

# West Side Manhattan Transitway Study

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In response to the current and anticipated changes in the type and intensity of land use activities on Manhattan's West Side, the New York City Department of City Planning is conducting the West Side Transitway Study to ensure that adequate transportation services are in place to serve the new workers, residents, and visitors. The study, funded by the UMTA, is a four-phase effort that is examining potential transportation problems created by the anticipated developments, defining the degree to which improvements are needed, and determining the feasibility of implementing and operating new transit services and facilities to solve the identified problems. Because current sources of funding for public transportation are fully committed to the operation, rehabilitation,

and upgrading of New York City's existing systems, innovative methods for financing and implementing the recommended improvements are being explored. This paper summarizes the first three phases of the study's transportation component. The existing transportation conditions in the study area are explored along with the future problems and needs created by the new development. The type of transportation improvement alternatives developed, primarily light rail transit (LRT) options, and specific issues related to reinstituting LRT in a dense urban environment such as Manhattan are described. In addition, issues related to privatization of the project implementation and operation are reviewed.

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TO COPE WITH SIGNIFICANT changes in land use activities on Manhattan's West Side, the New York City Department of City Planning is conducting a major study to examine potential transportation problems and to seek solutions. Funded by UMTA, the West Side Transitway Study will develop land use strategies and a financial, legal, and institutional plan to support any transportation improvements. The first phase of the study's transportation component identified the transportation problems and needs within the study area, shown in Figure 1. (Note: The study area indicated in the figures in this paper is the original designation in which the east boundary in Midtown Manhattan was Lexington Avenue; the study area was later extended further east to the East River.)

In the second phase, the initial set of alternatives was refined and evaluated in the light of physical and operational constraints, costs, and ability to serve new travel patterns and demand levels. A reduced set of alternatives was carried into the third phase where more specific travel demand analyses, engineering, cost estimates, environmental evaluations, and public policy analyses are used to select a preferred alternative. The last phase of the study will package the proposed transportation improvements with the results of the land use and financial and institutional evaluations to form an integrated strategy for addressing the future transportation needs of the West Side. This paper summarizes the first three phases of the study, including issues related to privatization of the project implementation and operation.

## EXISTING CONDITIONS

The primary transit service on the West Side of Manhattan is two subway (rapid rail transit) lines in the north-south direction—the Eighth Avenue IND (Figure 1, A, C) and the Broadway-Seventh Avenue IRT (1, 2)—and three in the east-west direction—the 53rd Street IND (E, F), 42nd Street Shuttle and Flushing IRT (7), and the 14th Street (Canarsie) (L) lines. The major cross-town streets have bus services that generally run river to river. The north-south avenues as far west as 10th Avenue also have bus services. The study area also contains several major commuter facilities, including the Port Authority Bus Terminal, Penn Station, Grand Central Terminal, the Port Authority Trans-Hudson Corporation's (PATH's) Uptown (33rd Street) and Downtown (World Trade Center) terminals, the Staten Island Ferry Terminal, and the George Washington Bridge Bus Terminal.

The travel demand for most of these services and facilities is approaching or exceeds the supply at present. During the morning peak period the express services of the Seventh Avenue IRT and Eighth Avenue IND subway lines are overcrowded where they enter the hub of Manhattan, specifically the south-bound services at 60th Street. These lines are also congested during the



evening peak, in the opposite direction. (The overcrowded conditions exist at current scheduled train service; however, the subway lines have the capacity to handle additional trains that could alleviate some of the overcrowded conditions.) Many of the subway stations in the study area are among the busiest in the subway system—Grand Central, Times Square, 34th Street (Penn Station), and Herald Square—and also experience significant crowding during peak periods.

Like much of the core of Manhattan, the West Side street network experiences increasing traffic congestion resulting from a growing reliance on travel by motor vehicles, particularly automobiles and taxis. Most of the north-south avenues and the major crosstown streets in the study area operate at congested levels—level of service D or worse on a scale of A (best) to F (worst). Travel speeds in the congested streets are as low as 2.5 mph, which is slower than average walking speed. Slow operating speeds and high traffic volumes combine to create concentrations (called “hot spots”) of carbon monoxide pollution in excess of federally accepted air quality levels.

In addition to these problems, the area west of 9th and 10th avenues between 14th and 72nd streets has no subway service (see Figure 1). While this deficiency is not a major contributor to the problems with the transportation system today, the situation will change as this area is built up with new housing and offices.

## **FUTURE TRAVEL PATTERNS AND NEEDS**

Recent and proposed development on the West Side is concentrated in four areas: Battery Park City/World Trade Center; Penn Station/Convention Center area; Lincoln Square West, which includes the proposed Trump City development; and Port Harlem at the west end of 125th Street. Most of this development is in the area with no subway service. Overall, the new residential development on the West Side will produce an estimated 22,000 new morning peak hour transit trips—a 10 percent increase over the number produced by today’s residential inventory. The new office development will attract an additional 136,000 morning peak hour transit trips into the study area—a 14 percent increase. The evening peak hour will generate similar numbers, and the presence or expected construction of several major special trip generators—the Javits Convention Center, a new, relocated Madison Square Garden west of Penn Station, and a 1.5-million-ft<sup>2</sup> retail shopping mall in the Trump City proposal for the former rail freight yards between 60th and 72nd streets along the Hudson River—will create added loads on the transit system during the evening peak hour.

Most of the trips attracted by the new commercial development will originate in established residential areas of the outer boroughs and the

surrounding suburbs. Many of these people will use the existing public transportation network to commute to midtown and downtown subway stations and commuter terminals. These transit patrons attracted by the new office space require connections between the existing transit system and the developing areas of the West Side not currently well served by the existing system. Specifically, the development concentrations in the area between 14th and 72nd streets west of 10th Avenue need to be tied into the stations of the Seventh Avenue and Eighth Avenue subway lines and possibly other lines farther east, as well as the Port Authority Bus Terminal, Penn Station, Grand Central Terminal, and PATH Terminals (see Figure 2). South of 14th Street and north of 72nd Street, existing subway lines are situated in proximity to the areas of proposed development and should be able to handle the anticipated transit trip levels.

Most of the trips from the new residential development will have destinations in the established employment centers in midtown and lower Manhattan, and will need direct transit links or connections to the existing transit system serving these established areas.

The majority of the trips generated by the new developments will end up on the existing transit lines and services. Although there is the potential that the 130,000 new peak hour transit trips—some 55,000 new trips in the peak hour on the Seventh Avenue IRT and Eighth Avenue IND subway lines alone—will increase crowding on the subway lines and stations, the capital programs of the New York Metropolitan Transportation Authority (MTA) and other transportation operating agencies in the region are designed to enable the existing system to handle these new trips.

The new West Side development will generate additional automobile and taxi trips on the already congested street network. In the absence of significant new transit connections in the area between 14th and 72nd streets west of 10th Avenue, 5,100 automobile and taxi trips in the morning rush hour and 7,500 afternoon peak hour vehicle trips will be generated. These numbers are up to twice the number of trips that would be generated if improved transit connections were provided. With a good transit connection available, this area would generate 3,400 fewer trips in the morning peak hour—a drop of 52 percent—and 2,800 fewer trips in the afternoon peak hour—a drop of nearly 30 percent. Given the problems of traffic congestion and air quality in the West Midtown area, it is essential that convenient, comfortable, and secure transit connections be provided to minimize the number of vehicle trips generated by the new developments.

The shift in the modal distribution of new trips away from automobiles and taxis to transit as a result of new transit connections will generate an estimated 7,300 additional transit trips in the morning peak hour for a total of 31,300 new transit trips in the peak hour (a 30 percent increase over existing

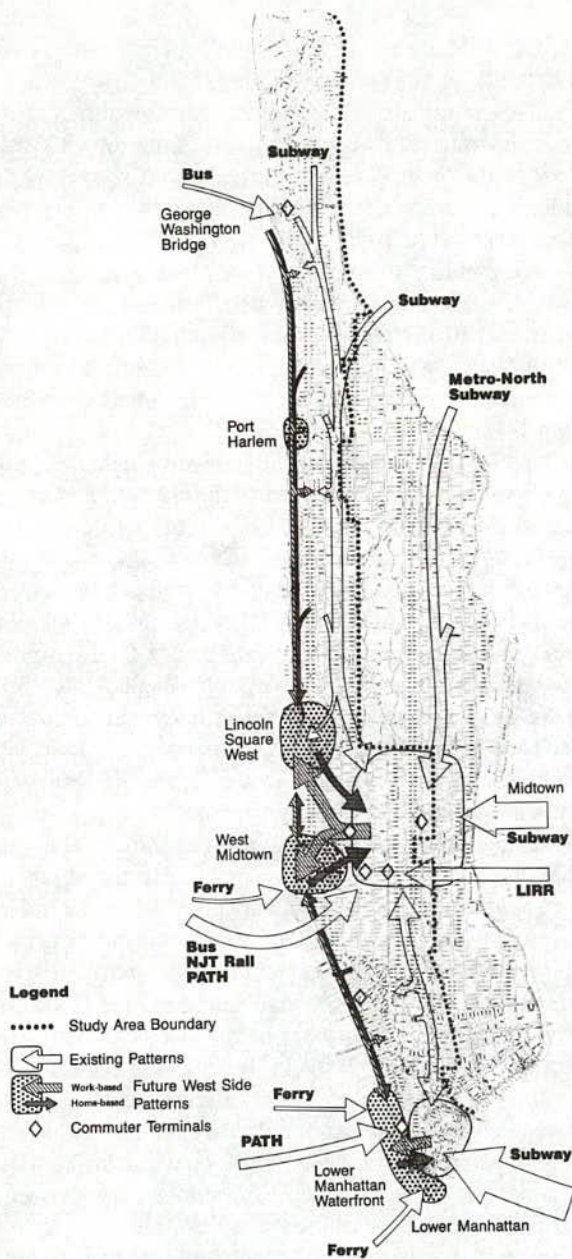


FIGURE 2 Transit demand patterns, morning peak.

transit volumes on the West Side). An additional 10,400 transit trips would be generated in the afternoon peak hour (a 28 percent increase) for a total of 47,000 new transit trips in the area between 14th and 72nd streets and west of 10th Avenue. The need to reduce traffic congestion and carbon monoxide produced by vehicles, as required by the policy of city, state, and federal governments, necessitates that good transit service connections be provided to the major development clusters on the West Side. This also will have the benefit of generating additional transit riders (and revenue) for the existing system.

In summary, the critical transportation needs identified in Phase I to be addressed by the West Side Transitway Study are twofold. First, to connect the developing areas of west Midtown between 14th and 72nd streets west of 10th Avenue with the Seventh Avenue IRT, Eighth Avenue IND, and other subway lines farther east; with the Port Authority Bus Terminal, Penn Station, PATH's 33rd Street Terminal and Grand Central Terminal; and to the midtown core. Second, to minimize automobile and taxi trips generated by the new development by attracting riders to transit through convenient, comfortable, and secure connections to the existing transportation system or to the midtown core.

In addition, the analysis of travel demand found that most of the trips from the new development were a combination of a north-south and an east-west trip and that a direct (no transfer) service was important in attracting riders to the transit service.

The West Side Transitway Study is focused on addressing the needs and problems of the developing area of the far West Side between 14th and 72nd streets, as well as considering the potential for improved transit services to the areas north and south. The problems of the existing public transportation systems and roadway network, such as crowding at stations and street congestion, are being addressed by the MTA, New York City and New York State departments of transportation, the Port Authority, and other state and local entities.

## **TRANSIT MODES**

The most pressing transit need that emerged from the analysis of travel patterns was for a collector-distributor system that would connect the developing areas of the far West Side of Manhattan that are underserved by transit today with the existing commuter terminals and subway system in Midtown Manhattan. Extensions of the existing subway system, or new subway construction, are too expensive to be privately financed—the major thrust of this study. In addition, the spacing of the stations would not

necessarily be compatible with the collector-distributor role of the proposed system.

Aerial structures across 42nd Street were determined to be unacceptable for environmental and aesthetic reasons. The lack of an affordable, completely exclusive right-of-way eliminated a fully automated guideway transit system.

Bus and light rail transit (LRT) emerged as the two modes of transportation that could work within the physical and operational constraints of the desired alignment. For many crosstown streets, improved bus service with some enhanced priority in the street to increase operating speeds meets the service needs. Along 42nd Street, however, the demand generated by either transit mode operating at the improved operating speeds offered by the transitway far exceeds the operational capabilities of bus technology. An unconstrained peak-hour, peak load point demand of 14,000 passengers is expected for a service operating at an average speed of about 9 mph at 3-min headways. As discussed later, LRT cannot handle the demand entirely.

## **PREFERRED ALTERNATIVES**

In Phase III of the study, eight alternatives were analyzed, including no-build and transportation systems management alternatives. The six "build" alternatives were all LRT options that essentially addressed the problem to be solved in the area. The alternatives varied in the north-south direction using either a railroad right-of-way (ROW) (called the Amtrak Cut), 11th Avenue, or the West Side Highway-12th Avenue, or some combination. All the options included a 42nd Street crosstown segment, except one that went across 34th Street. All included a grade-separated transit link between Penn Station and the Long Island Railroad yard development site.

The primary difference among the alternatives was the capital cost and, to a lesser degree, the revenue generated. As a result of the financial analysis (discussed later), only one alternative emerged as being financially feasible under a viable privatization scenario. This alternative is a two-track LRT line across 42nd Street (river-to-river) in an at-grade transitway (Figure 3). On the east end is a loop track with an extra layover track. At the west end the line has two possible alignments: down 11th Avenue at grade to 30th Street, where it goes onto an aerial structure along 30th Street to Ninth Avenue and then eastward along 31st Street to Penn Station; or down the reconstructed West Side Highway (12th Avenue) in the median or along the western edge of the highway to 33rd Street, where it would go into the tunnel under 33rd Street to Penn Station at Eighth Avenue. In either case, the end of the line will be a two-track stub-end terminal. The resolution of the issues that will determine which of these alignments will be selected will not occur within



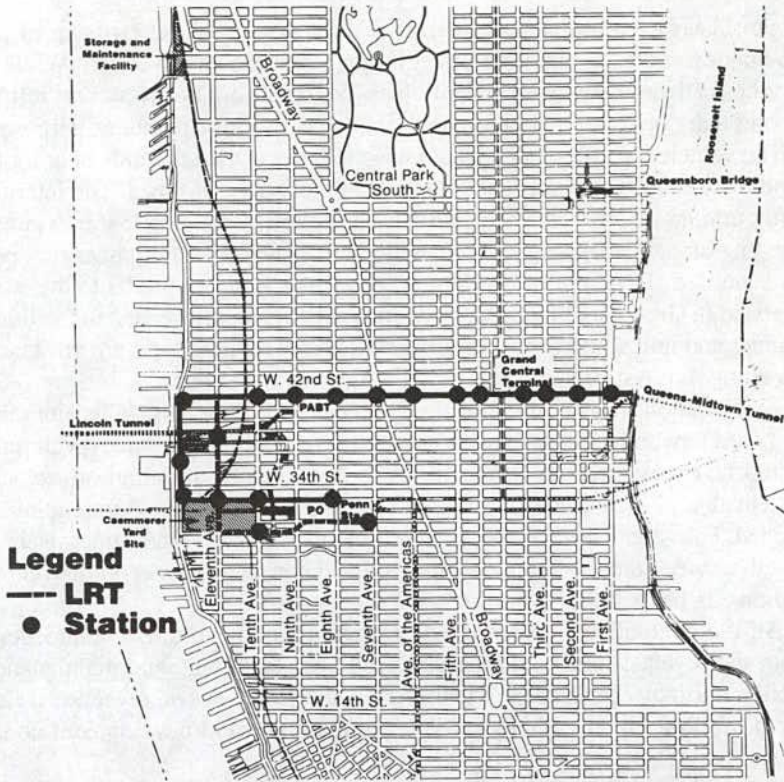


FIGURE 3 Preferred alternatives.

the time frame of the study, particularly the integration of the transitway with the highway reconstruction plans.

The peak-hour ridership for the system is forecast at 15,000 for the year 2005. The peak-load point demand of 14,000 (eastbound on 42nd Street in the area of Times Square) is constrained by the 10,000-passenger directional capacity of the system (two-car trains at 3-min headways). The total unconstrained peak hour demand for the system is estimated to be 19,000 riders. Even with the constraint, the daily ridership is expected to be 103,000 passengers. The annual ridership is forecast at 28.6 million, including over 3 million trips from the special trip generators such as Madison Square Garden and the Convention Center.

The operations are constrained by several factors. The block lengths in the north-south direction as well as some other factors limit the train length to under 200 ft. The study assumed two-car trains consisting of double-ended articulated vehicles of approximately 85 ft. The stub-end terminal at Penn

Station, heavy passenger boardings at several stops, and the crossing of all the major avenues along 42nd Street limited the headway to 3 min. While a shorter headway may be technically feasible, the 3-min headway was felt to be one that could be operated reliably and was used for planning purposes.

The vehicle for this service would have to have several features in order to handle the projected passenger loads and minimize dwell times. The internal configuration of the vehicle would have very few seats to allow maximum standing area. A total capacity (standing and seated) of 250 passengers per car is needed. To minimize dwell times, low-floor vehicles similar to the ones operated in Grenoble, France, or Geneva, Switzerland, are needed to facilitate loading and unloading from the curbside. High-level platforms are not feasible along 42nd Street.

An operational factor affecting dwell times is fare collection. Conventional on-board fare collection will not work at the high-volume stations; dwell time would be excessive. The issue still needs to be resolved, but an off-vehicle system that allows usage of all vehicle doors for loading and unloading is needed. Fare-controlled platforms are not feasible along 42nd Street. Hence, a self-service fare system, with inspection upon boarding at high-volume stations, is proposed.

All the alternatives, except the preferred option, have direct connections from the revenue tracks into the proposed vehicle storage and maintenance facility north of 72nd Street. The preferred alternative has no revenue service north of 42nd Street, although a future stage of system development could extend service farther north or south.

No viable sites for a full yard and shops exist adjacent to the revenue tracks south of 42nd Street. The 72nd Street site is the only location for the major maintenance and repair facility. The connection to the yards from the revenue tracks would be by way of the Amtrak Cut. The cut has sufficient width to have several lay-up tracks, but not a separate light transit connection to the yards. This connection would be over the proposed Amtrak tracks. Trains of light rail vehicles would be pulled over the Amtrak tracks by a diesel locomotive up to the yards. Overnight storage and major inspections and repairs would be done at the 72nd Street yards. Midday storage, running repairs, and daily inspections would be conducted south of the Amtrak connection in the railroad cut around 34th Street. While this arrangement is inefficient and imposes some potential operational constraints, it is the only means developed thus far to provide a yard and shop facility for the preferred alternative; without this, the alternative is infeasible.

The capital cost for the 3-mi line is \$284 million. The factors contributing to the high capital cost include:

- Relocation of the maze of utilities under Manhattan streets;

- Maintenance of traffic for Manhattan's heavily traveled roadways;
- Large fleet requirements (35 vehicles) relative to the system length;
- Remote location of a maintenance facility; and
- Construction of the aerial structure or tunnel for the connection into Penn Station.

The annual operating and maintenance cost is estimated to be \$7.5 million. This estimate includes costs for the fare collection system, the special operations for the connection to the remote yards, and extra service to handle the special events at Madison Square Garden and the Convention Center.

The ridership estimates are based on charging a separate \$1 fare to use the system—distinct from any fare charged to use the existing transit system. A significant portion (two-thirds) of the expected morning peak riders are traveling along 42nd Street for the final portion of their journey from the commuter terminals or the subway system. In the absence of the transitway, these passengers would either use the crosstown bus (which will be replaced by the LRT line) or walk. The transitway offers a substantial increase in speed and capacity over the existing bus service. It is the combination of attracting both trips along 42nd Street and trips from the developing areas of the far West Side that provides the revenue that is the basis of the financing plan for the system.

## **FINANCIAL AND INSTITUTIONAL ISSUES**

A major challenge in establishing the feasibility of the West Side Transitway was to determine whether the project could be constructed and operated without infringing on the region's ability to revitalize the existing public transportation system. This challenge posed two key questions. First, could the project succeed financially without relying on any of the revenue sources currently used to fund transit in the city? Second, under what type of institutional arrangements could these financial plans be implemented? An underlying theme to both of these questions, and an object of major interest to the study, was the extent to which private sector participation could expedite the project's implementation.

The financial and institutional analysis addressed these questions through the following steps. First, three financial plans were developed for each of the transitway alternatives. Each plan was intended to offer a different allocation of risk between the public and private sectors—100 percent private risk, shared public-private risk, and 100 percent public risk. Second, the feasibility of the plans was evaluated according to the internal rate of return to private investors in the project, and the amount of publicly derived revenues needed to make up the shortfall between operating revenues and the full cost

of the project. This included a review of new revenue sources that could be implemented to support the project's cost. And finally, a review of the ability of potential public sponsors for the project was undertaken to determine the legal and legislative requirements to implement the project.

These analyses found that private sector financing of the project was more attractive than a traditional, tax-exempt financing approach. A special assessment was selected as the preferred revenue source. Further, the preferred alternative (described in the previous section) was the only transitway alternative that met the tests of feasibility, and the project could be implemented either by the city or by an existing or new state-created public authority. The key findings from each of these analyses are summarized below.

### **Financing Plans**

The financing plans used in the analysis reflected a concept developed early in the study regarding possible approaches to the ownership of the transitway assets—a continuum ranging from complete private ownership to complete public ownership, with various options for shared ownership. The ownership of assets was stratified in this way because ownership dictates the types of financing mechanisms that can be used. The development of financing plans that reflected this distribution of ownership allowed the study to consider the merits of different financing mechanisms.

1. *Private Structure.* In the private structure approach, the transitway would be implemented via a franchise wherein a private company would assume all risks for the project. This approach relied on debt financing for construction and a combination of equity, senior lien debt, and subordinated debt for all permanent financing exclusive of vehicles. A leveraged lease was used for rolling stock procurement. Farebox revenues and advertising fees were the only sources of revenue for the project.

2. *Public-Private Structure.* In the public-private structure approach, the transitway would be implemented via a service contract between a sponsoring public agency and a private company or consortium. The private company would assume all risks for the cost of the project, while the public agency would assume all revenue risks. Thus, the public sponsor would agree to pay a negotiated annual service fee to the private company, irrespective of whether the operating revenues were sufficient to cover the fee. Revenue shortfalls would have to be made up from an alternate source. The financing structure used for the private company was similar to that used in the franchise approach above.

3. *Public Structure.* In the public structure approach, tax-exempt debt would be used to pay for construction and vehicle acquisition. Its chief

difference from the traditional approach to financing public transit capital projects is that no government grants were assumed to be available, and that the revenues (operating revenues and alternative revenue sources, such as special assessment) used to pay debt service cost would not be available until the transitway was operational. As a result, the capitalized interest costs would be substantial.

The results of this analysis contained some surprises. First, the public structure approach did not fare well because of the extent of capitalized interest costs. That is, the additional interest costs associated with 100 percent debt financing exceeded the benefits of the lower interest rate available through tax-exempt bonds. This finding is interesting in that it reveals the true cost of transit capital projects that is often masked when extensive federal financing is available. Second, the pretax rates of return for the private structure (i.e., the franchise approach) ranged from 4 to 12 percent—not high enough to attract investors. Given that the transitway alternatives are located in one of the most densely developed and transit-dependent areas of the country, these findings suggest that private sector ownership of capital-intensive transit systems is not viable without some public sector support. Finally, the annual shortfalls between full costs (operating and maintenance cost plus return on investment) and operating revenues for the public and public-private structures required that a strong and predictable alternative revenue source be available at least through the early years of the project.

## **Revenue Sources**

Existing transit services in New York City are funded by a combination of operating revenues, bridge and tunnel toll revenues, general funds of the city, a mortgage tax, and grants from the State of New York and the federal government. All of these revenue sources were considered to be off limits to the project, given the intense and regionwide interest in revitalizing the existing transit infrastructure. Accordingly, the search for potential revenue sources focused on new mechanisms not needed to support the revitalization efforts.

The revenue sources considered in the analysis were all related in some fashion to the real estate development projected to occur in the study area. The rationale for the use of these revenue sources reflected two attributes of the transitway project: its ability to improve accessibility for travel to and within the service area, which should contribute to higher land values and rents; and its ability to mitigate the impacts to the existing transportation infrastructure associated with higher density development. It was generally

agreed that existence of these benefits was essential to the acceptance and use of new, real estate-related revenue sources.

Six types of revenue sources were investigated:

- **Special assessments**—a fee (exclusive of property taxes) levied on property that is benefited by an adjacent or nearby public improvement. Special assessments have been used to support the financing of public transit improvements in Miami, Los Angeles, and Denver and were contemplated by the New York State legislature in the Rapid Transit Law of 1898.

- **Tax-increment financing (TIF)**—the dedication of incremental property taxes (above the current tax base) in a specified district to the financing of public improvements in that district. Although TIF is not commonly used to finance transit improvements, it was used to support the financing of the Embarcadero Station in San Francisco.

- **Sale or lease of public property or air rights**—the sale or lease of development rights above or adjacent to the station. It has been used as a source of revenue by the rapid transit systems in Washington, D.C., and Miami.

- **Zoning incentives**—incentives such as increases in the allowable floor-to-area ratio of a lot have been awarded by the city in return for the provision of certain public improvements (e.g., subway station improvements) by a developer, where these improvements are rationally related to the incentive being offered.

- **Mitigation**—actions taken by a person, or by a business entity, to minimize or avoid adverse environmental impacts associated with an action (e.g., a development) under consideration by a governmental agency. Developers have often provided public improvements as a component of the mitigative actions associated with new development (e.g., an esplanade along the East River was rebuilt by developers to mitigate an adverse environmental impact on open space).

- **Impact fees**—fees that are levied on new development and represent the new development's pro rata share of necessary public improvements that, but for the new development, would not be required to service existing residents. Although not commonly used for transit purposes, impact fees are levied on new office development in downtown San Francisco to support expansion of peak period transit services in connection with the increased transit demand generated by new office space.

Each of these potential revenue sources was evaluated with respect to five criteria: income generating ability (yield and profile), risk, legislative requirements, litigation risk, and administrative requirements. Special assessments were found to be the most logical choice. Although state enabling legislation

would be required, this revenue source was preferred because: (1) it was established that the transitway alternatives enhanced accessibility (as measured by travel time savings) both to and within the study area; (2) these benefits would accrue to existing and to new development; (3) assessments could be collected concurrent with the city's collection of property taxes and be subject to the same system of remedies if collections were delinquent; (4) there exists legislative precedent within the state for its use; and (5) it could easily meet the revenue shortfalls projected in the financing plans.

## **Feasibility Analysis**

Two criteria were used to evaluate the feasibility of the transitway alternatives. First, the pretax internal rate of return was used to evaluate the private structure finance plan. A minimum rate of 15 percent was believed to be necessary to attract investors to the project.

Second, the amount and duration of special assessments (based on the assessment per square foot of commercial property within walking distance of the transitway) was used to evaluate the public-private structure and the public structure finance plans. A rate of 30 cents/ft<sup>2</sup> was used as the threshold value. This rate was the approximate midpoint of the range of assessment rates in use in Miami and Los Angeles. These rates were adjusted to a comparable rate for New York City by normalizing for prevailing rents. This approach was used to ensure that the threshold rate was not so high as to deter new development.

The feasibility analysis found that only one of the transitway alternatives was financially viable and only under the public-private finance plan. This preferred alternative consists of an LRT line on 42nd Street between First and 12th avenues, on 11th or 12th Avenue between 42nd Street and the vicinity of the Jacob Javits Convention Center, and between the Convention Center and Penn Station. This alternative has a 15.4 percent internal rate of return and an assessment rate of 18 cents/ft<sup>2</sup> in 1994, declining to 3 cents/ft<sup>2</sup> in 1999 (the last year of the assessment).

It is notable that these results reflect relatively conservative assumptions on inflation rates [approximately 6.5 percent annually for construction and operating and maintenance (O&M) costs], financing charges, and ridership growth. Also, O&M and construction costs were modeled based on public sector experience. Nationally, private sector construction costs are approximately 15 percent lower. This would reduce the assessment rate by almost 50 percent and bring the private structure (i.e., franchise) approach to the threshold of feasibility.

## Legal and Legislative Requirements

The financial analyses found that the preferred transitway alternative should be implemented through the use of a service contract between a sponsoring public entity and a private company or consortium. It is likely that the service fee to be paid to this company could not be borne by operating revenues alone, at least in the early years of the project—an alternate revenue source will be needed. A special assessment was found to be the most logical choice to provide these additional revenues.

The provision of transit services in the city via a service contract, and the use of a special assessment to support the funding requirements of these services, is a significant departure from the existing institutional environment. Currently, transit services are provided by the New York City Transit Authority (TA). The TA accordingly has all the powers necessary to operate transit service and to use city streets for this purpose. However, the TA does not purchase transit services via contract and its ability to do so on the scale envisioned for this project is open to question. Also, while the power to levy special assessments was apparently conferred on the TA in its enabling legislation (when it was conferred powers that were originally conferred on the city by the Rapid Transit Law of 1898), its ability to exercise this power has never been established.

Accordingly, an analysis of the legal and legislative requirements for implementing the project was conducted. This analysis consisted of a review of the requirements for establishing special assessment districts and a review of the powers of existing public institutions to implement the project using a service contract.

While the project's implementation by any public entity would require state legislation, the city may face the lowest hurdles. With the passage of a local law, the city could enter into contracts for the purchase of transit services. State enabling legislation would be required, however, to implement a special assessment district. There is no associated requirement for local approval of the special assessment.

A public authority, such as the TA or any other state-created public authority, could also implement the project, but not without additional state legislation and not without the city's involvement. For these authorities, state legislation would be required for at least the use of a service contract (for the TA), and possibly other mass transportation-related powers (if an authority other than the TA were to sponsor the project). State legislation would also be required for the special assessments, and this legislation would stipulate the city's involvement in the exercise of this power (e.g., in establishing the assessment rate).



## CONCLUSION

This study generated several important findings that are relevant to consideration of LRT in comparable situations. The transportation need of new concentrations of dense development in urban centers is for a collector-distributor service connection to the existing transportation system. As such, frequent and easily accessible stations or stops are needed.

Placing a new LRT system into a very densely developed area that has limited feasible alignment options can introduce limitations on the operational potential (speeds, capacity) of the technology. The capital cost of constructing LRT is greatly affected by the environment into which it is placed. Relocation of dense old utilities, maintenance of traffic, and limited construction space can increase the cost significantly.

Given that the proposed transitway alternative is located in one of the most densely developed and transit-dependent areas of the country, this study indicates that private sector ownership of capital-intensive transit systems is not viable without some public sector segment.