. and of traveling between the two cities in a maximum elapsed time of 3 hours, with four intermediate stops. The Railroad ordered the 50 Metroliners in May 1966 and they were to be delivered in an operative condition by September 30, 1967.

In April 1966, the Railroad began upgrading its roadbed to provide for the safe operation of the Metroliners. A significant number of railroad crossties were replaced, a substantial amount of continuous welded track was laid, and a major portion of the catenary wire--the overhead electric wire--was replaced. This work was substantially completed in October 1967, but the Metroliners were not delivered because of technical problems which arose as manufacturing progressed, primarily because of the sophisticated nature of the equipment. The major technical problems which delayed delivery of the Metroliners are presented below.

1. Pantograph-catenary interaction. The ability of the pantograph--the power collection device on top of the railcars--to conduct electrical current from the catenary wire to the railcars at high speeds had not been determined prior to the time the Metroliner was being tested. This problem was solved during the testing of the trains.
2. Use of two propulsion-braking systems for the Metroliners. The Railroad, with the Government's concurrence, required the railcar manufacturer to use propulsion-braking systems from each of two suppliers. Unanticipated interfacing problems arose when railcars having one system were joined with railcars having another system. These compatibility problems were solved during the testing of the trains.
3. Dynamic-braking system: In addition to air brakes, dynamic brakes--brakes using electrical current--were required on all the Metroliners. Dynamic brakes were necessary as a safety precaution to prevent overheating of train wheels as a result of braking at high speeds using only air brakes. The dynamic-braking system provided by one supplier did

not meet the specifications included in the contract for the construction of the railcars. The problem was resolved by increasing the use of the air brakes over that anticipated. It should be noted that the trains will stop within the distance specified, using both dynamic and air brakes or air brakes alone.

4. Short-circuited substations: The Metroliners short-circuited the Railroad substations--the point at which electrical current is transferred from a higher voltage level to the 11,000-volt catenary wire--by drawing more electricity than the substations could produce. The problem was solved by modifying the substations to permit the Metroliners to draw sufficient electrical current.

Pending the Railroad's ability to maintain enough Metroliners in an operative condition to start the demonstration, the Agency authorized the Railroad to use the available Metroliners in regular passenger service. On January 16, 1969, the Railroad placed six Metroliners in regular passenger service between Washington and New York City. The service began with one train of six Metroliners making one round trip daily. During the operation of the train under normal service conditions, the Metroliners encountered additional technical problems with the electrical and propulsion systems. Each Metroliner has approximately 3,000 electronic components which require a high level of maintenance to prevent equipment failure. The problems encountered with the propulsion system were concerned primarily with overheating of the trains' transformers and gear boxes.

The start of the demonstration was delayed by the inability of the Railroad to upgrade and maintain the track to the contract specifications in addition to the technical problems encountered with the trains. Agency officials informed us that the contract had been amended to delete the precise track specifications and to substitute, therefore, a minimum level of track maintenance work by the Railroad during the demonstration period. The maintenance work will include installing additional continuous-welded rail and repairs such as resurfacing tops of rail-heads and renewing railroad crossties.

Status of the Metroliner demonstration

Although the technical problems with the Metroliners have not been resolved, the demonstration began on October 1, 1970, and, under the contract with the Railroad, is scheduled to run for 2 years. The demonstration is to be made with seven round trips daily between Washington and New York City instead of the more extended service originally planned. (See p. 11.) At the start of the demonstration the Railroad had accepted 49 of the 50 Metroliners; one Metroliner was used for spare parts.

The Railroad by letter dated April 6, 1970, advised the Secretary of Transportation that a research and development program should be undertaken immediately to overcome the technical problems of the Metroliners. The Railroad suggested that two of the Metroliners be used as prototypes to determine remedies for known deficiencies and potential weaknesses not fully apparent. The Railroad suggested also that the remedies be applied to four additional Metroliners which would be used as prototypes under actual service conditions. Data from the prototype operation would then be used to modify the remaining fleet of Metroliners.

The Railroad estimated that the total cost of this program would be about \$15 million and stated that such a program was necessary to avoid the threat of total failure of the project. As of November 30, 1970, the Agency was negotiating contracts with Westinghouse Electric Corporation and General Electric Company for 90-day studies of Metroliner technical problems. The Railroad's proposal is being held in abeyance pending the results of the studies.

Federal costs

The Agency's contract with the Railroad provided for a Government contribution of \$9.6 million for the conduct of the demonstration. Beginning in August 1967, the amount provided in the contract was increased to about \$11 million by contract amendments to provide for improvements to station facilities, including the construction of one new suburban station, the necessary track and electrical work for a second suburban station, and grade-crossing protection along the demonstration route.

The Agency entered into several other contracts for the preliminary design of the Metroliners, collection of revenue data, auditing, a computer simulation of rail operations, terminal improvements, and construction of the station facility for the second suburban station.

The Government's cost for the demonstration project, as provided for in the basic contract with the Railroad, was based, in part, on the expected use of the Metroliners. (See p. 11.) The Department has informed us that, although not provided for in the contract, a reduction of \$500,000 in the amount of the contract has been negotiated with the Railroad because the trains cannot be used to the extent planned. In our opinion, the \$500,000 reduction does not appear significant when compared with the remaining contract cost of \$10.7 million for the demonstration and the substantial reduction in the use of the Metroliners during the demonstration period.

A summary of the Government's total estimated costs for the Metroliner demonstration project as of October 1, 1970, is presented on the following page.

<u>Description</u>	<u>Estimated cost</u>
Contract for operation of demonstration	\$ 9,600,000
Contract additions.	
Improvements to existing stations	\$ 281,295
Pop-out windows for rail cars	4,000
Grade-crossing protection	14,000
Data for computer simulation of rail operations	45,251
Suburban stations.	
Lanham, Maryland	1,051,594
Woodbridge, New Jersey	<u>204,111</u>
Total additions	1,600,251
Less negotiated contract reduction	<u>- 500,000</u>
Contract as amended	10,700,251
Other contracts.	
Design railcars	100,000
Collection of revenue data and audit	36,785
Computer simulation of rail operations	125,842
Improvements to existing stations	40,556
Suburban stations:	
Lanham, Maryland	34,931
Woodbridge, New Jersey	
Federal Railroad Administration	608,886
Federal Highway Administration	<u>516,495^a</u>
Total other contracts	1,463,495
Anticipated expenditures during demonstration	
Experimental service changes	400,000
Terminal improvements	150,000
Grade-crossing improvements.	
Federal Railroad Administration	61,000
Federal Highway Administration	<u>150,000</u>
Total anticipated expenditures	<u>761,000</u>
Total, Government costs	<u>\$12,924,746</u>

^aSection 11 of the Federal-Aid Highway Act of 1968 authorizes the Federal Highway Administration to purchase land and construct parking facilities adjacent to Federal-aid highways if such facilities are served by a mass-transit commuter system. Funds are being provided by the Federal Highway Administration for construction of a parking facility for rail commuters at the Woodbridge station.

Under the terms of the contract, the Railroad is required to reimburse the Government for its costs if the Railroad's additional revenues from the demonstration exceed its additional operating costs. The contract provides for payment to the Government of an amount equal to one half of the excess of income over the operating costs up to the Government's costs of \$10.7 million under the contract, as amended. Since the demonstration did not start until October 1, 1970, the amount of the Government's investment that will be recovered is unknown.

Suburban stations

So that more convenient service may be provided during the demonstration, the Government agreed to participate in the cost of constructing two new suburban stations. The stations are located outside Washington in Lanham, Maryland, at the junction of the Capital Beltway and the Railroad's main line and outside New York City in Woodbridge, New Jersey, at the junction of the Garden State Parkway and the Railroad's main line. The States of Maryland and New Jersey and Prince Georges County in Maryland agreed to participate in the cost of constructing the stations. The total estimated cost of constructing the stations is about \$4.2 million, of which the Government has agreed to contribute \$2.4 million.

The station in Lanham, Maryland, was opened to service on March 16, 1970. As of October 1, 1970, two Metroliners and four conventional New York-bound trains and four Metroliners and four conventional Washington-bound trains stop at the Lanham station. The station in Woodbridge, New Jersey, will not open for service until about June 1971. The completion of the Woodbridge station has been delayed because of a change in the original design of the station that was necessary to provide a larger facility to accommodate the commuter traffic and because of the heavy volume of rail traffic at the station's location that prevents taking any section of track out of service for an extended period of time.

Prince Georges County, Maryland, will own the station building at Lanham and will lease the parking lot from the State. The Railroad will own the platforms and pedestrian tunnel. The Woodbridge station will be owned entirely by the State of New Jersey.

TURBO-TRAIN DEMONSTRATION

To test public reaction to improved intercity service and to test the operating characteristics of gas-turbine powered Turbo-Trains, the Agency entered into contracts with the United Aircraft Corporation and with the New York, New Haven and Hartford Railroad (NHRR) to permit the use of Turbo-Trains over its shoreline route between Boston and New York City.

In January 1966, the Agency entered into a contract with the United Aircraft Corporation for the lease of two three-car Turbo-Trains for 2 years for about \$1.2 million. In addition, the Agency agreed to provide about \$250,000 for the cost of tests considered necessary by the Agency to determine whether the Turbo-Trains met the specifications set forth in the lease contract. Among the tests performed were brake tests and stop-distance tests. Although the Turbo-Trains satisfactorily passed these tests by December 1968, the trains, as accepted, did not meet the ride-quality and noise-level specifications. As a result, the lease costs were reduced by \$98,000.

In February 1967, the Agency entered into a contract with United Aircraft Corporation to service and maintain the Turbo-Trains for a 2-year period (corresponding to the period of the lease) for about \$2 million and for safety and comfort modifications to the Turbo-Trains for about \$326,000. Service and maintenance of the trains included cleaning of the interior and exterior, fueling, furnishing of spare parts, and providing a maintenance facility to accomplish these tasks. The Agency contracted also with United Aircraft Corporation for the availability of the Turbo-Trains for testing and training prior to the start of the lease period.

The contracts with United Aircraft Corporation provided that, during the 2-year lease period which began October 22, 1968, the Agency would make fixed monthly lease and maintenance payments of about \$47,000 and \$40,000, respectively. The monthly payments were established, in part, on the basis of anticipated use of the trains; however, the contracts did not provide for a reduction in the payments in the event the trains could not be used to the degree anticipated.

Although technical problems resulted in a significant reduction in the use of the trains compared with the planned utilization, the Agency paid the fixed monthly lease and maintenance payments which, as of October 1, 1970, totaled about \$1,085,000 and \$924,000, respectively.

The Agency entered into contracts with NHRR for (1) improving and maintaining certain portions of the roadbed between Woodlawn, New York--the point at which the trains operate at slower speeds in and out of Grand Central Station in New York City--and Boston, (2) additional testing of the Turbo-Trains, (3) training of NHRR personnel in the operation of the train, and (4) insurance on the Turbo-Trains.

The Railroad acquired NHRR on January 1, 1969, and under contract with the Agency operated the Turbo-Trains during the demonstration. The contract provided for the Agency to share equally in any increase in the total passenger revenue from shoreline operations resulting from operation of the Turbo-Trains. An Agency official informed us, however, that, because of the operating schedule of the trains, no recovery of revenue was expected.

Because NHRR was in bankruptcy at the time the demonstration was planned in 1965, the Agency is paying the total cost of the demonstration. Prior to the decision to extend the demonstration period (see p. 21), the Agency estimated the cost of the demonstration to be \$6.4 million.

Technical problems delayed and curtailed the demonstration

When contracting for the lease of the Turbo-Trains in January 1966, the Agency planned that the trains be delivered about 10 months later, with the demonstration program to begin shortly thereafter. No specific date was set for the start of the demonstration. Because of engineering and construction problems, the trains were not accepted until October 21, 1968--approximately 23 months after the scheduled delivery date. These problems concerned primarily the ride quality and noise level of the trains. As previously stated, the lease costs were reduced because the trains did not meet the contract specifications for ride quality and noise level.

Shortly after the Railroad acquired NHRR, it requested the Agency to provide for additional testing of the braking capabilities of the Turbo-Trains. The Railroad informed the Agency that the previous tests had not been satisfactory for its purposes and had not been witnessed by Railroad employees who were currently responsible for train operation. In February and March 1969, the Agency conducted a series of stop-distance and braking tests to the satisfaction of the Railroad. The estimated costs of these additional tests was about \$30,000.

The demonstration began on April 8, 1969, with one Turbo-Train making one round trip daily between New York City and Boston. Although it was planned that each Turbo-Train would make two round trips daily between New York City and Boston, technical problems with the trains resulted in the demonstration consisting primarily of one Turbo-Train making one round trip daily and the other train being used for backup purposes in the event of equipment failure. The technical problems were concerned primarily with the reliability of the trains' gear boxes, which resulted in increased maintenance and which prevented the lessor from ensuring the availability of both trains.

The Agency anticipated spending about \$300,000 for experimental service changes designed to measure public reaction to improved intercity service; however, the equipment

failures prevented operation of the Turbo-Trains to the extent necessary to conduct the experimental service.

In addition, the Railroad would not increase the speed of the Turbo-Train to enable it to make two daily round trips because the Railroad felt that the roadbed and numerous grade crossings between New York City and Boston made it unsafe to operate the trains at higher speeds. The trains were operated at about 100 m.p.h., although they were capable of speeds up to about 170 m.p.h. The Agency anticipated spending about \$850,000 for grade-crossing and right-of-way improvements, but these improvements were held in abeyance pending action by the Congress on the Federal-Aid Highway Act of 1970 (Public Law 91-605, approved December 31, 1970) which provides for the elimination of all grade crossings along the route of both demonstrations.

The limited Turbo-Train demonstration was scheduled to end October 22, 1970. On October 12, 1970, the Secretary of Transportation announced that the demonstration would be extended on a month-to-month basis, pending negotiations for further use of the trains. In addition, the Agency authorized the Railroad to extend the insurance coverage on the Turbo-Trains through October 2, 1971, at a premium of \$47,520. As of November 30, 1970, the Agency was negotiating with the United Aircraft Corporation for additional use of the Turbo-Trains and had authorized the Corporation to renew its lease for the maintenance facility at Providence, Rhode Island.

Because of continuing technical problems with the trains' gear boxes, which materially affect the serviceability of the Turbo-Trains, it appears that any long-term extension of the demonstration without resolving these problems would contribute little toward providing the public with the degree of improved service which the Agency anticipated would be provided by the Turbo-Trains. In addition, unless the Turbo-Trains can be used to provide further improved service, it is questionable whether an extension of the demonstration will provide the Agency with any further beneficial data on public reaction to the service provided or on the operating characteristics of the Turbo-Trains.

CHAPTER 3

GAO PROPOSALS AND AGENCY COMMENTS

We proposed that the Secretary of Transportation (1) in sponsoring future demonstration projects involving new or novel equipment, encourage the use of prototypes to determine the operating characteristics of the new equipment and thereby provide assurance, to the greatest extent possible, that the equipment will be capable of meeting the program's objectives on a timely basis and (2) include appropriate provisions in future contracts for the use of equipment to conduct demonstrations that will provide for adjustment of the contract price in the event the equipment does not perform as anticipated

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By letter dated September 28, 1970 (app. I), the Assistant Secretary for Administration, Department of Transportation, agreed with our findings and stated that the Agency would adopt our proposals in sponsoring future demonstration projects. On December 21, 1970, the Agency issued a policy statement (FRA 4400.9) which provided for adopting the GAO proposals in sponsoring future demonstrations.

CHAPTER 4

SCOPE OF REVIEW

Our review was conducted at the Agency's headquarters office in Washington, D.C. We directed our review to the planning for and administration of the two high-speed passenger-train demonstration projects. In reviewing the administration of the projects, we directed our attention to determining (1) the reasons for the delay in the start of the demonstrations, (2) the reasons for the use of only one train to conduct the Turbo-Train demonstration, (3) the manner in which the projects are achieving their intended purposes, and (4) the current status of the demonstration projects. Our review included an examination of the contracts for the conduct of the demonstration projects. We reviewed also legislation, correspondence, and other records related to the projects. In addition, we interviewed officials of the Agency responsible for the conduct of the demonstration projects.

APPENDIXES



OFFICE OF THE SECRETARY OF TRANSPORTATION
WASHINGTON, D.C. 20590

ASSISTANT SECRETARY
FOR ADMINISTRATION

September 28, 1970

Mr. Bernard Sacks
Assistant Director
Civil Division
U.S. General Accounting Office
441 G Street, N.W.
Washington, D.C. 20548

Dear Mr. Sacks.

This is in reply to your letter of June 11, 1970, requesting our comments on a draft of a proposed report to the Congress entitled, "Review of Administration of Contracts for the High-Speed Ground Transportation Demonstration Projects." We are providing our comments by reference to each of the [see GAO note, p 28] recommendations of the report.

The report recommends that in future demonstrations FRA encourage the development of a prototype of the equipment to be used, and that future demonstration contracts include appropriate provisions for the adjustment of the contract price if the equipment cannot be used to the degree anticipated when the program began.

[See GAO note, p 28]

In answer to the [see GAO note, p. 28] recommendations, the FRA will encourage where appropriate, the testing of prototype equipment prior to sponsoring future demonstrations that involve new or novel equipment.

Secondly, the FRA will include in future demonstration contracts appropriate provisions for the adjustment of the contract price if the equipment cannot be used to the degree anticipated when the program began. We have negotiated a \$500,000.00 reduction in price with the Penn Central Transportation Company for changed conditions under the Metroliner Demonstration contract.

[See GAO note]

We appreciate the opportunity afforded us to comment on your draft report.

Sincerely,

William S. Hoffmeyer

fors Alan L. Dean

GAO note. The deleted comments relate to matters which were discussed in the draft report but omitted from this final report.

PRINCIPAL OFFICIALS
 OF THE DEPARTMENT OF TRANSPORTATION
 AND THE DEPARTMENT OF COMMERCE
 RESPONSIBLE FOR THE ADMINISTRATION
 OF THE ACTIVITIES DISCUSSED IN THIS REPORT

	<u>Tenure of office</u>	
	<u>From</u>	<u>To</u>
SECRETARY OF TRANSPORTATION (note a):		
John A. Volpe	Jan. 1969	Present
Alan S. Boyd	Jan. 1967	Jan. 1969
SECRETARY OF COMMERCE (note b):		
Alexander B. Trowbridge (actting)	Jan. 1967	Mar. 1967
John T. Conner	Jan. 1965	Jan. 1967
UNDER SECRETARY OF COMMERCE FOR TRANSPORTATION:		
Alan S. Boyd	June 1965	Jan. 1967
ADMINISTRATOR, FEDERAL RAILROAD ADMINISTRATION:		
Carl V. Lyon (actting)	July 1970	Present
Reginald N. Whitman	Feb. 1969	June 1970
A. Scheffer Lang	May 1967	Jan. 1969
DIRECTOR, OFFICE OF HIGH-SPEED GROUND TRANSPORTATION:		
Myles B. Mitchell (actting)	Dec. 1969	Present
Edward J. Ward (actting)	Oct. 1969	Dec. 1969
Robert A. Nelson	Oct. 1965	Oct. 1969

PRINCIPAL OFFICIALS
OF THE DEPARTMENT OF TRANSPORTATION
AND THE DEPARTMENT OF COMMERCE
RESPONSIBLE FOR THE ADMINISTRATION
OF THE ACTIVITIES DISCUSSED IN THIS REPORT

(continued)

^aPosition created by Department of Transportation Act
(Public Law 89-670), dated October 15, 1966.

^bAll functions, powers, and duties of the Secretary of Commerce under certain laws and provisions of law relating generally to railroads were transferred to and vested in the Secretary of Transportation on April 1, 1967, by the Department of Transportation Act.