
Office of Inspector General
Audit Report

Hudson-Bergen Light Rail Transit System
Federal Transit Administration

Report Number: RT-1999-123

Date Issued: August 18, 1999



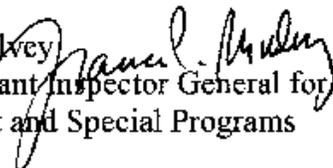


Memorandum

U.S. Department of
Transportation
Office of the Secretary
of Transportation
Office of Inspector General

Subject: ACTION: Report on the Baseline Review of the Hudson-Bergen Light Rail Transit System
Federal Transit Administration
Report No. RT-1999-123

Date: August 18, 1999

From: Francis P. Mulvey 
Deputy Assistant Inspector General for
Rail, Transit and Special Programs

Reply to: JA-50
Attn. of:

To: Federal Transit Administrator

We are providing this report for your information and use. Your August 11, 1999, comments on our July 15, 1999, draft report were considered in preparing this report. A copy of the response is Appendix A to the report.

We consider your concurrence with our recommendation and the Federal Transit Administration policy, which requires potential savings to be substantiated and verified before decisions are made on how to use the savings, to be responsive to our recommendation. Additional follow-up action may occur as authorized by Department of Transportation Order 8000.1C.

We appreciate the cooperation and assistance provided during the audit. If you need additional information or your staff needs further assistance, please contact me at (202) 366-0477.

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BASELINE REVIEW OF THE HUDSON-BERGEN LIGHT RAIL TRANSIT SYSTEM

The following is a baseline review of the Hudson-Bergen Light Rail Transit System (System) in northern New Jersey. The purpose of our baseline reviews is to track the progress of planned fixed guideway systems of national significance, which will enable us to perform timely audits of those projects experiencing cost, schedule, or financing problems. The specific objectives of this review were to determine the current status, estimated cost, funding sources, and completion schedule of the project, and to identify major issues that may affect the project. We selected this system for review because it is the first transit project in the United States in which the contractor will design and build the System and will also operate and maintain it for an established period before turning operations over to the local transit authority.

Summary

The System is estimated to cost \$2 billion and will be constructed in three phases (see Figure 1). New Jersey Transit Corporation (NJT) reported that, as of June 30, 1999, it had paid over \$613 million for the first phase of the System. NJT estimated that this phase will cost \$950 million, \$42.1 million less than the \$992.1 million originally estimated in the October 1996 full funding grant agreement. The potential savings resulted primarily from lower financing costs. In addition, the System's alignment has been changed from the east side of Hoboken to the west side. According to the NJT Project Director, rerouting the alignment will result in savings by reducing the need for track to be embedded into streets and by reducing property acquisition costs. In addition to savings from lower financing costs and the rerouting, required value engineering may also lead to additional cost reductions. The exact amount of any cost reductions will not be known until the first phase of the project is completed. If savings are realized, NJT plans to request that any Federal funds resulting from the savings be made available for the second phase. We recommend that the Administrator of the Federal Transit Administration (FTA) postpone approving any request to shift excess funds from the first phase's full funding grant agreement until pending issues are resolved. FTA agreed with our recommendation.

The rerouting of the track in Hoboken will delay the scheduled opening for the entire segment. Based on information NJT provided, only a portion of the first phase, 8.1 miles, is expected to be operating by the scheduled July 2000 start date.

The balance of the first phase, 1.2 miles, will start service in December 2001, 17 months later than the original planned start date.

Before the second phase can begin operations, NJT will need to comply with the requirements of the policy being developed by FTA and the Federal Railroad Administration (FRA) governing the shared use of railroad right-of-way and track by light rail transit systems and conventional rail operations. The proposed policy requires light rail operators that intend to share railroad right-of-way to comply with FRA safety rules. If a light rail system shares track with a railroad operator, it will either comply with FRA safety rules or obtain a waiver from the appropriate safety rules. Complying with the requirements or obtaining a waiver could impact the completion schedule, cost, and train schedule.

This review was performed in accordance with Government Auditing Standards as prescribed by the Comptroller General of the United States.



Figure 1 - Hudson-Bergen Light Rail Transit System

Project Description

The Hudson-Bergen Light Rail Transit System, when completed, will be a 20.1-mile, at-grade light rail network. The network will run primarily north-south along the west side of the Hudson River in northern New Jersey from North Bergen in Hudson County through Hoboken, Jersey City, and Bayonne. NJT is responsible for constructing the project, which is to be built in three phases. When completed, the System will include 30 at-grade stations, 5 major intermodal transfer stations (Exchange Place, Newport, Bergenline Avenue, Port Imperial Ferry Terminal, and Hoboken Terminal), and 8 park-and-ride facilities. Service will be provided by 66 light rail vehicles. Each light rail vehicle has a peak service capacity for 190 passengers (68 sitting and 122 standing).

The System is one of five FTA turnkey transit demonstration projects.¹ A turnkey project, alternatively known as “design/build,” is a procurement technique in which a public agency contracts with a single entity to deliver a complete and operational system. By transferring all or part of the management responsibility to a private contractor, a turnkey project is intended to reduce the cost and time of construction, streamline oversight procedures, allocate risk to those participants best able to manage it, and improve the organizational environment for communications and system integration. Of the five FTA turnkey projects, this System is the first one in which the contractor will also operate and maintain the system for a number of years before turning operations over to the transit agency.

The System is designed to improve transit mobility throughout the waterfront area on the New Jersey side of the Hudson River, especially regarding business and residential trips to the waterfront and commuter trips that connect with the rail and ferry systems that lead to and from Manhattan. The other systems include the Port Authority Trans-Hudson rail line and privately owned ferry systems. Park-and-ride lots at the northern, western, and southern ends of the System are expected to reduce traffic from areas outside Hudson County to the waterfront area and, thereby, reduce congestion and automobile pollution. Table 1 summarizes the three project phases.

¹ The five turnkey projects are the Baltimore Central Light Rail Extensions, Los Angeles Union Station Gateway, San Francisco Bay Area Rapid Transit Airport Extension, Hudson-Bergen Light Rail, and San Juan Tren Urbano. The San Juan turnkey project is also a design, build, operate, and maintain method of procurement.

**Table 1 – Baseline Data for the Three Phases of
the Hudson-Bergen Light Rail Transit System
As of June 30, 1999**

	First Phase	Second Phase	Third Phase ¹
Miles of track	9.3 miles	6.1 miles	4.7 miles
Construction Start End	December 1996 December 2001	Summer 1999 2005	TBD
Planned start of service	March 2000 ²	2005	TBD
Systemwide ridership expected by 2010 ³	36,825	72,360	92,560 ⁴
Light rail vehicle requirements	29	14	TBD
¹ The third phase is not included in the NJT 5 year capital budget for 1999-2003; therefore, actual start and finish dates, and number of vehicles are to be determined. ² Only a portion of the first phase, south of Exchange Place in Jersey City, will be in operation by this date. ³ The ridership numbers represent August 1999 estimates based on a flat fare. According to the NJT Project Director, NJT's Business Development Unit will set the actual fare structure in early 2000. ⁴ The ridership numbers were provided by the NJT Business Planning Office.			

The first phase is a 9.3-mile segment that includes 16 stations, running from East 34th Street in Bayonne through Jersey City to the Hoboken Terminal. Another branch will be constructed from the Liberty Park station into Jersey City. During this phase, a facility will be built to house maintenance shops, an operations control building, and a vehicle storage building. Twenty-nine light rail vehicles will be delivered for this phase to accommodate the forecasted weekday ridership of 20,000 when the segment south of Exchange Place begins operations in March 2000 and 36,825 for the full segment by 2010.

The second phase, totaling 6.1 miles and including eight stations, will add an extension north from the Hoboken Terminal through the Port Imperial Ferry station to the Tonnel Avenue station and south to 22nd Street. According to the NJT Project Director, approximately 14 additional light rail vehicles will be required during this phase. This segment is expected to begin operations in 2005 and systemwide weekday ridership will increase to 72,360 by 2010.

The third phase would add 4.7 miles and six stations to the System's northern, southern, and western ends; and additional light rail vehicles will be added. The NJT Business Planning Office estimates systemwide ridership will increase to 92,560 by 2010, after this segment is completed.

Project History

Planning for the system began in 1984, when NJT recognized that the full development potential of the Hudson River waterfront could not be realized without better transportation access. In 1985, an NJT study indicated that public transit should be the principal means of waterfront access given the magnitude of planned office space, the area's topographical problems, and the heavily congested highway network leading to the waterfront and to the trains and ferries crossing the Hudson River into Manhattan.²

In 1986 and 1987, NJT published studies that identified potential alignments and physical layouts for the waterfront corridor.³ After FTA approved NJT's application in November 1988, NJT examined nine transportation alternatives for the waterfront corridor as part of the original Environmental Impact Statement, which included seven build alternatives, a do-nothing alternative, and a low-cost alternative to expand and modify existing transportation systems.

In February 1993, the NJT Board approved a light rail system, extending from Hudson County to Bergen County; however, the Board recommended that NJT staff perform additional analyses to expand the system into Bayonne and through Jersey City. In November 1995, FTA approved expanding the system into Bayonne and providing rail service through downtown Jersey City. In January 1996, the NJT Board approved a locally preferred alternative report, which recommended the construction of a light rail project that would run along the east side of Hoboken, and include 32 stations and a yard and shop facility.

In October 1996, FTA awarded a full funding grant agreement for the first phase of the System, committing \$604.1 million of New Start funds and identifying an additional \$281.7 million in FTA funds. At the same time, NJT signed a contract with 21st Century Rail Corporation to design and build the first phase.⁴ In addition, 21st Century Rail will be responsible for commissioning, starting up, operating, and maintaining the entire system for 15 years before turning operations over to NJT.

² Hudson River Waterfront Transportation Study: Draft Transportation Plan, November 1985,

³ Hudson River Waterfront Transportation Study: Draft Transportation Plan Technical Report, April 1986, and Hudson River Waterfront Transportation Study: Conceptual Engineering Report, September 1987.

⁴ 21st Century Rail Corporation comprises Raytheon Engineers and Constructors, Kinki Sharyo (USA), Inc., and Itochu Rail Car, Inc. Raytheon Infrastructure Services, Inc., a subsidiary of Raytheon Engineers and Constructors, will serve as the general contractor and Kinki Sharyo and Itochu will build and maintain the light rail vehicles.

Construction of the first phase began in December 1996. In January 1997, at the request of the New Jersey Governor, the System's alignment was rerouted from the east side of Hoboken to the west side (see Figure 2 for the alignment change).

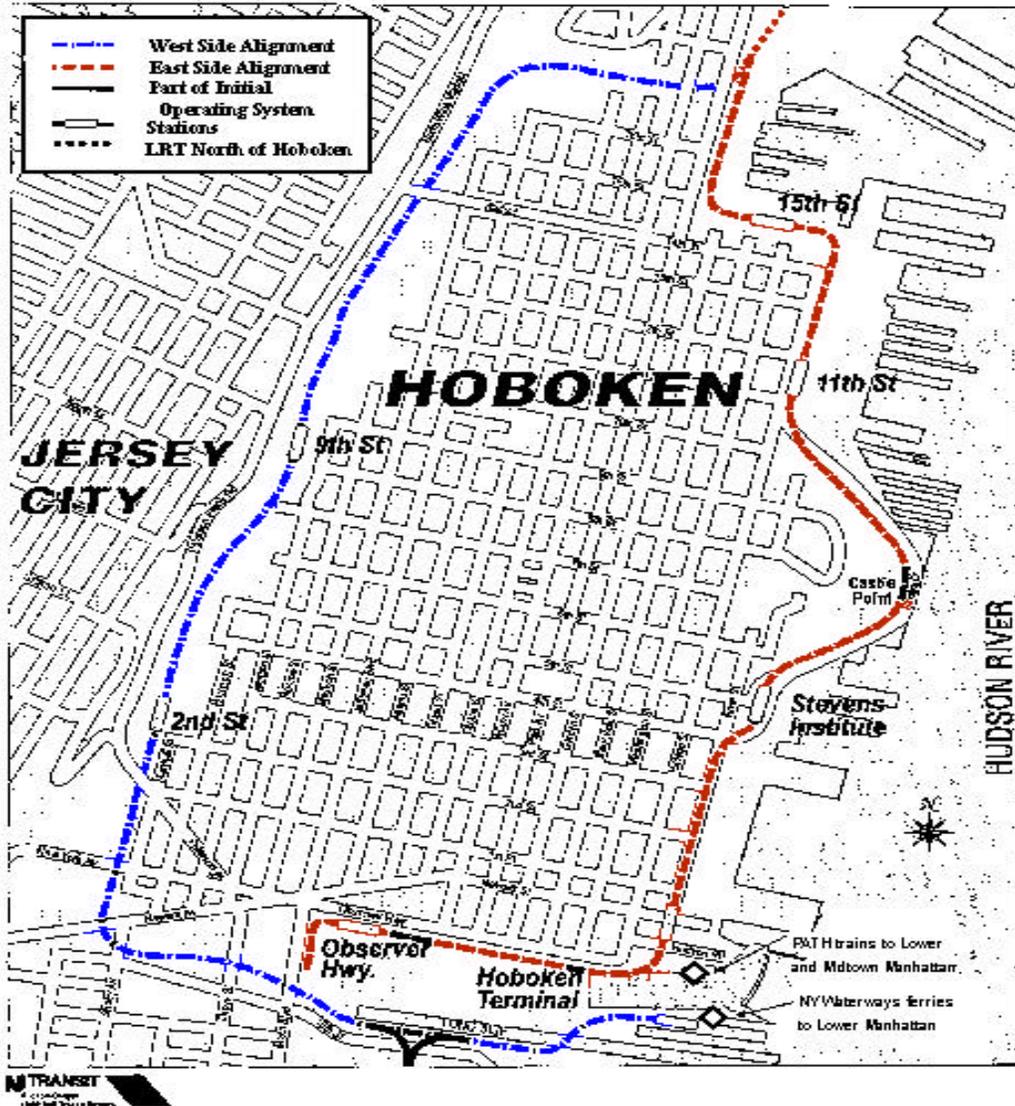


Figure 2-Alignment Change to the System

According to the NJT Project Director, the Mayor and City Council of Hoboken urged the Governor to request this alignment change because of the impact that the System would have on traffic and parking in downtown Hoboken. For example, the original alignment adversely affected traffic at two intersections and eliminated 778 parking spaces. The revised alignment would reduce the impact on traffic and eliminate only 12 parking spaces. Both the east side and the west side alignments were considered in the draft environmental impact statement that was developed between November 1988 and November 1992. FTA required that the impacts of the changed alignment, which primarily affects the System's second phase, be evaluated in an environmental assessment before it would approve the realignment. FTA also required NJT to perform the assessment because the Hoboken Terminal, including an adjacent area, is part of a historic waterfront district. NJT completed the environmental assessment for the alignment change in November 1998. After NJT received the necessary permits from the U. S. Army Corps of Engineers and approval from the State Historical Preservation Office, a Memorandum of Agreement was executed in April 1999 with the U. S. Department of Interior Advisory Council on Historic Preservation. On June 18, 1999, FTA issued a Finding of No Significant Impact approving the environmental assessment.

Current Status of Project

In its full funding grant agreement with FTA, NJT estimated that the cost of the first phase would be \$992.1 million (\$885.7 million in Federal funds and \$106.4 million in state funds) and it would begin service in July 2000. As of June 30, 1999, 21st Century Rail reported that 65 percent of the first phase's construction work had been completed and 15 of the 29 light rail vehicles required for the first phase had been delivered.⁵ In addition, revisions to the design/build contract's price and the start of service date stemming from the change in alignment were being negotiated between NJT and 21st Century Rail. According to the NJT Project Director, rerouting the alignment will result in savings from reducing the need for track to be embedded into streets and from property acquisition. In addition, changes in project financing have reduced the project's current cost to complete below the estimate in the grant agreement. About \$43.2 million in potential financing cost savings are already reflected in the June 1999 cost estimate for completing the project. The alignment change, however, will delay the start of service. The alignment change and required value engineering may further reduce the project's costs. However, the final amount of additional savings will not be known until the first phase of the project is

⁵ The rail vehicles were manufactured in Japan and the remaining vehicles for the first phase are being assembled at the Harrison Assembly Facility.

completed. If savings are realized, FTA plans to request that any Federal funds resulting from cost savings be made available for the second phase.

Costs Associated with the System

In its “Annual Report on New Starts: Proposed Allocations of Funds for Fiscal Year 2000,” FTA reported that NJT estimated the cost of the entire System at \$2 billion. As of June 1999, FTA had awarded a full funding grant agreement only for the first phase, which at that time was estimated to cost about \$950 million. In August 1999, the NJT Project Director estimated that the second and third phases would cost about \$990 million and \$250 million, respectively. Under the terms of the full funding grant agreement, funds can be used for designing and building the facilities and systems, procuring light rail vehicles, providing consulting services, using state and local agency labor forces, and project administration.

A contract with 21st Century Rail was awarded for the first phase of the System and includes additional costs that will be incurred after this phase is operating, and are not part of the full funding grant agreement. The contract includes costs associated with operating and maintaining the first and second phase of the System. The contract with 21st Century Rail estimated the costs at \$412.6 million over 15 years. NJT will pay the costs from revenue generated by the System. If NJT is unable to cover the costs from the System itself, it will cover them with other funds, including FTA formula funds.

The contract with 21st Century Rail has already been amended to reflect NJT's decision to incorporate bond financing. Expenses for the first phase will be paid from the proceeds of the bond sale until the full amount of FTA funds are received instead of having 21st Century Rail provide funds for the project, as originally planned. This decision reduced estimated financing costs by about \$43.2 million. As a large public agency, NJT has a lower cost of capital than a private firm such as 21st Century Rail. The full funding grant agreement included an estimate of \$161.9 million for 21st Century Rail to finance capital and light rail vehicle costs. As of June 30, 1999, NJT estimated its interest and finance costs for the first phase would be \$118.6 million to provide funding until Federal funds are received. Table 2 shows a comparison of the baseline budget in the full funding grant agreement for the first phase and the current estimated cost to complete.

Table 2 – Cost Data for the First Phase of the Hudson-Bergen Light Rail Transit System			
Types of Expenditures	Full Funding Grant Agreement Baseline Budget	Current Estimate to Complete	Difference
Design/build	\$476,625,077	\$476,625,077	\$ 0
Light rail vehicles	93,149,499	93,149,499	0
Consultant engineering	117,952,492	118,022,404	69,912
Financing cost	161,850,521	118,648,334	(43,202,187)
Property acquisition, in-house labor, project administration and other project costs	142,562,015	143,554,101	992,086
Total	\$992,139,604	\$949,999,415	(\$ 42,140,189)

In addition to the potential savings resulting from changes in financing, additional savings may be realized from required value engineering studies, and the change in track alignment. The exact amount of any cost reductions will not be determined until the first phase has been completed and the savings verified. If savings are realized at the completion of the first phase, NJT plans to request that any Federal funds resulting from the savings be made available for the second phase.

Sources of Funding for the Project

The Federal Government has committed to a maximum contribution of \$604.1 million in Section 5309, New Starts Funds, from fiscal year 1993 through fiscal year 2002. New Starts funds can be used to support final design, construction, consulting services, utility relocation, and project administration, including insurance and state and local agency labor costs. Additionally, NJT has chosen to use \$281.7 million in other FTA grant funds for the first phase of the System. These funds will be used primarily for debt service. The \$106.4 million in state funding commitments for the first phase come from funds expected to be provided by the Port Authority of New York and New Jersey and the New Jersey Transportation Trust Fund. In addition, NJT anticipates raising \$503.7 million from the issuance of two bonds to pay for the first phase's expenses until the full amount of Federal funds is received. As NJT reported in July 1999, over \$613 million for the System had been paid out through June 30, 1999. Federal funds totaling \$337.8 million have been appropriated for the first phase of which \$149.3 million have been spent (see Table 3 for the source of funds and expenditures).

Table 3- Source of Funds and Expenditures for the First Phase Through June 30, 1999			
Source of Funds	Authorized Funds	Appropriated Funds	Expended Funds
Federal:			
New Starts	\$604,088,750	\$228,303,620	\$105,928,882
Other FTA funds	281,651,665	109,449,998	43,390,332
Subtotal Federal	\$885,740,415	\$337,753,618	\$149,319,214
State:			
NJ Transportation Trust Fund	104,369,181	93,648,774	67,277,546
Port Authority NY/NJ	2,030,000	2,030,000	1,935,853
Subtotal State	106,399,181	95,678,774	69,213,613
Total	\$992,139,596	\$433,432,392	\$218,532,613

Although only \$69.2 million of the state's appropriated funds have been spent, NJT had also paid out \$394.5 million of the \$503.7 million in proceeds from the two bond issues. The bonds were issued at interest rates between 4.25 percent and 5.50 percent and were backed by the committed Federal funding. One of the bonds matures between 1999 and 2003. The other bond will be paid off over a 14-year period beginning in fiscal year 2000. In addition to providing funds for the state's share, the New Jersey Transportation Trust Fund guarantees that the first phase will be completed if there are any shortfalls in Federal funding. The grant agreement has a similar provision obligating NJT to complete the project regardless of any Federal funding shortfalls. Additionally, NJT has accepted sole responsibility for the payment of any additional costs.

In March 1999, FTA notified NJT that it hired an accounting firm, Walker & Company, to perform a financial capacity assessment of NJT. Walker & Company will analyze specific financial issues to assess NJT's ability to perform under its full funding grant agreement with FTA. The firm's assessment will include a review of the financial condition of NJT and the reliability of its funding partners, and its financial capability to operate the System. The assessment will also track funding sources. According to the FTA Director of Operations and Program Management, Region 2, this assessment is being performed to comply with the FTA Administrator's fiscal year 1999 policy decision requiring financial capacity assessment for all recipients of full funding grants.

Schedule of Planned Service

Under the full funding grant agreement, NJT agreed the entire first phase would begin service on or before July 2000. Service is scheduled to begin on an 8.1-mile segment, south of Exchange Place in Jersey City, by March 2000. Operations for the 1.2-mile portion north of Exchange Place to the Hoboken Terminal will be delayed until December 2001. The NJT Project Director attributed the delay to rerouting of the System and obtaining property easements through several properties between Exchange Place and 18th Street in Jersey City.

On May 24, 1999, NJT requested that FTA revise the full funding grant agreement to incorporate the west side alignment through Hoboken, to change the first phase's ending station from the Hoboken Terminal to Exchange Place, and recognize that the first phase will not reach the Hoboken Terminal until December 2001. NJT also noted in its request that neither final design nor construction could proceed until FTA revises the full funding grant agreement. In addition, NJT stated that revised project budget estimates would not be provided until 21st Century Rail completes the final design for the alignment change. The FTA Director of Operations and Program Management, Region 2, stated that no revisions to the full funding grant agreement will be made until all outstanding issues are settled and revised budget estimates are reviewed. NJT is negotiating with 21st Century Rail the cost to complete the design to build this segment.

Safety Issue That Could Affect the System

An issue that could affect operations relates to FTA and FRA coordination of safety oversight responsibilities when transit and freight operations share the same right of way and track. On the first phase of the System, light rail vehicles will operate on track that is within the same right of way as the Conrail successor's freight tracks.⁶ In addition, NJT's plans for the second phase include the west side alignment operating on the same track as Conrail's successor, with freight operating at night and transit operating during the day.

On May 25, 1999, FRA and FTA issued a Proposed Joint Statement of Policy Concerning Shared Use of the General Railroad System by Conventional Railroads and Light Rail Transit Systems. The proposed policy will affect both the first and second phase of the Hudson-Bergen system. It recognizes the potential for a collision between light rail and conventional railroad equipment, and describes the process FTA and FRA intend to follow for coordinating the use of their respective safety authorities, regarding rail transit systems that share right

⁶ As of June 1, 1999, Conrail's freight tracks, were part of the North Jersey Shared Asset Area between CSX and Norfolk Southern Railroad.

of way and tracks with freight equipment. In instances where a light rail system will operate on the same right of way as a conventional railroad and also share highway-rail grade crossings, FRA expects both systems to observe FRA rules on grade crossing signals. In addition, FRA and FTA will coordinate with transit agencies and railroads concerning safety measures.

The proposed FRA and FTA policy also requires light rail operators, who intend to share use of the general railroad system with conventional railroads, to comply with FRA safety rules or obtain a waiver from the appropriate rules. The policy summarizes how to obtain waivers of FRA safety regulations, including when light rail operations and conventional rail operations occur at different times. FRA also proposes that where time separation exists between light rail and conventional operations, it anticipates granting waivers concerning safety rules related to design of the passenger equipment, although waivers in other safety areas may not be granted. FRA requests that light rail operators and all other affected railroads jointly file a Petition for Approval of Shared Use. FTA will assist FRA in reviewing waiver requests. Accordingly, NJT must determine whether it will comply with FRA safety rules or obtain a waiver from the appropriate rules based on the finalized policy procedures for the planned shared track in the second phase.⁷ As of August 1999, NJT had not requested a waiver from FRA to operate the System on the general system railroad.

Pending Issues

At the conclusion of our baseline review, several of the issues discussed above were still pending final resolution by FTA and NJT. The alignment change and its impact on System costs and schedule were being negotiated between NJT and 21st Century Rail. The results of those negotiations could further affect the start of service date specified in the full funding grant agreement and project costs. Accordingly, we plan to monitor the actions that FTA and NJT take to resolve these open issues. Specifically we plan to monitor:

- the results of the accounting firm's financial capacity assessment,
- the System's ridership projections to determine whether System revenue will be sufficient to cover operation and maintenance costs,
- the actions NJT will take related to the FRA and FTA finalized joint policy statement and how operations of the second phase of the System will be impacted,

⁷ FTA and FRA issued the proposed policy for comments from interested parties before drafting a final policy. Written comments were requested to be submitted on or before October 29, 1999.

- actual costs of the alignment change, and
- contract modifications.

Recommendation

NJT expects to realize savings from reduced financing costs, value-engineering studies, and changes in the track alignment. Consequently, NJT plans to request that FTA revise the full funding grant agreement for the first phase so that any Federal funds resulting from the savings on the first phase be made available for the second phase. We recommend that the FTA Administrator postpone approving the NJT request to shift excess funds from the full funding grant agreement for the first phase until the pending issues are resolved.

Management Position

In its response to the draft report, FTA noted that the projected savings have not been finalized and will not be determined until the project is complete and has reached project closeout. FTA also noted that its policy requires potential savings to be substantiated and verified and any outstanding issues resolved before decisions are made on how to use the savings.

Office of Inspector General Comments

We consider FTA concurrence with our recommendation and the FTA policy, which requires potential savings to be substantiated and verified before decisions are made on how to use the savings, to be responsive to our recommendation.



U.S. Department
of Transportation
**Federal Transit
Administration**

Memorandum

Subject: **INFORMATON: FTA Response to OIG Draft Report on the Hudson-Bergen Light Rail Transit System: Project No. 99T-3013-R001** Date:

AUG 11 1999

From: *Dorrie Y. Aldrich for*
Dorrie Y. Aldrich
Associate Administrator for Administration

Reply to
Attn. of:

To: Francis P. Mulvey
Deputy Assistant Inspector General for Rail,
Transit and Special Programs

The Federal Transit Administration (FTA) has read through and worked with the Office of Inspector General (OIG) to complete the OIG Draft Report: the Hudson-Bergen Light Rail Transit System, dated July 15. For your reference, FTA's final comment to the OIG is as follows:

OIG Comment: The OIG cites cost of \$950.0 million for the project and a projected underrun of \$43.2 million.

FTA Response: This is a snapshot figure and because the project has at least another year to go before completion and probably another year after that to reach project close-out, this projected underrun appears to be premature. These project costs do not include any decreased costs that might be realized from the Hoboken Terminal alignment change. As a standard policy FTA does not entertain any recommendations on the use of any potential savings from the project until the savings have been substantiated and verified and any outstanding issues resolved.

I would like to thank you for the opportunity to read through and work with the OIG on the Draft Report as well as forward our comments. If you would like to discuss this further, please call me at 366-4007.